REQUEST FOR PROPOSAL

ALAMEDA-CONTRA COSTA TRANSIT DISTRICT (AC TRANSIT)
BUS RAPID TRANSIT BUS PROCUREMENT
27, 60 FOOT, LOW FLOOR DIESEL HYBRID, 5 DOOR BUSES

• Pre-Proposal Conference: 14 October 2014
• Contractor Questions Due Date: 28 October 2014
• Response to Contractor Questions: 07 November 2014 (or sooner)
• Proposal Due Date: 27 March 2015

ALL DETAILED INFORMATION REGARDING THE ABOVE DATA IS ENCLOSED HEREIN
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NR 1. Description of the Work to be Done

The District requests Proposals for the manufacture and delivery of transit buses/spare parts/options if any in accordance with the terms and conditions set forth in RFP 2013-1235. The Contract shall be a firm-fixed price Contract.

Specifically, the District is requesting the following types of buses: quantity 27, 60 foot, low floor diesel hybrid motor coaches (DHMC) with five (5) passenger doors.

This Addendum No. 3 restates the requirements of RFP 2013-1235, as initially issued in December 2012. The data contained in Addenda Nos. 1 and 2 have been superseded by this Addendum No. 3.
NR 2. Obtaining Proposal Documents
Proposal documents may be obtained from the Purchasing Manager, Sharon E. Dennis at the AC Transit District, 1600 Franklin Street, 8th Floor, Oakland, CA 94612. See IP3, for further detail.

NR 3. Proposal Due Date and Submittal Requirements
Proposals must be received by 1:00 p.m., 27 March 2015.

- Sealed Proposals shall be submitted to either of the following addresses:
  a. For courier delivery or hand delivery: AC Transit District, Purchasing Department, 8th Floor, 1600 Franklin Street, Lobby, Oakland, CA 94612. Or,
  b. By U.S. mail addressed to: AC Transit District, Purchasing Department, Ms. Sharon E. Dennis, 8th Floor, Oakland, CA 94612.

- Envelopes or boxes containing Proposals shall be sealed and clearly labeled with the District's Proposal number and the solicitation title: RFP 2013-1235/BUS RAPID TRANSIT (BRT) BUS PROCUREMENT.

- Proposers are requested to submit to the District one hard copy marked “Original,” ten (10) additional printed copies, and ten (10) CDs, each containing an electronic PDF copy of the Proposal. In case of any discrepancies, the hard copy will be considered by the District in evaluating the Proposal, and the electronic version is provided for the District's administrative convenience only. A Proposal is deemed to be late if it is received by the District after the date and time stated above. Proposals received after the submission deadline may be rejected.

NR 4. Validity of Proposals
Proposals/Offers shall be valid for a period of not more than 240 days.

NR 5. Pre-Proposal Conference Information
A Pre-Proposal Meeting will be held on 13 January 2015. The meeting will convene at 10:00 a.m. in the AC Transit District’s Board Room located at 1600 Franklin Street, 2nd Floor, Oakland, CA 94612. Proposers may also participate via conference call. The call-in number and instructions will be provided at a later date.

Prospective Proposers are requested to submit written questions to the Purchasing Manager, Ms. Sharon E. Dennis, identified below, two (2) weeks subsequent to the Pre-Proposal Conference. Addendum No. 4 will be issued within two (2) weeks subsequent to the receipt of these questions. The Pre-Proposal Conference will address all aspects of the RFP and will entertain questions directly related to clarifications of
content, all other questions will be provided at the Conference and shall be addressed by follow-on Addenda. Prospective Proposers are reminded that any changes to the RFP will be by written addenda only, and nothing stated at the Pre-Proposal Conference shall change or qualify in any way any of the provisions in the RFP and shall not be binding on the District.

Contact Information:
Name: Ms. Sharon E. Dennis
Title: Purchasing Manager/Contracting Officer
Address: AC Transit District, Purchasing Department, 1600 Franklin Street, Oakland, CA 94612
Phone number: 510-891-5497
E-mail: sdennis@actransit.org
Additional contact: Mr. Jonathan Medwin, Director of Procurement, 510-891-5474

Identification of Source of Funding
Financial support of this project is provided through financial assistance grants from the Federal Transit Administration (FTA), State of California and regional funds.

SECTION 2: INSTRUCTIONS TO PROPOSERS

IP 1. Quantities
The Work under these Contract documents consists of the manufacture and delivery of a base order of 27, 60 foot, 5 door BRT Buses.

IP 2. Proposed Schedule for the Procurement
The following is the solicitation schedule for proposers:

- Pre-Proposal Conference: 14 October 2014
- Proposer questions due: 28 October 2014
- Responses to Proposer’s Questions: 07 November 2014
- Proposal Due Date: March 27, 2015

IP 3. Obtaining Proposal Documents
Proposal documents may be obtained by downloading the RFP at www.actransit.org, bidding opportunities, documents requested by mail will be packaged and sent postage paid. Documents requested by courier will be packaged and sent only at the Proposers’ expense.
IP 4. Proposal Security Requirements (Reserved)

IP 5. Pre-Proposal Meeting/Information for Proposers
A Pre-Proposal Conference will be held on 14 October 2014. The meeting will convene at 10:00 a.m. in the District’s 2nd Floor Board Room located at 1600 Franklin Street, Oakland, CA 94612. Proposers can also participate via conference call. The call-in number and instructions are as follows: (TO BE DETERMINED). Prospective Proposers are urged to make every effort to attend this meeting.

Prospective Proposers can submit written questions to the Contracting Officer at least three (3) weeks in advance of the Pre-Proposal Conference, as well as two (2) weeks subsequent to the Pre-Proposal Conference. All written questions will be answered by formal Addendum.

IP 6. Questions, Clarifications and Omissions
All correspondence, communication and contact in regard to any aspect of this solicitation or offers shall be only with the Contracting Officer identified above. Unless otherwise instructed by the Contracting Officer, proposers and their representatives shall not make any contact with or communicate with any member of the District, or its employees and consultants, other than the designated Contracting Officer, in regard to any aspect of this solicitation or offer.

At any time during this procurement up to the time specified in “Proposed Schedule for the Procurement,” Proposers may request, in writing, a clarification or interpretation of any aspect, a change to any requirement of the RFP, or any addenda to the RFP. Requests may include suggested substitutes for specified items and for any brand names, which whenever used in this solicitation shall mean the brand name or approved equal. Such written requests shall be made to the Contracting Officer. The Proposer making the request shall be responsible for its proper delivery to the District as identified on the form CER 2 Request for Pre-Offer Change or Approved Equal. Any request for a change to any requirement of the Contract documents must be fully supported with technical data, test results or other pertinent information showing evidence that the exception will result in a condition equal to or better than that required by the RFP, without a substantial increase in cost or time requirements.

All responses to Request for Pre-Offer Change or Approved Equal shall be provided to all proposers. Any response that is not confirmed by a written addendum shall not be official or binding on the District.

If it should appear to a prospective Proposer that the performance of the Work under the Contract, or any of the matters relating thereto, is not sufficiently described or explained in the RFP or Contract documents, or that any conflict or discrepancy exists between different parts of the Contract or with any federal, state, local or District law,
ordinance, rule, regulation or other standard or requirement, then the proposer shall submit a written request for clarification to the District within the time period specified above.

**IP 7. Addenda to RFP**

The District reserves the right to amend the RFP at any time in accordance with “Proposed Schedule for the Procurement.” Any amendments to the RFP shall be described in written addenda. Notification of and/or the addenda also will be distributed to all such prospective Proposers officially known to have received the RFP. Failure of any prospective proposer to receive the notification or addenda shall not relieve the Proposer from any obligation under the RFP therein. All addenda issued shall become part of the RFP. Prospective Proposers shall acknowledge the receipt of each individual Addendum in their Proposals on the form Acknowledgement of Addenda CER 3. Failure to acknowledge in the Proposal receipt of Addenda may at the District’s sole option disqualify the Proposal.

If the District determines that the Addenda may require significant changes in the preparation of Proposals, the deadline for submitting the Proposals may be postponed no less than ten (10) days from the date of issuance of Addenda or by the number of days that the District determines will allow Proposers sufficient time to revise their Proposals. Any new Due Date shall be included in the Addenda.

**IP 8. DBE Requirements for Transit Vehicle Manufacturers**

Pursuant to Title 49, Code of Federal Regulations, Part 26.49, a Proposer, as a condition of being authorized to respond to this solicitation, must certify by completing the form DBE Approval Certification that it has on file with the Federal Transportation Administration (FTA) an approved or not disapproved annual disadvantaged business enterprise (DBE) subcontracting participation goal. CER 8.7 is adequate. Upon receipts of TVMs certificates, Contract Compliance Administrator will check the FTA directory to verify proposers’ eligibility for bidding.

**IP 9. Buy America Certification**

This Contract is subject to the “Buy America” requirements of 49 United States Code (USC) §5323(j) and 49 Code of Federal Regulations (CFR) Part 661, as may be amended from time to time, and applicable federal regulations. Prospective proposers’ attention is directed to 49 CFR §661.11, “Rolling Stock Procurements.” Prospective Proposers have the responsibility to comply with the cited and any governing statutes and regulations, including official interpretations.

A Proposer shall submit to the District the appropriate Buy America certification, included in this document, with all offers on FTA-funded contracts. Proposals that are not accompanied by a properly completed Buy America certification are subject to the provisions of 49 CFR 661.13 and will be rejected as nonresponsive.
The two signature blocks on the Buy America certificate are mutually exclusive. Proposers shall sign only one signature block on the certificate. Signing both signature blocks will make the Proposal nonresponsive. A false certification is a criminal act in violation of 18 USC §1001.

A Proposer who has submitted an incomplete Buy America certificate or incorrect certificate of noncompliance through inadvertent or clerical error (but not including failure to sign the certificate, submission of certificates of both compliance and noncompliance, or failure to submit any certification), may submit to the FTA chief counsel within ten (10) days of Proposal opening a written explanation of the circumstances surrounding the submission of the incomplete or incorrect certification in accordance with 28 USC §1746, sworn under penalty of perjury, stating that the submission resulted from inadvertent or clerical error. The Proposer will also submit evidence of intent, such as information about the origin of the product, invoices, or other working documents. The Proposer will simultaneously send a copy of this information to the District.

The FTA Chief Counsel may request additional information from the proposer, if necessary. The District may not make Contract award until the FTA Chief Counsel issues his or her determination, except as provided in 49 CFR Part 661.15(m).

Certification based on ignorance of proper application of the Buy America requirements is not an inadvertent or clerical error.

A waiver from the Buy America provisions will be sought by the District from the FTA, for the proposed awardee, if the grounds for a waiver exist. All Proposers seeking a waiver must submit to the District a timely request in writing, which shall include the facts and justification to support the granting of the waiver. Such waiver from the Buy America provisions may be granted if the FTA determines the following:

1. Their application would be inconsistent with the public interest;
2. Materials are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or
3. Inclusion of domestic material will increase the cost of the overall Contract by more than 25 percent.

Any party may petition the FTA to investigate a successful Proposer’s compliance with the Buy America certification. The procedures are set out in 49 CFR Part 661.15. If the FTA determines the evidence indicates noncompliance, the FTA will require the District to initiate an investigation. The successful proposer has the burden of proof to establish compliance with its certification. If the successful proposer fails to so demonstrate compliance, then the successful Proposer will be required to substitute sufficient domestic materials without revision of the original Contract terms. Failure to do so will
be a breach of the Contract and may lead to the initiation of debarment proceedings under 49 CFR Part 29.

IP 10. Conditions, Exceptions, Reservations or Understandings
Proposers are cautioned to limit exceptions, conditions and limitations to the provisions of this RFP, as they may be determined to be so fundamental as to cause rejection of the Proposal for not responding to the requirements of the RFP.

Any and all Deviations must be explicitly, fully and separately stated in the Proposal by completing Form for Proposal Deviation CER 5, setting forth at a minimum the specific reasons for each Deviation so that it can be fully considered and, if appropriate, evaluated by the District. All Deviations shall be evaluated in accordance with the appropriate evaluation criteria and procedures and may result in the Proposer receiving a less favorable evaluation than without the Deviation.

Form for Proposal Deviation shall be included in the Technical package.

IP 11. Protest Procedures
All protests must be in writing, stating the name and address of protestor, a contact person, Contract 2013-1235 and title. Protests shall specify in detail the grounds of the protest and the facts supporting the protest. District’s Protest language is stated below:

A. Protests based upon the content of the solicitation: Any protest concerning the contents of the solicitation must be filed prior to the bid opening or proposal submission date.

B. Protests based upon grounds other than the content of the solicitation: Protests must be filed no later than ten (10) calendar days after the District’s notice of intent to award, or notice of award, or notice of non-award; whichever occurs first.


Address

- District Contact: Mr. Jon Medwin, Director of Procurement, 510-891-5474.
- For special delivery or hand delivery: AC Transit, Contract Compliance Administrator, 5th Floor, 1600 Franklin Street, Oakland, CA 94612
- For U.S. Mail: AC Transit District, Mr. Phillip McCants, Contract Compliance Administrator, 5th Floor, 1600 Franklin Street, Oakland, CA 94612
Protests not properly addressed to the address shown above may not be considered by the District.

Copies of the District’s protest procedures and the protest provisions of FTA Circular 4220.1F or its successor may be obtained from Mr. Jon Medwin, Director of Procurement and Materials, 510-891-5474. Proposals will be opened and a Notice of Award will be issued by the District in accordance with the District’s protest procedures and the protest provisions of FTA Circular 4220.1F or its successor.

Pre-Proposal Protests
Pre-Proposal protests are protests based upon the content of the solicitation documents. Three copies of Pre-Proposal protests must be received by the District’s office no later than fifteen (15) calendar days prior to the Due Date. Protests will be considered and either denied or sustained in part or in whole, in writing, in a manner that provides verification of receipt, prior to the Due Date for Proposals. A written decision specifying the grounds for sustaining all or part of or denying the protest will be transmitted to the protestor prior to the Due Date for Proposals in a manner than provides verification of receipt prior to the Due Date for Proposals. If the protest is sustained, the Proposal Due Date may be postponed and an addendum issued to the solicitation documents or, at the sole discretion of the District, the solicitation may be canceled. If the protest is denied, Proposals will be received and opened on the scheduled date unless a protest is filed with FTA. See “FTA Review,” below.

Protests on the Recommended Award
All proposers will be notified of the recommended award. This notice will be transmitted to each proposer at the address contained in its Proposal form in a manner that provides verification of receipt. Any Proposer whose Proposal has not lapsed may protest the recommended award on any ground not specified in “Pre-Proposal Protests,” above. Three (3) copies of a full and complete written statement specifying in detail the grounds of the protest and the facts supporting the protest must be received by the District at the appropriate address in “Address,” above, no later than fifteen (15) calendar days after the date such notification is received. Prior to the issuing of the Notice of Award, a written decision stating the grounds for allowing or denying the protest will be transmitted to the protestor and the proposer recommended for award in a manner that provides verification of receipt.

FTA Review
After such administrative remedies have been exhausted, an interested party may file a protest with the Federal Transit Administration of the U.S. Department of Transportation pursuant to the procedures provided in the FTA C 4220.1F or its successor. FTA review is limited to the alleged failure of the District to have written protest procedures, the alleged failure of the District to follow those procedures, the alleged failure of the District to review a protest or the alleged violation of federal law or regulation.
IP 12. Preparation of Proposals

Use of Proposal Forms
Proposers are advised that the forms contained in this RFP are required to be used for submission of a Proposal.

Alternate and Multiple Proposals (Reserved)

Proposal Format Requirements
Proposals shall be submitted in ten (10) separately sealed packages identified below. Each package shall be marked as specified below and shall contain all of the Proposal documents for which the package is required to be marked and shall include no other documents. These same requirements shall apply to any best and final offers (BAFOs) that may subsequently be requested.

Proposers shall submit one (1) original (marked clearly as such), ten (10) hard copies, and ten (10) CDs, each containing an electronic PDF copy of the Proposal to the District. In case of any discrepancies, the original will be considered by the District in evaluating the Proposal, and the electronic version is provided for the District’s administrative convenience only.

The hard-copy Proposals shall be prepared double-sided on 8½ × 11 in. paper in at least 11-point font. The hard copies shall be contained in three-ring binders, the contents of which are identified on the outside. Use of 11 × 17 in. foldout sheets for large tables, charts or diagrams is permissible but should be limited. Elaborate formatting is not necessary. Do not provide promotional or advertising information, unless this information is requested and/or is necessary to support the technical submittal.

Package 1: Technical Proposal Requirements
- Letter of Transmittal
- Technical Proposal – TS13
- Acknowledgement of Addenda – CER 3
- Contractor Service and Parts Support Data – CER 4
- Form for Proposal Deviation (without price data) – CER 5
- Vehicle Questionnaire – CER 10
- References and Non-Priced Information
- Engineering organization chart, engineering change control procedure, field modification process
- Manufacturing facilities plant layout, other contracts, staffing
- Production and delivery schedule and other Contract commitments for the duration of this Contract
- Management Plan
Package 2: Price Proposal Requirements
The following are the requirements for qualifying responsible proposers. All of these requirements should be all Proposal items.

- Letter of Transmittal
- Pricing Schedule CER 6, (including but not limited to such pricing elements as option buses, spare parts package, manuals, training, special tools and test equipment)

The Proposer is required Each Price Proposal shall be on the prescribed Proposal form(s) and shall be for the entire Contract, including to complete and execute the District’s Pricing Schedule CER 6, contained as part of the Proposal documents, and provide same in the Price Proposal. The Contractor shall be liable for payment of all local taxes applicable to the complete bus as delivered and should add these amounts to the Proposal price.

Package 3: Qualification Package Requirements

- Pre-Award Evaluation Data Form CER 7
- A copy of the three (3) most recent financial statements audited by an independent third party or a statement from the Proposer regarding how financial information may be reviewed by the District
- Letter for insurance, indicating the Contractor’s ability to obtain the insurance coverage in accordance with the RFP requirements
- Letter from a surety for a Performance Guarantee, if required, indicating the Contractor’s ability to obtain financial guarantees in accordance with the RFP requirements.
- CER 5 Form for Proposal Deviation, if applicable (without price data)
- Proposal Form
- CER 8 All federal certifications included but not limited to: Buy America Certification, Debarment and Suspension Certification for Prospective Contractor, Debarment and Suspension Certification (Lower-Tier Covered Transaction), Non-Collusion Affidavit, Lobbying Certification, Certificate of Compliance with Bus Testing Requirement, DBE Approval Certification, and Federal Motor Vehicle Safety Standards.

Package 4: Proprietary/Confidential Information Package Requirements
The Proposer is directed to collect and submit any information it deems to be proprietary or confidential in nature in a separate marked and sealed package. If there is no confidential information, then the Proposer should include a statement to that effect. Subject package shall be submitted in accordance with the terms and conditions governing the submittal of proposer’s Proposal to this RFP. Blanket-type identification by designating whole pages or sections as containing proprietary information, trade secrets or confidential commercial and financial information will not ensure
confidentiality. The specific proprietary information, trade secrets or confidential commercial and financial information must be clearly identified as such.

The Proposer is advised that the District is a public and as such may be subject to certain state and/or local Public Records Act provisions regarding the release of information concerning this RFP. If a request is received by the District for the release of Proposer’s propriety/confidential information, subject request will be referred to the Proposer for review and consideration. If Proposer chooses to declare the information proprietary/confidential and advises the District to withhold it from release, it shall defend and hold harmless the District from any legal action arising from such a declaration including payment of any costs and legal fees.

District Treatment of Proprietary/Confidential Information

Access to government records is governed by the California Public Records Act (CPRA), Government Code Secs. 6250 et seq. Except as otherwise required to be disclosed by applicable city, state or local law, the District will exempt from disclosure proprietary information identified in Package 4.

Upon a request for records from a third party regarding this Proposal, the District will notify the Proposer in writing. The Proposer must respond within five (5) business days with the identification of any and all "proprietary, trade secret, or confidential commercial or financial" information. Failure to respond within the allowed period shall be deemed an approval to release. The proposer shall indemnify the District’s defense costs associated with its refusal to produce such identified information; otherwise, the requested information may be released.

The District shall employ sound business practices no less diligent than those used for the District’s own confidential information to protect the confidence of all licensed technology, software, documentation, drawings, schematics, manuals, data and other information and material provided by Proposers and the Contractor pursuant to the Contract that contain confidential commercial or financial information, trade secrets or proprietary information as defined in or pursuant to the Government Code Secs. 6250 et seq. against disclosure of such information and material to third parties, except as permitted by the Contract. The Contractor shall be responsible for ensuring that confidential commercial or financial information, trade secrets or proprietary information — with such determinations to be made by the District in its sole discretion — bears appropriate notices relating to its confidential character.

Signing of Proposal Forms

Proposals shall include firm name (and, in the event that the Proposer is a joint venture, the names of the individual firms comprising the joint venture); business address; and the name, title and business address of the responsible individual(s) with their telephone, facsimile (fax) numbers and email address who may be contacted during the
Proposal evaluation period for scheduling oral presentations and for receiving notices from the District. The proposer shall submit with their Proposal a copy of the joint venture agreement.

Proposals shall be signed by those individual(s) authorized to bind the proposer. The proposer shall submit evidence of the official’s authority to act for and bind the Proposer in all matters relating to the Proposal. (In the event the Proposer is a joint venture or consortium, a representative of each of the members of the joint venture or consortium shall execute the Proposal. Each joint venture or consortium member is jointly and severally liable for the joint venture or consortium.)

**Modification or Withdrawal of Proposals**

A modification of a Proposal already received will be accepted by the District only if the modification is received prior to the Proposal Due Date, is specifically requested by the District, or is made with a requested Best and Final Offer (BAFO). All modifications shall be made in writing and executed and submitted in the same form and manner as the original Proposal.

A Proposer may withdraw a Proposal already received prior to the Proposal Due Date by submitting to the District, in the same manner as the original Proposal, a written request for withdrawal executed by the Proposer’s authorized representative. After the Proposal Due Date, a Proposal may be withdrawn only if the District fails to award the Contract within the Proposal validity period prescribed in “Duration of the Validity of Proposals,” or any agreed-upon extension thereof. A timely withdrawal of a Proposal does not prejudice the right of a Proposer to submit another Proposal within the time set for receipt of Proposals.

**Ownership and Cost of Proposal Development**

All proposals will become the property of the District.

This RFP does not commit the District to enter into a Contract, to pay any costs incurred in the preparation or presentation of a Proposal, nor to procure or contract for the equipment.

**IP 13. Proposal Evaluation, Negotiation and Selection**

Proposals will be evaluated, negotiated, selected and any award made in accordance with the criteria and procedures described below. The approach and procedures are those that are applicable to a competitive negotiated procurement whereby Proposals are evaluated to determine which Proposals are within the Competitive Range. Discussions and negotiations may then be carried out with Proposers within the Competitive Range, after which BAFOs may be requested.
However, the District may select a Proposal for award without any discussions or negotiations or request for any BAFOs. Subject to the District’s right to reject any or all Proposals, the Proposer whose Proposal is found to be most advantageous to the District will be selected, based upon consideration of the criteria of “Proposal Selection Process,” below.

**IP 13.1 Confidentiality of Proposals**

Proposals will not be publicly opened. All Proposals and evaluations will be kept strictly confidential throughout the evaluation, negotiation and selection process, except as otherwise required by applicable law. Only the members of the Selection Committee and Evaluation Team and other District officials, employees and agents having a legitimate interest (need to know parties) will be provided access to the Proposals and evaluation results during this evaluation, negotiation process.

**IP 13.2 Duration of the Validity of Proposals**

Proposals and subsequent offers shall be valid for the period stated in “Section 1: Notice of Request for Proposals.” The District may request Proposers to extend the period of time specified herein by written agreement between the District and the Proposer(s) concerned.

**IP 13.3 Evaluation Committee**

An Evaluation Committee, which will include officers, employees and agents of the District, will be established. The Evaluation Committee will carry out the detailed evaluations, including establishing the Competitive Range, carrying out negotiations and making the selection of the Proposer, if any, that may be awarded the Contract.

The Evaluation Committee may report its recommendations and findings to the appropriate District individual or body responsible for awarding the Contract.

**IP13.4 Review of Proposals for Responsiveness and Proposers for Responsibility**

Each Proposal will be reviewed to determine if the Proposal is responsive to the submission requirements outlined in this RFP and if the Proposer is responsible.

A responsive Proposal is one that follows the requirements of this RFP, includes all documentation, is submitted in the format outlined in this RFP, is of timely submission, and has the appropriate signatures as required on each document. Failure to comply with these requirements may result in the Proposal being deemed nonresponsive.

A responsible Proposer is one that demonstrates the capability to satisfy the commercial and technical requirements set forth in the Solicitation. A Proposer’s failure to demonstrate that it is responsible may result in the proposal being rejected.
Any Proposal found to be nonresponsive or Proposer that is found to be non-responsive will not be considered further for award. Proposals that do not comply with the RFP instructions and requirements or do not include the required information may be rejected as insufficient and may not be further considered. The District reserves the right to request a Proposer to provide additional information and/or to clarify information. The District’s determination regarding the responsiveness of a Proposal and the responsibility of a Proposer shall be final.

IP13.5 Proposal Selection Process (Compliance)
Refer to the Section TS 13.1.3 for evaluation of proposals and selection process

The following describes the process by which Proposals will be evaluated and a selection made for a potential award. Any such selection of a Proposal shall be made by consideration of only the criteria set forth below.

“Qualification Requirements” specifies the requirements for determining responsible Proposers, all of which must be met by a Proposer to be found qualified. Final determination of a Proposer’s qualification will be made based upon all information received during the evaluation process and as a condition for award.

“Proposal Evaluation Criteria” contains all the evaluation criteria, and their relative order of importance, by which a Proposal from a qualified Proposer will be considered for selection. An award, if made, will be to a responsible Proposer for a Proposal that is found to be in the District’s best interests, based on price and other evaluation criteria considered. The procedures to be followed for these evaluations are provided in “Evaluation Procedures,” below.

Qualification Requirements
The following are the requirements for qualifying responsible proposers. All of these requirements should be the following are the requirements for qualifying responsible proposers. All of these requirements should be met; therefore, they are not listed by any particular order of importance. Any Proposal that the Evaluation Committee finds not to meet these requirements, and cannot be made to meet these requirements, may be determined by the Evaluation Committee not to be responsible and the Proposal rejected. The requirements are as follows:

- Sufficient financial strength, resources and capability to finance the Work to be performed and to complete the Contract in a satisfactory manner, as measured by the following:

Proposer’s financial statements prepared in accordance with generally accepted accounting principles of the jurisdiction in which the proposer is located, and audited by
an independent certified public accountant; or a statement from the Proposer regarding how financial information may be reviewed by the District.

Proposer’s ability to secure financial guarantees, if required, as evidenced by a letter of commitment from an underwriter, surety or other guarantor confirming that the Proposer can provide the required guarantee.

Proposer’s ability to obtain required insurance with coverage values that meet minimum requirements evidenced by a letter from an underwriter confirming that the proposer can be insured for the required amount.

- Evidence that the human and physical resources are sufficient to perform the Contract as specified and to ensure delivery of all equipment within the time specified in the Contract, to include the following:

  Engineering, management and service organizations with sufficient personnel and requisite disciplines, licenses, skills, experience and equipment to complete the Contract as required and to satisfy any engineering or service problems that may arise during the warranty period.

  Adequate manufacturing facilities sufficient to produce and factory-test equipment on schedule.

  A spare parts procurement and distribution system sufficient to support equipment maintenance without delays and a service organization with skills, experience and equipment sufficient to perform all warranty and on-site Work.

- Evidence that proposer is qualified in accordance with the provisions of “Section 8: Quality Assurance.”

- Evidence of satisfactory performance and integrity on contracts in making deliveries on time, meeting specifications and warranty provisions, parts availability and steps Proposer took to resolve any judgments, liens, Fleet Defects history or warranty claims. Evidence shall be by client references.

- Verified FTA Transit Vehicle Certification per 49 C.F.R§26.49.

Proposal Evaluation Criteria
The following are the complete criteria, listed by their relative degree of importance, by which Proposals from responsible Proposers will be evaluated and ranked for the purposes of determining any Competitive Range and to make any selection of a Proposal for a potential award. Any exceptions, conditions, reservations or understandings explicitly, fully and separately stated on Form for Proposal Deviation, which do not cause the District to consider a Proposal to be outside the Competitive
Range, will be evaluated according to the respective evaluation criteria and sub-criteria that they affect.

The criteria are listed numerically by their relative order of importance. However, certain criteria may have sub-criteria identified that are listed by their relative order of importance within the criterion they comprise. Also, certain sub-criteria may have sub-criteria that are listed by their relative degree of importance within the specific sub-criterion they comprise.

- Technical – Product design and performance - 30
- Qualifications (resources, management, engineering, etc.) - 20
- Price – 40
- Delivery – 20
- Past Performance - 10

IP 13.6 Evaluation Procedures
Proposals will be analyzed for conformance with the instructions and requirements of the RFP and Contract documents. Proposals that do not comply with these instructions and do not include the required information may be rejected as insufficient or not be considered for the Competitive Range. The District reserves the right to request that a Proposer provide any missing information and make corrections. Proposers are advised that the detailed evaluation forms and procedures will follow the same Proposal format and organization specified in "Preparation of Proposals." Therefore, Proposers should pay close attention to and strictly follow all instructions. Submittal of a Proposal will signify that the Proposer has accepted the whole of the Contract documents, except such conditions, exceptions, reservations or understandings explicitly, fully and separately stated on the forms and according to the instructions of Form for Proposal Deviation. Any such conditions, exceptions, reservations or understandings that do not result in the rejection of the Proposal are subject to evaluation under the criteria set forth in “Proposal Selection Process.”

Evaluations will be made in strict accordance with all of the evaluation methodology specified in the Section TS 13.1.3 “Evaluation of Proposals and Selection Process. The District will choose the Proposal from within the competitive range that it finds to be most advantageous to the District, based upon the evaluation criteria.

IP 13.7 Evaluations of Competitive Proposals
- Qualification of responsible Proposers. Proposals will be evaluated to determine the responsibility of proposers. A final determination of a Proposer’s responsibility will be made upon the basis of initial information submitted in the Proposal, any information submitted upon request by the District, information submitted in a BAFO and information resulting from District inquiry of Proposer’s references and its own knowledge of the Proposer.
**Detailed evaluation of Proposals and determination of Competitive Range.**
The District will carry out and document its evaluations in accordance with the criteria and procedures set forth in the Section TS 13.1.3 “Evaluation of Proposals and Selection Process.” Any Proposal deficiencies that may render a Proposal unacceptable will be documented. The District will make specific note of questions, issues, concerns and areas requiring clarification by Proposers and to be discussed in any meetings with Proposers that the District finds to be within the Competitive Range.

Rankings of the Proposals against the evaluation will then be made for determining which Proposals are within the Competitive Range, or may reasonably be made to be within the Competitive Range.

**Proposals not within the Competitive Range.** Proposers of any Proposals that have been determined by the District as not in the Competitive Range, and that cannot be reasonably made to be within the Competitive Range, will be notified in accordance with the District’s policies.

**Discussions with Proposers in the Competitive Range.** The Proposers whose Proposals are found by the District to be within the Competitive Range, or that may be reasonably made to be within the Competitive Range, will be notified and any questions or requests for clarifications provided to them in writing. Each such Proposer may be invited for an interview and discussions with the District to discuss answers to written or oral questions, clarifications and any facet of its Proposal.

In the event that a Proposal that has been included in the Competitive Range contains conditions, exceptions, reservations or understandings to any Contract requirements as provided in Form for Proposal Deviation, said conditions, exceptions, reservations or understandings may be negotiated during these meetings. However, the District shall have the right to reject any and all such conditions and exceptions, and instruct the Proposer to amend its Proposal and remove said conditions and exceptions; and any Proposer failing to do so may cause the District to find such Proposal to be outside the Competitive Range.

No information, financial or otherwise, will be provided to any Proposer about any of the Proposals from other Proposers, to the extent permitted by applicable law. Proposers will not be given a specific price or specific financial requirements they must meet to gain further consideration, except that proposed prices may be considered to be too high with respect to the marketplace or unacceptable. Proposers will not be told of their rankings among the other Proposers prior to Contract award.
Best and Final Offers.

After all interviews have been completed, the Proposers in the Competitive Range may be afforded the opportunity to amend their Proposals and make their BAFOs. The Request for BAFOs shall include the following: Notice that discussions and negotiations are concluded. A complete listing of the conditions, exceptions, reservations or understandings that have been approved. A common date and time for submission of written BAFOs, allowing a reasonable opportunity for preparation of the written BAFOs. Notice that if any modification to a BAFO is submitted, it must be received by the date and time specified for the receipt of BAFOs. Notice to Proposers that do not submit a notice of withdrawal or a BAFO that their immediately previous Proposal will be construed as their BAFO.

Any modification to the initial Proposal made by a Proposer in its BAFO shall be identified in its BAFO. BAFOs will be evaluated by the District according to the same requirements and criteria as the initial Proposals, (“Proposal Selection Process”). The District will make appropriate adjustments to the initial scores for any sub-criteria and criteria that have been affected by any Proposal modifications made by the BAFOs. These final scores and rankings within each criterion will again be arrayed by the District and considered according to the relative degrees of importance of the criteria defined in “Proposal Selection Process.”

The District will then choose the Proposal that it finds to be most advantageous to the District, based upon the evaluation criteria. The results of the evaluations and the selection of a Proposal for any award will be documented.

The District reserves the right to make an award to a Proposer whose Proposal it judges to be most advantageous to the District based upon the evaluation criteria, without conducting any written or oral discussions with any Proposers or solicitation of any BAFOs.

- **Debriefing.** Subsequent to the award, the unsuccessful Proposers will be notified and may request a debriefing. Proposers will be debriefed in accordance with District policies, including information regarding the shortcomings of their Proposal.

**IP 14. Response to Proposals**

**IP 14.1 Single Proposal Response**

If only one Proposal is received in response to this RFP and it is found by the District to be acceptable, a price or cost analysis, or both, possibly including an audit, may be
performed by or for the District. The Proposer has agreed to such analysis by submitting a Proposal in response to this RFP. The proposer may be asked for determination to support proposed costs.

IP 14.2 Availability of Funds

This procurement is subject to the availability of funding. The procurement will be funded by no more than 80% Federal Transit Administration (FTA) 5307 Formula funds, with the remaining 20% or more ‘local match’ being composed of State of California Proposition 1B Public Transportation Modernization, Improvement, and Service Enhancement (PTMISEA), Metropolitan Transportation Commission AB664 Bridge Toll Revenue, or AC Transit capital funds. The FTA funds are in process of being awarded to AC Transit, and authority to accrue charges against them is expected to be secured. The AB664 funds are also expected to be available for accruals. Allocation for PTMISEA funds has been approved granting pre-award authority and the funds are anticipated in April.

IP 14.3 District Contract Approval Process

At the conclusion of proposal scoring and if need be, negotiations, the District shall select a firm from within the competitive range for contract award whose proposal is deemed most advantageous to the District. Firms no longer under consideration for award will be notified accordingly, and be granted an opportunity for debriefing if requested.

The District shall then select contract awardees, and its Purchasing Department shall prepare and route the contract file through interdepartmental and General Manager approval channels. Upon this first phase of approvals, the recommendation shall be presented to the District’s Board for final approval.

Upon Board approval, the District’s Purchasing Department shall issue the contract for award along with a notice to proceed. Any certificates required of a contract awardee shall be submitted by the awardee prior to the commencement of work.

IP 14.4 District Rights

The District reserves the right to cancel the procurement in whole or in part, at its sole discretion, at any time before the Contract is fully approved and fully executed on behalf of the District.

The District reserves the right to reject any or all Proposals, to undertake discussions with one or more Proposers, and to accept that Proposal or modified Proposal which, in its judgment, will be most advantageous to the District, considering price and other evaluation criteria. The District reserves the right to determine any specific Proposal
that is conditional or not prepared in accordance with the instructions and requirements of this RFP to be nonresponsive. The District reserves the right to waive any Defects, or minor informalities or irregularities in any Proposal which do not materially affect the Proposal or prejudice other Proposers.

If there is any evidence indicating that two or more proposers are in collusion to restrict competition or are otherwise engaged in anti-competitive practices, the Proposals of all such Proposers shall be rejected, and such evidence may be a cause for disqualification of the participants in any future solicitations undertaken by the District.

The District may reject a Proposal that includes unacceptable Deviations as provided in Form for Proposal Deviation. – CER 5.

The District reserves to award in whole or in part by line item or group, and to make the most advantageous award for the District.

**IP 14.5 Execution of Contract**

The acceptance of a Proposal for award, if made, shall be evidenced in writing by a notice of award of Contract delivered to the Proposer whose Proposal is accepted. Upon notice of award of the Contract to a Proposer, the Proposer shall commence performance under the Contract by furnishing any required bonds, and by furnishing copies of the certificates of insurance required to be procured by the Contractor pursuant to the Contract documents within thirty (30) calendar days after the date of receipt of the notice of award. Failure to fulfill these requirements within the specified time is cause for termination of the Contract under “Termination for Default” in Section 3. – GC 9, 4, 2

**IP 15. Conflicts of Interests and Gratuities**

Proposers are prohibited from engaging in any practice that may be considered as a conflict of interests under existing District policies and/or state law, and to refrain from participating in any gifts, favors or other forms of compensation that may be viewed as a gratuity in accordance with existing policies and laws.

**IP 16. District-Specific Provisions**

See Section 4, Special Provisions (SP), page 49 through 61.
SECTION 3: GENERAL CONDITIONS

GC 1. Definitions

The following are definitions of special terms used in this document:

Authorized Signer: The person who is executing this Contract on behalf of the Contractor and who is authorized to bind the Contractor.

Best And Final Offer (BAFO): The last Proposal made by a Proposer. If a BAFO is not specifically requested by the District, or if the Proposer does not promptly respond to a request for BAFO, then the most recent, current Proposal is the BAFO.

California Public Records Act: CPRA

CEO: General Manager

Class 1 Failure (physical safety): A failure that could lead directly to passenger or operator injury and represents a severe crash situation.

Class 2 Failure (road call): A failure resulting in an enroute interruption of revenue service. Service is discontinued until the bus is replaced or repaired at the point of failure.

Competitive Range: The range of proposals that are identified as the most highly rated, unless the range is further reduced for purposes of efficiency.

Contract: The Proposal and its acceptance by the District as manifested by the Contract documents specified in “Section 10: Contract.”

Contracting Officer: The person who is executing this Contract on behalf of the District and who has complete and final authority except as limited herein.

Contractor: The successful Proposer who is awarded a Contract for providing all buses and equipment described in the Contract documents.

Days: Unless otherwise stated, “days” shall mean calendar days.

Defect: Patent or latent malfunction or failure in manufacture, installation or design of any component or subsystem.

Deviation: Variance from a requirement or specification that does not alter the basis of a contract or adversely affects its performance.

District: Alameda –Contra Costa Transit District
BUS RAPID TRANSIT (BRT) BUS PROCUREMENT
PERIOD OF PERFORMANCE: 01 JUNE 2015 THROUGH 30 NOVEMBER 2017
ADDENDUM NO. 3

District Observed Holidays:

Due Date: The date and time by which Proposals must be received by the District as specified in “Section 1: Notice of Request for Proposals.”

Extended Warranty: A warranty available for purchase above the standard warranty.

Fatigue Failure (Corrosion Fatigue): The mechanical degradation of a material under the joint action of corrosion and cyclic loading.

Pass-Through Warranty: A warranty provided by the Contractor but administered directly with the component Supplier.

Proposal: A promise, if accepted, to deliver equipment and services according to the underlying solicitation of the District documented using the prescribed form in the solicitation, including any Proposal or BAFO.

Proposer: A legal entity that makes a Proposal.

Related Defect: Damage inflicted on any component or subsystem as a direct result of a separate Defect.

Solicitation: District’s request for proposals.

Superior Warranty: A warranty still in effect after all contractually required warranties have expired. The remaining warranty is administered directly between the sub-Supplier and the District.

Supplier: Any manufacturer, company or Agency providing units, components or subassemblies for inclusion in the bus that is installed by the Contractor. Supplier items shall require qualification by type and acceptance tests in accordance with requirements defined in “Section 8: Quality Assurance.”

Subcontractor: Any manufacturer, company or Agency providing units, components or subassemblies for inclusion in the bus that is installed by a Subcontractor. Subcontractor items shall require qualification by type and acceptance tests in accordance with requirements defined in “Section 8: Quality Assurance.”

Work: Any and all labor, supervision, services, materials, machinery, equipment, tools, supplies and facilities called for by the Contract and necessary to the completion thereof.

Working Days: Monday through Friday, not including holidays
GC 1a. Abbreviation and Acronyms

A/C  air conditioning
ABS  anti-lock braking system
AC   alternating current
ACQ  alkaline copper quaternary
ADA  Americans with Disabilities Act
Ah   amp hour
ALR  auto-locking retractor
APA  The Engineered Wood Association, formerly the American Plywood Association
APC  automatic passenger counter
APTA American Public Transportation Association
ASTM ASTM International, formerly the American Society for Testing and Materials
ATC  automatic traction control
AVL  automatic vehicle location
AWG  American Wire Gauge
BAFO Best and Final Offer
BMS  Battery Management System
BRT  bus rapid transit
CARB California Air Resources Board
CCS  climate control system
CCTV closed-circuit television
cfm  cubic feet per minute
CGA  Compressed Gas Association
CNG  compressed natural gas
dB   decibel
DBE  disadvantaged business enterprise
DC   direct current
DDU  driver display unit
DEF  diesel exhaust fluid
DOT  Department of Transportation
DPF  diesel particulate filter
ECM  Engine Control and Monitoring
ECS  emission control system
ELR  emergency locking retractor
EMI  electromagnetic interference
EPA  Environmental Protection District
ESS  energy storage system
FEA  Finite Element Analysis
FEMA failure mode effects analysis
FMCSA Federal Motor Carrier Safety Administration
FMCSR Federal Motor Carrier Safety Regulations
FMVSS Federal Motor Vehicle Safety Standards
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FTA Federal Transit Administration
GAWR gross axle weight rating
GPS global positioning system
GVW gross vehicle weight
GVWR gross vehicle weight rating
H-point hip-point
HDS hybrid drive system
HMI human-machine interface
HSC hybrid system controller
HV high voltage
HVAC heating, ventilation and air conditioning
I/O input/output
IEEE Institute of Electrical and Electronics Engineers
ISO International Standards Organization
LEL LED emergency light
LV low voltage
mA milliampere
MDT mobile data terminal
MPa mega-Pascal
NC normally closed
NFPA National Fire Protection Association
NGV natural gas vehicle
NOx nitrogen oxide
NO normally open
NTP notice to proceed
OEM original equipment manufacturer
OSI Open Systems Interconnect
PA public address
PMO project management oversight
PPU primary propulsion unit
PPU prime power init
PPV price per vehicle
PRD pressure relief device
psi pounds per square inch
RF radio frequency
RFI radio frequency interference
RTC real-time clock
SAE SAE International, formerly the Society of Automotive Engineers
scf standard cubic feet
SLW seated load weight
SOC state of change
UL Underwriters Laboratories
UNECE United Nations Economic Commission for Europe
GC 2. Materials and Workmanship

The Contractor shall be responsible for all materials and workmanship in the construction of the bus and all accessories used, whether the same are manufactured by the Contractor or purchased from a Supplier. This provision excludes any equipment leased or supplied by the District, except insofar as such equipment is damaged by the failure of a part or component for which the Contractor is responsible, or except insofar as the damage to such equipment is caused by the Contractor during the manufacture of the buses.

GC 3. Conformance with Specifications and Drawings

Materials furnished and Work performed by the Contractor shall conform to the requirements of the Technical Specifications and other Contract documents. Notwithstanding the provision of drawings, technical specifications or other data by the District, the Contractor shall have the responsibility of supplying all parts and details required to make the bus complete and ready for service even though such details may not be specifically mentioned in the drawings and specifications. Items that are installed by the District shall not be the responsibility of the Contractor unless they are included in this Contract.

Omissions from the Contract specifications, or the inaccurate description of details of Work that are manifestly necessary to carry out the intent of the Contract specifications, or that are customarily performed, shall not relieve the Contractor from performing such omitted Work or inaccurately described details of the Work, and they shall be performed as if fully and correctly set forth and described.

GC 4. Inspection, Testing and Acceptance

GC 4.1 General

The District’s Representative shall at all times have access to the Work, the Contractor and, through the Contractor, its Suppliers. The Contractor and its Suppliers shall furnish every reasonable facility for ascertaining that the materials and the workmanship are in accordance with the requirements of the Contract Documents. All Work done shall be subject to the District Representative’s inspection and approval in accordance with the approved Work products developed as a result of the Contract Documents.

The pre-delivery tests and inspections shall be performed at the Contractor’s plant; they shall be performed in accordance with the procedures defined in “Section 8: Quality Assurance”; and they may be witnessed by the resident inspector. When a bus passes these tests and inspections, the resident inspector shall authorize release of the bus.

VDC  volts of direct current
Wh  watt-hours
VIN  vehicle information number
Within fifteen (15) calendar days after arrival at the designated point of delivery, the bus shall undergo the District tests defined in “Post-Delivery Tests.” If the bus passes these tests or if the District does not notify the Contractor of non-acceptance within 15 calendar days after delivery, then acceptance of the bus by the District occurs on the 15th day after delivery. If the bus fails these tests, it shall not be accepted until the repair procedures defined in “Repairs After Non-acceptance” have been carried out and the bus retested until it passes. Acceptance occurs earlier if the District notifies the Contractor of early acceptance or places the bus in revenue service.

GC 4.2 Risk of Loss
The District shall assume risk of loss of the bus on delivery, as defined in “Bus Delivery.” Prior to this delivery, the Contractor shall have risk of loss of the bus, including any damages sustained during the delivery regardless of the status of title or any payments related to the bus. Drivers shall keep a maintenance log enroute, and it shall be delivered to the District with the bus. If the bus is released back to the Contractor for any reason, the Contractor has the risk of loss upon such release.

GC 5. Title and Warranty of Title
Adequate documents for registering the bus in California shall be provided to the District not less than 10 business days before delivery to the District. Upon acceptance of each bus, the Contractor warrants that the title shall pass to the District free and clear of all encumbrances.

GC 6. Intellectual Property Warranty
The District shall advise the Contractor of any impending patent suit related to this Contract against the District and provide all information available. The Contractor shall defend any suit or proceeding brought against the District based on a claim that any equipment, or any part thereof, furnished under this Contract constitutes an infringement of any patent, and the Contractor shall pay all damages and costs awarded therein, excluding incidental and consequential damages, against the District. In case said equipment, or any part thereof, is in such suit held to constitute infringement and use of said equipment or parts is enjoined, the Contractor shall, at its own expense and at its option, either procure for the District the right to continue using said equipment or part, or replace same with non-infringing equipment, or modify it so it becomes non-infringing.

The Contractor’s obligations under this section are discharged and the District shall hold the Contractor harmless with respect to the equipment or part if it was specified by the District and all requests for substitutes were rejected, and the Contractor advised the District under “Questions, Clarifications and Omissions” of a potential infringement, in which case the Contractor shall be held harmless.
GC 7. Data Rights

GC 7.1 Proprietary Rights/Rights in Data

The term “subject data” used in this clause means recorded information, whether or not copyrighted, that is delivered or specified to be delivered under the Contract. It includes the proprietary rights of the following:

- Shop drawings and working drawings
- Technical data including manuals or instruction materials, computer or microprocessor software
- Patented materials, equipment, devices or processes
- License requirements

The District shall protect proprietary information provided by the Contractor to the fullest extent of the law. The Contractor shall grant a non-exclusive license to allow the District to utilize such information in order to maintain the vehicles. In the event that the Contractor no longer provides the information the District has the right to reverse engineer patented parts and software.

The District reserves a royalty-free, non-exclusive and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use, the following subject data for its purposes: (1) any subject data required to be developed and first produced in the performance of the Contract and specifically paid for as such under the Contract, whether or not a copyright has been obtained; and (2) any rights of copyright to which the Contractor, Subcontractor or Supplier purchases ownership for the purpose of performance of the Contract and specifically paid for as such under the Contract. The Contractor agrees to include the requirements of this clause, modified as necessary to identify the affected parties, in each subcontract and supply order placed under the Contract.

GC 7.2 Access to Onboard Operational Data

The District grants to the Contractor the right to inspect, examine, download, and otherwise obtain any information or data available from components provided by the Contractor, including, but not limited to, any electronic control modules or other data-collection devices, to the extent necessary to enable Contractor to perform reliability maintenance analysis, corrective action and/or other engineering type Work for the bus. This right expressly excludes access to information or data collected on any equipment not provided and installed by the Contractor.

GC 8. Changes

GC 8.1 Contractor Changes

Any proposed change in this Contract shall be submitted in writing to the Contracting Officer for its prior approval. Oral change orders are not permitted. No change in this
Contract shall be made without the prior written approval of the Contracting Officer. The Contractor shall be liable for all costs resulting from, and/or for satisfactorily correcting, any specification change not properly ordered by written modification to the Contract and signed by the Contracting Officer.

GC 8.2 District Changes
The District may obtain changes to the Contract by notifying the Contractor in writing. As soon as reasonably possible but no later than thirty (30) calendar days after receipt of the written change order to modify the Contract, the Contractor shall submit to the Contracting Officer a detailed price and schedule Proposal for the Work to be performed. This Proposal shall be accepted or modified by negotiations between the Contractor and the Contracting Officer. At that time, a detailed modification shall be executed in writing by both parties. Disagreements that cannot be resolved within negotiations shall be resolved in accordance with “Disputes,” below. Regardless of any disputes, the Contractor shall proceed with the Work ordered.

GC 9. Legal Clauses
GC 9.1 Indemnification
GC 9.1.1 The Contractor shall, to the extent permitted by law: (1) protect, indemnify and save the District and its officers, employees and agents, including consultants, harmless from and against any and all liabilities, damages, claims, demands, liens, encumbrances, judgments, awards, losses, costs, expenses and suits or actions or proceedings, including reasonable expenses, costs and attorneys’ fees incurred by the District and its officers, employees and agents, including consultants, in the defense, settlement or satisfaction thereof, for any injury, death, loss or damage to persons or property of any kind whatsoever, arising out of or resulting from the intentional misconduct or negligent acts, errors or omissions of the Contractor in the performance of the Contract, including intentional misconduct, negligent acts, errors or omissions of its officers, employees, servants, agents, Subcontractors and Suppliers; and (2) upon receipt of notice and if given authority, shall settle at its own expense or undertake at its own expense the defense of any such suit, action or proceeding, including appeals, against the District and its officers, employees and agents, including consultants, relating to such injury, death, loss or damage. Each party shall promptly notify the other in writing of the notice or assertion of such claim, demand, lien, encumbrance, judgment, award, suit, action or other proceeding hereunder. The Contractor shall have sole charge and direction of the defense of such suit, action or proceeding. The District shall not make any admission that might be materially prejudicial to the Contractor unless the Contractor has failed to take over the conduct of any negotiations or defense within a reasonable time after receipt of the notice and authority above provided. The District shall at the request of the Contractor furnish to the Contractor all reasonable assistance that may be necessary for the purpose of defending such suit, action or proceeding, and shall be repaid all reasonable costs incurred in doing so. The District
shall have the right to be represented therein by advisory council of its own selection at its own expense.

**GC 9.1.2** The obligations of the Contractor under the above paragraph shall not extend to circumstances where the injury, death or damages are caused solely by the negligent acts, errors or omissions of the District, its officers, employees, agents or consultants, including, without limitation, negligence in: (1) the preparation of the Contract documents, or (2) the giving of directions or instructions with respect to the requirements of the Contract by written order. The obligations of the Contractor shall not extend to circumstances where the injury, death or damages are caused, in whole or in part, by the negligence of any third-party operator, not including an assignee or Subcontractor of the Contractor, subject to the right of contribution. In case of joint or concurrent negligence of the parties giving rise to a claim or loss against either one or both, each shall have full rights of contribution from the other.
GC 9.2 Suspension of Work

GC 9.2.1 The District may at any time and for any reason within its sole discretion issue a written order to the Contractor suspending, delaying or interrupting all or any part of the Work for a specified period of time.

GC 9.2.2 The Contractor shall comply immediately with any such written order and take all reasonable steps to minimize costs allocable to the Work covered by the suspension during the period of work stoppage. Contractor shall continue the Work that is not included in the suspension and shall continue such ancillary activities as are not suspended. The Contractor shall resume performance of the suspended Work upon expiration of the notice of suspension, or upon direction from the District.

GC 9.2.3 The Contractor shall be allowed an equitable adjustment in the Contract price (excluding profit) and/or an extension of the Contract time, to the extent that cost or delays are shown by the Contractor to be directly attributable to any suspension. However, no adjustment shall be made under this section for any suspension, delay or interruption due to the fault or negligence of the Contractor, or for which an equitable adjustment is provided for, or excluded under any other term or condition of the Contract. As soon as reasonably possible but no later than forty-five (45) calendar days, or any other period of time agreed to by the parties, after receipt of the written suspension of work notice, the Contractor shall submit to the Contracting Officer a detailed price and schedule Proposal for the suspension, delay or interruption.

GC 9.3 Excusable Delays/Force Majeure

GC 9.3.1 If the Contractor is delayed at any time during the progress of the Work by the neglect or failure of the District or by a cause as described below, then the time for completion and/or affected delivery date(s) shall be extended by the District subject to the following cumulative conditions:

a. The cause of the delay arises after the Notice of Award and neither was nor could have been anticipated by the Contractor by reasonable investigation before such award. Such cause may also include force majeure events such as any event or circumstance beyond the reasonable control of the Contractor, including but not limited to acts of God; earthquake, flood and any other natural disaster; civil disturbance, strikes and labor disputes; fires and explosions; war and other hostilities; embargo; or failure of third parties, including Suppliers or Subcontractors, to perform their obligations to the Contractor;

b. The Contractor demonstrates that the completion of the Work and/or any affected deliveries will be actually and necessarily delayed;

c. The Contractor has taken measures to avoid and/or mitigate the delay by the exercise of all reasonable precautions, efforts and measures, whether before or after the occurrence of the cause of delay; and
d. The Contractor makes written request and provides other information to the District as described in GC 9.3.4 below.

A delay in meeting all of the conditions of this section shall be deemed an excusable delay. Any concurrent delay that does not constitute an excusable delay shall not be the sole basis for denying a request hereunder.

GC 9.3.2 None of the above shall relieve the Contractor of any liability for the payment of any liquidated damages owing from a failure to complete the Work by the time for completion that the Contractor is required to pay pursuant to “Liquidated Damages for Late Delivery of the Bus” for delays occurring prior to, or subsequent to the occurrence of an excusable delay.

GC 9.3.3 The District reserves the right to rescind or shorten any extension previously granted, if subsequently the District determines that any information provided by Contractor in support of a request for an extension of time was erroneous; provided, however, that such information or facts, if known, would have resulted in a denial of the request for an excusable delay. Notwithstanding the above, the District will not rescind or shorten any extension previously granted if the Contractor acted in reliance upon the granting of such extension and such extension was based on information which, although later found to have been erroneous, was submitted in good faith by the Contractor.

GC 9.3.4 No extension or adjustment of time shall be granted unless: (1) written notice of the delay is filed with the District after the commencement of the delay and (2) a written application therefore, stating in reasonable detail the causes, the effect to date and the probable future effect on the performance of the Contractor under the Contract, and the portion or portions of the Work affected, is filed by the Contractor with the District after the commencement of the delay. No such extension or adjustment shall be deemed a waiver of the rights of either party under this Contract. The District shall make its determination after receipt of the application.

GC 9.4 Termination
GC 9.4.1 Termination for Convenience
The performance of Work under this Contract may be terminated by the District in accordance with this clause in whole, or from time to time in part, whenever the contracting officer shall determine that such termination is in the best interest of the District. Any such termination shall be effected by delivery to the Contractor of a written notice of termination (Notice) specifying the extent to which performance of Work under the Contract is terminated, and the date upon which such termination becomes effective.
After receipt of the Notice, and except as otherwise directed by the Contracting Officer, the Contractor shall do the following:

- Stop Work under the Contract on the date and to the extent specified in Notice.
- Place no further orders or subcontracts for materials, services or facilities, except as may be necessary for completion of such portion of the Work under the Contract as is not terminated.
- Terminate all orders and subcontracts to the extent that they relate to the performance of work terminated by the Notice; assign to the District in the manner, at the times, and to the extent directed by the Contracting Officer, all of the right, title and interest of the Contractor under the orders and subcontracts so terminated, in which case the District shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts.
- Settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with the approval or ratification of the Contracting Officer, to the extent he or she may require, which approval or ratification shall be final for all the purposes of this clause.
- Transfer title to the District and deliver in the manner, at the times and to the extent, if any, directed by the Contracting Officer the fabricated or unfabricated parts, Work in process, completed Work, supplies and other material produced as part of, or acquired in connection with the performance of, the Work terminated, and the completed or partially completed plans, drawings, information and other property which, if the Contract had been completed, would have been required to be furnished to the District.
- Use its best efforts to sell, in the manner, at the times, to the extent, and at the price(s) directed or authorized by the Contracting Officer, any property of the types referred to above, provided, however, that the Contractor shall not be required to extend credit to any purchaser, and may acquire any such property under the conditions prescribed by and at a price(s) approved by the Contracting Officer, and provided further that the proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the District to the Contractor under this Contract or shall otherwise be credited to the price or cost of the Work covered by this Contract or paid in such other manner as the Contracting Officer may direct.
- Complete performance of such part of the Work as shall not have been terminated by the Notice.
- Take such action as may be necessary, or as the Contracting Officer may direct, for the protection or preservation of the property related to this Contract that is in the possession of the Contractor and in which the District has or may acquire an interest.
The Contractor shall be paid its costs, including Contract close-out costs, and profit on Work performed up to the time of termination. The Contractor shall promptly submit its termination claim to District to be paid the Contractor. Settlement of claims by the Contractor under this termination for convenience clause shall be in accordance with the provisions set forth in Part 49 of the Federal Acquisition Regulations (48 CFR 49) except that wherever the word “Government” appears, it shall be deleted and the word “District” shall be substituted in lieu thereof.

**GC 9.4.2 Termination for Default**

The District may, by written notice of default to the Contractor, terminate the whole or any part of this Contract if the Contractor fails to make delivery of the supplies or to perform the services within the time specified herein or any extension thereof; or if the Contractor fails to perform any of the other material provisions of the Contract, or so fails to make progress as to endanger performance of this Contract in accordance with its terms, and in either of these two circumstances does not cure such failure within a period of ten (10) business days, or such longer period as the Contracting Officer may authorize in writing, after receipt of notice from the Contracting Officer specifying such failure.

If the Contract is terminated in whole or in part for default, the District may procure, upon such terms and in such manner as the Contracting Officer may deem appropriate, supplies or services similar to those so terminated. The Contractor shall be liable to the District for any excess costs for such similar supplies or services, and shall continue the performance of this Contract to the extent not terminated under the provisions of this clause.

Except with respect to defaults of Subcontractors, the Contractor shall not be liable for any excess costs if the failure to perform the Contract arises out of a cause beyond the control and without the fault or negligence of the Contractor. If the failure to perform is caused by the default of a Subcontractor, and if such default arises out of causes beyond the control of both the Contractor and Subcontractor, and without the fault or negligence of either of them, the Contractor shall not be liable for any excess costs for failure to perform, unless the supplies or services to be furnished by the Subcontractor were obtainable from other sources and in sufficient time to permit the Contractor to meet the required delivery schedule.

Payment for completed supplies delivered to and accepted by the District shall be at the Contract price. The District may withhold from amounts otherwise due the Contractor for such completed supplies such sum as the Contracting Officer determines to be necessary to protect the District against loss because of outstanding liens or claims of former lien holders.
If, after notice of termination of this Contract under the provisions of this clause, it is determined for any reason that the Contractor was not in default under the provisions of this clause, or that the default was excusable under the provisions of this clause, the rights and obligations of the parties shall be the same as if the notice of termination had been issued pursuant to termination for convenience of the District.

**GC 9.5 Compliance with Laws and Regulations**
Contractor shall at all times comply with all applicable laws, regulations, policies, procedures and directives (together, the “Law”), including without limitation, FTA regulations, policies, procedures and directives, including those listed directly or by reference in the agreement between the District and FTA that funds any part of this Contract, as they may be amended or promulgated from time to time during the term of this Contract. Contractor’s failure to so comply shall constitute a material breach of this Contract.

**GC 9.6 Changes of Law**
Changes of Law that becomes effective after the Proposal Due Date may result in price changes. If a price adjustment is indicated, either upward or downward, it shall be negotiated between the District and the Contractor and the final Contract price will be adjusted upwards or downwards to reflect such changes in Law. Such price adjustment may be audited, where required.

**GC 9.7 Governing Law and Choice of Forum**
This Contract shall be governed by the laws of the State of California without regard to conflict of law rules. The Contractor consents to the jurisdiction of California, County of Alameda.

**GC 9.8 Disputes**
Except as otherwise provided in this Contract, any dispute concerning a question of fact arising under or related to this Contract that is not disposed of by agreement shall be decided in accordance with the following steps. However, by mutual agreement the matter may be taken immediately to any higher step in the dispute resolution process, or mutually agreed to alternative dispute resolution process (which may include structured negotiations, mediation or arbitration) or litigation. Pending final resolution of a dispute hereunder, the Contractor shall proceed diligently with the performance of the Contract and in accordance with the General Manager’s decision, as the case may be.

- **GC 9.8.1 Notice of dispute.** All disputes shall be initiated through a written dispute notice submitted by either party to the other party within 10 (ten) calendar days of the determination of the dispute.
- **GC 9.8.2 Negotiation between contracting officers.** The parties shall attempt in good faith to resolve any dispute arising out of or relating to this Contract promptly by negotiation between executives who have authority to settle the
controversy and who are at a higher level of management than the people with
direct responsibility for administration of this Contract. The District will have
disputes heard by the General Manager in the first instance; the decision should
be appealed to the Board of Directors. Any party may give the other party written
notice of any dispute not resolved in the normal course of business as provided
in (1) above. Within 14 (fourteen) calendar days after delivery of the dispute
notice, the receiving party shall submit to the other party a written response. The
dispute notice and written response shall include: (a) a statement of the party’s
position and a summary of the arguments supporting that position, (b) any
evidence supporting the party’s position and (c) the name of the executive who
will represent that party and of any others who will accompany the executive in
negotiations. Within 28 (twenty-eight) calendar days after delivery of the dispute
notice, the Contracting Officers shall meet at a mutually acceptable time and
place, and thereafter as they reasonably deem necessary to attempt to resolve
the dispute. All reasonable requests for information by one party to the other
shall be honored.

If the matter has not been resolved within 42 (forty-two) calendar days of the
dispute notice, the dispute may be referred to more senior executives of both
parties who have authority to settle the dispute and who shall likewise meet to
attempt to resolve the dispute.

- **GC 9.8.3 Chief Executive Officer's (General Manager) decision.** Should the
dispute not be resolved by negotiation between the Contracting Officers, as
provided in (GC 9.8.2) above, the District’s Contracting Officer from (2) above
shall submit a written request for decision to the District’s Chief Executive Officer
(CEO) along with all documentation and minutes from the negotiations. The Chief
Executive Officer shall issue a final written decision within 14 (fourteen) days of
receipt of a request.

A. For disputes involving $50,000 or less, the decision of the CEO shall be
administratively final and conclusive. For disputes involving $50,000 or less, it
is the intent of the parties that such administratively final and conclusive
decision pursuant to either this paragraph or paragraph 4 shall only be
overturned if determined by a court of competent jurisdiction to be fraudulent,
arbitrary, capricious, unsupported by the evidence or so grossly erroneous as
to imply bad faith. For disputes greater than $50,000, the decision of the CEO
shall be administratively final and conclusive unless, within thirty (30) days
from the date of delivery of the written decision, the Contractor appeals the
decision in writing to the District’s Chief Executive Officer or designee who
shall render a written decision within fourteen (14) days of delivery of such
written appeal. Such decision by the Chief Executive Officer or his or her
designee shall be administratively final and conclusive.
B. Within thirty (30) days of the issuance of any administratively final and conclusive decision under this paragraph, the Contractor shall notify the District in writing of the Contractor’s agreement with the final decision. Failure to provide such written notice of agreement shall indicate an intent by the Contractor to litigate the claim.

C. Any dispute that is not resolved by the parties through the operation of the provisions of this paragraph, or any mutually agreed-upon alternative disputes resolution process pursuant to paragraph 4 may be submitted to any State or Federal court in Alameda County.

D. Pending final resolution of a dispute hereunder, the Contractor shall proceed diligently with the performance of its obligations under the Contract in accordance with the written directions of the District.

• GC 9.8.4 Alternatives disputes resolution. If agreed to by both parties, disputes may be resolved by a mutually agreed-to alternative dispute resolution process that may include structured negotiations different from (GC 9.8.2) above, i.e. mediation or arbitration.

GC 9.9 Maintenance of Records; Access by District; Right to Audit Records
In accordance with 49 CFR § 18.36(i), 49 CFR § 19.48(d), and 49 USC § 5325(a), provided the District is the FTA recipient or a sub-grantee of the FTA recipient, the Contractor agrees to provide the District, FTA, the Comptroller General of the United States, the Secretary of the U.S. Department of Transportation, California or any of their duly authorized representatives access to any books, documents, papers and records of the Contractor that are directly pertinent to or relate to this Contract (1) for the purpose of making audits, examinations, excerpts and transcriptions and (2) when conducting an audit and inspection.

• In the event of a sole source Contract, single Proposal, single responsive Proposal, or competitive negotiated procurement, the Contractor shall maintain and the Contracting Officer, the U.S. Department of Transportation (if applicable) or the representatives thereof shall have the right to examine all books, records, documents and other cost and pricing data related to the Contract price, unless such pricing is based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the public, or prices set by law or regulation, or combinations thereof. Data related to the negotiation or performance of the Contract shall be made available for the purpose of evaluating the accuracy, completeness and currency of the cost or pricing data. The right of examination shall extend to all documents necessary for adequate evaluation of the cost or pricing data, along with the computations and projections used therein, including review of accounting principles and practices.
that reflect properly all direct and indirect costs anticipated for the performance of the Contract.

- For Contract modifications or change orders the Contracting Officer, the U.S. Department of Transportation, if applicable, or their representatives shall have the right to examine all books, records, documents and other cost and pricing data related to a Contract modification, unless such pricing is based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the public, or prices set by law or regulation, or combinations thereof. Data related to the negotiation or performance of the Contract modification or change order shall be made available for the purpose of evaluating the accuracy, completeness and currency of the cost or pricing data. The right of examination shall extend to all documents necessary for adequate evaluation of the cost or pricing data, along with the computations and projections used therein, either before or after execution of the Contract modification or change order for the purpose of conducting a cost analysis. If an examination made after execution of the Contract modification or change order reveals inaccurate, incomplete or out-of-date data, the Contracting Officer may renegotiate the Contract modification or change order price adjustment, and the District shall be entitled to any reductions in the price that would result from the application of accurate, complete or up-to-date data.

The requirements of this section are in addition to other audit, inspection and record-keeping provisions specified elsewhere in the Contract documents.

**GC 9.10 Confidential Information**

Access to government records is governed by the State of California. Except as otherwise required by the State of California, the District will exempt from disclosure proprietary information, trade secrets and confidential commercial and financial information submitted or disclosed during the Contract period. Any such proprietary information, trade secrets or confidential commercial and financial information that a Contractor believes should be exempted from disclosure shall be specifically identified and marked as such. Blanket-type identification by designating whole pages or sections as containing proprietary information, trade secrets or confidential commercial and financial information will not ensure confidentiality. The specific proprietary information, trade secrets or confidential commercial and financial information must be clearly identified as such.

Upon a request for records from a third party regarding the Contract, the District will notify the Contractor in writing. The Contractor must respond within ten (20) days with the identification of any and all “proprietary, trade secret or confidential commercial or financial” information, and the Contractor shall indemnify the District’s defense costs
associated with its refusal to produce such identified information; otherwise, the requested information may be released.

The District shall employ sound business practices no less diligent than those used for the District’s own confidential information to protect the confidence of all licensed technology, software, documentation, drawings, schematics, manuals, data and other information and material provided by the Contractor pursuant to the Contract that contain confidential commercial or financial information, trade secrets or proprietary information as defined in or pursuant to the State of California against disclosure of such information and material to third parties except as permitted by the Contract. The Contractor shall be responsible for ensuring that confidential commercial or financial information, trade secrets or proprietary information, with such determinations to be made by the District in its sole discretion, bears appropriate notices relating to its confidential character.

During the performance of the Work under the Contract, it may be necessary for either party (the “Discloser”) to make confidential information available to the other party (the “Recipient”). The Recipient agrees to use all such information solely for the performance of the Work under the Contract and to hold all such information in confidence and not to disclose same to any third party without the prior written consent of the Discloser. Likewise, the Recipient agrees that all information developed in connection with the Work under the Contract shall be used solely for the performance of the Work under the Contract, and shall be held in confidence and not disclosed to any third party without the prior written consent of the Discloser, provided confidentiality complies with provision of the CPRA.

This Confidentiality section shall survive the termination or expiration of the Contract.

**GC 9.11 Conflicts of Interest, Gratuities**

No member, officer, or employee of the District shall have any interest, direct or indirect, in this Contract or the proceeds thereof.

Government Code 1090 and the Political Reform Act are the California state laws pertaining to financial interests in contracts or public agency decisions. Government Code Section 87406.3 prohibits board members and general managers of a local agency, upon leaving office, from appearing before that agency to influence an administrative decision or action to issue or revoke permits, award contracts, etc. for a twelve month period thereafter. Government Code Section 87407 prohibits public officials from using his/her position to influence any governmental decision directly relating to a prospective employer, but does not specify a time period. See Non-Collision Affidavit – CER 8.4
GC 9.12 General Nondiscrimination Clause
In connection with the performance of Work provided for under this Contract, the Contractor agrees that it will not, on the grounds of race, religious creed, color, national origin, ancestry, physical disability, medical condition, marital status, sex, sexual orientation or age, discriminate or permit discrimination against any person or group of people in any manner prohibited by federal, state or local laws.

GC 9.13 Amendment and Waiver
GC 9.13.1 Amendment
Any modification or amendment of any provisions of any of the Contract documents shall be effective only if in writing, signed by authorized representatives of both the District and Contractor, and specifically referencing this Contract.

GC 9.13.2 Waiver
In the event that either party elects to waive its remedies for any breach by the other party of any covenant, term or condition of this Contract, such waiver shall not limit the waiving party’s remedies for any succeeding breach of that or of any other term, covenant or condition of this Contract.

GC 9.14 Remedies not Exclusive
The rights and remedies of the District provided herein shall not be exclusive and are in addition to any other rights and remedies provided by law or under the Contract.

GC 9.15 Counterparts
This Contract may be executed in any number of counterparts. All such counterparts shall be deemed to constitute one and the same instrument, and each of said counterparts shall be deemed an original thereof.

GC 9.16 Severability
Whenever possible, each provision of the Contract shall be interpreted in a manner as to be effective and valid under applicable law. However, if any provision, or part of any provision, should be prohibited or invalid under applicable law, such provision, or part of such provision, shall be ineffective to the extent of such prohibition or invalidity without invalidating the remainder of such provision or the remaining provisions of the Contract.

GC 9.17 Third-Party Beneficiaries
No provisions of the Contract shall in any way inure to the benefit of any third party, including the public at large, so as to constitute such person a third-party beneficiary of the Contract or of any one or more of the terms and conditions of the Contract or otherwise give rise to any cause of action in any person not a party to the Contract, except as expressly provided elsewhere in the Contract.
GC 9.18 Assignment of Contract
Neither party will assign or subcontract its rights nor obligations under the Contract without prior written permission of the other party, and no such assignment or subcontract will be effective until approved in writing by the other party.

GC 9.19 Independent Parties
The Contractor is an independent contractor with respect to the performance of all Work hereunder, retaining control over the detail of its own operations, and the Contractor shall not be considered the agent, employee, partner, fiduciary or trustee of the District.

GC 9.20 Survival
The following sections shall survive the nominal expiration or discharge of other Contract obligations, and the District may obtain any remedy under law, Contract or equity to enforce the obligations of the Contractor that survive the manufacturing, warranty and final payment periods:

- “Intellectual Property Warranty”
- “Data Rights”
- “Indemnification”
- “Governing Law and Choice of Forum”
- “Disputes”
- “Confidential Information”
- “Parts Availability Guarantee”
- “Access to Records”
- “Training”

GC 10. District-Specific Provisions (Reserved)
SECTION 4: SPECIAL PROVISIONS

SP 1. Inspections, Tests and Repairs

SP 1.A Lead Production Bus

Refer to the Section TS 12.6 for inspection and testing review information.

First Article Inspection – Production

The purpose of a first article inspection is to confirm that any components, systems, subsystems, major assemblies, subassemblies, products, parts, apparatuses, articles and other materials comply with the Technical Specifications and other Contract documents.

Where required by the Contract documents or requested by the District, the Contractor shall cause first article inspections to be conducted. A first article inspection may include both a physical configuration inspection and a functional demonstration. First article inspections shall be conducted at the Contractor or Subcontractor’s facility. The Contractor shall furnish to the District prior to each first article inspection a written inspection and demonstration plan for each item for review. The District’s inspectors will attend each first article inspection unless the District provides a written waiver of its right to attend any such inspection. The results of each first article inspection shall be documented by the Contractor in a format deemed acceptable by the District, and all documents relating to the inspection shall be forwarded to the District.

Post-Delivery Tests

The District will conduct acceptance tests on each delivered bus. These tests shall be completed within fifteen (15) days after bus delivery and shall be conducted in accordance with written test plans. The purpose of these tests is to identify Defects that have become apparent between the time of bus release and delivery to the District. The post-delivery tests shall include visual inspection and bus operations. No post-delivery test shall apply criteria that are different from the criteria applied in an analogous pre-delivery test (if any).

Buses that fail to pass the post-delivery tests are subject to non-acceptance. The District shall record details of all Defects on the appropriate test forms and shall notify the Contractor of acceptance or non-acceptance of each bus according to “Inspection, Testing and Acceptance” after completion of the tests. The Defects detected during these tests shall be repaired according to procedures defined in “Repairs after Non-Acceptance.”
SP 1.1 Repairs after Non-Acceptance
The Contractor, or its designated representative, shall perform the repairs after non-acceptance. If the Contractor fails or refuses to begin the repairs within five (5) days, then the Work may be done by the District’s personnel with reimbursement by the Contractor.

SP 1.2 Repair Performance
SP 1.2.1 Repairs by Contractor
After non-acceptance of the bus, the Contractor must begin Work within five (5) working days after receiving notification from the District of failure of acceptance tests. The District shall make the bus available to complete repairs timely with the Contractor repair schedule.

The Contractor shall provide, at its own expense, all spare parts, tools and space required to complete the repairs. At the District’s option, the Contractor may be required to remove the bus from the District’s property while repairs are being made. If the bus is removed from the District’s property, repair procedures must be diligently pursued by the Contractor’s representatives, and the Contractor shall assume risk of loss while the bus is under its control.

SP 1.2.2 Repairs by the District
The District will not take responsibility to correct Defects, except to replace defective parts as instructed by the Contractor.

- **Parts used.** If the District performs the repairs after non-acceptance of the bus, it shall correct or repair the Defect and any Related Defects using Contractor-specified parts available from its own stock or those supplied by the Contractor specifically for this repair. Reports of all repairs covered by this procedure shall be submitted by the District to the Contractor for reimbursement or replacement of parts monthly, or at a period to be mutually agreed upon. The Contractor shall provide forms for these reports.

- **Contractor-supplied parts.** If the Contractor supplies parts for repairs being performed by the District after non-acceptance of the bus, these parts shall be shipped prepaid to the District.

- **Return of defective components.** The Contractor may request that parts covered by this provision be returned to the manufacturing plant. The total costs for this action shall be paid by the Contractor.

- **Reimbursement for labor.** The District shall be reimbursed by the Contractor for labor. The amount shall be determined by the District for a qualified mechanic at a straight time wage rate which includes fringe benefits and overhead adjusted for the District’s most recently published rate in effect at the time the Work is performed, plus the cost of towing in the bus, if such action was necessary.
These wage and fringe benefits rates shall not exceed the rates in effect in the District’s service garage at the time the Defect correction is made.

- **Reimbursement for parts.** The District shall be reimbursed by the Contractor for defective parts that must be replaced to correct the Defect. The reimbursement shall include taxes where applicable and fifteen (15) percent handling costs.

## SP 2. Deliveries
### SP 2.1 Bus Delivery

Delivery of buses shall be determined by signed receipt of the District’s designated agent, Mr. Ed Barrow at the following point of delivery and may be preceded by a cursory inspection of the bus at the AC Transit Central Maintenance Facility, 10626 International Blvd., Oakland, CA 94603.

### SP 2.2 Delivery Schedule

The buses shall be delivered at a rate not to exceed three buses per week. Delivery shall be completed within 40 weeks after delivery of the executed Contract documents. Hours of delivery shall be 7:00am – 2:30 pm on the following days of the week: Monday thru Friday.

### SP 2.3 Contract Deliverables

Contract deliverables associated with this Contract are set forth in the table below, along with other pertinent information. Contract deliverables shall be submitted in accordance with Section 6: Technical Specifications. Due dates shown note the last acceptable date for receipt of Contract deliverables. The District will consider early receipt of Contract deliverables on a case-by-case basis. The reference section designates the appropriate specification section(s) where the requirement is referenced.

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>District Action</th>
<th>Due Date</th>
<th>Format</th>
<th>Quantity Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bus Testing — Altoona Test Report</td>
<td>Review</td>
<td>Prior to pilot bus delivery</td>
<td>Hardcopy</td>
<td>1</td>
</tr>
<tr>
<td>2. List of serialized units installed on each bus</td>
<td>Review</td>
<td>With each delivered bus</td>
<td>Electronic Media</td>
<td>1 per bus</td>
</tr>
<tr>
<td>3. Copy of Manufacturers formal Quality Assurance Program</td>
<td>Review</td>
<td>Pre-award site visit</td>
<td>Hardcopy</td>
<td>1</td>
</tr>
<tr>
<td>4. QA manufacturing certificate</td>
<td>Review</td>
<td>With each delivered bus</td>
<td>Hardcopy</td>
<td>1 per bus</td>
</tr>
<tr>
<td>5. QA purchasing certifications acknowledging receipt of applicable specification</td>
<td>Review</td>
<td>30 days following first pre-production meeting</td>
<td>Hardcopy</td>
<td>1 per major Supplier</td>
</tr>
<tr>
<td>6. Pre-Delivery Bus Documentation Package</td>
<td>Review</td>
<td>With each delivered bus</td>
<td>Hardcopy</td>
<td>1 per bus</td>
</tr>
<tr>
<td>Deliverable</td>
<td>District Action</td>
<td>Due Date</td>
<td>Format</td>
<td>Quantity Due</td>
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<tr>
<td>----------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>7. Motor Vehicle Pollution Requirements Certificate</td>
<td>Review</td>
<td>With each bus</td>
<td>Hardcopy</td>
<td>1</td>
</tr>
<tr>
<td>8. Engine Emissions Certificate — NOx levels</td>
<td>Review</td>
<td>Prior to completion of pilot bus</td>
<td>Hardcopy</td>
<td>1</td>
</tr>
<tr>
<td>9. Pre-production meeting minutes</td>
<td>Approval</td>
<td>30 days after each meeting</td>
<td>Hardcopy</td>
<td>2 originals</td>
</tr>
<tr>
<td>10. Driver's log and incident report</td>
<td>Review</td>
<td>With each bus delivery if drive-away service is used</td>
<td>Hardcopy</td>
<td>1 per bus</td>
</tr>
<tr>
<td>11. Title documentation</td>
<td>Review</td>
<td>10 days prior to bus delivery</td>
<td>Hardcopy</td>
<td>1 per bus</td>
</tr>
<tr>
<td>12. Performance bond</td>
<td>Review</td>
<td>30 days following execution of Contract</td>
<td>Hardcopy</td>
<td>1</td>
</tr>
<tr>
<td>13. Insurance certificates</td>
<td>Approval</td>
<td>Before Work commences</td>
<td>Hardcopy</td>
<td>1</td>
</tr>
<tr>
<td>14. Engineering support</td>
<td>Review</td>
<td>During pre-production meeting</td>
<td>Contracts</td>
<td>1</td>
</tr>
<tr>
<td>15. Training instructor information</td>
<td>Approval</td>
<td>30 days prior to delivery of pilot bus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Training curriculum</td>
<td>Approval</td>
<td>30 days prior to delivery of pilot bus</td>
<td>Electronic Media</td>
<td></td>
</tr>
<tr>
<td>17. Teaching materials</td>
<td>Review</td>
<td>During classroom instruction</td>
<td>Hardcopy</td>
<td>1</td>
</tr>
<tr>
<td>18. Professionally prepared mechanics’ “Bus Orientation” training video</td>
<td>Review</td>
<td>30 days prior to first production bus</td>
<td>Electronic Media</td>
<td>20 each</td>
</tr>
<tr>
<td>19. Final preventative maintenance manuals</td>
<td>Review</td>
<td>90 days after District written approval</td>
<td>Hardcopy</td>
<td>10/100 buses</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>20. Final diagnostic procedures manuals</td>
<td>Review</td>
<td>90 days after District written approval</td>
<td>Hardcopy</td>
<td>10/100 buses</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>21. Final parts manuals</td>
<td>Approval</td>
<td>90 days after District written approval</td>
<td>Hardcopy</td>
<td>10/100 buses</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>22. Component repair manuals District approval/review period of 90 days from date of receipt</td>
<td>Approval</td>
<td>90 days after District written approval of OEM component repair list</td>
<td>Hardcopy</td>
<td>2</td>
</tr>
<tr>
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<td></td>
<td>2</td>
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<tr>
<td>Deliverable</td>
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<td>Due Date</td>
<td>Format</td>
<td>Quantity Due</td>
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<td>----------------------------------------------------------------------------</td>
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<td>--------------</td>
</tr>
<tr>
<td>23. Draft preventative maintenance manuals District approval/review period of 90 days from date of receipt</td>
<td>Approval</td>
<td>With pilot bus</td>
<td>Hardcopy</td>
<td>10</td>
</tr>
<tr>
<td>24. Draft diagnostic procedures manuals District approval/review period of 90 days from date of receipt</td>
<td>Approval</td>
<td>With pilot bus</td>
<td>Hardcopy</td>
<td>10</td>
</tr>
<tr>
<td>25. Draft parts manuals District approval/review period of 90 days from date of receipt</td>
<td>Approval</td>
<td>With pilot bus</td>
<td>Hardcopy</td>
<td>10</td>
</tr>
<tr>
<td>26. List of OEM component repair manuals</td>
<td>Approval</td>
<td>With pilot bus</td>
<td>Hardcopy</td>
<td>10</td>
</tr>
<tr>
<td>27. Draft operators' manuals District approval/review period of 90 days from date of receipt</td>
<td>Approval</td>
<td>With pilot bus or maximum of 30 days prior to start of production</td>
<td>Hardcopy</td>
<td>10</td>
</tr>
<tr>
<td>28. Final operators' manuals</td>
<td>Review</td>
<td>30 days following District approval of draft manual</td>
<td>Hardcopy</td>
<td>1 per bus</td>
</tr>
<tr>
<td>29. Recommended spare parts list, including bill of materials</td>
<td>Review</td>
<td>60 days prior to shipment of first bus</td>
<td>Hardcopy</td>
<td>1</td>
</tr>
<tr>
<td>30. Part number index</td>
<td>Approval</td>
<td>60 days prior to shipment of first bus</td>
<td>Hardcopy</td>
<td>1</td>
</tr>
<tr>
<td>31. Current price list</td>
<td>Review</td>
<td>90 days after District written approval of draft parts manual</td>
<td>Hardcopy</td>
<td>20</td>
</tr>
<tr>
<td>32. In-process drawings</td>
<td>Review</td>
<td>30 days prior to production</td>
<td>Scale drawings</td>
<td>1</td>
</tr>
<tr>
<td>33. Electrical and air schematics</td>
<td>Review</td>
<td>30 days prior to production</td>
<td>Hardcopy</td>
<td>1</td>
</tr>
<tr>
<td>34. As-built drawings</td>
<td>Review</td>
<td>Within 60 days after final bus delivery</td>
<td>Electronic Media</td>
<td>1</td>
</tr>
<tr>
<td>35. Material samples</td>
<td>Review</td>
<td>By conclusion of pre-production meetings</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>36. Undercoating system program</td>
<td>Approval</td>
<td>First pre-production meeting</td>
<td>Hardcopy</td>
<td>1</td>
</tr>
<tr>
<td>37. Flooring certificate</td>
<td>Review</td>
<td>First pre-production meeting</td>
<td>Certificate/copy of purchase order</td>
<td>1</td>
</tr>
<tr>
<td>38. Interior features – fire-resistance certificates</td>
<td>Review</td>
<td>Prior to pilot bus completion</td>
<td>Certificates</td>
<td>1</td>
</tr>
<tr>
<td>39. Crashworthiness</td>
<td>Review</td>
<td>Pre-award audit</td>
<td>Certificate</td>
<td>1</td>
</tr>
<tr>
<td>40. Technical review of electronic functionality</td>
<td>Approval</td>
<td>Prior to production</td>
<td>Hardcopy</td>
<td>1</td>
</tr>
</tbody>
</table>
### Deliverable Details

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>District Action</th>
<th>Due Date</th>
<th>Format</th>
<th>Quantity Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>41. Interior security camera layout</td>
<td>Approval</td>
<td>Prior to pilot bus completion</td>
<td>Copies of interior views</td>
<td>1 each</td>
</tr>
<tr>
<td>42. Technical review of power plant</td>
<td>Approval</td>
<td>Prior to production</td>
<td></td>
<td></td>
</tr>
<tr>
<td>43. Power plant certifications</td>
<td>Review</td>
<td>Prior to pilot bus completion</td>
<td>Hardcopy</td>
<td>1 each</td>
</tr>
<tr>
<td>44. Striping layout</td>
<td>Approval</td>
<td>Prior to production</td>
<td>Hardcopy</td>
<td>1</td>
</tr>
<tr>
<td>45. Resolution of issues “subject to District approval”</td>
<td>Approval</td>
<td>Prior to production</td>
<td>Hardcopy</td>
<td>1</td>
</tr>
</tbody>
</table>

### SP 3. Options and Option Pricing (Not Applicable)

### SP 4. Assignability of Options (Not Applicable)

### SP 5. Payment

The District shall pay and the Contractor shall accept the amounts set forth in the price schedule as full compensation for all costs and expenses of completing the Work in accordance with the Contract, including but not limited to all labor, equipment and material required, overhead, expenses, storage and shipping, risks and obligations, taxes (as applicable), fees and profit, and any unforeseen costs.

#### SP 5.1 Payment Terms

**Option 1: Payment Upon Delivery**

All payments shall be made as provided herein, less any additional amount withheld as provided below and less any amounts for liquidated damages in accordance with “Liquidated Damages for Late Delivery of the Bus.”

The District shall make payments for buses at the unit prices itemized in the price schedule within 10 calendar days after the delivery and acceptance of each bus and receipt of a proper invoice.

The District shall make payments for spare parts and/or equipment at the unit prices itemized in the price schedule within 10 calendar days after the delivery and acceptance of said spare parts and/or equipment and receipt of a proper invoice.

The District shall make a final payment for all withholding within fifteen (15) calendar days of receipt of a final proper invoice and the following:

- Delivery and acceptance of all Contract deliverables, including manuals and other documentation required by the Contract, excluding training.
- Contractor provision of any certifications as required by law and/or regulations.
- Completion of post-delivery audits required under the Contract.
The Contractor may charge interest for late payment if payment is delayed more than ten (10) days after the payment Due Date set forth above. Interest will be charged at a rate not to exceed the prime rate of interest published by The Wall Street Journal on the 10th day.

**Option 2: Payment upon Delivery with Retention**

All payments shall be made as provided herein, less a retention of (percentage to be determined) plus any additional amount retained as provided below and less any amounts for liquidated damages in accordance with “Liquidated Damages for Late Delivery of the Bus.”

The District shall make payments for buses at the unit prices itemized in the price schedule within ten (10) calendar days after the delivery and acceptance of each bus and receipt of a proper invoice.

The District shall make payments for spare parts and/or equipment at the unit prices itemized in the price schedule within ten (10) calendar days after the delivery and acceptance of said spare parts and/or equipment and receipt of a proper invoice.

The District shall make a final payment for all retained funds within fifteen (15) calendar days of receipt of a final proper invoice and the following:

- Delivery and acceptance of all Contract deliverables, including manuals and other documentation required by the Contract, excluding training.
- Contractor provision of any certifications as required by law and/or regulations.
- Completion of post-delivery audits required under the Contract.

The Contractor may charge interest for late payment if payment is delayed more than ten (10) days after the payment Due Date set forth above. Interest will be charged at a rate not to exceed the prime rate of interest published by The Wall Street Journal on the 10th day.

**SP 5.2 Performance Guarantee**

The Contractor shall furnish, at its own expense, performance guarantee in the form of a cashier’s check, a letter of credit in a form approved by the District before Proposal submission, or a performance bond from a surety duly licensed to do business in the state of California having a financial rating from A.M. Best Company of “A VIII” or better, in the amount of [*insert dollar amount (not a percentage) where there are no progress payments and payment is made upon delivery and acceptance]*. The bond shall cover all of the Contractor’s obligations under the Contract except for the warranty and shall remain in force until said obligations have been fulfilled. To sixty-five (65) percent of the original amount when fifty (50) percent of the required number of buses are delivered and accepted:
• To thirty (30) percent of the original amount when seventy-five (75) percent of the required number of buses are delivered and accepted; and
• To zero (0) percent of the original amount when one hundred (100) percent of the required number of buses are delivered and accepted.

In the case that a surety becomes insolvent, its license is revoked or suspended, or in the case of a surety approved on the basis that it is listed as an approved federal surety and such federal approval is revoked or suspended, the Contractor, within five (5) days after notice by the District, shall substitute other and sufficient surety or sureties. If the Contractor fails to do so, such failure shall be an event of default.

SP 5.3 Payment of Taxes
Unless otherwise provided in this Contract, the Contractor shall pay all federal, state and local taxes, and duties applicable to and assessable against any Work, goods, services, processes and operations incidental to or involved in the Contract, including but not limited to retail sales and use, transportation, export, import, business and special taxes. The Contractor is responsible for ascertaining and paying the taxes when due. The total Contract price shall include compensation for all taxes the Contractor is required to pay by laws in effect on the Proposal Due Date. At the present time, District asserts that the taxes applicable to this Contract are California State and Local Sales/Use Tax (currently 9%), from which ADA equipment is exempt. The District will make Use Tax payments directly to the State for those contractors who are Out-of-State without California business license. The Contractor will maintain auditable records, subject to the District reviews, confirming that tax payments are current all times.

SP 6. Liquidated Damages for Late Delivery of the Bus
It is mutually understood and agreed by and between the parties to the Contract that time is of the essence with respect to the completion of the Work and that in case of any failure on the part of the Contractor to deliver the buses within the time specified in “Delivery Schedule,” except for any excusable delays as provided in “Excusable Delays/Force Majeure” or any extension thereof, the District will be damaged thereby. The amount of said damages, being difficult if not impossible of definite ascertainment and proof, it is hereby agreed that the amount of such damages due to the District shall be fixed at $500.00 per calendar day per bus not delivered in substantially as good condition as inspected by the District at the time released for shipment.

The Contractor hereby agrees to pay the aforementioned amounts as fixed, agreed and liquidated damages, and not by way of penalty, to the District and further authorizes the District to deduct the amount of the damages from money due the Contractor under the Contract, computed as aforesaid. If the money due the Contractor is insufficient or no money is due the Contractor, then the Contractor shall pay the District the difference or the entire amount, whichever may be the case, within thirty (30) days after receipt of a written demand by the Contracting Officer.
The payment of aforesaid fixed, agreed and liquidated damages shall be in lieu of any damages for any loss of profit, loss of revenue, loss of use, or for any other direct, indirect, special or consequential losses or damages of any kind whatsoever that may be suffered by the District arising at any time from the failure of the Contractor to fulfill the obligations referenced in this clause in a timely manner.

**SP 7. Service and Parts**

**SP 7.1 Contractor Service and Parts Support**

The Contractor shall state on the form Contractor Service and Parts Support Data the representatives responsible for assisting the District, as well as the location of the nearest distribution center, which shall furnish a complete supply of parts and components for the repair and maintenance of the buses to be supplied. The Contractor also shall state below, or by separate attachment, its policy on transportation charges for parts other than those covered by warranty.

**SP 7.2 Documentation**

The Contractor shall provide current maintenance manual(s) include preventative maintenance procedures, diagnostic procedures or trouble-shooting guides and major component service manuals, current parts manual(s), and as specified in section TS-8. The Contractor also shall exert its best efforts to keep maintenance manuals, operator manuals and parts books up to date for a period of fifteen (15) years. The supplied manuals shall incorporate all equipment ordered on the buses covered by this procurement. In instances where copyright restrictions or other considerations prevent the Contractor from incorporating major components information into the bus parts and service manuals, separate manual sets as published by the subcomponent Supplier will be provided.

**SP 7.3 Parts Availability Guarantee**

The Contractor hereby guarantees to provide, within reasonable periods of time, the spare parts, software and all equipment necessary to maintain and repair the buses supplied under this Contract for a period of at least twelve (12) years after the date of acceptance. Parts shall be interchangeable with the original equipment and shall be manufactured in accordance with the quality assurance provisions of this Contract. Prices shall not exceed the Contractor’s then-current published catalog prices.

Where the parts ordered by the District are not received within two working days of the agreed-upon time and date and a bus procured under this Contract is out of service due to the lack of said ordered parts, then the Contractor shall provide the District, within eight (8) hours of the District’s verbal or written request, the original Suppliers’ and/or manufacturers’ parts numbers, company names, addresses, telephone numbers and contact persons’ names for all of the specific parts not received by the District.
Where the Contractor fails to honor this parts guarantee or parts ordered by the District are not received within thirty (30) days of the agreed-upon delivery date, then the Contractor shall provide to District, within seven (7) days of the District's verbal or written request, the design and manufacturing documentation for those parts manufactured by the Contractor and the original Suppliers’ and/or manufacturers’ parts numbers, company names, addresses, telephone numbers and contact persons’ names for all of the specific parts not received by the District. The Contractor’s design and manufacturing documentation provided to the District shall be for its sole use in regard to the buses procured under this Contract and for no other purpose.

**SP 7.4 District-Furnished Property**

In the event that equipment or other goods or materials are specified in the Technical Specifications to be furnished by the District to the Contractor for incorporation in the Work, the following provisions shall apply:

The District shall furnish the equipment, goods or materials in a timely manner so as not to delay Contract delivery or performance dates. If District-furnished property is received in a condition not suitable for the intended use, then the Contractor shall promptly notify the District, detailing the facts, and at the District’s expense repair, modify, return or take such other action as directed by the District. The parties may conduct a joint inspection of the property before the Contractor takes possession to document its condition.

The District retains title to all District-furnished property. Upon receipt of the District-furnished property, the Contractor assumes the charge and care of the property and bears the risk of loss or damage due to action of the elements or from any other cause. The Contractor shall provide appropriate protection for all such property during the progress of the Work. Should any District-furnished equipment or materials be damaged, such property shall be repaired or replaced at the Contractor’s expense to the satisfaction of the District. No extension of time will be allowed for repair or replacement of such damaged items. Should the Contractor not repair or replace such damaged items, the District shall have the right to take corrective measures itself and deduct the cost from any sums owed to the Contractor.

Warranty administration and enforcement for District-furnished equipment are the responsibility of the District, unless the parties agree to transfer warranty responsibility to the Contractor.

**SP 8. Federal Motor Vehicle Safety Standards (FMVSS)**

The Contractor shall submit one (1) manufacturer’s FMVSS self-certification, Federal Motor Vehicles Safety Standards, which the vehicle complies with relevant FMVSS or two manufacturer’s certified statement that the contracted buses will not be subject to FMVSS regulations.
SP 9. Insurance
The Contractor shall maintain in effect during the term of this Contract, including any warranty period, at its own expense, at least the following coverage and limits of insurance:

- Statutory Workers’ Compensation and Employers Liability insurance and/or qualified self-insurance program covering Supplier’s employees while on District property, in the amount(s) required by law.
- Commercial General Liability Insurance:
  - Bodily Injury and Property Damage, including Contractual Liability covering the indemnification contained herein, $10,000,000 combined single limits per occurrence, $10,000,000 aggregate, where applicable.
  - Product liability: $5,000,000 per occurrence, for a period of five (5) years after acceptance of the last bus delivered under this Contract (Products Liability coverage may be affected through one or more excess liability policies).
- Automobile Liability Insurance: Bodily Injury and Property Damage, $1,000,000 combined single limits per occurrence.

Contractor shall deliver to the District, within ten (10) days after receiving Notice of Award of this Contract, evidence of the above, to District General Counsel prior to the expiration of any insurance during the time required, the Supplier shall furnish evidence of renewal to the District’s Contract Compliance Administrator.

SP 10. Software Escrow Account
All Contractor’s policies shall contain an endorsement naming the District as an additional insured and providing that written notice shall be given to District Contracting Officer at least thirty (30) days prior to termination, cancellation or material reduction of coverage in the policy; provided, however, that such notice may be given on ten (10) days’ notice if the termination is due to nonpayment of premium.

Upon execution of the Contract, the Contractor shall provide the District a list of all OEM software comprising proprietary works (“Proprietary Software”) for all major vehicle subsystems. From time to time and only upon request, information contained within the listed software may be made available to the District through the OEM of the vehicle subsystem. The Contractor and OEM are not obligated to provide copies of source code as this is proprietary intellectual property; however, the Contractor is obligated to assist the District with any technical assistance for the duration of the life of the vehicle. It is the District’s prerogative to evaluate the long-term viability of the Contractor and its Subcontractors and Suppliers based upon the criteria set forth in “Qualification Requirements.”
SP 11. Sustainability

The District recognizes that being sustainable (environmentally, economically and socially responsible) involves everyone, both internal and external to the District. The District expects its contractors to have their own sustainability policies and programs in place and to provide services in line with the principles established therein. Implementation of sustainable practices may include maximizing the use of environmentally and socially responsible materials and services, utilizing energy-efficient and non-polluting vehicles, equipment and processes, and ensuring that employee awareness of sustainability initiatives.
SECTION 5: FEDERAL REQUIREMENTS

FR 1. Access to Records
The Contractor agrees to maintain all books, records, accounts and reports required under this Contract for a period of not less than three years after the date of termination or expiration of this Contract, except in the event of litigation or settlement of claims arising from the performance of this Contract, in which case Contractor agrees to maintain same until the District, the FTA Administrator, the Comptroller General or any of their duly authorized representatives have disposed of all such litigation, appeals, claims or exceptions related thereto. Reference 49 CFR 18.39(i) (11).

FR 1.1 Local Governments
In accordance with 49 CFR 18.36(i), the Contractor agrees to provide the District, the FTA Administrator, the Comptroller General of the United States or any of their authorized representatives access to any books, documents, papers and records of the Contractor that are directly pertinent to this Contract for the purposes of making audits, examinations, excerpts and transcriptions. Contractor also agrees, pursuant to 49 CFR 633.17 to provide the FTA Administrator or his authorized representatives including any PMO Contractor access to Contractor’s records and construction sites pertaining to a major capital project, defined at 49 USC 5302(a)1, which is receiving federal financial assistance through the programs described at 49 USC 5307, 5309 or 5311. The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

FR 1.2 State Governments
In accordance with 49 CFR 633.17, the Contractor agrees to provide the District, the FTA Administrator or its authorized representatives, including any PMO Contractor, access to the Contractor’s records and construction sites pertaining to a major capital project, defined at 49 USC 5302(a) 1, which is receiving federal financial assistance through the programs described at 49 USC 5307, 5309 or 5311. By definition, a major capital project excludes contracts of less than the simplified acquisition threshold currently set at $100,000.

FR 2. Federal Funding, Incorporation of FTA Terms and Federal Changes
The preceding provisions include, in part, certain standard terms and conditions required by the Department of Transportation, whether or not expressly set forth in the preceding Contract provisions. All contractual provisions required by DOT, as set forth in FTA Circular 4220.1F or its successors are hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this
agreement. The Contractor shall not perform any act, fail to perform any act or refuse to comply with any District requests that would cause the District to be in violation of the FTA terms and conditions.

The Contractor shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Master Agreement between District and FTA, as they may be amended or promulgated from time to time during the term of this Contract. Contractor's failure to so comply shall constitute a material breach of this Contract.

**FR 3. Federal Energy Conservation Requirements**
The Contractor agrees to comply with mandatory standards and policies relating to energy efficiency that are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act.

**FR 4. Civil Rights Requirements**
The following requirements apply to the underlying Contract:

1. **Nondiscrimination:** In accordance with Title VI of the Civil Rights Act, as amended, 42 USC § 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 USC § 6102, section 202 of the Americans with Disabilities Act of 1990, 42 USC § 12132, and Federal transit law at 49 USC § 5332, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, creed, national origin, sex, age, or disability. In addition, the Contractor agrees to comply with applicable Federal implementing regulations and other implementing requirements FTA may issue.

2. **Equal Employment Opportunity:** The following equal employment opportunity requirements apply to the underlying Contract:

   (a) **Race, Color, Creed, National Origin, Sex:** In accordance with Title VII of the Civil Rights Act, as amended, 42 USC § 2000e, and Federal transit laws at 49 USC § 5332, the Contractor agrees to comply with all applicable equal employment opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, “Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor,” 41 CFR Parts 60 et seq., (which implement Executive Order No. 11246, “Equal Employment Opportunity,” as amended by Executive Order No. 11375, “Amending Executive Order 11246 Relating to Equal Employment Opportunity,” 42 USC § 2000e note), and with any applicable Federal statutes, executive orders, regulations, and Federal policies that may in the future affect construction activities undertaken in the course of the Project. The Contractor agrees to take affirmative action to ensure that
applicants are employed, and that employees are treated during employment, without regard to their race, color, creed, national origin, sex, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(b) Age: In accordance with section 4 of the Age Discrimination in Employment Act of 1967, as amended, 29 USC §§ 623 and Federal transit law at 49 USC § 5332, the Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(c) Disabilities: In accordance with section 102 of the Americans with Disabilities Act, as amended, 42 USC § 12112, the Contractor agrees that it will comply with the requirements of U.S. Equal Employment Opportunity Commission, “Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act,” 29 CFR Part 1630, pertaining to employment of persons with disabilities. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

3. The Contractor also agrees to include the requirements in subparagraphs 1 and 2 immediately above each subcontract financed in whole or in part with Federal assistance provided by FTA, modified only if necessary to identify the affected parties.

FR 5. No Government Obligation to Third Parties

- The District and Contractor acknowledge and agree that, notwithstanding any concurrence by the Federal Government in or approval of the Solicitation or award of the underlying Contract, absent the express written consent by the Federal Government, the Federal Government is not a party to this Contract and shall not be subject to any obligations or liabilities to the District, Contractor, or any other party (whether or not a party to that Contract) pertaining to any matter resulting from the underlying Contract.

- The Contractor agrees to include the above clause in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clause shall not be modified, except to identify the Subcontractor who will be subject to its provisions.
FR 6. Program Fraud and False or Fraudulent Statements or Related Acts

- The Contractor acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 USC §§ 3801 et seq. and U.S. DOT regulations, “Program Fraud Civil Remedies,” 49 CFR Part 31, apply to its actions pertaining to this Project. Upon execution of the underlying Contract, the Contractor certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, or causes to be made, pertaining to the underlying Contract or the FTA assisted project for which this Contract Work is being performed. In addition to other penalties that may be applicable, the Contractor further acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification, the Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 on the Contractor to the extent the Federal Government deems appropriate.

- The Contractor also acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification to the Federal Government under a Contract connected with a project that is financed in whole or in part with Federal assistance originally awarded by FTA under the authority of 49 USC § 5307, the Government reserves the right to impose the penalties of 18 USC § 1001 and 49 USC § 5307(n)(1) on the Contractor, to the extent the Federal Government deems appropriate.

- The Contractor agrees to include the above two clauses in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clauses shall not be modified, except to identify the Subcontractor who will be subject to the provisions.

FR 7. Suspension and Debarment

This Contract is a covered transaction for purposes of 49 CFR Part 29. As such, the Contractor is required to verify that none of the Contractor, its principals, as defined at 49 CFR 29.995, or affiliates, as defined at 49 CFR 29.905, are excluded or disqualified as defined at 49 CFR 29.940 and 29.945.

The Contractor is required to comply with 49 CFR 29, Subpart C, and must include the requirement to comply with 49 CFR 29, Subpart C, in any lower-tier covered transaction it enters into.

By signing and submitting its bid or Proposal, the Bidder or Proposer certifies as follows:

The certification in this clause is a material representation of fact relied upon by AC Transit. If it is later determined that the Bidder or Proposer knowingly rendered an erroneous certification, in addition to remedies available to the District, the federal government may pursue available remedies, including but not limited to suspension and/or debarment. The Bidder or Proposer agrees to comply with the requirements of
49 CFR 29, Subpart C, while this Proposal is valid and throughout the period of any Contract that may arise from this Proposal. The Bidder or Proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

FR 8. Disadvantaged Business Enterprise (DBE)
This Contract is subject to the requirements of Title 49, Code of Federal Regulations, Part 26, Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs.

The Contractor shall maintain compliance with “DBE Approval Certification” throughout the period of Contract performance.

The Contractor shall not discriminate on the basis of race, color, national origin or sex in the performance of this Contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of this DOT-assisted Contract. Failure by the Contractor to carry out these requirements is a material breach of this Contract, which may result in the termination of this Contract or such other remedy as District deems appropriate. Each subcontract the Contractor signs with a Subcontractor must include the assurance in this paragraph (see 49 CFR 26.13(b)).

FR 9. Clean Water Requirements
- The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 USC 1251 et seq. The Contractor agrees to report each violation to the District and understands and agrees that the District will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office.
- The Contractor also agrees to include these requirements in each subcontract exceeding $100,000 financed in whole or in part with Federal assistance provided by FTA.

FR 10. Clean Air Requirements
- The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 USC §§ 7401 et seq. The Contractor agrees to report each violation to the District and understands and agrees that the District will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office.
- The Contractor also agrees to include these requirements in each subcontract exceeding $100,000 financed in whole or in part with Federal assistance provided by FTA.
FR 11. Compliance with Federal Lobbying Policy
 Contractors who apply or bid for an award of $100,000 or more shall file the certification required by 49 CFR Part 20, “New Restrictions on Lobbying.” Each tier certifies to the tier above that it will not and has not used federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any District, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any federal Contract, grant or any other award covered by 31 USC 1352. Each tier shall also disclose the name of any registrant under the Lobbying Disclosure Act of 1995 who has made lobbying contacts on its behalf with non-federal funds with respect to that federal Contract, grant or award covered by 31 USC 1352. Such disclosures are forwarded from tier to tier up to the recipient.

FR 12. Buy America
 The Contractor agrees to comply with 49 USC 5323(j) and 49 CFR Part 661, which provide that federal funds may not be obligated unless steel, iron and manufactured products used in FTA-funded projects are produced in the United States, unless a waiver has been granted by FTA or the product is subject to a general waiver. General waivers are listed in 49 CFR 661.7. A general public interest waiver from the Buy America requirements applies to microprocessors, computers, microcomputers, software or other such devices, which are used solely for the purpose of processing or storing data. This general waiver does not extend to a product or device that merely contains a microprocessor or microcomputer and is not used solely for the purpose of processing or storing data.

Separate requirements for rolling stock are set out at 49 USC 5323(j) (2) (C) and 49 CFR 661.11. Rolling stock must be assembled in the United States and have a 60 percent domestic content.

A Bidder or Proposer must submit to the District the appropriate Buy America Certification with all offers on FTA-funded contracts, except those subject to a general waiver. Proposals that are not accompanied by a properly completed Buy America certification are subject to the provisions of 49 CFR 661.13 and may be rejected as nonresponsive.

FR 13. Testing of New Bus Models
 The Contractor agrees to comply with 49 USC A 5323(c) and FTA’s implementing regulation at 49 CFR Part 665 and shall perform the following:

- A manufacturer of a new bus model or a bus produced with a major change in components or configuration shall provide a copy of the final test report to the recipient at a point in the procurement process specified by the recipient, which will be prior to the recipient’s final acceptance of the first Vehicle.
• A manufacturer who releases a report under Paragraph 1 above shall provide notice to the operator of the testing facility that the report is available to the public.

• If the manufacturer represents that the vehicle was previously tested, the vehicle being sold should have the identical configuration and major components as the vehicle in the test report, which must be provided to the recipient prior to recipient’s final acceptance of the first vehicle. If the configuration or components are not identical, the manufacturer shall provide a description of the change and the manufacturer’s basis for concluding that it is not a major change requiring additional testing.

• If the manufacturer represents that the vehicle is “grandfathered” (has been used in mass transit service in the United States before October 1, 1988, and is currently being produced without a major change in configuration or components), the manufacturer shall provide the name and address of the recipient of such a vehicle and the details of that vehicle’s configuration and major components.

FR 14. Pre-Award and Post-Delivery Audits
The Contractor agrees to comply with 49 USC § 5323(l) and FTA’s implementing regulation at 49 CFR Part 663 and to submit the following certifications:

• **Buy America requirements:** The Contractor shall complete and submit a declaration certifying either compliance or noncompliance with Buy America. If the recommended Bidder/Proposer certifies compliance with Buy America, it shall submit documentation that lists (1) component and subcomponent parts of the rolling stock to be purchased identified by manufacturer of the parts, their country of origin and costs; and (2) the location of the final assembly point for the rolling stock, including a description of the activities that will take place at the final assembly point and the cost of final assembly.

• **Solicitation specification requirements:** The Contractor shall submit evidence that it will be capable of meeting the bid specifications.

• **Federal Motor Vehicle Safety Standards (FMVSS):** The Contractor shall submit (1) manufacturer’s FMVSS self-certification, Federal Motor Vehicle Safety Standards, that the vehicle complies with relevant FMVSS or (2) manufacturer’s certified statement that the contracted buses will not be subject to FMVSS regulations.
FR 15. Cargo Preference
The Contractor agrees to the following:

1. To use privately owned U.S.-flag commercial vessels to ship at least fifty (50) percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners and tankers) involved, whenever shipping any equipment, material or commodities pursuant to the underlying Contract to the extent such vessels are available at fair and reasonable rates for U.S.-flag commercial vessels;

2. To furnish within twenty (20) working days following the date of loading for shipments originating within the United States or within thirty (30) working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, “on-board” commercial ocean bill of lading in English for each shipment of cargo described in the preceding paragraph to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590 and to the FTA recipient (through the Contractor in the case of a Subcontractor’s bill-of-lading.)

3. To include these requirements in all subcontracts issued pursuant to this Contract when the subcontract may involve the transport of equipment, material or commodities by ocean vessel.

FR 16. Fly America
The Contractor agrees to comply with 49 USC 40118 (the “Fly America” Act) in accordance with the General Services Administration’s regulations at 41 CFR Part 301-10, which provide that recipients and sub recipients of federal funds and their contractors are required to use U.S. flag air carriers for U.S. government-financed international air travel and transportation of their personal effects or property, to the extent such service is available, unless travel by foreign air carrier is a matter of necessity, as defined by the Fly America Act. The Contractor shall submit, if a foreign air carrier was used, an appropriate certification or memorandum adequately explaining why service by a U.S. flag air carrier was not available or why it was necessary to use a foreign air carrier and shall, in any event, provide a certificate of compliance with the Fly America requirements. The Contractor agrees to include the requirements of this section in all subcontracts that may involve international air transportation.

FR 17. Contract Work Hours and Safety Standards Act

1. Overtime requirements: No Contractor or Subcontractor contracting for any part of the Contract Work that may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any work week in which he or she is employed on such Work to work in excess of 40 hours in such work week unless such laborer or mechanic receives compensation at a
rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages: In the event of any violation of the clause set forth in paragraph 1 of this section, the Contractor and any Subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such Contractor and Subcontractor shall be liable to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph 1 of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 1 of this section.

3. Withholding for unpaid wages and liquidated damages: The Alameda – Contra Costa Transit District shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any monies payable on account of work performed by the Contractor or Subcontractor under any such contract or any other Federal contract with the same Prime Contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same Prime Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or Subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 2 of this section.

4. Subcontracts: The Contractor or Subcontractor shall insert in any subcontracts the clauses set forth in paragraphs 1 through 4 of this section and also a clause requiring the Subcontractors to include these clauses in any lower tier subcontracts. The Prime Contractor shall be responsible for compliance by any Subcontractor or lower-tier Subcontractor with the clauses set forth in paragraphs 1 through 4 of this section.

SECTION 6: TECHNICAL SPECIFICATIONS

TS 1. General Requirements

TS 1.1 Scope

The technical specifications define the requirements of the (27) BRT low floor sixty foot articulated diesel hybrid coaches in accordance with the terms and conditions set forth in this Contract. Coaches shall have total of (5) doors. All coaches must meet the
District BRT station platform design requirements for left and right hand boarding stations. Coaches must incorporate a method to safely board passengers with the designed platforms and allow level boarding at all the available doors. Coaches shall have a minimum expected life of twelve years (12) years or 500,000 miles, whichever occurs first and are intended for the widest possible spectrum of passengers, including children, adults, the elderly, and people with disabilities.

These technical specifications are based on a general performance type specification pursuant to which the Contractor shall be responsible for. The designing, fabricating, assembling, testing, and the finishing transit-type buses, are in compliance with the requirements of the Contract Documents. Included within these requirements are specified components, equipment and systems usually accompanied by the phrase "or approved equal." Such components, equipment and systems, or deviations and substitute items specifically approved by the District, shall be provided as part of the completed buses under this Contract. The District’s specification of such components, equipment and systems or the approval of such items, however, shall not relieve the Contractor of any obligation under the Contract Documents since the District expects and is relying on the Contractor, in designing and testing the bus, to verify the suitability and safety of materials, components, equipment, systems and items before incorporating them into the design, fabrication or assembly of the bus provided by Contractor.

Prior to acceptance of the first bus, the vehicle as described in this section must have completed an FTA-required Altoona test. Any items that required repeated repairs or replacement must undergo the corrective action with supporting test and analysis. A report clearly describing and explaining the failures and corrective actions taken to ensure any and all such failures will not reoccur shall be submitted to the District.

Without limiting the general provisions or other requirements of these specifications, all work included herein shall conform to or exceed the applicable requirements of the following documents. Reference to other sections or specific provisions of the Contract, including these technical specifications, is only for the convenience of the Contractor. Failure of the District to accurately or completely reference one requirement to other related requirements shall not relieve the Contractor of its obligation to fully understand and correlate all of the Contract’s requirements.

Reference to standard specifications, manuals, or codes of any technical society, organization, or association, or to the codes, laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, or laws or regulations in effect at the time of submittal of proposals except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual, or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to
change the duties and responsibilities of the Contractor, agents, or employees from those set forth in the Contract Documents.

Whenever in the Contract Documents the terms "as ordered," "as directed," "as allowed," "as reviewed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper," or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review, or judgment of the District as to the work, it is intended that such requirement, direction, review, or judgment will be solely to evaluate the work for compliance with the Contract Documents, unless there is a specific statement indicating otherwise. "Approval" by the District of any component, part, equipment or system as required herein shall not constitute any waiver or modification of Contract Documents unless such requirement is revised by change order.

The terms "coach," "vehicles" and "buses" are used interchangeably.

Contractor shall fully cooperate at its own cost in providing test data and technical analyses, and in conducting additional tests and analyses, as the District may require, to confirm to the District’s reasonable satisfaction that the bus will meet the requirements of the Contract Documents.

To the maximum extent practicable, the materials, parts components and equipment utilized in the bus, including spare and warranty parts, shall be readily available from domestic U.S. commercial and manufacturing sources. The Contractor shall fully cooperate in the substitution of domestic parts in place of foreign manufactured or supplied parts at the request of the District.

**TS 1.2 General Configuration Guidelines**

This specification covers 3 axle heavy-duty transit-type buses equipped for use by both disabled and non-disabled passengers. The bus shall have a total of five passenger doors. Three passenger doorways on the right side of the vehicle: one ahead of the first axle (front door) a second door forward of the articulation joint, and one between the articulation and the third axle (rear door). Two passenger doors shall be on the left side of the vehicle that includes one in the forward unit and one in the trailing unit.

Buses shall be equipped and arranged so that two forward facing passengers in wheelchairs can be accommodated. When such passengers are carried, three regular seats per wheelchair may be folded out of the way individually to provide a securement area.

A single diesel-fueled engine shall power coaches utilizing a hybrid electric drive system. It is to be a series hybrid system driving the third axle.
TS 1.3 Dimensions
TS 1.3.1 Length
Overall length of nominal 60-foot buses shall be 59.5 feet to 61.5 feet (18.1 m to 18.75 m).

TS 1.3.2 Width
Overall width of buses, excluding mirrors, lights, and fenders, shall be a maximum of 102 inches (259 cm).

TS 1.3.3 Height
Overall height of buses with roof-mounted energy storage is 140 inches (356 cm). Height measurements, including the heights specified below, are with the air suspension system operating and fully adjusted, with the bus on proper tires correctly inflated, and with roof vents closed.

TS 1.3.4 Not Used

TS 1.3.5 Step Height
The step height shall not exceed 14 inches (355.6 mm) at all doorways, without kneeling. Inclines, if necessary to accommodate localized variations in floor height, shall not exceed 4 degrees with respect to the horizontal plane. A maximum of two steps is allowed to accommodate a raised aisle floor in the rear of the bus.

TS 1.3.6 General Aisle Width
The minimum clear aisle width between pairs of transverse seats with all attached hardware shall be at least 22 inches (558mm).

TS 1.3.7 Front Area Aisle Width
The aisle width between the front wheelhouses shall be at least 35.5 inches (902 mm), and the entire area between the front wheelhouses shall be available for passengers and mobility aid devices. It is a requirement to allow adequate clearance for maneuvering a mobility aid device to and from the securement locations.

TS 1.3.8 Headroom
The minimum clear headroom along the bus centerline shall be at least 77 inches (196 cm). Headroom may reduce to 72 inches (183 cm) over seating areas along the bus and at the rear. Preferred headroom is 78.7 inches (200 cm) throughout.

TS 1.4 Clearances
TS 1.4.1 Ground Clearance
All buses shall maintain the minimum ground clearance as defined and shown in Figure 1-1 of SAE standard J689. Ground clearance shall be no less than 9 in., (8 in. @ the
jacking point) except within the axle zone and wheel area. Axle zone clearance, which is the projected area between the tires and wheels on the same axial centerline, shall be no less than 5.4 in. Wheel area clearance shall be no less than 8 in. for parts fixed to the bus body and 6 in. for parts that move vertically with the axles. No part of the bus, other than wheels, tires or static strap, shall touch a flat road surface in a stopped condition with the tire(s) and/or air system suspension at any one wheel or dual wheel fully deflated. Any part of the bus that is lower than the wheel rims must have the approval of the District.

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TS 1.4.2 Approach and Departure Angles

It shall be a design objective to attain the maximum angle of approach and angle of departure in order that buses may safely negotiate vertical curves in the service area of the District. Buses shall have a minimum angle of approach of 9 degrees and a minimum angle of departure of 9 degrees.

Each coach shall have the approach and departure angles measured. This shall be accomplished by using a full coach-width wedge, designed to measure the angle by being placed under the front or rear of the coach and slid up to the tire-road contact point. The wedge shall be constructed by the Contractor and approved by the District. The angles are referenced in Figure 1-2.

TS 1.4.3 Breakover Angle

The breakover angle is the angle measured between two lines tangent to the front and rear tire static loaded radius and intersecting at a point on the underside of the vehicle that defines the largest ramp over which the vehicle can roll. Buses shall have a minimum breakover angle of 8.7 degrees.
Figure 1-1

- Midpoint between axles
- Minimum ground clearance area
- 9° departure angle
- 9° approach angle
AC TRANSIT DISTRICT
Purchasing Department

REQUEST FOR PROPOSAL
No. 2013-1235

BUS RAPID TRANSIT (BRT) BUS PROCUREMENT
PERIOD OF PERFORMANCE: 01 JUNE 2015 THROUGH 30 NOVEMBER 2017
ADDENDUM NO. 3

TS 1.4.4 Turning Radius
Buses shall have a turning radius such that all parts of the bus body remain within the outer space envelope (point A) as indicated in Figure 1-2. This shall occur both in left hand and right hand turns. All coaches will be tested to verify these conditions.

Figure 1-2

STANDARD 60 FT BUS

MAXIMUM TURNING RADIUS "A" = 520 INCHES (13,210 mm)

MINIMUM TURNING RADIUS "B" = 206.3 INCHES (5,240 mm)

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TS 1.5 Weight and Axle Loading
It shall be a design goal to construct each bus as light in weight as possible without degradation of safety, appearance, comfort, traction or performance.

Buses at the maximum GVWR shall not exceed the tire factor limits specified in the motor vehicle laws of the State of California.

The Contractor's GAWR and GVWR for the bus shall, as a design goal, exceed the actual total weight and axle weights of the bus with 150% of a seated load.
TS 1.6 Performance

Buses shall operate safely and reliably in revenue service at the minimum performance standards listed on Table 1-1. All buses delivered must meet such performance standards as long as the propulsion components are adjusted within the parameters specified in the maintenance manuals.

Table 1-1

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>MINIMUM PERFORMANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Speed At Level Grade</td>
<td>65 mph (104 km/h)</td>
</tr>
<tr>
<td>Acceleration 0-20 mph (0-32 km/h) At Level Grade</td>
<td>09 Seconds</td>
</tr>
<tr>
<td>Acceleration 0-45 mph (0-72 km/h) At Level Grade</td>
<td>36 Seconds</td>
</tr>
<tr>
<td>Maintain Speed At 3.5% Grade</td>
<td>43 mph (69 km/h)</td>
</tr>
<tr>
<td>Acceleration 0-20 mph (0-32 km/h) At 5% Grade</td>
<td>14 Seconds</td>
</tr>
<tr>
<td>Acceleration 0-10 mph (0-16 km/h) At 9% Grade</td>
<td>09 Seconds</td>
</tr>
</tbody>
</table>

*Vehicle load is at GVWR*

Acceleration times begin when the accelerator pedal is depressed. The lag time between depression of the accelerator pedal and movement of the bus should be minimized. The District tests bus acceleration with a Vericom 3000/4000 Performance Monitor.

The Contractor shall design the bus and propulsion components so as to operate safely and reliably in revenue service conditions at the specified minimum performance levels set forth above. The Contractor shall provide capability in the bus performance beyond the specified minimums in recognition that buses may be operated, on occasion, for extended periods above or below maximum and minimum speed limits.

A bus meeting the performance requirements in Table 1-1 will not be able to achieve a higher top speed no greater than 68 MPH on an extended downgrade. All systems and components on the bus shall not be adversely affected by these higher speeds. The Contractor may propose a speed-limiting system to control top speed on downgrades.

TS 1.7 Duty Cycles

Coaches shall be designed to be compatible to the terrain and environment found in the District’s service area. Also, coaches shall be capable of running continuously with capacity load in the terrain and environment conditions found in the District’s service area. These conditions include high humidity, rain, and temperature extremes.

Coaches shall be capable of continuous operation within the District’s service environment at a capacity load and an ambient temperature of 105° F without
overheating or degradation of any operating component. Coaches shall operate in stop and go downtown traffic with no adverse effects. Coaches shall also be able to safely and efficiently negotiate the conditions found in the District’s service area.

Fig 1-3 shows typical routes the coach shall take in normal revenue service. These may include freeway and arterial travel. Coaches shall be capable of operating continuously on either of these routes with a capacity load making all stops with an ambient temperature of 105° F without overheating or degradation of any operating component.

(Figure 1-3 Shown Below)
TS 1.8 Ride Quality
Each bus, at any load condition between empty and GVWR, shall produce a comfortable, stable ride quality on a variety of road surfaces of moderate to good condition, when driven at legal speeds. On poor quality road surfaces, the ride quality shall not contain excessive instability or bottoming when the bus is driven at prudent speeds for the road surface. The bus shall provide a safe and stable ride at freeway speeds and shall maintain this condition even when changing lanes.

The Contractor shall submit evidence, which may include technical analysis and comparisons or subjective tests, establishing that the design used produces a ride quality comparable to the best state of the art for heavy-duty buses. Ride quality shall conform to these guidelines with the bus loading ranging from empty to GVWR.

TS 1.9 Appearance
Each bus shall be designed to hold a quality appearance, both on the exterior and the interior, during the entire service life of the bus. All materials, fabrics, colors, textures, painting schemes and all equipment and components relating to the interior decor of the bus shall be coordinated. Detailing shall be kept simple; add-on devices and trim should be minimized and where practical integrated into the basic design.

The interior layout shall be designed to convey a sense of spaciousness, pleasant surroundings, comfort, convenience and modern design, with a minimum of protrusions. There shall be no sharp corners, edges or gaps that could cut or trap a passenger’s hands and/or fingers. The design shall avoid horizontal ledges and other ‘dust catchers’ and water traps.

TS 1.10 Passenger, Operator and Maintenance Personnel Safety
All design factors shall take into consideration the safety of the passengers, operators and maintenance personnel. Items requiring safety consideration in design include, but are not limited to:

- Elimination of sharp corners and edges
- Locations for handrails and stanchions
- Impact yielding handrails on seats
- No obstructions in aisles
- Implementation of Federal safety standards, Intensity and distribution of interior lighting
- Elimination of interior driver area windshield glare
• Exterior lighting at doorways
• Steps
• Elimination of pinch hazards on interior and exterior assemblies
• Implementation of ADA requirements
• Body construction
• Side impact barriers, padding on seat back tops, yellow non-skid step nosing
• Acceleration and Braking
• Floor hatches

**TS 1.11 Emergency Exits**

Buses shall be provided with adequate exits for quick passenger escape during emergency conditions, which comply with applicable codes and requirements and the best industry practice.

An air pressure relief valve shall be provided near each door to allow passengers to manually open the door in an emergency.

Most large passenger windows on the sides of the bus shall open outward to provide an emergency escape path. Based on FMVSS, windows in the rear, raised floor section should not be emergency exit windows. The driver's side window is also an emergency exit.

Exits shall be provided to allow passenger escape in a rollover situation, including the use of roof exits.

**TS 1.12 Windshield Reflections**

Buses shall be designed so that a bus operator shall see no hazardous infractions or windshield reflections. The interior lighting design shall be coordinated with the design of the driver's station to minimize reflections off the windshield and other parts of the bus.

Buses will be used in suburban areas on narrow roads without street lighting, and the driver's environment must be adequate for such use at night.

The Contractor shall provide information on how this requirement is to be met at the design review, and shall demonstrate the result on the prototype bus, for the approval by the District.
TS 1.13 Service Life
It is required that buses be designed and constructed to assure a minimum service life of at least 12 years or 500,000 miles (805,000 km), whichever comes first. The Contractor must submit evidence that the design is adequate to meet this.

TS 1.14 Failures
Each bus shall be designed to minimize the potential for failure of components while the bus is in service.

The following specific examples are design goals for mean mileage between failures by failure class by bus, provided that all specified preventative maintenance procedures are followed.

TS 1.14.1 Physical Safety
Physical safety is defined as a failure that could lead directly to passenger or driver injury and represents a severe crash situation. Mean mileage between incidents shall be greater than 1,000,000 miles (1,609,300 km).

TS 1.14.2 Road Call
Road call is defined as a failure resulting in an interruption of revenue service. Service is discontinued until the coach is replaced or repaired at the point of failure. Mean mileage between incidents shall be greater than 20,000 miles (32,186 km).

TS 1.14.3 Coach Change
Coach change is defined as a failure that requires removal of the coach from service during its assignments. The coach is operable to a rendezvous point with a replacement coach. Mean mileage between incidents shall be greater than 16,000 miles (25,749 km).

TS 1.14.4 Road Service
A road service is defined as a failure that does not require the removal of the coach from service during its assignments but does degrade operation. The failure shall be reported by Operations and/or Maintenance. Mean mileage between incidents shall be greater than 10,000 miles (16,093 km).

TS 1.15 Maintainability
Prime consideration shall be given to the routine problems of maintaining the buses. All systems or components serviced as part of periodic maintenance or
whose failure may result in a 1.14.2 or 1.14.3 class failure shall be readily accessible for service and inspection.

To the extent practicable, removal or physical movement of components unrelated to the specific maintenance or repair tasks involved shall be avoidable. These areas shall include but not be limited to the bus propulsion system and its accessories and components, fueling, storage tanks, batteries, electrical controls, multiplex components, electrical fuse and breaker panels, lighting fixtures, door actuators, fluid and air filters, test connections, air compressor, HVAC systems, and air system components. It shall not be necessary to disassemble portions of the bus structure and equipment such as seats and flooring under seats in order to gain access to these areas.

Each bus shall be designed to facilitate the disassembly, re-assembly, servicing or maintenance thereof by use of tools and items that are normally available as commercial standard items. The engine compartment shall be designed, and equipment placed, to give maximum room possible for maintenance accessibility. Special tools must have the approval of the District. Refer to the Section TS 8.9 Special Tools and Diagnostoc Equipment.

The body and structure of all buses shall be designed for ease of maintenance and repair. Individual panels or other equipment, which may be damaged in normal service, shall be easily repairable or replaceable. Ease of repair shall be related to the vulnerability of the item to damage while in revenue service.

All electronic devices on the bus down to the line replaceable unit level shall be repairable and maintainable by the District. No potted electronic components or sub-assemblies are allowed without the specific approval of the District.

**TS 1.16 Electronic Noise Control**

Electrical and electronic sub-systems and components on all buses shall not emit electromagnetic radiation that will interfere with on-board sub-systems, components or equipment, telephone service, radio or TV reception or violate regulations of the Federal Communications Commission.

Electrical and electronic sub-systems on the coaches shall not be affected by external sources of Radio Frequency Interference (RFI), Electromagnetic Interference (EMI). This includes, but is not limited to, radio and TV transmission, portable electronic devices including computers in the vicinity of or onboard the buses, AC power lines and RFI/EMI emissions from other vehicles.
Electronic components that are subject to RFI/EMI shall have shielded power and data cabling. Deviations from this requirement shall require District approval. On-board equipment can include but is not limited to automatic passenger counters, two-way radio, electronic engine and transmission controls, automatic vehicle locating equipment, fare collection equipment, and destination signs and associated wiring.

If one coach and/or component are susceptible to RFI/EMI, it will be assumed that all coaches suffer the same defect. Corrections will be made on a fleet basis unless the District grants relief.

Upon request of the District, the Contractor shall submit test data or other evidence that all of the requirements will be met in Section 1.16.

**TS 1.17 Noise Levels**

**TS 1.17.1 Interior Noise**

The combination of inner and outer panels and any material used between them shall provide sufficient sound insulation so that a sound source with a level of 80 dBA measured at the outside skin of the bus shall have a sound level of 65 dBA or less at any point inside the bus. These conditions shall prevail with all openings, including doors and windows, closed and with the engine and accessories switched off.

The bus-generated noise level experienced by a passenger at any seat location in the bus shall not exceed 83 dBA and the operator shall not experience a noise level of more than 75 dBA under the following test conditions. The bus shall be empty except for test personnel, not to exceed 4 persons, and the test equipment. All openings shall be closed and all accessories shall be operating during the test. The bus shall accelerate at full throttle from a standstill to 35 mph on level commercial asphalt or concrete pavement in an area free of large reflecting surfaces within 50 feet of the bus path. During the test, the ambient noise level in the test area shall be a least 10 dBA lower than the bus under test. Instrumentation and other general requirements shall conform to SAE Standard J366.

**TS 1.17.2 Exterior Noise**

Airborne noise generated by the bus and measured from either side shall not exceed 83 dBA under full power acceleration when operated at or below 35 mph at curb weight and just prior to transmission up shift. The maximum noise level generated by the bus pulling away from a stop at full power shall not exceed 83 dBA. The bus-generated noise at curb idle shall not exceed 65 dBA. All noise
readings shall be taken 50 feet from and perpendicular to, the centerline of the
bus with all accessories operating. Instrumentation, test sites, and other general
requirements shall be in accordance with SAE Standard J366. The pull away test
shall begin with the front bumper even with the microphone. The curb idle test
shall be conducted with the rear bumper even with the microphone.

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TS 2. Vehicle Requirements
TS 2.1 Body Structure
TS 2.1.1 Design
Integral design bus structure shall be used that consists or composes of parts that together constitute as a whole. Other types of structure may be used with the approval of the District prior to bidding, after submission of evidence that the bus structure proposed is suitable and proven for heavy-duty transit service over the required lifetime.

Alternatives to the detailed requirements of this subsection may be proposed by the Contractor with proper data analysis for the District’s approval.

The exterior of each bus shall be of clean and simple shape. The skin shall be of smooth panels, securely fastened to structural members and in a way that permits easy replacement or repair, provides the necessary strength and rigidity for the design requirements of this specification, and protects the basic structure from minor damage. Of primary concern are ease of maintenance, durability, and consistency of appearance.

Reinforced fiberglass and plastic materials shall be excluded from the basic body skin and/or structure, except for non-structural access doors, panels and caps.

Exceptions to this requirement may be proposed by the Contractor for approval by the District.

Water deflecting roof gutters shall be provided above the doors and the driver's side window. The roof gutter over the driver's side window shall extend to the front of the bus. When the bus is accelerated, decelerated, coasting or stopped, water from the gutters shall not spill onto the outside mirrors, driver's window, and windshield or passenger doors.

Air flow characteristics around the moving vehicle shall not cause water, road dirt or tire thrown water to accumulate on the exterior mirrors, driver's side window or front door glass. Water from tires, particularly in turns, shall not be deposited on exterior mirrors.

TS 2.2 Interconnection Structure
Buses shall be equipped with an interconnecting structure (hinge) which permanently joins the lead unit and trailing unit sections, allows relative motion between the sections about the pitch and yaw axes, and allows a small amount of relative roll between the sections.
A rotating turntable connection shall be provided between the lead unit and trailing unit to serve as a floor and allow passenger access between the sections of the bus under all operating conditions. The turntable shall be designed for all horizontal and vertical turns that the bus is capable of making without introducing discontinuities between the turntable and adjacent vehicle floors. The turntable shall also accommodate, without damage, a minimal amount of relative roll between the lead and trailing units. The structures and finishes in the interconnecting section shall be designed to prevent passenger injury under all conditions. The turntable floor cover plate shall be supported so there will be no honing of the floor plate making it sharp at the outer edge. The gap between the floor and the turntable shall be minimized in order to prevent a tripping hazard. It shall be designed for ease of access for inspection and repairs of all devices that are part of it or devices that pass through the turntable area. Under floor turntable components shall be easily accessible; floor plates must be easily lifted and secured in the open position by one person for inspection and repairs; turntable seats shall be quickly and easily removable by one person.

The under floor turntable area shall be completely enclosed by the bellows and bulkheads on the lead and trailing units to prevent drafts into the passenger compartment. The area between the turntable floor and the bellows shall be closed to prevent collection of trash in the bottom of the bellows. Closeouts shall be attached with removable fasteners.

An anti-jackknife joint shall be provided. This joint, by sensing vehicle speed, relative angle between the lead and trailing sections, throttle and braking actions and any other necessary inputs, will control the degree of stiffness in the joint to insure that the bus does not jackknife or operate in a dangerous or unsafe condition. The District shall approve the anti-jackknife joint.

The interconnecting structure shall be designed to prevent separation of the lead and trailing units.

Provide easy access to overhead lines (electric, air, hydraulic, refrigerant) passing through the joint. Hydraulic fittings to be "Parker" or approved equal. Lines are to be secured, separated, and labeled at the lead and trailing unit bulkheads. Separation shall be maintained on the flexible portion of all lines. All electrical terminations and hose fittings shall be easily visible and easily tightened or removed without removing any other component. All lines, routing, securement and labeling shall be approved by the District.

In order to prevent damage to the structure and electrical, air, hydraulic and refrigerant lines when the vertical or horizontal bending capabilities of the hinge...
are exceeded, the bus shall be provided with appropriate warning devices, brake interlocks and positive mechanical stops. These devices shall operate when the maximum bend angle is being approached in either plane. A means shall be provided so the driver can override the control or recover from the situation. The bus shall be equipped with a reverse speed governor which shall apply the brake and accelerator interlocks when bus speed in reverse gear exceeds 1.5 mph (2.4 km/h) but the bus shall have sufficient power in reverse to back out of wheel locator 1½" - 2" depressions at a floor hoist. The proposed configuration of these devices and the reverse speed requirements shall be submitted for approval of the District.

**TS 2.3 Bellows**

Replacement fabric type bellows from "Hubner" or approved equal with draft-free, no-sag bottom closure with guard and water drains shall be provided between the lead and trailing sections to seal the bus interior and keep it free of water, dirt, and drafts. The bellows shall be a dark color to reduce the appearance of dirt. Bellows hardware shall be corrosion resistant and the under floor area of the bellows shall be easy to clean when necessary. The passageway between the lead unit and trailing unit shall have an inside cross section that is as nearly equal as possible to the inside cross section of the bus bodies, with no tripping hazards created by the turn table cross section or close outs. The bellows shall be durable and its' supporting structure and stiffeners shall support the bellows material in a neat, sag-free manner. The Contractor shall supply information on the actual service life achieved by the type of bellows being proposed. Sample of bellows and attaching hardware may be requested for evaluation at the District's option. Bellows shall be approved by the District.

**TS 2.4 Subfloor**

Sub floor material shall be of 3/4-inch (19mm), 7-ply plywood, treated for exterior use, and with no voids. The material shall be wet and dry rot resistant and impervious to insects. All raw edges, wood-to-wood surfaces, and wood-to-metal surfaces shall be coated and totally waterproofed using an approved material prior to installation. The sub floor shall be finished and filled as necessary with waterproof filler after installation in the manner prescribed by the manufacturer of the floor covering so that no sub floor irregularities and/or seams are visible after installation of the finish flooring. All sub-flooring seams and/or joints will be totally supported by structural framing.

The sub floor shall support a capacity load continually with the bus in service without perceptible flexing and it shall be free from squeaks. At GVWR, the floor shall have an elastic deflection of no more than 0.25 inches (6.3 mm) from the
unloaded condition. The District shall approve sub-flooring material and attaching methods.

**TS 2.5 Floor Covering**

All aisles, steps, floor areas where people walk and floors in securement locations shall have slip-resistant surfaces. After assembly of the bus, any temporary protective coating on the flooring shall be washed off in the manner prescribed by the flooring manufacturer.

Floor coverings shall be attached continuously to the sub-flooring without voids or trapped debris, using methods and adhesives recommended by the floor-covering manufacturer. The floor shall be neat in appearance, free of tripping hazards and easy to clean by dry methods and wet wash with cleaning solutions. Bus floors shall be undamaged for the life of the bus by routine cleaning with wet wash methods. It is expected that the floor covering (excluding step treads) will last the life of the bus. The District shall approve materials, adhesion methods and trim of the floor covering.

The outer edge of each entryway shall be marked with "Altro", or approved equal, 2.7mm step edge with integral adhesive strip, running the full width of the edge, in yellow color. A transverse standee line shall be provided at the aft end of the front door entrance area in yellow color.

Steps in the aisle shall meet the dimensional requirements of Section 2.10, be the width of the aisle, be plainly marked and illuminated, be covered with "Altro" or approved equal step tread with 3/16 inch step nosings with integral abrasive strip or approved equal in yellow color.

The floor and front entrance area shall be covered with "Altro" or approved equal 2.7mm flooring, installed between the wheelhouses and running longitudinally from the rear seat to the front dash, interrupted only for the steps in the aisle and the joint.

The wearing area of the driver's station platform shall be covered with a 14-gauge aluminum plate covered with "Talfourd-Jones" TACTAL, or approved equal non-skid material. The plate shall be attached with screws, and a thin layer of non-hardening caulk shall be used under the plate to prevent water damage or flexing.
TS 2.6 Moldings
Interior trim molding around the base of the driver's platform, dash, rear seat riser, wheel housings and any raised seating areas shall be of anodized aluminum, stainless steel or other approved material. The edge of the driver's platform and any raised seating area shall have a right angle anodized aluminum or stainless steel molding. Any trim moldings shall be attached with stainless steel screws and sealed to the floor and vertical surface so as to exclude water and dirt. It shall provide a neat, finished appearance. Anodizing shall be free from scratches and quality control defects.

Any air ducts located at floor level shall be of smooth finish stainless steel of adequate strength to resist damage by passenger's feet.

TS 2.7 Interior Paneling and Carpeting
The interior panels may be integral with the basic structure of the vehicle. Panels shall have sufficient strength to resist vandalism and to avoid resonant vibrations under operating conditions. The surface of lower sidewall panels and of ceiling panels shall be easily cleanable and resistant to scratches and marking. The interior panels shall be applied in sections and secured properly with a neat finish. All metal attaching hardware shall be stainless steel.

Ceiling panels shall be supported to prevent buckling, drumming or flexing. Panels shall be installed so they will not discolor from contact with structural pieces behind them for the life of the bus. Trim strips at joints of ceiling panels shall be of vinyl clad metal.

Lower sidewall panels shall be easy to remove for maintenance and replacement panels shall fit easily through the doorway of a finished bus. Sidewall and ceiling panel thickness shall be a minimum of 0.100 inch (2.5mm). All interior panels, panel size and installation shall be approved by the District.

TS 2.8 Wheel housings
Second and third axle wheel housings shall be constructed of minimum 14 Gage (.0747 inch, 1.8974 mm) stainless steel. Front axle wheel housings may be fiberglass and grey in color. Wheel housings shall be reinforced to resist damage from stones, broken tire chains or tire fragments and to prevent any entry of such items into the passenger compartment. The design shall have no exterior ledges that will trap water and/or dirt.

Wheel housings shall provide clearance to permit the bus to be driven to a repair facility with one or more air suspension bellows deflated. There shall be a
minimum of 4 inches (102 mm) of clearance, or 3.5 inches with pre-bid approval, between a fully inflated tire and the wheel housing on all sides. The District shall approve design and colors of the wheel housings.

**TS 2.9 Entryways**

The front platform area including the aisle floor ahead of the wheelhouses shall provide a passageway wide enough to meet the objectives of this section, past the driver's station and fare collection equipment and into the bus proper. The design shall accommodate passengers in mobility devices as well as on foot (1.3.7).

The vertical clearance between the top of all door opening and the floor shall be a minimum of 78 inches (198 cm).

The front doorway clear width, including door-mounted passenger assists, shall be no less than (34 inches). The rear and middle doorway clear width, including door-mounted passenger assists, shall be no less than (41 inches). Clear opening is measured between handrails.

The floor area just inside the doors shall be slightly sloped to prevent water from collecting. Sealing at the door bottom shall preclude water entry. Floor edge nosing (Section 2.05.02) shall be supplied.

At each door entryway a Braille placard shall be attached to the closest modesty panel that describes the bus number. The size and location of the placard shall be determined and approved by the District.

**TS 2.10 Steps**

Risers shall be vertical and they shall be 7.5 to 10 inches (109 to 254 mm) equal within a variation of 0.5 inch (13 mm). Usable step tread depth between the nosing and the riser shall not be less than 11 inches (279 mm).

**TS 2.11 Thermal and Sound Insulation**

The floor, walls, ceiling and propulsion compartment of all buses shall be adequately insulated to:

1. Control body surface temperatures
2. Assist in providing the required interior temperature environment
3. Obtain the required noise control.

Insulation in the engine compartment must withstand grease, oil, dirt and steam cleaning for the life of the bus.
Roof insulation shall be at least 1 inch (25.4 mm) in thickness. In addition, it is preferred that the underside of the roof skin be coated with an approved undercoating material to reduce condensation in cold, damp weather, and noise. Sidewall insulation shall be at least 0.75 inch (19 mm) in thickness. Material shall be selected and installed so insulating properties will not be impaired during the life of the bus. Alternate configurations may be proposed for approval by the District.

**TS 2.12 Strength Requirements**

Each bus, at capacity load under dynamic and static conditions, shall not exhibit deformation or deflection that will damage panels or structural members or impair operation of doors, windows, or other mechanical elements. The Contractor will be requested to provide a written certification or copies of actual test results or both for all requirements of Section 2.13. Static conditions include the case of a bus at rest with any one wheel or combination of wheels mounted on a 6-inch (15 cm) curb.

Dynamic conditions include operation on a variety of road surfaces at prudent speeds up to the maximum for each type of bus and road irregularities such as potholes and railroad level crossings.

The structure of each bus, at the maximum practical passenger load, shall withstand without permanent deformation or damage, impact and inertial loads due to uneven roadways traversed at prudent speeds or, occasional aberrations at normal speeds.

The bus body and roof structure shall withstand a static load equal to 150 percent of the curb weight evenly distributed on the roof with no more than a 6 inch (152 mm) reduction in any interior dimension. Windows shall remain in place and shall not open under such a load, but shall be easily opened when used as emergency exits.

The bus shall withstand a 25 mph (40 km/h) impact by a 4,000 pound (1814 kg), post-1973, American automobile at any point, excluding doorways and bellows, along either side of the bus or front end with no more than 3 inches (76 mm) of permanent structural deformation at seated passenger hip height. This impact shall not result in sharp edges or protrusions in the bus interior.

Exterior panels below the window line and their supporting structural members shall withstand a static load of 2,000 pounds (907 kg) applied perpendicular to the bus anywhere below the floor line by a pad no larger than 5 inches (127 mm) square. This load shall not result in deformation that prevents installation of
new exterior panels to restore the original appearance of the bus. Components located behind these panels cannot be damaged by this test method.

**TS 2.13 Resonance**

It shall be a design objective to provide buses where all vibration frequencies of the body, panels and structure, including vertical, lateral and body torsional modes, are sufficiently outside the bandwidth of all primary and major harmonic operating frequencies of all rotating and reciprocating equipment, including the engine, so as to preclude resonant vibrations.

**TS 2.14 Fatigue Life**

The basic bus structure shall be designed so that fatigue damage will not occur throughout the service life of the vehicle.

**TS 2.15 Exclusion of Water**

Each bus shall be tested to assure that the underside, wheel houses, floor, exterior body, windows, passenger doors, lamps, access doors and other openings do not admit water into the interior of the bus or into any compartments covered by exterior doors during operation. Any equipment compartment located inside the coach shall be sealed from water entry.

During production, preferably before interior components and insulation are installed, each bus must be tested in accordance with a water test proposed by the Contractor and approved by the District. Approval must be given on duration of test, rate of water flow, amount and placement of nozzles, and nozzle pressure/pattern. Buses that fail any part of this test shall be repaired and 100 percent re-tested until they pass.

Use of sealers, externally applied to already attached components to meet the water test requirement, is prohibited. All exterior hardware must be installed. No temporary sealing methods can be used.

After delivery, the District will water test all buses in a bus wash rack. Leakage during this test will be repaired by the Contractor, who will also make appropriate corrections in the assembly line and factory water test.

**TS 2.16 Resistance to Corrosion**

All exterior materials, finishes, surface treatments, and any other bus surfaces subject to the conditions below shall either be of non-corroding material or fully protected by the application of corrosion preventatives. Buses shall be subjected to tire-thrown rocks, puddles of water, saltwater air, commercial floor,
ceiling and wall cleaning solutions, window washer solutions, human wastes, and extended periods of damp and rainy weather. Buses will normally be stored outdoors.

The underside of each bus shall be coated with a non-flammable material, "Ashland Petroleum Co." Tectyl, "Liquid Plastics Limited" Isoclad, "Dolchem" 7751 Hydro Armor, "PPG" Corashield (white) or approved equal, to inhibit corrosion. The corrosion inhibitor shall be of a light color (preferably white) to aid in under coach inspection and maintenance. Special attention will be given to applying the inhibitor on all horizontal frame members, wheel housings and other dirt/water catchers. All bellows, valves, air system components, brake system components and electrical connectors shall be covered when applying the undercoating to facilitate easy replacement of parts when required. Application of the under coach corrosion inhibitor shall be approved by the District.

The battery compartment and adjacent area shall be protected against corrosion from battery fluid. Specific information is in Section 2.22.

All unpainted exterior and interior hardware shall be non-magnetic stainless steel or steel coated with ASTM-8-633-85 Fe.Zn SC 3 (Type 2 - supplementary gold chromate treatment iridescent yellow). The District reserves the right to request sample testing to determine conformity using methods referenced in ASTM-A-165, A-219 and/or 8-117. Other methods of corrosion protection may be used. Alternate hardware coating methods must demonstrate the same corrosion protection life results using the Salt Spray (Fog) Testing ASTM-B-117 and be approved by the District. Exterior or interior component hardware that will see removal and replacement to normally service the component must be non-magnetic stainless steel or other non-rusting material.

Completed unassembled frame structures, sub-assemblies or component parts shall not be stored or assembled in locations that allow moisture to rust the interior or exterior of the materials. No rusted or corroded metal may be used in the bus. After assembly, the interior of all sidewall tubing up to the roof and under floor frame (structure) tubing shall be coated with "Waxoyllnc." 120-4, "Ashland Petroleum Co." Tectyl corrosion preventative, or approved equal, applied in accordance with the manufacturer's recommendations and with the manufacturer's approved application devices. Frame tubing shall have drain holes with an approved anti-plugging method installed to eliminate any water trapping or build-up. Any Waxoyl application hole not utilized as a water drain shall be closed and sealed using plastic plugs. The use of "CoraTube" material
is strictly prohibited. The Contractor shall be responsible for providing an approved method and equipment to check for proper application.

Any bus body or chassis assembly carried on an ocean-going vessel must be carried below deck on a Role-on Role-off ship. Shipping methods and corrosion protection shall be approved by the District.

All unexposed metal body parts shall be primed or painted prior to assembly. Joints between dissimilar metals shall be treated or protected so as to prevent electrolytic corrosion for the service life of the vehicle. All bright metal exterior components such as (but not limited to) lamp sockets, brackets, mirror assemblies, rivets and clamps shall not rust.

**TS 2.17 Exterior Finish**

The Contractor shall execute the exterior finish of the vehicles, which will include painting, decaling, or a combination thereof. Exteriors will be executed to a design specification that will be detailed at a later date. The exterior paint scheme will not exceed three colors. Prior to execution, the District shall approve colors and materials to be used in the specified design.

After execution of the Contract, the Contractor shall supply to the District detailed drawings of the front, rear, both sides, and roof of the bus that will be supplied. These drawings will include measurements and material specifications. Within 90 days of receipt of the drawings, the District will return these drawings to the Contractor with details of the color scheme and decals included.

The exterior of the bus shall be finished with “PPG" Delfleet Essential", DuPont" Imron 7200, or approved equal polyurethane enamel. The finish coat shall be free of runs, sags, dirt and/or silicon contamination, orange peel and areas of no gloss. Finish coat thickness and application method shall be as specified by the finish coat manufacturer. All primers and fillers applied before the finish coat shall be approved as to material, thickness and application by the manufacturer of the final finish coat. Surface preparation of the substrate shall be similarly approved. The Contractor is required to submit procedures for the installation of any reflective tape. The Contractor shall supply copies of all required approvals to the District before production. All exterior paint, primer, fillers, etc. shall be lead-free. There shall be no bare or exposed metal surfaces showing on the exterior of the bus, exclusive of ornamentation, accessories and bumpers.

**TS 2.17.1 Decals**

All exterior and interior decals shall be provided by the contractor. Bus exterior decaling will be executed to a design specification that is detailed at a later
date. A decal wrap will not exceed coverage of 85% of the vehicle. Perforated decaling over the windows may be required.

Exterior decals shall include but not limited to the District’s branding (Logo, URL), the service branding (which shall be determined at a later date), ‘Jacking Point’, ‘Electrical Main Switch’, ‘Air Tank Drain’ Wheel Chair entrances” and Bicycle entrances, Interior decals shall be in English with the exception of the “Watch Your Step”, “Emergency Exit Instructions”, these decals shall have three languages (English, Spanish, and Chinese). The Contractor shall supply copies of all required approvals to the District before production. The Contractor shall supply final artwork files of the interior and exterior decals, subsequent to production.

**TS 2.18 Interior Finish**

Bus interior ceiling and vertical surfaces not melamine, vinyl or bright metal, including certain areas of the driver's station, shall be painted with, DuPont® Imron Paint Code #F6812MR®, or approved equal polyurethane enamel. Inside finish and primer coats shall be applied per the specifications of the finish coat manufacturer. The District shall approve the degree of driver station paint ‘flatness’. All interior paint, primer, fillers, etc. shall be lead-free. Colors and material shall be approved by the District.

**TS 2.19 General Painting Preparations**

All metallic and non-metallic surfaces shall be thoroughly cleaned, by methods in accordance with the paint manufacturer's recommendations, immediately before the first coat of paint is applied. All metal-to-metal joints shall be properly primed. Wood-to-metal surfaces shall be coated with anti-squeak compound. All paint and surface preparation methods shall be approved by the District.

**TS 2.20 Fleet Numbers**

Buses shall have fleet numbers applied in sequence with factory VIN numbers. Factory VIN numbers shall be in one sequential group per delivery group. The District will inform the Contractor of the fleet number sequence within 90 days of contract execution. The Contractor will submit a complete list of fleet and VIN numbers for approval by the District before the start of production.

The exterior fleet numbers shall appear on all four corners of the bus. Locations shall include above the rear windows, driver’s window, above the front door, center of the rear of the bus and both front corners below the windshield. These numbers shall be 4-inch (127mm) reflective vinyl characters. The fleet numbers on the roof shall be large characters labeled longitudinally legibility by police aircraft. Interior fleet numbers of the bus located above the
windshield and above the rear window shall be provided by the District. The District shall approve the fleet number style and locations.

**TS 2.21 Builder's Plate**
A metal builder's plate shall be installed on the inside of the front of the bus, listing the manufacturer's name, bus or chassis model, VIN number, date of manufacture and any other required information. The plate shall be installed with permanent metal fasteners. Alternatively, a non-removable foil tag mounted to an aluminum plate pop riveted to the bus may be supplied. The District shall approve the Builders Plate location and content.

**TS 2.22 Battery Compartment**
Each bus shall be equipped with a battery compartment and preferably a swingslide-out battery tray, accessible from outside only and hinged to swing open counter-clockwise on the curbside or clockwise on the street side. The battery compartment shall be on the curb (right) side of the bus. It is preferred that the battery compartment also slide out, in order to provide working room beside the engine. The stowed batteries are parallel to the longitudinal centerline of the bus. The battery compartment shall be as far from exhaust heat, engine heat and other generated heat as is practical and still be conveniently located for inspection, maintenance and battery replacement. The design of the battery compartment shall prevent the entry of dirt and water. In addition a metal 24 volt caution tag, approximately 12 inches long by 4 inches tall (305mm by 102mm) shall be provided on the inside of the battery compartment access door. This tag shall be held in place by a means other than glue. The tag shall have red Helvetica lettering on a white background. The District shall approve the battery compartment and all components.

The frame and tray shall be constructed to provide ease of movement without deformation of members or mounting hardware. The compartment, tray, and hardware shall be of stainless steel. The compartment shall vent battery fumes and will have drainage for washing batteries and compartment. Provision shall be made to securely latch the battery tray in the retracted position and, in addition, a detent or a spring activated positive type lock shall be provided in the extended position. There shall be no lip on the edge of the tray where the batteries are slid into and out of the tray. The battery tray shall easily accommodate any two 8D flag post batteries from major manufacturers. A swing-out tray shall have a zero fitting to lubricate the tray pivot.
TS 2.23 Electronic Equipment Compartment

Each bus shall be equipped with a fully sealed and locked compartment located on the left front wheelhouse to provide a mounting location for a radio transceiver, data package, security camera controller, APC equipment, and other electronic equipment. The compartment shall contain four slide out shelves capable of height adjustment. Shelves shall securely latch in the stowed position.

The compartment shall be equipped with a power supply and shall be a minimum 40 inches high by 21 inches wide by 27 inches deep. The compartment shall be sealed and locked against the entry of water, and equipped with a lockable door, retained with approved fasteners. The District shall approve the box design, shelves, and power supplies. The voltage should be switched and non-switched 12V and 24V buss 10 minute delay for the CAD/AVL system. Compartment Door Key shall be a 751 CH key.

The Contractor shall supply a compartment that shall be equipped with an exhaust fan. The Exhaust fan shall turn on when the interior compartment temperature reaches 72°F.

TS 2.24 Towing and Lifting

Provision shall be made for lifting and towing the bus from the front with towing service tow trucks used by the District. Buses will be towed in the forward direction with the front of the bus lifted. All bus bodies shall be sufficiently strong to prevent permanent deformation or damage while being lifted or towed.

Alternate provisions for towing and lifting may be proposed for approval by the District. The District must approve all provisions for towing and lifting.

Hoisting and jacking points shall be provided on each bus for use with a pit hoist, post lift using one post per axle, platform hoist or a portable hoist under each wheel or axle.

With a tire or dual tire set completely flat and the bus on a hard level surface it shall be possible to safely jack up the bus with either a common 10 in (254 mm) high hand jack or a 10-ton floor jack.

If it is not possible to slide a floor jack under the jacking point with airbags deflated at any wheel end location, provide suitable jacking points on the outside of the body at each wheel opening.
With the bus at normal ride height, there shall be clearance to slide a 9.5-inch (241 mm) high portable hydraulic jack under a jacking point at each wheel.

These locations shall be sufficiently strong to withstand the jacking force required to lift that portion of the bus without damage to any vehicle components. The bus shall be capable of being lifted at any one or combination of three points without permanent deformation.

Towing points under the bus and hoisting and jacking points shall be marked with riveted, permanently attached metal tags of a contrasting color. A riveted, permanently attached metal diagram showing size and location of hoisting and jacking points shall be provided. The District shall approve the design and location of the tags and diagram.

Provide sufficient bumper and frame strength to allow another bus or a maintenance push/tow vehicle to push the bus from either end without body, bumper or bike rack damage.

**TS 3. Furnishings**

**TS 3.1 Door Panel Configuration**

The front door shall be of the slide-glide two sections, inward opening type, and the center rear doors on both sides of the bus shall be of the slide glide or outward-opening type. The District shall approve outward projection of door panels in any position. Alternative configurations may be proposed by the Contractor for approval by the District. The District shall approve door panels, handrails, glass, design and location.

Door panels shall be of adequate strength to perform their function without buckling or shaking. Doors may be made from aluminum sheet and extrusions, assembled with threaded fasteners. Fastening system shall be non-corroding per section 2.17.03. The intent is to provide a repairable door. Window glazing, retained by a rubber channel, preferably with an integral locking strip for easy replacement, shall be provided which covers at least 80 percent of the area of each door panel, with two-piece glazing required (Section 3.11.03).

Sensitive edges shall be supplied on all doors except the front door panels.

Durable rubber weather stripping 2 to 3 inches (51-76 mm) per panel shall be provided on the mating edge of each door panel. The rubber mating edge of the forward panel of each door shall overlap the outside of the rear panel when closed. Additional approved weather stripping shall be provided around all door
panels and the doorway openings, as necessary, to preclude the entry of water, dirt, drafts or objectionable noises.

It shall be possible to open and close all passenger doors when the bus loaded to gross vehicle weight rating is not knelt and parked with the tires touching a * inch high curb on a street sloping toward the curb so that the street side wheels are 5 inches higher than the curb side wheels.

**TS 3.2 Door Actuators and Linkages**

A single door engine as made by "Vapor Electric door Actuator", or approved equal shall power each pair of door panels. The time to fully open or close shall be adjustable between 2 and 4 seconds. Doors shall remain in the closed position without rattling during bus operation. Actuators shall be designed to prevent doors from slamming open or closed under any combination of door control, front door air release, and door panel position. Exhaust air from actuators and controls shall be vented outside the bus or with District approval, vented quietly inside the bus. Alternative configurations may be proposed by the Contractor for approval by the District. The District shall approve door actuators, linkages, electronic control devices, enclosures and their designs. Proximity switches are strongly preferred to micro switches.

The actuator assembly shall be concealed from view and shall be located for easy servicing access. Access panels to the actuator assembly shall be hinged at the top with metallic 'piano' hinge material. Hinges shall be secured with nut and bolt type fasteners.

Each actuator access panel will be equipped with 2 adjustable quarter turn spring latches, or other approved latches, easily operated by hand and requiring no tools. Each access panel shall be held open by means of an over-center spring, gas cylinder or approved prop. Access panels shall have a minimum travel of 130 degrees when opened and shall not interfere with other internal components.

Door actuator linkages shall be designed to preclude lubricant from becoming visible or from getting on surfaces that passengers may touch, throughout the service life of the bus. Any shafts and/or linkages exposed shall be enclosed with a metal shield, painted to match the area color. Operation of doors shall produce no pinch or trap hazard to passengers.

**TS 3.3 Door Controls**

The door control shall be located in the operators’ area within the hand reach envelope described in SAE Recommended Practice J287, “Driver Hand Control
Reach.” The driver’s door control shall provide tactile feedback to indicate the commanded door position and resist inadvertent door actuation. The control device shall be protected from moisture. The door control buttons shall be free from interference by other equipment and have adequate clearance so as not to create a pinching hazard. All entrance and exit doors shall be fully air operated with pneumatic door engines. The operator shall control all doors (right front, only the right rear doors, all right side doors and all left side doors). Alternative configurations may be proposed by the Contractor for approval by the District. The District shall approve all door controls and their locations.

The operation of the curb-side doors and street-side doors shall be independent from each other. Operation of, and power to, the passenger doors shall be completely controlled by the driver. When an elevated station is present on the street side of the bus the street side doors can be enabled and/or opened by the driver and the curb side doors are locked. When a station is present on the curb side of the bus the curb side doors can be enabled and/or opened by the driver and the street side doors are locked. The contractor shall provide a method to override all passenger doors, in an emergency.

A control or valve in the driver’s compartment shall shut off the power to, and/or dump the power from, the front door mechanism to permit manual operation of the front door with the bus shut down.

A master door override switch which is not within reach of the seated driver shall when set in the “off” position, close the doors, deactivate the door control system, release the interlocks and permit only manual operation of the doors.

**TS 3.4 Rear Door Safety Devices**

**TS 3.4.1 General**

The District shall approve the design, components and the operation of the rear door sensitive edges and the interlock systems. The closing door edge speed shall not exceed 12 inches per second, and opening door speed shall not exceed 19 inches per second. Doors shall not slam closed under any circumstance, even if the door is obstructed during the closing cycle. If a door is obstructed during the closing cycle, the pressure exerted on the obstruction shall not increase once initial contact has been made.

**TS 3.4.2 Sensitive Edges**

Vapor Class electric sensors shall be provided in the meeting edges of the rubber weather stripping of the rear door. The design of the sensor shall be
coordinated with the design of the door and the rubber so the following criteria are met:

The door edge system shall be designed to release the door-closing force and to reopen it sufficiently to immediately and fully release a person or object that is caught in the closing doors. It shall have rubber edges and/or seals (used to activate the automatic opening cycle on doors or alert driver to obstruction). If the door edges are used as a pressure-sensing device, sealed ends shall be vulcanized rubber. No silicon shall be used for this purpose.

Doors shall reopen when closing on a 1 inch smooth cylinder between the rubber edges. The door shall reopen when the 1 inch smooth cylinder is placed at all positions along the vertical edges, except within 2 inches from the edge at the top and within 2 inches from the edge at the bottom. The system shall be designed to react to this obstruction within no more than 1 second commencing from the time the sensor edges come in contact with the rod.

The system shall be designed and equipped to signal the driver if the doors completely close on any part of a person's body or any object. This signal shall be audible to the driver and shall sound when the edges close on 1 inch smooth cylinder perpendicular to the plane of the door, except within 2 inches from the edge at the top and within 2 inches from the edge at the bottom.

The complete sensitive edge system shall be Vapor Class supplied by "Vapor Division" or approved equal and meet all California Code of Regulations.

**TS 3.4.3 Interlocks**

The rear door interlock system shall be enabled when the master switch is in any position except off. The rear door shall be interlocked to prevent the bus from moving unless the door is fully closed and the operator makes a full brake application.

A brake interlock shall be provided and the brakes on at least one axle will be applied when, or before, the rear door begins to open. Activation of the rear door interlock system shall activate the brake stop lamps. The brake interlock system shall incorporate a speed sensor to prevent engagement of the interlock over 3 mph (4.8 km/h). This speed sensor system shall fail to a condition of brake interlock operation at any speed.

An accelerator interlock shall also be provided to prevent the engine from speeding above idle when the rear door interlock is actuated and the rear door is open. The accelerator pedal shall be released and free when the interlock is
activated. The brakes cannot be released nor the accelerator applied while the
doors are open except as listed under Interlock Override System. If the Interlock
Override System is placed in the override position it shall actuate a warning
consisting of an audible indicator and a red light indicator visible to the driver with
a label integral with or adjacent to the light stating “Warning-Interlock
Deactivated” in letters at least 3/16 inch high.

No more than 35 pounds (15.9 kg) of force shall be required to remove a 1 inch
smooth cylinder after the rear door closes on the cylinder and the sensitive edge
or safety device on the rear door is inoperative. This requirement also applies to
the front door.

**TS 3.4.4 Not Used**

**TS 3.4.5 Emergency Release Mechanism**

A release means shall be provided inside the front and rear door actuator boxes
to allow passengers to manually open the doors in an emergency, using a force
of no more than 15 pounds (11.4 kg) with the coach resting on level road. The
door interlock system shall apply the brakes to stop the bus when the rear door
release is actuated, or alternatively when the rear door is moved from the closed
position. The releases shall be in an easily accessible location with a frangible
plastic cover, and shall be properly labeled. Doors that are required to be
classified as “Emergency Exits” shall meet the requirements of FMVSS 217.

**TS 3.5 Passenger Seating Layout**

Passenger seating shall be provided with the exact layout subject to precise bus
size, floor layout, location and size of wheelhouses, location of doors, etc. The
minimum number of wheelchair tie down positions per bus shall be as given in
sectionTS1.2. It shall be a design goal to provide the maximum number of seats
possible within the seat spacing and comfort limitations specified. No rear-facing
passenger seats shall be allowed. Aisle facing seats shall be provided between
the third axle wheelhouses and the rear couch seat; otherwise forward-facing
seats are preferred. Not more than three aisle-facing seats may be installed
together without an additional divider barrier being installed.

Transverse seats shall be cantilever-mounted to the inside wall of the bus.
Raised seats shall be provided with a foot platform. The height of the non-
compressed seat cushion above the floor or raised platform shall be
approximately 17 inches (432 mm).

Transverse spacing shall be 30 7/8 to 32 inches (784 to 813 mm) center to
center or a minimum of 27 inches hip-to-knee. 'Hip-to-knee' is defined as the
horizontal distance measurement taken in a straight line from the lowest open point on an non-compressed vertical seat back cushion to any fixed panel, seat or other object located forward of the seat. All seats in every bus must meet these requirements. Each passenger seat will be 18 inches (457 mm) wide.

Rear couch seats shall adequately fill the space or, approved closeouts shall be used. These closeouts will be sloped so as to eliminate pockets and trash-catching areas. Rear couch seats shall be hinged to provide access to the rear engine compartment hatch.

The detailed seating layouts shall be submitted to the District with both the Technical Proposal and as part of the Best and Final Offer submitted by the Contractor. In addition, the seating layout will be considered at the design review but final approval will not be given until the prototype review.

**TS 3.5.1 Priority Seating Signs**
Priority seating signs will be supplied by the District and installed by the Bus Manufacturer.

**TS 3.6 Seat Construction**
Passenger seats shall be "4ONE" Model CitiPro or approved equal, all seat back and bottom shall be plastic or approved equal. All seats shall be of a coordinated design including transverse seats, aisle facing seats, seats across the rear of the bus, and folding seats. Seat back and seat bottom throughout the bus shall be interchangeable to the maximum extent possible.

Seat bottoms and backs shall be plastic or approved equal, with District cooperate green (pantone 342) color. Certain transverse seats, per section 3.09, shall have provision for attachment of a seat- to-ceiling stanchion on the aisle side. Longitudinal and transverse seat and rear couch seat attachment methods shall be approved by the District.

**TS 3.6.1 Tie-down Area Seating**
One of the following two arrangements shall be used in the tie-down seating area:

- A three-passenger aisle-facing folding seat with a transverse barrier shall be provided behind each front wheelhouse where passengers in mobility aid devices can be accommodated and to provide regular seating when no passengers using mobility aids are aboard. The transverse barrier shall be wide enough to allow both wheels of a standard size adult wheelchair to
rest against the barrier in the same plane. Provide a longitudinal grab rail on the top of the three-passenger seat back, for the use of persons in the tie-down area.

Folding seats shall be comfortable, easy and safe to stow and deploy, and designed for minimum thickness in the folded position. They shall not lock in the deployed position, and shall detent or lock into the stowed position with an easy to use release. Provide large, easy to grasp seat release latch handles, yellow in color. The bottom cushion of folding seats shall be tilted up slightly on the forward edge. Seat bottoms shall be retained with screws. Back and bottom inserts shall be removable from the seat frame.

A metal wheelchair tie down instruction plate shall be supplied in each tie down location. This plate and its placement will require the approval of the District.

Longitudinal seats shall have individual back and bottom inserts. They shall have armrests on both fore and aft sides. With the approval of the District, specific armrests can be eliminated if that side is placed against a barrier or panel. A barrier dark gray in color, with both sides finished shall be attached to the armrest seat backs shall be attached to, or braced from, coach sidewall to preclude deformation due to long term flexing.

**TS 3.7 Seat Handrail**

Transverse seats shall have a passenger assist handgrip, which shall be upswept on the aisle end to provide a vertical handhold for standing passengers. The handgrip shall be cast aluminum coated with an energy-absorbing material, dark grey in color. The handgrip shall be securely mounted on the seat frame.

**TS 3.8 Wheelchair Securement Devices**

**TS 3.8.1 Design Load**

Securement systems and their attachments shall restrain a force in the forward longitudinal direction of up to 2,000 pounds (907 kg) per securement leg or clamping mechanism and a minimum of 4,000 pounds (1,814 kg) for each mobility aid.

**TS 3.8.2 Location and Size**

The securement system shall be placed as near to the accessible entrance as practicable and shall have a clear floor area of 30 inches by 48 inches (762 mm by 1219 mm) minimum. Such space shall adjoin, and may overlap an access path. Not more than 6 inches (152 mm) of the required clear floor space may be accommodated for footrests under another seat provided there is a minimum of 9
inches (229 mm) from the floor to the lowest part of the seat overhanging the space. Securement areas shall have fold-down seats to accommodate other passengers when a wheelchair or mobility aid is not occupying the area, provided the seats, when folded up, do not obstruct the clear floor space required.

**TS 3.8.3 Mobility Aids Accommodated**
The securement system shall secure common wheelchairs and mobility aids and shall either be automatic or easily attached by a person familiar with the system and mobility aid and having average dexterity.

**TS 3.8.4 Orientation**
Either securement devices or systems shall secure the wheelchair or mobility aid, one facing toward the front of the vehicle and the other securement device facing toward the rear of the vehicle.

**TS 3.8.5 Movement**
When the wheelchair or mobility aid is secured in accordance with manufacturer's instructions, the securement system shall limit the movement of an occupied wheelchair or mobility aid to no more than 2 inches (51 mm) in any direction under normal vehicle operating conditions.

**TS 3.8.6 Stowage**
When not being used for securement, or when the securement area can be used by standees, the securement system shall not interfere with passenger movement, present any hazardous condition, reasonably protected from vandalism, and readily accessed when needed for use.

**TS 3.8.7 Seat Belt and Shoulder Harness**
For each wheelchair or mobility aid securement device provided, a passenger seat belt and shoulder harness, complying with all applicable provisions of 49 CFR part 571, shall also be provided for use by wheelchair or mobility aid users. Such seat belts and shoulder harnesses shall not be used in lieu of a device that secures the wheelchair or mobility aid itself.

The mobility and securement system shall consist of materials supplied by "Q-Straint." or approved equal. Passengers in mobility aids shall be restrained with separate retractable lap and shoulder belts, black in color. The shoulder belt shall be secured to a bus wall or separate structural member if a window precludes wall attachment. The occupant restraint shall provide properly positioned belts across both lap and shoulder regardless of whether a person is sitting in a wheelchair with armrests, a scooter or other mobility aid.
The mobility aid shall be secured with a four point system. The both rear belts, retractable, red in color and permanently mounted, shall have a belt loop and a buckle on the outer end. One shall be located near the intersection of the wall and floor, and the other near the aisle end of the barrier and the floor. Both front belts shall be red in color and permanently mounted near the intersection of the wall and floor at the front of the tie down area. The inner belt shall have a belt loop and a buckle at the outer end and be equipped with a hand-operated retractor. The outer front belt shall be able to be temporarily attached to an L-pocket floor attachment location and be equipped with a hand-operated retractor. Provided are one to two clips or temporary attachment points on the bottom of each folding seat so the driver can temporarily attach the wall side belts while prepping the area.

The securement system shall be easy to access and utilize by the bus driver, so as not to create awkward body movements, exposing the driver to possible strain or back injury. Restraint belts, when not in use, shall retract, fold or stow so as to give a neat appearance, present no tripping or catching hazards, and cause no interference with the use of the folding seats.

Wheelchair position, chair restraints and passenger tie down shall meet all Federal and California safety requirements.

**TS 3.9 Stanchions and Handrails**

Each bus shall be equipped with stanchions and handrails to allow passengers to safely enter and exit and move about the interior of the bus.

Interior handrails and stanchions shall permit sufficient turning and maneuvering space for wheelchairs and other mobility aids to reach a securement location from the ramp.

Handrails and stanchions shall be provided in the entrance to the vehicle in a configuration which allows persons with disabilities to grasp such assists from outside the vehicle while starting to board, and to continue using such assists throughout the boarding and fare collection process.

A horizontal passenger assist shall be located across the front dash of the vehicle and shall prevent passengers from sustaining injuries on the fare collection device or windshield in the event of a sudden deceleration. Without restricting the vestibule space, the assist shall provide support for a boarding passenger from the front door through the boarding procedure. Passengers shall be able to lean against the assist for support while paying fares.
Overhead handrails shall be provided which shall be continuous except for a gap at the center and rear doorway and the joint.

Handrails shall be between 70 and 73 inches (178-185 cm) above the floor or raised foot platforms and 33 inches (84 cm) apart equally spaced from the bus centerline. In the event any portion of the floor is sloped or ramped, the horizontal handrails shall be sloped in coordination to preserve the 70-73 inch (178-185 cm) dimension. The curbside handrail shall be angled toward the bus sidewall just aft of the front doorway, if necessary, to provide clearance for de-boarding passengers. All stand-offs or brackets shall be stainless steel to compliment the coach interior. Horizontal handrails shall be separate from any vertical stanchion.

Flexible drop strap loops every three feet (91 cm) along the ceiling handrail will be provided. Drop strap material, size, and attachment method will be approved by the District.

Handrails and stanchions shall be sufficient to permit safe boarding, onboard circulation, seating and standing assistance, and alighting by persons with disabilities.

Vertical stanchions immediately behind the driver shall be 'dog-leged' so that the floor attachment does not impede or interfere with wheelchair footrests. The driver seat platform, to the maximum extent practicable, shall not extend into the aisle or vestibule beyond the wheel housing.

The minimum interior height along the path from the ramp to the securement location shall be 68 inches (173 cm).

Vertical stanchions shall be provided at the inner aft corner of the front doorway, and at the second doorway; these shall be an integral part of the modesty panel at the aft side of the rear doorway (Section 3.10). A vertical floor to ceiling stanchion shall be provided at the inner front corner of the rear doorway.

Vertical seat to ceiling stanchions shall be provided at alternate transverse seats. Groups of aisle-facing seats shall have a vertical stanchion at every other seating position with a minimum of two stanchions. Additional vertical stanchions may be required in the front of the coach because of extended spacing of seats forming the wheelchair securement areas. The aft stanchions at the aisle facing seats over the rear axle wheelhouses shall be reinforced in an approved manner to prevent deformation by passengers. Vertical stanchions fore and aft of the joint shall be provided.
Grab rails, stanchions and handrails shall have a cross-sectional diameter between 1.25 inches (32 mm) and 1.5 inches (38 mm) or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than 0.125 inch (3 mm). All items that could be used as a handrail shall be placed to provide a minimum 1.5 inches (38 mm) knuckle clearance from the nearest adjacent surface. Handrail or stanchion attachment points in doorways shall not trap drawstrings on clothing, backpacks or other items carried by passengers.

Grab rails, stanchions and handrails shall be stainless steel or stainless clad pipe type 304 ASTM 554. Fittings and connectors shall have no sharp corners. Welding of stanchions and/or brackets is prohibited. All bends shall be made cold with no heat applied. Vertical stanchions shall not be more than 0.25 inch (6.25 mm) out of plumb; horizontal handrails shall not be more than 0.25 inch (6.35 mm) out of parallel with the bus floor and sidewall. Stanchion 'Ts' shall have an extra fastener to prevent movement.

Stanchions that connect between the ceiling or structures attached to it and the floor or structures (such as seats) attached to it (except for aisle-facing seats) shall have one end mounted in rubber to allow for flexing of the bus structure without placing undue stress on the stanchions or their hardware. The penetration of the stanchions into the seats shall be 80 percent of each cup.

The complete details of the stanchions and handrails, including detailed layout drawings of all hardware, supports, clamps, etc. shall be submitted to the District prior to the design. Final approval will be given at prototype review.

**TS 3.10 Divider Panels**

A two-piece divider panel shall be provided at the aft side of the rear doorway. The lower section beginning 0.5 inch (13 mm) from the floor and stopping at a height of 34 inches (864 mm) above the floor and the second section starting 34 inches (152 mm) and stopping at a height of 60 inches (152 cm) above the floor. There shall be no gaps between the panel and the sidewall that will allow a hand, foot or other body part to be caught in the panel assembly or pinched by passenger door operation. If an integral vertical stanchion is used as the securing point on the aisle (inboard) side, the second panel section shall have knuckle clearance for the entire vertical height distance of the second panel.

Lower divider panels shall be of 0.25-inch (6.4 mm) thick plastic laminate, with horizontal handrails along the top. Color and pattern for the lower section shall be Platinum D 315-60. The upper section shall be laminated safety glass at least 0.1875 inches (4.76 mm) thick fully enclosed and secured in a metal frame.
Divider panels shall be adequately supported to prevent permanent or undue deformation in use and to prevent rattle and shake when the bus is in operation.

A flat area enclosed with stanchion tubing supporting a garbage container shall be provided on the right front wheelhouse and approved by the District.

A one-piece divider panel shall be placed at the front of the street and curbsides of the trailing unit immediately behind the turntable. It shall be approximately 34 inches (86 cm) high by 34 inches (86 cm) wide, flush to the floor and sidewall or bellows. It shall be similar to the panel in 3.10.03.

**TS 3.11 Windshield, Driver, Side, and Door Windows**

**TS 3.11.1 General**

Openings shall be provided in the body structure to accommodate a front windshield, side passenger windows and a driver’s window. It is preferred that all side passenger window openings be identical. Side window openings shall be designed to provide good visibility to seated and standing passengers. All windows shall be fully supported by a metal sub-structure. Windows shall not be supported in any manner by fiberglass material. Color of glazing material in all side windows shall be 44% gray safety glass.

Openings for windows set in rubber channels shall match the contour of the glass. The gap between the glass and the opening shall not exceed the gap allowed by the channel manufacturer. The plane of the glass shall match the plane of the opening.

Openings for windows with metal sash shall not exceed the gap allowed by the sash manufacturer. No shims are allowed between the window opening and sash. Any non-compliant opening will be replaced with a compliant opening before the bus is approved for shipment. Alternatives to the detailed requirements of this subsection may be proposed by the Contractor for approval by the District. The District shall approve the design for all glazing, including arrangement and hardware.

**TS 3.11.2 Windshield**

The windshield of all buses shall be of laminated safety plate or float glass meeting the requirements of American Standard 1 (AS1), and shall be a nominal 0.25 inches (6.3 mm) thick. It shall be designed to optimize visibility for the driver during all driving and loading conditions, and it shall be designed to minimize reflections from the interior of the bus during night operations. It is required that the windshield be of two or more piece construction. The windshield shall have
an integral shade band at the top, and the color of the glass shall be blue-green tinted with 73% transmitted light.

**TS 3.11.3 Side Passenger and Optional Rear Windows**

All side and rear windows shall be of laminated safety glass which meets the requirement of American Standard 2 (AS2) and shall be a nominal 0.25 inches (6.3 mm) thick. Tint for side and rear passenger windows shall be 44% grey.

Passenger windows shall have inward opening transom panels (fixed bottom, tip-in top). Each operable side window shall incorporate an upper transom portion. The transom shall be between 25 and 35 percent of the total window area. The lower portion of the window shall be fixed. The transom portion shall be hinged along the lower edge and open inward. The transom shall have means of securing the window, using a 5/16 square key.

If the side destination and route signs (Section 3.17.03, 3.17.04) are located behind the upper part of a side window, there shall be a separate window in front of the sign(s), with no tint.

**TS 3.11.4 Driver’s Window and Door Glazing**

The driver's windows and door glazing shall be of laminated safety glass that meets the requirement of AS2 and shall be a nominal thickness of 0.25 inches (6.3 mm) thick. Tint for the driver's windows and door glazing shall be 73% transmitted light. The driver's window and door glazing shall be made of flat glass.

The driver's window shall be easily adjusted with a one hand operation, and it shall be of two half sections sliding horizontally. The front sliding section shall be provided with handles both inside and outside, and the outside handle shall be located approximately in the vertical center of the sash. The rear section shall have an inside latch. Handles shall have rounded corners. Machined and finished drain holes shall be provided to drain water to the exterior of the bus from the lower channels. There shall be no hand or finger pinch hazard when either half of the window is opened.

**TS 3.11.5 Window Hardware**

All window sashes shall be "Ricon", "Storm-Tite Rapid Replacement", or approved equal, finished with black anodized aluminum. All window hardware including screws retaining the window frame to the bus body shall be non-corroding.
TS 3.11.6 Emergency Exit Instruction Plates
Each emergency exit window location shall be labeled with a metal instruction plate that is riveted in place. Instructions shall be English, Spanish and Chinese languages transcribed on the plates. Design and placement of these instruction plates shall be approved by the District.

TS 3.11.7 Window, Modesty Panels and Door Liners
Supply easily replaceable anti-graffiti shield 3M multilayer or approved equal to all side windows, transoms, modesty panels and doors in the front and trailing sections of the bus. Window liners shall be installed by the window, modesty panel and door manufacturer.

TS 3.12 Not Used

TS 3.13 Windshield Wipers and Washer
Electrically powered windshield wipers shall be provided to clean each side of the windshield. The District is particularly interested in cleaning as much of the right side of the curbside windshield as possible. The wipers shall have two speeds plus an intermittent control position. Failure of the intermittent wiper function shall not disable the wiper system. The control shall have a park position causing blades to be parked at or near the longitudinal centerline of the bus in the vertical position or in another position if approved by the District. The windshield wiping system shall be "Bosch", "Sprague" or approved equal. It is preferred that motor(s) be rebuild able. Each wiper blade shall be replaceable within three minutes. The District must approve maintenance accessibility of the wiper motor(s) and any electronic control system.

An electrically powered windshield washer shall be provided to spray cleaning solution onto the left and right sides of the windshield. The solution shall be sprayed on the windshield by a pump, from a translucent, corrosion resistant reservoir located in the dash compartment and filled from outside the bus without opening any major panels. The reservoir cap shall be attached by a cable to the filler neck. The reservoir shall hold not less than 1 gallon (3.8 liters). The spray shall be applied by wet arm nozzles with a minimum of four streams per arm. Washer fluid shall hit the windshield over the entire length of the wiper blade. The District must approve maintenance accessibility of the pump and reservoir.

TS 3.14 Main Interior Lighting
Ample glare free light shall be provided for reading by seated and standing passengers, for safe entry, exit and circulation within the bus, and as an aid in producing a pleasant, attractive interior appearance at all times of the day and
night. The lighting system shall be of a coordinated design approved by the District.

The system shall provide an average illumination of no more than 5 to 15 foot candles at the reading plane of a seated passenger, 33 inches (840 mm) above the floor at a 45-degree angle. The aisle floor shall be lit to allow safe passenger movement within the coach.

Lower levels, or lamps that are on, only when the front door is open, may be used in the front of the bus (Section 1.11). Lamps may be divided into two groups if necessary, controlled by "ON" and "PARTIAL" on the light switch. Lamps shall be single pin and have a 60,000-hour life expectancy. Colored sleeves may not be used to reduce light levels. District shall approve interior light levels.

Lighting shall be "Pretoria LED" or approved equal. The interior lighting system shall provide a min. 15 foot-candle illumination on a 1 square foot plane at an angle of 45 degree from horizontal, center 33 inches above the floor and 24 inches in front of the seat back at each seat position. Allowable average light level for the rear bench seats shall be 7 foot-candles. Floor surface in the aisles shall be a minimum of 10 foot-candles, vestibule area a minimum of 4 foot-candles with the front doors open and minimum of 2 foot-candles with the front doors closed. The front entrance area and curb lights shall illuminate when the front door is open and master run switch is in the “Night” or “Park” positions. Rear exit area and curb lights shall illuminate when rear door is unlocked. Lighting shall be provided in the turntable area. Forward facing lamps, if provided, are to be off whenever all doors are closed.

**TS 3.15 Entryway and Curb Lamps**

Any doorway immediately adjacent to the driver shall have, when the door is open, at least 2 foot-candles of illumination measured on the entryway.

Other doorways shall have, at all times, at least 2 foot-candles of illumination measured on the entryway.

The vehicle doorways, including doorways in which ramps are installed, shall have an interior door header lamp(s) which, when the door is open, provide at least 1 foot-candle of illumination on the street surface for a distance of 3 feet (914 mm) perpendicular to all points on the bottom step tread outer edge. Such lamp(s) shall be shielded to protect the eyes of entering and exiting passengers.
TS 3.16 Exterior Lighting Equipment and Back-up Alarm

Turn signals, stop lamps, marker lamps, flashers, backup lamps and backup signals shall conform to all Federal and State of California requirements. Exterior lamps shall be selected and positioned in a coordinated manner that will lend a pleasant appearance and clean lines to the exterior of the bus. All coach LED lighting shall be a nominal 12 volts DC. The District shall approve all exterior lamps and their placement.

All LED lamps shall be easily replaceable by one person in less than 5 minutes. The inside of lamp lenses shall be easily cleanable. All lamp assemblies shall be sealed to prevent the entry of water and dirt. Exterior lamps shall not admit water into the bus body for the lifetime of the bus. All lamps shall have enough slack wiring length to allow easy removal and servicing. All lamp components shall have quick disconnects to allow easy replacement.

TS 3.16.1 Head Lamps

Each bus shall be provided with two or four sealed beam rough service, nominal 12 Volt DC automotive headlamps, countersunk type, having tilt-ray features controlled by a sealed type foot-operated switch convenient to the driver’s left foot. Headlamps shall be installed with supports and mountings that are sufficiently rugged to maintain adjustment under road shock and service conditions. The lamps shall be replaceable in 5 minutes or less. Headlamps shall be aimed before coach delivery. Headlamp bezels shall be retained with machine screws and rivnuts or their equivalent.

TS 3.16.2 Brake and Tail Lamps

Two combination brake and tail lamps meeting the requirements of SAE J1398 and J2040 and with a diameter of 4 inches (102 mm) each shall be provided on each side of the bus mounted vertically. Lamps shall not be mounted on a rear compartment door and shall be visible with the door open. Lamps shall be "Dialight" LED or approved equal.

TS 3.16.3 Back-up Lamps & Alarm

"Dialight" LED or approved equal backup lamps, one at each side of the rear of the bus above the bumper, shall be provided. An audible backup signal, "Floyd Bell, Inc.", "Ecco", or approved equal, shall be provided.

TS 3.16.4 Turn Signals & Emergency Flashers

Turn signals shall be placed on the front of the bus, on the rear of the bus, and on each side directly above all axles. Height shall be approximately 48 inches (122 cm) above the ground. Turn signal lamps shall be amber in color and meet
the requirements of SAE J1395. Provide a single lamp above each wheel opening. Side turn signal lamps shall be "Dialight" LED or approved equal. All side turn lamps shall be visible in the rear view mirrors by a seated driver.

Front turn signals to be "Dialight" LED or approved equal. Rear turn signals shall have a diameter of 4 inches (102 mm). Lamps to be "Dialight" LED or approved equal, mounted between the combination brake and tail lamps on each side. These signals shall be controlled by two sealed type foot-operated switches, "Cole Hersee" No. 7792 or approved equal, one for left turns and one for right turns, convenient to the driver's left foot. A short harness from the switches to a waterproof connector located near the base of the steering column shall be supplied. The turn signal switch mounting plate and switches will be removed as a unit for servicing.

**TS 3.16.5 Directional signals** shall be equipped for flashing of all lamps for emergency use, controlled by an easily reached switch with an extended arm toggle located the side console. This control will operate the directional signals with the master switch in any position. Special power requirements when directional signals are used as emergency flashers can be referenced in section 6.03.07. The emergency flasher shall provide an audible click to the driver.

**Marker Lamps**

Buses shall be equipped with clearance, side marker and identification lamps as specified in SAE J2042.

The identification lamps shall be individual units and mounted in the center of the front and rear roof crown panels. The front lamps shall be "Dialight" amber LED marker lights and the rear lamps shall be "Dialight" red LED marker lamps or approved equal.

Corner roof marker lamps shall be provided at each corner of the bus with "Dialight" amber LED marker lamps in the front and red LED marker lamps or approved equal at the rear.

Additional "Dialight" amber LED marker lamps or approved equal shall be provided at the roof edge on each side of the bus at the midpoint.

**TS 3.16.6 License Plate Lamp**

Provide an LED rear license plate lamp. The LED lamp shall be shielded from direct view of the following driver, and the lamp is to be shock resistant to withstand repeated closing of the engine door.
TS 3.16.7 Third Brake Lamp
Two LED 18’ x 1’ third brake lamps, in the rear of the coach, high enough to be clearly visible but positioned so as not to interfere with any access door, ad frame or other component shall be provided. Location of the third brake light shall be approved by the District.

TS 3.16.8 Engine Compartment Hazard Lamps
If the rear directional signal lamps are obstructed or hidden when the engine compartment door is in the open position, a second set of LED lamps shall be located so as to be visible with the door open. These lamps shall be activated by the 4-way flasher control switch and be amber in color. The lamps shall be located to be visible for the same distance as the normal rear directional lamps. These lamps shall be mounted to resist shock in a protected location and shall not pose a head bump hazard for those working in or around the engine compartment opening.

TS 3.16.9 Towing Connector
An electrical receptacle shall be provided behind the front bumper of each bus, adjacent to the air connector described elsewhere in this section, to receive power for illuminating the tail lamps, stop lamps and directional signals from a towing vehicle. The receptacle shall be a 7-way receptacle assembly, "Cole-Hersee" No. 12063 or approved interchangeable equal. The pins shall be coated with corrosion resistant paste. The termination end of the receptacle shall be strain relieved and sealed against water entry.

TS 3.17 Destination Signs
TS 3.17.1 General
Provide an automatic, electronic destination sign system on each bus. When a reading is selected at the driver's station, it shall be automatically displayed on the front, curb and street side of the bus. The route number shall be automatically displayed on the rear, curb and street side of the bus. The sign system shall be a Twin Vision Amber or approved equal Light Emitting Diodes LED display system. The District shall approve the design and placement of the sign system and sign boxes. Readability of the signs will be approved at the prototype review. New Signs must be J1708 and RS232 compatible, be able to communicate with Affiliated Computer Services (ACS), Advanced Mobile Data Terminal (AMDT) Version 5.27 Bios Build, and perform per the Districts Computer Aided Dispatch (CAD), Automatic Vehicle Location (AVL) requirements which shall include the ability to automatically communicate via the RS232 interface.
TS 3.17.2 Front Sign
The Front Sign display shall consist of a Twin Vision 16 row x 160 Column Amber model utilizing both color LED’s for the route number and amber LED’s for the route name. Light Emitting Diodes LED shall be used for superior outdoor environmental performance. LED’s should be made of superior UV resistant Epoxy lens and offer superior resistance to the effects of moisture. Each pixel shall have a dedicated LED for illumination of that pixel in all lighting conditions.

TS 3.17.3 Curb and Street Side Signs
The curb side sign shall be a Twin Vision 14 Row x 108 Column amber LED amber and located on the right side of the bus near the front door either mounted near the top of an existing window or in a separate enclosed but accessible weather-proof compartment provided by the Bus manufacturer. The street sign shall be Twin Vision 14 Row x 108 Column amber LED and located on the left side of the bus near the front driver’s window either mounted near the top of an existing window or in a separate enclosed but accessible weather-proof compartment provided by the bus manufacturer.

TS 3.17.4 Rear Sign
The Rear Sign (external) shall be a Twin Vision 16 Row x 48 Column amber LED W/O W/C symbol and mounted on Twin Vision supplied brackets on the rear of the vehicle on an appropriate sized cutout provided by the Bus Manufacturer.

TS 3.17.5 Not Used

TS 3.17.6 Sign Control
A “Slim line” Operator’s Console Unit (OCU), part number 906-2100-000 shall be used to view and update display messages. It shall be capable to be recess mounted on the Bus vehicle front Sign compartment access cover or in the driver’s dash area. The OCU shall utilize a multi-key conductive rubber pad keyboard and be designed for transit operating conditions and a maximum depth of 1.25 inches.

The OCU Unit shall contain a display of at least two-lines of 20-character capability. The OCU Unit shall contain an audio enunciator that beeps indicating that a key is depressed. The OCU Unit shall continuously display the message associated with the selected destination readings (except the emergency message feature as noted above). The OCU shall also contain the capability to manually select the Block Number Sign information (from 1 to 4 Alpha-Numeric characters) to be sent to the Block Number sign, independent of any pre-programmed destination sign message information. Up to four digit route numbers shall be selectable by the driver and shall be independent from the
destination sign message. Leading zeros shall not be displayed. The system shall have the additional ability to sequentially display multi-line destination messages, but with the route number portion remaining stable in a constant 'on' mode at all times.

The OCU shall contain a USB port which will accept the destination data upload programmed by the software package below. 3.17.09

**TS 3.17.7 Sign Features**

No blank messages shall be shown during a message sequence unless specifically programmed. Sequential messages shall be displayed in a manner and at a rate that makes it easy to read and comprehend the complete reading. Readings shall be stored in electronic memory on plug-in circuit boards. The message displays shall not be adversely affected by continued exposure to sunlight or other environmental conditions normally associated with bus operation. The system shall incorporate an auto-blanking feature that will cause the entire display area to be blank (black) within 30 seconds after the vehicle master power switch is turned off.

**TS 3.17.8 Sign Electronics**

Flash memory integrated circuits shall be capable of storing and displaying up to 10,000 message lines. Message memory shall be changeable by the use of a “USB Key” sized according to the message listing noted herein. Download via a PCMCIA card or Memory Transfer Unit will not be accepted.

The System shall have the ability to sequentially display multi-line destination messages, with the route number portion remaining in a constant “on” mode at all times, if so programmed. It shall also be capable of accepting manual entry of Route Alpha/Numeric information on any/all signs.

The various Signs shall be programmable to display independent messages or the same messages; up to two destination messages and one public relations message shall be pre-selectable. The operator shall be able to quickly change between the pre-selected messages without re-entering a message code. Public relations messages shall be capable of being displayed alternately with the regular text and route messages or displayed separately.

**TS 3.17.9 Sign Programming**

A WINDOWS® Server 2008 R2 (at a minimum) programming software package shall be supplied, under limited-use license, to generate message lists for the
Sign system. The software must be able to operate in a VMware based virtual server environment.

The programming software package shall use the capacity of the virtual server to allow the USB to be programmed directly from the PC. The program shall be designed for ease of deleting and adding messages to a destination Sign list in a WINDOWS® server based Operating Environment.

The Programming Software shall be intuitive, of design to facilitate ease of training, and use context-sensitive help features. On-site training support shall be provided with the software. This software will provide capability for custom message writing by selection of preprogrammed standard variable width fonts. This allows for creation of a custom font by varying spacing between characters, words, or other message elements. This software also allows for creation of graphic displays with or without text; by selecting preprogrammed graphic Sign images and by allowing use of multiple fonts within the same message and graphic symbols placed anywhere within the display area.

**TS 3.17.10 Component Quality**

Electronic circuit boards shall be of a quality to facilitate repeated repair cycles and maintain a 10-year minimum life. All connectors, including I.C. sockets and board edge connectors shall be plated with a noble metal, preferably gold. Boards shall be mounted to reduce vibration stress. The system shall operate at a nominal input voltage of 24 volts DC (+/- 6 volts DC). The sign system shall be internally protected against voltage transients and/or R.F. interference. Sufficient transient interference suppression will be included so the system will withstand transient pulses of 600 volts for 10 microseconds and 100 volts for 10 milliseconds. Sign interface cabling shall be shielded throughout the coach.

**TS 3.17.11 Visibility**

- **FRONT SIGN:**

  The front sign message shall be readable by a person with 20/20 vision from a distance not less than 350 feet for signs of display height greater than 8 inches and from a distance not less than 275 feet for display heights less than 8 inches. The front sign shall have a viewing cone of equal readability at 65 degrees on either side of a line perpendicular to the center of the mean plane of the display. The intensity of the illumination of the display pixels shall appear, to the naked eye, to be approximately uniform throughout the full viewing cone.

- **SIDE SIGNS:**
The street and curb side signs message shall be readable by a person with 20/20 vision, from a distance of not less than 110 feet. The side signs shall have a viewing cone of equal readability at 65 degrees on either side of a line perpendicular to the center of the mean plane of the display. The intensity of the illumination of the display pixels shall appear, to the naked eye, to be approximately uniform throughout the full viewing cone.

- **REAR DESTINATION SIGN:**

The rear sign shall be capable of independently displaying alpha-numeric characters. Its message shall be readable by a person with 20/20 vision, from a distance of not less than 225 feet. The rear sign shall have a viewing cone of equal readability at 65 degrees on either side of a line perpendicular to the center of the mean plane of the display. The intensity of the illumination of the display pixels shall appear, to the naked eye, to be approximately uniform throughout the full view cone.

**TS 3.18 Sign Lighting and Boxes**

The LED intensity automatically adjusts to the ambient light. Special attention will be given to using and mounting. LEDs that will not fail due to vibration stress when the coach is used in normal revenue service.

Sign mechanisms and boxes shall be constructed of materials designed to minimize static build-up and subsequent dirt accumulation. The front and rear destination sign cavities shall be sealed to prohibit the entry of dirt, dust, water and insects during normal revenue service.

Sign boxes shall not vibrate or rattle and shall be sealed to exclude dirt, dust, water and insects. Each sign shall be housed in a protective cover that is removable with the sign.

A means shall be provided on the side signs to prevent accumulation of dirt on the inside of the bus window or on the outside of the sign box window. Signs shall be visible at all times with no fogging of any glass.

Sign boxes shall have access doors to allow replacement of sign mechanisms and to allow servicing and cleaning. The front sign compartment access door shall have thumb latches. The front sign compartment access door shall have a metallic piano hinge running the entire width of the access door; if bottom hinged, provide appropriate retaining straps. No components shall need to be removed to allow full opening of the sign door. The sign is removed and installed through this door unless the District agrees to other methods.
The rear and both side sign compartment access doors shall have quarter turn adjustable spring latches. These latches shall have slotted heads requiring the use of a screwdriver to open the access door. The rear and side sign compartment access doors shall be hinged at the bottom by metallic piano hinge running the entire width of the access door. The sign is removed and installed through this door unless the District agrees to other methods.

Front and rear exterior sign glass (defined as the glass attached to the coach body) shall be masked to keep sign wiring and other compartment items hidden from view. Sign visibility shall not be affected with masking installed. Material used shall be black. Installation, visibility and type of material used will require approval of the District.

**TS 3.19 Not Used**  
**TS 3.20 Dash Sign Holders (Spring steel Clips)**

Holders (spring steel clips) shall be provided on both right and left front dash corners to hold interior windshield cardboard or plastic express or special route signs 20 inches (508 mm) wide by approximately 8 inches (204 mm) high. All corners of the dash sign holders shall be rounded to eliminate possible passenger or operator injury. Units shall be attached with rivnuts and machine screws. Mounting reinforcements will be supplied as deemed appropriate. The District at the design review shall approve the sign holder, location and mounting.

**TS 3.21 Exterior /Interior Access Panels**

All equipment requiring access from outside of the bus body shall be provided with metal-hinged access doors, hinged at the top or side and operable with one hand if possible. Panels shall be designed not to rattle, to remain and be secured in both the closed and full open position, and to be quickly and easily opened and closed during servicing and maintenance. All access doors and the surrounding panel material shall be reinforced as necessary to prevent distortion of body panels. Large panels shall open and close easily. If needed, special grab handles shall be used to enhance ease of use. If an access door is large or heavy, making it inconvenient to open easily, it shall be provided with an approved gas cylinder assist mechanism. Mounting brackets for the gas cylinder must be welded, bolted, or riveted to the door and body. Gas cylinders shall not be equipped with any mechanical locking mechanism in the open position. It is preferred that all under floor skirt panels be accessible, even if no equipment is immediately behind them. It is preferred that all doors open 180 degrees, or as close to that as practicable.
Panels shall be held securely in the closed position by gas cylinders, positive quarter turn adjustable latches or, if small, by spring loaded hinges or other approved latching methods. A nominal 5/16 inch (7.9 mm) square-end tool shall open all exterior access panel locks except the access door for the battery main switch. All fasteners that retain access panels shall be captive in the cover. Panels shall close against rubber stops (bumpers). Hinges, springs and latches shall be of non-corroding material. A rubber hinge is required on an exterior electrical panel door beneath the driver’s side window; otherwise they are not allowed.

Metal hinges are to be attached with the following fasteners, in descending order of preference: bolts and nuts; bucked rivets, monobolts, pop rivets. The District requests metal hinges on all other access doors. Latches shall be adjustable.

All exterior compartments, other than the battery compartment, must be completely sealed; cable, harness, wire or piping entry is by watertight fittings. Duckbill drains are supplied. Compartment openings have a continuous bulb seal with formed corners. The outside access door makes continuous contact with this seal. Electrical or other components that should not be wet are preferably mounted on the sides, back, or top of the compartment.

Access panels shall not interfere, and/or suffer any damage when the coach is towed or lifted. Panels may be built to quick disconnect from the coach under towing and/or lifting circumstances. The District will approve methods used to obtain this result.

District requests that high-value components not be located near the doors in the compartments around the bottom of the bus where they will be vulnerable to minor collision damage.

Access panels shall include, but not be limited to:

Engine Access

- Radiator
- Electrical Panel
- Transmission Access
- Engine Air Cleaner Intake
- Battery
- Engine Coolant Check and Filler
- Exhaust after treatment
- Engine Oil Dipstick and Filler
Access panels shall be provided on the interior of the bus as required for servicing and maintenance. If hinged, they shall be hinged at the top or side and designed to remain and be secured in both the closed and full open position.

Access hatch to allow a mechanic to disconnect the drive shaft from the differential from inside the bus shall be provided. Floor or rear couch seat area access panels for the engine or other components shall be easily fastened and unfastened and shall be finished to match the surrounding area. Floor openings shall have a metal angle on the inside of the opening that seals the plywood edges. The access panel shall have a 'T' molding which is recessed into the floor rubber as necessary to preclude a tripping hazard. Fasteners shall be captive in the panel. The panel shall be supported by bus structure on all four sides. Floor hatches shall be sealed to prevent noise and fumes from entering the passenger area. Engine access panels shall not be hidden behind additional sound proofing panels.

Access panels shall be designed to allow plenty of clearance for use of hands and all appropriate maintenance tools. Panels shall have positive stops to prevent hinge damage when opening. Use of adhesive backed foam tape as a door sealing method is prohibited. The District shall approve access panels, floor hatches, locks and all associated hardware.

**TS 3.22 Bumpers**

Bumpers shall be installed front and rear to cushion, distribute and transmit collision shock to the bus structure. Bumper heights shall be selected considering S.A.E. standards to protect against automobile damage, and considering the optional bumper height provisions of FMVSS 215. Bumper design and placement shall be approved by the District.

The front bumper shall be a black "Romeo-Rim" HELP semi-pneumatic, energy absorbing bumper of the wrap-around type, or approved equal. The bumper shall not have separate end caps. It shall be at least 8 inches (203 mm) high, and shall project at least 4 inches (102 mm) ahead of the foremost part of the bus. The bumper shall provide immediate, automatic resetting after impact without any adjustments or manual operations.
The bumper shall protect the bus from damage as a result of 6.5 mph (10.5 km/h) impacts at any point by the striker defined in FMVSS 215 loaded to 4000 lb. (1820 kg) parallel to the longitudinal centerline of the bus and 5.5 mph (8.8 km/h) impacts into the corners at a 30 degree angle to the longitudinal centerline of the bus. The bumper shall provide 5 mph (8 km/h) fixed barrier impact capability, without passenger load, with no damage to the bus.

The rear bumper shall be a black "Romeo-Rim" HELP semi-pneumatic energy absorbing bumper or approved equal. Rear bumper performance with the conditions given in section 3.22.02 shall be 4 mph (6.4 km/h), 4 mph (6.4 km/h) and 2 mph (3.2 km/h) respectively.

The bumper shall have integral anti-ride capability; adjacent body panels shall be designed to protect the bus while discouraging persons from standing on or hitching rides on the bumper.

It is preferred that there be a suitable bus structure between the rear bumper and the aft end of the rear axle wheel opening to protect these areas of the bus.

**TS 3.23 Exterior Fittings**

**TS 3.23.1 License Plate Holders**

Provide four 1/4-20 rivnuts and four hex head cap screws with nylon washers front and rear for attaching U.S. standard size license plates. The attached license plates shall be generally flush with the outer surfaces of the bus to avoid being caught by the brushes of the bus washer. License plates shall be held securely to preclude rattling or scratching of adjacent surfaces.

**TS 3.23.2 Radio Antennas**

Interfere with any components or bus numbers on the roof. Unpainted antennas are mounted with splinted rivnuts and stainless steel machine screws, with installation to be approved by the District. If the bus does not have a metal roof, suitable ground planes, to be approved by the District, shall be installed. Antennas shall be mounted in the center of their ground planes. RF Radio and GPS antennas shall be installed on top of the bus, at least 4ft apart. A hinged, drop down access panel door for antenna servicing the antennas shall be provided.

1) 3.23.2.1 Radio RF Antenna

2) Radio, RF Antenna- PN# ASPC572 ANTENNA SPECIALIST

3) 3.23.2.2 Radio / GPS Antenna
4) Radio GPS PN# ACS 120076-2 / Cable PN# 140405-366 / ACS optional spacer# 131100

5) 3.23.2.3 Camera Surveillance / WI/FI Antenna, per vendor Specs

6) 3.23.2.4 Camera Surveillance / GPS Antenna, per vendor Specs

7) 3.23.2.5 APC System Antenna, per vendor Specs

8) 3.23.2.6 –TSP System Antenna, per vendor Specs

**TS 3.23.3 Reflectors**

Two red reflectors shall be provided on the rear of each bus. At least three reflectors shall be provided on each side of all buses with the forward reflectors amber and the rear one red. Care shall be taken in selection and placement of the reflectors to both provide appropriate warning to other vehicles and complement the overall exterior appearance of the bus. Mounting shall be with machine screws and rivnuts. Peel-and-stick reflectors are acceptable.

**TS 3.23.4 Horn**

Dual electric heavy-duty horns shall be provided and mounted to prevent entry of water and dirt into horn trumpets. The horns shall sound high and low notes and provide a sound that is effective as a warning without being unduly annoying. The horn shall be clearly audible over 75-dBA traffic noises at a distance of 300 feet (91 m).

**TS 3.23.5 Static Ground**

A method of grounding static electricity shall be provided on each bus and will be approved at the design review.

**TS 3.23.6 Splash Aprons**

A splash apron consisting of three separate panels shall be provided across the entire bus at the rear of the driven wheels and separate splash aprons shall be provided behind all other wheels.

**TS 3.23.7 Fenders, Rub Rails and Adjustable Curb Feelers**

Any rubber fenders must be approved. Fenders to be attached with threaded fasteners. The wheel opening on the outside of the bus shall be neatly finished with no visible weld points. Metal rub rails are allowed only if they are necessary to cover a panel joint and if no rubber is in contact with the bus skin. Adjustable curb feelers to be installed forward of the front axle.
TS 3.23.8 Interior Bicycle Rack
Bicycle storage racks of stainless steel shall be finished to match the bus interior supplied by Sportworks Interlock, or approved equal, shall be installed to conform to these specifications. The bike racks shall be installed in the interior of the vehicle by the rear doors. Bicycle racks shall be installed prior to receipt of vehicles by the District. The bike racks shall accommodate a minimum of three (3) bikes with two (2) wheels each. Load capacity for each bike shall be a minimum of fifty-five (55) pounds in a central location of the bike rack. All hinges and pivot pins shall be stainless steel in construction. There shall be no sharp corners that will pose a safety problem to the passenger. The bike rack shall be able to be deployed by the passenger with one hand, and without additional assistance. Any support arms or locking device to hold the bike rack shall be constructed in such a way that when the bike rack is being stored in the upright position, it will not be necessary for the customer to orient it beforehand. The bike rack shall accommodate all bicycles with a wheel size equal to or greater than sixteen (16") inches in diameter, to include children’s and mountain bikes. The bike racks shall not cause aisle interference when a bike is stowed.

TS 3.23.9 General
All exterior rivnuts shall be non-magnetic stainless steel and waterproof. Machine or cap screws shall be non-magnetic stainless steel.

TS 3.23.10 Roof Safety Features
If any roof-mounted equipment is provided (e.g. HVAC, or batteries), anti-skid walking surface, safety strap attachment points, and permanent no-step markings as necessary, shall be provided and approved by the District.

TS 3.24 Passenger Signal
TS 3.24.1 General
The main function of the chime signal systems is to enable any mobile passenger to inform the driver and the other passengers that the bus is requested to stop at the next bus stop (system A) and to alert the driver that a mobility aid passenger wishes to disembark (system B). These systems shall alert the driver, both visually and audibly, and separately from each other. The Contractor may propose integrated or separate system(s) that accomplish this. The District shall approve the design, position, materials, and operation of both systems.

TS 3.24.2 System A
The purpose of this system is to request stops and to alert the driver that a fully mobile passenger wishes to disembark. One solid-state electronic chime signal
shall be provided. A separate light signal shall be provided on the driver's instrument panel and shall illuminate when the system is activated. Two text message signs, one single-sided at the rear of the driver's barrier, and one single-sided opposite the rear door, shall be mounted near the center line on the ceiling.

System A signals shall be actuated by wire-centered clear plastic cords running horizontally for the full length of each side of the bus except at door openings. These cords shall be located along the imaginary line separating the upper bin windows from the lower sections of the side windows, and shall not interfere with opening of the side destination sign and route number sign for inspection. If the cord is not usable in the rear door area, a button to actuate the signal shall be placed on a nearby stanchion. Vertical drop cords shall be located at every side window pillar. These cords shall be secured to the horizontal chime cord with tiller clamps so they will not slide or travel. They shall be anchored at the opposite (bottom) end by means of an eyelet attached to the bus sidewall, and secured with a tiller clamp. Use dual half-shell "Atwood Corp." tiller clamps, p.n. 8043-3 or approved equal with Torx screws at each chime cord crimp location. Cords shall not interfere with any window operation.

When system A is actuated by a passenger, a chime shall sound and the text message sign shall display 'stop requested' and the driver's dash mounted lamp shall illuminate. The chime shall be disabled while the displays are on. When any door is opened, the displays shall be on with the chime disabled. After all doors close, the system shall be reset.

**TS 3.24.3 System B**

This system shall allow a mobility aid user to request a stop and alert the driver that he/she wishes to disembark. One solid-state electronic chime signal shall be provided. This chime shall produce a different sound than the system A chime. A separate light signal shall be provided on the driver's instrument panel and shall illuminate when the system is activated. Activation of this system shall illuminate the two lighted display signs referenced in section TS 3.24.2 (system A).

Controls for system B shall be mounted no higher than 48 inches (1219 mm) and no lower than 15 inches (381 mm) above the floor. It shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lb. (22.2 N). A touch tape on the bottom of the folding seat in each tie down location shall be provided. This touch pad shall be located where it will not be accidentally activated by movement of the secured mobility aid device. The touch pad shall have an
electrical disconnect plug to facilitate removal of the flip-up seat for maintenance. Plug to be accessible to maintenance and not visible to passengers.

When any tie down area stop request signal is activated, the system B chime shall sound and the driver's dash mounted lamp shall illuminate. The chime shall be disabled while the display is on. When any door is opened, the display shall be on with the chime disabled. After all doors close, the system shall be reset.

**TS 3.25 Camera Surveillance System Provisions**

The 16 surveillance camera system shall be installed by the Contractor using the Apollo video system MRH-16 or approved equal, with a 2TB hard drive. All Cameras must have the capability to be designated as IP cameras and shall have HD capability if requested. Camera locations and quantity shall be as given in Table 3-1. Camera audio shall be recorded through an external mic not though the camera. All wiring is to be marked and labeled for power wiring and camera identification. The wiring and termination locations for the video system power and cameras and the system layout of equipment and placement for camera views shall be approved by the District. The main power wiring shall be ran directly from the hot side of the bus battery and fused with a circuit breaker and then terminated in the electronics cabinet and marked and labeled. The contractor shall provide two independent event marker switches. Switch one shall be wired to the Apollo system, the other switch shall be wired to the emergency alarm switch.

**Table 3-1**

<table>
<thead>
<tr>
<th>Camera Number</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Front Door</td>
</tr>
<tr>
<td>2</td>
<td>Rear Door, 1st street side</td>
</tr>
<tr>
<td>3</td>
<td>Rear Door, 1st curb side</td>
</tr>
<tr>
<td>4</td>
<td>Center to Front of Bus</td>
</tr>
<tr>
<td>5</td>
<td>Center to Rear of Bus</td>
</tr>
<tr>
<td>6</td>
<td>Rear Door, 2nd street side</td>
</tr>
<tr>
<td>7</td>
<td>Rear Door, 2nd curb side</td>
</tr>
<tr>
<td>8</td>
<td>Rear to Center of Bus (Audio Included)</td>
</tr>
<tr>
<td>9</td>
<td>Front-Interior-Forward Facing (Audio Included)</td>
</tr>
<tr>
<td>10</td>
<td>C/S-Exterior-Rear Facing-Above Front Door</td>
</tr>
<tr>
<td>11</td>
<td>C/S-Exterior-Forward Facing-Front Section- Above First Set of Rear Doors</td>
</tr>
</tbody>
</table>
CAMERA LOCATIONS

<table>
<thead>
<tr>
<th>Camera Number</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>C/S-Exterior-Rear Facing-Trailer Section- Above First Passenger Window</td>
</tr>
<tr>
<td>13</td>
<td>Rear-Exterior-Rear Facing</td>
</tr>
<tr>
<td>14</td>
<td>S/S-Exterior-Rear Facing-Trailer Section-Above First Passenger Window</td>
</tr>
<tr>
<td>15</td>
<td>S/S-Exterior-Rear Facing-Above Operator Window</td>
</tr>
<tr>
<td>16</td>
<td>Operators Area</td>
</tr>
</tbody>
</table>

TS 3.25.1 3.25.02 Bus Only Lane Camera Enforcement System

In addition to or a part of the surveillance camera system the Contractor shall provide cameras to support the District’s bus only lane enforcement program. These cameras shall provide a close up of the rear license plate of vehicles in the bus only lane and the surrounding traffic conditions in the adjacent lane. The camera(s) thus identify both the offenders and possible mitigating circumstances that could be taken into consideration. Cameras and camera location used for bus only lane enforcement shall be approved by the District.

TS 3.26 Public Address System Provisions

Public address system provisions shall be provided on each bus for facilitating automated and driver-originated announcements to passengers. Driver-originated announcements shall override automated announcements. The PA system uses radio transceiver or other equipment as an amplifier. Supplied components shall not contribute distortion or low voltage noise interference and shall produce a clean, clear sound. The District at the design review shall approve the equipment and the locations of the components.

The microphone shall be a "Shure" model 592 LB, or an approved equal and the hand held microphone mounting point shall be reinforced with a tapping plate and be in a convenient location for ease of driver access. Rivnuts and machine screws shall be used. The location where the microphone cable passes through the body shall have full chafe protection. Location of the hand microphone shall be approved by the District.

The microphone cable shall terminate on the left side of the instrument panel. Each cable end shall be terminated with a "Switchcraft" A4M or interchangeable approved equal connector. Also, it shall be mounted above the driver and final location to be determined by the District.
At a minimum, 6 interior loudspeakers shall be provided, semi flush mounted, on alternate sides of the bus passenger compartment, installed with proper phasing. Total impedance at the input connecting end shall be 8 ohms. Mounting shall be accomplished with rivnuts, machine screws and utilize a metal backing plate. One exterior speaker of weatherproof design shall be provided near each door. Speakers shall be installed so as to facilitate testing and replacement when necessary. There shall be a speaker control switch mounted within easy reach of the driver. This switch shall include ‘INSIDE, OUTSIDE and BOTH’ speaker selections.

**TS 3.27 Advertising Provisions**

Interior advertising racks designed for advertising media 11 in (280 mm) high shall be provided running the interior length of the bus on both sides over the windows interrupted only as necessary for the doors and joint. Grooves on the top and bottom shall accommodate media up to 0.090 inches (2.3 mm) thick. These racks may be combined as part of the interior lighting system (Section 3.14).

**TS 3.28 Automatic Passenger Counter Provisions**

A complete stand-alone APC system shall be installed by the Contractor. The APC system shall be a UTA Model 30 APC or approved equal and approved by the District. The power wiring shall be fused with a circuit breaker at the bus electrical panel.

Each passenger door (5 doors) shall be wired for and equipped with APC sensors. The District shall approve the final placement of the APC components.

**TS 3.29 Safety Equipment**

**TS 3.29.1 Fire Extinguisher**

Furnish a dry chemical fire extinguisher, "Amerex Corp." model SOOT or approved equal on each bus. The extinguisher shall be mounted for easy access from the driver's station using bracket 5BRK. Provide an approved mount and mounting location for the extinguisher. If the extinguisher is located in a compartment, provide an approved ‘Fire Extinguisher Inside' decal. The fire extinguisher shall have a manufacturer's inspection tag marked NEW with the date installed, plus space for subsequent inspection entries. The District at the design review shall approve the equipment and the locations of the fire extinguisher components.
TS 3.29.2 Reflector Triangles
Buses shall be equipped with a safety triangle reflector kit with a durable protective container, "Grote Manufacturing Company" #71422 or approved equal. This item shall be mounted neatly in the driver's area. The District at the design review shall approve the equipment and the locations of the reflector triangle components.

TS 3.30 Fleet Monitoring System
A complete fleet monitoring system shall be installed on each bus by the Contractor. The fleet monitoring system shall be an S&A Systems model JX55. The power wiring shall be fused with a circuit breaker at the bus electrical panel. The complete fleet monitoring system shall be purchased and installed by the bus manufacturer. The location of the fleet monitoring system components shall be approved by the District.

Install system equipment in the electronic cabinet and mount the Fleet Watch sensor in the destination sign area. The District at the design review shall approve the equipment and the locations of the components.

TS 3.31 Transit Signal Priority
The on-board Transit Signal Priority (TSP) system shall automatically initiate requests for priority at signalized intersections using on-board TSP equipment, a Priority Request Generator (PRG) and roadside equipment. The decision to initiate requests for TSP from the traffic signal controllers will be determined by the PRG. The PRG shall initiate the request for TSP from the traffic signal controllers.

The bus shall provide for an area to house the on-board TSP equipment including power and a conduit system between the TSP equipment including the GPS receiver/antenna, TSP radio and antenna, door controls, wheelchair ramp controls, stop request controls, and automatic passenger counters. The TSP equipment will consist of an industrial-rated computer which will communicate with the PRG in real-time providing bus location information including position and direction/heading.

The bus manufacturer shall coordinate with the District and the TSP System Integrator on the installation of the TSP equipment on-board the vehicle including the equipment installation and during system integration and acceptance testing.

The TSP system data management functions shall be fully integrated as part of the IVLU.
The TSP system data management functions shall run on servers, workstations, and other data processing hardware utilizing systems and data base management software provided or already operational for the existing Transit Master CAD/AVL system. No additional data processing hardware or equipment shall be required.

**TS 3.32 Text Messaging Sign**

Three interior next stop sign display signs shall be supplied, compatible with the auxiliary communication system ACS radio system. One sign shall be located so as to be visible to the seated operator and seated passengers in the front section of the bus. The second sign shall be located aft of the articulation joint so as to be visible to seated passengers in the rear section of the bus. The third sign shall be located so as to be visible to rear facing wheelchair passenger in the front of the bus. The signs shall be capable of displaying the next stop request sign function in addition to displaying the scrolled next stop announcement. The text message sign manufacturer shall be selected and approved by the District.

The interior stop request / next stop announcement displays shall:

- Be a single line 16 character, 27”x2.125”x6.125”, red LED display with clear 20/20 visibility at a minimum of 90 ft. and with a +/- 75 deg. view angle. Power requirements for the display shall not exceed 30W and shall be capable of operating on a voltage between +10Vdc and +30Vdc. The display shall be addressable through the Districts radio system and have a SAE J1708/1587 compliant RS-485 serial communication interface. The system shall be capable of operating with temperatures between 0 and 40 deg. C., and at relative humidity between 10 and 90 %. The unit shall withstand temperatures between –40 and +70 deg. C. without damage or deterioration.
- Have power supplied by the same source as the radio equipment over a minimum of 18 AWG two-conductor fused power cable with a twisted shielded cable pair for connecting the J1708 control signals.
- Have the power cable and signal lines share a single split loom jacket. The connections are made with ring terminal lugs. There shall be four: two signal connections and two power connections.
TS 4. Driver’s Station and Controls

TS 4.1 Design Factors

The design of the driver's station shall have as its primary objective the provision of an environment for the bus operator to manage the bus safely and efficiently for long periods of time without injury and with minimum fatigue. Human factors and design principles shall be used in the layout and proportioning of the driver's station and its components with attention given to safety, comfort, and body support. The size, shape and location of switches, levers, pedals, gauges, and all other factors that affect the design objective shall be considered.

The driver’s station shall accommodate bus operators who are of various heights and body proportions by the use of human factors design in locating and proportioning the devices in the station and by the use of adjustable components such as the driver's seat and the steering column. It is required that the station accommodates persons within the range of the 5th percentile female to the 95th percentile male.

The Contractor shall, as a joint effort with the District, determine the location of all equipment with respect to proper lighting, ease of operation, accessibility and passenger flow. Factors to be considered include, but are not limited to, the provision of mountings for and determining the location of the fare box, radio speaker, radio control head and any other equipment supplied by the District. Complete details of the driver's station design shall be presented at the design review and at the prototype review for approval by the District.

TS 4.2 Driver's Seat

The driver's seat shall be adjustable to provide comfort for bus operators within the range of sizes given in the previous subsection. It shall have a full 9 inches (229 mm) of adjustment in the fore and aft direction without contacting any coach part. The seat back, seat cushion, and the seat height shall be adjustable. The seat shall be installed in the same location in all buses. All adjustments shall be easily made without the possibility of crushing or pinching the bus operators hand or fingers. A dynamic load damper shall be provided on the seat to augment the springs and padding in the cushions. Under no operational condition will the seat 'bottom out'. The air line connection to the seat shall have a shut off valve and a quick disconnect provision. The bus connector shall be a brass push-to-connect socket, 1/4-inch coupler size. The seat shall be equipped with a quick disconnect feature; the cap screws retaining the seat base to the driver platform shall be threaded into tapping plates or weld nuts under the platform. The driver's seat shall be a "Recaro Egro Metro" or approved equal with the following features: air suspension system; wide back with 20° recline; air lumbar support; mechanically
adjustable side bolsters; vinyl upholstery; molded long life foam; ABS protective back shell; air slide release mechanism; 4 way adjustable headrest; 4" slanted steel riser with internal tethers; riser dust cover; 2 point lap belt system.

The entire face of the driver's seat and back cushions shall be perforated black vinyl and no welt cord shall be used. Seat cushions shall be of long lasting foam. Particular attention shall be given to providing a seat which is comfortable in warm, humid weather and which gives full consideration to long periods of occupancy.

The driver’s seat shall be supplied with inertia locked retractable and adjustable lap belt assemblies. The belt systems shall extend from left to right and shall accommodate all drivers in all positions of the seat. All seatbelt assemblies shall come equipped with a warning switch device on the seat to remind operators to buckle up.

**TS 4.3 Barrier**

An approved full height barrier shall be provided around the driver's station. The driver barrier shall extend from the left side coach wall to the stanchion at the right rear of the driver's station and then wrap around the side of the driver's seat. This panel shall in no way interfere with the safe normal operation of the bus or restrict the movement of the driver's seat.

Vertical stanchions at the intersection of the back and curb side panels and at the forward edge of the curbside panel shall be provided. Stanchions shall have minimum 16 inches (406 mm) usable length, 3 inches (76 mm) knuckle clearance.

The remainder of the barrier shall be aluminum, fiberglass or other approved material of color and finish. The barrier assembly shall be rigid, shall not shake or rattle in service, and shall withstand forces from passengers using it as a handhold. Any screws and/or bolts protruding through the barrier shall have rounded heads to eliminate passenger injury.

Space on the backside of the wheelhouse equipment compartment to attach (2) 11 x 17 inch “top loading” ad card holder frames and four District route brochures shall be provided. Design, material and locations of the ad card frames and District route brochure holders shall be approved by the District.

**TS 4.4 Controls and Switches**

All controls shall be within the hand reach of the driver. Switches and other electrical controls located on the driver's side console shall be water resistant.
The design, material, and location on all side console, instrument panel controls, and switches shall be approved by the District at the prototype review.

Accelerator and brake pedals shall be designed for ankle motion without fatigue. When the driver's foot is placed on the non-depressed accelerator or brake pedal, the ankle shall be at a neutral angle (the angle assumed when standing). This angle shall be approximately 45 degrees from true horizontal. Both accelerator and brake pedal surfaces shall be on the same plane. Both assemblies shall be equipped with heel rests. Foot surfaces shall be faced with wear-resistant, non-skid replaceable material. The accelerator shall be a "Williams" or approved equal, electronically operated. The brake control valve shall be a "Bendix" or approved equal. The District shall approve pedal angles, placement and design at the prototype review.

**TS 4.4.1 Hill Holder**
Shall be a separate switch control and operate per section 5.9.

**TS 4.4.2 Parking & Emergency Brake Controls**
The parking and emergency brake control shall be located to the left of the driver for easy ergonomic actuation by a seated driver. The preferred location is on the side console. Control location to be approved by District.

**TS 4.4.3 Steering Wheel and Horn Button**
Reference sections 6.10 and 3.23.

**TS 4.4.4 Hybrid Drive Directional Control**
Reference section 5.4.

**TS 4.4.5 Door Controls and Door Pressure Release**
Reference section 3.3.

**TS 4.4.6 Headlamp High Beams**
Reference section 3.16

**TS 4.4.7 Directional Signals**
Reference section 3.16.

**TS 4.4.8 Emergency Flashers**
Reference section 3.16.
TS 4.4.9 Windshield Wiper and Washer Controls
Reference section 3.13.

TS 4.4.10 Not Used

TS 4.4.11 Heating Ventilating and Demister Controls
Supply separate controls for driver's heater and defrosters, and for main coach HVAC. Main coach HVAC control to be a 6-position switch labeled OFF/ Cool / Vent High/ Vent Low/ Heat Low/ Heat High (Section 6.7.2).

TS 4.4.12 Master Electrical Control (Master Switch)
The master control shall activate and disable certain subsystems. It shall have four positions, affecting bus subsystems according to the Table 4-1 and it shall be located on the primary panel. It shall be sized to accommodate maximum loads with an additional 150% operating margin (load factor). No heavy electrical loads shall be run through the master switch.

When the master switch is switched from OFF to ‘Day Run’ or ‘Night Run’, the indicator lights flash momentarily to signal that the bus is being asked to wake up. Other controls detailed below and elsewhere may affect these conditions. The brake lights, horn and emergency flashers shall be enabled in all positions of the master control.

Table 4-1

<table>
<thead>
<tr>
<th>Position</th>
<th>Engine</th>
<th>Interior Lamps</th>
<th>Head Lamps</th>
<th>Other Exterior Lamps</th>
<th>Indicators Alarms etc.</th>
<th>Rear Door Interlock</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>Stop</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>DAY RUN</td>
<td>Run</td>
<td>On</td>
<td>On</td>
<td>Off</td>
<td>On</td>
<td>On</td>
</tr>
<tr>
<td>NIGHT RUN</td>
<td>Run</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>On</td>
</tr>
<tr>
<td>NIGHT PARK</td>
<td>Stop</td>
<td>On 50%</td>
<td>Off</td>
<td>On</td>
<td>Off</td>
<td>On</td>
</tr>
</tbody>
</table>
TS 4.4.13 Engine Start Button
Shall be interlocked (Section 5.03) and shall be located on the side driver console.

TS 4.4.14 Emergency Alarm
Mounted below the side driver console (Section 4.14.05).

TS 4.4.15 Ramp Controls
Located on the primary instrument panel, these controls shall function per section 6.08.

TS 4.4.16 Not Used.
TS 4.4.17 Public Address System Switch

TS 4.4.18 Not Used.
TS 4.4.19 Fast Idle Control
Not required with a Hybrid system.

TS 4.4.20 Engine Diagnostic Switch
Switch and safety cover shall be provided on the primary instrument panel.

TS 4.4.21 General Interior Lighting Switch
A three-position switch, providing ON, PARTIAL, and OFF positions shall be provided on the instrument panel console.

TS 4.4.22 Driver’s Area Lamp Switch
The switch shall provide ON and OFF positions, located on the primary or secondary instrument panel. (Section 4.8).

TS 4.4.23 Fare Equipment Area Lamp Switch
Shall provide NORMAL and ON positions, located on the primary or secondary instrument panel (Section 4.08).

TS 4.4.24 Exterior Lamp Test Switch
Shall turn on all exterior lamps for 60 seconds when both turn signal foot switches are pressed simultaneously.
TS 4.4.25 Indicator Test Switch
Supply a button or spring loaded switch, located on the primary instrument panel, to test operation of indicator lamps. Switch shall be rated to handle load requirements. If many wire terminations are required, an approved terminal strip board shall be used. The District shall approve type of switch and installation.

TS 4.4.26 Instrument Panel Dimmer Switch
Control shall be located on the primary or secondary instrument panel. This control shall operate all illumination lamps on both primary and secondary panels (Section 4.05). Control shall have linear operation with smooth dimming. The fully bright setting shall be at the counter-clockwise end of travel. The control shall have a label clearly indicating the proper direction to accomplish dimming.

TS 4.4.27 Operator Booster Fan Switch
Install a bus operator booster fan switch that shall provide an OFF, LOW and High position, located on the secondary instrumental panel.

TS 4.4.28 Remote Mirror Control Switch
Install heavy duty, labeled mirror control switch on the secondary panel for the exterior mirrors (Section 4.11.03).

TS 4.4.29 Kneeling Control Switch
Provide a control on the side console to kneel the right front corner of the bus. The control shall be labeled KNEEL and OFF.

TS 4.4.30 Interlocks
Provide a labeled toggle switch in the front sign or other overhead compartment to override the rear door interlock (Section 3.04.04), the ramp front door interlock (Section 6.08.02.01), and the hinge interlock (Section 2.02.01). Activation of the interlock override(s) shall be indicated by a buzzer or electronic audio device. Location shall be approved by the District.

TS 4.5 4.05 Instruments
The following gauges shall be included on the instrument panel. All gauges shall be illuminated and operate on 12 volts DC.

TS 4.5.1 Speedometer
A dash mounted speedometer and odometer shall be provided. The needle and numbers shall be easily visible to the operator under all lighting conditions. It
shall be a fully transistorized unit. The speedometer signal shall be from the hybrid drive unit. The speedometer shall be approved by the District.

**TS 4.5.2 Air Pressure Gauges**

Supply mechanical gauges as follows: one needle per axle brake system plus one needle for auxiliary air. A maximum of 2 needles per gauge shall be provided.

**TS 4.5.3 Diesel Exhaust Fluid (DEF) Gauge**

Supply a diesel exhaust fluid gauge on the instrument panel. The gauge and location shall be approved by the District.

**TS 4.6 Indicators**

The following visual indicators shall be provided, augmented as shown below in Table 4-2 with audible warnings. Indicators may be located on the instrument panel or other approved location. The audible alarm buzzer shall be noticeable to the driver, but not at a sound level or pitch that is objectionable. Audible alarms shall be electronic.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Telltale Alarm</th>
<th>Lamp</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear door open</td>
<td>None</td>
<td>EXIT DOOR</td>
<td>Red</td>
</tr>
<tr>
<td>Air brake application</td>
<td>None</td>
<td>STOP LAMP</td>
<td>Red</td>
</tr>
<tr>
<td>Headlight high beam</td>
<td>None</td>
<td>Symbol</td>
<td>Blue</td>
</tr>
<tr>
<td>Low air pressure</td>
<td>Buzzer</td>
<td>LOW AIR</td>
<td>Red</td>
</tr>
<tr>
<td>Low oil pressure</td>
<td>Buzzer</td>
<td>LOW OIL</td>
<td>Red</td>
</tr>
<tr>
<td>High engine temp.</td>
<td>Buzzer</td>
<td>ENG HOT</td>
<td>Red</td>
</tr>
<tr>
<td>High hybrid drive or transmission temp.</td>
<td>Buzzer</td>
<td>TRN HOT</td>
<td>Red</td>
</tr>
<tr>
<td>Turn indicator, R</td>
<td>None</td>
<td>Symbol</td>
<td>Green</td>
</tr>
<tr>
<td>Turn indicator, L</td>
<td>None</td>
<td>Symbol</td>
<td>Green</td>
</tr>
<tr>
<td>Emergency flashers</td>
<td>None</td>
<td>Symbol</td>
<td>Green</td>
</tr>
<tr>
<td>Parking brake on</td>
<td>None</td>
<td>PARK BRAKE</td>
<td>Red</td>
</tr>
<tr>
<td>Generator not charging</td>
<td>None</td>
<td>DISCHARGE</td>
<td>Red</td>
</tr>
<tr>
<td>Passenger stop</td>
<td>Chime 1</td>
<td>PASS STOP</td>
<td>Yellow</td>
</tr>
<tr>
<td>Mobility aid user stop</td>
<td>Chime 2</td>
<td>(International Wheelchair Symbol)</td>
<td>Yellow</td>
</tr>
<tr>
<td>Engine fire alarm</td>
<td>Buzzer</td>
<td>ENGINE FIRE</td>
<td>Red</td>
</tr>
<tr>
<td>Low fuel</td>
<td>None</td>
<td>LOW FUEL</td>
<td>Red</td>
</tr>
</tbody>
</table>
Condition | Telltale Alarm | Lamp | Color
--- | --- | --- | ---
Rear door interlock off | Buzzer | “WARNING INTERLOCK DEACTIVATED” | Red
Ramp enabled | None | RAMP | Red
Excessive ramp angle | Buzzer | RAMP ANGLE | Red
ABS working | None | ANTI-LOCK | Red
Rear door sensitive edge | Buzzer | DOOR ALARM | Red
Joint dampening failure | Alarm | | Red
Joint dampening on | None | | Green
Low joint oil pressure | Alarm | | Red
Maximum hinge angle | Alarm | | Red
Joint self-test | None | | Red
Driver Seat Belt Light | Alarm | Seat Belt Symbol | Red
A/C Stop | High Pressure | | Red
A/C Stop | Low Pressure | | Red

Hybrid drive status as necessary

The instrument panel indicators shall be easily seen in bright and/or direct sunlight. If needed, an instrument panel sun shield will be supplied. The District shall approve design and placement of indicators.

**TS 4.7 Stowage of Personal Items**

A coat hook and tieback loop shall be provided for the driver. The coat hook shall be attached with riv-nuts and machine screws. The District shall approve the placement and material used.

A bus operator water bottle receptacle shall be supplied on the street side console panel to contain the District furnished water bottle. This receptacle shall be fabricated metal and placed so as not to interfere with coach operation but positioned so the driver can access the water bottle, placed in the receptacle. The receptacle shall be located so spills will not puddle nor affect any instrumentation. The District shall approve the design and placement of the receptacle.

A secure storage compartment for the bus operator’s personal items shall be located in the driver's barrier. The storage compartment shall lock using the square drive from the removable door control handle. The District shall approve the design, size and placement of the storage compartment.
TS 4.8 Convenience Lamps
The following separate lamps shall be supplied, controlled by switches as described below and in section 4.04. Location of the lamps and their installation shall be approved by the District.

TS 4.8.1 Fare Equipment Area Lamp
An adjustable ceiling-mounted spotlight, in addition to any lamps in the fare equipment, shall be placed over the fare box to illuminate the fare equipment area when the front door is open and the master switch is not OFF. Special provisions will be taken to assure no heat build-up if this lamp is operated for long periods of time. A separate override switch shall enable the driver to illuminate it at any time.

TS 4.8.2 Driver's Area Lamp
Supply a lamp to provide general illumination of the driver's station, suitable for reading and recovery of items on the floor. This lamp shall be enabled in all master switch positions except OFF.

TS 4.9 Sun Shades
Sunshades shall be provided for the driver on both street and curb sides of the windshield and driver's window. Shades shall operate with cantilever arms or rods to keep them close and parallel to the window. The cantilever arm shall allow easy deployment when pulled downward, remaining where placed until stowed by the driver.

The front shades shall cover the entire width of both windshield halves using a cantilever arm design. The side shade when pulled all the way down shall have a solid section on the bottom and a mesh section on the top. The requirements are to block direct sun, but still allow visibility through the windshields and to the left and right side mirrors.

This driver's side shade shall cover the entire width and height of the driver side window. The edges of the side window shade shall be secured to the side rods to keep the shade from blowing out of the open side window. The shade design and materials shall be approved by the District.

TS 4.10 Driver Platform
The driver seat platform edges shall be neatly finished with no sharp edges or corners. The platform shall not extend into the aisle or front entrance area vestibule beyond the line of the wheel housing. The platform shall not interfere or impede wheelchairs or other mobility aids. The surface of the driver platform shall
be finished as referenced in section 2.05.04. Provide steps to reach the driver platform in a low floor bus. The driver's platform steps will have a non-skid coating and yellow edge. The District shall approve the driver platform.

**TS 4.11 Exterior Mirrors**

Buses shall be equipped with two exterior rear vision mirrors, one at each side, firmly attached to the bus in a manner which precludes vibration at normal speeds and located so as to reflect to the driver an adequate view of the highway to the rear along both sides of the vehicle.

The District shall approve exterior mirrors and their mountings; final approval for location will be at the prototype review.

The left and right outside mirrors shall be "B&R" remote controlled or approved equal. The driver side mirror single 8x11 inch flat and curbside mirror to be a single 8x15 inch flat. Both large mirrors are individually adjustable from the driver's station with separate controls.

The Curbside mirror shall be mounted to achieve as much clearance above the ground as possible, subject to the following: the mirror shall be placed so that it is seen through the portion of the windshield that is cleaned by the wipers, and so that it gives a view along the entire side of the bus whether the front door is open or closed.

Mirror arms shall not be visible in the mirrors. Left and right mirror mounts shall be spring-loaded break-a-way mirror brackets by "B&R" or approved equal. The left-right axis of the mirror head shall be perpendicular to the floor of the bus. The fore and aft axis shall be optimized for the range of drivers being accommodated. Mirrors will be designed to fold flat against the bus during bus washing operations. Brackets shall be attached with cap screws and riv-nuts (Section 3.23.10). Mirror heads and glass shall be easily replaceable. Mirror electrical connector shall be concealed beneath each side mirror. Harness routing from bus skin to connector to be approved. In the event of an accident, it is preferred that mirror assemblies shall break away without damaging the body attachment points. Exterior mirrors shall be approved by the District.

**TS 4.12 Interior Mirrors**

Interior mirrors and mounting hardware shall be finished in colors that match or are compatible with colors in the area in which they are mounted. Interior mirrors shall have a rubber edge. Mirrors shall be mounted in a manner that precludes vibration at idle and normal speeds, and they shall be mounted where they do
not interfere with passengers or the opening of access panels. Mirrors shall be by "Acme Specialties Co.", "Rasco", or approved equal. The District shall approve interior mirrors and their mountings; final approval for location will be at the prototype review.

A fully adjustable rectangular flat mirror, of minimum size 7.5 by 16 inches (190 by 406 mm) shall be provided above and to the right of the bus operator for observation of passengers.

A 6-inch (152 mm) minimum diameter mirror shall be provided at the front windshield header, coordinated with a four 12-inch (305 mm) minimum diameter convex mirror located to the rear of the exit doors. In combination they shall provide the driver with a complete view of the rear doorways.

A rectangular convex mirror, of minimum size 7 by 10 inches (178 by 254 mm), with adjustable brackets, shall be installed above the front door. This mirror shall provide the driver with a complete view of the front doorway despite the presence of people standing in the front platform area.

A six-inch convex mirror shall be mounted in the area of the curbside destination sign to allow the driver to view the area directly behind the front equipment compartment. All interior mirror locations shall be approved by the District.

**TS 4.13 Fare Collection Equipment**

**TS 4.13.1 General**

Each bus shall be equipped with provisions for mounting a GFI Fast-Fare or approved equal electronic fare box with a TRIM transfer issue machine. The floor in the mounting area shall be of sufficient strength to prevent the floor mounted fare box from vibrating.

A fare box platform with four weld nuts mounted on a metal plate for the fare box shall be provided. The box may be rotated slightly to accommodate mobility aid clearance, operator ingress and egress and vault changing. The fare box mounting shall be located as far forward as practicable and shall not obstruct traffic in the vestibule, especially wheelchairs or mobility aids.

**TS 4.13.2 Electrical**

The electrical supply shall be rated at 20 amps, and protected by a circuit breaker.
TS 4.13.3 Harness Specification
The fare box harness shall be a shielded cable, Belden PIN 8720, or approved equal, with 2 conductors of 12AWG wire, plus one 14AWG stranded, tinned copper drain wire.

TS 4.13.4 Harness Termination
The shield shall terminate at the fare box end only, and shall be maintained to within 2 in. of the cable end. Protect the jacket/shield end with 1 in. of heat-shrink tubing. The cable shall terminate in a four-position plug connector, "AMP" with socket (female pin) (sockets on a strip) or (singles) or approved interchangeable equal. Pin out is as follows:

<table>
<thead>
<tr>
<th>Pin 1- Black Wire</th>
<th>(24V Return)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin 2- Clear Wire</td>
<td>(+24Vdc)</td>
</tr>
<tr>
<td>Pin 3- Bare Wire</td>
<td>(Shield Drain)</td>
</tr>
</tbody>
</table>

The shield at the bus end shall be maintained to within 12 inches of the connection to the 20A circuit breaker, at which point the shield shall be cut back with the cable jacket. The strip-back shall be covered with a 1 in. minimum section of heat-shrink tubing to protect the shield from accidental contact with other conductive surfaces.

TS 4.13.5 Ground Strap Installation
Provide and install a ground strap and stud for the GFI fare box equipment. The bolt and its attaching hardware shall be stainless steel; installation to be approved by the District.

TS 4.13.6 “Smart Card” System (Clipper)
The Smart Card System shall be a Clipper System supplied by Cubic or approved equal. Provisions for a Cubic Local/Transbay switch shall be installed by the Contractor located on the secondary console panel. Power wiring shall be fused with a Circuit Breaker at bus electrical panel. Wiring and circuit breaker size shall be based on the manufactures equipment specifications. System Power shall be wired hot, except for when bus battery knife switch is cut off. The system shall operate with the switched ignition for system control. Data wiring must be based on Clipper equipment specifications. Power and Data wire shall be a twisted pair and be shielded per Cubic Inc specifications. The Drivers Console unit shall be mounted in the driver’s area and subject to the Districts approval. Brackets for the DC unit shall be manufactured by the bus
manufacturer to specifications supplied by Cubic and installed by the Contractor. The location of the DC unit shall be determined by the District. Requires inclusion specifications for Clipper WLAN antennae on the roof (See 3.23.2).

**TS 4.13.7 Smart Card Wiring & Patron Devices**
All bus doors will be wired for and equipped with Clipper Patron Devices. Patron Device mounting locations and brackets shall be approved by the District. The Clipper Junction box Encoder/Decoder shall be installed by the Contractor preferably in the electronics cabinet. All equipment will be acquired by the bus manufacturer from the vendor. Any changes to the Smart Card System shall be approved by the District.

**TS 4.14 Radio Handset and Control System**

**TS 4.14.1 General**
The bus manufacturer shall be responsible to design and install the mounting provisions for components used by the District’s CAD / AVL systems. The Contractor shall supply and install the radio handset, driver display unit (DDU) CAD / AVL plus its active cradle, the Radio Control Unit (RCU), and radio transceiver. The contractor shall supply and install all other components noted in this section unless otherwise indicated. The locations and mounting arrangements for the components shall be approved by the District at the prototype review.

**TS 4.14.2 Driver’s Speaker**
Each bus shall have a recessed speaker in the ceiling panel above the driver. This speaker shall be the same component used for the speakers in the passenger compartment. It shall have 8 ohms of impedance. It shall be painted the same color as the surrounding area. Mounting shall be accomplished with riv-nuts, machine screws and utilize a metal backing plate.

**TS 4.14.3 Handset**
Each bus shall mount a radio handset convenient to the driver a base plate will be required to accomplish this mounting. It is preferred that the bracket be mounted on a horizontal plane. A 0.5 inch (13mm) continuous conduit with fish wire shall be provided between the radio handset and the right side of the instrument panel near the fare box area to allow easy installation and replacement of the handset wiring and to prevent rubbing and chafing.

**TS 4.14.4 Driver Display Unit**
Each bus shall have a provision for mounting a Driver Display Unit (DDU) and its active cradle as close to the right side of the instrument panel as possible. The
DDU and its bracket are supported on a mounting system and shall be approved by the District. The mount must be attached to the bus structure by means of Contractor supplied bracket(s) and reinforcing plate(s). The bracket plate shall be ¼” gauge.

**TS 4.14.5 Emergency Alarm**

An Emergency Response Button mounted close to the left side of the driver below the driver side console shall be provided. The button type shall prevent false activation by the driver. The Contractor shall provide a switch, PN# P3-90011 manufactured by Sager. The location of the switch shall be approved by the District at the prototype review.

**TS 4.14.6 Cable Installation**

The Contractor will install all required wiring harnesses, hardware, and associated interfaces. The locations and mounting arrangements for these components shall be approved by the District at the prototype review.

**TS 4.15 Registration Certificate Holder**

A certificate holder in the driver’s area of a clear plastic cover to hold a State of California vehicle registration certificate measuring 9 x 6 in shall be provided. The cover shall be attached with pop rivets. The design and location shall be approved by the District.

**TS 5. Propulsion and Braking**

**TS 5.1 Engine Propulsion System**

Each coach shall be equipped with a diesel electric hybrid drive propulsion system and drive train to enable the coach to meet the defined acceleration, top speed, gradeability requirement, and operate all propulsion accessories. The propulsion system includes fuel storage, fuel delivery, the heavy-duty diesel fueled engine, a hybrid drive system, and a drive train to the driving wheels.

**TS 5.2 Engine**

**TS 5.2.1 General**

The engine shall be specifically adapted for and proven on the transit urban bus duty cycle that includes long periods of idling as well as start and stop operation. The engine shall be a California Air Resources Board (CARB) certified for urban buses "Cummins" ISL or approved equal. Where applicable, maintenance services necessary in order to meet CARB useful life emissions compliance requirements must be included as part of the proposal. The engine shall be
turbocharged and after cooled. In addition to power required for propulsion, sufficient excess power shall be available to operate all accessories at their normal operating condition throughout the transit bus duty cycle. Sufficient power shall also be available at normal idling speed to operate all accessories. All engines supplied in this contract shall be of the same model year, engine family number, and emission level.

A programmable governor shall be provided to limit engine speed to a safe value. Engine operation, including fueling, shall be electronically controlled. It shall have a programmable engine performance operating system and Insite maintenance and diagnostic software system.

The Cummins engine control system shall have onboard diagnostic capabilities able to monitor vital engine functions; store and time stamp out-of-parameter conditions in memory, and communicate faults and vital conditions to service personnel and to the hybrid drive logic. Diagnostic reader device connector ports, suitably protected against dirt and moisture, shall be provided in operator's area and near or inside engine compartment.

The engine shall have a minimum design life of 12 years or 500,000 miles (805,000 km).

A major overhaul consists of component replacement, due to wear, such as cylinder sleeves, piston rings, and bearings. The District shall approve the engine, all accessories and propulsion sub-systems.

**TS 5.2.2 Accessory Drives**

All coach accessories shall be powered electrically by the hybrid energy storage system, including but not limited to A/C compressor(s), power steering pump, air compressor, engine cooling fans, HVAC ventilation fans, wheelchair ramps and bridge plates.

**TS 5.2.3 Mounting**

The engine mounting shall be arranged so that accessibility for all routine maintenance is as easy as possible. With a T-drive configuration the engine and hybrid electric drive system shall be easily removable by one person.

Approved means for separating hydraulic, air and electrical systems shall be used. These disconnects shall be located for easy access in the engine compartment. Electrical quick disconnects shall be metal "ITT Cannon" electrical plugs of aviation quality. "Weather-Pak" and "Deutsch" connectors may be used only with prior approval by the District. The engine valve cover shall be easily
removable with no disassembly of nearby components. No special tools other than standard dollies, hoists and hand tools shall be required to remove or replace the engine. All mountings shall be mechanically isolated to minimize the transmission of vibration and noise to the body structure.

TS 5.2.4 Exhaust and After-Treatment
Exhaust products and heat shall be vented so as not to impinge upon pedestrians adjacent to the rear of the bus. Special care shall be taken to prevent exhaust products or heat from entering the bus body. Exhaust system piping shall be located to prevent burns to pedestrians. If flexible pipes or couplings are planned, their use shall require the prior approval of the District. Special attention shall be paid to clamps and mounting. Engine exhaust outlet shall be at the left rear corner of the roof. The roof terminating point shall not allow water entry into the system. There shall be a 90-degree bend in the pipe, pointed to the rear. Use of any type of ‘flapper valve’ is prohibited. Routing of the exhaust system shall not place excess heat on wiring, lamps or any other components to include body structure. Exhaust routing, piping, clamps, supports, access doors and panels and their fasteners to be approved by the District. The compartment containing the diesel particulate filter (DPF) and diesel exhaust fluid (DEF) components located adjacent to it shall be easy to access and shall be able to withstand the heat generated by the DPF in any operating mode, including failure. An easy access door or panel with quarter-turn or other approved fasteners, to allow maintenance of the exhaust after-treatment device shall be provided.

TS 5.2.5 Cooling System
The capacity of the cooling system shall be adequate to maintain design engine temperature under all operating conditions in the service area and environment of the District. The cooling system design shall take into account the fact that engines normally are shut down for time periods of any length, typically 5 to 10 minutes, at route terminals and then restarted. The Contractor shall provide evidence to the District that the cooling system selected has the capability to handle peak heat rejection from the engine, intercooler, and any hybrid components with a partially clogged radiator at maximum ambient temperature plus heat reflected off the pavement. The Contractor shall submit an analysis verifying cooling system capabilities to the District. The cooling system shall be an electric driven system approved by the District.

5.2.5.1 Fluid
The entire cooling system shall be self-purging and shall require no longer than 10 minutes to be completely filled after draining. Drain plugs (Section 5.02.08)
shall be supplied at all the low points in the cooling system. The engine shall be equipped with an electronic low water detection device to indicate low water level on the driver's control panel.

Buses shall be delivered filled with a mixture of 50/50 ethylene glycol anti-freeze mix, meeting Cummins Engineering specification 14603 or other percentage as specified by the engine manufacturer.

5.2.5.2 Surge Tank

A heavy-duty surge tank of non-corroding material with two sight glasses, or approved alternative sight method, shall be provided. A coolant fill shall be provided on this tank. The coolant fill shall be designed to eliminate the possibility of hot liquid splashing out of the fill due to heat expansion. The sight glasses and coolant fill location shall be accessible and clearly visible from the exterior of the coach through a separate access door on the left side without opening the main engine compartment door. This door shall be equipped with an over-center spring latch to retain it positively in the open or closed position.

A manual override shall be provided to safely eliminate pressure in the surge tank. This assembly shall be mounted separately from the coolant fill but accessible from the same access door as used for the coolant fill and sight glass. When activated, any coolant exiting this pressure relief shall drain to the ground without contacting any coach part. The Contractor shall install a pressure port in the cooling system surge tank using a Cummins Compucheck fitting and pressure gauge.

5.2.5.3 Radiator

The radiator shall be a heavy duty engineered machined products EMP or approved equal unit. The radiator shall be accessible for cleaning. The radiator shall be mounted on the left side of the bus, and be easily removable for servicing.

5.2.5.4 Fan Assembly

The radiator cooling fans shall be provided by EMP or approved equal. The radiator fans shall be electrically operated and be thermostatically controlled. The fan controls shall enable the flow of air to be reversed for cleaning.

5.2.5.5 Hoses
All engine coolant and heater hoses shall be of the silicon polyester covered type. "FC 300 Aeroquip" premium silicone rubber hose may be provided with prior approval of the District. Contractor shall provide ‘Breeze’ hose clamps compatible with the type of hose used.

5.2.5.6 Water Filter

The cooling system shall be equipped with a long life water filter able to remove particle contamination. The coolant lines shall have ¼ turn ball-type shut off valves on both sides of the filter. The engine manufacturer shall approve the water filter.

5.2.5.7 Charge Air Cooler

Provide a charge air cooler for the engine shall be beside the radiator to minimize radiator stacking.

5.2.5.8 Not Used

TS 5.2.6 Air Cleaners

Dry type air cleaners shall be provided for engine aspiration. All filtering devices within the air cleaner shall be readily removable for cleaning and replacement. Air ducting shall minimize entry of water into the induction system.

A "Fleetguard Optiair 1300 Series filter." or approved equal with an air restriction indicator Filter Minder™ shall be provided in a location that is both easily seen and approved by the District.

TS 5.2.7 Lubrication System

The engine shall be equipped with oil filtration of ample capacity according to its manufacturer's recommendations. Filters shall be spin-on type. The oil filler pipe shall be provided with a hinged, spring-loaded cap as recommended by the engine manufacturer.

TS 5.2.8 Drain Plugs

All fuel, lubricant and hydraulic drain plugs shall be hexagon head made of steel. Coolant drain plugs shall be brass. Lubricant drain plugs shall be magnetic. The engine oil drain plug shall not be the lowest point on the bus. Fluid drain plugs shall point down, not sideways, to allow easy draining into standard portable automotive drain tanks, with the bus on a hoist or over a pit. Engine, hybrid drive, and transmission oil pans shall be equipped with "Quick Changer" or approved equal oil drain system available from "Unique Truck Equipment Inc.".
TS 5.2.9 Starter
Coaches shall utilize the hybrid drive integrated starter / generator electric motor to start the engine. The starting function shall be interlocked so that:

- Engine can be started in neutral gear only with the transmission selector in neutral only.
- Starter will not operate when engine is running.
- Other major electrical loads are disconnected while cranking

TS 5.3 Engine Compartment, Controls, Gauges and Linkages
Each coach shall be provided with all controls necessary for engine operation.

TS 5.3.1 Starter Interlock
A protective interlock shall be utilized through the multiplex system.

TS 5.3.2 Fast Idle
Not required with a Hybrid system.

TS 5.3.3 Engine Compartment
The engine shall be contained in a separate compartment isolated from the passenger compartment to minimize entry of heat and noise and to minimize the danger from fire. It shall be designed for simplicity and ease of access and maintenance. Engine doors shall be vented when possible to allow heat to escape.

TS 5.3.4 Compartment Lighting
The compartment shall contain a sufficient number of low profile 18" x 1" LED lamps (minimum 5) to adequately light the compartment for nighttime road service. There shall be a conveniently mounted ON and OFF waterproof toggle switch to control these lamps on the rear run box.

TS 5.3.5 Engine Compartment Controls and Gauges
There shall be an easily accessible rear engine control box located in the engine compartment. This box shall be metal, serviceable and water tight. Controls provided in the box will include an illuminated direct reading (hydraulic) engine oil pressure gauge, an illuminated cooling system temperature gauge, fast idle switch, and a connector for electronically diagnosing the engine using portable instruments.
There shall be a switch located on the box so maintenance personnel can prevent the engine from being started or run from the driver's seat. This control shall be by a waterproof toggle switch. There shall be controls that can start, run, or stop the engine. These controls shall be interlocked so the coach cannot be rear started when the transmission is in gear. The District at the design review shall approve function and placement of rear engine controls and gauges.

**TS 5.3.6 Fluid Refill Tags**
Permanent metal tags, easily readable and riveted in place, listing fluid and refill capacities shall be provided for engine oil, power steering fluid, engine coolant, engine fuel, A/C refrigerant; diesel exhaust fluid (DEF) and hybrid drive oil / coolant. Label design and location shall be approved by the District.

**TS 5.3.7 Fire Detection/Suppression**
Provide a fully automatic fire detection and dry chemical fire suppression system, "Amerex" modular or approved equal. At least 4 detectors and 4 discharge nozzles shall be supplied. Provide a supplemental manual actuator in the driver's station. Provide appropriate status and warning lights on the driver's dash and an audible fire detection warning. The system shall be unaffected by engine compartment cleaning with high-pressure hot water ('steam cleaning'). The system shall be as maintenance-free as possible. Access panel(s) shall be provided, if necessary, to allow reading the gauge on the fire suppression bottle.

**TS 5.4 Hybrid Drive**

**TS 5.4.1 General**
Buses shall have a BAE TB-300 hybrid drive unit or approved equal that, coordinated with the engine and the rear axle drive ratio, enables the vehicle to achieve the required top speed, acceleration and hill climbing capability while still maintaining passenger comfort and providing a smooth ride. The hybrid drive shall be rated to operate at the GVWR of the bus. The hybrid system shall be a series hybrid system with no mechanical power transmission linkage between the diesel engine crankshaft and the drive axle. The series hybrid traction motor and traction generator shall be brushless and shall have standard mounting interfaces.

The engine and hybrid drive combination shall automatically prevent lugging when climbing hills of any gradient on which the bus is designed to operate. The hybrid drive and its push-button shift select control head shall be designed or interlocked so the possibility of damage or uncontrolled acceleration due to driver misuse of the shift select control head is minimized. An “engine off” mode for quiet operation in revenue service shall be provided.
Evidence shall be provided to insure that the driver has a consistent level of retardation, based on pedal angle, despite the level of charge of the Energy Storage System.

The electronically controlled hybrid drive shall have on-board diagnostic capabilities, be able to monitor functions, store and time stamp out-of-parameter conditions in memory, and communicate faults and vital conditions to service personnel. The hybrid drive shall contain built-in protection software to guard against severe damage. A diagnostic reader device connector port, suitably protected against dirt and moisture, shall be provided in the operator's area. As the hybrid drive unit is controlling the engine, the hybrid drive logic will respond to all out of normal range outputs from the engine in order to protect the engine from damage. The Contractor will submit evidence of this coordination among the engine manufacturer, the hybrid drive manufacturer, and the Contractor, for District approval. The Propulsion Control System (PCS) and the accessory power system (APS) shall be cooled by a separate cooling system loop. The cooling shall be provided by a self-contained cooling system with an integrated radiator, reservoir, fan and pump called the Electronics Cooling Package (ECP). This self-contained cooling system shall contain a mixture of ethylene glycol and water. Any devices cooled by engine coolant or oil shall have quarter-turn ball valves on each side of the device.

For oil sampling, the hybrid drive shall be equipped with a "Probalizer" or approved equal oil sampling valve, with Viton seal, metal cap and 3/16" tubing spout barb. This unit shall be approved by the District, and mounted in coordination with the manufacturer's requirements. The hybrid drive system shall be supplied with TranSynd fluid by the Contractor. The hybrid drive shall be equipped with an overheat warning at the driver's station.

**TS 5.4.2 Fluid Filters and Cooler**

A hybrid drive spin on fluid filter as recommended by the hybrid drive manufacturer shall be supplied. The hybrid drive shall be capable of being easily and completely drained. It shall be removable without removing the engine, unless other removal methods have pre-bid approval. An oil cooler that maintains the fluid temperature below the limit allowed by the fluid manufacturer under all service conditions shall be provided. The oil cooler shall be supplied by the hybrid drive manufacturer. The hybrid drive manufacturer shall supply all hoses and wiring harnesses.
TS 5.4.3 Electric Energy Storage System

The traction energy storage system (ESS) shall be composed of nano-phosphate, lithium-ion batteries. The energy storage system shall contain all battery management electronics, environmental controls and other subsystems necessary to insure proper operation and long service life. The energy storage system shall include the ability to report fault codes and other diagnostic information through the hybrid drive system standard diagnostic interface to facilitate debugging and servicing. This system shall be designed to provide a load leveling function in the hybrid propulsion system. The energy storage devices used, and their arrangement shall be selected and sized to meet bus performance specifications and design goals, including: reduced vehicle exhaust emissions, improved vehicle fuel economy, long cycle life, low life-cycle cost, safety, maintainability, durability, and simple robust diagnostics. The minimum design life of the energy storage system shall be 6 years. The traction energy storage system shall require only ambient air to maintain acceptable energy storage internal temperatures. No external heating or coolant shall be required. The energy storage system shall utilize electrically driven fans in lieu of mechanical or hydraulically driven fans.

Individual energy storage devices shall be packaged in one or more modules, which shall be mounted in an enclosure(s) that permits ease of servicing. Energy storage shall be roof-mounted to optimize weight distribution. The enclosure shall be double-hulled to prevent any leaked substance from escaping. The energy storage system and enclosure(s) shall be designed to minimize shock hazard to maintenance personnel. Access to individual devices within each module shall be through two covers or panels. Adequate walking and working room with both doors open shall be provided. Hazard warnings shall be visible on the inner cover or panel and hazard warnings shall remain visible with both covers open. Supporting documentation shall be provided to the District that the individual devices within a module, or the entire module, shall be replaceable within 1 hour.

The storage system shall include a management system to monitor and control the operating conditions within each energy storage system module, including voltage, current, and temperature. This system shall include an over-current and an over-temperature protection feature that disconnect current to and from the energy storage modules in the event of an over-temperature or over-current condition.

The energy storage system shall include a voltage equalization system that will provide real-time equalization of voltage between individual energy storage
devices within each module. This equalization function shall be accomplished automatically, and shall not require manual intervention by the bus operator or maintenance personnel. Charging may be accomplished either through an engine-generator or regenerative braking system or both that recharge the energy storage system. The propulsion system shall be designed so that the energy storage system shall not require external charging from the electric grid.

**TS 5.4.4 High Voltage Devices**

All devices that contain circuits or equipment energized or capable of being energized at high voltage shall be contained within protective enclosures or enclosed bus body compartments. All access covers for these compartments shall be permanently labeled with 'DANGER HIGH VOLTAGE' signs.

**TS 5.4.5 High Voltage Wiring**

All conductors carrying voltages of 50 Volts AC, 50 Volts DC, or greater, shall be considered High Voltage (HV). All HV wiring shall be approved by hybrid drive manufacturer. HV wiring specifically supplied and recommended by the hybrid drive manufacturer is allowed. HV wiring must be installed separately from low voltage wiring, and must be installed damage-free. Any box with HV terminations shall be sealed, with HV wires entering through high quality gland nuts of the correct size. HV terminations shall not be covered with tape or heat shrink.

**TS 5.4.6 Drive Shaft**

The drive shaft and universal joints shall be heavy duty, 'Spicer Industries', 'Dana Corp.' or approved equal, approved by the hybrid drive and drive axle manufacturers. Provide a drive shaft guard, or functionally equivalent structure, to prevent the drive shaft from hitting the ground or major electrical and mechanical component in case of shaft or universal joint failure. Universal joints and drive shaft slip joints shall have separate grease fittings accessible by a standard grease gun. Universal joints shall be installed with proper phasing and the drive shaft shall be balanced for all bus speeds up to the maximum specified for the type of vehicle. Drive shaft angles and offset must not exceed universal joint manufacturer's recommendations. The slip joint must not 'bottom out' even at maximum drive axle suspension travel. At both ends of the drive shaft, a flange type yolk shall be provided.

**TS 5.5 Axles, Wheel Bearings, Air Suspension and Kneeling**

**TS 5.5.1 Axles**

Suspension shall be by solid axles, unless other methods have pre-bid approval, and all components shall be of sufficient capacity to carry all static and dynamic
loads imposed upon them on the severe transit bus duty cycle through the expected service life of the bus.

Drive axle gearing shall be designed for long life and quiet operation at all speeds and conditions of positive or negative torque and shall be easily accessible for lubrication. Hub reduction units may be used. Front and center axles to be "MAN" or approved equal. Rear axle to be the latest heavy duty "MAN" or approved equal, with gearing for quiet operation. All wheel hubs shall be painted Black. Axles shall be approved by the District.

**TS 5.5.2 Wheel Bearings**

Wheel bearings shall be sized for anticipated loads and shall provide smooth low friction rotation of the wheels under all conditions of temperature, loading and operating speed herein described. The bearings shall be easily accessible, serviceable and replaceable and shall be properly sealed to prevent leakage of lubricant. Non-drive axle wheel bearings shall be lubricated by an oil bath system. Oil seals shall be the unitized type, "Chicago Rawhide" or approved equal, or another brand as recommended by the axle supplier. A "Stemco" or approved equal hubcaps on the front axle shall be provided.

**TS 5.5.3 Suspension**

Buses shall be provided with a full air suspension system. It shall include provisions for stabilizing and damping so as to produce a satisfactory ride quality as described in section 1.07 under all load conditions. All suspension components shall be sized for at least 150% of seated load capacity or GAWR’s whichever is less. Methods of construction and materials used shall permit easy access to and convenient replacement of bellows, shock absorbers and other suspension components. A suspension torque chart attached to the bus shall be provided and the final location shall be determined by the District.

**TS 5.5.4 Air Bellows**

Provide two or four air bellows on the front axle and four air bellows on the second and drive axle, with a heavy- duty "Koni", or approved equal, shock absorbers on each side of each axle. Air bellows should be placed as far outboard as possible. The air suspension system shall, by use of leveling valves, the air supply, and the bellows, automatically regulate air pressure to maintain constant spring characteristics and height of the bus body regardless of loading of the bus. The valves shall have a damping or compensating feature to prevent excessive consumption of air during rapid axle fluctuations. Leveling valve exhaust ports shall be protected to avoid plugging with road dirt. Leveling valves shall be approved by the District.
TS 5.5.5 Stabilizing Devices
Radius rods and other stabilizing devices shall be provided as necessary at the axles to control lateral, longitudinal and torsional movement of the suspension system. Anti-sway bars shall be provided at any axle as required to minimize bus sway while maneuvering in traffic. Radius rods and their wearing components shall be sized for allowable loads, engineered for long life, and designed and integrated into the bus for ease of accessibility for replacement.

TS 5.5.6 Alignment
All normal alignment adjustments to steering axles shall be capable of being performed easily and without disassembly of suspension components. Steering linkages and components shall be adjustable using standard shop tools. All coaches shall have the axles aligned to the coach body and the front wheels aligned before delivery.

TS 5.5.7 Lubrication
All joints and parts of the suspension and steering system requiring lubrication shall be provided with zero type fittings that are designed and located for ease of visual inspection, accessibility and serviceability. If 'lifetime-lubricated' steering system components are proposed, the District shall approve their use.

TS 5.5.8 Kneeling
A kneeling system shall lower the front door of the bus a minimum of 2.5 in. during loading or unloading operations regardless of load up to GVWR, measured at the longitudinal centerline of the front door by the driver. The kneeling control shall provide the following functions:

- Downward control must be held to allow downward kneeling movement.
- Release of the control during downward movement must completely stop the lowering motion and hold the height of the bus at that position.
- Upward control actuation must allow the bus to return to normal floor height without the driver having to hold the control.

The brake and throttle interlock shall prevent movement when the bus is kneeled. The kneeling control shall be disabled when the bus is in motion. The bus shall kneel at a maximum rate of 1.25 in. per second at essentially a constant rate. After kneeling, the bus shall rise within 3 seconds to a height permitting the bus to resume service and shall rise to the correct operating height within 7 seconds regardless of load up to GVWR. During the lowering and raising operation, the maximum vertical acceleration shall not exceed 0.2g, and the jerk shall not exceed 0.3g/second.
An indicator visible to the driver shall be illuminated until the bus is raised to a height adequate for safe street travel. An audible warning alarm will sound simultaneously with the operation of the kneeler to alert passengers and bystanders. A warning light mounted near the curbside of the front door, a minimum 2.5 in. diameter amber lens, shall be provided that will blink when the kneel feature is activated. Kneeling shall not be operational while the wheelchair ramp is deployed or in operation.

**TS 5.6 Fuel Storage and Handling**

The fuel system consists of the fuel filler provisions, filters, and lines to deliver the fuel to the engine.

**TS 5.6.1 Fuel Tank(s)**

The fuel tank(s) shall be rigidly attached to the bus chassis, baffled to prevent sloshing and vented to relieve over pressure without fuel spillage. The fuel tank shall be located between the joint and third axle, and shall have a hex head sump drain plug. The fuel tank shall be a heavy-duty unit constructed of stainless steel or other corrosion resistant materials that will show no interior or exterior corrosion for at least 12 years. The fuel tank shall have an inspection plate or easily removable filler neck to permit cleaning and inspection of the tank without removal. The fuel outlet shall be at the center of the tank. Minimum usable capacity shall be 130 gallons (492 liters). The fuel tank shall be removable from the underside of the bus.

**TS 5.6.2 Fuel Filling**

The fuel filler pipe shall be located on the right side of the bus, between the joint and the third axle. The fuel fill shall be at least 30 inches (762 mm) above ground level. The minimum fuel filling rate shall be 40 gallons per minute.

An "Emco-Wheaton" Posi/Lock-11™ with Posisnap™ Cap or interchangeable approved equal Dry-Break® pressure fueling system shall be used. Length of the filler neck shall be minimized. Any flexible hose used between the fuel filler neck and the fuel tank shall be impervious to diesel fuel. Body and trim in the vicinity of the filler shall allow any overflow to drop to the ground without spilling on side panels. A plastic protector may be required on the surrounding body to eliminate damage from the fuel fill nozzle. A metal-hinged access door with replaceable over-center springs shall be provided. The fuel fill opening and/or door shall not interfere with the fuel nozzle in any position.
TS 5.6.3 Filter
Spin-on type fuel filters as recommended by the District, shall be mounted on the engine in an area easily accessible for servicing.

TS 5.6.4 Siphoning & Priming
Provisions shall be made in the fuel system to prevent fuel from siphoning or draining back into the tank from the system or from siphoning during fuel filter maintenance.

TS 5.6.5 Flexible Fuel and Oil Line Hose Assemblies
Flexible fuel and oil hose assemblies shall preferably be of the Teflon liner type, TFE fluorocarbon resin flexible hose, wire braid reinforced with a plastic outer cover. "Synflex FC300" orange nylon tubing may be provided with prior approval of the District.

TS 5.6.6 Pressure Point Testing
Fuel system shall have pressure/vacuum test ports to allow accurate measurement of fuel pressures at test points necessary for maintenance or troubleshooting. These ports shall be a quick disconnect in design and covered when not being used.

TS 5.7 Braking System
Buses shall be equipped with brake systems that conform to the requirements of all Federal and State of California regulations, designed so such conformance can be maintained throughout the normal adjustment cycle. The braking system shall include service brakes, a parking and emergency brake, and a hill holder.

TS 5.7.1 Service Brakes
Service air brakes shall be furnished on all wheels of each bus. The District shall approve the brake system including all components.

TS 5.7.2 Control
The driver's brake pedal shall control the service brake and the supplemental brake in a coordinated manner to give a total braking effort depending on the position of the pedal up to the maximum capability of the braking system. The control shall make maximum practical use of the supplemental brake to minimize brake fade and to achieve maximum brake lining lifetimes. Braking forces shall be proportioned among the axles to assure balanced braking and equalize lining life between axles. Braking shall be initiated at the rear axle. The brake lamps
shall illuminate only when the brake pedal is depressed (not when auxiliary braking is applied).

**TS 5.7.3 Disc Brakes**
Disc brake shall be Knorr cylinders, with Ferodo lining. Rotors shall be labeled with the maximum safety thickness for rotor refinishing.

**TS 5.7.4 Pad Wear Indicator**
Contractor shall provide a method to monitor brake pad thickness.

**TS 5.7.5**
Brake hoses shall be installed in locations where the possibility of damage is minimized. Hoses shall be clamped and supported by the bus structure to minimize long unsupported hose lengths and to eliminate rubbing and/or chafing.

**TS 5.7.6 Brake Chambers**
Chambers shall be long-stroke, "MAXI", "MGM"-Tube style with push rod stroke indicator or approved equal with a brake adjustment indicator if available. Chambers shall be sealed to prevent entry of dirt or water. Rubber diaphragms will be replaceable without removing the chamber from the coach. Geometry of the brake chambers in relation to the slack adjuster will eliminate any possible contact between the push rod and the chamber housing.

**TS 5.7.7 Anti-Lock Braking**
The buses shall be equipped with an all wheel Anti-Lock Braking System (ABS) by "WABCO" or approved equal to reduce the possibility of tire skid on slippery roads and/or during panic stops.

This ABS system shall have sensors located at every wheel and the electronic/air controls and operation shall be fully automatic and transparent to the driver. The ABS system shall have onboard diagnostic capabilities able to monitor vital functions; store and time stamp out of parameter conditions in memory, and communicate faults and vital conditions to service personnel. Diagnostic reader device connector ports, suitably protected against dirt and moisture, shall be provided in an approved location. The District shall approve the installation.

**TS 5.7.8 Brake Balance**
It is required that brake wear be distributed approximately equally among the axles. To ensure this, the Contractor and the designer/supplier of the foundation
braking system on each type of bus will work with the District’s Technical Service Department to perform brake thermal balance testing on the prototype bus at Contractor’s facility in order to optimize the following parameters: crack pressure; application timing; pressure balance throughout the operating range during application and release; release timing; and thermal balance of the foundation brakes under load. Results shall be approved by the District. Resulting modifications will be incorporated on all production buses, and retrofitted to the prototype(s) buses.

**TS 5.8 Parking and Emergency Brake**

The parking and emergency brake shall be a spring applied/air released brake, acting on the drive axle, controlled by a manual valve located to the left of, and convenient to, the driver. The control valve shall be a "Bendix" Model PP-1, or approved equal valve. It shall automatically apply if air system pressure falls below 60-65 psi. Or such other value as is recommended by the Contractor. This brake shall hold the bus with a GVWR on a 20% grade, both uphill and downhill, with new brake linings; it shall also keep the bus from moving under full throttle on level ground when the coach is in gear. The parking brake shall fully release within two seconds of pressing the PP1 valve.

**TS 5.9 Hill Holder**

A means shall be provided so the bus operator can hold brakes on while moving his or her foot from the brake pedal to the accelerator, to prevent rollback. The control shall be an extended arm toggle switch positioned for actuation by the bus operator’s left hand. The control shall activate the service brakes on all axles except the first. Bus operator activation of the hill holder shall be accomplished through the hill holder switch. Deactivation of the hill holder shall occur upon activation of the throttle. Hill holder may not be engaged unless coach speed is below 3 mph. Activation of the hill holder shall light the brake lamps. The District shall approve the hill holder and its location.

**TS 5.10 Tow Vehicle- Controlled Braking**

Supply the necessary piping and valves to allow a tow truck to proportionally actuate all axle braking (except the first axle) on the bus while the bus is being towed from the front. The air signal is taken from the tow truck's glad hand. Provide an Industrial design plug, 1/4 inch coupler size, protected with a brass push-to-connect socket with a screen, behind the front access door or other approved location for control air hose hook up while towing. The ‘Push to Connect' air connector is to be a "Parker" type 30 or approved interchangeable equal. Hardware and piping layout shall be approved by the District.
TS 6. Equipment and Suspension Components

TS 6.1 Air Compressor

TS 6.1.1 Compressed Air System
The electric air brake compressor shall be a "Compair Hydrovane", or approved equal. The compressor shall have pumping capacity sufficient to maintain all systems at rated pressure and makeup and shall be adequately cooled and lubricated so it will last the service life of the bus without excessive maintenance. The compressor air intake shall be supplied with filtered clean air. The compressor shall provide its rated output at 120 psi (8.4 bar).

TS 6.1.2 Air Reservoirs
Non-corroding tanks or reservoirs shall be provided of sufficient capacity and quantity to supply all components that depend on the compressed air system. Tanks shall meet the requirements specified in S.A.E. J10. A 'ping' tank between the compressor and air dryer to smooth compressor output shall be provided. A means to drain this tank from beneath the bus, including a remote drain if necessary shall be provided. All tanks shall be provided with a readily accessible manually operated drain valve. The valves shall be protected to prevent accidental breakage.

TS 6.1.3 Air Dryer
The air system shall be equipped with an air dryer located before the No.1 air tank and as far from the compressor as possible. The dryer shall be a “Bendix” Dual AD-IP desiccant dryer with heating element.

TS 6.1.4 Valves Piping and Air Control Equipment
All valves, piping and air control equipment shall be of non-rusting and non-corroding materials. Flexible lines shall be provided where excessive vibration or flexing of lines would lead to failure of rigid lines. All air lines shall be installed to minimize freezing. All exhaust ports on the air system shall be protected to avoid plugging by road dirt or debris. A check valve or valves shall be provided to isolate air using equipment other than brakes from the air system so that brakes can operate despite failures such as ruptured air bags, etc. Air exhausting to the atmosphere from air filters, valves, dryers etc. shall be muffled with permanent no-maintenance silencers to prevent annoying noise, particularly when the bus is stopped.

Air lines, except necessary flexible lines, shall conform to the installation and material requirements of SAE Standard J844-Type 1 for copper tubing with standard, brass, flared or ball sleeve fittings, or SAE Standard J844- Type 3B for
nylon tubing if not subject to temperatures over 200 degrees F. Accessory and other non-critical lines may use Type 3A tubing. Nylon tubing shall be installed in accordance with the following color-coding standards:

- Green Primary brakes and supply
- Red Secondary brakes
- Brown Parking brake
- Yellow Compressor governor signal
- Black Accessories
The air system shall have air pressure tap off ports to allow accurate measurement of air pressures at each pressure regulator valve. These ports shall be covered when not being used.

**TS 6.1.5 Air System Charging Connectors**

Buses shall be provided with a front air connector to be used for supplying air for releasing the bus brakes while towing. The connector shall be located in a closed box on the front panel of the bus above the bumper. The connector shall be easily accessible, but shall not be subject to damage from towing hardware connections.

Buses shall be provided with a rear air connector in or near the engine compartment for supplying the coach with compressed air in the shop. Front and rear air connectors shall be plumbed through the air dryer. Both connectors shall be brass, industrial design, push-to-connect sockets, Milton S785 1/4-inch coupler size. Locations shall be approved by the District.

Provide a 1/4-inch coupler size Industrial design plug and a 90-degree fitting on the end of the wet and brake air tanks to apply shop air to the bus from a pit.

**TS 6.2 Hydraulic Systems**

The hydraulic system is defined as those components consisting of all the valves, fittings, lines, pumps, reservoirs, filters and accumulators required to serve its loads. These loads are defined as the power steering, and/or any other approved load. The hydraulic system shall provide a separate hydraulic circuit for each load. Special attention shall be paid to joints, fittings, valves and welds to reduce the possibility of leakage. All lines shall be protected from chafing and rubbing. The hydraulic pump(s) shall be driven by electrically.

Filtering shall be provided as recommended by the manufacturers of the hydraulically powered units. Spin-on filters are preferred. Hydraulic reservoirs shall be located in easily accessible locations, approved by the District. There shall be a sight glass or other approved fluid level checking method on each hydraulic system reservoir and it shall be easily readable. The fluid level-checking requirement may be deleted with prior approval from the District.

All hydraulic systems shall have pressure tap ports to allow accurate measurement of hydraulic pressures at test points necessary for maintenance or troubleshooting. These ports shall be a quick disconnect in design and covered when not being used.
TS 6.3 Electrical and Electronic Systems

General requirements for the electrical system shall be as specified in Section 6.03.04. The Electrical System consists of the vehicle batteries and all other equipment that generates, distribute and use battery power throughout the vehicle (e.g., generator, voltage regulator, wiring, relays, and connectors). Electronics are those components of the electrical system made up of discrete solid-state devices such as transistors, resistors, capacitors and diodes that are part of individual vehicle systems. Electronics also include the integrated circuits that are part of microprocessors that allow individual vehicle systems to process and store data.

Data Communication Systems shall be as specified in Section 6.03.17. These systems consist of the bi-directional communications networks that electronic devices use to share data with other electronic devices and systems. Communication networks are essential to integrate electronic functions both on and off the vehicle.

Data Communications Systems are divided into three levels to reflect the use of multiple data networks.

- Drive train Level- Components related to the drive train including the engine, hybrid drive unit, and anti-lock braking system (ABS).
- Multiplex Level- Electrical devices controlled through input output signals such as discrete, analog, and serial data information (i.e., on/off switch inputs, relay or relay control outputs). Multiplexing is used to control components not typically found on the Drive train or Information Levels such as lights, ramp, doors, and HVAC systems.
- Information Level -Components whose primary function is the collection, control or display of data that is not necessary to the safe drivability of the vehicle (i.e., those functions that when inoperable, will still allow the vehicle to operate). These components typically consist of those required for automatic vehicle location (AVL) systems, destination signs, fare boxes, passenger counters, radio systems, automated voice and signage systems, video surveillance, and similar components.

Design of the electrical, electronic and data communication systems (Section 6.05) shall be modular so that each major component, apparatus panel, or wiring bundle is easily separable with standard hand tools or by means of connectors. Each module, except the main body wiring harness, shall be removable and replaceable in less than 1 hour by one mechanic. Power plant wiring shall be an independent wiring module. Replacement of the engine compartment wiring module(s) shall not require pulling wires through any bulkhead or removing any terminals from the wires.
TS 6.3.1 Environmental and Mounting Requirements
The electrical system and its electronic components shall be capable of operating in the area of the vehicle in which they will be installed as recommended in SAE J1455.

Electrical and electronic equipment shall not be located in an environment that will reduce the performance or shorten the life of the component or electrical system. No vehicle component shall generate, or be affected by, electromagnetic interference or radio frequency interference (EMI/RFI) that can disturb the performance of electrical/electronic equipment as defined in SAE J1113.

The District shall follow recommendations that must be provided by bus manufacturers and subsystem suppliers regarding methods to prevent damage from voltage spikes generated from welding, jump starts, shorts, etc.

TS 6.3.2 Mounting
All electrical/electronic hardware shall be accessible and replaced by one mechanic in 30 minutes. It shall be mounted on an insulating panel to facilitate replacement. The mounting of the hardware shall not be used to provide the sole source ground, and all hardware shall be isolated from potential EMI/RFI.

All electrical/electronic hardware mounted in the interior of the vehicle shall be inaccessible to passengers and hidden from view unless intended to be viewed. The hardware shall be mounted in such a manner as to protect it from splash or spray.

All electrical/electronic hardware mounted on the exterior of the vehicle, that is not designed to be installed in an exposed environment, shall be mounted in a sealed enclosure.

All electrical/electronic hardware and its mounting shall comply with the shock and vibration requirements of SAE J1455.

TS 6.3.3 Batteries
The system shall supply a nominal 12 VDC and 24 VDC batteries used for auxiliary power. The batteries shall be easily accessible for inspection and service from the outside of the vehicle only.

Two DEKA or approved equal group 8D batteries conforming to SAE Standard J537 shall be provided. Each battery shall have a minimum of 1400 cold cranking amps. Each battery shall have a purchase date no more than 120 days from date of bus delivery and shall be fully maintained prior to shipment to the District. The battery compartment must be well-ventilated to prevent hydrogen buildup while protecting the compartment from road spray, water intrusion and de-icing chemicals.
Positive and negative terminal ends on the batteries shall have different size studs to prevent incorrect installation. Prior approval from the District is required if same size terminal studs are to be provided. The battery terminal ends and cables shall be color-coded with red for the primary positive, black for negative, and another color for any intermediate voltage cables. Battery cables shall be flexible and sufficiently long to reach the batteries with tray in the extended position without stretching or pulling on any connection and shall not lie directly on top of the batteries. Cables shall not rub on the tray or compartment, shall not touch each other, and shall be securely clamped. Except as interrupted by the master battery switch, wiring shall be continuous cables with connections secured by bolted terminals; and shall conform to specification requirements of SAE Standard J1127-Type SGT or SGX and SAE Recommended Practice J541.

Jump-start connectors, "Anderson Power Products" Model 6322G1, or approved interchangeable equal, shall be provided in the engine compartment and next to the battery main switch, equipped with dust cap, adequately protected from moisture, dirt and debris, and located so that the mating connector can easily be connected.

The battery-configuration scheme shall isolate the starting batteries (ESS) from the auxiliary batteries (8D), not to interfere with the key-off electrical loads. The configuration shall prevent a vehicle from a no start condition.

TS 6.3.4 Master Battery Switch

A single master switch shall be provided near the battery compartment for the disconnecting of all battery positives (12V & 24V) except for safety devices such as fire suppression system, the radio system, camera system and other systems as specified. The location of the master battery switch shall be clearly identified on the exterior access panel, be accessible in less than 10 seconds for de-activation, and prevent corrosion from fumes and battery acid when the batteries are washed off or are in normal service. Turning the master switch "OFF", with the power plant operating, shall not damage any component of the electrical system. The master switch shall be capable of carrying and interrupting the total circuit load.

TS 6.3.5 Voltage Equalizer

If the bus electrical system is 24 volts, a "Vanner" 100 amp battery equalizer, or approved equal, shall be used to provide 12 volts for exterior lights and other equipment.

TS 6.3.6 Power Generation

The power generating system shall be able to accommodate all electrical 28VDC and 208VAC loads described in (Section 5.02.02). The vehicle manufacturer shall provide to the District both at time of bid and actual production an analysis of the estimated electrical load for each system. Over-voltage output protection shall be provided.
TS 6.3.7 Power Distribution
Power distribution to all equipment requiring dedicated power and ground wiring to the batteries shall be accomplished by using power bus bars consisting of either a solid copper bar or heavy-duty terminal strip. One bus bar for each voltage potential, including ground, shall be located as close to the source of the potential as possible. Cabling from the bus bars to the equipment must be sized to supply the total current requirements with no greater than a 5 percent voltage drop across the length of the cable.

TS 6.3.8 Special Equipment Circuits
A coil of wire under the floor powered by a dedicated circuit for later hookup of farebox power shall be provided if supplied by the District (Section 4.13.02).

A dedicated electrical circuit for the radio communication equipment shall be provided. This circuit shall be initiated at the batteries and terminated at the electronic equipment compartment (reference Section 2.24). It shall be isolated from the coach's starting batteries and all other electronic and electrical equipment. This circuit shall be independent of the electrical main switch, be capable of delivering 25 continuous amperes at 12 volts, measured at the electronic equipment compartment. It shall be protected at the source with an adequately sized, manually tripped and resettable circuit breaker. The radio equipment positive and negative cables shall be continuous from the battery compartment to the electronic equipment compartment and be installed to minimize pickup of electrical noise, and voltage transients. If a 24-volt coach electrical system is used for the bus, an "Electric Transit Laboratories Inc. (ETL)" or approved equal converter shall be provided in the electronic equipment compartment to supply the required power. A "Cole Hersee" 95517-A or approved equal keyed switch with key no. 833S7 mounted on the front side of the electronic equipment compartment in an approved location shall be provided. The switch function is to reset radio power.

The electronic equipment compartment (Section 2.24) shall also be equipped with the following labeled power supplies:

- (1) 12 VDC 5A switch
- (1) 24 VDC 5A switch
- (1) 12 VDC 10A battery
- (3) 24 VDC 10A batteries

TS 6.3.9 Circuit Protection
All branch circuits, except battery-to-starting motor and battery-to-generator/alternator circuits, shall be protected by circuit breakers or fuses sized to the requirements of the load. Electronic circuit protection for the cranking motor shall be provided to prevent engaging of the motor for no more than 30 seconds at a time to prevent overheating. The circuit breakers or fuses shall be easily accessible for authorized personnel. Fuses shall be
used only where it can be demonstrated that circuit breakers are not practicable. Circuit breakers shall be manually trippable and resettable, and shall provide visible indication of open circuits. Radio and camera power circuit breakers shall be specifically labeled with District approved location.

Circuit breakers or fuses shall be sized to a minimum of 15 percent larger than the total circuit load current. The current rating for the wire used for each circuit must exceed the size of the circuit protection being used.

**TS 6.3.10 Grounds**

The battery shall be grounded to the vehicle chassis/frame at one location only, as close to the batteries as possible. When using a chassis ground system, the chassis shall be grounded to the frame in multiple locations, evenly distributed throughout the vehicle to eliminate ground loops. No more than four ground connections shall be made per ground stud. Electronic equipment requiring an isolated ground to the battery (i.e., electronic ground) shall not be grounded to the chassis.

**TS 6.3.11 Wiring and Terminals**

All power and ground wiring shall have double electrical insulation, shall be waterproof, and shall conform to specification requirements of SAE Recommended Practice J1127, J1128 and J1292. Double insulation shall be maintained as close to the junction box, electrical compartment, or terminals as possible.

Wiring shall be grouped, embossed numbered, and color-coded (with at least six colors). Wiring harnesses shall not contain wires of different voltage classes unless all wires within the harness are insulated for the highest voltage present in the harness. Kinking, grounding at multiple points, stretching, and exceeding minimum bend radius shall be prevented.

Strain-relief fittings shall be provided at points where wiring enters all electrical compartments. Grommets or other protective material shall be installed at points where wiring penetrates metal structures outside of electrical enclosures. Wiring supports shall be protective and non-conductive at areas of wire contact and shall not be damaged by heat, water, solvents, or chafing. Wiring shall be strain-relieved near terminations.

To the extent practicable, wiring shall not be located in environmentally exposed locations under the vehicle. Wiring and electrical equipment necessarily located under the vehicle shall be insulated from water, heat, corrosion, and mechanical damage. Where feasible, front to rear electrical harnesses should be installed above the window line of the vehicle.

All wiring harnesses over five feet long and containing at least five wires shall include 10 percent (minimum one wire) excess wires for spares. This requirement for spare wires does not apply to data links and/or communication cables. Wiring length shall allow end terminals to be replaced twice without pulling, stretching, or replacing the wire. Wire
terminals shall be crimped and may be soldered only if the wire is not stiffened above the
terminal and no flux residue remains on the terminal. Battery cable connectors shall be
crimped and soldered.

Terminals shall be crimped, corrosion-resistant and full ring type or interlocking lugs with
insulating ferrules. When using pressure type screw terminal strips, stranded wire only shall
be used. Insulation clearance shall ensure wires have a minimum of ‘visible clearance’ and
a maximum of two (2) times the conductor diameter or 1/16 inch whichever is less. When
using shielded or coaxial cable, upon stripping of the insulation, the metallic braid shall be
free from frayed strands that can penetrate the insulation of the inner wires.

Ultra-sonic and T-splices may be used with 7 AWG or smaller wire. When a T-splice is
used it shall meet these additional requirements: include a mechanical clamp in addition to
solder on the splice; the wire supports no mechanical load in the area of the splice; and the
wire is supported to prevent flexing. All splicing shall be staggered in the harness so that
no two splices are positioned in the same location within the harness.

For wiring harness connectors, pins shall be removable, crimp contact type of the correct
size, and rated for the wire being terminated. All supply-side terminations shall end in a
socket, not a pin. Unused pin positions shall be sealed with sealing plugs. Adjacent
connectors shall either use opposing pin genders, different insert orientations, or different
connectors to prevent incorrect connections. All cable connectors shall be placed to provide
adequate space for ease of removal and disconnection. All electrical connectors subjected
to environmental exposure outside the passenger compartment shall be corrosion resistant
and splash proof.

**TS 6.3.12 Electrical Components**

All electrical components, including switches, relays, flashers, and circuit breakers, shall be
heavy-duty designs with either a successful history of application to heavy-duty vehicles, or
design specifications for an equivalent environment. These components shall be
replaceable in less than 5 minutes by one mechanic.

All electric motors shall be either heavy-duty brushless type where practical, or have a
constant duty rating of no less than 40,000 hours (except cranking motors and wiper
motors). All electric motors shall be easily accessible for servicing.

**TS 6.3.13 Electrical Compartments**

All relays, controllers, flashers, circuit breakers, and other electrical components shall be
mounted in easily accessible electrical compartments. All compartments exposed to the
outside environment shall be corrosion resistant and sealed. The components and circuits
in each electrical compartment shall be identified and their location permanently recorded
on a drawing attached to the inside of the access panel or door.
The drawing shall be protected from oil, grease, fuel, and abrasion. The front compartment shall be completely serviceable from the operator's seat, vestibule, or from outside. A rear start and run control box shall be mounted in an accessible location in the engine compartment.

**TS 6.3.14 General Electronic Requirements**

If an electronic component has an internal clock, it shall provide its own battery backup to monitor time when battery power is disconnected. Any component with its own real-time clock will be set to Pacific Standard Time.

All electronic component suppliers shall ensure that their equipment is self-protecting in the event of shorts in the cabling, and also in over-voltage and reverse polarity conditions. If an electronic component is required to interface with other components, it shall not require external pull-up and/or pull-down resistors. Kinking, grounding at multiple points, stretching, and exceeding minimum bend radius shall be prevented.

**TS 6.3.15 Discrete I/O (Inputs/Outputs)**

All wiring to I/O devices, either at the harness level or individual wires, shall be labeled, stamped or color-coded in a fashion that allows unique identification. Labels shall be resistant to rubbing (hot stamped tubing and protected printing are service-proven examples of acceptable labels). Wiring for each I/O device shall be bundled together. If the I/O terminals are the same voltages, then jumpers may be used to connect the common of each I/O terminal.

**TS 6.3.16 Shielding**

All wiring that requires shielding shall meet the following minimum requirements. A shield shall be generated by connecting to a ground, which is sourced from a power distribution bus bar or chassis. A shield shall be connected at one location only, typically at one end of the cable. However certain standards or special requirements, such as SAE J1939 or RF applications, have separate shielding techniques that shall also be used as applicable. Note: A shield grounded at both ends forms a ground loop, which can cause intermittent control or faults. When using shielded or coaxial cable, upon stripping of the insulation, the metallic braid shall be free from frayed strands, which can penetrate the insulation of the inner wires. To prevent the introduction of noise, the shield shall not be connected to the common side of a logic circuit.

**TS 6.3.17 Communications**

The data network cabling shall be selected and installed according to the selected protocol requirements. The physical layer of all network communication systems shall not be used for any other purpose other than communication between the system components, unless provided for in the network specifications.
Communications networks that use power line carriers (e.g. data modulated on a 24V-power line) shall meet the most stringent applicable wiring and terminal specifications.

**TS 6.3.18 Radio Frequency (RF)**

RF components, such as radios, video devices, cameras, global positioning systems (GPS), etc, shall use coaxial cable or twisted pair as required to carry the signal. All RF systems require special design consideration for losses along the cable. Connectors shall be minimized, since each connector and crimp has a loss, which will attribute to attenuation of the signal.

Cabling should allow for the removal of antennas or attached electronics without removing the installed cable between them. The corresponding component vendors shall be consulted for proper application of equipment including installation of cables.

**TS 6.3.19 Audio**

Cabling used for microphone level and line level signals shall be 22 AWG minimum with shielded twisted pair and with drain wire. Cabling used for amplifier level signals shall be 18 AWG minimum.

**TS 6.4 Multiplexing**

**TS 6.4.1 General**

All vehicles shall be equipped with a multiplexing system. The primary purpose of the multiplexing system is control of components necessary to operate the vehicle. This is accomplished by processing information from input devices and controlling output devices through the use of an internal logic program. This system shall meet the network communications requirements of Section 6.03.02. The District shall approve the multiplex system.

Versatility and future expansion shall be provided for by expandable system architecture. The multiplex system shall be capable of accepting new inputs and outputs through the addition of new modules and/or the utilization of existing spare inputs and outputs. All like components in the multiplex system shall be modular and interchangeable with self-diagnostic capabilities. The modules shall be easily accessible for troubleshooting electrical failures and performing system maintenance. Multiplex input/output modules shall use solid-state devices to provide extended service life and individual circuit protection.

Ten percent (10%) of the total number of inputs and outputs (or at least one each) at each zone location shall be designated as spares. Zone locations are: (1) behind the rear bulkhead; (2) forward of the bulkhead above the window line; and (3) forward of the bulkhead below the window line.
TS 6.4.2 System Configuration
Multiplexing may either be distributed or centralized. A distributed system shall process information on multiple control modules within the network. A centralized system shall process the information on a single control module. Both systems shall consist of several modules connected to form a control network.

TS 6.4.3 I/O (Input/Output) Signals
The input/output for the multiplex system may contain three types of electrical signals: discrete, analog, or serial data.

Discrete signals shall reflect the on/off status of switches, levers, limit switches, lights, etc. Analog signals shall reflect numerical data as represented by a voltage signal (0-12V, 10-24V, etc) or current signal (4-20mA). Both types of analog signals shall represent the status of variable devices such as rheostats, potentiometers, temperature probes, etc. Serial data signals shall reflect ASCII or alphanumeric data used in the communication between other on-board components.

TS 6.5 Data Communications Systems
TS 6.5.1 General
All data communication networks shall be either in accordance with a nationally recognized interface standard such as those published by SAE, IEEE, or ISO, or shall be published to the District with the following minimum information:

- Protocol requirements for all timing issues (bit, byte, packet, inter-packet timing, idle line timing, etc.) packet sizes, error checking, and transport (bulk transfer of data to/from the device)
- Data definition requirements that ensure access to diagnostic information and performance characteristics
- The capability and procedures for uploading new application or configuration data
- Access to revision levels of data, application software and firmware
- The capability and procedures for uploading new firmware or application software

Any electronic vehicle components used on a network shall be conformance tested to the corresponding network standard. All components on the Drive train network shall communicate data over the network as specified in Section 6.6. The Multiplex Level shall use a communications network that meets the requirements of Section 6.6.03.

TS 6.6 Drive Train Level
TS 6.6.1 General
Drive train components, consisting of the engine, hybrid drive, retarder, anti-lock braking system, and all other related components shall communicate data using a combination of
the SAE Recommended Communications Protocols J1939 and/or J1708/J1587, or other open protocols as referenced in Section 3.06.05.01.

**TS 6.6.2 Diagnostics & Fault Detection**

Drive train performance, maintenance and diagnostic data, and other electronic messages shall be formatted and transmitted on the communications networks. The Drive train Level shall have the ability to record abnormal events in memory and provide diagnostic codes and other information to service personnel. At a minimum, this network level shall provide live/fail status, current hardware serial number, software/data revisions, and uninterrupted timing functions.

**TS 6.6.3 Data Access**

Access to Drive train data shall be provided through diagnostic device connector ports. Location of these diagnostic ports shall comply with Sections 5.02.01 for the engine; 5.04.01 for the hybrid drive; and 5.07.09 for brake actuation.

**TS 6.6.4 Programmability (Software)**

The Drive train Level components shall be programmable by the District with limitations as specified by the sub-system supplier.

**TS 6.6.5 Multiplex Data Access**

At a minimum, information shall be made available via a communication port on the multiplex system. The location of the communication port shall be easily accessible.

**TS 6.6.6 Diagnostics and Fault Detection**

The multiplex system shall have a proven method of determining its status (system health and input/output status) and detecting either active (Online) or inactive (Offline) faults through the use of on-board visual/audible indicators. In addition to the indicators, the system shall employ an advanced diagnostic and fault detection system, which shall be accessible via either a personal computer (PC) or a hand held unit. Either unit shall have the ability to check logic function.

**TS 6.6.7 Programmability (Software)**

The multiplex system shall have security provisions to protect its software from unwanted changes. This shall be achieved through any or all of the following procedures: password protection, limited distribution of the configuration software, limited access to the programming tools required to change the software, and hardware protection that prevents undesired changes to the software.

Provisions for programming the multiplex system shall be possible through a PC or Laptop. The multiplex system shall have proper revision control to insure that the hardware and software is identical on each vehicle equipped with the system. Revision control shall be
provided by all of the following: hardware component identification where labels are included on all multiplex hardware to identify components; hardware series identification where all multiplex hardware displays the current hardware serial number and firmware revision employed by the module; and software revision identification where all copies of the software in service displays the most recent revision number, and a method of determining which version of the software is currently in use in the multiplex system.

**TS 6.7 Heating and Ventilation System**

**TS 6.7.1 Capacity and Performance**

The Heating, Ventilation and Air Conditioning (HVAC) climate control system shall be a fully AC high voltage electric driven air conditioning system with full hermetic A/C compressor, condenser fan, evaporator blower motors, and brushless AC generators. The A/C system shall be capable of maintaining the interior of the bus at the temperature and humidity levels defined in the following paragraphs.

The HVAC unit shall be roof-mounted, with an additional unit for the front section of an articulated bus. Accessibility and serviceability of components preferably shall be provided without requiring maintenance personnel to climb-up on the roof of the bus.

With the bus running at the design operating profile with corresponding door opening cycle, and carrying a number of passengers equal to the GVWR, the HVAC system shall maintain an average passenger compartment temperature within a range between 65° and 80° F, while controlling the relative humidity to a value of 50 percent or less. The system shall maintain these conditions while subjected to any outside ambient temperatures within a range of 10° to 95°F and at any ambient relative humidity levels between 5 and 50 percent.

When the bus is operated in outside ambient temperatures of 95° to 115° F, the interior temperature of the bus shall be permitted to rise one degree for each degree of exterior temperature in excess of 95° F.

System capacity testing, including pull down/warm-up, stabilization and profile, shall be conducted in accordance to the APTA "Recommended Instrumentation and Performance Testing for Transit Bus Air Conditioning System" and approved by the District.

The heating system shall have sufficient capacity to maintain an interior air temperature of 55° F (13° C) with an outside temperature of 15° F (-9° C) with the doors cycled open 15% of the test time, evenly distributed throughout the test duration. The cooling system fluid and engine shall be at normal operating temperature. The engine and cooling system temperatures shall be monitored. A cold room may be used to simulate the environmental factors.

From a cold start, the heating system shall be able to increase the interior air temperature by 15° F (8° C) within 20 minutes, and reach specified inside air temperature within 30
minutes, with an outside temperature of (-9° C). The Contractor shall supply information
detailing what engine load will be required to meet this condition. The engine and cooling
system temperatures shall be monitored. A cold room may be used to simulate the
environmental factors.

Additional testing shall be performed as necessary to ensure compliance performance
requirements stated herein.

The air conditioning portion of the HVAC system shall be capable of reducing the
passenger compartment temperature from 110° F to 90° F in less than 20 minutes after
engine start-up. Engine temperature shall be within the normal operating range at the time
of start-up of the cool-down test and the engine speed shall be limited to fast idle that may
be activated by an operator-controlled device. During the cool-down period the refrigerant
pressure shall not exceed safe high-side pressures and the condenser discharge air
temperature, measured 6 inches from the surface of the coil, shall be less than 45° F above
the condenser inlet air temperature. The appropriate solar load requirements shall meet the
APTA "Recommended Instrumentation and Performance Testing for Transit Bus Air
Conditioning System". There shall be no passengers on board, and the doors and windows
shall be closed.

The air conditioning system shall meet these performance requirements using HFC R134a.

The climate control blower motors and fan shall be designed such that their operation
complies with the interior noise level requirements as specified in Section 1.16.01.

HVAC unit and controls to be "Thermo King" or approved equal. An additional data port in
or near the driver's area shall be provided with location approved by the District.

**TS 6.7.2 Controls and Temperature Uniformity**

The HVAC system excluding the operator's heater/defroster shall be centrally controlled
with an advanced electronic/diagnostic control system with provisions for extracting/reading
data. Driver's control shall be a 6-position switch labeled OFF/ Cool / Vent High/ Vent Low/
Heat Low/ Heat High. The district shall approve the location of the IntelligAIRE III or
approved equal standard four-key keypad.

After manual selection and/or activation of climate control system operation mode, all
interior climate control system requirements for the selected mode shall be attained
automatically to within ±2°F of specified temperature control set point. The temperature
control set point for the system in the cooling mode shall be 70° F and 68° F in the heating
mode. Contractor shall provide all HVAC programming options to the District. The District
will select initial settings. The operator shall have full control over the defroster and
operator's heater. The operator shall be able to adjust the temperature in the operator's
area through air distribution. The interior climate control system shall switch automatically to the ventilating mode if the refrigerant compressor or condenser fan fails.

Interior temperature distribution shall be uniform to the extent practicable to prevent hot and/or cold spots. After stabilization with doors closed, the temperatures between any two points in the passenger compartment in the same vertical plane, and 6 inches to 72 inches above the floor, shall not vary by more than 5° F with doors closed. The interior temperatures, measured at the same height above the floor, shall not vary more than ±5° F, from the front to the rear, from the average temperature determined in accordance to APTA "Recommended Instrumentation and Performance Testing for Transit Bus Air Conditioning System". Variations of greater than ±5° F will be allowed for limited, localized areas provided the majority of the measured temperatures fall within the specified requirement.

**TS 6.7.3 Air Flow**

Passenger Area: The cooling mode of the interior climate control system shall introduce air into the bus at or near the ceiling height at a minimum rate of 25 cubic feet per minute (cfm) per passenger based on the standard configuration bus carrying a number of passengers equal to 150 percent of the seated load. Airflow shall be evenly distributed throughout the bus with air velocity not exceeding 100 feet per minute on any passenger. The ventilating mode shall provide air at a minimum flow rate of 20 cfm per passenger.

Airflow may be reduced to 15 cfm per passenger (Max GVWR) when operating in the heating mode. The fans shall not activate until the heating element has warmed sufficiently to assure at least 70° F air outlet temperature. The heating air outlet temperature shall not exceed 120° F under any normal operating conditions.

**TS 6.7.4 Bus Operator Area**

The bus interior climate control system shall deliver at least 100 cfm of air to the operator's area when operating in the ventilating and cooling modes. Adjustable nozzles shall permit variable distribution or shutdown of the airflow. Airflow in the heating mode shall be reduced proportionally to the reduction of airflow into the passenger area. The windshield defroster unit shall meet the requirements of SAE Recommended Practice J382, Windshield Defrosting Systems Performance Requirements, and shall have the capability of diverting heated air to the operator's feet and legs. The defroster or interior climate control system shall maintain visibility through the operator's side window.

**TS 6.7.5 Controls for the Climate Control System (CCS)**

The controls for the operator's compartment for heating, ventilation, and cooling systems shall be integrated and shall meet the following requirements.
A separate switch that has an "Off" position and at least two positions for speed control shall control the heat/defrost system fan. All switches and controls shall preclude the possibility of clothing becoming entangled and shields shall be provided, if required.

A manually operated control ball valve shall control the coolant flow through the heater core.

If a cable operated manual control valve is used, the cable length shall be kept to a minimum and it shall be well supported to reduce cable seizing. Heater water control valves shall be 'positive' type, closed or open. The District shall approve the method of operating remote valves.

**TS 6.7.6 Bus Operator Compartment Requirements**

A separate heating, ventilation, and defroster system for the operator's area shall be provided and shall be controlled by the operator. The system shall meet the following requirements:

1. The heater and defroster system shall provide heating for the operator and heated air to completely defrost and defog the windshield, operator's side window, and the front door glasses in all operating conditions. Fan(s) shall be able to draw air from the bus body interior and/or the exterior through a control device and pass it through the heater core to the defroster system and over the operator's feet. A minimum capacity of 100cfm shall be provided. The operator shall have complete control of the heat and fresh airflow for their area.

2. The defroster supply outlets shall be located at the lower edge of the windshield. These outlets shall be unbreakable and shall be free of sharp edges that can catch clothes during normal daily cleaning. The system shall preclude foreign objects such as coins or tickets to not allow entry into the defroster air outlets. Adjustable ball vents shall be provided at the left of the operator's position to allow direction of air onto the side windows.

3. A ventilation system shall be provided to ensure operator comfort and shall be capable of providing fresh air in both the foot and head areas. Vents shall be controllable by the operator from the normal driving position. Decals shall be provided indicating, 'operating instructions' and 'open' and 'closed' positions as well. When closed, vents shall be sealed to prevent the migration of water or air into the bus.

4. A ram-type ventilator that will not allow water entry into the driver's area under any operating condition, including freeway speeds, shall be provided on the front of the bus to bring fresh air into the driver's station. This ventilator and associated ducting shall be no smaller than 12 inches by 6 inches (305 mm by 152 mm). Control of airflow shall be easily accessible to the operator and an extension handle shall be provided if necessary. When closed, the vent shall be sealed against drafts. Sealing material shall be replaceable.
TS 6.7.7 Air Filtration
Air shall be filtered before discharge into the passenger compartment. The filter shall meet the ANSI/ASHRAE 52.1 requirement for 5 percent or better atmospheric dust spot efficiency, 50 percent weight arrestance, and a minimum dust holding capacity of 120 gram per 1,000 cfm cell. More efficient air filtration may be provided to maintain efficient heater and/or evaporator operation. Air filters shall be easily removable for service. Air filters shall be of disposable type.

TS 6.7.8 Roof Ventilators
Ventilators in the roof of the bus, one approximately over each axle shall be provided. Each ventilator shall be easily opened and closed manually by a 50th percentile female. If roof ventilator(s) cannot be reached by a 50th percentile female, then a tool shall be provided to allow this. Location and mounting of the roof ventilator tool shall be approved by the District. When open with the bus in motion, this ventilator shall provide fresh air inside the bus. Ventilator shall cover an opening area no less than 425 square inches and shall be capable of being positioned as a scoop with either the leading or trailing edge open no less than 4 inches, or with all four edges raised simultaneously to a height of no less than 3-1/2 inches.

An escape hatch shall be incorporated into the roof ventilator. Roof ventilator(s) shall be sealed to prevent entry of water when closed. Roof ventilators to be Pro-Lo by "Specialty Manufacturing Co.", or approved equal.

TS 6.7.9 Maintainability
Manually controlled shutoff valves in the refrigerant lines shall allow isolation of the compressor, receiver and dehydrator filter for service. To the extent practicable, self-sealing couplings utilizing 0-ring seals shall be used to break and seal the refrigerant lines during removal of major components, such as the refrigerant compressor. Shut-off valves may be provided in lieu of self-sealing couplings. The condenser shall be located to efficiently transfer heat to the atmosphere, and shall not ingest air warmed above the ambient temperature by the bus mechanical equipment, or to discharge air into any other system of the bus. The location of the condenser shall preclude its obstruction by wheel splash, road dirt or debris. HVAC components located within 6 inches of floor level shall be constructed to resist damage and corrosion.

Coolant boost pumps shall be "EG&G Rotron Inc." ECDC Seal-less or approved equal. It is preferred the pumps operate on 24 volts. These pumps shall be wired to be electrically 'off' when the HVAC system is not calling for heat. In the event of a charging system failure, the pumps shall be deactivated. Supply brass ball valves with hand-operated quarter turn handles on each side (inlet and outlet) of all boost pumps.
TS 6.8 Wheelchair Ramp
TS 6.8.1 Ramp
A deployable ramp at the curbside front door shall be provided for mobility aid devices. The ramp shall be equipped with side rails, and any surfaces designed to be walked on shall be covered with flooring or non-skid material. Wheelchair ramp floor pocket shall have yellow edge/stripe visible when ramp is deployed to warn passengers of an uneven floor surface.

The ramp shall be controlled by a toggle switch on the dash. Ramp operation shall actuate brake and acceleration interlocks. Front door operation shall be interlocked with ramp operation. The ramp shall be able to be deployed without kneeling the bus onto a 13 inch platform. Visual and adjustable audible warning devices shall alert passengers that the ramp is in operation. The ramp shall be straight electric with a manual backup system approved by the District.

TS 6.8.2 Loading System for Level Boarding
Other than the front unit entrance door, a Ricon Express or approved equal, automated bridge plate shall be provided at each door for level-entry boarding. In applications such as BRT, where the vertical transition from the vehicle floor and the boarding and alighting surface is more than 5/8 inch and 2 inches and horizontally a bridgeplate shall be used. Bridgeplates 36 inch or longer shall support a load of 800lbs, placed at the center of the ramp or bridgeplate distributed over an area of 26 x 26 in., with a safety factor of at least 3, based on the ultimate strength of the material. When deployed to the boarding and lighting surface, the slope of the bridgeplate shall not exceed 6:1. Loading system for level boarding shall be approved by the District. The bridge plate shall be straight electric with a manual backup system approved by the District.

TS 6.9 Wheels and Tires
TS 6.9.1 Wheels
Wheels shall be aluminum one piece, hub-piloted style made by "ALCOA" or approved equal. They shall be the self-- ventilating disc type, and all shall be interchangeable wheel to wheel and coach to coach. Wheels shall be polished aluminum with a Durabright finish. Mating surfaces on dual wheel assemblies shall be corrosion protected without the use of paint. Wheels and attachment system shall be approved by the District.

TS 6.9.2 Tires
The Contractor, together with the District's tire supplier, is responsible for choosing tires of adequate load rating. When this is determined, the District will supply tires to a Contractor's plant located in the U.S. or Canada. The Contractor will be responsible for shipping tires to any other location. The District uses leased radial tubeless mileage tires, presently supplied by "Brandon Tire", and it is required that the tire size and type proposed by the Contractor be one that the District tire supplier can provide.
Tires and wheels shall not be the limiting factors in the GVWR or the speed of the bus.

**TS 6.9.3 Balancing**

All wheel and tire assemblies shall be spin balanced. Weights used shall be specifically approved for use on these wheels.

**TS 6.9.4 Wheel Attachment System**

Wheel studs and nuts shall be sized to the GVWR and transit duty cycle and shall meet J429 and J1102 (studs) and J995 (nuts).

**TS 6.10 Steering**

Buses shall be equipped with a steering mechanism that makes the bus easy to steer and which produces a natural and precise handling characteristic for the bus operator, free of wander and motions that are hard to predict. The steering system shall be power assisted with a hydraulic system. Design factors for this power source are given in section 6.02 (Hydraulic System). The District shall approve the power steering system.

The steering gear shall be an integral type with the use of flexible lines, minimizing the number and length. Steering torque applied by the driver shall not exceed 10 foot-pounds. Steering effort shall be measured with the coach at capacity load, stopped with the brakes released and the engine at normal idling speed on clean, dry, level, commercial asphalt pavement and the tires inflated to recommended pressure. Power steering failure shall not result in loss of steering control. With the coach at capacity load, engine off, coasting in neutral at 8 to 10 mph, the steering effort shall not exceed 55 pounds at the steering wheel rim and perceived free play in the steering system shall not materially increase as a result of power assist failure. Gearing shall require no more than seven turns of the steering wheel lock to-lock.

**TS 6.10.1 Steering Wheel and Column**

The design and placement of the steering wheel and the design of the steering mechanisms as it relates to forces necessary to steer the bus shall be with consideration given to human factors. The steering wheel and steering mechanism shall be designed so the bus can be driven by bus operators defined in section 4.01 for long periods of time without undue effort or fatigue. The steering column shall be "Douglas Autotech" or approved equal, shall be telescoping and shall have two separate tilt locations, one near the top of the column and one at the universal joint below the floor where the column is connected to the right angle steering box; tilt and telescope are controlled by levers on the left side of the column. Bus operator knees shall not contact wheel spokes at any adjustment point.
The steering wheel shall be a 20-inch (508 mm) diameter two-spoke hard plastic rim wheel from "VIP" or approved equal. It shall be provided with a horn button and with puller holes in the hub so that a standard or universal puller may be used.
TS 7. Materials

TS 7.1 Materials and Construction

For economy in maintenance, it is essential that parts and units be arranged so that rapid assembly and disassembly will be possible. All units or parts not specified shall be the Contractor's standard items, conforming in material, design and workmanship to the best practices in the heavy vehicle industry.

All parts shall be new and in no case will used, reconditioned, repaired or obsolete parts be accepted. Any one part used shall be an exact duplicate in each of the buses.

Workmanship throughout shall conform to the highest standard of commercially accepted practice for the class of work and shall result in a neat and finished appearance. All exposed surfaces and edges shall be smooth, free from burrs, scratches, mars, discolorations and other deviations from a neat, quality finish. All bolted and torqued metal-to-metal joints must have corrosion protection on the facing surfaces while not allowing any coating elasticity to loosen correctly torqued fasteners.

No slotted head screws shall be used. All screws shall use Phillips type heads unless otherwise specified. The District prefers very limited use of pop-rivets. Access covers and any cover or component removed for maintenance access shall be secured with riv-nuts and machine screws. Use of any type of sheet metal screw or well nut is prohibited. Any tapping plate shall be the thickness of a standard nut, minimum.

TS 7.2 Hazardous Materials

It shall be a design objective to eliminate from the buses, all materials that are or may become hazardous to passengers, drivers or maintenance workers. Of particular concern are materials that produce toxic smoke or gases when heated, possibly due to an accidental fire or when bodywork using welding equipment or cutting torches is necessary. No asbestos shall be used in any part of the bus including gaskets; no PCBs shall be used in the bus. Any use of polyurethane foam material shall require District approval.

The Contractor shall identify any hazardous materials and coatings used and provide information on how to safely deal with them under normal maintenance conditions, when discarding or in response to destruction by fire. The Contractor shall provide Material Safety Data Sheets (MSDS) for all coatings, paints, adhesives and insulation used on the bus. The Contractor will also supply, in a timely manner, MSDS for any other materials on the bus at the request of the District. All documentation shall be supplied in advance of the Design Review for approval by the District.

TS 7.3 Welding

All welding shall be in accordance with the requirements of the American Welding Society as specified in the current AWS specification. Work performed outside the U.S. must
conform to U.S. welding standards as approved by the District. An English language copy of these standards shall be made available to the District for review. The Contractor shall supply descriptions on the components making up the weld process. This description should include (but may not be limited to) material composition (types of steel used in the basic body and chassis frame), weld wire composition, and types of welding machines used for each differing function.

The Contractor shall have an on-going quality control program of inspection, non-destructive and destructive testing to insure quality welds. The Contractor shall supply complete documentation as to how its welders are certified and monitored. Complete documentation shall be provided describing, in specific detail to this Contract, the type of weld testing performed, frequency of the tests and actions taken if defective workmanship is found. Documentation shall also be supplied on the testing and monitoring of the welding devices used. All documentation shall be supplied in advance of the Design Review for approval by the District.

**TS 7.4 Fire Resistance**

The FTA/DOT Notice of Recommended Fire Safety Practices for Transit Bus and Van Materials must be adhered to the adoption of these recommended fire safety practices to help minimize a fire threat in the buses and, thereby reduce injuries and damages resulting from possible fire. If any material proposed by the District will not pass these requirements, the Contractor is responsible to propose alternative materials.

The District will require certification that the materials to be used in the construction of the buses have been tested by a recognized testing laboratory and that the results are within the recommended limits. The Contractor shall supply complete test report results before the shipment of the first production bus.

**TS 8. Documentation, Training, Special Tools**

**TS 8.1 Maintenance Manuals and Parts Books**

**TS 8.1.1 General**

For each separately ordered group of buses, the Contractor shall supply detailed and well-organized maintenance manuals and illustrated parts books covering all items on the bus. Hard copies of maintenance and parts manuals shall be delivered in three ring binders with the sections separated with sturdy plastic divider pages with tabs.

**TS 8.1.2 Maintenance Manuals**

Maintenance manuals shall contain complete data required for preventive and corrective maintenance of all parts of the buses including but not limited to the following general information and specifications:
1. A complete, well developed troubleshooting guide covering all the mechanical, electrical and electronic components.
2. All preventive maintenance, lubrication and adjustment requirements.
3. Complete wiring and schematic diagrams and schedules for wire and cable sizes and ratings including actual cable layout with connector locations, plus locations in the bus of all electrical and electronic components.
4. Illustrative drawings, such as isometrics or exploded views, identifying components in relationship to each other as mounted in the buses.
5. Components shown in exploded views with all parts clearly identified including Contractor part number.
6. Rebuilding procedures for all rebuildable components.
7. Detailed, well-illustrated procedures for component change-out plus servicing, adjusting, testing and run-in information as required.
8. Body and structural information and material specifications for major accident repairs.
9. Seating and stanchion layouts and window diagrams.
10. Repair and calibration instructions and values.
11. List of special test equipment and tools required to maintain and repair systems down to the component level.

The District prefers that the Contractor's maintenance manual thoroughly describe the maintenance of all parts of the bus. Realizing that some specialized original equipment manufacturer (OEM) manuals will be provided, the District requires that the Contractor supply the following OEM vendor manuals and publications:

13. Electrical system diagnostic and troubleshooting guides.
15. Engine service, troubleshooting, and overhaul manuals.
16. Hybrid drive service, troubleshooting, and overhaul manuals.
17. HVAC system service, troubleshooting, and overhaul manuals.
18. Air system diagnostic and troubleshooting guides.
19. Comprehensive color-coded air system schematics.
20. Foundation brake system analysis and troubleshooting guides.
22. Differential and drive shaft service, troubleshooting, and overhaul manuals.
23. Passenger door system service, troubleshooting, and overhaul manuals.
24. Steering column service, troubleshooting, and overhaul manuals.
25. Steering gear service, troubleshooting, and overhaul manuals.
26. Articulation system service, troubleshooting, and overhaul manuals.
27. Wheelchair ramp system service, troubleshooting, and overhaul manuals.
28. Fire suppression system service, troubleshooting, and overhaul manuals.
TS 8.1.3 Parts Manuals
Illustrated parts books shall contain exploded views that show all parts used on buses built under this contract, and no other parts. The exploded views will show all fasteners and miscellaneous hardware. The books shall contain data arranged so that part numbers can be readily found and identified in the illustration for each system and subsystem component, assembly, subassembly or piece part from an orderly breakdown of the complete bus. It shall contain a ready reference part number index and part name index and be sufficiently well illustrated to identify items requiring repair, replacement and storage for use in the maintenance of the buses. The OEM supplied sub-assemblies (such as wiper motor, water pump, seats, etc.) shall have OEM part number displayed at the beginning of the appropriate parts listing section.

Lists shall include at least the following information for all parts: Generic description and specifications, Contractor part number, OEM name and part number. Contractor shall provide an indicator if the part is custom manufactured. Standard hardware described by size, type, material and grade shall be provided.

It is preferred that the parts manual shall include all OEM names, addresses and contact information. The parts manual shall include all special tools, test and diagnostic equipment supplied by the Contractor.

TS 8.1.4 Parts Pricing List
The parts pricing list shall have all parts by alpha order starting with "A" and ending with "Z" and then in numerically ascending order starting with "0" and ending with "9". The parts list shall supply the purchase price (including freight), and a description of the part. Updated price lists will note all part number supercessions since the last general issue of the price list. Unit of sale will also be noted (IE each, minimum, per foot, etc).

TS 8.1.5 Special Tools & Diagnostic Equipment Manuals
The Contractor shall supply one operator manual for each special tool or piece of diagnostic equipment supplied by the Contractor. These manuals shall be provided 90 days before the delivery of the first prototype bus.

TS 8.1.6 Quantities and Drafts
The Contractor shall submit drafts of all maintenance manuals and parts books to the District. The District will review and approve of the manuals 60 days prior to the production cycle. The Contractor will supply 100 percent of the final copies by the delivery schedule. For each separately ordered group of buses the following items shall be provided to the District:

- Fifteen paper copies of maintenance manuals and ten CDs.
Twenty (20) paper copies of parts manuals and ten CDs. (Please note that multiple copies of vendor manuals are required for training in Sections 8.4, 8.6, and 8.7.)

Draft manuals shall be in complete detail as to the information content. The manuals may have some cosmetic deficiencies such as temporary bindings, sketches in place of final artwork, etc. Manuals, schematics and prints shall be supplied to the District's engineering representative as soon as draft copies are available.

**TS 8.1.7 Manual Updates**

Maintenance and parts manuals must be updated to include all changes made to the bus during production and post-delivery retrofits authorized or requested by the Contractor and to correct all errors and omissions found by the District. Changes required to the parts and maintenance manuals due to warranty and/or post-delivery retrofits shall be completed within 90 days from the date of modification approval. Maintenance manuals shall be updated as necessary with service letters during the life of the bus. Maintenance and parts manuals shall be available from the Contractor for ten years following acceptance of the bus delivery. Revised parts price lists will also be supplied as prices change.

**TS 8.2 Drawing Reproducible**

If available, Mylar drawing reproducible shall be provided in addition to the maintenance manuals specified above. These are drawings that need to be in large sizes, those such as patterns that may be consumed when used, electrical, air and hydraulic system drawings, and those which otherwise are more useful unbound than as part of a book. A tree type or other index shall be supplied to identify the drawings. Reproducible shall be durable and shall have a high standard of quality when printed for shop copies to assure ready legibility. Drawing sizes shall be such that they lend themselves to standard reproduction methods. Six (6) sets of reproducible shall be delivered no later than when the first production bus is delivered.

Six (6) sets of general configuration and body framing reproducible are required. The configurations will assist major body rebuilding. These drawings may be in PDF, and shall be in English.

Full size Mylar patterns for all flat glass shall be provided no later than 30 days before delivery of the first production bus.

Material call-out information shall be supplied to the District when needed for maintenance or accident repair. All materials shall be identified with size and wall thickness.
TS 8.3 Operating Manual
The Contractor shall provide operating manuals for each separately ordered group and type of bus delivered. There shall be a separate manual for each type of bus. Fifty paper copies of operating manuals and ten CDs shall be supplied.

The Contractor shall submit drafts of the operating manuals to the District for approval early enough to have a final draft on hand when the prototype bus is delivered, and all final copies when the first production bus is delivered.

The operating manual shall cover all operational requirements for the bus driver while in service, but exclude driving skills, rules of the road and interpretation of laws. Information and instructions for all phases of operation shall be provided, including but not limited to bus mechanical operation, response to safety alarm systems, engine operation, lighting system controls, emergency actions, and maintenance checks and turning characteristics of the bus.

TS 8.4 Vehicle Maintenance Training
TS 8.4.1 General
For each separately ordered group of buses, the Contractor shall provide a program of instruction, instructional materials, and training aids targeted for specific groups of Vehicle Maintenance personnel. The timing of the maintenance training, delivery of the specified training aids and the vehicle maintenance will specify equipment, and constitution of the groups to be trained. The materials, schedule, instructors, and course outlines to be approved by the District.

The Contractor shall provide copies of all lesson plans, detailed instructor guides for each training program, student workbooks, manuals, publications, videos, power point, and any other training aids used by an instructor when teaching a course 90 days prior to the delivery of the first production bus. The Contractor shall identify the instructors and provide the qualifications of the instructors. The Contractor shall inform the District of any training support equipment (such as DVD, power point, etc.) and/or supplies required of the District for the Contractor portion of the training.

The Contractor will designate a specific individual as the "Principal Training Contact" for the scheduling and accomplishment of the Contractor and vendor training. The Contractor will provide a name, complete mailing address, telephone number, e-mail, and fax number for this person to the District no later than 90 days after Notice to Proceed.

TS 8.4.2 Instructional Materials
The Contractor will supply the following instructional materials for each separately ordered group of buses 90 days before delivery of the first production bus in each group.
The Contractor will provide two complete sets of master engineering electrical and electronic wiring diagrams and two sets Programmable Logic Controller videos. The Contractor will provide two detailed electrical system instructor guides and training aids to cover:

- Explanation of the electrical and electronic systems.
- Electrical and electronic component function and location.
- Wiring diagram analysis and interpretation.
- Troubleshooting the electrical and electronic systems.
- Use of diagnostic test equipment and analysis of results.
- Preventive maintenance of the electrical system and components.

The Contractor will provide two OEM engine system videos and/or Power Point Presentations and one set of engine system wall chart training aids and power point presentations (for use with overhead projectors) of the wall charts. The Contractor will provide two detailed engine system instructor guides and training aids to cover:

- Explanation of the engine system.
- Engine system component function and location.
- Troubleshooting the engine
- Use of diagnostic test equipment and analysis of results.
- Preventive maintenance on the engine.

The Contractor will provide six (6) detailed hybrid drive system instructor guides, training aids, overhaul process and color transparencies, and to include wall chart series information. The aids will cover the following information:

- Explanation of the hybrid drive system.
- Component function and location within the system.
- Troubleshooting of the electronic control system.
- Troubleshooting of the hybrid drive system.
- Use of diagnostic test equipment and analysis of results.
- Preventive maintenance of the hybrid drive system.

The Contractor will provide one wall chart depicting the operation of the HVAC system and power point presentation depicting the operation of the HVAC system. The Contractor will provide two detailed HVAC system instructor guides and training aids to cover:

- Explanation of the HVAC System.
- Troubleshooting the HVAC System.
- Use of test equipment and analysis of results.
- Preventive maintenance on the HVAC System.
The function and operation of Programmable Logic Controller in the HVAC System.

The Contractor will provide six (6) color wall charts of the bus air system depicting air flow, pressures, and components and power point presentation depicting the bus air system. The Contractor will provide two comprehensive air system DVD sets. The Contractor will provide two detailed air system instructor guides and training aids to cover:

- Explanation of the air system.
- Air system component function and location.
- Troubleshooting the air system.
- Use of test equipment and analysis of results.
- Preventive maintenance on the air system.

The Contractor will provide six (6) sets of color wall charts depicting foundation brake component functions and power point presentation of the foundation brake system wall charts. The Contractor will provide two comprehensive foundation brake system DVD sets. The Contractor will provide two detailed foundation brake system instructor guides and training aids to cover:

- Explanation of the foundation brake system.
- Troubleshooting of the foundation brake system.
- Use of diagnostic test equipment and analysis of results.
- Preventive maintenance of the foundation brake system.

The Contractor will provide two sets of color wall charts depicting the differential and drive shaft and power point presentation of the wall charts. The Contractor will provide two detailed differential and propeller shaft instructor guides and training aids to cover:

- Explanation of the differential and propeller shaft.
- Troubleshooting of the differential and propeller shaft.
- Preventive maintenance of the differential and propeller shaft.

The Contractor will provide two sets of color wall charts depicting steering system components, hydraulic flow and pressures and power point presentation of the wall charts. The Contractor will provide two detailed suspension, steering, alignment, articulation and axle instructor guides and training aids to cover:

- Explanation of the suspension, steering, articulation and axle systems.
- Troubleshooting of the suspension, steering, articulation and axle systems.
- Use of diagnostic test equipment and analysis of results.
- Preventive maintenance of the suspension, steering, articulation and axle systems.
- Cutaway of the power steering pump supplied.
• Cutaway of the power steering gear supplied.
• Alignment procedures.

The Contractor will provide two detailed Entrance and Exit Door instructor guides and training aids to cover:

• Explanation of the door system.
• Troubleshooting of the door system.
• Use of diagnostic test equipment and analysis of results.
• Preventive maintenance of the door system.

The Contractor will provide power point presentations depicting the ramp system components, bridgeplates, electrical schematics, hydraulic flow and pressures. The Contractor will provide two detailed ramp instructor guides and training aids to cover:

• Explanation of the ramp system.
• Troubleshooting of the ramp system.
• Use of diagnostic test equipment and analysis of results.
• Preventive maintenance of the ramp system.

The instructor guides are complete lesson plans, containing detailed presentation materials as well as all material included in the student guides described in the this section. The instructor guide is sufficient to allow any vehicle maintenance trainer to pick up the material and give the class.

**TS 8.5 Training Aids**

The Contractor will supply the following training aids for each separately ordered group of buses 90 days before the delivery of the first production bus in each group.

• Air Conditioning System Training Aid

One stand-alone fully operational "Air Conditioning System Training Aid" representative of the vehicle’s air conditioning system. The air conditioning system training aid will be constructed using actual bus parts identical to those being used on the vehicles provided under this contract including but not limited to the following: compressor & clutch assembly, service valves, condenser, condenser fans, receiver tank, filter dryer, expansion valve, evaporator pressure regulator (if applicable), evaporator coil, evaporator fans, heater coil, return air filter, minimal ducting. The unit will demonstrate the operation of the complete air conditioning system. The unit will also include all switches, electronic controls, sensors, lights, warning devices, and gauges to indicate all system functions. The unit shall be delivered fully charged with the same refrigerant used on the vehicles provided under this contract. The unit will be powered by a 3- phase 440-volt AC motor and pulley which
simulates the rotational horsepower taken from a diesel engine's accessory drive pulley. Pre-production design of the unit shall be subject to the approval by the District. The efficient use of space will be one of the design criteria during pre-production review.

- Engine, Hybrid, and Exhaust After-treatment Module

The module shall consist of a fully operational engine, transmission, and exhaust after-treatment that is equipped with the vehicle to be delivered. Pre-production design of the unit shall be subject to the approval by the District. The efficient use of space will be one of the design criteria during pre-production review.

- Vehicle Multiplex Module

The module shall be a fully operational multiplex system that is equipped with the vehicle to be delivered. Pre-production design of the unit shall be subject to the approval by the District. The efficient use of space will be one of the design criteria during pre-production review.

- Articulation System Module

The module shall be a fully operational Articulation system that is equipped with the vehicle to be delivered. Pre-production design of the unit shall be subject to the approval by the District. The efficient use of space will be one of the design criteria during pre-production review.

- Door System Module

The module shall be a fully operational Door system that is equipped with the vehicle to be delivered. Pre-production design of the unit shall be subject to the approval by the District. The efficient use of space will be one of the design criteria during pre-production review.

**TS 8.6 OEM "Train the Trainer" Maintenance Training**

The Contractor will secure from the OEM vendors "Train the Trainer" course slots for each separately ordered group of buses covering the systems listed below. The "Train the Trainer" program for Instructors will be accomplished through a combination of Contractor, OEM vendor at the District-site, covering preventive maintenance, overhaul, diagnostics and troubleshooting, and repair of the buses that the Contractor will provide to the District. This training will also include the use of the instructional materials described in 8.04.02. Train the Trainer training is preferably at the manufacturer's factory location. All courses will include all transportation, lodging and meal per diem. The training will be provided in two
phases: pre-delivery, and post-delivery of buses. The “Train the Trainer” program will accommodate a minimum of twenty (20) maintenance personnel. The “Train the Trainer” program will include the following courses and details not limited to:

- Multiplex
  - a. Introduction to Multiplex
  - b. Diagnostics and Troubleshooting of Multiplex
  - c. Programming the Multiplex
- Engine System
  - a. Engine diagnostics, troubleshooting, and use of diagnostic tools
  - b. Tune-up
  - c. Engine overhaul
- Hybrid Drive System
  - a. Hybrid drive and transmission diagnostics, troubleshooting, and use of diagnostic tools
  - b. Service and adjustments
  - c. Hybrid drive and transmission overhaul
- Heating, Ventilation, and Air Conditioning System (HVAC)
  - a. HVAC diagnostics, troubleshooting, and use of diagnostic tools
  - b. Service and adjustments
  - c. AC Certification
- Air System
  - a. Diagnostics and troubleshooting
  - b. Repair and service
- Foundation Brake System
  - a. Operation and maintenance
  - b. Foundation brake diagnostics and troubleshooting
  - c. Use of service and diagnostic tools
  - d. Service and adjustments
- Differentials and Drive Shaft
  - a. Operation and maintenance
  - b. Diagnostics and troubleshooting
  - c. Use of service and diagnostic tools
  - d. Overhaul, service and adjustments
- Suspension, Steering, Articulation and Axle Systems
TS 8.6.1 Maintenance Training Program Content

The standalone system specific courses include engine overhaul, hybrid overhaul, and multiplex system training.

- **Engine Overhaul**

A course of not less than 40 hours wherein the engine will be taken through the overhaul and dyno test procedures. This course will be conducted at the District Unit Repair Facility. Delivery: Twice, to a class size of approximately seven maintenance personnel, for each separately ordered group of buses.

The Contractor will provide suitable training aids, books, manuals, and publications covering the engine system which will be distributed to students during training. These materials will be kept by the students and serve as reference materials while on the job.

- **Hybrid Overhaul**

Course of not less than 40 hours, wherein the hybrid drive and transmission will be taken through the overhaul procedure and a dynamometer test. This course will be conducted in the District Unit Repair Facility or the OEM training facility. Delivery: Twice, to a class size
of approximately seven maintenance personnel for each separately ordered group of buses.

The Contractor will provide suitable training aids, books, manuals, and publications covering the transmission system, which will be distributed to students during training. These materials will be kept by the students and serve as reference materials while on the job.

- **Multiplex System**

Course will be designed for the electronic technicians to learn the Multiplex systems at the component level. This will be a course of not more than 40 hours. The Contractor will provide suitable training aides, books, manuals and publications that will be distributed to students during training. These materials will be kept by the students and serve as reference materials while on the job. Delivery: Twice to a class of approximately 10 electronic technicians for each separately ordered group of buses.

**TS 8.6.2 Maintenance Training Courses**

The Contractor will provide maintenance training utilizing two modules of instruction: general orientation and technical orientation.

- **The General Orientation**

For each separately ordered group of buses the Contractor will provide an initial orientation for maintenance personnel. The general orientation will be provided in five (5) District bus maintenance facilities and may, at the discretion of the District, be provided on more than one shift. The orientation will be repeated until all available mechanics and service personnel have received the orientation (approximately three presentations per facility). The orientation will be presented on and around the bus. The audience size will be approximately 7 personnel per session. The orientation session will not exceed 4 hours in duration and will include, but not be limited to, the following; overview of the vehicle's systems, component location and general function, bus operation and controls, servicing and inspection.

The target population for this training is approximately 270 maintenance and service personnel.

- **The Technical Orientation**

The Contractor will provide a structured program of technical training to a maximum class size of 7 technicians. The number of times this program is delivered depends on the quantity of buses in each separately ordered group of buses. For 20-40 buses 1 time; for 75-125 buses 4 times; for 250 or more buses 7 times. This program will be delivered at
locations to be specified by the District. The training will consist of specific and identifiable
separate areas of instruction to accommodate 180 maintenance personnel and consist with the following:

a) Electrical and Electronics
Electrical system instruction will cover preventative maintenance and the major failure
events experienced in the system, and how to recognize the failure signs through
troubleshooting with test equipment. Students will be given failure/trouble parameters and
shown step-by-step troubleshooting procedures to isolate problems. Hands on exercises
with the actual electrical and electronic systems on a bus will reinforce troubleshooting
procedures.

The contractor will provide suitable training aids, books, manuals, and publications covering
the electrical and electronic systems that will be distributed to students during training. These materials will be kept by the students and serve as reference materials while on the job.

b) Engine and Accessories
The engine system instruction will cover preventative maintenance and the major failure
events experienced in the system, and how to recognize the failure signs through
troubleshooting with test equipment. Students will be given failure/trouble parameters and
shown step-by-step troubleshooting procedures to isolate the problem. Hands on exercises
with the actual engine system on a bus will reinforce troubleshooting procedures.

The contractor will provide suitable training aids, books, manuals, and publications covering
the engine system that will be distributed to students during training. These materials will be kept by the students and serve as reference materials while on the job.

c) Hybrid Drive System Controls
The Hybrid Drive system instruction will cover preventative maintenance and the major
failure events experienced in the system, and how to recognize the failure signs through
troubleshooting with test equipment. Students will be given failure/trouble parameters and
shown step-by-step troubleshooting procedures to isolate the problem. Hands on exercises
with the actual hybrid drive or transmission system on a bus will reinforce troubleshooting
procedures.

The contractor will provide suitable training aids, books, manuals, and publications covering
the transmission system that will be distributed to students during training. These materials will be kept by the students and serve as reference materials while on the job.

d) Heating, Ventilation and Air Conditioning (HVAC)
Heating, ventilation and air conditioning system instruction will cover preventative
maintenance and the major failure events experienced in the system, and how to recognize
the failure signs through troubleshooting with test equipment. The training will be to the level of AC certification. Students will be given failure/trouble parameters and shown step-by-step troubleshooting procedures to isolate problems. Hands on exercises with the actual HVAC system on a bus will reinforce troubleshooting procedures.

The contractor will provide suitable training aids, books, manuals, and publications covering the HVAC system that will be distributed to students during training. These materials will be kept by the students and serve as reference materials while on the job.

e) Air System
Air system instruction will cover preventative maintenance and the major failure events experienced in the system, and how to recognize the failure signs through troubleshooting with test equipment. Students will be given failure/trouble parameters and shown step-by-step troubleshooting procedures to isolate problems. Hands on exercises with the actual air system on a bus will reinforce troubleshooting procedures.

The contractor will provide suitable training aids, books, manuals, and publications covering the air system, which will be distributed to students during training. These materials will be kept by the students and serve as reference materials while on the job.

f) Brake System
The brake system instruction will cover preventative maintenance and the major failure events experienced in the system, and how to recognize the failure signs through troubleshooting with test equipment. Students will be given failure/trouble parameters and shown step-by-step troubleshooting procedures to isolate the problem. Hands on exercises with the actual brake system on a bus will reinforce troubleshooting procedures.

The contractor will provide suitable training aids, books, manuals, and publications covering the brake system that will be distributed to students during training. These materials will be kept by the students and serve as reference materials while on the job.

g) Differential and Drive Shaft
The differential and drive shaft instruction will cover preventative maintenance and the major failure events experienced in the system, and how to recognize the failure signs through troubleshooting with test equipment. Students will be given failure/trouble parameters and shown step-by-step troubleshooting procedures to isolate the problem. Hands on exercises with the actual differential and drive shaft on a bus will reinforce troubleshooting procedures.

The contractor will provide suitable training aids, books, manuals, and publications covering the differential and drive shaft system that will be distributed to students during training. These materials will be kept by the students and serve as reference materials while on the job.
h) Suspension, Steering, Articulation and Axles
Suspension, steering, articulation and axle system instruction will cover preventative maintenance and the major failure events experienced in the system, and how to recognize the failure signs through troubleshooting with test equipment. Students will be given failure/trouble parameters and shown step-by-step troubleshooting procedures to isolate the problem. Hands on exercises with the actual suspension, steering, articulation and axle systems on a bus will reinforce troubleshooting procedures.

The contractor will provide suitable training aids, books, manuals, and publications covering the suspension, steering, and axle systems that will be distributed to students during training. These materials will be kept by the students and serve as reference materials while on the job.

i) Ramp and Bridgeplates
Ramp and bridgeplate system instruction will cover preventative maintenance and the major failure events experienced in the system, and how to recognize the failure signs through troubleshooting with test equipment. Students will be given failure/trouble parameters and shown step-by-step troubleshooting procedures to isolate the problem. Hands on exercises with the actual ramp and bridgeplate system on a bus will reinforce troubleshooting procedures.

The contractor will provide suitable training aids, books, manuals, and publications covering the ramp and bridgeplate system that will be distributed to students during training. These materials will be kept by the students and serve as reference materials while on the job.

j) Fire Suppression System
The fire suppression system instruction will cover preventative maintenance and the major failure events experienced in the system, and how to recognize the failure signs through troubleshooting with test equipment. Students will be given failure/trouble parameters and shown step-by-step troubleshooting procedures to isolate the problem. Hands on exercises with the actual fire suppression system on a bus will reinforce troubleshooting procedures. Training will be to the level of certification.

k) Entrance and Exit Doors
The entrance and exit door system instruction will cover preventative maintenance and the major failure events experienced in the system, and how to recognize the failure signs through troubleshooting with test equipment. Students will be given failure/trouble parameters and shown step-by-step troubleshooting procedures to isolate the problem. Hands on exercises with the actual entrance and exit door system on a bus will reinforce troubleshooting procedures. Training will be to the level of certification.
TS 8.7 Operator Training
For each separately ordered group of buses provide 4 hours of training to the District’s Operations trainers on driving characteristics of the bus, use of all controls, gauges and warning lamps, driver’s seat controls plus other operational items as requested. The Contractor will provide copies of all lesson plans, detailed instructor guides, videos, transparencies, and any other training aids. The Contractor shall identify the instructor and provide the qualifications of the instructor. Dates of the training and timing of deliverables will be determined by the Operations trainers in coordination with the Contractor. Training and materials shall be approved by the District.

TS 8.8 Electronic Maintenance Information
The Contractor shall supply all software information, including source codes for any programmed module or component. Also to be supplied is any special hardware necessary to repair or modify any microprocessors and/or software used in the bus. The Contractor shall supply: complete schematic drawings containing component identification, and the location of the components on the circuit board; circuit descriptions and theory of operation for all electronic components. The Contractor shall also supply information on programmed array logic (PAL) and any other preprogrammed device. The District will consider all such data as proprietary.

TS 8.9 Special Tools and Diagnostic Equipment
The following list of special tools and diagnostic equipment shall be provided by the Contractor upon delivery of the first bus. All tools and electronic test equipment described throughout this section must be of heavy duty industrial grade quality approved by the District. Where software is provided to operate diagnostic equipment, a subscription for maintenance, support and updates to that software should be included for the period of the warranty, including access to calibration codes.

- Special Purpose Electrical & Electronic Diagnostic Tools:
  a. Ten complete sets of industrial quality electrical and electronic system test equipment and diagnostic tools to include scope meters (Fluke 124 or approved equal), carbon pile testers, inductive pick-up ammeters, PLC logic analysis software and computer interface connectors, and other software, etc.
  b. Training Tool Sets

- Special Purpose Engine Tools:
  a. Ten complete sets of engine maintenance, tune-up, and diagnostic tools to include lap-top computers, software and connectors. Laptops are to be Panasonic Toughbook, having the storage and performance capacity to effectively
handle all the diagnostics utilized on the bus, or approved equal having equivalent or superior durability, dependability and ease of use.

b. Two complete sets of engine overhaul, tune-up, and diagnostic tools
c. Two engines stand adapters for overhaul purposes.

- Special Purpose Hybrid-drive Tools:
  a. Seven complete sets of hybrid drive maintenance and diagnostic tools to include electronic diagnostic data software, computer connectors and printers.
  b. Two complete sets of hybrid drive overhaul and diagnostic tools.
  c. Two hybrid drive stand adapters for overhaul purposes.

- Special Purpose HVAC System Tools:
  a. Seven complete sets of OEM tools needed to maintain the HVAC system.

- Special Purpose Suspension, Steering, and Axle Systems Tools:
  a. Seven complete sets of OEM special tools and diagnostic equipment for the suspension, steering and axle system
  b. Seven pressure and flow meters for the power steering system.

- Special Purpose Articulation System Tools:
  a. Seven complete sets of OEM tools needed to maintain the articulation system.
TS 9. Material, Equipment, Workmanship and Warranty

TS 9.1 General Quality

TS 9.1.1 Workmanship

Material and equipment shall be new and of a quality equal to that specified or accepted as the best industry practice. Mechanical, electrical and electronic equipment and components shall be the products of manufacturers of established good reputations regularly engaged in the fabrication of such equipment and components.

The Work shall be executed in conformity with the best accepted standard practice of the trade so as to contribute to maximum efficiency of operation, accessibility, pleasing appearance and minimum cost of maintenance.

The fit and finish of exterior and interior components shall be to the best industry standards of the automotive trade.

TS 9.1.2 Quality Assurance

Whenever under the Contract Documents it is provided that the Contractor shall furnish materials or manufactured components or shall do work for which no detailed specifications are set forth, the work performed shall be in full conformity and harmony with the intent to secure the best standards of manufacture in the work as a whole or in part. No advantage shall be taken by the Contractor in the omission of any part or detail which goes to make the bus complete and ready for service, even though such part or detail is not mentioned in the Specifications or in the Contractor's approved design.

TS 9.1.3 Material Conformity

Components shall be current manufactured items that have been in successful transit revenue operation under comparable conditions for a period of at least two (2) years. This time requirement may not apply to minor details or to thoroughly demonstrated improvements in design or in materials of construction. Components not conforming to the time requirement may be used as proposed by the Contractor and approved by the District. The use of such components may require, at the option of the District, an extended warranty on the component or subsystem.

The two (2) year time requirement will not apply to changes to components made by the Contractor in response to changes in government regulatory requirements.

TS 9.2 Material and Equipment Specified by Name

Whenever any material or equipment is specified by patent, proprietary name or by the name of the manufacturer, such specification shall be considered as used for the purpose of describing the level of quality of the material or equipment desired and shall be
considered as if followed by the words or approved equal, whether or not such words appear.

**TS 9.3 Proof of Compliance with Contract**

In order that the District may determine whether the Contractor has complied with the requirements of the Contract Documents not readily determinable through inspection and test of equipment, components or materials utilized in the work, the Contractor shall, at any time when requested, submit to the District properly authenticated test results, design documents or other satisfactory proof as to its compliance with such requirements.

**TS 9.4 Defective Workmanship and Materials**

When and as often as the District determines that the Work done or being done under the Contract, or the kind or quality of components, equipment or materials supplied in connection therewith, is not fully and completely in accordance with any requirement of the Contract Documents, it may give notice of such noncompliance to the Contractor in writing, and the Contractor shall immediately upon receipt of such notice do all things required to remedy such noncompliance to District satisfaction, at no additional cost to the District.

**TS 9.5 Warranty Provisions**

**TS 9.5.1 Contractor Warranty**

Warranties in this Contract are specifically agreed to and in addition to any remedies or warranties imposed on the Contractor by statute or otherwise by California law. It is understood that compliance within the warranty provisions, and the acceptance of the bus manufactured and assembled to these specifications does not waive any warranty either expressed or implied in Sections 2312 to 2315, inclusive, of the Commercial Code of the state of California, or any liability of the contractor as determined by any decision in a court of the State of California.

The Contractor will be responsible for all warranty-covered repair work to the Alameda-Contra Costa Transit District (District) on each complete bus, specific subsystems, components and spare parts. The Contractor shall insure in its procurement arrangements that the warranty requirements of this Contract are enforceable through and against the Contractor's suppliers, Vendors, material men and subcontractors. Any inconsistency or difference between the warranties extended to the District by the Contractor and those extended to the Contractor by its suppliers, vendors, material men and subcontractors shall be at the risk and expense of the Contractor. Such inconsistency or difference will not excuse the Contractor's full compliance with its obligations under the Contract Documents.

Upon request of the District, the Contractor promptly shall provide to the District complete copies of all written warranties or guarantees and documentation of any other arrangement relating to such warranties or guarantees extended by the Contractor's suppliers, sub
suppliers, vendors, and subcontractors covering parts, components, and systems utilized in the bus.

The Contractor shall ensure that such suppliers, sub suppliers, vendors, and subcontractors satisfactorily perform warranty related work.

All warrantable repairs will include 100% of parts and labor costs. "Defects" defined herein are patent or latent malfunctions or failure in manufacture or design of any component or subsystem that causes the vehicle to cease operating or to operate in a degraded mode. "Related defects" defined herein are damages inflicted on any component or subsystem as a direct result of a defect.

**TS 9.5.2 Complete Bus**

The complete bus, as supplied by the Contractor, is warranted and guaranteed by the Contractor to be free from defects due to design or workmanship for two years or 100,000 miles, whichever comes first, beginning on the in-service date for each bus. During this warranty period the bus shall maintain its structural integrity. The warranty is based on normal operation of the bus under the operating conditions prevailing in the District local service environment.

**TS 9.5.3 Body and Chassis Structure**

Body, body structure, floor covering and subfloor are warranted to be free from defects, related defects, and to maintain structural integrity for a period of twelve (12) years. Primary load carrying members of the bus structure, including structural elements of the suspension, are to be warranted against defects and corrosion failure and/or fatigue failure sufficient to cause a failure for a period of twelve (12) years.

**TS 9.5.4 Propulsion System**

Propulsion system components, specifically the engine, transmission or hybrid propulsion, drive and non-drive axles shall be warranted to be free from defects and related defects for five years or 300,000 miles, whichever comes first.

**TS 9.5.5 Major Subsystems**

Major components and subsystems have warranties from their Original Equipment Manufacturers (OEM) that differ in terms of coverage, both annually and by mileage from the warranty offered. Those components and subsystems and their applicable coverage (years or miles, whichever comes first) are identified in the System Warranty Coverage Table 9-1.

<table>
<thead>
<tr>
<th>System</th>
<th>Years</th>
<th>Mileage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### Table 9-1: System Warranty Coverage

<table>
<thead>
<tr>
<th>System</th>
<th>Years</th>
<th>Mileage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air System</td>
<td>2</td>
<td>unlimited</td>
<td>Compressor, tanks, dryer, tubing lines, relay valves, check valves, accelerator and rear brake interlock valves, pressure switch and towing lines.</td>
</tr>
<tr>
<td>APC</td>
<td>5</td>
<td>300000</td>
<td>CPU, cables, sensors, with lan access points</td>
</tr>
<tr>
<td>Axles</td>
<td>5</td>
<td>300000</td>
<td>Front, rear, and drive axles housing, bearings, pinions, flanges, shaft, and hubs. Exclude maintenance items &amp; items that are not covered by the OEM's warranty.</td>
</tr>
<tr>
<td>Brake System</td>
<td>3</td>
<td>150000</td>
<td>Chamber, Interlock, pressure regulator, solenoid valve, pedal, and hoses. All friction materials are excluded from this limited warranty. Wear and third party items supplied with the axle (e.g. slack adjuster, seals/bearings, shocks, air bellows, radius rods, brake chambers)</td>
</tr>
<tr>
<td>Camera System</td>
<td>5</td>
<td>Unlimited</td>
<td>DVR, cameras, cables, software</td>
</tr>
<tr>
<td>Cooling System</td>
<td>3</td>
<td>150000</td>
<td>Radiator, surge tank, charge air cooler, water pump, and fan.</td>
</tr>
<tr>
<td>Destination Sign</td>
<td>5</td>
<td>Unlimited</td>
<td>All repairs/warranty claims to be handled by the destination sign OEM.</td>
</tr>
<tr>
<td>Door System</td>
<td>3</td>
<td>150000</td>
<td>Panels, linkage, sensitive edges, actuators</td>
</tr>
<tr>
<td>Electrical System</td>
<td>2</td>
<td>unlimited</td>
<td>Alternator, starter, battery, regulator, electric panel, multiplex system, wiring connectors, cabling and console assembly switches/panels.</td>
</tr>
<tr>
<td>Emission</td>
<td>5</td>
<td>100000</td>
<td>Include particulate filter, DEF components and after-treatment devices.</td>
</tr>
<tr>
<td>Engine</td>
<td>5</td>
<td>300000</td>
<td>Castings, electronic controls, fuel pump, oil tube/filler and throttle controls. All repairs/warranty claims to be handled by the local authorized repair facility.</td>
</tr>
<tr>
<td>Energy Storage</td>
<td>5</td>
<td>300000</td>
<td>Cells, voltage regulators, casings, cables as well as the insulation and shields. Associated electronic components outside of the Energy Storage System casing. All repairs/warranty claims to be handled by the local authorized repair facility.</td>
</tr>
<tr>
<td>Fire Suppression</td>
<td>5</td>
<td>300000</td>
<td>Cylinders, nozzles, extinguishing agents, and electronic circuit detection.</td>
</tr>
<tr>
<td>Fuel</td>
<td>3</td>
<td>150000</td>
<td>Tank, lines, and filler neck.</td>
</tr>
<tr>
<td>HVAC</td>
<td>5</td>
<td>Unlimited</td>
<td>Condenser, evaporator motor, compressor, seals, fan motors, controller, power pack internal components. All repairs/warranty claims to be handled by the local authorized repair facility.</td>
</tr>
<tr>
<td>Ramp</td>
<td>5</td>
<td>300000</td>
<td>Power train components to include hoses and fittings, cylinders, flow control valves, pressure switch, motor and pump.</td>
</tr>
<tr>
<td>Seating</td>
<td>3</td>
<td>150000</td>
<td>Driver and passenger seating to include all metal, plastic and moving components.</td>
</tr>
<tr>
<td>Steering System</td>
<td>3</td>
<td>150000</td>
<td>Drag link, tie rod, steering gears, knuckle/pitman arms, steering shaft, power steering pump.</td>
</tr>
<tr>
<td>Suspension</td>
<td>3</td>
<td>150000</td>
<td>Bellow brackets, shocks, leveling valves, air chambers, radius rods, turn buckle, and axle stops.</td>
</tr>
<tr>
<td>Hybrid Drive</td>
<td>5</td>
<td>300000</td>
<td>Castings, converter, retarder, electronic controls, oil pump, governor, external heat exchanger and cooler. All repairs/warranty claims to be handled by the local authorized repair facility.</td>
</tr>
</tbody>
</table>
TS 9.5.6 Extension of Warranty
If, during the warranty period, repairs or modifications on any bus made necessary by
defective design, materials or workmanship are not completed due to lack of material or
inability to provide the proper repair for 30 (thirty) calendar days, the applicable warranty
period shall be extended by the number of days equal to the delay period.

TS 9.5.7 Voiding of Warranty
The warranties shall not apply to the failure of any part or component of the bus that results
from misuse, negligence, accident, or repairs not conducted in accordance with the
Contractor provided maintenance manuals and with workmanship performed by adequately
trained personnel in accordance with recognized standards of the industry.

TS 9.5.8 Exceptions and Additions to Warranty
The warranty requirements do not apply to normal wear and tear items such as bulbs,
brake linings, filters, belts, and wiper blades unless any of them fail due to defective
manufacture, improper installation by the Contractor or defects in the design, manufacture
or installation of the part or the system within which the part functions.

The warranties applied to components and major subsystems offered and declined by the
supplier to participate, shall be passed to the Contractor to fulfill herein.

TS 9.5.9 Detection of Defects
If the District detects a defect within the warranty periods defined in the warranty provisions
herein, it shall notify the Contractor’s representative in writing. Within five working days
after receipt of notification, the Contractor’s representative shall either agree that the defect
is in fact covered by warranty, or reserve judgment until the subsystem or component is
inspected by the Contractor’s representative or is removed and examined at the District’s
property or at the Contractor’s plant. At that time, the status of warranty coverage on the
subsystem or component shall be mutually resolved between the District and the
Contractor. Work shall commence to correct the defect within ten (10) working days after
receipt of notification and shall be conducted in accordance with "Repairs by Contractor"
guidelines under the warranty provisions herein.

TS 9.5.10 Scope of Warranty Repairs
When warranty repairs are required, the District and the Contractor’s representative shall
agree within ten working days after notification on the most appropriate course for the
repairs and the exact scope of the repairs to be performed under the warranty. Warranty
repairs shall restore the bus to its operating condition just prior to the failure, by repairing
and/or replacing the defective warranted part needed to correct the defect. Warranty
claims submitted by the District to the Contractor will be of electronic correspondence.
In the event of warranty claims being rejected by the contractor or contractor's supplier, the contractor or contractor's supplier shall respond in writing to the District within ten (10) days of receipt of such claim, and the reason for said rejection. The District will have the right to resubmit rejected claims with substantiating information. In the event of further rejections, the District will have the right to arbitration of such disputes.

**TS 9.5.11 Repair Performance**

The Contractor will be responsible for all warranty-covered repair work. To the extent practicable, the District will allow the contractor or contractor's suppliers or its designated representative to perform such work at the District. At its discretion, the District may perform such work if it is so determined, based on service requirements. Such work will be reimbursed by the contractor or contractor's suppliers.

Warranty work performed by the District will include the cost of towing the bus and/or a road service if either is necessary because of a failure of a warranted part. The cost of a road service will consist of the warranty labor rate in the “reimbursement for labor” section herein for the actual number of mechanics sent (one or two), plus a charge for a tow truck if used at the current towing rate.

**TS 9.5.12 Repairs by Contractor**

The contractor or its designated representative will be available within forty-eight (48) hours at a location identified by the District. If the District requires the contractor to perform warranty covered repairs, the contractor, contractor's suppliers or contractor's representative will begin, within ten (10) working days after receiving notification of a defect from the District, the work necessary to affect repairs. The District will make the bus available to complete repairs timely with the District approved contractor, contractor's suppliers or contractor's representative repair schedule. Any warranty covered repairs decided by the District to be performed by the contractor would be performed only after it is determined by the contractor to be the appropriate course of action. At the District's option, the contractor, contractor's suppliers or contractor's representative may be asked to organize repairs to be done outside the District's property whereby the bus needs to be moved from the District property. If the bus is removed from the District property, to undergo scheduled warranty work performed under this contract, the bus will be made available to the District within seven (7) calendar days after the finalization of the scheduled warranty work. If any bus is NOT returned to revenue service after 7 days warranty work, the contractor, contractor's suppliers or contractor's representative may be assessed $300.00 per day per bus (liquidated damages) by the District. Payment will be for administrative and amortization expenses.

**TS 9.5.13 Parts Used**

If the District performs the warranty covered repairs, it will use parts/components available from its own stock or those supplied by the contractor specifically for this repair. All parts
used from the District's own stock or those supplied by the contractor will be subject to a 25% handling charge at the current parts prices at the time of repair. Monthly reports, or reports at intervals mutually agreed upon, of all repairs covered by this warranty will be submitted by the District to the contractor for reimbursement or replacement of parts/components. The contractor will provide forms for these reports.

**TS 9.5.14 Contractor Supplied Parts**

The District may request that the contractor supply new parts/components for warranty covered repairs being performed by the District. These parts will be shipped prepaid to the District within ten (10) working days of receipt of the request for said parts/components. If the contractor is unable to provide the parts/components within the agreed time limit, he/she will notify the District in writing within five (5) working days of receipt of the request for parts/components.

**TS 9.5.15 Defective Components Return**

The contractor, contractor's suppliers or contractor's representative may request that parts/components covered by warranty be returned to the contractor, contractor's suppliers or contractor's representative. The total cost for this action will be paid by the contractor, contractor's suppliers or contractor's representative. Materials will be returned in accordance with the contractor, contractor's suppliers or contractor's representative's instructions. The District may be asked to stock the materials to be returned for a maximum of 100 calendar days from date of reported failure.

**TS 9.5.16 Failure Analysis**

The contractor will, upon specific request of the District, provide a failure analysis of fleet defect or safety related parts, or major components removed from buses under the terms of warranty that could affect fleet operation. Such report will be delivered within sixty (60) days of receipt of the failed parts. The District will, upon request of the contractor provide a bus and a driver to facilitate failure analysis of fleet defects.

**TS 9.5.17 Reimbursement Requirements**

The contractor, contractor's suppliers or contractor's representative will reimburse the District for warranty labor and/or parts within forty-five (45) days of receipt of the warranty claim.

**TS 9.5.18 Reimbursement for Labor**

The District will be reimbursed by the contractor, contractor's suppliers or contractor's representative for labor. The amount shall be determined by multiplying the number of man-hours reasonably and actually required to correct the defect by a per hour wage rate, at the current Journey-Level Mechanic wage rate, plus 62% fringes, plus 125% overhead, plus the cost of towing if such action was necessary. These rates shall not exceed the District's rates at the time the Defect correction is made. The wage rates, and warranty
labor rate, are subject to adjustment once each year, anniversary or receipt of 1st bus. Reimbursement for towing would be limited to the nearest repair facility, as appropriate. The District will maintain records of warranty repairs and such records shall be available to the Contractor to verify warranty claims.

**TS 9.5.19 Reimbursement for Parts**
The District will be reimbursed by the contractor, contractor's suppliers or contractor's representative for defective parts/components and for parts/components that must be replaced to correct the defect. The reimbursement will be at the invoice cost of the parts/components at the time of repair and will include taxes where applicable, or the parts/components used to correct the defect will be replaced free of charge by the contractor, contractor's suppliers or contractor's representative.

**TS 9.5.20 Replacement Warranty**
If any component, unit, or subsystem is repaired, rebuilt or replaced by the contractor, contractor's suppliers or contractor's representative, or by District personnel with the concurrence of the contractor, contractor's suppliers or contractor's representative, the component, unit, or subsystem will begin a new warranty period based on the original terms. The warranty will begin on the replacement date for corrected parts on each bus.

**TS 9.5.21 Fleet Defect**
A fleet defect is defined as cumulative failures of the same kind in the same components in the same or similar application where such items are covered by the warranty provisions herein. Such failures that occur in the warranty period in the specified proportion of the buses delivered under this contract will be declared a fleet defect when the cumulative failure proportion reaches fifteen percent (15%).

**TS 9.5.22 Fleet Defect Occurrence and Remedy**
The contractor or contractor's supplier will correct a fleet defect under the warranty provisions and to the satisfaction of the District. After notification of a fleet defect by the District, the contractor will present a remediation plan for that fleet defect to the District.

The District will have the right to reject any remediation plan that the District deems to not be in the best interest of the District. In the event of such a rejection of a remediation plan the contractor will either submit an acceptable plan or apply for arbitration. When a suitable remediation plan is accepted by the District, the contractor or contractor's supplier will then schedule the implementation of that plan with the District's approval.

The remediation plan will include inspection and/or correction of defective and/or potentially defective parts in all of the buses supplied under this contract. If more than one day of labor is required per bus, the District may reserve the right to require the contractor to remove the buses from District's property in order to perform the remediation plan repairs. The
warranty for items covered under a fleet defect remediation plan will start over for the normal interval of warranty for that part. This new warranty will commence at the time that repairs are completed for each bus.

**TS 9.5.23 Exceptions to Fleet Defects**

Fleet defect warranty does not apply to District-supplied items to the Contractor except for defects or related defects caused by Contractor's installation. Fleet defects exclude damage that is a result of normal wear and tear items.

**TS 9.6 Spare Parts**

**TS 9.6.1 General**

Blanket purchase orders, purchase orders and other contracts for the supply of replacement parts issued or awarded by the District to the Contractor or its subcontractors shall incorporate the terms and conditions of this Contract as modified through Change Orders. Parts shall be available both as separate components and built-up assemblies. Parts or rebuild kits shall be offered for all repairable or rebuildable components on the bus.

The District may relieve the Contractor of a portion of the responsibility for providing spare parts once the established warranty periods have ended. If the Contractor desires to reduce its responsibility for providing spare parts, it shall establish direct purchasing by the District from the Contractor's subcontractors and suppliers or from open market distributors. Such direct purchasing may take the form of agreements between the District and various spare parts suppliers facilitated by the Contractor.

When parts are shipped to the District, the Contractor will include priced packing slips with all shipments.

The Contractor will supply the following spare parts for each separately ordered group of buses 90 days after the delivery of the first production bus in each group.

---

**Table 9-2**

<table>
<thead>
<tr>
<th>SPARES PARTS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPONENTS</td>
<td>QTY</td>
</tr>
</tbody>
</table>

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Complete ENGINE and HYBIRD ASM (DRESSED) & 1 
ENGINE ASM ( DRESSED) & 3 
HYBIRD ASM (BARE ) & 3 
RAD SURGE TANK & PIPING & 3 
A/C UNIT W/ CONTRLR & PIPING & 1 
A/C COMPRESSOR & 1 
FAREBOX & 1 
WHEELCHAIR RAMP & 1 
PASSENGER SEAT INSERTS & 10 
DRIVER'S SEAT & 1 
DEST SIGN BUS SET W/ CABLES & 1 
SET OF WINDSHIELDS & 3 

**MISC.**

Engine and Transmission Dolly & 1 
Door Motors & 6 
Wiper Motors & 6 
Exterior Mirrors & 6 
Bumpers & 1 
Set of Passenger Windows Framed & 10 
Windows glazing & 10 
Multiplex Modules & 3 
Aftertreatment exhaust & 1 
Differential & 3 
Differential Housing & 2 
Complete Differential assembly & 1 
Video Systems Camera & 4 
Video Systems DVR & 4

After the execution of this Contract, a separate parts contract will be negotiated between the Contractor and the District.

After the warranty period, the District may use substitute parts. Where it is feasible to make a substitution, and the Contractor has prior knowledge or experience, the Contractor will share any knowledge and technical information on parts substitutions. The Contractor shall respond to the District in writing within ten (10) Working Days, and agrees, if requested by the District, to provide any information in the Contractor’s possession regarding the potential parts substitution.
TS 9.6.2 Initial Parts Order

The Contractor shall send to the District an initial suggested stocking list for every major system and subsystem, to include engine, transmission, suspension, axles, brakes, electrical, and body parts, and their location in the parts catalog, at least 120 days before the delivery of the first production bus. The suggested stocking list of parts shall contain all of the information on the parts required within the contract. The District will return completed orders within thirty (30) days of receiving the suggested list, price list and a draft parts catalog.

The Contractor will supply 100 percent (100%) of the District's initial order, taken from the Contractor's suggested parts stock list, at least thirty (30) days prior to the delivery of the first production bus.

Failure by the Contractor to ship the initial order of parts within thirty (30) days from receipt and acceptance of the initial purchase order at the Contractor's warehouse, shall entitle the District to collect liquidated damages of $100.00 per day, per part for each day of late delivery.

TS 9.6.3 Parts Availability Guaranty

The Contractor hereby guarantees to provide spare parts, software and all equipment necessary to maintain and repair the buses supplied under this Contract for a period equal to the service life stated in section A1.01 after the date of acceptance of the last bus in the order for two (2) additional years. Parts shall be interchangeable with the original equipment and be manufactured in accordance with the quality assurance provisions of this Contract. Prices shall not exceed the Contractor's then current published catalog prices.

Where the parts ordered by the District are not received within two (2) Working Days of the agreed upon time/date and a bus procured under this Contract is out-of-service due to the lack of said ordered parts, then the Contractor shall provide the District, within eight (8) hours of the District's verbal or written request, the original suppliers' and/or manufacturers' part numbers, company names, addresses, telephone and fax numbers and contact persons' names for all of the specific parts not received by the District.

Where the Contractor fails to honor this parts guaranty or parts ordered by the District are not received within thirty (30) days of the agreed upon delivery date, then the Contractor shall provide the District, within seven (7) days of the District's verbal or written request, the design and manufacturing documentation for those parts manufactured by the Contractor and the original suppliers' and/or manufacturers' part numbers, company names, addresses, telephone and fax numbers and contact persons' names for all of the specific parts not received by the District. Subject to California State public disclosure laws, Contractor's design and manufacturing documentation provided to the District shall be for its sole use in regard to the buses procured under this Contract and for no other purpose.
TS 9.6.4 Returned Parts
The District shall be able to return parts purchased from the Contractor for cash or credit at the price originally invoiced, subject to the following conditions:

- Returned parts value is limited to 5 percent (5%) of the total parts purchased from the Contractor.
- The District will prepay freight if charges are for delivery within the United States or Canada.
- Charges for delivery in any other location shall be the responsibility of the Contractor.
- The Contractor shall limit the restocking charge to a maximum of fifteen percent (15%) of the price originally invoiced.

TS 9.6.5 Consumables
The following list of consumable items shall be available in the U.S. from U.S. suppliers:

- Ventilating air filters
- Belts, Lamps, and Fuses
- Brake lining material
- Hoses and lines - air, coolant and hydraulic
- Wire terminations and connectors
- Shock absorbers
- Air bags, Brake drums, and Suspension bushings

TS 9.6.6 Failure of Delivery
In the event the District incurs costs due to Contractor's failure to deliver parts and assesses damages as provided in this Contract, or becomes aware of payments under prices that were not fair or reasonable or were clearly in excess of standard industry pricing for similar parts, or the Contractor fails or refuses to provide cash or credit for returned parts, which results in damages to the District, then the District shall be entitled to deduct from Contract amounts earned by the Contractor, sufficient amounts to cover the District's costs, provided the District gives the Contractor ten (10) days advance notice of its intent to deduct.

TS 9.7 Pricing
TS 9.7.1 Fair and Reasonable
The Contractor pricing to the District shall reflect a most favored customer status during the contractually required spare parts stocking period, and similar requirements shall be placed in all supplier, sub supplier and Vendor agreements. The District will review the prices for spare parts submitted by the Contractor to determine if the pricing appears to be fair and reasonable. The District shall have the right to conduct a cost/price analysis on specific spare parts if pricing appears to be in excess of standard industry pricing for similar parts. Any differences shall be subject to negotiations to the satisfaction of the District.
TS 9.7.2 Competitive Pricing
Competitive pricing is defined as the circumstances in which the District could obtain bids or proposals from alternative sources for the same parts. Proprietary parts and noncompetitive parts will be considered sole source parts requiring cost/price justification.

TS 9.7.3 Record Audit
The Contractor shall maintain records related to pricing of spare parts. The District shall have access to such records for audit purposes.

TS 10. Vehicle Options
TS 10.1 FareBox
TS 10.1.1 Fareboxes
Provide and install Fast Fare electronic fareboxes with the following features: 36 in. tall; Route/Run Segmenter; Electronic Lock; Dollar Bill Accelerator; Card Reader; Cash Box I.D.; 3 Digit Display; 16 Button Keypad; Passenger Display; and ‘Gold Contacts’. To the extent practicable, make these fareboxes compatible with the groups of GFI fareboxes previously purchased by the District (1350 + 100). Farebox details to be approved by the District.

TS 10.1.2 Cash Boxes
Provide GFI S/A cash boxes to fit the fareboxes in section 10.1.1.

TS 10.1.3 Transfer Trim Unit
Provide a GFI compatible transfer trim unit for the GFI farebox.

TS 10.2 Advanced Styling Features
TS 10.2.1 Flush Passenger Side Windows
Provide side windows on the bus that appear to be continuous, but which retain the ease of replacement feature of current windows mounted in sash. All other requirements for liners, emergency escape, tint, etc. must still be met. For this option to be an extra-cost feature, the Proposer must have in current production the basic bus type requested in this RFP without the flush-appearing side windows. Otherwise, it will be a no cost option.

TS 10.2.2 Full-length Raised Roof Cap
Provide a full bus length raised roof cap to cover hybrid energy storage. Provide provision to open the cap for maintenance access. All other requirements for roof-mounted equipment must still be met. The roof cap shall not have the ability to trap leaves and other debris while operating in the District routes. For this option to be an extra-cost feature, the
Proposer must have in current production the basic bus type requested in this RFP without the full-length raised roof cap. Otherwise, it will be a no cost option.

**TS 11. District / Contractor Relations**

**TS 11.1 Performance of the Work**

The performance of the Work shall be done in complete conformance with the Contract documents, and consistent with the best standards within the industry for the manufacture of the transit buses.

It is expressly stipulated, however, that these Specifications and other Contract documents do not purport to control the means or methods of performing the Contractor's Work. The Contractor assumes the entire responsibility for planning, design and testing and for methods of manufacturing and assembling the buses.

The Work performed and the buses delivered to the District shall demonstrate the Contractor's consistent adherence to the best industry standards of design, manufacture and assembly.

**TS 11.2 District Representatives**

The Contracting Officer is the District's designated representative for all contacts by the Contractor. The Contract Officer will be designated by the District at the time of award of this Contract and this person's name, address, phone number, fax number, and email address will be given to the Contractor.

The District's Contracting Officer shall answer or give progress updates to all written communications from the Contractor within seven (7) working days from receipt.

The Contracting Officer will appoint a Fleet Inspector. It is the District's intention to have one or more representatives present at the site of the Contractor's worksites continuously during the manufacture or assembly of the buses. The Inspector will normally be available eight (8) hours per day, five (5) days per week at the Contractor's worksite(s). Overtime, holiday work, swing shift, graveyard shift or split shift work will be at the discretion of the District. The failure of the District to provide an on-site representative for other than day shift work will not be a reason or excuse for delay in the manufacture and delivery of the buses.

The District's Inspector shall answer or give progress updates to all written communications from the Contractor within seven (7) working days from receipt.

The function of the Inspector is to represent the District at the site of the Contractor as required to:
**BUS RAPID TRANSIT (BRT) BUS PROCUREMENT**
**PERIOD OF PERFORMANCE: 01 JUNE 2015 THROUGH 30 NOVEMBER 2017**
**ADDENDUM NO. 3**

- Perform technical liaison functions
- Assist in the non-legally binding interpretation of Contract Documents
- Inspect and approve the Work as it progresses for conformity to the Contract
- Witness performance and quality assurance tests
- Conduct the pre-shipment inspection of production units.

The District's Inspector shall have complete access to any and all design offices, testing facilities and workshops at all times when work is being performed on this Contract, including subcontractor workshops where any major component, subassembly or assembly is being fabricated or assembled. The Contractor shall provide the Inspector with all information, equipment or facilities necessary to perform assigned tasks, including ensuring conformity of the material or equipment to the specifications as required by the Inspector. The Inspector shall have authority to retain components for examination and testing and to document by photography or video or both all parts of the buses as well as any disputed process or technique used in the manufacture of the buses. The Contractor shall give a minimum of three (3) Work Days prior notice on any tests or inspections at which the presence of the Inspector is required by the Contract or requested by the Inspector.

Whenever the Inspector(s) is (are) present at the Contractor's worksite, the Contractor shall make available at its cost a private and lockable office adjacent to the final inspection area with:

1. Lockable desk (one per inspector)
2. A minimum of one bookcase
3. A minimum of one four-drawer file cabinet
4. Telephone service providing all inside lines, one outside line; (Contractor pays telephone charges)
5. Office supplies as needed.
6. Interpreter, if necessary

If English is not the prevalent language used at the worksite, an interpreter fluently proficient in the other language(s) used and in English shall be available to the Inspector during all working hours. All documentation shall be supplied in English including, but not limited to design drawings, inspection reports and any other Contract documentation.

In the event the District's Inspector or a delegate is or becomes unacceptable to the Contractor, the Contractor will notify the District's Contract Officer. The District and the Contractor will promptly discuss the matter and attempt to arrive at a mutually satisfactory remedy or replacement.
TS 11.3 Contractor's Appointed Representative(s)
At the time of execution of the Contract, the Contractor shall appoint a representative as a point of contact for the District. The Contractor shall immediately supply the name, address, phone number, fax number, and email address of this person to the District's Contract Officer. This representative shall be the contract liaison agent through whom the District will communicate with the Contractor. The Contractor shall respond to all written communications from the District's Contracting Officer within seven (7) working days from receipt by Contractor's representative.

The Contractor shall also appoint a representative who will be the contact point in the Contractor's plant for the District's Inspector. The Contractor's plant representative shall be the contract liaison agent through whom the District's Inspector will communicate with the Contractor.

Correspondence from the Contractor's representative(s) will be binding on the Contractor.

The Inspector and the Contractor will jointly establish in a timely manner the procedure to be followed relating to identification and control of letters of transmittal, telephone memoranda, reports and drawings, and the Contractor shall comply with such procedure. The Contractor shall answer or give progress updates to all written communications from the Districts' Inspector within seven (7) working days from issuance.

In the event a Contractor's appointed plant representative is or becomes unacceptable to the District, the Contractor shall promptly discuss and consider the matter with the District and attempt to arrive at a mutually satisfactory solution. If no such solution is developed, the Contractor shall replace the plant representative with a person acceptable to the District.

TS 11.4 Paragraph Headings
Headings to parts, sections, forms, articles and sub-articles are inserted for convenience of reference only and shall not affect the interpretation of these Contract Documents.

TS 11.5 Successor's Obligation
All grants, covenants, provisos, and claims, rights, powers, privileges and liabilities contained in the Contract Documents shall be read and held as made by and with and granted to and imposed upon the Contractor and the District and their respective heirs, executors, administrators, successors and assigns.
TS 11.6 Contractor's Plant, Equipment and Employees
The Contractor alone shall at all times be responsible for the availability, adequacy, efficiency and sufficiency of its and its subcontractor's plant, equipment and employees.

TS 11.7 Assignment of Contract
Either party is unable to assign or subcontract its rights or obligations under the Contract without the prior written permission of the other party, and no such assignment or subcontract will be effective until approved in writing by the other party. Involuntary assignment of the Contract caused by the Contractor being adjudged bankrupt, assignment of the Contract for the benefit of Contractor's creditors or appointment of a receiver on account of Contractor's insolvency shall all be considered as a failure to comply with the provisions of the Contract and subject to the termination for default provisions contained herein.

TS 11.8 Subcontracts
The Contractor shall perform, with its own organization, not less than one third of the Work and shall not sublet to one subcontractor or supplier more than one half of the Work without the previous written consent of the District. No subcontractor or supplier will be recognized as having a contract with the District and all persons engaged in the Work will be considered employees of the Contractor or subcontractor. All subcontractor and supplier Work shall be subject to the provisions of the Contract through the terms and provisions of their subcontract that shall comply, in all pertinent respects, with the Contract Documents. No provision herein is intended to allocate or determine liability or responsibility between the Contractor and its subcontractors and suppliers. The provisions herein allocate or determine liability and responsibility only between the Contractor and the District.

The Contractor will provide to auditors representing or designated by the District, the name, address, phone number, fax number, and email address of any subcontractor or supplier who is engaged in the Work or supplying parts for the Contractor as it relates to this Contract. If such Work or parts information is needed for the specific purpose of certifying the Buy America requirements or any other requirements of this Contract, or if otherwise reasonably required, the District reserves the right to audit or otherwise inspect the subcontractor's facilities, equipment and records.

TS 11.9 Service of Notices
Any notice, order, direction, request or other written communication given by the District to the Contractor under the Contract shall be deemed to be well and sufficiently given the Contractor if delivered to the Contractor's appointed representative, or if hand carried, sent by mail, or sent by email or by fax to the Contractor at the address or fax number designated as that of the Contractor's appointed representative with receipt thereof.
acknowledged. Notice shall also be deemed to be well and sufficiently given three (3) days after mailing said notice by registered mail to the Contractor's last known place of business.

**TS 11.10 Deviation from Contract**

The Contractor shall not make any alterations or variation in or addition to or deviation or omission from the terms of this Contract without the prior written consent of the District.

**TS 11.11 Suggestions to Contractor**

Any plan or method of work suggested by the District to the Contractor, but not specified or required in writing under the Contract, if adopted or followed by the Contractor in whole or part shall be used at the risk and responsibility of the Contractor, and the District shall assume no responsibility therefore.

**TS 11.12 Wages and Benefits of Employees**

The Contractor and each subcontractor or other Person doing the whole or any part of the Work to be performed under the Contract in the State of California shall pay if required by said statutes each employee working in the State of California an amount not less than the general prevailing rate of wage as specified by the Industrial Statistician of the Department of Labor and Industries of California, paid in the vicinity of the Work to be performed under the Contract for the particular trade or occupation of each employee.

Any employee whose type of work is not covered by any of the classified wage rates specified by the District shall be paid not less than the rate of wage listed for the classification that most nearly corresponds to the type of work to be performed. In case any dispute arises as to who is to be paid and what are the prevailing rates of wages for work of a similar nature which cannot be adjusted by the parties in interest, including labor and management representatives, the matter shall be referred for arbitration to the Director of the Department of Labor and Industries of the State of California, whose decision therein shall be final and conclusive and binding on all parties involved in the dispute.

The Contractor will be held responsible for paying the prevailing wages and for taking any other actions required to comply under this Contract.

As may be required by law, the Contractor on or before the date of commencement of the Work shall file a statement under oath with the District and with the Department of Labor and Industries certifying the rate of hourly wage paid and to be paid each classification of laborers, workers or mechanics employed upon the Work in the State of California by the Contractor or subcontractor which shall be not less than the prevailing rate of wage. Such statement and any supplemental statements that may be necessary shall be filed in
accordance with the practices and procedures required by the Department of Labor and Industries.

**TS 11.12.1 Workers’ Benefits**

The Contractor shall make all payments required for unemployment compensation, industrial insurance and medical aid that is required under California code. The Contractor shall also obey all federal, state and local laws, ordinances, and regulations establishing safety standards for the protection of employees. If any payment required by the District is not made when due, the District may retain such payments from any money due to the Contractor and pay the same into the appropriate fund. Before release of any funds retained, the Contractor shall complete a "Request for Release" form and submit such form to the District for approval and for the purpose of obtaining a release with respect to the payments of industrial insurance and medical aid premiums. Such approved form shall be submitted to the District.

Under certain circumstances a Contractor whose entire operations are outside the State of California may not be required to make workers' benefits payments under the Revised Code of California. If the Contractor has determined this to be the case, the Contractor will provide the District with a signed statement to this effect no later than 30 days after Notice to Proceed.

**TS 11.12.2 Compliance with All Laws**

The Contractor shall give the notices, file information and pay taxes, deductions and premiums as may be required by law and shall at all times comply with all applicable federal, state, and local laws, ordinances, permit requirements, rules and regulations pertaining to the conduct of the Work, including but not limited to the contractual provisions required by the Federal Transit Administration. The Contractor shall be liable for violations of same in connection with Work provided by the Contractor, and the Contractor shall cooperate with all governmental entities regarding inspection of the Work and compliance with such requirements.

**TS 11.12.3 Audits**

The District may inspect or audit the Contractor's wage and payroll records. The Contractor agrees to maintain all books, records, accounts and reports required under this Contract for a period of not less than three (3) years after the date of termination or expiration of this Contract, except in the event of litigation or settlement of claims arising from the performance of this Contract, in which case the Contractor agrees to maintain same until the District, the FTA Administrator, the Comptroller General, or any of their duly authorized representatives, have disposed of such litigation, appeals, claims or exceptions related thereto. The Contractor shall also guarantee that wage and payroll records of all its
subcontractors and agents shall be open to similar inspection and auditing for the same period of time. The District will give the Contractor reasonable notice of the starting date if an audit will begin more than 60 days after the Contract acceptance date.

**TS 11.13 Contractor Variations**

In the event the Contractor is a joint venture of two or more contractors, all grants, covenants, provisos and claims, rights, powers, privileges, and liabilities of the Contract shall be construed and held to be several as well as joint. Any notice, order, direction, request or other communications required to be or that may be given by the District to the Contractor under this Contract shall be well and sufficiently given to the joint venture if given to the Contractor's liaison or other designated contact. Any notice, request or other communication to the District under this Contract shall be deemed to have been given to the District if signed by the Contractor's liaison or other designated contact.

In the event that the Contractor is not the bus manufacturer, then the manufacturer of the proposed bus shall be a party to this Contract for the purpose of guaranteeing full and complete performance in the event of default by the Contractor and providing the District with information and documentation necessary to assure the Contractor's complete performance and preserve all of the District's rights under the Contract. The manufacturer shall be bound by all grants, covenants, provisos, and claims, rights, powers and liabilities of the Contract. In the event of default by the Contractor, the District shall have the absolute right to require the manufacturer to fully perform under the terms of the Contract. Such right shall be in addition and not in lieu of any rights under the performance bond.

**TS 11.14 Waiver of Rights by the District**

No action or want of action on the part of the District at any time to exercise any rights or remedies conferred upon it under this Contract shall be deemed to be a waiver on the part of the District of any of its rights or remedies. The District shall be deemed to have waived a right or remedy only if issued or confirmed in writing as a waiver by the District. No waiver of one right or remedy shall act as a waiver of any other right or remedy or as a subsequent waiver of the same right and remedy.

**TS 11.15 Dispute Resolution**

All claims, counterclaims, disputes or other matters, arising out of the performance of this Contract that cannot be resolved by the Contract Officer and the General Manager shall be referred to the Director or designee for final resolution. The Director or designee shall make a determination within 30 days of such referral, provided the Director is given all facts, data and contentions which relate to the referral, and all other information and material necessary for its resolution. Such referral and determination by the Director or designee
shall be a condition precedent to the commencement of a civil action to adjudicate such dispute.

**TS 11.16 Units of Measure**
The Contractor may use either standard units of measure as used in the United States or metric units of measure in the conduct of the Work. If metric units are used, the standard equivalent shall be shown immediately adjacent to it. The chosen units of measure shall be applied consistently in all drawings and documentation. The District must approve any exception.

**TS 11.17 Errors and Omissions**
If the Contractor in the course of the Work becomes aware of any errors or omissions in the Contract Documents or in the data as given in the instructions or if it becomes aware of any discrepancies in the Contract Documents, the Contractor shall immediately inform the District. Any Work done after such discovery until the Contractor has delivered written notification thereof to the District post one Work Day, the Work will be done at the Contractor's risk and expense.

**TS 11.18 Assignment of Options (Not Applicable)**

**TS 12. Drawings and Design Review**

**TS 12.1 Engineering Drawings**

**TS 12.1.1 General**
Buses shall be manufactured according to the requirements of the Contractor's engineering drawings which shall completely describe and define the buses, consistent with both the requirements and the intent of the Contract documents and all applicable federal, state, and local laws, regulations, rules, executive orders and codes. The Contractor shall submit such additional or revised drawings, diagrams, calculations, test results and demonstrative evidence as the District deems necessary to confirm the completeness and accuracy of the Contractor's engineering drawings.

**TS 12.1.2 Distribution**
One (1) copy of all design drawings, engineering process sheets, and other bus manufacturing documentation, including latest revisions; shall be supplied to the Inspector as they are produced.

Copies of all design drawings and other bus manufacturing documentation, including latest revisions, shall be supplied to the Contract Officer as they are produced, if requested.
TS 12.1.3 Standards
The drawings shall reference various engineering standards or standard specifications, as appropriate, which shall control material quality, assembly techniques and fabrication of the buses and components on them. English language copies of these standards shall be available to the Inspector.

TS 12.2 Control of Changes to Bus Design
No change that would alter the approved bus design shall be incorporated into a bus without prior approval in writing by the District. The Contractor shall submit a request for change in writing which describes the change and the reasons for it and includes the fleet number and VIN of the bus on which the change is proposed to have first application and detailed drawings of the portions of the bus affected by the proposed change. The Contractor shall fully explain and justify any change proposed which will affect cost or delivery dates. The District retains full authority to decide whether such a change should be authorized. The District will respond within ten (10) days of receipt of a notice requesting a change by denying, approving or requesting additional information. Unless otherwise approved in writing, the Contractor shall assume the additional cost of the change including any other related revisions to the design or modifications to the buses. The acceptance of any such change by the District shall not relieve the Contractor from responsibility for the efficiency, quality and performance of the bus as required by the Contract Documents.

TS 12.3 English Language
All schedules, drawings, manufacturing documentation, manuals, parts lists and any other written material or other communication required in the performance of the Contract shall be prepared using the English language as used in the U.S. throughout, so that the documents will be readily understood when in use in the maintenance facilities and by the staff members of the District. Drawings and diagrams of electrical or electronic circuits shall use symbols and notation as used in the U.S. electronics industry. The English language as used in the U.S. shall be used for all oral, written or other communications.

TS 12.4 Standards
The latest edition in effect on the date of submittal of Best and Final Offers shall be used whenever a standard specification, code or recommended practice is referred to and it shall be considered to be a part of the Contract Documents insofar as it applies.

TS 12.5 Design Review
The Contractor shall schedule a preliminary and final design review to be held prior to the start of manufacture or assembly of the prototype bus. Such review shall be conducted after all necessary design work has been completed and all documentary information needed to demonstrate that the design is in conformance with the specifications has been
submitted to the District. The design review shall be conducted at a location determined by the District.

The purposes of the design review include, but are not limited to, the following: a detailed review of the Contractor's engineering drawings to verify conformance of the design with the Specifications; review of substitute or equal materials or equipment not dealt with prior to Contract award; review of manufacturing or assembly methods or components submitted during the proposal process; review of the Contractor's critical path schedule for the Work; and review and approval of the Contractor's quality assurance program.

The information shall be sufficiently complete to assure that the buses and their components meet the specified levels of function and performance. The Contractor and the chief subcontractors shall present this design material over a 30 day period by a schedule established by the Contractor. All analyses and requests for approvals shall be submitted prior to the design review.

The design as refined and confirmed by the review shall constitute the approved design for the bus. The construction of the prototype bus should follow the design review and resolution of items of non-conformance.

Any failure by the District to detect any defects or omissions in any design, material, method or program shall in no way relieve the Contractor from fully complying with the requirements and intent of the Contract documents.

The District participation in design or engineering drawing reviews or acceptance of any schedule, change proposal or drawing or any information shall not relieve the Contractor of its commitment and responsibility for compliance with the Specifications. The Contractor shall at its own expense remedy any deficiencies and defects that may develop even though prior tests have seemingly indicated compliance with the Specifications.

**TS 12.6 Lead Production Bus Review**

Four (4) lead production buses shall be made available for inspection and testing at the District's facilities. The bus review shall be scheduled by the Contractor when a vehicle has been completed with all equipment and furnishings installed, but early enough so minor design changes resulting from the review will not delay production or cause scrapping of production material. The lead production bus must be available for inspection and approval under the Contract Documents not less than ninety (90) days prior to start of production of any buses of its type. The Contractor shall bear the delay, expense and inefficiency resulting from failure to schedule and complete the prototype review sufficiently in advance of production.
The Contractor may wish to build an additional bus, which will remain at the Contractor's plant during lead production bus review and testing by the District.

Any failure by the District to detect any defects or omissions in this review shall in no way relieve the Contractor from fully complying with the Contract Documents. All lead production buses shall be brought up to the final production bus configuration in all respects at no additional cost to the District, except as may be agreed by Change Order(s).

**TS 12.7 Compliance Testing**

When the District requests the Contractor to demonstrate that the bus complies with any requirement in the Specification, the Contractor shall submit a test plan for approval by the District not less than fourteen (14) days before the demonstration is scheduled to begin. The demonstration shall be conducted at a site proposed by the Contractor and approved by the District. If the demonstration requires specific test equipment, or requires the bus to be loaded with weight, or put in a cold room, the Contractor will supply all necessary items. Any defects found shall be corrected, and all necessary changes shall be incorporated in all production buses at no additional cost to the District. The Contractor will supply a written test report to the District within thirty (30) days of the completion of the test.

The District shall be informed at least fourteen (14) days prior to any test or analysis used for verification of Contract compliance and may witness each such test or analysis. Certified results of tests not conducted strictly for this Contract may be submitted in lieu of conducting additional tests, if the Contractor can demonstrate to the District that the proposed test results are relevant and applicable.
TS 13. Technical Proposal Requirements

TS 13.1 Proposal Overview and Specification Requirements

TS 13.1.1 General

The technical proposal shall enable District evaluating personnel to arrive at a sound determination as to whether or not the proposed vehicles will meet the requirements of District. To this end, the technical proposal shall be sufficiently specific, detailed, and complete as to clearly and fully demonstrate that the Offeror has a thorough knowledge and understanding of the requirements and has valid and practical solutions for technical problems. Concise text, graphs, tables and drawings should be included, as needed, to clearly describe the equipment and performance. Statements that paraphrase the specifications or attest that standard procedures will be employed are inadequate to demonstrate how it is proposed to comply with the specified requirements. The District seeks a contract which provides the best solution for the procurement yet allows the Contractor flexibility in providing a cost-effective solution. Accordingly, the District expects Offeror to include their own solutions in proposed designs, as appropriate.

The technical proposal shall be a technical description of the proposed vehicle subsystems, system support, and of the management approach for completing the work. It shall incorporate, on a section-by-section basis, sufficient information to permit a thorough understanding of the proposed vehicle and systems, without the need for any additional information or discussion. Key design data shall be provided on the General Coach Data Sheet and include the proposal. If offer includes alternate Contractors for subsystems, then sufficient information shall be provided for each alternate. All drawings required to adequately describe the vehicle design elements being offered shall be of sufficient quality and detail to enable a meaningful evaluation. The drawings shall be bound in the proposal, and those larger than 8.5” x 11” shall be properly folded. Drawings may be half-size or reduced-size providing clarity and legibility is maintained.

TS 13.1.2 Organization

The technical proposal shall consist of numbered sections, clearly separated from each other by index tabs. The title and number used to identify each section shall be consistent with the sections of the Technical Specification identified in the Contract. Each technical proposal section shall be complete and self-contained so that the reviewer can obtain a thorough understanding of the solution(s) being offered to meet the requirements of the associated Specification sections. All drawings, schematics, tables, or other pre-packaged technical documentation shall be included as enclosures or appendices to the proposal section to which they pertain. The following items of information shall be included in the technical Sections (see TS 13.1.4) in the proposal to the extent they are applicable:

- A complete description of the system and equipment being offered.
• Brand names and/or subcontractor identity for major systems and/or equipment.
• Evidence of in-service performance (duration, type of service, where/transit property and performance record). Provide the manufacturer’s data sheets, specifications and number of units in service elsewhere. Include contact points and telephone numbers of individuals at properties where the equipment has been in service.
• Diagnostic capabilities integral to the equipment. Include the type of records, and their accessibility and a description of how the diagnostics minimize fault finding and the mean time to repair (MTTR).
• Estimated routine maintenance requirements and intervals.
• Design status as it relates to solutions requiring design and development of any new equipment required to meet the Districts specifications.
• Offeror may propose alternatives for suppliers of subsystems.
• Verification that the offered solution is fully compliant with the Specification. The Offeror may include alternative solutions, which may deviate from the Specified requirements. However, should the Offeror elect to include solutions which are believed to be advantageous to the District but which are not in full compliance with the Specification they shall be clearly identified and included using the District Deviations Form. The Offeror shall include in this form all applicable items in 1 through 6 above, plus a clear explanation of and supporting documentation on the advantages and acceptability of the alternative for the intended service, and the specific changes to the Specification required to make the alternative compliant. If the Offeror proposes the use of an alternative technical standard in place of the standard specified in the Technical Specification, in addition to the above requirements, Offeror shall provide a copy of the proposed standard in the English Language. (Any price benefits associated with each proposed deviation shall also be identified on the deviation form and submitted in the Price Proposal.)
• Table of Contents, at the beginning of the section, listing major subdivisions of the technical presentation, all enclosures and other attachments comprising the individual and separate sections.
• Evidence that the Offeror is a Federal Transit Administration (FTA) authorized Transit Vehicle Manufacturer for the year that the Offeror is submitting a proposal.

TS 13.1.3 Evaluation of proposals and selection process

Evaluation/Selection Committee

An Evaluation/Selection Committee, which may include Agency staff, consortium members, and possibly one or more outside experts, will review and screen the Proposals submitted according to the pre-established criteria as set forth below.
Evaluation Methodology (Total of 1000 Points)
The maximum number of points achievable in each of the aforementioned areas is as follows:

- **Product design and performance**: 0–400 points
- **Manufacturer’s reputation and performance**: 0–400 points
- **Price proposal**: 0–200 points

Technical Evaluation Criteria (maximum of 800 points)
Proposals will be evaluated using the following principal selection criteria:

1. **Product design and performance (0–400 points):**

   The information provided by the Proposer in its technical submittal relating to the buses to be provided will be utilized to evaluate the proposal in relation to this factor. Failure to complete the required submissions or list all requested deviations on the proper form with adequate supporting data will impact the final point determination of this section. The number and significance of the requested deviations from the District’s specifications, which are intended to describe a bus design that provides for fleet commonality and standardization of parts, training and related support costs will impact the final point determination of this section. Vehicle construction and system design, as well as documented reliability may be used in this evaluation, as well as other design and performance elements of the components which comprise those systems. At a minimum, test results, safety and maintenance factors, and cost of normal operation for the bus design and system components proposed may be considered in determining a final value for this factor.

2. **Proposer’s reputation and performance (0–400 points):**

   The Committee will consider the capability and reputation of the Proposer as presented in the Proposal or as is determined by review of information available from references or other resources. The evaluation may look at the Proposer’s overall organizational and financial capabilities and consider key components such as organizational reporting structure, quality control, quality assurance, research and development, technical, training and parts support, response time, product capabilities, ability to furnish multiple bus configurations, bonding capacity, and financial history, as well as other considerations, in reaching a final point determination. The committee may also look at judgments, liens, Fleet Defect history, warranty claims and the steps that the manufacturer took to resolve these concerns in assessing the overall reputation of the manufacturer.
Price Proposal Evaluation (maximum of 200 points)
The Cost Proposal criteria will be based on the average of the “Total Base Offer per Bus” for each bus type as noted in Section TS 13.2 Price Proposal Requirements.

TS 13.2 Price Proposal Requirements

TS 13.2.1 General
The Offeror is required to complete and execute the Pricing Schedule Forms CER 6 and provide same in the price proposal. All prices shall include any applicable taxes. The Contractor shall be liable for payment of all local taxes applicable to the complete bus as delivered and should add these amounts to the Offer price. The District shall be liable for any such state and local taxes applicable to the complete bus as delivered that are circulated and become effective between the due date and the delivery date.

TS 13.2.2 Furnishings
The Offeror shall provide the following furnishings listed below along with any deviations to exclude price information. All Bond or security offered will be included.

- Special Tools
  As part of the Price Proposal, Offeror shall furnish prices for portable and shop test equipment, diagnostic equipment, and special tools required for these vehicles as described in Section TS 8.9 of the Contract. The District shall have the right to use software on other machines.

- Training Aids and Materials
  As part of the Price Proposal, Offeror shall provide all the training materials and specified training aids as described in Section TS 8.5 of the Contract.

- Spare Parts Package.
  As part of the Price Proposal, Offeror shall provide pricing for all of the spare parts shown in section TS 9.6 the Price Schedule.

TS 13.3 Contracts Administration Package Requirements

TS 13.3.1 Statements
The Contracts Administration Package shall include a Pre-Award Evaluation Data Form, including a statement of the Offeror’s experience record, and the type of contract work previously performed. The Offeror shall include a list of the following statements:
• Governmental agencies and/or private concerns for which the work was performed, a statement by the financial institutions with which the Offeror conducts business and a list of contracts, if any, on which failure to complete within a specified time resulted in the assessment of liquidated damages.
• A copy of the most recent audited financial statement or a statement agreeing to present on site financial documentation with the Districts CFO or designee of sufficient completeness to satisfy requirements of the schedule and pre-award evaluation data form.
• A letter from the Offeror’s insurance carrier stipulating that the Offeror has or can obtain the required insurance.
• A letter from surety stipulating that the Offeror can obtain the required performance bond. No pricing information shall be provided in this letter.
• A letter of commitment, signed by an authorized officer of the parent company, stipulating the willingness of the parent company to provide financial guaranty.
• Offer form made by an individual, shall be signed by him or her, and if he or she is doing business under a fictitious name the proposal shall so state. If the offer is made by a co-partnership, the full name and addresses of all members and the address of the co-partnership shall be stated and the offer shall be signed for all members by one or more members thereof. If the offer is made by a corporation, it shall be signed in the corporate name, by an authorized officer or officers. If the offer is made by a joint venture, the full name and addresses of all the members of the joint venture shall be stated and the offer shall be signed by each venture.

• Buy America Certification
• Debarment & suspension Certification
• Lobbying Certification
• DBE Approval Certification
• Certification of Compliance with Bus Testing Requirements

**TS 13.4 Proprietary/ Confidential Information Package**
This package shall include any material that the Offeror has identified as proprietary information, trade secrets or confidential commercial and financial information as set forth in the RFP.

**TS 13.5 Proposal Packaging Requirements**
Proposals shall be submitted in four separately sealed packages. Each package shall be marked as specified below and shall contain all of the proposal documents for which the package is required to be marked and no other documents. These same requirements shall apply to any Best and Final Offers which may be requested.

1. PACKAGE NO. 1
BUS RAPID TRANSIT (BRT) BUS PROCUREMENT
PERIOD OF PERFORMANCE: 01 JUNE 2015 THROUGH 30 NOVEMBER 2017
ADDENDUM NO. 3

TECHNICAL PROPOSAL
RFP Number; 60ft. BRT Buses
1. Technical Proposal
2. References
3. Deviations (without price information)
4. Acknowledgment of Addenda
5. General Coach Data Sheet

SUBMITTED BY:
(Offeror’s Name and Address)

2. PACKAGE NO. 2
PRICE PROPOSAL
RFP Number; 60ft. BRT Buses
1. Price Schedule (Including option sheet, spare parts package and diagnostic test equipment).
2. Bond or other Offer Security
3. Deviations (with pricing information)

SUBMITTED BY:
(Offeror’s Name & Address)

3. PACKAGE NO. 3
CONTRACTS ADMINISTRATION PACKAGE
RFP Number; 60ft. BRT Buses
1. Pre-Award Evaluation Form
2. A presentation of the Offeror’s financial statement
3. Letter for Insurance
4. Letter for Performance Bond
5. Letter of Commitment for Financial Guaranty
6. Offer Form
7. Buy America Certification
8. Debarment & Suspension Certification
9. Lobbying Certification
10. DBE Approval Certification
11. Certification of Compliance with Bus Testing Requirements
12. Certification Requirements of the American Recovery & Reinvestment Act

SUBMITTED BY:
(Offeror’s Name & Address)
4. PACKAGE NO. 4

PROPRIETARY/CONFIDENTIAL INFORMATION PACKAGE
RFP Number; 60ft. BRT Buses
1. Proprietary/Confidential Information
2. Trade Secrets

SUBMITTED BY:
(Offeror’s Name & Address)

No cost, price or financial information of any kind shall be included in Packages No. 1, 3 or 4 or in any of the proposal documents that are contained therein. Any proprietary infor-
mation, trade secrets, or confidential commercial and financial information, which an Offe-
ror believes should be exempt from disclosure, shall be submitted in a separate volume
(Package No. 4). Proposal packages shall be addressed and delivered to the address
specified by the Districts “Contracting Officer”.

(REMAINDER OF PAGE INTENTIONALLY LEFT BLANK)
TS 13.6 Vehicle Questionnaire

TS 13.6.1 Form

This form must be completed and included in the Technical Proposal.

**GENERAL COACH DATA SHEET:**
**SIXTY FOOT LOW FLOOR (5 DOOR) BRT BUS**

<table>
<thead>
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<th><strong>Bus manufacturer:</strong></th>
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<td><strong>Understructure manufacturer:</strong></td>
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</tr>
<tr>
<td><strong>Model number:</strong></td>
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**Basic Body Construction**

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**Tubing or frame member thickness and dimensions**

<table>
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<th><strong>Overstructure</strong></th>
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<tbody>
<tr>
<td><strong>Understructure</strong></td>
<td></td>
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**Skin thickness and material**

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<tr>
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<tr>
<td><strong>Rear end</strong></td>
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**Dimensions**

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<thead>
<tr>
<th><strong>Overall length</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Over bumpers</strong></td>
<td>ft</td>
</tr>
<tr>
<td><strong>Over body</strong></td>
<td>ft</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Overall width</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Over body excluding mirrors</strong></td>
<td>ft</td>
</tr>
<tr>
<td><strong>Over body including mirrors—driving position</strong></td>
<td>ft</td>
</tr>
<tr>
<td><strong>Over tires front axles</strong></td>
<td>ft</td>
</tr>
<tr>
<td><strong>Over tires center axle</strong></td>
<td>ft</td>
</tr>
<tr>
<td><strong>Over tires rear axles</strong></td>
<td>ft</td>
</tr>
</tbody>
</table>

| **Overall height (maximum)** | ft | in. |
Overall height (main roof line)  

<table>
<thead>
<tr>
<th>Angle of approach</th>
<th>deg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Break over angle</td>
<td>deg</td>
</tr>
<tr>
<td>Break over angle</td>
<td>deg</td>
</tr>
<tr>
<td>Angle of departure</td>
<td>deg</td>
</tr>
</tbody>
</table>

**Doorway Dimensions**

<table>
<thead>
<tr>
<th></th>
<th>Front</th>
<th>Center</th>
<th>Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width between door posts</td>
<td>in.</td>
<td>in.</td>
<td>in.</td>
</tr>
<tr>
<td>Door width between panels</td>
<td>in.</td>
<td></td>
<td>in.</td>
</tr>
<tr>
<td>Clear door width</td>
<td>in.</td>
<td>in.</td>
<td>in.</td>
</tr>
<tr>
<td>Doorway height</td>
<td>in.</td>
<td>in.</td>
<td>in.</td>
</tr>
<tr>
<td>Knuckle clearance</td>
<td>in.</td>
<td>in.</td>
<td>in.</td>
</tr>
</tbody>
</table>

**Step height from ground measured at center of doorway**

**Front doorway, empty**

<table>
<thead>
<tr>
<th>Kneeled</th>
<th>a.</th>
<th>in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unkneeled</td>
<td>b.</td>
<td>in.</td>
</tr>
</tbody>
</table>

**Ramp angle**

<table>
<thead>
<tr>
<th>R1</th>
<th>deg</th>
<th>a.</th>
<th>in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>R2</td>
<td>deg</td>
<td>b.</td>
<td>in.</td>
</tr>
</tbody>
</table>

**Rear Doorway, empty**

**Interior head room (center of aisle)**

<table>
<thead>
<tr>
<th>Front axle location</th>
<th>in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center axle location</td>
<td>in.</td>
</tr>
<tr>
<td>Rear axle location</td>
<td>in.</td>
</tr>
</tbody>
</table>

**Aisle width between transverse seats**  
in.
**Floor height above ground (centerline of bus)**

<table>
<thead>
<tr>
<th>Location</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>At front door</td>
<td></td>
</tr>
<tr>
<td>At front axle</td>
<td></td>
</tr>
<tr>
<td>At center door</td>
<td></td>
</tr>
<tr>
<td>At center axle</td>
<td></td>
</tr>
<tr>
<td>At drive axle</td>
<td></td>
</tr>
<tr>
<td>At rear door</td>
<td></td>
</tr>
</tbody>
</table>

**Minimum ground clearance (between bus and ground, with bus unkneeled)**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excluding axles</td>
<td></td>
</tr>
<tr>
<td>Including axles</td>
<td></td>
</tr>
</tbody>
</table>

**Horizontal turning envelope** (see diagram below)

<table>
<thead>
<tr>
<th>Radius Type</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outside body turning radius, TR0 (including bumper)</td>
<td>ft, in.</td>
</tr>
<tr>
<td>Front inner corner radius, TR1</td>
<td>ft, in.</td>
</tr>
<tr>
<td>Front wheel inner turning radius, TR2</td>
<td>ft, in.</td>
</tr>
<tr>
<td>Front wheel outer turning radius, TR3</td>
<td>ft, in.</td>
</tr>
<tr>
<td>Inside Body Turning Radius innermost point, TR4 (including bumper)</td>
<td>ft, in.</td>
</tr>
</tbody>
</table>
## Wheelbase

<table>
<thead>
<tr>
<th></th>
<th>Front</th>
<th>Center</th>
<th>Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Overhang, centerline of axle over bumper

<table>
<thead>
<tr>
<th></th>
<th>Front</th>
<th>Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Floor

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Interior length</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interior width (excluding coving)</td>
<td>ft</td>
<td>in.</td>
</tr>
<tr>
<td>Total standee area (approximately)</td>
<td>ft(^2)</td>
<td>in.</td>
</tr>
<tr>
<td>Minimum distance between wheelhouses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Center</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Maximum interior floor slope (from horizontal) |         |
|                                              | deg     |
## Passenger capacity provided

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total maximum seating</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standee capacity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum hip to knee room</td>
<td>in.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum foot room</td>
<td>in.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Weight

<table>
<thead>
<tr>
<th>No. of people</th>
<th>Front axle</th>
<th>Center axle</th>
<th>Rear axle</th>
<th>Total bus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Left Right Total</td>
<td>Left Right Total</td>
<td>Left Right Total</td>
<td>Total bus</td>
</tr>
<tr>
<td>Empty bus, full fuel and farebox</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fully seated, full fuel and farebox</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fully loaded standee and fully seated, full fuel and farebox</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crush load (1.5x fully loaded)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GVWR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAWR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Engine, main

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type and weight rating</td>
<td></td>
</tr>
</tbody>
</table>
Model number

Bore     in.
Stroke   in.
Displacement in.³
Compression ratio

Injector type and size

Net SAE horsepower hp at RPM
Net SAE torque lb/ft at RPM

Crankcase oil capacity

New engine, dry gal
New engine, wet gal

Turbocharger make and model

Maximum speed, no load RPM
Maximum speed, full load RPM
Speed at idle RPM
Speed at fast idle RPM

**Engine information/graphs to be attached with this form:**

- Engine speed vs. road speed
- Torque vs. engine speed
- Horsepower vs. engine speed
- Fuel consumption vs. engine speed
- Vehicle speed vs. time (both loaded and unloaded)
- Vehicle speed vs. grade (both loaded and unloaded)
- Acceleration vs. time
- Change of acceleration vs. time

**Hybrid drive or transmission**

Manufacturer

Type

Speeds

Gear ratios

<table>
<thead>
<tr>
<th></th>
<th>Forward</th>
<th>Reverse</th>
</tr>
</thead>
</table>

Shift speeds

<table>
<thead>
<tr>
<th>Shift</th>
<th>mph</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st–2nd</td>
<td></td>
</tr>
<tr>
<td>2nd–3rd</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>3rd–4th mph</td>
<td></td>
</tr>
<tr>
<td>4th–5th (if applicable) mph</td>
<td></td>
</tr>
<tr>
<td>5th–6th (if applicable) mph</td>
<td></td>
</tr>
<tr>
<td>Fuel capacity (including heat exchanger and filters)</td>
<td></td>
</tr>
<tr>
<td>Voltage regulator</td>
<td></td>
</tr>
<tr>
<td>Manufacturer</td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td></td>
</tr>
<tr>
<td>Voltage equalizer</td>
<td></td>
</tr>
<tr>
<td>Manufacturer</td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td></td>
</tr>
<tr>
<td>Alternator</td>
<td></td>
</tr>
<tr>
<td>Manufacturer</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td></td>
</tr>
<tr>
<td>Output at idle</td>
<td></td>
</tr>
<tr>
<td>Output at maximum speed</td>
<td></td>
</tr>
<tr>
<td>Maximum warranted speed</td>
<td></td>
</tr>
<tr>
<td>Speed at idle (approximately)</td>
<td></td>
</tr>
<tr>
<td>Drive type</td>
<td></td>
</tr>
<tr>
<td>Starter motor</td>
<td></td>
</tr>
<tr>
<td>Manufacturer</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td></td>
</tr>
<tr>
<td>Air compressor</td>
<td></td>
</tr>
<tr>
<td>Manufacturer</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>Rated capacity</td>
<td></td>
</tr>
<tr>
<td>Capacity at idle (approximately)</td>
<td></td>
</tr>
<tr>
<td>Capacity at maximum speed (engine)</td>
<td></td>
</tr>
<tr>
<td>Maximum warranted speed</td>
<td>rpm</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>Speed idle</td>
<td>rpm</td>
</tr>
<tr>
<td>Drive type</td>
<td></td>
</tr>
<tr>
<td>Governor:</td>
<td></td>
</tr>
<tr>
<td>Cut-in pressure</td>
<td>psi</td>
</tr>
<tr>
<td>Cut-out pressure</td>
<td>psi</td>
</tr>
</tbody>
</table>

### Axles

<table>
<thead>
<tr>
<th></th>
<th>Manufacturer</th>
<th>Type</th>
<th>Model number</th>
<th>Gross axle weight rating</th>
<th>Axle load</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Second</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Third</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Axle ratio

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>

### Suspension system

<table>
<thead>
<tr>
<th></th>
<th>Manufacturer</th>
<th>Type:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>First:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Second:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Third:</td>
</tr>
<tr>
<td>Springs:</td>
<td></td>
<td>First:</td>
</tr>
</tbody>
</table>
## Second:

### Joint

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Type</th>
<th>Model number</th>
</tr>
</thead>
</table>

## Third:

### Wheels and tires

#### Wheels

<table>
<thead>
<tr>
<th>Make</th>
<th>Size</th>
<th>Capacity</th>
<th>Material</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Tires</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Type</th>
<th>Size</th>
<th>Load range/air pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Steering, power

#### Pump

<table>
<thead>
<tr>
<th>Manufacturer and model number</th>
<th>Type</th>
<th>Relief pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>psi</td>
</tr>
</tbody>
</table>

#### Booster/gear box

<table>
<thead>
<tr>
<th>Manufacturer and model number</th>
<th>Type</th>
<th>Ratio</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Power steering fluid capacity</th>
<th>gal</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Maximum effort at steering wheel</th>
<th>lbs (unloaded stationary coach on dry asphalt pavement)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Steering wheel diameter</th>
<th>in.</th>
</tr>
</thead>
</table>
### Brakes

Make of fundamental brake system

Brake chambers vendor size and part number:

<table>
<thead>
<tr>
<th>First:</th>
<th>Second:</th>
<th>Third:</th>
</tr>
</thead>
</table>

Brake operation effort Max Load @ 20MPH

Brake operation effort Min Load @ 20MPH

---

### Brake Discs

<table>
<thead>
<tr>
<th>First: (Manufacturer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part number</td>
</tr>
<tr>
<td>Diameter in.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second: (Manufacturer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part number</td>
</tr>
<tr>
<td>Diameter in.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third: (Manufacturer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part number</td>
</tr>
<tr>
<td>Diameter in.</td>
</tr>
</tbody>
</table>

Brake Pad manufacturer

Type

Brake lining thickness in.

---

### Cooling System

#### Radiator/charge air cooler

<table>
<thead>
<tr>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>Model number</td>
</tr>
</tbody>
</table>

Number of tubes

<table>
<thead>
<tr>
<th>Tubes outer diameter in./in.</th>
</tr>
</thead>
</table>

Fins per inch fins

Fin thickness in.
Total cooling and heating system capacity [gal]

Radiator fan speed control [quarts]

Surge tank capacity

Engine thermostat temperature setting:
  Initial opening (fully closed) [°F]
  Fully open [°F]

Overheat alarm temperature sending unit setting [°F]

Shutdown temperature setting [°F]

Air reservoir capacity

Supply reservoir [in.³]

Primary reservoir [in.³]

Secondary reservoir [in.³]

Packing reservoir [in.³]

Accessory reservoir [in.³]

Other reservoir type [in.³]

Heating, ventilation and air conditioning equipment

Heating system capacity [BTU/hr]

Air conditioning capacity [BTU]

Ventilating capacity [CFM]

Compressor

Manufacturer

Model

Number of cylinders

Drive ratio

Maximum warranted speed [rpm]

Operating speed [rpm (recommended)]

Weight [lbs]

Oil capacity
  Dry [gal]
  Wet [gal]

Refrigerant: Type [lbs]
### Condenser

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td></td>
</tr>
<tr>
<td>Number of fins/in.</td>
<td></td>
</tr>
<tr>
<td>Outer diameter of tube</td>
<td>in.</td>
</tr>
<tr>
<td>Fin thickness</td>
<td>in.</td>
</tr>
</tbody>
</table>

### Condenser fan

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td></td>
</tr>
<tr>
<td>Fan diameter</td>
<td>in.</td>
</tr>
<tr>
<td>Speed maximum</td>
<td>rpm</td>
</tr>
<tr>
<td>Flow rate (maximum)</td>
<td>CFM</td>
</tr>
</tbody>
</table>

### Receiver

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td></td>
</tr>
<tr>
<td>Capacity</td>
<td>lbs</td>
</tr>
</tbody>
</table>

### Condenser fan drive motors

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>Horsepower</td>
<td>hp</td>
</tr>
<tr>
<td>Operating speed</td>
<td>rpm</td>
</tr>
</tbody>
</table>

### Evaporator fan drive motors

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>Horsepower</td>
<td>hp</td>
</tr>
<tr>
<td>Operating speed</td>
<td>rpm</td>
</tr>
</tbody>
</table>

### Evaporator(s)

Page 245 of 303
| **Manufacturer** |  |
| **Model** |  |
| **Number of rows** |  |
| **Number of fins/in.** |  |
| **Outer diameter of tube** | in.  |
| **Fin thickness** | in.  |
| **Number of evaporators** |  |

**Expansion valve**

| **Manufacturer** |  |
| **Model** |  |

**Filter-drier**

| **Manufacturer** |  |
| **Model** |  |

**Heater cores**

| **Manufacturer** |  |
| **Model** |  |
| **Capacity** | Btu/hr  |
| **Number of rows** |  |
| **Number of fins/in.** |  |
| **Outer diameter of tube** | in.  |
| **Fin thickness** | in.  |
| **Number of heater cores** |  |

**Floor heater blowers**

| **Front** |  |
| **Rear** |  |

**Controls**

| **Manufacturer** |  |
### Model

<table>
<thead>
<tr>
<th>Driver's heater</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manufacturer</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Capacity</strong></td>
<td>Btu/hr</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ventilation system</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coolant heater</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Make</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Capacity</strong></td>
<td>Btu</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interior lighting</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manufacturer</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Number of fixtures</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Size of fixtures</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Power pack</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Doors

#### Front

<table>
<thead>
<tr>
<th>Manufacturer of operating equipment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of door</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Type of operating equipment</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Rear

<table>
<thead>
<tr>
<th>Manufacturer of operating equipment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of door</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Type of operating equipment</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Passenger windows

#### Front

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>

---

Page 247 of 303
| Manufacturer |  |
| Model |  |
| Type |  |
| Number: | Side |  |
| Rear |  |
| Sizes: |  |
| Glazing: | Type |  |
| Thickness |  |
| Color of tint |  |
| Light transmission |  |

### Mirrors

<table>
<thead>
<tr>
<th>Size</th>
<th>Type</th>
<th>Manufacturer</th>
<th>Part no.</th>
<th>Model no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right side exterior</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left side exterior</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Center rearview</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front entrance area</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper-right corner</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rear exit area</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Seats

#### Passenger

| Manufacturer |  |
| Model |  |
| Type |  |

### Operator

| Manufacturer |  |
| Model and part number |  |
| Type |  |

### Paint

<p>| Manufacturer |  |
| Type |  |</p>
<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model number</th>
<th>Capacity</th>
<th>lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width of platform</td>
<td>in.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of platform</td>
<td>in.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System fluid capacity</td>
<td>quarts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of fluid used</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating hydraulic pressure</td>
<td>psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydraulic cylinders:</td>
<td>Size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model number</th>
<th></th>
</tr>
</thead>
</table>

**Destination signs**

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td></td>
</tr>
</tbody>
</table>

**Character length**

<table>
<thead>
<tr>
<th>Front destination</th>
<th>in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front route</td>
<td>in.</td>
</tr>
<tr>
<td>Curbside destination</td>
<td>in.</td>
</tr>
<tr>
<td>Rear route</td>
<td>in.</td>
</tr>
</tbody>
</table>

**Character height**

<table>
<thead>
<tr>
<th>Front destination</th>
<th>in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front route</td>
<td>in.</td>
</tr>
<tr>
<td>Curbside destination</td>
<td>in.</td>
</tr>
<tr>
<td>Rear route</td>
<td>in.</td>
</tr>
</tbody>
</table>
Number of characters
Front destination
Front route
Curbside destination
Rear route

Message width
Front destination in.
Front route in.
Curbside destination in.
Rear route in.

Electrical
Multiplex system
Manufacturer
Model number

Batteries
Manufacturer
Model number
Type

Communication system
GPS
Manufacturer
Model number

PA system

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model number</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amplifier</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microphone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal speakers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>External speaker</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Energy storage (hybrid drive)
<table>
<thead>
<tr>
<th>Type</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cells</td>
<td></td>
</tr>
<tr>
<td>Battery pack voltage</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>lbs</td>
</tr>
</tbody>
</table>

**Security camera system**

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Model number</td>
<td></td>
</tr>
<tr>
<td>Number of cameras</td>
<td></td>
</tr>
<tr>
<td>Storage capacity</td>
<td></td>
</tr>
</tbody>
</table>

**Bike racks**

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Model number</td>
<td></td>
</tr>
</tbody>
</table>

**Fire detection system**

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Model number</td>
<td></td>
</tr>
<tr>
<td>Fire detectors</td>
<td></td>
</tr>
<tr>
<td>Type (thermal or optical)</td>
<td></td>
</tr>
<tr>
<td>Number of detectors</td>
<td></td>
</tr>
</tbody>
</table>

**Automatic voice annunciator system**

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Model and part number</td>
<td></td>
</tr>
</tbody>
</table>

**Annunciator LED sign**

<table>
<thead>
<tr>
<th>Number of signs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing dimensions</td>
<td></td>
</tr>
<tr>
<td>Character length in.</td>
<td></td>
</tr>
<tr>
<td>Character height in.</td>
<td></td>
</tr>
<tr>
<td>Character width in.</td>
<td></td>
</tr>
</tbody>
</table>

**GPS antenna**
Manufacturer Model and part number

Automatic passenger counter
Manufacturer Model and part number a. b. c.

Sensor type

Real-time bus arrival prediction system

<table>
<thead>
<tr>
<th></th>
<th>Manufacturer</th>
<th>Model number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Router</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cellular modem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charge protection</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Electronic tire pressure monitoring system

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model number</th>
</tr>
</thead>
</table>

Electronic brake stroke/wear indicator system

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model number</th>
</tr>
</thead>
</table>

NOTE: All information above is accurate to the timeframe upon submission. The Agency reserves the right to update above data if changes occur, upon consultation with the customer.

TS 14. Technical Specification Definitions

- **Alternative.** An alternative specification condition to the default bus configuration. The District may define alternatives to the default configuration to satisfy local operating requirements. Alternatives for the default configuration will be clearly identified.
- **Ambient Temperature.** The temperature of the surrounding air. For testing purposes, ambient temperature must be between 16 °C (50 °F) and 38 °C (100 °F).
- **Analog Signals.** A continuously variable signal that is solely dependent upon magnitude to express information content. NOTE: Analog signals are used to represent the state of variable devices such as rheostats, potentiometers, temperature probes, etc.
• **Audible Discrete Frequency**: An audible discrete frequency is determined to exist if the sound power level in any 1/3-octave band exceeds the average of the sound power levels of the two adjacent 1/3-octave bands by 4 decibels (dB) or more.

• **Battery Compartment**: Low-voltage energy storage, i.e. 12/24 VDC batteries.

• **Battery Management System (BMS)**: Monitors energy, as well as temperature, cell or module voltages, and total pack voltage. The BMS adjusts the control strategy algorithms to maintain the batteries at uniform state of charge and optimal temperatures.

• **Braking Resistor**: Device that converts electrical energy into heat, typically used as a retarder to supplement or replace the regenerative braking.

• **Burst Pressure**: The highest pressure reached in a container during a burst test.

• **Capacity (fuel container)**: The water volume of a container in gallons (liters).

• **Cells**: Individual components (i.e., battery or capacitor cells).

• **Code**: A legal requirement.

• **Container**: A pressure vessel, cylinder, or cylinders permanently manifolded together used to store CNG.

• **Container Appurtenances**: Devices connected to container openings for safety, control or operating purposes.

• **Container Valve**: A valve connected directly to a container outlet.

• **Curb Weight**: Weight of vehicle, including maximum fuel, oil and coolant; and all equipment required for operation and required by this Specification, but without passengers or driver.

• **dBA**: Decibels with reference to 0.0002 microbar as measured on the “A” scale.

• **DC to DC Converter**: A module which converts a source of direct current (DC) from one voltage level to another.

• **Default Configuration Bus**: The bus described if no alternatives are selected. Signing, colors, the destination sign reading list and other information must be provided by the District.

• **Destroyed**: Physically made permanently unusable.

• **Discrete Signal**: A signal that can take only pre-defined values, usually of a binary 0 or 1 nature where 0 is battery ground potential and 1 is a defined battery positive potential.

• **DPF**: Diesel particulate filter.

• **Driver's Eye Range**: The 95th-percentile ellipse defined in SAE Recommended Practice J941, except that the height of the ellipse shall be determined from the seat at its reference height.

• **Energy Density**: The relationship between the weight of an energy storage device and its power output in units of watt-hours per kilogram (Wh/kg).

• **Energy Storage System (ESS)**: A component or system of components that stores energy and for which its supply of energy is rechargeable by a PPU and/or an off-vehicle energy source.

• **Flow Capacity**: For natural gas flow, this is the capacity in volume per unit time (normal cubic meters/minute or standard cubic feet per minute) discharged at the required flow rating pressure.
AC TRANSIT DISTRICT
PURCHASING DEPARTMENT
REQUEST FOR PROPOSAL
No. 2013-1235

BUS RAPID TRANSIT (BRT) BUS PROCUREMENT
PERIOD OF PERFORMANCE: 01 JUNE 2015 THROUGH 30 NOVEMBER 2017
ADDENDUM NO. 3

- **Fuel Line.** The pipe, tubing or hose on a vehicle, including all related fittings, through which natural gas passes.
- **Fusible Material.** A metal, alloy or other material capable of being melted by heat.
- **Fire Resistant.** Materials that have a flame spread index less than 150 as measured in a radiant panel flame test per ASTM-E 162-90.
- **Fireproof.** Materials that will not burn or melt at temperatures less than 2000 °F.
- **Free Floor Space:** Floor area available to standees, excluding the area under seats, area occupied by feet of seated passengers, the vestibule area forward of the standee line, and any floor space indicated by manufacturer as non-standee areas such as, the floor space “swept” by passenger doors during operation. Floor area of 1.5 sq ft shall be allocated for the feet of each seated passenger that protrudes into the standee area.
- **Fuel Management System.** Natural gas fuel system components that control or contribute to engine air fuel mixing and metering, and the ignition and combustion of a given air-fuel mixture. The fuel management system would include, but is not limited to, reducer/regulator valves, fuel metering equipment (e.g. carburetor, injectors), sensors (e.g., main throttle, wastegate).
- **GAWR (Gross Axle Weight Rating).** The maximum total weight as determined by the axle manufacturer, at which the axle can be safely and reliably operated for its intended purpose.
- **Gross Load.** 150 lbs for every designed passenger seating position, for the driver, and for each 1.5 square feet of free floor space. (Stuart: Applicable to? Per Ken)
- **GVW (Gross Vehicle Weight).** Curb weight plus gross load.
- **GVWR (Gross Vehicle Weight Rating):** The maximum total weight as determined by the vehicle manufacturer, at which the vehicle can be safely and reliably operated for its intended purpose.
- **High Pressure.** Those portions of the CNG fuel system that sees full container or cylinder pressure.
- **High Voltage (HV).** Greater than 50 volts (AC and DC).
- **Hose:** Flexible line.
- **Hybrid.** A vehicle that uses two or more distinct power sources to propel the vehicle.
- **Hybrid System Controller (HSC).** Regulates energy flow throughout hybrid system components in order to provide motive performance and accessory loads, as applicable, while maintaining critical system parameters (voltages, currents, temperatures, etc.) within specified operating ranges.
- **Hybrid Drive System (HDS).** The mechanical and/or electromechanical components, including the PPU and energy storage system, which comprise the traction drive portion of the hybrid propulsion system.
- **Intermediate Pressure.** The portion of a CNG system after the first pressure regulator, but before the engine pressure regulator. Intermediate pressure on a CNG vehicle is generally from 3.5 to 0.5 MPa (510 to 70 psi).
Inverter. A module that converts DC to and from AC.

Labeled. Equipment or materials to which has been attached a label, symbol or other identifying mark of an organization, which is acceptable to the authority having jurisdiction and concerned with product evaluation, which maintains periodic inspection of production labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Leakage. Release of contents through a Defect or crack. See Rupture.

Line: All tubes, flexible and hard, that carry fluids.

Local Regulations. Regulations below the state level.

Low-Floor Bus. A bus that, between at least the front (entrance) and rear (exit) doors, has a floor sufficiently low and level so as to remove the need for steps in the aisle between the doors and in the vicinity of these doors.

Low Voltage (LV). 50 volts or less (AC and DC).

Lower Explosive Limit. The lowest concentration of gas where, given an ignition source, combustion is possible.

Maximum Service Temperature. The maximum temperature to which a container/cylinder will be subjected in normal service.

Metallic Hose. A hose whose strength depends primarily on the strength of its metallic parts; it can have metallic liners or covers, or both.

Metering Valve. A valve intended to control the rate of flow of natural gas.

Module. Assembly of individual components

Motor (Electric). A device that converts electrical energy into mechanical energy.

Motor (Traction). An electric motor used to power the driving wheels of the bus.

Operating Pressure. The varying pressure developed in a container during service.

Physical Layer. The first layer of the seven-layer International Standards Organization (ISO) Open Systems Interconnect (OSI) reference model. This provides the mechanical, electrical, functional and procedural characteristics required to gain access to the transmission medium (e.g., cable) and is responsible for transporting binary information between computerized systems.

Pipe: Nonflexible line.

Power. Work or energy divided by time

Power Density. Power divided by mass, volume or area.

Propulsion System. System that provides propulsion for the vehicle proportional to operator commands. Includes, as applicable, the HDS, energy storage system and the hybrid system controller.

Real-Time Clock (RTC). Computer clock that keeps track of the current time.

Regenerative Braking. Deceleration of the bus by switching motors to act as generators, which return vehicle kinetic energy to the energy storage system.
• Retarder. Device used to augment or replace some of the functions of primary friction based braking systems of the bus.

• Rupture. Sudden and unstable damage propagation in the structural components of the container resulting in a loss of contents. See Leakage.

• Seated Load. 150 lbs for every designed passenger seating position and for the driver.

• SLW (Seated Load Weight). Curb weight plus seated load.

• Serial Data Signals. A current loop based representation of ASCII or alphanumeric data used for transferring information between devices by transmitting a sequence of individual bits in a prearranged order of significance.

• NOTE: An example is the communication that takes place between two or more electronic components with the ability to process and store information.

• Service Pressure. The settled pressure at a uniform gas temperature of 21 °C (70 °F) and full gas content. It is the pressure for which the equipment has been constructed, under normal conditions. Also referred to as the nominal service pressure or working pressure.

• Settled Pressure. The gas pressure when a given settled temperature, usually 21 °C (70 °F), is reached.

• Settled Temperature. The uniform gas temperature after any change in temperature caused by filling has dissipated.

• Solid State Alternator. A module that converts high-voltage DC to low-voltage DC (typically 12/24 volt systems).

• Sources of Ignition. Devices or equipment that because of their modes of use or operation, are capable of providing sufficient thermal energy to ignite flammable compressed natural gas-air mixtures when introduced into such a mixture, or when such a mixture comes into contact with them.

• Special Tools. Tools not normally stocked by the District.

• Specification. A particular or detailed statement, account, or listing of the various elements, materials, dimensions, etc. involved in the manufacturing and construction of a product.

• Standard. A firm guideline from a consensus group.

• Standards. Standards referenced in “Part 5: Technical Specifications” are the latest revisions unless otherwise stated.

• Standee Line. A line marked across the bus aisle to designate the forward area that passengers may not occupy when the bus is moving.

• State of Charge (SOC). Quantity of electric energy remaining in the battery relative to the maximum rated Amp hour (Ah) capacity of the battery expressed in percent. This is a dynamic measurement used for the energy storage system. A full SOC indicates that the energy storage system cannot accept further charging from the engine driven generator or the regenerative braking system.

• Stress Loops. The “pig-tails” commonly used to absorb flexing in piping.
• **Structure.** The structure shall be defined as the basic body, including floor deck material and installation, load bearing external panels, structural components, axle mounting provisions and suspension beams and attachment points.

• **Wheelchair.** A mobility aid belonging to any class of three- or four-wheeled devices, usable indoors, designed for and used by individuals with mobility impairments, whether operated manually or powered.

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SECTION 7 WARRANTY REQUIREMENTS (RESERVED)

SECTION 8 QUALITY ASSURANCE (RESERVED)

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ATTACHMENT “A”

Build schedule
The bus manufacturer’s contract administrator shall supply a fleet build production schedule based on the dates in the Notice to Proceed, and a description of the manufacturer’s schedule for plant operations.

The production schedule should contain specific milestone dates, such as:

- First vehicle on production line (date on which any work will begin);
- First vehicle off production line;
- First vehicle through manufacturer’s quality assurance inspections;
- First vehicle shipped to the District;
- Last vehicle on production line;
- Last vehicle off production line; and
- Last vehicle shipped to the District.

Plant tour (if meeting at OEM’s location)
The District will review the entire process from start to finish and review the work completed at each line station, including quality control measures.

Visual and Measured Inspections
Visual and measured inspections shall be conducted with the bus in a static condition. The purpose of the inspection testing includes verification of overall dimension and weight requirements, that required components are included and are ready for operation, and that components and subsystems designed to operate with the bus in a static condition do function as designed.

Total bus operation
Total bus operation shall be evaluated during road tests. The purpose of the road tests is to observe and verify the operation of the bus as a system and to verify the functional operation of the subsystems that can be operated only while the bus is in motion.

Each bus shall be driven for a minimum of 15 miles during the road tests. If requested, computerized diagnostic printouts showing the performance of each bus shall be produced and provided to the District. Observed defects shall be recorded on the test forms. The bus shall be retested when defects are corrected and adjustments are made. This process shall continue until defects or required adjustments are no longer detected.
Post-delivery tests
The District shall conduct acceptance tests on each delivered bus. These tests shall be completed within 15 days after bus delivery and shall be conducted in accordance with the District’s written test plans. The purpose of these tests is to identify defects that have become apparent between the time of bus release and delivery to the District. The post-delivery tests shall include visual inspection and bus operations. No post-delivery test shall apply new criteria that are different from criteria applied in a pre-delivery test.

Buses that fail to pass the post-delivery tests are subject to non-acceptance. The District shall record details of all defects on the appropriate test forms and shall notify the contractor of acceptance or non-acceptance of each bus, after completion of the tests. The defects detected during these tests shall be repaired according to procedures defined in the contract.

- Complete electrical system audit
- Dimensional requirements audit
- Seating capacity
- Water test
- Water runoff test
- Function test of systems/subsystems and components
- Sound/noise level tests
- Vehicle top speed
- Acceleration tests
- Brake stop tests
- Airflow tests
- PA function tests
- Air/brake system audit
- Individual axle weight
- Standee capacity
- Body deflection tests
- Silent alarm function test
- Interior lighting
- Exterior lighting
- Gradeability test
- Kneeling system function
- HVAC pulldown/heat
- Speedometer
- Outside air infiltration (smoke)
- Wheelchair ramps
• Engine performance qualification

This test shall be jointly conducted by the contractor and engine manufacturer (including but not limited to charge air cooler performance, air to boil test, loss of coolant, fuel system electrical inputs and engine protection system).

• Transmission performance qualifications

This test shall be jointly conducted by the Contractor and transmission manufacturer (including but not limited to retarder operation, heat exchanger, interface with ABS and electrical inputs).

Buy America audit

A post-delivery Buy America audit is required for federally funded bus procurements (see 49 CFR Part 663 for additional information). The onsite resident inspectors are to monitor the production processes to verify compliance with final assembly requirements identified by the Buy America pre-award audit. This audit is to verify compliance with final assembly requirements and final documentation of Buy America compliance and must be completed prior to title transfer.

Resident Inspection Process for Serial Production

At the discretion of the District the resident inspection process will be contracted by a qualified contract inspector.

Inspector responsibilities

The resident inspection process for the serial production of the buses begins following the completion and acceptance of the prototype or pilot vehicle if required, or according to the serial bus production schedule. Resident inspectors should represent the District for all build-related issues (quality, conformance, etc.). Resident inspectors can also address contractual type issues but should only do so under the consult of the District’s contracts administrator. Resident inspectors are sent to the manufacturer’s facility according to a Resident Inspection Schedule. Typically, one or two inspectors arrive on site at the manufacturing facility about one week prior to actual production to set up the resident inspection process and to begin preliminary quality assurance inspections for items such as power plant build-up and wire harness production, and to inspect incoming parts, fasteners, fluids, etc., that will be used in the production of the buses. During the serial production of the buses, the resident inspectors should monitor the production of each bus, verifying the quality of materials, components, sub-assemblies and manufacturing standards. In addition, the configuration of each vehicle should be audited using the vehicle manufacturer’s Build Specification and other documents to ensure contract compliance and uniformity.
Inspector rotation/scheduling
During the resident inspection phase, a single inspector or multiple inspectors could be used. If it is decided to use multiple inspectors, then the inspectors could be rotated on a biweekly to monthly basis as required. During the rotation of inspectors, a sufficient period of overlap should be provided to guarantee the consistency of the resident inspection process.

Resident inspector orientation
A resident inspector orientation by the bus manufacturer should take place upon the arrival of the initial inspection team. The orientation should include expectations for the use of personal protective equipment (safety shoes, safety glasses, etc.), daily check-in and check-out requirements, lines of communication, use of production documents such as speed memos and line movement charts, inspector/production meetings, inspector office arrangements, and anything else pertinent to the inspection team’s involvement during the build. Many of the above items should already be formalized during the pre-production meeting.

Audits, inspections and tests
The resident inspection process monitors the production of each vehicle. Inspection stations should be strategically placed to test or inspect components or other installations before they are concealed by subsequent fabrication or assembly operations. These locations typically are placed for the inspection of underbody structure, body framing, electrical panels and harnesses, air and hydraulic line routings, installation of insulation, power plant build-up and installation, rust inhibitor/undercoating application, floor installation, front suspension alignment, and other critical areas.

Vehicle inspections
Each bus is subjected to a series of inspections after the bus reaches the point of final completion on the assembly line. Typically, the vehicle manufacturer performs its own quality assurance inspections following assembly line completion before releasing each bus to the resident inspectors. The inspections for each vehicle are documented, signed off upon passing and included in the vehicle history book.

These are the typical (but not limited to) inspections performed on each bus by the resident inspectors:

- Water test inspection
- Road test inspection
- Interior inspection (including functionality)
- Hoist/undercarriage inspection
• Exterior inspection (including roof)
• Electrical inspection
• Wheelchair ramp/lift inspection

**Water test inspection**
The water test inspection checks the integrity of the vehicle’s body seams, window frame seals and other exterior component close-outs for their ability to keep rainwater, road splash, melting snow and slush, and other exterior water from entering the inside of the vehicle. The vehicle’s interior is inspected for signs of moisture and water leaks. To perform the leak inspection, interior ceiling and side panels are removed, and access doors are opened. If any moisture or water is detected, then the source of the leak will be located and repaired by the manufacturer, and the vehicle will be tested again.

**Road test inspection**
The road test inspection checks all the vehicle’s systems and sub-systems while the vehicle is in operation. Typically, the road test inspection is performed immediately following the water test inspection to reveal any standing water that may be present due to a leak, but was not noticed during the “static” water test. Objectionable vibrations, air leakage and other factors that affect ride quality are recorded and reported to the vehicle manufacturer for resolution. Vehicle stability, performance, braking and interlock systems, HVAC, and other critical areas are checked to ensure that the vehicle is complete and ready to provide safe and reliable service.

The following tests (but not limited to) may be performed and recorded during the road test:

• Acceleration test
• Top speed test
• Gradeability test
• Service brake test
• Parking brake test
• Turning effort test
• Turning radius test
• Shift quality
• Quality of retarder or regenerative braking action

During the road test, a vehicle may be taken to a weigh station to record the vehicle’s front axle weight; rear axle weight and total vehicle (curb) weight.

**Interior inspection**
The interior inspection checks the fit and finish of the interior installations.
In addition, the inspection also verifies the installation and function of systems and subsystems according to the contract documents. All systems and functions accessed from the interior are inspected for functionality, appearance and safety.

Examples of systems/functions inspected include the following:

- Interior and exterior lighting controls
- Front and rear door systems
- Flooring installation
- Passenger and operator’s seat systems
- Wheelchair securement and ramp systems
- Fire suppression system
- Electrical installations (multiplex, tell-tale wiring, panels, etc.)
- Window systems and emergency escape portals
- Operator dash/side panel controls/indicators

### Hoist/undercarriage inspection

The hoist/undercarriage inspection checks the installation of components, wiring, air lines, presence of fluid leaks, etc., located under the vehicle. Typically, this inspection is performed following the road test. The vehicle is lifted onto a hoist or pulled over a pit for the inspection. Areas inspected are the front suspension, air bags, air line routings, electrical connections and routings, drive-train components, linkages, and any other system or component that may be prone to early failure due to inadequate installation techniques. All lines, cables, hoses, etc., are inspected for proper securement and protection to prevent rubbing, chafing or any other condition that could result in a failure. The engine/powerplant and HVAC compartments are also inspected during this time.

### Exterior inspection

The exterior inspection checks the fit and finish of components installed on the exterior of the vehicle. Access panels are opened and accessories are inspected for proper installation. In addition, vehicle paint, graphics and proper decals are also inspected. Acceptable paint finish quality (orange peel, adhesion, etc.) should be agreed on with the vehicle manufacturer prior to production to ensure consistency of inspections.

### Electrical inspection

The vehicle’s main electrical panels and other sub-panels are inspected for proper components, to include relays, fuses, modules, terminal strips, decals, etc. In addition, electrical harnesses are inspected for proper wiring and termination techniques, bulkhead protection, looming and other items that could result in future electrical failure. Onboard vehicle compartment schematics are verified for accuracy.
Wheelchair ramp inspection
The wheelchair ramp assembly is inspected for proper installation and performance. Clearances critical to the operation of the ramp are verified, and the ramp’s electrical systems are inspected to ensure appropriate wire routings and protection. The successful integration of the ramp assembly into the vehicle is verified, and the vehicle interlocks are checked during automatic and manual ramp operation.

Audits
During serial production of the bus’s quality assurance inspection, tests may be performed to ensure that the manufacturer’s quality standards are being followed. These inspection audits could be on items such as torque wrench calibrations, proper techniques for fastener installations, proper use and type of adhesives, use of correct installation drawings on the production line, etc.

Communications
The lines of communications, formal and informal, should be discussed and outlined in the pre-production meeting. As previously discussed, resident inspectors should represent the District for all bus-build related issues (quality, conformance, etc.). Resident inspectors can relay communications addressing contractual type issues but should do so only under the consult of the District’s contracts administrator. Actual personnel contacts for the manufacturing facility should be established during resident inspector orientation. These contacts could include quality assurance, production, material handling, engineering, and buy-off area personnel.

Documentation
The following documents/reports are typically generated during the bus build process:

- Vehicle Build Specification
- Sales Order
- Pre-production meeting notes
- Prototype and production correspondence (vehicle build file)
- Manufacturer’s Vehicle Record (Warranty file)
  - Vehicle line documents
  - Serialization documents (Warranty file)
  - Alignment verification
  - Brake testing
  - HVAC testing and checkout
  - Manufacturer’s QA checklist and signoff
- Weight Slip (Prototype & Warranty file)
Prototype Performance Tests document (vehicle build file)

- Acceleration Test
- Top Speed Test
- Gradeability Test
- Interior Noise Test A – Stationary
- Interior Noise Test B – Dynamic
- Exterior Noise Test A – Pull Away
- Exterior Noise Test B – Pass-By
- Exterior Noise Test C – Curb Idle
- Turning Radius Test
- Turning Effort Test
- Parking Brake Test
- Service Brake Test

Vehicle Acceptance Inspections – Production (Warranty file)

- Water Test Inspection Report
- Road Test Inspection Report
- Interior Inspection Report
- Hoist/Undercarriage Inspection Report
- Exterior Inspection Report
- Electrical Inspection Report
- Wheelchair Inspection Report

- Speed Memos (Warranty file) and Critical Emails
- District Vehicle Inspection record (Warranty file)
- Release for Delivery documentation (Warranty file)
- Post-Production Acceptance – Certificate of Acceptance (Accounting)
- Post-Delivery Inspection Report – (Fleet Management & Warranty files)

**Vehicle Release for Delivery**

Upon satisfactory completion of all inspection, audit and test criteria, and resolution of any outstanding issues affecting the purchase of any or all buses, proper documentation (the Release for Delivery) is signed by the designated resident inspector authorizing the bus manufacturer to deliver the vehicle to the District’s facility, where it will undergo a post-delivery inspection process and final acceptance. The satisfactory sign-off of the Release for Delivery should complete the resident inspector’s duties for each bus. In final preparation for delivery, the bus manufacturer may request the resident inspector to do a final walk-through of the bus after it has been cleaned and prepped for shipping.
Post-Delivery and Final Acceptance

The District shall conduct acceptance tests on each delivered bus. These tests shall be completed within 30 days after bus delivery and shall be conducted in accordance with the District’s written test plans. The purpose of these tests is to identify defects that have become apparent between the time of bus release and delivery to the District. The post-delivery tests shall include visual inspection, along with a verification of system(s) functionality and overall bus operations including a road-test. No post-delivery test shall apply new criteria that are different from criteria applied in a pre-delivery test.

Buses that fail to pass the post-delivery tests are subject to non-acceptance. The District shall record details of all defects on the appropriate test forms and shall notify the contractor of acceptance or non-acceptance of each bus within five days after completion of the tests. The defects detected during these tests shall be repaired according to procedures defined in the contract after non-acceptance. After the contractor repairs a bus that was placed in a non-acceptance status, the bus will restart the post-delivery and final acceptance process.

Certificate of Acceptance

- **Accepted**
- **Not accepted:** In the event that the bus does not meet all requirements for acceptance. The District will identify reasons for non-acceptance and work with the OEM to develop a timeline of addressing the problem for a satisfactory resolution and redelivery.
- **Conditional acceptance:** In the event that the bus does not meet all requirements for acceptance, the District may conditionally accept the bus and place it into revenue service pending receipt of contractor furnished materials and/or labor necessary to address the identified issue(s).

SECTION 9: FORMS AND CERTIFICATIONS

CER 1. Proposer’s Checklist

**RFP 2013-1235 ALAMEDA- CONTRA COSTA TRANSIT DISTRICT (AC TRANSIT DISTRICT)**

Package 1: Technical Proposal

- 1. Letter of Transmittal
- 2. Technical Proposal
- 3. Acknowledgement of Addenda
- 4. Form for Proposal Deviation
5. Vehicle Questionnaire
6. References and non-priced information (if provided by Proposer)
7. Engineering organization chart, engineering change control procedure, field modification process
8. Manufacturing facility plant layout, other contracts, staffing
9. Production schedule and other Contract commitments for the duration of this Contract.
10. Quality Assurance Program

Package 2: Price Proposal
1. Letter of Transmittal
2. Pricing Schedule (including option buses, spare parts package, engineering, manuals, training, special tools and test equipment)

Package 3: Qualifications Package
1. Pre-Award Evaluation Data Form
2. A copy of the three (3) most recent audited financial statements or a statement from the Proposer regarding how financial information may be reviewed by the District
3. Letter for insurance
4. Letter for performance bond
5. Proposal Form

Package 4: Proprietary/Confidential Information Package
1. Proprietary/Confidential Information

1. There may be items in the first three packages that are included in Package 4 because they are considered to be proprietary/confidential information. When this occurs, the Proposer must note that fact in Packages 1 through 3.
CER 2. Request for Pre-Offer Change or Approved Equal

This form must be used for requested clarifications, changes, substitutes or approval of items equal to items specified with a brand name and must be submitted as far in advance of the Due Date, as specified in “Questions, Clarifications and Omissions.”

<table>
<thead>
<tr>
<th>Request #:</th>
<th>Proposer:</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFP Section:</td>
<td>Page:</td>
</tr>
</tbody>
</table>

Questions/clarification or approved equal: ]

<table>
<thead>
<tr>
<th>District action:</th>
<th>Approved</th>
<th>Denied</th>
</tr>
</thead>
<tbody>
<tr>
<td>See addendum</td>
<td>See response below</td>
<td></td>
</tr>
</tbody>
</table>

District response:
CER 3. Acknowledgement of Addenda

Failure to acknowledge receipt of all addenda may cause the Proposal to be considered nonresponsive to the Solicitation. Acknowledged receipt of each addendum must be clearly established and included with the Proposal.

The undersigned acknowledges receipt of the following addenda to the documents:

<table>
<thead>
<tr>
<th>Addendum No.</th>
<th>Dated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Proposer:
Name:
Title:
Phone:
Street address:
City, state, ZIP:

Authorized signature _________________________________________ Date ___________________
### CER 4. Contractor Service and Parts Support Data

<table>
<thead>
<tr>
<th>Location of nearest Technical Service Representative to District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
</tr>
<tr>
<td>Address:</td>
</tr>
<tr>
<td>Telephone:</td>
</tr>
<tr>
<td>Describe technical services readily available from said representative:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location of nearest Parts Distribution Center to District:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
</tr>
<tr>
<td>Address:</td>
</tr>
<tr>
<td>Telephone:</td>
</tr>
<tr>
<td>Describe the extent of parts available at said center:</td>
</tr>
</tbody>
</table>

**Policy for delivery of parts and components to be purchased for service and maintenance:**

Regular method of shipment:

Cost to District:
CER 5. Form for Proposal Deviation

This form shall be completed for each condition, exception, reservation or understanding (i.e., Deviation) in the Proposal according to “Conditions, Exceptions, Reservations or Understandings.” One copy without any price/cost information is to be placed in the Technical Proposal as specified in “Technical Proposal Requirements,” and a separate copy with any price/cost information placed in the Price Proposal as specified in “Price Proposal Requirements.”

<table>
<thead>
<tr>
<th>RFP 2013-1235 ALAMEDA- CONTRA COSTA TRANSIT DISTRICT (AC TRANSIT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deviation No.:</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Complete description of Deviation:</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Rationale (pros and cons):</td>
</tr>
</tbody>
</table>
CER 6. Pricing Schedule

NOTE: The following is an example of what a pricing schedule might look like and should be customized by the District to reflect the costs for its procurement.

Alameda – Contra Costa Transit District
RFP 2013-1235 ALAMEDA- CONTRA COSTA TRANSIT DISTRICT (AC TRANSIT)

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Insert quantity, size, type and description] buses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manuals</td>
<td>Lump Sum</td>
<td></td>
</tr>
<tr>
<td>Training</td>
<td>Lump Sum</td>
<td></td>
</tr>
<tr>
<td>Spare parts package</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test equipment and special tools</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extended Warranty [District to identify subsystem]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extended Warranty [District to identify subsystem]</td>
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<tr>
<td>Extended Warranty [District to identify subsystem]</td>
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<tr>
<td>Extended Warranty [District to identify subsystem]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extended Warranty [District to identify subsystem]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other [District to specify]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales tax (if applicable)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery charges</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL PROPOSED PRICE**

ADA equipment (included in above unit prices)

This form is to be completed and included in the Price Package.
<table>
<thead>
<tr>
<th>CER 7. Pre-Award Evaluation Data Form</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NOTE:</strong> This form is to be completed and included in the Qualification Package. Attach additional pages if required.</td>
</tr>
<tr>
<td><strong>RFP 2013-1235 ALAMEDA- CONTRA COSTA TRANSIT DISTRICT (AC TRANSIT)</strong></td>
</tr>
</tbody>
</table>

1. Name of firm:  

2. Address:  

3. □ Individual □ Partnership □ Corporation □ Joint Venture  

4. Date organized:  
   - State in which incorporated:  

5. Names of officers or partners:  
   - a.  
   - b.  
   - c.  
   - d.  

6. How long has your firm been in business under its present name?  

7. Attach as **SCHEDULE ONE** a list of similar current contracts that demonstrates your available capacity, including the quantity and type of bus, name of contracting party, percentage completed and expected completion date.  

8. Attach as **SCHEDULE TWO** a list of at least three similar contracts that demonstrates your technical proficiency, each with the name of the contracting party and number and they type of buses completed within the last five years.  

9. Have you been terminated or defaulted, in the past five years; on any Contract you were awarded?  
   - □ Yes □ No  
   - If yes, then attach as **SCHEDULE THREE** the full particulars regarding each occurrence.  

10. Attach as **SCHEDULE FOUR** Proposer’s last three (3) financial statements prepared in accordance with generally accepted accounting principles of the jurisdiction in which the Proposer is located, and audited by an independent certified public accountant; or a statement from the Proposer regarding how financial information may be reviewed by the District [This may require execution of an acceptable non-disclosure agreement between the District and the Proposer.]  

11. Attach as **SCHEDULE FIVE** a list of all principal Subcontractors and the percentage and character of Work (Contract amount) that each will perform on this Contract.  

12. If the Contractor or Subcontractor is a joint venture, submit **PRE-AWARD EVALUATION DATA** forms for each member of the joint venture. (Joint venture requirements)  

The undersigned certifies to the accuracy of all information:  

**Name and title:**  
**Company:**  

Authorized signature ___________________________ Date ___________________________  

Page 274 of 303
CER 8. Federal Certifications

CER 8.1 Buy America Certification

This form is to be submitted with an offer exceeding the small purchase threshold for federal assistance programs, currently set at $100,000.

Certificate of Compliance

The Proposer hereby certifies that it will comply with the requirements of 49 USC Section 5323(j)(2)(C), Section 165(b)(3) of the Surface Transportation Assistance Act of 1982, as amended, and the regulations of 49 CFR 661.11:

Name and title:
Company:

Authorized signature ______________________ Date ______________________

Certificate of Non-Compliance

The Proposer hereby certifies that it cannot comply with the requirements of 49 USC Section 5323(j)(2)(C) and Section 165(b)(3) of the Surface Transportation Assistance Act of 1982, as amended, but may qualify for an exception to the requirements consistent with 49 USC Sections 5323(j)(2)(B) or (j)(2)(D), Sections 165(b)(2) or (b)(4) of the Surface Transportation Assistance Act, as amended, and regulations in 49 CFR 661.7.

Name and title:
Company:

Authorized signature ______________________ Date ______________________
CER 8.2 Debarment and Suspension Certification for Prospective Contractor

Primary covered transactions must be completed by proposer for contract value over $25,000.

Choose one alternative:

☐ The Proposer, [insert name], certifies to the best of its knowledge and belief that it and its principals:

1. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any federal department or District;

2. Have not within a three-year period preceding this Proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state or local) transaction or Contract under a public transaction; violation of federal or state antitrust statutes or commission or embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

3. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (federal, state, or local) with commission of any of the offenses enumerated in Paragraph 2 of this certification; and

4. Have not within a three-year period preceding this Proposal had one or more public transactions (federal, state or local) terminated for cause or default.

OR

☐ The Proposer is unable to certify to all of the statements in this certification, and attaches its explanation to this certification. (In explanation, certify to those statements that can be certified to and explain those that cannot.)

The Proposer certifies or affirms the truthfulness and accuracy of the contents of the statements submitted on or with this certification and understands that the provisions of Title 31 USC § Sections 3801 are applicable thereto.

Executed in [insert city and state].

Name: ___________________________________________________________________________

Authorized signature ___________________________ Date ___________________________
**CER 8.3 Debarment and Suspension Certification (Lower-Tier Covered Transaction)**

This form is to be submitted by each Subcontractor receiving an amount exceeding $25,000.

<table>
<thead>
<tr>
<th>The prospective lower-tier participant (Proposer) certifies, by submission of this Proposal, that neither it nor its “principals” as defined at 49 CFR § 29.105(p) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or District.</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the prospective Proposer is unable to certify to the statement above, it shall attach an explanation, and indicate that it has done so by placing an “X” in the following space: ____</td>
</tr>
<tr>
<td>THE PROPOSER, _____________________________________________, CERTIFIES OR AFFIRMS THE TRUTHFULNESS AND ACCURACY OF EACH STATEMENT OF ITS CERTIFICATION AND EXPLANATION, IF ANY. IN ADDITION, THE PROPOSER UNDERSTANDS AND AGREES THAT THE PROVISIONS OF 31 USC §§ 3801 ET SEQ. APPLY TO THIS CERTIFICATION AND EXPLANATION, IF ANY.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name and title of the proposer’s authorized official:</th>
</tr>
</thead>
<tbody>
<tr>
<td>____________________________</td>
</tr>
<tr>
<td>Authorized signature</td>
</tr>
</tbody>
</table>
CER 8.4 Non-Collusion Affidavit

This affidavit is to be filled out and executed by the Proposer; if a corporation makes the bid, then by its duly authorized agent. The name of the individual swearing to the affidavit should appear on the line marked “Name of Affiant.” The affiant’s capacity, when a partner or officer of a corporation, should be inserted on the line marked “Capacity.” The representative of the Proposer should sign his or her individual name at the end, not a partnership or corporation name, and swear to this affidavit before a notary public, who must attach his or her seal.

State of ____________________________, County of ____________________________

I, ____________________________, being first duly sworn, do hereby state that

(Name of Affiant)

I am ______________________ of ____________________________

(Capacity) (Name of Firm, Partnership or Corporation)

whose business is ____________________________________________________________

and who resides at __________________________________________________________

and that __________________________________________________________

(Give names of all persons, firms, or corporations interested in the bid)

is/are the only person(s) with me in the profits of the herein contained Contract; that the Contract is made without any connection or interest in the profits thereof with any persons making any bid or Proposal for said Work; that the said Contract is on my part, in all respects, fair and without collusion or fraud, and also that no members of the Board of Trustees, head of any department or bureau, or employee therein, or any employee of the Authority, is directly or indirectly interested therein.

__________________________________________________________
Signature of Affiant

___________________________
Date

Sworn to before me this _________ day of ______________________, 20____.

__________________________________________________________
Notary public

My commission expires ____________________________

Seal
CER 8.5 Lobbying Certification
This form is to be submitted with an offer exceeding $100,000.

The Proposer certifies, to the best its knowledge and belief, that:

1. No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of a federal department or District, a member of the U.S. Congress, an officer or employee of the U.S. Congress, or an employee of a member of the U.S. Congress in connection with the awarding of any federal Contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification thereof.

2. If any funds other than federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any District, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this federal Contract, grant, loan or cooperative agreement, the undersigned shall complete and submit Standard Form LLL, “Disclosure Form to Report Lobbying,” in accordance with its instruction, as amended by “Government-wide Guidance for New Restrictions on Lobbying,” 61 Fed. Reg. 1413 (1/19/96).

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants and contracts under grants, loans and cooperative agreements) and that all subrecipients shall certify and disclose accordingly. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this federal Contract, grant, loan or cooperative agreement imposed by 31, USC § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

THE PROPOSER, ___________________________________________, CERTIFIES OR AFFIRMS THE TRUTHFULNESS AND ACCURACY OF EACH STATEMENT OF ITS CERTIFICATION AND DISCLOSURE, IF ANY. IN ADDITION, THE PROPOSER UNDERSTANDS AND AGREES THAT THE PROVISIONS OF 31 USC §§ 3801 ET SEQ. APPLY TO THIS CERTIFICATION AND DISCLOSURE, IF ANY.

Name of the bidder or Proposer’s authorized official: ___________________________________________

Title: _________________________________________________________________________________________________

________________________________________________________________________               ________________________

Signature ____________________________ Date ______________

Per paragraph 2 of the included form Lobbying Certification, add Standard Form–LLL, “Disclosure Form to Report Lobbying,” if applicable.
CER 8.6 Certificate of Compliance with Bus Testing Requirement

The undersigned certifies that the vehicle offered in this procurement complies and will, when delivered, comply with 49 USC § 5323(c) and FTA’s implementing regulation at 49 CFR Part 665 according to the indicated one of the following three alternatives.

Mark one and only one of the three blank spaces with an “X.”

1. ____ The buses offered herewith have been tested in accordance with 49 CFR Part 665 on _____________ (date). If multiple buses are being proposed, provide additional bus testing information below or on attached sheet. The vehicles being sold should have the identical configuration and major components as the vehicle in the test report, which must be submitted with this Proposal. If the configuration or components are not identical, then the manufacturer shall provide with its Proposal a description of the change and the manufacturer’s basis for concluding that it is not a major change requiring additional testing. If multiple buses are being proposed, testing data on additional buses shall be listed on the bottom of this page.

2. ____ The manufacturer represents that the vehicle is “grandfathered” (has been used in mass transit service in the United States before October 1, 1988, and is currently being produced without a major change in configuration or components), and submits with this Proposal the name and address of the recipient of such a vehicle and the details of that vehicle’s configuration and major components.

3. ____ The vehicle is a new model and will be tested and the results will be submitted to the District prior to acceptance of the first bus.

The undersigned understands that misrepresenting the testing status of a vehicle acquired with federal financial assistance may subject the undersigned to civil penalties as outlined in the Department of Transportation’s regulation on Program Fraud Civil Remedies, 49 CFR Part 31. In addition, the undersigned understands that FTA may suspend or debar a manufacturer under the procedures in 49 CFR Part 29.

Company name:
Name and title of the proposer’s authorized official:

_________________________________________________________  _______________________
Authorized signature                                                                 Date
CER 8.7 DBE Approval Certification

I hereby certify that the Proposer has complied with the requirements of 49 CFR 26, Participation by Disadvantaged Business Enterprises in DOT Programs, and that its goals have not been disapproved by the Federal Transit Administration.

Name and title of the proposer’s authorized official:

________________________________________________________________________              _______________________
Authorized signature                                                                                                                              Date
CER 8.8 Federal Motor Vehicle Safety Standards

The Proposer and (if selected) Contractor shall submit (1) manufacturer's FMVSS self-certification sticker information that the vehicle complies with relevant FMVSS or (2) manufacturer's certified statement that the contracted buses will not be subject to FMVSS regulations.

Company name:
Name of signer:
Title:

_____________________________  ______________________
Authorized signature                          Date
CER 9. Other Certifications

CER 9.1 Notice of Award

NOTE: This form is included as an example. Standard industry practice is to execute a separate Contract as provided as an example in Appendix E. (TO BE DETERMINED)

By execution below, the District accepts Proposal as indicated above.

Contracting officer: __________________________________________________________

__________________________________  _______________________
Authorized signature  Date
SECTION 10: APPENDICES

Appendix A: Not Used

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Appendix B: Not Used

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EVALUATION OF PROPOSALS AND SELECTION PROCESS

A. Evaluation/Selection Committee
An Evaluation/Selection Committee (Committee), which may include District staff, and possibly one or more outside experts, will review and screen the Proposals submitted according to the pre-established criteria as set forth below.

B. Technical Evaluation Criteria (maximum of 70 points)
Proposals will be evaluated using the following principal selection criteria:

- Technical Product design and performance (0-30 points): The information provided by the Proposer in its technical submittal relating to the buses to be provided will be utilized to evaluate the Proposal in relation to this factor. Vehicle construction and system design, as well as documented reliability, may be used in this evaluation, as well as other design and performance elements of the components that comprise those systems. At a minimum, test results, safety and maintenance factors, and cost of normal operation for the bus design and system components proposed, may be considered in determining a final value for this factor.

- Qualification (0-20 points): The Committee will consider the capability and reputation of the Proposer as presented in the Proposal or as is determined by review of information available from references or other resources. The evaluation may look at the Proposer’s overall organizational and financial capabilities and consider key components such as organizational reporting structure, quality control, quality assurance, research and development, technical, training and parts support, response time, product capabilities, ability to furnish multiple bus configurations, bonding capacity, and financial history, as well as other considerations, in reaching a final point determination. The committee may also look at judgments, liens, Fleet Defect history, warranty claims and the steps that the manufacturer took to resolve these concerns in assessing the overall reputation of the manufacturer.

- Delivery schedule (0-20 points): The Committee will review the proposed delivery schedule for the District’s minimum purchase of coaches. Delivery schedules that fulfill the delivery requirements, with evidence that the schedule can be accomplished, may receive higher points for this category.

C. Cost Proposal Evaluation (maximum of 30 points)
As described below, the proposed cost as submitted by the Proposer on the District’s form will be assigned a maximum of 30 points. The Contractor is required to use the District’s form, without alteration, for submittal of its cost Proposal. Please DO NOT use your own forms.

The cost will be evaluated in the following manner:
• Cost Proposal Criteria (0-40 points)

a. The Cost Proposal criteria will be based on the “Total of Both the Low-Floor and Standard Floor Bus,” Line 3.C. of Appendix B as noted in Section 8.B.6, “Sum of Total Base Offer per Bus.”
b. The lowest average Cost Proposal will receive 30 points. Every other Proposal previously found to be in the Competitive Range will be given points proportionately in relation to the lowest price. This point total will be calculated by dividing the lowest price by the total price of the Proposal being evaluated and the result multiplied by the maximum weight for price (40 points) to arrive at a Cost Proposal score.

*Example:* Lowest Proposed Price / Proposer’s Proposed Price × 40 = Proposal Score

The application of the above formula will result in a uniform assignment of points relative to the criterion of price.

D. Evaluation Methodology

The maximum number of points achievable in each of the aforementioned areas is as follows:

- **Technical Product design and performance:** 0-40 points
- **Qualification:** 0-20 points
- **Delivery schedule:** 0-20 points
- **Cost proposal:** 0-30 points

**TOTAL POSSIBLE POINTS: 100**

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Appendix D: Sample Contract

NOTE: (TO BE DETERMINED AT A LATER DATE) The following will be a sample Contract which is included as an illustration of a format that the District may choose to use.

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Appendix E: Sample Performance Bond Form

NOTE: The following is a sample Performance Bond, which is included as an illustration of a format that a District may choose to use.

Alameda – Contra Costa Transit District

CONTRACT NO. 2013-1235

Bus Rapid Transit (BRT) Bus Procurement

PERFORMANCE BOND

WHEREAS the Alameda – Contra Costa Transit District has awarded to _________ (“Principal”), Contract No. 2013-1235, Up To 27 (quantity) BRT Buses AND

WHEREAS Principal is required under the terms of the Contract to furnish a Bond for the faithful performance of the Contract;

NOW, THEREFORE, we ________________, as Principal, and ____________________, (“Surety”), as Surety, are held and firmly bound unto [District] in the sum of $ (District to insert amount), in lawful money of the United States of America, for payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents. In case suit is brought upon this Bond, Surety shall pay reasonable attorneys’ fees to District in an amount to be fixed by the court. In no event shall the surety be liable under this Bond for an amount greater than the aggregate penal sum designated in this paragraph.

The condition of this obligation is such that, if the hereby-bonded Principal or its heirs, executors, administrators, successors, assigns, or Subcontractors shall in all things stand to and abide by and well and truly keep and perform all the undertakings, terms, covenants, conditions and agreements in the Contract and any alteration thereof, made as therein provided, all within the time and in the manner therein-designated and in all respects according to their true intent and meaning, then this obligation shall become null and void; otherwise, it shall be and remain in full force and effect.

Further, Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or modification of the Contract, or of the Goods to be furnished thereunder, shall in any way affect its obligations under this Bond, and it does hereby waive notice of any such change, extension of time, alteration, or modification of the Contract or of the Goods and Technical Services to be performed thereunder.

IN WITNESS WHEREOF, three identical counterparts of this instrument, each of which shall for all purposes be deemed an original hereof, have been duly executed by Principal and Surety named herein, on the ___ day of _______________, 20__, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative pursuant to authority of its governing body.
BUS RAPID TRANSIT (BRT) BUS PROCUREMENT
PERIOD OF PERFORMANCE: 01 JUNE 2015 THROUGH 30 NOVEMBER 2017
ADDENDUM NO. 3

By

(“Principal”)

By

(“Surety”)

By

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Appendix F: Not Used

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Appendix G: Example of a Software Escrow Agreement

NOTE: This is a sample form of escrow agreement that may be used in conjunction with SP 10, Software escrow account, when the Contract involves software that is considered proprietary on the part of the Contractor.

ESCROW AGREEMENT

THIS AGREEMENT (“Escrow Agreement”) is made and entered into as of this day of __________, 20__ by and among [insert name of Contractor], a [insert state] type of entity (“Licensor”), Alameda – Contra Costa Transit District (“Licensee”), and ______________, a national banking association, as escrow agent (“Escrow Agent”).

WHEREAS, Licensor and Licensee have entered into an agreement pursuant to which Licensor has licensed to Licensee the use of specified computer programs and related materials, being described with particularity therein (the “License Agreement”), which License Agreement is attached hereto as Exhibit D; and

WHEREAS, the Escrow Agent can provide third-party software escrow protection by storing, retaining and allowing limited access to proprietary computer software, related media and materials.

NOW, THEREFORE, in consideration of the promises and mutual covenants contained herein and for other good and valuable consideration, receipt of which is hereby acknowledged, the parties hereby agree as follows:

1. DEPOSIT OF DOCUMENTATION

(a) The term “Documentation” as used in this Escrow Agreement means the computer source code for the application software magnetic media provided pursuant to the License Agreement (the “System Software”) owned by Licensor and, in turn, licensed to Licensee, and such other related technical documentation and materials as shown in Exhibit A.

(b) Licensor agrees to deposit with the Escrow Agent a complete copy of the Documentation as provided in Exhibit A on or before __________________________________________, 20__.

(c) As Licensor creates new releases of the System Software or any part thereof, Licensor shall promptly deposit one copy of each of the Documentation applicable thereto in escrow with the Escrow Agent. Concurrently with each such deposit, Licensor shall deliver to the Escrow Agent and Licensee a revised Exhibit A, and shall deliver to Licensee a certificate in the form attached hereto as Exhibit B. Licensor shall maintain in escrow the latest field-supported releases of the Documentation or the last emergency maintenance release, whichever is most current; provided, however, all Documentation deposited in the escrow account pursuant to this Escrow Agreement shall remain in escrow so long as Licensor is obligated under the License Agreement to provide the System Software to Licensee.

(d) All copies of source codes delivered hereunder shall be clearly marked, both on the sealed container in which the magnetic media comprising such copies are contained and on the magnetic media themselves, to indicate the Documentation and the version thereof represented by such copies.

2. STORAGE AND SECURITY
(a) The Escrow Agent shall act as custodian of the Documentation until this escrow is terminated pursuant to Section 3 of this Escrow Agreement. The Escrow Agent shall establish, under its control, a secure receptacle for the purpose of storing the Documentation. The Escrow Agent shall exercise reasonable care to keep the Documentation protected from electric or magnetic current that could damage the Documentation, and shall provide the same degree of care of the Documentation as it maintains for its software including without limitation source code and valuable documents and those of clients stored in the same location; provided, however, that the Escrow Agent shall have no liability with respect to any damage to the Documentation unless such damage is the result of the fault of the Escrow Agent.

(b) The Documentation deposited with the Escrow Agent by Licensor pursuant to this Escrow Agreement shall remain the exclusive property of the Licensor, except as otherwise provided herein.

(c) Except as provided in this Escrow Agreement or the attached Exhibits or as required by applicable law, the Escrow Agent agrees that:

1. The Escrow Agent shall not divulge, disclose or otherwise make available to any person other than Licensor, or make any use whatsoever of the Documentation except in accordance with this Escrow Agreement;

2. The Escrow Agent shall not permit any person access to the Documentation, except as may be necessary for the Escrow Agent’s authorized representatives to perform its function under this Escrow Agreement; and

3. Access to the Documentation by Licensor shall be granted by the Escrow Agent only to those persons duly authorized in writing by a competent officer of Licensor.

(d) The Escrow Agent shall have no obligation or responsibility to verify or determine that the Documentation deposited with the Escrow Agent by Licensor does, in fact, consist of those items which Licensor is obligated to deliver under this or any other agreement, and the Escrow Agent shall bear no responsibility whatsoever to determine the existence, relevance, completeness, currency or accuracy of the Documentation at any time.

(e) The Escrow Agent’s sole responsibility shall be to accept, store, protect and deliver the Documentation deposited with the Escrow Agent by Licensor in accordance with the terms and conditions of this Escrow Agreement.

(f) If the Escrow Agent should at any time be confronted with inconsistent claims or demands by the other parties to this Escrow Agreement, then, subject to the provisions of Section 8, it shall have the right to interplead the parties in any court of competent jurisdiction and request that the court determine the respective rights of the parties with respect to this Escrow Agreement and the Documentation and, upon doing so, the Escrow Agent automatically shall be released from any obligation or liability as a consequence of any such claims or demands.

3. RELEASE FROM ESCROW

(a) The Escrow Agent shall release the Documentation (or any designated part thereof) at any time in accordance with a written notice signed by both Licensor and Licensee and specifying the particular item or items of Documentation to be released and the party to whom release shall be made.

(b) The Escrow Agent shall release the Documentation 16 (sixteen) days following receipt of a notice from Licensee
(the “Licensee Notice”) given in accordance with Section 10 hereof, unless the Escrow Agent receives a counter-
notice in accordance with Section 3(c) hereof, given in accordance with Section 10 hereof. The Licensee Notice
shall state that a Licensee Release Condition, as hereinafter defined, has occurred and shall state with particularity
the nature of such Licensee Release Condition. The Licensee Notice shall be given to Licensor in accordance
with Section 10 hereof at the same time and by the same means that it is transmitted to the Escrow Agent, and
proof of such transmission shall be submitted to the Escrow Agent along with the Licensee Notice. A “Licensee
Release Condition” shall mean: (1) any material breach by Licensor of any material term or condition of the
License Agreement, if such material breach has not been cured within the 30 (thirty) day period following
Licensor’s receipt of written notice thereof pursuant to the License Agreement; or (2) Licensor fails to support
the System Software licensed to Licensee as required by the License Agreement; or (3) Licensor fails to fulfill
its warranty obligations pursuant to the License Agreement.

(c) If Licensor disputes the existence of a Licensee Release Condition, Licensor shall give to Licensee and the
Escrow Agent a counter-notice in accordance with Section 10 hereof, within 15 (fifteen) days of the date on
which the Licensee Notice was given to the Escrow Agent and Licensor.

(d) If the Escrow Agent is given a counter-notice under Section 3(c) hereof, it shall not release the requested item
or items of the Documentation until and unless it receives an order and instruction, in writing, signed either by
representatives of both Licensee and Licensor, or by an arbitrator as provided in Section 8 hereof.

Any receipt of the Documentation (or any designated part thereof) by Licensee pursuant to this Section 3 shall
be subject to the terms and conditions of the License Agreement, such that Licensee shall accord the same
security and protection to the Documentation or any part as it is obligated to give to the System Software.

The Escrow Agent shall release to Licensor all Documentation held by it upon termination of the License
Agreement pursuant to clause (2) of the first sentence of Section 4 or, if that day is not a business day, on the
next succeeding business day.

4. TERMINATION

(a) This Escrow Agreement shall terminate upon the earlier of: (1) the release by the Escrow Agent of all the
Documentation pursuant to the terms of this Agreement; or (2) [month/day/year] (or if the Escrow Agent receives
documentation satisfactory to it to the effect that the term of the License Agreement has been extended pursuant
to the provisions thereof, then such date as is 180 (one hundred eighty) days following the expiration date of the
term of the License Agreement, as extended from time to time). No party shall have any liability hereunder
(except pursuant to Section 2(c)) for acts or omissions occurring after termination of this Escrow Agreement.
Upon such termination, the Escrow Agent shall return the Documentation then in escrow to Licensor after the
payment of all costs, fees and expenses due to the Escrow Agent, including fees and expenses of its agents and
attorneys.

(b) Licensee and Licensor may terminate this Escrow Agreement by mutual written agreement upon 15 (fifteen)
days’ advance written notice to the Escrow Agent.

(c) This Escrow Agreement cannot be changed or terminated orally and may be changed only with the prior written
consent of all of the parties hereto. This Escrow Agreement is not intended to modify or supersede any of the
arrangements of Licensor and Licensee as set forth in the License Agreement.

(d) The Escrow Agent may resign as escrow agent at any time upon 30 (thirty) days’ notice to Licensor and
Licensee, but only if a successor escrow agent has been appointed prior to the effective date of the Escrow Agent’s resignation. Upon receipt of notice of resignation, Licensor and Licensee promptly shall use their best efforts to designate a successor escrow agent to serve in accordance with the terms of this Agreement. If a successor escrow agent has not been appointed within a 60 (sixty) day period, the Escrow Agent may apply to a court of competent jurisdiction to have a successor appointed. Upon receipt of an affidavit signed by an officer of Licensor and an officer of Licensee directing the disposition of the Documentation to a successor escrow agent, the Escrow Agent shall promptly comply with that affidavit.

5. INDEMNIFICATION

The Escrow Agent shall not be liable to any party under this Escrow Agreement in connection with the performance of its duties hereunder, except for liability resulting from the Escrow Agent’s fault. Licensor and Licensee shall, jointly and severally, indemnify and hold the Escrow Agent harmless against any loss, damage or expense, including legal it may incur to anyone as a result of acting as escrow agent under this Agreement, except for any loss, liability, damage or expense arising from the Escrow Agent’s fault. If Licensor or Licensee makes any payment (an “Indemnification Payment”) to the Escrow Agent pursuant to the provisions of the preceding sentence, then the party making the Indemnification Payment (the “Paying Party”) shall be entitled to contribution from the other (the “Contributing Party”) in an amount such that following contribution by the Contributing Party, the Paying Party and the Contributing Party shall each bear the portion of the Indemnification Payment as is proportionate to the relative fault of each of them with respect to the event that gave rise to the Indemnification Payment; provided, however, that if neither the Paying Party nor the Contributing Party is at fault, the Paying Party shall be entitled to contribution from the Contributing Party in an amount equal to one-half of the Indemnification Payment. The provisions of the preceding sentence shall not in any way limit the liability of Licensor or Licensee to the Escrow Agent pursuant to the second sentence of this Section 5 or any other provision of this Agreement.

6. GOOD FAITH RELIANCE

The Escrow Agent may rely and act upon written instructions, instruments or signatures believed by the Escrow Agent in good faith to be genuine and may assume that any person purporting to give any written notice, respect, advice or instruction in connection with or relating to this Escrow Agreement has been duly authorized to do so. The Escrow Agent’s duties shall be determined with respect to this Agreement and applicable laws only, and the Escrow Agent is not charged with knowledge of or duties under any other document, including the License Agreement.

7. FEES

(a) In consideration of performing its functions as Escrow Agent, the Escrow Agent shall be compensated as set forth on Exhibit C. The fees set forth on Exhibit C will be billed periodically by the Escrow Agent to:

___________________________________________________
___________________________________________________

(b) The fees set forth in Exhibit C are for ordinary services as escrow holder. In the event the Escrow Agent is required to incur any additional or extraordinary legal fees as a result of being escrow holder, including intervention in any litigation or proceeding, the Escrow Agent shall receive full compensation for any such reasonable legal fees that are documented to the Licensor and/or Licensee’s satisfaction.
8. ARBITRATION

Any dispute or controversy between Licensor and Licensee regarding the release of the Documentation shall be settled by arbitration to be held in the City of Oakland, CA, in accordance with the rules of the American Arbitration Association.

Licensor and Licensee shall jointly select an arbitrator within 10 (ten) days following the giving of a counter-notice under Section 3(c) hereof. If during that 10 (ten) day period, Licensor and Licensee do not jointly select an arbitrator, then the arbitrator shall be administratively appointed by the (insert city and state) Regional Office of the American Arbitration Association, and neither the Licensor nor Licensee shall have the right to object to such appointment. Any arbitration pursuant to this Section 8 shall be conducted on an expedited basis and shall be binding upon Licensor and Licensee. Licensor and Licensee shall use their respective best efforts to conclude such arbitration within 45 (forty-five) days from the date an arbitrator is elected pursuant to this Section 8. The prevailing party in any arbitration pursuant to this Section 8 shall be entitled to recover from the other party all reasonable out-of-pocket expenses in connection with such arbitration including but not limited to the fees of the arbitrator, reasonable legal fees and disbursements and business-class travel and lodging expenses. Escrow Agent shall be entitled to fully rely upon the decision and rulings of such arbitrator.

9. ENTIRE AGREEMENT

This Escrow Agreement, including Exhibits A, B and C hereto, constitutes the entire agreement among the parties concerning the subject matter hereof and shall supersede all previous communications, representations, understandings and agreements, either oral or written among the parties. This Escrow Agreement is intended to be and shall be treated as an agreement separate and distinct from the License Agreement.

10. NOTICE

All notices required or permitted by this Escrow Agreement shall be sufficiently served by mailing the same by certified or registered mail, return receipt requested, to the parties at their respective addresses, as follows:

(a) Escrow Agent:

__________________________________________

__________________________________________

__________________________________________

Attn: ______________________________

Ref: ______________________________
11. COUNTERPARTS

This Escrow Agreement may be executed in one or more counterparts, each of which shall be deemed an original, and all of which taken together shall constitute one and the same instrument.

12. GOVERNING LAW

This Escrow Agreement shall be governed by and construed in accordance with the laws of the State of (insert state), without regard to its choice-of-laws or conflicts-of-law provisions.

13. SEVERABILITY

In the event any of the provisions of this Escrow Agreement shall be held by a court of competent jurisdiction to be contrary to any state or federal law, the remaining provisions of this Escrow Agreement will remain in full force and effect.

14. HEADINGS

The section headings in this Escrow Agreement do not form a part of it, but are for convenience only and shall not limit or affect the meaning of the provisions.

15. MISCELLANEOUS

(a) If in doubt as to its duties hereunder, Escrow Agent may consult with counsel of its choice.

(b) Nothing in this Agreement shall impose on the Escrow Agent the duty to qualify to do business or act as fiduciary in any jurisdiction other than
IN WITNESS WHEREOF, the parties have executed this Escrow Agreement on the date first above written.

As Escrow Agent: ______________________________________________________________

Name and title

_________________________                             __________________
Signature                     Date

As Licensor: ___________________________________________________________________

Name and title

_________________________                             __________________
Signature                     Date

As Licensee: ___________________________________________________________________

Name and title

_________________________                             __________________
Signature                     Date

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AC TRANSIT DISTRICT
PURCHASING DEPARTMENT

REQUEST FOR PROPOSAL
No. 2013-1235

BUS RAPID TRANSIT (BRT) BUS PROCUREMENT
PERIOD OF PERFORMANCE: 01 JUNE 2015 THROUGH 30 NOVEMBER 2017
ADDENDUM NO. 3

EXHIBIT A
DOCUMENTATION
CERTIFICATE AS TO DEPOSIT OF ADDITIONAL SOURCE CODES

………………………………………….. (“Licensor”) hereby certifies to
………………………………………….. (“Licensee) that Licensor has delivered to
Escrow Agent on _________________________, 20__, to be held in escrow pursuant to the terms
of the Escrow Agreement dated as of ____________________________, 20__, among Licensor,
Licensee and Escrow Agent, one copy of each of the following Source Codes:

(Describe Source Codes)

Dated: ________________________________, 20__

CONTRACTOR
As Licensor: ___________________________________________________________________
Name and title

_________________________________________  ____________________________
Signature                                      Date
EXHIBIT C
FEES
EXHIBIT D

[Insert Form of License Agreement per Introductory paragraph of Escrow Agreement -TBD]

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<td>J10</td>
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<td>Methods of Test for Paints - Part J10: Determination of Deposition Efficiency of Coating Powders</td>
<td>Sep 15, 1998</td>
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<td>J211</td>
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<td>Instrumentation for Impact Test—Part 2: Photographic Instrumentation</td>
<td>May 1, 2001</td>
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<td>J287</td>
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<td>Driver Hand Control Reach</td>
<td>Feb 1, 2007</td>
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<td>J366</td>
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<td>Exterior Sound Level for Heavy Trucks and Buses</td>
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<td>J382</td>
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<td>Windshield Defrosting Systems Performance Requirements - Trucks, Buses, and Multipurpose Vehicles.</td>
<td>Jan 1, 1994</td>
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<td>J534</td>
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<td>Lubrication Fittings</td>
<td>May 1, 2008</td>
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<td>J537</td>
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<td>Storage Batteries</td>
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<td>J541</td>
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<td>Voltage Drop for Starting Motor Circuits</td>
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<td>J587</td>
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<td>License Plate Illumination Devices (Rear Registration Plate Illumination Devices)</td>
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<td>Backup Lamps (Reversing Lamps)</td>
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<td>Automotive Safety Glasses</td>
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<td>J680</td>
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<td>Location and Operation of Instruments and Controls in Motor Truck Cabs, Recommended Practice</td>
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<td>J686</td>
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<td>Motor Vehicle License Plates</td>
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<td>Curbstone Clearance, Approach, Departure, and Ramp Breakover Angles—Passenger Car and Light Truck</td>
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<td>J833</td>
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<td>Human Physical Dimensions</td>
<td>May 1, 2003</td>
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<td>Nonmetallic Air Brake System Tubing</td>
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<td>Motor Vehicle Drivers’ Eye Locations</td>
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<td>Alarm—Backup—Electric Laboratory Performance Testing</td>
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<td>Electromagnetic Compatibility Component Test Procedure Part 42, Conducted Transient Emissions</td>
<td>Oct 1, 2006</td>
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<td>J1127</td>
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<td>Low Voltage Battery Cable</td>
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<td>Metallic Air Brake System Tubing and Pipe</td>
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<td>J1292</td>
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<td>Automobile and Motor Coach Wiring</td>
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<td>J1455</td>
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<td>Recommended Environmental Practices for Electronic Equipment Design in Heavy-Duty Vehicle Applications</td>
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<td>J1587</td>
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<td>Joint SAE/TMC Electronic Data Interchange between Microcomputer Systems in Heavy-Duty Vehicle Applications, Recommended Practice</td>
<td>Jan 1, 1996</td>
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<td>J1708</td>
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<td>Serial Data Communications Between Microcomputer Systems in Heavy-Duty Vehicle Applications</td>
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<td>J1986</td>
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<td>Balance Weight and Rim Flange Design Specifications, Test Procedures, and Performance</td>
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### Recommendations

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<td>J2402</td>
<td>Road Vehicles—Symbols for Controls, Indicators, and Tell-tales</td>
<td>Jan 1, 2010</td>
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<td>J2711</td>
<td>Recommended Practice for Measuring Fuel Economy and Emissions of Hybrid-Electric and Conventional Heavy-Duty Vehicles</td>
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