



THE CITY OF WINNIPEG

TENDER

TENDER NO. 1325-2019

SUPPLY AND DELIVERY OF AUDIBLE SIGNALS CONTROLLER BOARD

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 SUPPLY AND DELIVERY OF AUDIBLE SIGNALS CONTROLLER BOARD

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 4:00 p.m. Winnipeg time, January 17, 2020

B2.2 Bids determined by the Manager of Materials to have been received later than the Submission Deadline will not be accepted and will be returned upon request.

B2.3 The Contract Administrator or the Manager of Materials may extend the Submission Deadline by issuing an addendum at any time prior to the time and date specified in B2.1.

B3. ENQUIRIES

B3.1 All enquiries shall be directed to the Contract Administrator identified in D5.1.

B3.2 If the Bidder finds errors, discrepancies or omissions in the Tender, or is unsure of the meaning or intent of any provision therein, the Bidder shall promptly notify the Contract Administrator of the error, discrepancy or omission at least five (5) Business Days prior to the Submission Deadline.

B3.3 Responses to enquiries which, in the sole judgment of the Contract Administrator, require a correction to or a clarification of the Tender will be provided by the Contract Administrator to all Bidders by issuing an addendum.

B3.4 Responses to enquiries which, in the sole judgment of the Contract Administrator, do not require a correction to or a clarification of the Tender will be provided by the Contract Administrator only to the Bidder who made the enquiry.

B3.5 The Bidder shall not be entitled to rely on any response or interpretation received pursuant to B3 unless that response or interpretation is provided by the Contract Administrator in writing.

B4. CONFIDENTIALITY

B4.1 Information provided to a Bidder by the City or acquired by a Bidder by way of further enquiries or through investigation is confidential. Such information shall not be used or disclosed in any way without the prior written authorization of the Contract Administrator. The use and disclosure of the confidential information shall not apply to information which:

- (a) was known to the Bidder before receipt hereof; or
- (b) becomes publicly known other than through the Bidder; or
- (c) is disclosed pursuant to the requirements of a governmental authority or judicial order.

B4.2 The Bidder shall not make any statement of fact or opinion regarding any aspect of the Tender to the media or any member of the public without the prior written authorization of the Contract Administrator.

B5. ADDENDA

B5.1 The Contract Administrator may, at any time prior to the Submission deadline, issue addenda correcting errors, discrepancies or omissions in the Tender, or clarifying the meaning or intent of any provision therein.

- B5.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.
- B5.3 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>
- B5.4 The Bidder is responsible for ensuring that he/she has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.
- B5.5 The Bidder shall acknowledge receipt of each addendum in Paragraph 8 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.
- B5.6 Notwithstanding B3, enquiries related to an Addendum may be directed to the Contract Administrator indicated in D5.

B6. SUBSTITUTES

- B6.1 The Work is based on the materials, equipment, methods and products specified in the Tender.
- B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least fourteen (14) Business Days prior to the Submission Deadline.
- B6.4 The Bidder shall ensure that any and all requests for approval of a substitute:
- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the material, equipment, method or product as either an approved equal or alternative;
 - (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
 - (c) identify any anticipated cost or time savings that may be associated with the substitute;
 - (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the Contract;
 - (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the Contract.
- B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his/her sole discretion grant approval for the use of a substitute as an "approved equal" or as an "approved alternative", or may refuse to grant approval of the substitute.
- B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, to the Bidder who requested approval of the substitute.
- B6.6.1 The Contract Administrator will issue an Addendum, disclosing the approved materials, equipment, methods and products to all potential Bidders. The Bidder requesting and obtaining the approval of a substitute shall be responsible for disseminating information regarding the approval to any person or persons he/she wishes to inform.

- B6.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his/her Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B16.
- B6.9 No later claim by the Contractor for an addition to the price(s) because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

B7. BID SUBMISSION

- B7.1 The Bid shall consist of the following components:
- (a) Form A: Bid; and
 - (b) Form B: Prices.
- B7.2 Further to B7.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B6.
- B7.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely.
- B7.4 The Bid Submission may be submitted by mail, courier or personal delivery, or by facsimile transmission.
- B7.5 If the Bid Submission is submitted by mail, courier or personal delivery, it shall be enclosed and sealed in an envelope clearly marked with the Tender number and the Bidder's name and address, and shall be submitted to:
- The City of Winnipeg
Corporate Finance Department
Materials Management Division
185 King Street, Main Floor
Winnipeg MB R3B 1J1
- B7.5.1 Samples or other components of the Bid Submission which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Tender number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid Submission.
- B7.6 If the Bid Submission is submitted by facsimile transmission, it shall be submitted to 204- 949-1178.
- B7.6.1 The Bidder is advised that the City cannot take responsibility for the availability of the facsimile machine at any time or guarantee the successful receipt of a faxed Bid Submission.
- B7.7 Bidders are advised not to include any information/literature except as requested in accordance with B7.1.
- B7.8 Bidders are advised that inclusion of terms and conditions inconsistent with the Tender document, including the General Conditions, will be evaluated in accordance with B16.1(a).
- B7.9 Bids submitted by internet electronic mail (e-mail) will not be accepted.

B8. BID

- B8.1 The Bidder shall complete Form A: Bid, making all required entries.

- B8.2 Paragraph 2 of Form A: Bid shall be completed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, his/her name shall be inserted;
 - (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
 - (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
 - (d) if the Bidder is carrying on business under a name other than his/her own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.
- B8.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.
- B8.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.
- B8.4 Paragraph 11 of Form A: Bid shall be signed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, it shall be signed by the Bidder;
 - (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
 - (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers;
 - (d) if the Bidder is carrying on business under a name other than his/her own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.
- B8.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.
- B8.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

B9. PRICES

- B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B9.1.1 Prices on Form B: Prices shall include:
- (a) duty;
 - (b) freight and cartage;
 - (c) Provincial and Federal taxes [except the Goods and Services Tax (GST) and Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable] and all charges governmental or otherwise paid;
 - (d) profit and all compensation which shall be due to the Contractor for the Work and all risks and contingencies connected therewith.
- B9.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.
- B9.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.

B10. DISCLOSURE

B10.1 Various Persons provided information or services with respect to this Work. In the City's opinion, this relationship or association does not create a conflict of interest because of this full disclosure. Where applicable, additional material available as a result of contact with these Persons is listed below.

B10.2 The Persons are:

- (a) n/a

B11. CONFLICT OF INTEREST AND GOOD FAITH

B11.1 Bidders, by responding to this Tender, declare that no Conflict of Interest currently exists, or is reasonably expected to exist in the future.

B11.2 Conflict of Interest means any situation or circumstance where a Bidder or employee of the Bidder proposed for the Work has:

- (a) other commitments;
- (b) relationships;
- (c) financial interests; or
- (d) involvement in ongoing litigation;

that could or would be seen to:

- (i) exercise an improper influence over the objective, unbiased and impartial exercise of the independent judgment of the City with respect to the evaluation of Bids or award of the Contract; or
- (ii) compromise, impair or be incompatible with the effective performance of a Bidder's obligations under the Contract;
- (e) has contractual or other obligations to the City that could or would be seen to have been compromised or impaired as a result of its participation in the Tender process or the Work; or
- (f) has knowledge of confidential information (other than confidential information disclosed by the City in the normal course of the Tender process) of strategic and/or material relevance to the Tender process or to the Work that is not available to other bidders and that could or would be seen to give that Bidder an unfair competitive advantage.

B11.3 In connection with its Bid, each entity identified in B11.2 shall:

- (a) avoid any perceived, potential or actual Conflict of Interest in relation to the procurement process and the Work;
- (b) upon discovering any perceived, potential or actual Conflict of Interest at any time during the Tender process, promptly disclose a detailed description of the Conflict of Interest to the City in a written statement to the Contract Administrator; and
- (c) provide the City with the proposed means to avoid or mitigate, to the greatest extent practicable, any perceived, potential or actual Conflict of Interest and shall submit any additional information to the City that the City considers necessary to properly assess the perceived, potential or actual Conflict of Interest.

B11.4 Without limiting B11.3, the City may, in its sole discretion, waive any and all perceived, potential or actual Conflicts of Interest. The City's waiver may be based upon such terms and conditions as the City, in its sole discretion, requires to satisfy itself that the Conflict of Interest has been appropriately avoided or mitigated, including requiring the Bidder to put into place such policies, procedures, measures and other safeguards as may be required by and be acceptable to the City, in its sole discretion, to avoid or mitigate the impact of such Conflict of Interest.

- B11.5 Without limiting B11.3, and in addition to all contractual or other rights or rights at law or in equity or legislation that may be available to the City, the City may, in its sole discretion:
- (a) disqualify a Bidder that fails to disclose a perceived, potential or actual Conflict of Interest of the Bidder or any of its employees proposed for the Work;
 - (b) require the removal or replacement of any employees proposed for the Work that has a perceived, actual or potential Conflict of Interest that the City, in its sole discretion, determines cannot be avoided or mitigated;
 - (c) disqualify a Bidder or employees proposed for the Work that fails to comply with any requirements prescribed by the City pursuant to B11.4 to avoid or mitigate a Conflict of Interest; and
 - (d) disqualify a Bidder if the Bidder, or one of its employees proposed for the Work, has a perceived, potential or actual Conflict of Interest that, in the City's sole discretion, cannot be avoided or mitigated, or otherwise resolved.

B11.6 The final determination of whether a perceived, potential or actual Conflict of Interest exists shall be made by the City, in its sole discretion.

B12. QUALIFICATION

B12.1 The Bidder shall:

- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Bidder does not carry on business in Manitoba, in the jurisdiction where the Bidder does carry on business; and
- (b) be financially capable of carrying out the terms of the Contract; and
- (c) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract.

B12.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

- (a) be responsible and not be suspended, debarred or in default of any obligations to the City. A list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <https://winnipeg.ca/finance/findata/matmgt/listing/debar.pdf>

B12.3 The Bidder and/or any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

- (a) have successfully carried out work similar in nature, scope and value to the Work; and
- (b) be fully capable of performing the Work required to be in strict accordance with the terms and provisions of the Contract; and
- (c) have a written workplace safety and health program, if required, pursuant to The Workplace Safety and Health Act (Manitoba);

B12.4 The Bidder shall submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.

B12.5 The Bidder shall supply within fourteen (14) Calendar Days of a request from the Contract Administrator samples and / or technical documentation specific to any item or assembly that would be included in the deliverables.

B12.5.1 The Bidder is responsible for all freight costs associated with the delivery and return of any requested sample(s) as described in B12.5.

- B12.5.2 Unsolicited samples will be returned at Bidder's expense.
- B12.6 The Bidder may be considered as non-responsive if requested information and / or sample as described in B12.4 or B12.5 is not received within the time frame specified.
- B12.7 Following non-destructive testing, the item will be evaluated to determine suitability to intended purpose.
- B12.8 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B13. OPENING OF BIDS AND RELEASE OF INFORMATION

- B13.1 Bids will not be opened publicly.
- B13.2 Following the Submission Deadline, the names of the Bidders and their Total Bid Price (unevaluated, and pending review and verification of conformance with requirements or evaluated prices) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt>
- B13.3 After award of Contract, the name(s) of the successful Bidder(s), their address(es) and the Contract amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt>
- B13.4 The Bidder is advised that any information contained in any Bid may be released if required by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law or by City policy or procedures (which may include access by members of City Council).
- B13.4.1 To the extent permitted, the City shall treat as confidential information, those aspects of a Bid Submission identified by the Bidder as such in accordance with and by reference to Part 2, Section 17 or Section 18 or Section 26 of The Freedom of Information and Protection of Privacy Act (Manitoba), as amended.

B14. IRREVOCABLE BID

- B14.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 9 of Form A: Bid.
- B14.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work for the time period specified in Paragraph 9 of Form A: Bid.

B15. WITHDRAWAL OF BIDS

- B15.1 A Bidder may withdraw his/her Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.
- B15.1.1 Notwithstanding C21, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.
- B15.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 11 of Form A: Bid, and only such person, has authority to give notice of withdrawal.
- B15.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:
- (a) retain the Bid until after the Submission Deadline has elapsed;

- (b) open the Bid to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 11 of Form A: Bid; and
- (c) if the notice has been given by any one of the persons specified in B15.1.3(b), declare the Bid withdrawn.

B15.2 A Bidder who withdraws his/her Bid after the Submission Deadline but before his/her Bid has been released or has lapsed as provided for in B14.2 shall be liable for such damages as are imposed upon the Bidder by law and subject to such sanctions as the Chief Administrative Officer considers appropriate in the circumstances. The City, in such event, shall be entitled to all rights and remedies available to it at law.

B16. EVALUATION OF BIDS

B16.1 Award of the Contract shall be based on the following bid evaluation criteria:

- (a) compliance by the Bidder with the requirements of the Tender, or acceptable deviation therefrom (pass/fail);
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B12 (pass/fail);
- (c) Total Bid Price;
- (d) economic analysis of any approved alternative pursuant to B6.

B16.2 Further to B16.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid Submission is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities if the interests of the City so require.

B16.3 Further to B16.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his/her Bid or in other information required to be submitted, that he/she is qualified.

B16.4 Further to B16.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.

B16.5 This Contract will be awarded as a whole.

B17. AWARD OF CONTRACT

B17.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B17.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be qualified, and the Bids are determined to be responsive.

B17.2.1 Without limiting the generality of B17.2, the City will have no obligation to award a Contract where:

- (a) the prices exceed the available City funds for the Work;
- (b) the prices are materially in excess of the prices received for similar work in the past;
- (c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with its own forces;
- (d) only one Bid is received; or
- (e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.

B17.3 Where an award of Contract is made by the City, the award shall be made to the qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B16.

- B17.3.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his/her Bid upon written request to the Contract Administrator.
- B17.4 Notwithstanding C4, the City may issue a purchase order to the successful Bidder in lieu of the execution of a Contract.
- B17.5 The Contract Documents, as defined in C1.1(n)(ii), in their entirety shall be deemed to be incorporated in and to form a part of the purchase order notwithstanding that they are not necessarily attached to or accompany said purchase order.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for the Supply of Goods* (Revision 2019-01-15) are applicable to the Work of the Contract.
- C0.1.1 The *General Conditions for the Supply of Goods* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/gen_cond.stm
- C0.2 A reference in the Tender to a section, clause or subclause with the prefix "**C**" designates a section, clause or subclause in the *General Conditions for Supply of Goods*.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

D1.1 In addition to the *General Conditions for the Supply of Goods*, these Supplemental Conditions are applicable to the Work of the Contract.

D2. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of supply and delivery of audible signal controller boards from the date of award until November 30, 2020 with the option of four (4) mutually agreed upon one (1) year extensions.

D2.1.1 The City may negotiate the extension option with the Contractor within ninety (90) Calendar Days prior to the expiry date of the Contract. The City shall incur no liability to the Contractor as a result of such negotiations.

D2.1.2 Changes resulting from such negotiations shall become effective on December 1st of the respective year. Changes to the Contract shall not be implemented by the Contractor without written approval by the Contract Administrator.

D2.2 The Work shall be done on an "as required" basis during the term of the Contract.

D2.2.1 The type and quantity of Work to be performed under this Contract shall be as authorized from time to time by the Contract Administrator and/or Users.

D2.2.2 Notwithstanding C7, the City shall have no obligation under the Contract to purchase any quantity of any item in excess of its actual operational requirements.

D2.3 Notwithstanding D2.1, in the event that operational changes result in substantial changes to the requirements for Work, the City reserves the right to alter the type or quantity of work performed under this Contract, or to terminate the Contract, upon thirty (30) Calendar Days written notice by the Contract Administrator. In such an event, no claim may be made for damages on the ground of loss of anticipated profit on Work.

D3. COOPERATIVE PURCHASE

D3.1 The Contractor is advised that this is a cooperative purchase.

D3.2 The Contract Administrator may, from time to time during the term of the Contract, approve other public sector organizations and utilities, including but not limited to municipalities, universities, schools and hospitals, to be participants in the cooperative purchase.

D3.3 The Contract Administrator will notify the Contractor of a potential participant and provide a list of the delivery locations and estimated quantities.

D3.4 If any location of the potential participant is more than ten (10) kilometres beyond the boundaries of the City of Winnipeg, the Contractor shall, within fifteen (15) Calendar Days of the written notice, notify the Contract Administrator of the amount of any additional delivery charge for the location.

D3.5 If any additional delivery charges are identified by the Contractor, the potential participant may accept or decline to participate in the cooperative purchase.

D3.6 The Contractor shall enter into a contract with each participant under the same terms and conditions as this Contract except:

- (a) supply under the contract shall not commence until the expiry or lawful termination of any other contract(s) binding the participant for the same goods;

- (b) a participant may specify a duration of Contract shorter than the duration of this Contract;
- (c) a participant may specify that only some items under this Contract and/or less than its total requirement for an item are to be supplied under its contract; and
- (d) any additional delivery charge identified and accepted in accordance with clause D3.4 and D3.5 will apply.

D3.7 Each participant will be responsible for the administration of its contract and the fulfilment of its obligations under its contract. The City shall not incur any liability arising from any such contract.

D3.8 No participant shall have the right or authority to effect a change in the Contract, or of any other participant in this Contract.

D4. DEFINITIONS

D4.1 When used in this Tender:

- (a) "**AASTO**" means American Association of State Highway and Transportation;
- (b) "**ASTM**" means American Society for testing and Materials;
- (c) "**IMSA**" means International Municipal Signal Association;
- (d) "**ITE**" means Institute of Transportation Engineers.

D5. CONTRACT ADMINISTRATOR

D5.1 The Contract Administrator is:

Vic Hucko
Asset Standards & Contract Specialist
Telephone No.: 204-986-4191
Email Address: vhucko@winnipeg.ca

D6. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON DISCLOSURE

D6.1 The Contract, all deliverables produced or developed, and information provided to or acquired by the Contractor are the property of the City and shall not be appropriated for the Contractors own use, or for the use of any third party.

D6.2 The Contractor shall not make any public announcements or press releases regarding the Contract, without the prior written authorization of the Contract Administrator.

D6.3 The following shall be confidential and shall not be disclosed by the Contractor to the media or any member of the public without the prior written authorization of the Contract Administrator;

- (a) information provided to the Contractor by the City or acquired by the Contractor during the course of the Work;
- (b) the Contract, all deliverables produced or developed; and
- (c) any statement of fact or opinion regarding any aspect of the Contract.

D6.4 A Contractor who violates any provision of D6 may be determined to be in breach of Contract.

D7. RETURNED GOODS

D7.1 Further to C.7 and C.11, The Contract Administrator or his/her designate shall inform the Contractor of the item(s) being returned and the reason for the return. The Contractor shall provide the Contract Administrator with Return Material Authorization (RMA) including shipping instructions, within five (5) Calendar Days of the request.

- D7.1.1 The Contractor shall be responsible for all transportation charges on returned goods and further to C.8 the goods will be held at the Contractor's risk pending instruction.
- D7.2 Further to D7.1 (above) the RMA shall include the following information, as a minimum:
- (a) Company name, if different than Contractor, and ship to addresses;
 - (b) Written authorization for the return and for a collect shipment;
 - (c) Preference of carrier / shipping method, a contact person with either a local Winnipeg telephone number or a toll-free telephone number;
 - (d) A contact person, responsible for the returned goods, with a toll-free telephone number.
- D7.3 The Contract Administrator shall provide, as a minimum:
- (a) The City department returning the goods, including an address and contact information for pick up;
 - (b) The City account number; if applicable;
 - (c) The City of Winnipeg's Department and address;
 - (d) Two (2) copies of the written authorization / RMA, one (1) copy on the outside and one (1) within the package;
 - (e) Total number of packages, weight and dimensions.

D8. NOTICES

- D8.1 Notwithstanding C21.3, all notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer.

SUBMISSIONS

D9. AUTHORITY TO CARRY ON BUSINESS

- D9.1 The Contractor shall be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Contractor does not carry on business in Manitoba, in the jurisdiction where the Contractor does carry on business, throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

SCHEDULE OF WORK

D10. COMMENCEMENT

- D10.1 The Contractor shall not commence any Work until he/she is in receipt of a notice of award from the City authorizing the commencement of the Work.
- D10.2 The Contractor shall not commence any Work until:
- (a) the Contract Administrator has confirmed receipt and approval of:
 - (i) evidence of authority to carry on business specified in D9;
 - (ii) evidence of the workers compensation coverage specified in C6.16;
 - (b) the Contractor has attended a meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a meeting.
 - (c) a purchase order has been received from The City of Winnipeg Public Works Stores personnel noting quantity of material required.

D11. DELIVERY

D11.1 Goods shall be delivered on an "as required" basis during the term of the Contract, f.o.b. destination, freight prepaid, to:

Public Works Stores
1277 Pacific Ave.
Winnipeg, MB

D11.1.1 Goods shall be delivered within ninety (90) Business Days of the placing of an order.

D11.2 Initial start-up delivery shall be sixty (60) Business days from the date of award.

D11.3 After the initial start-up delivery stated in D11.2, Goods shall be delivered in accordance with D11.1.1.

D11.4 The Contractor shall confirm each delivery with the Contract Administrator or his/her designate, at least two (2) Business Days before delivery.

D11.5 Goods shall be delivered between 8:00 a.m. and 2:30 p.m. on Business Days.

D11.6 The Contractor shall off-load goods as directed at the delivery location.

D12. LIQUIDATED DAMAGES

D12.1 If the Contractor fails to achieve delivery of the goods within the time specified in D11. Delivery the Contractor shall pay the City one hundred twenty-five dollars (\$125) per Calendar Day for each and every Calendar Day until the goods have been delivered.

D12.2 The amount specified for liquidated damages in D12.1 is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve delivery by the day fixed herein for same.

D12.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D13. ORDERS

D13.1 The Contractor shall provide a local Winnipeg telephone number or a toll-free telephone number at which orders for delivery may be placed.

D13.2 The City intends to place an initial order for not less than 400 units.

D14. RECORDS

D14.1 The Contractor shall keep detailed records of the goods supplied under the Contract.

D14.2 The Contractor shall record, as a minimum, for each item listed on Form B: Prices:

- (a) user name(s) and addresses;
- (b) order date(s);
- (c) delivery date(s); and
- (d) description and quantity of goods supplied.

D14.3 The Contractor shall provide the Contract Administrator with a copy of the records for each quarter year within fifteen (15) Calendar Days of a request of the Contract Administrator.

MEASUREMENT AND PAYMENT

D15. INVOICES

D15.1 Further to C10, the Contractor shall submit an invoice for each order delivered to:

The City of Winnipeg
Corporate Finance - Accounts Payable
4th Floor, Administration Building, 510 Main Street
Winnipeg MB R3B 1B9

Facsimile No.: 204- 949-0864

Email: CityWpgAP@winnipeg.ca

D15.2 Invoices must clearly indicate, as a minimum:

- (a) the City's purchase order number;
- (b) date of delivery;
- (c) delivery address;
- (d) type and quantity of goods delivered;
- (e) the amount payable with GST, MRST, and any applicable environmental handling charges/fees identified and shown as separate amounts; and
- (f) the Contractor's GST registration number.

D15.3 The City will bear no responsibility for delays in approval of invoices which are improperly submitted.

D15.4 **Bid Submissions must not be submitted to the above facsimile numbers. Bids must be submitted in accordance with B7.**

D16. PAYMENT

D16.1 Further to C10, payment shall be in Canadian funds net thirty (30) Calendar Days after receipt and approval of the Contractor's invoice.

D16.2 Further to C10, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

WARRANTY

D17. WARRANTY

D17.1 Notwithstanding C11, the warranty period for each item of Work supplied shall begin on the date of successful delivery and expire three (3) year(s) thereafter unless extended pursuant to C11.3, in which case it shall expire when provided for thereunder.

D17.1.1 The warranty period shall cover all hardware components as well as any future firmware updates from the manufacturer.

D17.2 In addition to Warranty details published in D17.1, the supplier shall be responsible for all transportation and service charges for any item that fails with the warranty period.

D17.3 Warrantable items must be repaired or replaced and returned to the City in operating condition within 30 days of item arriving at the repair facility.

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS

- E1.1 These Specifications shall apply to the Work.
- E1.2 Bidders are reminded that requests for approval of substitutes as an approved equal or an approved alternative shall be made in accordance with B6. In every instance where a brand name or design specification is used, the City will also consider approved equals and/or approved alternatives in accordance with B6.

E2. GOODS

- E2.1 The Contractor shall supply supply and delivery of audible signal controller boards in accordance with the requirements hereinafter specified.
- E2.2 This specification is based and expands upon the standards prescribed by the current Manual on Uniform Traffic Control Devices for Canada. It is not intended to impose restrictions upon design or materials, which conform to the AASHTO, ASTM, ITE, or IMSA Standards. All AASHTO, ASTM, ITE or IMSA standards not mentioned in this specification shall still apply.
- E2.3 The Audible Signals Controller design shall operate from firmware provided by the controller manufacturer that accommodates all features described in this section. The firmware shall be programmed into a user-replaceable memory storage device that shall be removable without the use of electrical tools or other unique equipment. The firmware shall be backwards-compatible to previous models of audible signals controllers from the same manufacturer.
 - E2.3.1 Weather resistant labels affixed to the memory storage device(s) shall include information appropriate to the model, firmware version and release date, and may be colour-coded to assist in visually identifying the version of firmware contained within the memory device.
 - E2.3.2 If applicable, the most recent firmware supplied to the City of Winnipeg for previous audible signals controllers shall operate properly in the hardware supplied under this Contract.
- E2.4 The Audible Signals Controller shall be an "Internal" style device, that would normally be mounted within a controller cabinet, a 300mm (12-inch) square pedestrian signal head or similar enclosure and shall be designed to drive either one(1) or two (2) or more series-connected, externally-mounted "standard" City speakers described in clause E2.11.
 - E2.4.1 Each audible signals controller shall be supplied complete with a microphone and associated wiring to provide for ambient noise compensated sound output levels as detailed per clause E3.7.
 - E2.4.2 Physical dimensions and characteristics of the audible signals controller are contained in clause E4.2.
- E2.5 The City of Winnipeg shall install audible signals controllers and the (vendor-supplied) ambient noise compensation microphone. The City shall furnish, install and connect to each audible signals controller wiring to or from the appropriate associated push-button(s) inputs, the standard output speakers to generate all specified output sounds described in E3 and the "Walk" and "Don't Walk" pedestrian signal field wiring connections.
- E2.6 The audible signals controller either automatically or (as a selectable option) via pushbutton command shall issue one (1) of four (4) selectable "Leave Curb Sound" during the "Walk" interval or a portion thereof to indicate the appropriate interval for people to begin to cross a street.
- E2.7 The lowest volume setting of each of the audible signal controller sounds shall be variable, adjustable and ambient noise compensated for minimal neighborhood disturbance as detailed in clause E3.7.

- E2.8 The volume levels for all sounds shall be set manually at the time of installation. These infinitely variable controls shall be of suitable quality to tolerate repeat adjustments without failure and the external housing of each control shall incorporate external scale markings to assist in the setup and troubleshooting of each audible signal controller board.
- E2.9 Each audible signals controller, when controlled by push-buttons, shall issue a very low-volume "Locator Sound" to alert pedestrians of the presence of audible signals controller and to help visually impaired people locate the appropriate push-button. The audible signals controller(s) shall provide audible feedback - one (1) "Push-button Click" - issued immediately upon every activation of a push-button. The structure components (shaft and arm etc.) shall be placed on timber blocking and secured with nylon ropes during their transportation.
- E2.10 The audible signals controller(s) shall become silent and all sounds deactivated when the associated visual pedestrian signals are dark, such as during flashing operation of the traffic control signals.
- E2.11 The City of Winnipeg standard speaker for the audible signals controller is the Amesco Model SHX-52. This speaker has 8-ohm coil resistance, sound pressure level of 97 dB/W (1m) and 15-watt power rating. Either a single speaker or two (2) to four (4) speakers in series may be connected to the output circuit of each audible signals controller.
- E2.12 All sounds ("Leave Curb Sound", "Locator Sound" and "Push-button Click") produced by the audible signals controller shall be emitted by the above noted speakers.

E3. PERFORMANCE REQUIREMENTS

- E3.1 When operating at a traffic signalized installation, each audible signals controller shall be capable of generating audible sounds as defined below.
- E3.2 Each audible signals controller shall be capable of being user-configured to provide any one specified "Leave Curb Sound" as shown in Table 1 (below). The selected sound shall be output during all or a portion of the appropriate associated "Walk" pedestrian signal interval (its function being to give an audible notification to pedestrians when to start their crossing). Additional sound characteristics are detailed in clause E3.8(a).
- E3.3 Sounds: Each audible signals controller shall be able to emit one (1) of four (4) audible "Leave Curb Sound" during the "Walk" display interval as shown in table 1 (below).

Table 1: Audible Signals Controller Output Parameters for "Leave Curb Sound"

Parameter	Sound #1 *	Sound #2 **	Sound #3 *	Sound #4 **
Sound Type	Bird Call "Peep" or "Chirp"	Bird Call "Cuckoo"	High Frequency "Beep-Beep-Beep"	"Canadian Melody"
Sound Pattern	Short Duration Tone of "Ramped" Rapidly Descending Frequency	Two (2) Tone Pattern of Alternating High then Low Frequency Tones	Continuous Equal "On-Off" Pulses of Single Frequency	Four (4) Tone Pattern of Decreasing Frequencies
Pattern Sequence Period	1.0 second (+/- 20%)	1.5 second (+/- 20%)	200 milliseconds (+/- 20%)	1.5 second (+/- 20%)
Sound Duration	170 milliseconds (+/- 20%)	500 milliseconds (+/- 20%)	100 milliseconds (+/- 20%)	300 milliseconds per tone (+/- 20%)
Initial Frequency	2,800 Hz (+/- 20%)	1,250 Hz (+/- 20%)	2,800 Hz (+/- 20%)	1,250 Hz (+/- 20%)

* - Sound #1 and Sound #3 are legacy sounds from previous Canadian Accessible Pedestrian Signal Standards, and are still in use at some signalized pedestrian crossings in Winnipeg.

** - Sound #2 and Sound #4 are sounds described within the current Manual of Uniform Traffic Control Devices for Canada for Accessible Pedestrian Signals.

- E3.4 “Locator Sound”: Each audible signals controller shall also be capable of generating a “Locator Sound”. The purpose of the “Locator Sound” is in part to alert pedestrians that other sounds will be generated sent to assist pedestrians with visual impairments to more readily locate the appropriate pedestrian push-button which governs the corresponding pedestrian signal and to provide some directional guidance to those still crossing when the “Leave Curb Sound” terminates. The “Locator Sound” should be a constant pattern of repetitive short duration pulses, and shall be dissimilar from the four (4) specified “Leave Curb Sound” as defined below. Additional “Locator Sound” characteristics are detailed in clause E3.8(b).
- E3.5 “Push-button Click”: Each audible signals controller shall be capable of generating a “Push-button Click” immediately in response to each push-button press to initiate a call for the “Leave Curb Sound”. The purpose of “Push-button Click” is to provide audible feedback that the push-button has been pressed, registered and acknowledged by the Audible Signals Controller unit. The “Push-button Click” shall be a single short duration sound, similar to the metallic sound from a conventional light switch, and shall be dissimilar from any of the other sounds specified herein. The push-button interface is described in clause E3.10. Additional “Push-button Click” characteristics are detailed in clause E3.8(c).
- E3.6 Future Sound Outputs: Each audible signals controller should be designed to have the capability of generating possible any future “Pedestrian Clearance Sound”:
- (a) Provision for a “Pedestrian Clearance Sound” for the visual “Flashing Don’t Walk” Interval (future option): in addition to the four (4) above noted “Leave Curb Sound”, it is possible that up to four (4) additional sounds may be defined in future, intended to sound concurrently during the Flashing Hand signal interval. A specific “Pedestrian Clearance Sound” would likely be defined for each “Leave Curb Sound”. Although all characteristics of any future “Pedestrian Clearance Sound” are currently undefined, the audible signals controller offered should be designed to provide the option to incorporate any future “Pedestrian Clearance Sound” within the audible signals controller offered, with minimal hardware alterations being required for the upgrade (e.g. audible signals controller upgradeable via replacement only of socket-mounted memory device(s) or programmable logic integrated circuit(s) and setting of pin(s) or jumper(s), for example); and
 - (b) The future option “Pedestrian Clearance Sound” would emit from the same speaker(s) as the corresponding “Leave Curb Sound”, should be ambient-noise compensated, and should have the same sound pressure level (***) characteristics as the “Leave Curb Sound”. The future “Pedestrian Clearance Sound” would be generated only when it would follow its companion “Leave Curb Sound”, that is, it would be provided only after the corresponding “Leave Curb Sound” had been issued during all or a portion of the immediately preceding “Walk” interval. If initiated, the future “Pedestrian Clearance Sound” would be emitted during the entire portion of the “Flashing Don’t Walk” interval, and would cease to sound within one (1.0) second after the “Flashing Don’t Walk” signal becomes non-flashing (or dark).
- E3.7 **Ambient-Noise Compensated Sound Output Levels:** the volume of the Audible “Leave Curb Sound” and the “Locator Sound” shall be continuously adjustable to provide a “quiet” sound pressure level (***) range from absolute silence to a volume of approximately 2 dB to 5 dB at one (1) metre above ambient during minimal (silent) street activity. During periods of greater ambient street noise, the sound volume shall be ambient noise level compensated, the volume automatically increasing in proportion to ambient noise, up to a maximum sound pressure level (***) of approximately 90 dB at one (1) metre. The output volume shall vary proportionately to the relative level of ambient noise measured during the appropriate “Walk” indication. The response time of the automatic volume control circuitry (i.e. the time between measured increase in ambient noise and the corresponding change of the output sound volume) shall be between 150 to 200 milliseconds. Each audible signals controller shall provide means to permit the City to field-adjust the minimum volume level above or below the above noted “quiet” sound pressure level (***) of 2 to 5 dB level (i.e. to set the “minimum volume” level during minimal street activity).

- E3.7.1 *** NOTE: Sound Pressure Level Test Conditions: respecting all specified sound pressure levels for audible signals controllers, for test conditions assume a series connection of two (2) output speakers, each speaker having 8-ohm coil resistance, sensitivity (i.e. efficiency) of 97 dB/W/ (1m) and 15-watt power rating. The City of Winnipeg standard audible signals controller speaker is an Amesco Model SHX-52.
- E3.8 Additional Sound Characteristics:
- (a) "Leave Curb Sound" shall be programmable to issue concurrently with the associated "Walk" circuit, as long as that circuit is active. However, the following circumstances may modify the operation of the "Leave Curb Sound" output:
- (i) the sound shall be inhibited when the "device inhibit" function (described in E3.9) is active;
 - (ii) the sound shall be deactivated whenever there is no voltage on either the "Walk" or "Don't Walk" circuit for a period greater than 1.5 seconds ("visual pedestrian signals dark" condition). Preferably the sound should be inhibited when there is energy concurrently on both the "Walk" and "Don't Walk" circuits which power the audible signals controller (a fault condition);
 - (iii) there shall be means to program the audible signals controller to limit the "Leave Curb Sound" duration to a maximum interval. This "Leave Curb Sound" time limit shall be user adjustable over a range of six (6) seconds or less to at least 18 seconds;
 - (iv) the "Leave Curb Sound" shall normally be initiated at the beginning of the associated "Walk" interval by default if the "no push-button control" option is selected, or when a valid push-button call has been registered prior to the beginning of the "Walk" interval;
 - (v) the "Leave Curb Sound" shall be capable of being initiated (or re-initiated) at "any point" during the associated "Walk" interval should a valid push-button call be received during "Walk" whenever the "Leave Curb Sound" is silent; and
 - (vi) the maximum interval shall not override audible signal termination control by the associated "Walk" circuit (i.e. whenever the associated "Walk" signal terminates, then shall the "Leave Curb Sound" also immediately terminate, regardless whether the maximum interval has expired).
- (b) "Locator Sound": The "Locator Sound" when selected shall be generated at all times, subject to the following exceptions:
- (i) it shall be inhibited when the "device inhibit" function is active;
 - (ii) it shall be deactivated whenever there is no voltage on either the "Walk" or "Don't Walk" circuit for a period greater than 1.5 seconds ("visual pedestrian signals dark" condition). Preferably the sound should be inhibited when there is energy concurrently on both the "Walk" and "Don't Walk" circuits which power the audible signals controller (a fault condition);
 - (iii) optionally, it may be inhibited when the "Leave Curb Sound" is active;
 - (iv) optionally, the "Locator Sound" may markedly increase in volume for a brief period immediately following termination of the "Leave Curb Sound". This brief period of greater volume of the "Locator Sound" may serve as a "homing beacon" navigation aid to assist visually-impaired pedestrians to maintain their bearing and stay within the crosswalk; and
 - (v) the "Locator Sound" minimum volume level shall be silent. It shall be ambient-noise compensated in similar manner as the "Leave Curb Sound". Its output volume should be continuously adjustable by means of a control separate from that for the "Leave Curb Sound". (The "Locator Sound" volume is field-adjusted not more than 2 to 5 dB louder than ambient, so as to be audible in the range of two (2) to four (4) metres from the appropriate push-button).
- (c) "Push-button Click": The "Push-button Click" generated immediately upon each press of the push-button, shall be functional at all times, excepting:
- (i) it shall be inhibited when the "device inhibit" function is active;
 - (ii) it shall be inhibited when the "Leave Curb Sound" is active; and

- (iii) it shall be deactivated whenever there is no voltage on either the "Walk" or "Don't Walk" circuit for a period greater than 1.5 seconds ("visual pedestrian signals dark" condition). Preferably the "Push-button Click" sound should be inhibited when there is energy concurrently on both the "Walk" and "Don't Walk" circuits which power the audible signals controller (a fault condition).
 - (iv) The minimum volume level shall be silent. The maximum volume shall be at least 60 dB at one(1) metre. Preferably, the "Push-button Click" should be ambient-noise compensated in similar manner as the "Leave Curb Sound". The "Push-button Click" output volume shall be continuously adjustable by means of a control separate from that for the "Locator Sound." The "Push-button Click" volume control may be independent or set by means of the same volume control as the "Leave Curb Sound".
- E3.9 The audible signals controller shall have a sound inhibit input. Application of 115 (\pm 20) VAC at this input shall disable all sound outputs of the audible signals controller ("Leave Curb Sound", the "Locator Sound" and the "Push-button Click").
- E3.10 Pedestrian push-button Interface: The audible signals controller shall be capable of connection to a pedestrian push-button control circuit for "demand-only" operation. The two (2) distinct pedestrian push-button electrical interfaces with which the audible signals controller shall be compatible are specified as follows:
 - (a) the electrical interface shall accept all input voltages from 12 to 24 volts (plus or minus 2 volts) alternating or direct current. It shall recognize a short circuit as a true input. This short circuit shall be any voltage from zero to three volts; and
 - (b) the electrical interface shall also be capable of supplying electrical energy into the push-button circuit through the push-button connection terminals. When programmed to supply power to the push-button circuit, the unit shall provide either DC or AC consistent with the above-described push-button interfaces.
- E3.11 Constant Push-button Call Fault Response: If the audible signals controller is programmed for push-button activated operation and there is an indefinitely long period during which no energy is presented at the push-button interface (a common "stuck button" fault condition) the audible signals controller shall default to the following operation:
 - (a) at the onset of a "constant call" condition, a single call confirmation click shall sound during "Don't Walk" (as usual) or the "Leave Curb Sound" shall issue during the "Walk" (as usual). No additional call confirmation click shall thereafter be issued until the following sequence of events shall occur;
 - (b) at this point, if the "Walk" circuit is active, the "Leave Curb Sound" shall be issued. If the "Leave Curb Sound" exceeds its maximum interval (if programmed), it shall then become silent, and shall not be issued again until the next recurrence of the "Walk";
 - (c) if the "Don't Walk" is active, no further call confirmation click shall be issued until the start of the next recurrence of the "Don't Walk" following the next successive "Walk"; and
 - (d) following restoration of normal push-button operation, the audible signals controller shall automatically resume its normal mode of operation.
- E3.12 The selection of the appropriate "Leave Curb Sound" shall be by such means as to permit the appropriate sound to be selected by the City by straightforward manual means, (i.e. by means of a long-life, moisture-proof switch or hermetically sealed switch, pin selected jumper, etc.). If more than one (1) of the "Leave Curb Sound" is selected (either in error or due to failure of the selector mechanism), the unit shall default to a silent "fail-safe" mode which permits neither "Leave Curb Sound" to be emitted. Preferably, the "Locator Sound" and the call confirmation click would also be inhibited by this fault condition.
- E3.13 The User shall be capable of selecting "Pushbutton" or "No Pushbutton" operation of the audible signals controller by changing the position of a moisture-proof or hermetically sealed switch.

E4. PHYSICAL AND ENVIRONMENTAL REQUIREMENTS

- E4.1 Device Operating Conditions: Audible signals controllers shall be mounted within an ITE standard twelve inch square pedestrian head, within the Traffic Signal Controller Cabinet or other suitable enclosure. The audible signals controllers shall operate throughout a high relative humidity environment in temperatures from -37 °C to +74 °C (-35 °F to +165 °F).
- E4.2 Physical Size: The dimensions of the audible signals controller (excluding microphone) may not exceed the following:
- (a) length of module, including all connectors 10-1/4 inches maximum;
 - (b) width of module, including all connectors 4-5/8 inches maximum; and;
 - (c) depth of module (underside of PC board to topmost component) - 1-3/4 inches maximum.
- E4.3 Electrical termination of all input and output circuits required by the audible signals controller shall be done by means of standard electrical barrier terminals. All electrical interface terminals and connectors shall be clearly labeled or marked as to function. Screw-type terminals made of non-ferrous metal shall be used for all wiring connections.

E5. ELECTRICAL REQUIREMENTS

- E5.1 Audible signals controllers may be CSA or UL approved and if so, shall bear a label on the housing.
- (a) All electrical interface terminals and connectors shall be clearly labeled or marked as to function. Screw-type terminals made of non-ferrous metal shall be used for all wiring connections.
 - (b) Electrical isolation between the (push-button) input pins and all AC input and common circuits shall be 1,000 Megohms and 2,500 volts DC.
- E5.2 Audible signals controllers shall be powered from 115 VAC (± 20 VAC), 60 Hz, which shall be derived from both the "Walk" and the "Don't Walk" signal circuits. The audible signals controller shall be capable of reliable uninterrupted operation when powered from a "Flashing Don't Walk" signal circuit, which input flashes at one (1) Hz. with a 50% on-time duty cycle. There shall be no energy feedback or transfer between the "Walk" and "Don't Walk" AC circuits resulting from the operation or presence of the audible signals controller. Loss of power from both these circuits for 1.5 seconds or greater shall initiate a "device inhibit" state whereby the audible beginning of walk indication ("Leave Curb Sound") is disabled, until power has been restored. Occurrence of voltage simultaneously on both the appropriate "Walk" and "Don't Walk" circuits is a fault condition and should immediately establish a "device inhibit" state such that all audible sounds are inhibited unless and until the voltage on either circuit should terminate.
- E5.3 The audible signals controller shall use replaceable fuses.
- E5.4 Movistors shall be used to protect the audible signals controller from high voltage transients. Movistors shall be installed between AC+ and neutral, AC+ and ground; and neutral and ground.
- (a) 2 kV High Energy Electrical Transient Tests: The audible signals controller shall withstand without damage the discharge of a 25 microfarad capacitor charged to 2,000 volts applied while the unit is energized and operational, across:
 - (i) each field input (push-button);
 - (ii) AC+ to Protective Ground;
 - (iii) AC- (Neutral) to Protective Ground; and
 - (iv) AC+ to AC- (Neutral).
 - (b) 1 kV Low Energy Input Test (No Load): the audible signals controller shall be designed to withstand without failure the discharge of a 10 microfarad capacitor, charged to $\pm 1,000$ volts, directly across the (push-button) input pins with no load present; and
 - (c) 2 kV Low Energy Input Test (Dummy Load): the audible signals controller shall be designed to withstand without failure the discharge of a 10 microfarad capacitor, charged

to $\pm 2,000$ volts, directly across the (push-button) input pins and across either of the input pins and the Protective Ground. For the duration of this test, a dummy resistive load of five (5) ohms shall be placed across the input terminals.

- E5.5 Each audible signals controller shall be supplied with an ambient-noise compensating microphone with a minimum of 600mm (24-inch) long shield cable attached. The microphone wires shall be terminated on the audible signals controller via screw-type terminals.
- E5.6 All printed circuit board(s) shall be protected with an acrylic conformal coating that conforms to MIL-I-46058. The coating thickness shall be 0.003 +0.002/-0.001 inch and shall be applied to both sides of the cleaned printed-wiring assembly.

E6. DOCUMENTATION

- E6.1 Every item supplied shall be accompanied by a complete documentation package for the audible signals controller. Each package shall include: make and model reference; installation, programming and adjustment procedures; test and check list procedures; electrical characteristics, assembly specifications and printed circuit board layout drawings (including part numbers and circuit board reference numbers).
- E6.2 The Manufacturer's trademark, product identification, date of manufacture and serial number shall be labeled on each audible signals controller in an easily identifiable location.
- E6.3 If applicable, the manufacturer may exclude specific details in the required product documentation package to protect patented technology or other intellectual property.