THE CITY OF WINNIPEG

REQUEST FOR PROPOSAL

RFP NO. 757-2016B

TRANSIT BUS MAINTENANCE AND REPAIR GARAGE EXPANSION DESIGN – BUILD PROJECT

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 TRANSIT BUS MAINTENANCE AND REPAIR GARAGE EXPANSION DESIGN – BUILD PROJECT

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, May 9, 2017.

B2.2 Proposals 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. BIDDING PRE-REQUISITE

B3.1 Only Proponents short-listed from Request for Qualifications 757-2016 are invited to submit detailed Proposals in response to this RFP.

B4. PROPONENTS' CONFERENCE

B4.1 Further to C3.1, the Proponent should attend a Proponents' conference at 421 Osborne Street (Fort Rouge Transit Base) from 10:00 AM to 12:00 PM (CST) on March 20, 2017. Attendance is strongly recommended.

B4.2 The Proponent is advised that, at the Proponents' conference, a tour of the existing Transit Bus Maintenance and Repair Garage will be provided. Proponents will be shown the various functions, equipment and space requirements that will apply to the new expansion. Transit will also identify areas that are deficient and therefore are looking for innovations that will improve operations and increase efficiency within the expansion.

B4.3 The Proponent shall not be entitled to rely on any information or interpretation received at the Proponents' conference unless that information or interpretation is provided by the Contract Administrator in writing.

B4.4 Further to C3.1, the Proponent may make an additional appointment to view the Site by contacting the Contract Administrator.

B4.5 The Proponent is responsible for confirming:

(a) the location of any utility which can be determined from the records or other information available at the offices of any public authority or person, including a municipal corporation and any board or commission thereof, having jurisdiction or control over the utility;

(b) the nature of the surface and subsurface conditions at the Site;

(c) the location, nature, quality or quantity of the materials to be removed or to be employed in the performance of the Work;

(d) the nature, quality or quantity of the Plant needed to perform the Work;

(e) all matters concerning access to the Site, power supplies, location of existing services, utilities or materials necessary for the completion of the Work; and

(f) all other matters which could in any way affect his/her Proposal or the performance of the Work.

B4.6 The Proponent is advised that the existing Transit Bus Maintenance and Repair Garage is a facility which operates twenty-four (24) hours a day, seven (7) days a week. Any proposed

additional visits must be coordinated with daily and special operational functions of the facility to ensure the safety for both City staff and the Proponent.

B5. ENQUIRIES

B5.1 All enquiries shall be directed to the Contract Administrator identified in D4.1.

B5.2 Proponents are permitted to submit questions categorized as follows:

(a) Questions that are of general application and that would apply to other Proponents ("General Questions"), and

(b) Questions that the Proponent considers to be commercially sensitive or confidential to that particular Proponent ("Commercially Confidential Questions")

B5.2.1 If the Contract Administrator disagrees with a Proponent's categorization of a question as a Commercially Confidential Question, it shall give the Proponent an opportunity to either re-categorize the question as a General Question or to withdraw the question.

B5.2.2 If the Contract Administrator determines, in its discretion, that a Commercially Confidential Question, even if it is withdrawn by a Proponent, is of general application to the Proponents or would provide a significant clarification to the information provided by the City to the Proponents or to the RFP process, the Contract Administrator may issue to all of the Proponents a clarification that deals with the same subject matter as the Commercially Confidential Question.

B5.2.3 If a Proponent does not categorize a question, it will be deemed to be a General Question.

B5.3 If the Proponent finds errors, discrepancies or omissions in the proposal, or is unsure of the meaning or intent of any provision therein, the Proponent shall promptly notify the Contract Administrator of the error, discrepancy or omission at least five (5) Business Days prior to the Submission Deadline.

B5.4 If the Proponent is unsure of the meaning or intent of any provision therein, the Proponent should request clarification as to the meaning or intent prior to the Submission Deadline.

B5.5 Responses to enquiries which, in the sole judgment of the Contract Administrator, require a correction to or a clarification of the Request for Proposal will be provided by the Contract Administrator to all Proponents by issuing an addendum.

B5.6 Responses to enquiries which, in the sole judgment of the Contract Administrator, do not require a correction to or a clarification of the Request for Proposal will be provided by the Contract Administrator only to the Proponent who made the enquiry.

B5.7 The Proponent shall not be entitled to rely on any response or interpretation received pursuant to B5 unless that response or interpretation is provided by the Contract Administrator in writing.

B6. COMMERCIALLY CONFIDENTIAL MEETINGS

B6.1 The City may, in its sole discretion, convene commercially confidential meetings with Proponents ("Commercially Confidential Meetings" or "CCM"). These Commercially Confidential Meetings may be

(a) bilateral meetings between the City (and its representatives and advisors) and individual Proponents (and their representatives and advisors), to discuss the Contract and the Proponent's suggested amendments to the terms of the Contract; or

(b) bilateral meetings between the City (and its representatives and advisors) and individual Proponents (and their representatives and advisors) to discuss either,

(i) Project design issues (including Proponents' proposed designs) in accordance with to the RFP, or

(ii) other matters.

B6.2 The approximate dates for Commercially Confidential Meetings will be set out via addendum. While attendance at Commercially Confidential Meetings is not mandatory, Proponents are strongly encouraged to attend. A Proponent's failure to attend a Commercially Confidential Meeting is at the Proponent's sole risk and responsibility.

B6.3 No statement, consent, waiver, acceptance, approval or anything else said or done in any of these Commercially Confidential Meetings or pursuant to any design feedback by the City or any of its respective advisors, employees or representatives shall amend or waive any provision of the RFP documents, or be binding on the City or be relied upon in any way by Proponents, Proponent team members or their advisors except when and only to the extent expressly confirmed in an addendum to the RFP documents issued in accordance with RFP Section B8.

B6.4 The Proponent, its Proponent team members and their respective advisors and representatives and any of their attendees at Commercially Confidential Meetings acknowledge and agree that:

(a) any statement made at a Commercially Confidential Meeting or pursuant to any design feedback by the City or any of its advisors or representatives is not and shall not be deemed or considered to be an indication of a preference by the City or a rejection by the City of anything said or done by the Proponent, Proponent team member or any of their respective advisors or representatives;

(b) any statement made at a Commercially Confidential Meeting or pursuant to any design feedback by the City or any of their advisors or representatives shall not and will not be relied upon in any way by the Proponent, Proponent team member or any of their respective advisors or representatives for any purpose, including any purpose in connection with the RFP, the Contract, the Project or otherwise, except and only to the extent expressly confirmed by addendum in accordance with RFP Section B8, provided that the City shall not be under any obligation to confirm any information by addendum;

(c) the City may share process-related information, including clarifying information, with all Proponents if the need arises; and

(d) the Proponent, its Proponent team members and their respective advisors and representatives:

(i) shall participate in the Commercially Confidential Meetings in accordance with the guidelines, procedures and processes set out in the RFP;

(ii) waive any and all rights to contest and/or protest the RFP and the processes and guidelines set out herein, including the Commercially Confidential Meetings, based on the fact that Commercially Confidential Meetings or design feedback occurred or on the basis that information may have been received during a Commercially Confidential Meeting or pursuant to design feedback by another Proponent, another Proponent's team member, or their respective advisors or representatives that was not received by the Proponent, its own Proponent team member(s) or any of their respective advisors or representatives; and

(iii) agree that the Proponent, its Proponent team members and their respective advisors and representatives must treat information received at a Commercially Confidential Meeting and pursuant to design feedback as confidential information.

B6.5 All Proponents are strongly advised to review and abide by the following CCM guidelines with respect to the various rules and requirements for the conduct of Commercially Confidential Meetings. The following CCM guidelines are not binding on either the City or the Proponents; however the City intends to follow the CCM guidelines and expects the Proponents to do so, except in exceptional circumstances.

B6.5.1 CCMs are not intended to be a question and answer session about the RFP process or RFP documents or the forum in which general or commercially confidential questions are submitted or discussed for oral responses. The enquiries process outlined in B5 is intended to serve that purpose.

B6.5.2 Proponents will be requested to provide an agenda and topics for discussion a minimum of one week ahead of the date for the CCM as outlined via addendum. Proponents will be

expected to lead the discussion through their agendas and the City representatives may ask questions and provide responses as the meeting progresses.

(a) Further to B6.1, the purpose of the CCMs is to allow Proponents an opportunity to raise questions or provide comments on the proposed Contract or design related issues. The City's participation is intended to provide assistance to Proponents in developing designs that are compliant with the Specifications.

(b) Presentation of the agenda prior to the meeting will allow sufficient time for City representatives to review and prepare for the topics of discussion. The City may decline responding to specific questions or comments outlined in the agenda or arising during the CCMs.

(i) Proponents shall provide six (6) copies of the agenda, discussion topics and any presentation materials to the City.

(c) Proponents wishing to follow-up on the agenda topics, questions or comments submitted beforehand; or follow-up on anything said or indicated at a CCM; or have formal responses to questions and or comments will be required to follow the enquiries process.

(d) Proponents are reminded not to release or discuss any specific pricing or costing information during the CCMs.

(e) The City will not suggest alternatives or express preferences with regard to the Proponent's design, except to the extent that such preference is indicated in the Specifications. Additionally, background information and context that might assist a Proponent in making decisions to ensure a compliant design may be provided (i.e. why a material, product or equipment was chosen).

(f) Information provided by Proponents in the CCM will remain confidential with the City. If the City makes a decision to amend the RFP, the revisions will be communicated to all Proponents via addendum.

B6.5.3 Further to B6.4, all CCMs are non-binding and nothing said at the CCMs by either the City or its advisors can amend the RFP, nor will anything said be binding on the City except when and only to the extent expressly confirmed in an addendum to the RFP.

B6.5.4 CCMs will not be a forum for evaluating Proponent's proposed designs or comments. CCMs are not interviews for the purpose of evaluation.

B6.5.5 All participants in CCMs are obliged to treat all information received at the meetings in confidence in accordance with B7.

B6.5.6 The total number of participants from the Proponent's team will be limited to six (6). The total number of participants from the City's team will be limited to six (6).

B7. CONFIDENTIALITY

B7.1 Information provided to a Proponent by the City or acquired by a Proponent 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 Proponent before receipt hereof; or

(b) becomes publicly known other than through the Proponent; or

(c) is disclosed pursuant to the requirements of a governmental authority or judicial order.

B7.2 The Proponent shall not make any statement of fact or opinion regarding any aspect of the Request for Proposal to the media or any member of the public without the prior written authorization of the Contract Administrator.

B8. ADDENDA

B8.1 The Contract Administrator may, at any time prior to the Submission Deadline, issue addenda correcting errors, discrepancies or omissions in the Request for Proposal, or clarifying the meaning or intent of any provision therein.

B8.2 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.

B8.2.1 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.

B8.2.2 The Proponent 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.

B8.3 The Proponent shall acknowledge receipt of each addendum in Paragraph 9 of Form A: Proposal. Failure to acknowledge receipt of an addendum may render a Proposal non-responsive.

B9. SUBSTITUTES

B9.1 The Work is based on the Plant, Materials and methods specified in the Request for Proposal.

B9.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.

B9.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least ten (10) Business Days prior to the Submission Deadline.

B9.4 The Proponent 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 Plant, Material or method 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 proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance; and

(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 proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.

B9.5 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.

B9.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, to the Proponent who requested approval of the substitute.

B9.6.1 The Contract Administrator will issue an addendum, disclosing the approved materials, equipment, methods and products to all potential Proponents. The Proponent 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.

B9.7 If the Contract Administrator approves a substitute as an "approved equal", any Proponent may use the approved equal in place of the specified item.

B9.8 If the Contract Administrator approves a substitute as an "approved alternative", any Proponent 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 B25.

B9.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

B10. PROPOSAL SUBMISSION

B10.1 The Proposal shall consist of the following components:

(a) Form A: Proposal;

(b) Proposal Security

(i) Form G1: Bid Bond and Agreement to Bond, or

(ii) Form G2: Irrevocable Standby Letter of Credit and Undertaking or certified cheque or draft.

(c) Form B: Prices (to be submitted in a separate envelope, refer to B10.7.2 and B10.7.3);

B10.2 The Proposal should also consist of the following components:

(a) Management Plan (Section D) in accordance with B13;

(b) Building Design Summary (Section E), in accordance with B15; and

(c) Project Schedule (Section F) in accordance with B16.

B10.3 Further to B10.1, all components of the Proposal shall be fully completed or provided in the order indicated, and submitted by the Proponent no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Proposal.

B10.4 Further to B10.2, all components of the Proposal should be fully completed or provided in the order indicated, and submitted by the Proponent no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Proposal.

B10.5 Proposal format:

B10.5.1 Proponents should submit one (1) unbound 8.5" x 11" original (marked "original") with original signatures including drawings and six (6) copies for sections identified in B10.1and B10.2.

B10.5.2 Proponents should include one (1) digital copy on CD or memory stick. Digital copies of the proposal submission must be in PDF format, mirroring the content of the original paper version of the proposal. Electronic drawings must be in full size PDF format.

B10.5.3 Full size drawings must be included in the submission at the scales indicated on paper size of the Proponent's choice. Drawings should include and be presented with coloured line work to illustrate and delineate the different systems, and existing versus new features being proposed.

B10.5.4 Each submission should be limited to a total of one-hundred (100) single-sided pages (standard 8.5x11 "), including all required forms, certificates, tables or graphics which form

part of the Proponent's response to B11 to B16, but excluding the cover, cover letter, table of contents and resumes, using a twelve (12) point printing font.

B10.5.5 The pages must be numbered and text divided into tabbed sections addressing the requirements set out herein, in a logical manner reflecting the requirements of this Request for Proposal.

B10.5.6 Proponents are encouraged to use their creativity to submit a Proposal which provides the requested information for evaluation and other information which illustrates the strength of their team.

B10.5.7 Proponents are encouraged to be as concise as possible.

B10.6 Proponents are advised that inclusion of terms and conditions inconsistent with the Request for Proposal, will be evaluated in accordance with B25.1(a).

B10.7 The Proposal shall be submitted in two (2) separate envelopes as follows:

B10.7.1 Proposal

(a) The Proposal shall contain Form A (B11) and the Proposal Security (B12) and should contain the Management Plan (B14), Building Design Summary (B15), and Project Schedule (B16).

B10.7.2 Form B: Prices

(a) The Form B: Prices submission shall contain the Form B: Prices form as outlined in B13.

B10.7.3 The Proposal shall be submitted enclosed and sealed in the two (2) envelopes/packages clearly marked with the RFP number and the Proponent's name and address.

(a) Further to B10.7.1, the envelope/package containing the technical components of the proposal shall be clearly marked "Proposal" on the label.

(b) Further to B10.7.2, the envelope containing Form B: Prices shall be clearly marked "Prices" on the label.

B10.8 Proposals submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.

B10.9 Proposals shall be submitted to:

The City of Winnipeg
Corporate Finance Department
Materials Management Division
185 King Street, Main Floor
Winnipeg MB R3B 1J1

B10.10 Any cost or expense incurred by the Proponent that is associated with the preparation of the Proposal shall be borne solely by the Proponent.

B11. PROPOSAL (SECTION A)

B11.1 The Proponent shall complete Form A: Proposal, making all required entries.

B11.2 Paragraph 2 of Form A: Proposal shall be completed in accordance with the following requirements:

(a) if the Proponent is a sole proprietor carrying on business in his/her own name, his/her name shall be inserted;

(b) if the Proponent is a partnership, the full name of the partnership shall be inserted;

(c) if the Proponent is a corporation, the full name of the corporation shall be inserted;

(d) if the Proponent 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.

B11.2.1 If a Proposal is submitted jointly by two (2) or more persons, each and all such persons shall identify themselves in accordance with B11.2.

B11.3 In Paragraph 3 of Form A: Proposal, the Proponent shall identify a contact person who is authorized to represent the Proponent for purposes of the Proposal.

B11.4 Paragraph 11 of Form A: Proposal shall be signed in accordance with the following requirements:

(a) if the Proponent is a sole proprietor carrying on business in his/her own name, it shall be signed by the Proponent;

(b) if the Proponent is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;

(c) if the Proponent is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, should be affixed;

(d) if the Proponent is carrying on business under a name other than its 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.

B11.4.1 The name and official capacity of all individuals signing Form A: Proposal should be printed below such signatures.

B11.5 If a Proposal is submitted jointly by two (2) or more persons, the word "Proponent" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Proponents in the Proposal and the Contract, when awarded, shall be both joint and several.

B12. PROPOSAL SECURITY (SECTION C)

B12.1 The Proponent shall provide proposal security in the form of:

(a) a bid bond, in the amount of at least ten percent (10%) of the Total Bid Price, and agreement to bond of a company registered to conduct the business of a surety in Manitoba, in the form included in the Bid Submission (Form G1: Bid Bond and Agreement to Bond); or

(b) an irrevocable standby letter of credit, in the amount of at least ten percent (10%) of the Total Bid Price, and undertaking issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form included in the Bid Submission (Form G2: Irrevocable Standby Letter of Credit and Undertaking); or

(c) a certified cheque or draft payable to “The City of Winnipeg”, in the amount of at least fifty percent (50%) of the Total Bid Price, drawn on a bank or other financial institution registered to conduct business in Manitoba.

B12.1.1 If the Proponent submits alternative bids, the bid security shall be in the amount of the specified percentage of the highest Total Bid Price submitted.

B12.1.2 All signatures on bid securities shall be original.

B12.1.3 The Proponent shall sign the Bid Bond.

B12.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.

B12.2 The proposal security of the Proponents will be released by the City when a Contract for the Work has been duly executed by the successful Proponent and the performance security furnished as provided herein.

B12.2.1 Where the proposal security provided by the successful Proponent is in the form of a certified cheque or draft pursuant to B12.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.

B12.2.2 The City will not pay any interest on certified cheques or drafts furnished as proposal security or subsequently retained as performance security.

B12.3 The proposal securities of all Proponents will be released by the City as soon as practicable following notification by the Contract Administrator to the Proponents that no award of Contract will be made pursuant to the Bid Opportunity.

B13. PRICES (SECTION B)

B13.1 The Proposal shall be submitted in a separate envelope as outlined in B10.7.2 and B10.7.3.

B13.2 The Proponent shall state the lump sum price in Canadian funds for the Work on Form B: Prices.

B13.2.1 The lump sum price shall be inclusive of MRST and exclusive of GST.

B13.2.2 The lump sum price shall include the following cash allowance(s):

(a) Interior Fit-up Furniture, Fixtures and Equipment - $270,000.00

B13.3 The Proponent shall state a separate price in Canadian funds for each of the following items of Work on Form B: Prices:

(a) Separate Price - Item No. 1 shall be the amount to be deducted from the lump sum price if one (1) pre-manufactured paint booth system for a 40 foot bus is deleted in accordance with E24.6.1 of the Specifications.

(b) Separate Price - Item No. 2 shall be the amount to be deducted from the lump sum price if one (1) pre-manufactured prep booth system for a 40 foot bus is deleted in accordance with E24.6.2 of the Specifications.

(c) Separate Price - Item No. 3 shall be the amount to be deducted from the lump sum price if hoist equipment for a 60 foot typical bus service bay is substituted with hoist equipment for a 40 foot typical bus service bay in accordance with E24.6.3 of the Specifications; and

(d) Separate Price - Item No. 4 shall be the amount to be deducted from the lump sum price if one (1) pre-manufactured refurb booth system for a 40 foot bus is deleted in accordance with E24.6.4 of the Specifications.

(e) Separate Price – Item No. 5 shall be the amount to be deducted from the lump sum price if the full scope for the design and construction of the Interior Fit-up component is deleted in accordance with E21.37.34.

B13.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

B14. MANAGEMENT PLAN (SECTION D)

B14.1 Proponents should submit a written management plan confirming the Proponent's entire team including specialist consultants where contemplated to be used for such disciplines as codes, landscape, geotechnical, equipment, LEED®, etc. The plan should reiterate the information submitted with the Request for Qualifications.

B14.2 The management plan should include, but is not necessarily limited to:

(a) understanding of the Project's requirements and intended outcomes;

(b) restatement of the key personnel involved and a clear explanation of their respective roles and responsibilities on the Project. This is to confirm that the team that was approved in the shortlisting process is intact. Include the following details:

(i) Percentage of each team member's time involved in the project through all phases, and

(ii) Identification of staff that work in Winnipeg and outside of Winnipeg;

(c) a description of the internal and external communications plan, including communication with the City, Contract Administrator and, authorities having jurisdiction. Outline the lines of communication, reporting protocol, meeting type(s) and frequency, and submission type(s) and schedule;

(d) approach to City and public consultation process and approvals and integration of comments into the design;

(e) risk management planning;

(f) Project specific health and safety procedures and policies; and

(g) Project specific quality assurance/quality control program outlining for both the design and construction of the Work. The outline should address issues such as code compliance, design co-ordination, site organization, health and safety and a particular focus on materials and installation testing and inspections.

B15. BUILDING DESIGN SUMMARY (SECTION E)

B15.1 Provide a narrative describing the salient features of the design Proposal including:

(a) the Proponent's design philosophies and approach to the Bus Maintenance and Repair Garage Expansion and parking lot;

(b) image and character of the building;

(c) exterior materials;

(d) massing and building organization;

(e) description of key interior spaces;

(f) connection and integration into the existing facility;

(g) phasing and sequencing of work so as to minimize impact of construction to existing operations;

(h) parking lot layout and integration of design into the neighbourhood feel;

(i) consideration of public feedback regarding the character, feel and impact of the new construction into the neighbourhood; and

(j) value added and key design points.

B15.2 Proponents should prepare and submit drawings and outline specifications in enough detail to allow the Technical Evaluation Committee to properly assess the proposed building's massing and scale, exterior treatment, construction materials and details, quality, building systems and conformity with the Facility/Building Program and Room Data Sheets. As a minimum, the submission should include the following.

B15.2.1 Drawings

(a) Provide a narrative and site plan(s) describing the salient features of the site design, including:

(i) building placement and orientation;

(ii) site grading;

(iii) site services;

(iv) site development schematics with Crime Prevention Through Environmental Design (CPTED) labels and a narrative describing CPTED solutions;

(v) circulation of transit vehicles around the site during and after construction, including relevant turning radii, traffic movement and emergency vehicle access;

(vi) relocated staff parking including handicapped accessible parking locations;

(vii) traffic movement between the relocated gate at Brandon Avenue and the VIA Rail site;

(viii) approach to landscaping (hard and soft), submit a preliminary landscape plan including a listing of all proposed soft and hard landscaping elements;

(ix) pedestrian and cyclist circulation relative to the Active Transportation pathways;

(x) parking requirements as per City of Winnipeg by-laws and compliance with those requirements;

(xi) storm water management concept; and

(xii) parking lot snow clearing strategy.

(b) Perspective Renderings, showing:

(i) two (2) views of the building exterior;

(ii) interior view from the transition of existing to new garage space; and

(iii) two (2) views of the new parking lot including landscaping features, active transportation corridor and buffering strategies.

(c) Building Floor Plans (for all floor areas), showing:

(i) scale at 1:200;

(ii) layout of each and every function listed including circulation within each functional area to accurately depict the gross area of each function;

(iii) circulation between functional areas including clear dimensions of circulation spaces;

(iv) incorporation of all exiting provisions and other code requirements;

(v) references for interior and exterior wall; and floor assemblies;

(vi) key structural, mechanical and electrical elements;

(vii) clear dimensions for spaces where building structure or installed equipment will encroach into the space; and

(viii) fire separations and firewalls.

(d) Building Sections, showing:

(i) scale at 1:200;

(ii) all clear heights, floor-to-floor heights and relevant dimensions;

(iii) clear height from main floor to underside of structure;

(iv) roof assembly references; and

(v) proposed structural systems.

(e) Building Elevations, showing:

(i) scale at 1:200;

(ii) all clear heights, floor-to-floor heights and relevant dimensions;

(iii) all materials provided;

(iv) line of floor elevations;

(v) exterior building signage; and

(vi) all windows, doors and canopies.

(f) Exterior Wall Sections, showing:

(i) scale at 1:25;

(ii) wall sections of typical exterior wall and roof assemblies; and

(iii) clearly identified building envelope elements and detailing, including wall cladding, air/vapour barriers, insulation and interior finishes.

B15.2.2 Architectural Outline Specifications, including:

(a) a list of exterior wall assemblies, cross-referenced with the floor plans indicating types of construction, insulation levels, exterior cladding, interior finishes, air/vapour barrier and liner panels;

(b) a list of interior wall assemblies, cross-referenced with the floor plans indicating materials and sizes, and indicating fire-resistance ratings and sound transmission class ratings as required;

(c) roofing membranes, insulation types and thickness, air/vapour barrier and structure; and

(d) window types and finishes, including framing, glazing, openers, and associated hardware.

B15.2.3 Mechanical Engineering Design Report

(a) Provide design criteria including:
  (i) outside design temperatures;
  (ii) indoor design temperatures; and
  (iii) reference codes and standards.

(b) Describe the proposed measures for indoor air quality assurance, including but not limited to the following:
  (i) outside-air ventilation rate;
  (ii) minimum air change rates in occupied spaces;
  (iii) minimum outside-air change rates; and
  (iv) description of air cleaning devices including minimum MERV ratings for each area/function.

(c) Describe the proposed heating systems, including but not limited to the following:
  (i) fuel sources;
  (ii) heat generating equipment;
  (iii) distribution systems; and
  (iv) system types.

(d) Describe the proposed cooling systems, including but not limited to the following:
  (i) system types for all equipment;
  (ii) output; and
  (iii) distribution.

(e) Describe the proposed air-handling systems, including but not limited to the following:
  (i) air-conditioning unit types;
  (ii) ventilation unit types;
  (iii) sanitary exhausts; and
  (iv) general and dedicated exhaust systems and components.

(f) Describe the proposed humidity control systems, including but not limited to the following:
  (i) energy source;
  (ii) distribution systems; and
  (iii) design conditions.

(g) Describe the proposed controls system, including but not limited to the following:
  (i) proposed DDC control equipment including sensors, controllers and other devices;
  (ii) preliminary sequence of operation for each system;
  (iii) integration of controls into existing system; and
  (iv) examples of systems and component graphics.

(h) Describe the fire protection systems, including but not limited to the following:
  (i) sprinkler protection;
  (ii) standpipe protection;

(iii) portable fire extinguisher protection; and

(iv) specialized fire protection systems and their locations.

(i) Provide a statement with respect to design solutions addressing the following:

(i) compressed air systems distribution, capacity and integration with existing;

(ii) breathing air systems distribution, capacity and integration with existing;

(iii) acoustics and vibration; and

(iv) proposed energy conservation measures.

(j) Describe how energy analysis calculations will be performed.

(k) Provide a drawing showing the location of mechanical rooms in relation to the rest of the facility, indicating location of major equipment.

(l) Provide drawings showing primary distribution of HVAC systems, plumbing systems, compressed and breathing air systems etc; and

(m) Describe the plumbing fixtures, plumbing systems, materials, and plumbing equipment including DHW systems.

B15.2.4 Electrical Engineering Design Report

(a) Provide an electrical energy budget analysis.

(b) Describe the main electrical service system, including, but not limited to the following:

(i) capacity, complete with electrical load estimations for new and existing systems;

(ii) feeders;

(iii) primary switchgear;

(iv) transformers;

(v) capacitors;

(vi) motor control systems;

(vii) panels; and

(viii) conduits and cable trays.

(c) Describe the medium voltage power distribution system, including but is not limited to the following:

(i) outdoor power distribution centres;

(ii) feeders;

(iii) transformers;

(iv) panels;

(v) breakers;

(vi) conductors; and

(vii) sequencing of work so as to minimize shutdown requirements during the transfer of power from the old to new system.

(d) Describe the proposed building grounding and lightning protection system.

(e) Describe exit signage and emergency lighting system.

(f) Describe lighting systems and lighting controls, including but is not limited to the following:

(i) interior lighting, including lighting levels;

(ii) exterior lighting, including lighting levels;

(iii) roadway and parking lot lighting, including lighting levels;

(iv) lighting control input devices;

(v) lighting control system sequence of operation; and

(vi) lighting control system interfaces.

(g) Describe the fire alarm system, including but not be limited to the following:

(i) system type;
(ii) system operation;
(iii) system interconnections with other systems, such as sprinklers and security door release system; and
(iv) integration into the existing fire alarm building system.

(h) Describe the voice and data system and security systems, including, but not be limited to the following:
(i) system types;
(ii) systems operation; and
(iii) integration into the existing building system.

(i) Describe the design solution for the following:
(i) heating, ventilation, air conditioning and plumbing motors, starters and disconnects;
(ii) electrical outlets and connections;
(iii) special power distribution;
(iv) wiring methods and components;
(v) lighting and controls; and
(vi) energy conservation.

(j) Describe the energy management and control system (EMCS) interfaces: specifically those inputs and outputs, which will be co-ordinated with the controls area of the mechanical section of the Specifications.

(k) Provide locations of electrical, telecommunications and equipment rooms.

(l) Provide schematic design single-line diagrams of the following:
(i) electrical distribution;
(ii) fire alarm;
(iii) voice / data;
(iv) access control system;
(v) video surveillance system; and
(vi) lighting control system.

(m) Describe the emergency generating system including, but not be limited to the following:
(i) type/manufacture of system, exterior self-contained unit, fuel source, run-time and tank location if applicable;
(ii) system capacity;
(iii) locations of electrical power generating equipment;
(iv) method of exhaust ventilation, cooling and sound proofing; and
(v) operation and control system.

(n) Describe the PA system and its operation.
(i) type / manufacture of system;
(ii) system capacity / zoning;
(iii) system interface options;
(iv) recommended speaker density for various spaces;
(v) system sequence of operation; and
(vi) integration into existing building PA system.

B15.2.5 Equipment Design and Integration Report

(a) Describe the new equipment systems incorporated into the building design including but not limited to the following:

(i) typical bus maintenance bay equipment (hoists, fuel distribution, specialty); and

(ii) shop equipment.

(b) For new equipment, describe the following:

(i) type/manufacture of system;

(ii) special features;

(iii) coordination and integration with other mechanical and electrical building systems; and

(iv) conformance to the requirements in Section E.

(c) For existing equipment, describe the following:

(i) preliminary layout of existing equipment within proposed shop spaces;

(ii) coordination and integration with mechanical and electrical building systems; and

(iii) conformance to the requirements in Section E.

B15.2.6 Compliance with Specifications

(a) A City imperative is that the proposed design meets or exceeds the net areas and/or the performance requirements as set forth in Section E.

(b) Proponents may add to the net areas identified should they consider the building program to be deficient or understated in certain areas. Specific design considerations might require some minor changes to the areas listed in Section E.

(c) Provide a narrative confirming that the requirements of Section E have been met by the design. In areas where the requirements have been exceeded, please identify the space type and magnitude of the increase, and describe how the increased area will improve the functionality of the bus maintenance and repair garage expansion. Alternatively provide a description of any reductions in program area or deviation from the performance requirements and explain how the facility will continue to meet the functional requirements of the Transit bus maintenance and repair garage expansion despite the reduction and/or deviation.

B15.2.7 Proponents should provide a narrative and drawings (if required) to explain the value added features, innovations or enhancements that their design provides to the City. Proponents must clearly demonstrate the benefit to the City that the value added feature, innovation or enhancement creates.

B15.3 LEED® Silver Certification Process

(a) Provide information on the process for the delivery of the project to achieve a minimum level of LEED® Silver Certification. The information should include information on the initiatives and related points that may potentially be pursued to meet the requirements for the process and eventual certification.

(b) Provide a preliminary LEED® Project Checklist/Scorecard that indicates prerequisites, displays a Y/Y?/N?/N assessment, each individual credit, the percentage likelihood calculation and the total projected score for the project.

B16. PROJECT SCHEDULE (SECTION F)

B16.1 Proponents should submit a schedule in MS Project format specific to the proposed design, management and construction techniques to be employed while recognizing the commencement, key milestone and completion dates established by the City, as indicated in Sections D15 Commencement and D16 Critical Stages.

B16.1.1 Further to identifying key milestone and overall completion dates, the Proponent's project schedule should also include, but is not limited to, timelines for the following:

(a) Design development;

(b) Permit review and approval periods (including development, zoning/by-law etc.);

(c) Shop drawing approvals;

(d) Specialty equipment lead times (procurement and installation);

(e) Commissioning (overall building commissioning and LEED®); and

(f) Project closeout.

B16.2 Include a narrative describing the Proponent's methodology and strategies for monitoring and controlling the schedule to meet the milestones within the proposed schedule submitted in B16.1.

B16.3 In this section, Proponents must confirm their understanding of the Earned Value Management Schedule Requirements in Section D14 and their willingness to comply with these requirements.

B17. DISCLOSURE

B17.1 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.

B17.2 The Persons are as defined in Request For Qualification 757-2016A.

B18. QUALIFICATION

B18.1 The Proponent 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 Proponent does not carry on business in Manitoba, in the jurisdiction where the Proponent 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.

B18.2 The Proponent 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 http://www.winnipeg.ca/matmgt/debar.stm.

B18.3 The Proponent 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);

(d) have been shortlisted for this Request for Proposal through RFQ 757-2016.

B18.4 The Proponent 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 Proponent and of any proposed Subcontractor.

B18.5 The Proponent shall provide, on the request of the Contract Administrator, full access to any of the Proponent's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Proponent's equipment and facilities are adequate to perform the Work.

B18.6 Further to B18.3(c), the Proponent shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Proponent/Subcontractor has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:

(a) a copy of their valid Manitoba COR certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Certificate of Recognition (COR) Program administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or

(b) a copy of their valid Manitoba SECOR™ certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Small Employer Certificate of Recognition Program (SECOR™) administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or

(c) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/.

B18.7 The Proponent 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 Proponent and of any proposed Subcontractor.

B18.8 The Proponent shall provide, on the request of the Contract Administrator, full access to any of the Proponent's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Proponent's equipment and facilities are adequate to perform the Work.

B19. OPENING OF PROPOSALS AND RELEASE OF INFORMATION

B19.1 Proposals will not be opened publicly.

B19.2 After award of Contract, the names of the Proponents and the Contract amount of the successful Proponent 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/.

B19.3 Proponents are advised that any information contained in any Proposal 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).

B19.4 Following the award of Contract, a Proponent will be provided with information related to the evaluation of his/her submission upon written request to the Contract Administrator.

B20. IRREVOCABLE OFFER

B20.1 The Proposal(s) submitted by the Proponent shall be irrevocable for the time period specified in Paragraph 10 of Form A: Proposal.

B20.2 The acceptance by the City of any Proposal shall not release the Proposals of the other responsive Proponents and these Proponents shall be bound by their offers on such Work until a Contract for the Work has been duly executed and the performance security furnished as herein provided, but any offer shall be deemed to have lapsed unless accepted within the time period specified in Paragraph 10 of Form A: Proposal.

B21. WITHDRAWAL OF OFFERS

B21.1 A Proponent may withdraw his/her Proposal without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.

B21.1.1 Notwithstanding C23.3, the time and date of receipt of any notice withdrawing a Proposal shall be the time and date of receipt as determined by the Manager of Materials.

B21.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Proposal or the Proponent's authorized representatives named in Paragraph 11 of Form A: Proposal, and only such person, has authority to give notice of withdrawal.

B21.1.3 If a Proponent gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:

(a) retain the Proposal until after the Submission Deadline has elapsed;

(b) open the Proposal to identify the contact person named in Paragraph 3 of Form A: Proposal and the Proponent's authorized representatives named in Paragraph 11 of Form A: Proposal; and

(c) if the notice has been given by any one (1) of the persons specified in B21.1.3(b), declare the Proposal withdrawn.

B21.2 A Proponent who withdraws his/her Proposal after the Submission Deadline but before his/her offer has been released or has lapsed as provided for in B20.2 shall be liable for such damages as are imposed upon the Proponent 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.

B22. COMPENSATION TO PROPONENTS

B22.1 The successful Proponent will be required to pay an honorarium to each responsive unsuccessful Proponent in the amount of $20,000.00 (Twenty Thousand Dollars, Canadian Funds) including the GST. The honorarium will be paid in recognition that the Proponents have undertaken a portion of the professional services that would normally be done during a conventional design project. No other compensation or reimbursement of the Proponent's costs will be made for any activity associated with this Request for Proposal. Honoraria will be paid to the unsuccessful Proponents in accordance with the following:

(a) following the award of a Contract to a successful Proponent;

(b) upon written submittal noting the Proponent agrees to transfer to the City all intellectual property rights (including waiving of moral rights) contained within the Proponent's Proposal; and

(c) following the successful Proponent's internal financial system schedule, which is outside the City's control.

B22.2 The successful Proponent will be required to provide documentation that payments have been made to each responsive unsuccessful Proponent within sixty (60) days of receipt of notification from the City to make payment. If documentation is not provided, the City will not process subsequent payments on this Contract until the documentation is provided to the City.

B22.3 In the event that the City cancels the current procurement process for any reason, after issuance of the RFP, and after Proponents have incurred significant costs developing their Proposals, the City will pay a Break Payment to each such Proponent of up to $20,000.00 for Proposal development costs provided that the Proponent first submits its Proposal development work together with a transfer of all intellectual property rights (including waiver of moral rights).

B22.4 The amount of the Break Payment will be proportionate to the amount of work completed and scheduled time expired for the RFP procurement process with maximum possible entitlement where cancellation occurs after final Proposals have been submitted at the end of the RFP process.

B23. INTERVIEWS

B23.1 The Contract Administrator may, in his/her sole discretion, interview Proponents during the evaluation process.

B24. NEGOTIATIONS

B24.1 The City reserves the right to negotiate details of the Contract with any Proponent. Proponents are advised to present their best offer, not a starting point for negotiations in their Proposal Submission.

B24.2 The City may negotiate with the Proponents submitting, in the City's opinion, the most advantageous Proposals. The City may enter into negotiations with one or more Proponents without being obligated to offer the same opportunity to any other Proponents. Negotiations may be concurrent and will involve each Proponent individually. The City shall incur no liability to any Proponent as a result of such negotiations.

B24.3 If, in the course of negotiations pursuant to B24.2 or otherwise, the Proponent amends or modifies a Proposal after the Submission Deadline, the City may consider the amended Proposal as an alternative to the Proposal already submitted without releasing the Proponent from the Proposal as originally submitted.

B25. EVALUATION OF PROPOSALS

B25.1 Award of the Contract shall be based on the following evaluation criteria:

(a)	compliance by the Proponent with the requirements of the Request for Proposal or acceptable deviation therefrom:	(pass/fail)
(b)	qualifications of the Proponent and the Subcontractors, if any, pursuant to B18:	(pass/fail)
(c)	Total Bid Price;	40%
(d)	Management Plan; (Section D)	10%
(e)	Building Design Summary; (Section E)	40%
(f)	Project Schedule. (Section F)	10%
(g)	Economic analysis of any approved alternative pursuant to B9.	

B25.2 Further to B25.1(a), the Award Authority may reject a Proposal as being non-responsive if the Proposal 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 Proposal, or waive technical requirements or minor informalities or irregularities if the interests of the City so require.

B25.3 Further to B25.1(b), the Award Authority shall reject any Proposal submitted by a Proponent who does not demonstrate, in its Proposal or in other information required to be submitted, that it is responsible and qualified.

B25.4 Further to B25.1(c), the Total Bid Price shall be the lump sum price shown on Form B: Prices adjusted, if necessary, by deducting the separate prices.

(a) if the lowest evaluated responsive Bid submitted by a responsible and qualified Proponent is within the budgetary provision for the Work, no adjustment will be made to the Total Bid Price; or

(b) if the lowest evaluated responsive Bid submitted by a responsible and qualified Proponent exceeds the budgetary provision for the Work, the Total Bid Prices of all responsive Bids submitted by responsible and qualified Proponents will be adjusted by progressively deducting separate item(s) 1 to 5 in the order listed, until a Total Bid Price within the budgetary provision is achieved.

B25.5 If, in the sole opinion of the City, a Proposal does not achieve a pass rating for B25.1(a) and B25.1(b), the Proposal will be determined to be non-responsive and will not be further evaluated. For clarity, the "Prices" envelope in B10.7.3(b) will not be evaluated and returned unopened to Proponents.

B25.6 The "Prices" envelope in B10.7.3(b) will not be evaluated and returned unopened to Proponents for Proposals which do not achieve a minimum technical score of 70% for B25.1(d) to B25.1(g).

B25.7 Further to B25.1(d), Management Plan will be evaluated considering the Proponent's confirmation of team members listed within RFQ 757-2016 and the project specific approach to managing the Work.

B25.7.1 A breakdown of the scoring criteria for the Management Plan is as follows:

Criterion (B13)	Weighting
B14.2(a) Project understanding and intended outcomes	2.5%
B14.2(b) Restatement of key personnel	0.5%
B14.2(c) Communications plan	1.5%
B14.2(d) City and public consultation process	1.5%
B14.2(e) Risk management planning	2.0%
B14.2(f) Project specific health and safety procedures and policies	0.5%
B14.2(g) Project specific quality assurance/quality control program	1.5%
Total (Management Plan)	10.0%

B25.8 Further to B25.1(e), Building Design Summary will be evaluated considering the proposed design elements and narratives for the architectural, mechanical, electrical and equipment systems, drawings and illustrations, innovations, value added features and adherence to the overall functional program areas.

B25.8.1 A breakdown of the scoring criteria for the Building Design Summary is as follows:

Criterion (B15)	Weighting
B15.1 Design summary narrative	2.0%
B15.2.1(a) Site design	4.0%
B15.2.1(b) to B15.2.1(f), B15.2.2 Building design and specifications	8.0%
B15.2.3 Mechanical design	6.0%
B15.2.4 Electrical design	6.0%
B15.2.5 Equipment design and integration	8.0%
B15.2.6 Narrative of proposed functional space program	2.0%
B15.2.7 Value added features	2.0%
B15.3 LEED® Silver Certification Process	2.0%

Total (Building Design Summary)	40.0%

B25.9 Further to B25.1(f), Project Schedule will be evaluated considering the Proponent's ability to comply with the requirements of the Project.

B25.9.1 A breakdown of the scoring criteria for the Project Schedule is as follows:

Criterion (B16)	Weighting
B16.1 Proponent project specific schedule – adherence to Critical Stages	4.0%
B16.2 Proponent's methodology and strategies for schedule control	4.0%
B16.3 Understanding and compliance to EVM requirements	2.0%
Total (Building Design Summary)	10.0%

B25.10 Notwithstanding B25.1(d) to B25.1(f), where Proponents fail to provide a response to B10.2(a) to B10.2(c), the score of zero (0) may be assigned to the incomplete part of the response.

B25.11 Proposals will be evaluated considering the information in the Proposal Submission and any interviews held in accordance with B23.

B26. AWARD OF CONTRACT

B26.1 The City will give notice of the award of the Contract, or will give notice that no award will be made.

B26.2 The City will have no obligation to award a Contract to a Proponent, even though one or all of the Proponents are determined to be responsible and qualified, and the Proposals are determined to be responsive.

B26.2.1 Without limiting the generality of B26.2, 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 Proposal 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.

B26.3 The Work of this Contract is contingent upon Council approval of the project scope and budget in the Capital Budget, and execution of the Federal and Provincial funding agreements. If the Capital Budget approved by Council does not include sufficient funding for the Work, the Work cannot be completed within the required timeframe, or if the Federal and Provincial funding agreements are not finalized, the City will have no obligation to award a Contract.

B26.4 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Proponent submitting the most advantageous offer.

B26.4.1 Following the award of Contract, a Proponent will be provided with information related to the evaluation of his/her Proposal upon written request to the Contract Administrator.

B26.5 The City may, at its discretion, award the Contract in phases.

B26.5 Further to Paragraph 6 of Form A: Proposal and C4, the successful Proponent will be provided with Contract documents for execution following issuance of a Letter of Intent.

B26.6 The form of Contract with the City of Winnipeg will be based on the Contract as defined in C1.1(n).

B26.7 Following the award of Contract, a Proponent will be provided with information related to the evaluation of its Proposal upon written request to the Contract Administrator.

B26.8 If, after the award of Contract, the Project is cancelled, the City reserves the right to terminate the Contract. The Proponent will be paid for all Services rendered up to time of termination.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

C0.1 The *General Conditions for Construction* (Revision 2006 12 15) are applicable to the Work of the Contract.

C0.1.1 The *General Conditions for Construction* 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 Request for Proposal to a section, clause or subclause with the prefix "**C**" designates a section, clause or subclause in the *General Conditions for Construction*.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

D1.1 In addition to the *General Conditions for Construction*, 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 the design, construction and commissioning of a Bus Maintenance and Repair Garage Expansion with a general scope that includes but is not limited to:

(a) Maintenance space to accommodate approximately twelve (12) - forty (40) foot and six (6) – sixty (60) foot articulated buses. The garage maintenance function will generally include full refurbishment and overhaul, bus body and engine repair and general bus maintenance. Equipment will generally include in-ground lifts, compressed air, breathing air, exhaust systems, fall arrest and fluid distribution.

(b) Space to accommodate approximately three (3) forty foot and one (1) sixty foot articulated buses for general body preparation, painting, curing and drying. Equipment will generally include pre-manufactured paint and prep booths, paint storage and mixing, compressed air, breathing air, exhaust systems, and fall arrest.

(c) Ancillary shop, office and storage spaces to support the maintenance and repair operation. Equipment will generally include new/existing shop equipment; overhead crane systems, fluid storage tanks and storage racking.

(d) Upgrade of the existing main electrical service feed including the upgrade and replacement of the existing electrical distribution panels and provision of back-up generation capability for the 421 Osborne Street Transit campus;

(e) New permanent parking lot area with associated site access, active transportation links and landscape buffering to be constructed adjacent to the 421 Osborne Street Transit Campus.

(f) The anticipated area for the proposed addition is approximately 5,500 (60,000 SF) square metres to 6,050 (65,000 SF) square metres.

(g) Interior office fit-up of approximately 1,300 (14,000 SF) square meters including but not limited to selective demolition, renovation, fit-up and exterior access modifications. Components of this work are confidential as identified by the Specifications in Part E and will be provided to Proponents upon written request.

D2.2 The Contractor shall provide the following as part of its Services including but not necessarily limited to:

D2.2.1 Deliverables:

(a) Documents and drawings required for all permits, regulatory approvals (including necessary Underground Structures approvals), inspections and certifications. Either a Registered Architect licensed in the Province of Manitoba or a Professional Engineer registered to practice engineering in the Province of Manitoba shall stamp all construction drawings and specifications as appropriate.

(b) Detailed schedule(s) for the entire Project including a critical path. Schedules shall be submitted in the latest version of Microsoft Project, and shall contain enough information to fully characterize the Project including, but not limited to, all City design approval milestones and their associated review periods, dates of required coordination and input from other disciplines, including the City, all applicable permit application dates and their associated review periods, the commissioning process,

deficiency identification and correction period, and warranty review and warranty close out.

(c) A schedule detailing the completion of all construction documents.

(d) A construction schedule (to be submitted before the Contractor mobilizes to the site). The construction schedule must include a detailed list and schedule of submittals including but not limited to shop drawings, samples, mock-ups, tests and inspections and demonstration/training.

(e) Once a schedule has been established, a list of the regular design and construction coordination meetings so that the Contract Administrator may attend at their discretion.

(f) Minutes of all design and construction meetings submitted to the Contract Administrator with 48 hours following each meeting.

(g) Provide comprehensive Schematic Design Report and Design Development Report including design briefs, outline specifications and associated drawings for architectural, structural, mechanical, electrical (including IT, security), public address, civil, landscape, and LEED®/sustainability disciplines at the conclusion of both the schematic design phase and design development phase.

(h) Quality assurance and control management plans for key components of the Work such as the foundations, building envelope, roofing, and other key components identified by the Contract Administrator.

(i) Door and hardware schedule, keying plan, sample boards displaying interior and exterior finishes for approval by the City.

(j) Detailed drawings and specifications (hard copy and electronic format) at the 33%, 66% and 90% working drawing stages, or other design review milestones approved by the City and Contract Administrator. Allow ten (10) Business Days for review.

(k) Provide preconstruction public information sessions to inform area residents of the final design of the facility and measures taken to address concerns expressed at the pre-design information session and stakeholder meetings administered by the Contract Administrator.

(l) Detailed design calculations and related design documentation.

(m) Monthly progress reports containing a summary of the Work completed, planned Work for the upcoming month, schedule updates, risk updates, and progress photos.

(n) Copies of all field review reports completed by the Contractor's consultants during construction phase.

(o) Material and product co-ordination shop drawings.

(p) Records of all design clarifications, interpretations and changes implemented during and after tendering process.

(q) Progress photographs submitted bi-weekly.

(r) Closeout documents, including all as-built drawings, warrantees and operation and maintenance manuals.

(s) Samples of key components of the Work for the purposes of establishing a quality of workmanship acceptable to the City prior to construction of those components on site.

(t) Energy modelling results at the end of the design development stage to confirm the feasibility of achieving the anticipated energy credits; and

(u) All other deliverables as required by the Section E.

D2.2.2 Equipment

(a) The Contractor will be responsible for the supply and installation of the following Furniture, Fixtures and Equipment as found in Appendix L:

(i) Bus maintenance and repair hoists (2-post and 3-post systems);

(ii) Pre-manufactured paint booths systems (integrated mechanical, ventilation and electrical systems);

(iii) Pre-manufactured prep booth systems (integrated mechanical, ventilation and electrical systems);

(iv) Pre-manufactured bus overhaul and repair booth systems (integrated mechanical, ventilation and electrical systems);

(v) Fluid dispensing reels, hoses and connectors connected to existing fluid distribution system;

(vi) Pressure Wash System;

- Easy-Kleen Pressure Systems Ltd., Model EH430E424A (3000 PSI, 24KW);
- Location within a 60 foot bus refurbish service bay, include wash curtains, and trench drains. See Appendix H; and
- complete with stainless steel covers and heater skins, connections to mechanical and electrical services as required for operation, all upstream chemical injection, two (2) single lance gun assemblies with high pressure hoses for multi-gun operation;

(vii) Metal shop storage racking as found in Appendix L, Appendix H, and Appendix I; and

(viii) New shop equipment as found in Appendix L.

(b) The City will be responsible for the supply and installation of the following Furniture, Fixtures and Equipment:

(i) Existing shop equipment to be relocated into the new shop areas within the Bus Maintenance and Repair Garage Expansion.

(ii) The Contractor will be responsible to provide all layout, systems and connections required to accommodate the relocated equipment within the expansion area.

D2.2.3 Construction Administration

(a) During the course of the construction the Contractor shall:

(i) Maintain full time on-site supervision and quality controls for the duration of the Work.

(ii) Administer and maintain on-site files of all contemplated change notices, change orders, clarifications, field reports, monthly progress and monthly control reports.

(iii) Administer and maintain an FTP site that provides access to drawings, specifications and other design documents to the City and Contract Administrator.

(iv) Review shop drawings, samples and other submittals from Subcontractors to ensure compliance with the intent of the original design.

(v) Review and reject or approve Subcontractors' submittals as appropriate.

(vi) Obtain and assemble all warranties, maintenance manuals and related documents.

(vii) Maintain the predetermined completion and milestone dates, as outlined in this document or as modified in writing throughout the period of the Work.

(viii) Maintain and enforce a strict safety policy on the Site; and

(ix) Maintain a site office and an on-site computer, capable of reading and editing all document types used for the Project, complete with e-mail and communications capabilities, connected by the best internet speed available at the Place of the Work. Site staff shall be properly trained and be fully conversant with all relevant software.

D2.2.4 Inspection

(a) The Contractor shall hire independent, suitably qualified testing and inspection agencies as required to provide all necessary testing and inspection of the Work to the satisfaction of the City. This testing and inspection to include, but not be limited to:

(i) Caissons and driven piles;

(ii) Soils bearing capacity and compaction;

(iii) Concrete compressive strength, air entrainment, slump, and placement;

(iv) Reinforcing steel type and placement;

(v) Structural steel type, shop and field welding, connections, bolt torque, alignment, coatings, and installation;

(vi) Roof deck type, welds, joint crimping, trimming at openings, and placement;

(vii) Waterproofing, roofing, flashing, insulation and vapour barriers, type and placement;

(viii) Trench compaction; and

(ix) Materials testing for granular and asphalt.

(b) The testing and inspection agencies shall make their test and inspection reports available to the Contract Administrator. The testing and inspection agencies shall notify the Contract Administrator of any non-conformance items within 48 hours.

D2.2.5 Legal Survey

(a) Contractors are responsible to undertake a certified survey prepared by a registered Manitoba Land Surveyor showing all property limits, setbacks, roadways as required for the submission of a development and/or building permit; and

(b) On completion of the Work the Contractor shall provide a certified survey prepared by a registered Manitoba Land Surveyor, showing all site dimensions, major site improvement dimensions, building outline and corner locations, catch basins and finished floor elevations.

D2.2.6 Project Closeout and Occupancy

(a) The Contractor shall prepare a closeout and handover procedure that ensures all systems operate as designed in coordination with vendors', subcontractors', designers' and building operations staff's requirements prior to Substantial Completion.

(b) Building systems training and operations and maintenance manuals shall be provided to the building operations staff by the Contractor prior to Substantial Completion.

(c) The Contractor shall provide full-time on-site supervision to oversee the work of the Contractor's own forces, subcontractors, or suppliers to allow prompt problem resolution during the operational transfer for a minimum of two (2) weeks of occupancy following Substantial Completion.

(d) The Contractor shall obtain and pay for all necessary regulatory approvals for occupancy, including building and fire code inspections, occupancy permit, elevator licensing, health and safety approvals.

(e) The Contractor shall provide three hard copies and two digital copies, in a format approved by the Contract Administrator, of Project record documents including as-built drawings of all physical building attributes, including, but not necessarily limited to, architectural, mechanical, communications, electrical and structural plans, mechanical and electrical systems components, such as motors, HVAC units, control systems, fans, pumps, roofing details, and furniture/equipment layouts. The documents shall identify and list valve tag numbers and any other specialty coding or numbering systems employed in the Work. Drawings generated in CAD format will be submitted in both CAD format and PDF format. All others will be submitted in PDF format.

(f) The Contractor shall provide maintenance manuals, which shall include: detailed instructions and recommended materials for cleaning, lubrication, adjustment and

maintenance; replacement parts lists; names and addresses of suppliers; recommended minimum and maximum time intervals for inspection and maintenance, as applicable.

(g) All commissioning reports, certificates, letters of assurance, all additional manufacturers' guarantees and warranties, all maintenance recommendations, maintenance and operating manuals and instructions, and all Project record documents shall be handed over to the City after review and verification for completeness and accuracy by the Contract Administrator; and

(h) The City will retain $50,000 (Fifty Thousand Dollars, Canadian Funds) until the above training, regulatory approvals, closeout procedures and documentation have been successfully provided by the Contractor, to the satisfaction of the Contract Administrator.

D2.2.7 Deficiencies

(a) The Contractor shall undertake a complete inspection of the Work and jointly prepare a list of all deficiencies with the City and Contract Administrator. Sufficient funds will be retained from progress draws to cover the cost of outstanding deficiencies.

(b) All deficiencies shall be corrected expeditiously and to the satisfaction of the City prior to final payment.

(c) An end-of-warranty-period review and list of outstanding warranty issues shall be prepared jointly between the Contractor, City and Contract Administrator. The Contractor shall ensure all warranty issues are resolved expeditiously and to the satisfaction of the City and Contract Administrator.

D3. DEFINITIONS

D3.1 When used in this Request for Proposal:

(a) "**Acceptance**" means:

(i) when in reference to a Request for Proposal, a Letter of Intent sent by the Chief Administrative Officer or his/her delegated authority notifying the Contractor that a contract for Services is being awarded to the Contractor; or

(ii) when in reference to Services provided by the Contractor to the City, a letter of acceptance of the particular report, recommendation, program project or totally completed project, or other related matter proposed by the Contractor requiring acceptance, endorsement, confirmation or other appropriate form of approval or consent from the Contract Administrator prior to continuance by the Contractor of the previously agreed upon Services or the conclusion of same;

(b) "**Break Payment**" means the amount determined by the City to be payable to each Proponent for wasted Proposal development costs in the event that the procurement process is terminated by the City after issuance of this RFP at a time when the City recognizes that Proponents have expended significant time and effort preparing to respond to the RFP;

(c) "**Commercially Confidential Meeting**" means a private and confidential meeting with the Technical Evaluation Committee that will be offered to Proponents during the RFP period;

(d) "**Change in Services**" or "**Scope Change**" means an addition, deletion or modification to the Work as described in the Contract and which have been approved by the Contract Administrator;

(e) "**City Council**" means the Council of the City of Winnipeg. This is sometimes used interchangeably with the term "Council";

(f) "**Design**" means graphic representation of the evolution of the functional and spatial concept;

(g) "**Design-Build**" means a project delivery method where a Person is engaged to provide a turnkey project, from preliminary design, through to construction, commissioning, and warranty services;

(h) "**Design-Builder**" means the successful Proponent selected to design, construct and commission the Work for the City;

(i) "**Deliverables**" means all reports, drawings, calculations, designs, plans, leading practices, specifications, and other data, information and all material utilized, collected, compiled, drawn and produced (including digital files) to carry out Services contemplated in this Contract;

(j) "**LEED®**" means Leadership in Energy and Environmental Design as defined by the Canadian Green Building Council;

(k) "**Letter of Intent**" means the letter sent by the Chief Administrative Officer or his/her delegated authority notifying the Proponent that a contract for the Work has been awarded to the Proponent;

(l) "**Owner's Consultants**" means Colliers Project Leaders, Number Ten Architectural Group, MMM Group Limited, WSP Canada, Smith and Anderson, Footprint, HTFC Inc, and their sub-consultants. None of the Owner's Consultants are eligible to participate on a Design-Build team;

(m) "**Project**" means the design, construction and commissioning of the Transit Bus Maintenance And Repair Garage Expansion Design–Build as further described in this RFP;

(n) "**Proponent**" means any one of the short-listed Person or Persons submitting a Proposal in response to this Request for Proposal;

(o) "**Proposal**" means a Proponent's stipulated price submission made in response to this Request for Proposal. This is sometimes used interchangeably with the term "Bid";

(p) "**Proposal Submission**" means the documents, drawings, illustrations, forms, schedules and spreadsheets stipulated in the Request for Proposal which must be completed or provided and submitted by the Submission Deadline in order to constitute a responsive Proposal;

(q) "**Request for Proposal**" means this Request for Proposal 757-2016B, which consists of the Proposal Submission forms, the Bidding Procedures, the general conditions, the Supplemental Conditions, the Specifications, the Drawings, the appendices and all addenda contained therein;

(r) "**Request for Qualification**" means the Request for Qualification 757-2016 issued by the City;

(s) "**Services**" means carrying out and doing of all things of every kind, expressly or impliedly requires, that are to be done by the Contractor in accordance with the terms of this Contract and includes all Services, testing, analysis, equipment, matters and things necessary for or incidental to the fulfilment of the requirements of the Contract, and all Changes in Work which may be approved as herein provided;

(t) "**Technical Evaluation Committee**" means the committee that will evaluate the technical and financial proposal submissions within certain criteria and advise Council of the evaluation findings. The committee consists of representatives from the City, the Contract Administrator and the Owner's Consultants.

D3.2 Notwithstanding C1.1, when used in this Request for Proposal:

(a) "**Contract Administrator**" means the person authorized to represent the City in respect to the Request for Proposal and subsequent Project.

(b) "**Total Performance**" means that the entire Work, except for those arising from the provisions of C13 and E20, have been performed in accordance with the Contract.

D4. CONTRACT ADMINISTRATOR

D4.1 The Contract Administrator is Colliers Project Leaders, represented by:

Kevin Sim, P.Eng, PMP, LEED Green Associate
Principal
Telephone No. 204.956.4055 ext. 5211

Email Address kevin.sim@colliersprojectleaders.com

D4.2 Before commencement of Work, Colliers Project Leaders will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

D4.3 Bid Submissions must be submitted to the address in B10**.**

D5. CONTRACTOR'S KEY PERSONNEL

D5.1 Further to C6, the Contractor shall employ and keep on the Work, at all times during the performance of the Work, a competent Project Manager and Site Supervisor acceptable to the Contract Administrator. The Project Manager and Site Supervisor shall represent the Contractor on the Site and be considered "Key Personnel" to the Project.

D5.2 The Contractor shall identify his/her designated Project Manager and Site Supervisor for this Project as requested in B13.

D5.3 The Contractor acknowledges that it must ensure that the Project Manager and Site Supervisor identified in B13 are not removed from those positions for the duration of the Project except in the case of:

(a) Dismissal from the Contractor's employment;

(b) Voluntary resignation without accepting any new positions with the Contractor or its affiliates;

(c) Leave of absence due to illness or serious injury to any of such Key Personnel or their immediate family;

(d) Removal by the Contractor at the request of the City or with the City' prior written consent; or

(e) Death.

D5.3.1 If it is necessary to replace any of the Key Personnel for any reason, then the Contractor must promptly provide a substitute person approved in writing by the City.

D5.3.2 The Contractor acknowledges that the Key Personnel are critical for the management, supervision and performance of the Work. The Contractor agrees that if it is necessary prior to the completion of the Work (excluding any soft landscaping) to replace any person named as a Key Personnel from time to time, except for one of the reasons listed above, then the Contractor will pay to the City, as liquidated damages, the sum of $100,000 (One Hundred Thousand Dollars, Canadian Funds) for each Key Personnel who is replaced, on account of the loss of continuity and resulting inefficiencies to the performance of the Work.

D5.3.3 The City and Contractor acknowledge and agree that the amounts set forth in D5.3.2 are a genuine and reasonable pre-estimate of the City's damages for the Contractor's replacement of the Key Personnel prior to the completion of the Work (excluding soft landscaping). The City shall be entitled to retain any amounts that become payable by the Contractor pursuant to D5.3.2 from monies otherwise payable to the Contractor under the Contract.

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. NOTICES

D7.1 Notwithstanding C23.2.2, all notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer at the following facsimile number:

The City of Winnipeg
Chief Financial Officer

Facsimile No.: 204 949-1174

D7.2 Bid Submissions must not be submitted to this facsimile number. Bids must be submitted in accordance with B10.

D8. FURNISHING OF DOCUMENTS

D8.1 Upon award of the Contract, if requested the Contractor will be provided with five (5) complete sets of the Request for Proposal. If the Contractor requires additional sets of the Request for Proposal, they will be supplied to him at cost.

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.

D10. SAFE WORK PLAN

D10.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D10.2 The Safe Work Plan should be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/safety/default.stm .

D11. INSURANCE

D11.1 The City will provide and maintain the following owner controlled project insurance coverage to remain in place at all times during the performance of the Work:

(a) Broad form builder's risk insurance including testing and commissioning, insuring 100% of the Contract Price until Substantial Performance.

(i) The Contractor shall be responsible for deductibles up to fifty thousand dollars ($50,000) per occurrence except for flood and water and testing and commissioning damage losses of one hundred thousand dollars ($100,000).

(b) All risks property insurance policy for the full replacement cost insuring the existing structures while under renovation for the transit bus maintenance and repair garage expansion Project. The Contractor shall be held responsible for any damage to the existing structure sustained as a result of their Work for deductibles up to two hundred, fifty thousand dollars ($250,000).

(c) Wrap-up liability insurance in an amount of no less than twenty-five million dollars ($25,000,000) inclusive per occurrence and twenty-five million dollars ($25,000,000) general aggregate, covering bodily injury, personal injury, damage to existing structure, property damage and products and completed operations consistent with industry standard insurance policy wordings. Wrap up liability insurance to also include evidence of contractual liability and cross liability clauses.

(i) The Contractor shall be responsible for deductibles up to fifty thousand dollars ($50,000) maximum of any one loss.

(ii) The City will carry such insurance to cover the City, the Contractor and all sub-consultants and contractors and sub-contractors as insured's. Provision of this insurance by the City is not intended in any way to relieve the Contractor from their obligations under the terms of the Contract. Specifically, losses relating to deductibles for insurance, as well as losses in excess of limits of coverage and any risk of loss that is not covered under the terms of the insurance provided by the City remains with the Contractor.

(iii) Wrap-up liability insurance shall be maintained from the date of the commencement of the Work until the date of Total Performance of the Work and shall include an additional twenty-four (24) months completed operation coverage which will take affect after Total Performance.

D11.2 Further to D11.1, the Contractor shall exhibit insurability and provide and maintain the following insurance coverage at all times during the performance of the Work and throughout the warranty period:

(a) Project specific professional liability insurance in the amount of at least five million dollars ($5,000,000) per occurrence and five million dollars ($5,000,000) aggregate, per claimant basis. Professional Liability insurance to remain in place during the performance of the Work and for twenty-four (24) months after completion.

(b) Contractor's pollution liability (CPL) insurance in the amount of at least one million dollars ($1,000,000) per occurrence and two million dollars ($2,000,000) annual aggregate insuring against claims covering third-party injury and property damage claims, and including clean-up costs and transported cargo as a result of pollution conditions arising suddenly or gradually from the Contractor operations and completed operations. Such policy to name the City as additional insured and remains in place for a minimum of twelve (12) months following Total Performance.

(c) Commercial general liability insurance, in the minimum amount of ten million dollars ($10,000,000) inclusive per occurrence and ten million dollars ($10,000,000) general aggregate. The said commercial general liability insurance shall include coverage for products and completed operations, blanket contractual, non-owned automobile and unlicensed motor vehicle liability. Such policy shall not contain any exclusions or limitations for demolition work, asbestos abatement, lead removal and will add the City as an additional insured.

(d) Automobile liability insurance for licensed automobiles used for or in connection with the Work in the amount of no less than five million dollars ($5,000,000); and

(e) Property insurance for equipment and tools used on the project that may be owned, rented, leased or borrowed.

D11.3 Deductibles shall be borne by the Contractor.

D11.4 All policies must be taken out with insurers licensed to carry on business in the Province of Manitoba.

D11.5 The Contractor shall provide the Contract Administrator with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D11.6 All policies shall be in a form satisfactory to the City and shall be kept in full force during the Work and throughout the warranty period.

D11.7 All parties covered under the wrap up insurance shall continue to carry general liability for two (2) years (or warranty period) whichever is greater.

D11.8 The Contractor shall not cancel, materially alter, or cause the policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

D11.9 The City shall have the right to alter the limits and/or coverages as reasonably required from time to time during the continuance of this agreement.

D12. PERFORMANCE SECURITY

D12.1 The Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:

(a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; or

(b) an irrevocable standby letter of credit issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form attached to these Supplemental Conditions (Form H2: Irrevocable Standby Letter of Credit), in the amount of fifty percent (50%) of the Contract Price; or

(c) a certified cheque or draft payable to “The City of Winnipeg”, drawn on a bank or other financial institution registered to conduct business in Manitoba, in the amount of fifty percent (50%) of the Contract Price.

D12.1.1 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.

D12.2 The Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award and prior to the commencement of any Work on the Site.

D13. SUBCONTRACTOR LIST

D13.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form J: Subcontractor List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D14. EARNED VALUE MANAGEMENT SCHEDULE REQUIREMENTS

D14.1 Notwithstanding C12, upon award of a Contract, the Contractor shall comply with the following requirements regarding scheduling, cost reporting, and Work progress for purposes of monthly progress payment claims.

D14.2 The Contractor’s schedule of the Work shall identify the duration and completion dates for each major activity.

D14.3 Within fifteen (15) Business Days of award of the Contract, the Contractor shall prepare and submit the schedule for the Work within the framework of B16 Project Schedule. For each scheduled activity (Task) within the schedule, the Contractor shall identify at least the following:

(a) Task name;

(b) Task duration;

(c) Task start date;

(d) Task end date;

(e) Task value;

(f) Interdependency with other tasks (finish-to-start, start-to-finish, start-to-start, finish-to-finish); and

(g) Resource allocation (if requested by the Contract Administrator).

D14.4 For each task, the Contractor shall assign a value (task value) corresponding to the total of the labour, material, service, equipment, overhead and profit associated with that task within the Contractor's Contract amount. The sum of the task values for all tasks in the Contractor's schedule shall equal the total Contract amount.

D14.5 The Contract Administrator will review the Contractor's schedule which, once approved, will form part of the Project Schedule.

D14.6 The Contractor shall make whatever revisions to its schedule the Contract Administrator might reasonably require and provide supporting information as might be requested to verify compliance with the Project Schedule.

D14.7 The Contractor's schedule shall include, but shall not be limited to, the following:

(a) Design schedule tasks;

(b) Shop drawing tasks – including allowance for preparation, review and resubmission;

(c) Submittal tasks;

(d) Fabrication and delivery schedule tasks;

(e) Temporary works tasks;

(f) Construction tasks;

(g) Commissioning, testing, start-up and demonstrations tasks;

(h) Change order tasks; and

(i) Resource allocation tasks (if requested by the City or Contract Administrator).

D14.8 The schedule software used by the Contractor shall be MS Project. The Contractor shall submit to the Contract Administrator one (1) hard copy of the schedule and one electronic copy in MS Project format. Monthly updates of the Contractor's schedule shall be similarly submitted as one hard copy and one electronic copy prepared using MS Project software.

D14.9 The Contractor shall update the schedule and report to the Contract Administrator on a monthly basis. The monthly update of the Contractor's schedule shall identify the percentage completion of each task, including approved change orders. The product of the percentage complete multiplied by the task value, and summed for all.

D14.10 Tasks on the Contractor's schedule shall equal the total application for payment claimed. The submission of the updated Contractor's schedule, including the identification of the percentage completion of all tasks in accordance with the foregoing requirement, shall be a prerequisite to the certification by the Contract Administrator of any progress claim.

D14.11 If the Contractor and Contract Administrator agree to a change in the Contractor's schedule then the Contractor shall submit a revised schedule that identifies the task values for all tasks within the revised schedule and the percentage completion for all tasks.

SCHEDULE OF WORK

D15. COMMENCEMENT

D15.1 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.

D15.2 The Contractor shall not commence any Work on the Site 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 C6.15;

(iii) the Safe Work Plan specified in D10;

(iv) evidence of the insurance specified in D11;

(v) the performance security specified in D12;

(vi) the Subcontractor list specified in D13; and

(vii) the Earned Value Management Schedule specified in D14.

(b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.

D15.3 Further to D15.2, specific elements of the Work shall not commence prior to the following dates or approvals:

(i) Construction of the Interior office fit-up shall not commence prior to February 28, 2018.

D15.4 The City intends to award this Contract by June 27, 2017

D15.4.1 If the actual date of award is later than the intended date, the dates specified for Commencement, Critical Stages, Substantial Performance, and Total Performance may be adjusted by the difference between the aforementioned intended and actual dates.

D16. CRITICAL STAGES

D16.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:

(a) Brandon Avenue Parking Lot on or before December 31, 2017;

(b) LEED®-NC Silver certification by December 31, 2020 as per E20.6

D17. SUBSTANTIAL PERFORMANCE

D17.1 The Contractor shall achieve Substantial Performance by December 31, 2018.

D17.2 When the Contractor considers the Work to be substantially performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Substantial Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.

D17.3 The date on which the Work has been certified by the Contract Administrator as being substantially performed to the requirements of the Contract through the issue of a certificate of Substantial Performance is the date on which Substantial Performance has been achieved.

D18. TOTAL PERFORMANCE

D18.1 The Contractor shall achieve Total Performance by March 1, 2019.

D18.2 When the Contractor or the Contract Administrator considers the Work to be totally performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Total Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.

D18.3 The date on which the Work has been certified by the Contract Administrator as being totally performed to the requirements of the Contract through the issue of a certificate of Total Performance is the date on which Total Performance has been achieved.

D19. LIQUIDATED DAMAGES

D19.1 If the Contractor fails to achieve critical stages, Substantial Performance or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Working Day for each and every Working Day following the days fixed herein for same during which such failure continues:

(a) Critical stage as stated in D16.1(a): Two hundred dollars ($200) / Working Day;

(b) Substantial Performance: Four thousand dollars ($4,000) / Working Day;

(c) Total Performance: One thousand five hundred dollars - ($1,500) / Working Day.

D19.2 The amounts specified for liquidated damages in D19.1, D19.4 and D19.6 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve critical stages, Substantial Performance or Total Performance by the days fixed herein for same.

D19.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed pursuant to D19.1.

D19.4 The date of Total Performance identified in D18.1 is a critical milestone which has been pre-determined by the Provincial and Federal governments as a condition of their funding. The consequence of the failure to complete the Work and achieve Total Performance by this date is the potential complete loss of Provincial and Federal funding.

D19.5 Further to D19.4 and in addition to D19.1, upon Contract award, the Contractor shall deliver or cause to be delivered to the City an irrevocable standby letter of credit to achieve Total Performance by the fixed date noted in D18.1 in an amount and form to be confirmed by the City, which may include the following consideration:.

(a) the City making all reasonable efforts to mitigate losses, including requesting extension of the Total Performance date from funders;

(b) assurance that the City will only draw upon the Letter of Credit in the amount equal to the loss incurred, relative to the late performance, as it relates to the funding.

D19.5.1 The details of the terms and the amount of the irrevocable standby letter of credit are contingent upon the final funding agreements between the City and the Provincial and Federal governments and will be clarified for Proponents via addendum.

D19.6 Further to D16.1(b) and E20.6, upon Contract award, the Contractor shall deliver or cause to be delivered to the City and irrevocable standby letter of credit in the amount of indicated in E20.6. The Contractor shall maintain or cause to be maintained the letter of credit until it has completed the LEED® Work in accordance with Section E20

(a) The City shall, no later than 15 Business Days following the completion of the LEED® Work in accordance with Section E20 prior to the date identified in D16.1(b), return the letter of credit to the Contractor. The City shall be entitled to draw on the entire amount of the letter of credit,

(i) at any time following the day that is 15 Business Days following the date identified in D16.1(b) if the Contractor does not complete the LEED® Work in accordance with Section E20 on or prior to the date identified in D16.1(b).

(b) Upon presenting the letter of credit for payment, the City may retain the proceeds therefrom as liquidated damages.

CONTROL OF WORK

D20. JOB MEETINGS

D20.1 Regularly scheduled bi-weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one (1) representative of the Contract Administrator, one (1) representative of the City and one (1) representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.

D20.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

D21. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D21.1 Further to C6.23, the City may in its sole discretion:

(a) Award separate contracts to other contractors in connection with work related to the site that is outside the scope of the Contract; or

(b) Perform work with its own forces related to the site that is outside the scope of the Contract.

D21.2 Further to C6.24, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

D22. THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA) – QUALIFICATIONS

D22.1 Further to B18.6, the Contractor/Subcontractor must, throughout the term of the Contract, have a Workplace Safety and Health Program meeting the requirements of The Workplace Safety and Health Act (Manitoba). At any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require updated proof of compliance, as set out in B18.6.

D23. SAFETY

D23.1 Further to C6, the Contractor shall be solely responsible for safety at the Site and for compliance with all laws, rules, regulations and practices required by the applicable safety legislation.

D23.2 The Contractor shall be solely responsible for securing the Site, and any existing facility thereon, and for the proper care and protection of the Work already performed.

D23.3 The Contractor shall do whatever is necessary to ensure that:

(a) no person, property, right, easement or privilege is injured, damaged or infringed by reason of the Contractor's activities in performing the Work;

(b) the health and safety of all persons employed in the performance of the Work or otherwise is not endangered by the method or means of its performance;

(c) adequate medical services are available to all persons employed on the Work and at all times during the performance of the Work;

(d) adequate sanitation measures are taken and facilities provided with respect to the Work;

(e) pedestrian and other traffic on any public or private road or waterway is not unduly impeded, interrupted or endangered by the performance or existence of the Work or Plant; and

(f) fire hazards in or about the Work are eliminated.

D24. SITE CLEANING

D24.1.1 The Contractor shall maintain the Site and the Work in a tidy condition and free from the accumulation of waste and debris, other than that caused by the City or by other contractors not associated with this Project. The Contractor will be responsible for the garbage and recycling bins and associated hauling and tipping fees for all material.

D24.1.2 As the Work progresses, the Contractor shall remove any Plant and Material not required for the performance of the remaining Work. He shall also remove waste and debris other than that caused by the City or other contractors, and leave the Site and the Work clean and suitable for occupancy by the City unless otherwise specified.

D24.1.3 Total Performance shall not be considered to have been achieved until the Contractor has cleaned up the Site and has removed all Plant, surplus Material, waste and debris, other than that left by the City or other contractors.

D25. INSPECTION

D25.1 Before beginning or resuming operations upon any portion of the Work, the Contractor shall notify the Contract Administrator so as to enable him to arrange for inspection. If the Contractor fails to notify the Contract Administrator, the Contractor shall, if and when required by the Contract Administrator, forthwith take down or expose and redo that portion of the Work required to facilitate inspection. The cost of such taking down or exposure, and redoing, if any, shall be borne by the Contractor.

D25.2 If and when required by the Contract Administrator, the Contractor shall take down or expose forthwith any portion of the Work where the Contract Administrator determines that the Work is not in accordance with the Contract. The cost of such taking down or exposure, and redoing, if any, shall fall upon the City if the taking down or exposure indicates that the portion exposed was properly performed, but if otherwise the cost shall be borne by the Contractor.

D25.3 During the pre-construction public engagement consultation, area residents expressed concern that construction traffic and activities will have a negative impact causing vibration and damage to their homes.

(a) The Contractor shall conduct pre-construction and post-construction residential inspections to document the condition of existing impacted residences in the area to alleviate claims arising during or after the design and construction of the Work.

(b) The Contractor's representative designated to complete these inspections shall be qualified to undertake this work and have the appropriate Security Clearance Check as outlined in PART F - Security Clearance.

(c) Following completion of the residential inspections, the Contractor shall submit a copy of the information gathered to the City for their records. At a minimum, the following shall be obtained during the residential inspection:

(i) Legal address;

(ii) Home owner's name or apartment's contact name;

(iii) Date of inspection;

(iv) Results of the findings with an appropriate amount of pictures; and,

(v) Signature of the home owner or apartment contact that the inspection was conducted or that they declined the inspection.

(d) The Contractor shall conduct pre-construction and post-construction vibration monitoring at various locations throughout the Project as necessary to provide information on vibration levels before, during, and after construction.

(e) Damage caused by construction activities will be the Contractor's responsibility to fix, repair, and rectify.

D26. DEFICIENCIES

D26.1 Further to C11, the Contract Administrator may order the Contractor to alter or improve his methods, to increase or improve his Plant, to furnish additional or more suitable Material, or to employ additional or more qualified labour if, at any time, the Contract Administrator determines that:

(a) the Work is not being, or will likely not be, performed satisfactorily; and/or

(b) progress is not being, or will likely not be, maintained in accordance with the Project Schedule.

D26.2 If the Work or any part thereof is taken out of the Contractor's control pursuant to C18.7, all Plant and Material, and the interest of the Contractor in all licences, powers and privileges acquired, used or provided by the Contractor under the Contract shall be assigned by the Contractor to the City without compensation to the Contractor.

D26.3 The City shall have the right to take possession of and use any of the Contractor's material and property of every kind provided by the Contractor for the purpose of the Work, and to procure other Plant or Material for the completion thereof.

D26.4 When the Contract Administrator certifies that any Plant, Material or any interest of the Contractor referred to in D26.2, is no longer required for the purposes of the Work, or that it is not in the best interest of the City to retain that Plant, Material or interest, it shall revert to the Contractor.

MEASUREMENT AND PAYMENT

D27. PAYMENT

D27.1 Further to C12, the Contractor should submit a draft copy of each progress claim for review by the Contract Administrator to facilitate timely processing of each monthly progress request.

D27.2 Each progress request submitted by the Contractor for payment shall include the following:

(a) Updated earned value management schedule as outlined in D14;

(b) Updated schedule of values outlining the status of progress including:

(i) Amounts previously progressed,

(ii) Amounts claimed on the current progress submission, and

(iii) Amounts indicating the balance of work remaining; and

(c) Detailed consultant and sub-contractor invoices to support the amounts being claimed by the Contractor.

D27.3 Following review by the Contract Administrator, the Contractor shall revise and resubmit the progress request to incorporate any changes as may be requested by the Contract Administrator or the City. Once the revised, final progress request is submitted, it will be processed for payment by the Contract Administrator.

D27.4 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

D28. CHANGES IN WORK

D28.1 Further to C7.2, the Contractor shall provide written notice of a proposed Change in Work within ten (10) business days of identifying the need for a change.

D28.2 Further to C7.3, the Contract Administrator shall respond to the proposed Change in Work within ten (10) business days of receipt of the proposed change.

D28.3 Further to C7.3.4, if the Contract Administrator requests the Contractor to submit a proposal for a change and then elects not to proceed with the change, a Change Order shall be issued by the Contract Administrator to reimburse the Contractor for all costs incurred by the Contractor in developing the proposal, including the cost of the related design services.

D28.4 Notwithstanding C7.4(d), the adjustment in Contract Price may be determined by the actual cost of the Change in Work to the Contractor plus Overhead Cost of fifteen percent (15%) on any portion of the Change in Work undertaken by the Contractor's own forces or plus Overhead Cost of ten percent (10%) on any portion of the Change in Work undertaken by a Subcontractor.

D28.4.1 Further to C7.4 (d) the additional percent on any portion of the Change in Work shall be considered Overhead Cost, meaning:

(a) In respect to a Change in Work issued under C7, the costs of the Contractor, subcontractors and sub-subcontractors performing the work attributable to a Change Order related to all-inclusive costs associated with the Work including, but not limited to the following:

(i) Operation and maintenance of head offices, branch offices and site offices;
(ii) Administration at head offices, branch offices, and site offices;
(iii) General management, legal, audit and accounting services;
(iv) Procurement administration;
(v) Financing and other bank charges
(vi) Bonding and insurance;
(vii) Salaries and other compensation of off-site personnel;
(viii) Salaries and other compensation of on-site superintendent and other supervisory personnel;
(ix) Designing, planning, estimating and scheduling of work;
(x) Expendable and non-expendable small tools not owned by personnel, including maintenance thereof, and consumables;
(xi) Recruitment and training of on-site staff;
(xii) Safety and protection measures;
(xiii) Other costs of a similar nature not included with the actual cost of the Change in Work, and
(xiv) Profit.

D28.4.2 Notwithstanding 7.4.1, for the purposes of C7.4(c) or (d), "actual cost" on any portion of the Change in Work undertaken by the Contractor's own forces shall mean the direct cost of labour, purchase or rental of Plant and Material, and any other payments made by the Contractor with the prior approval of the Contract Administrator that are necessary for the performance of the Change in Work.

D28.5 Further to C7.7, upon receipt of notice from the Contract Administrator the Contractor shall promptly proceed with the Change in Work.

D28.5.1 The adjustment in the Contract Price for a change carried out by way of a Change in Work under C.7 shall be determined on the basis of the cost of the Contractor's actual expenditures and savings attributable to the Change in Work, valued in accordance with paragraph C7.4.

(a) The Contractor shall keep full and detailed accounts and records necessary for the documentation of the cost of performing the Work attributable to the Change in Work and shall provide the Contract Administrator with copies thereof when requested.

D28.6 It is the responsibility of the Contractor to ensure that all prices included in the Change in Work, including those of subcontractors, are fair and reasonable in view of the terms expressed herein and represent the current market rates for such Work.

(a) The Contractor shall use commercially reasonable efforts to obtain the best value for money when procuring any Work, services, supplies, materials or equipment required by the Change in Work and shall use commercially reasonable efforts to comply with prevailing good industry practice in relation to any such procurement to a standard no less than the Contractor would apply if all costs incurred were to its own account.

(b) If the City would be required by applicable law to require the Contractor to seek invitational tenders or to competitively tender any contract in relation to the proposed Change in Work, then the Contract Administrator may include in the notice under C7.3.4 a requirement that the Contractor seek and evaluate invitational tenders or quotations, or seek and evaluate competitive tenders, for the proposed Change in Work in preparing the estimate.

D29. CASH ALLOWANCES

D29.1 Cash allowances, unless otherwise specified, cover net cost to Contractor for procurement and supply of services, labour, products, construction machinery and equipment, freight, handling, unloading, storage, installation and other authorized expenses incurred in performing Work outlined to be paid from cash allowances.

(a) The Contractor shall seek competitive tenders for items to be supplied and/or installed under cash allowances at the City's request.

D29.2 The Total Bid Price and not cash allowance includes Overhead Cost in connection with such cash allowance.

D29.3 A change order will be issued to adjust for excess or deficits to each cash allowance.

D29.4 Where costs under a cash allowance exceed amount of allowance, The Contractor will be compensated for excess incurred and substantiated plus allowance for Overhead Cost as set out in the Contract documents.

D29.5 Include progress payments on accounts of work authorized under cash allowances in monthly certificate for payment. The costs to be paid under cash allowances shall be substantiated by receipts, invoices, or purchase orders and shall be submitted with each progress payment request.

WARRANTY

D30. WARRANTY

D30.1 Notwithstanding C13.2, the warranty period shall begin on the date of Substantial Performance and shall expire one (1) year thereafter, except where longer warranty periods are specified in the respective Specification sections, unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.

D30.1.1 For the purpose of performance security, the warranty period shall be one (1) year.

D30.2 Notwithstanding C13.2, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Substantial Performance if a portion of the Work cannot be completed because of unseasonable weather or other conditions reasonably beyond the control of the Contractor but that portion does not prevent the balance of the Work from being put to its intended use.

D30.2.1 In such case, the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.

D30.3 Further to C13.3, manufacturer's warranties for fixtures, process equipment, or other features that are shorter than that specified by C13.2 shall be extended by the Contractor to match the overall warranty period and commence on the date of Substantial Performance.

D30.4 For seasonal equipment, components and systems which are not normally used continuously throughout the year, the warranty period shall include at least one full season of satisfactory operation.

FORM H1: PERFORMANCE BOND
(See D12)

KNOW ALL MEN BY THESE PRESENTS THAT

_____
(hereinafter called the "Principal"), and

_____ ,
(hereinafter called the "Surety"), are held and firmly bound unto **THE CITY OF WINNIPEG** (hereinafter called the "Obligee"), in the sum of

_____

_____ dollars ($_____.____)

of lawful money of Canada to be paid to the Obligee, or its successors or assigns, for the payment of which sum the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS the Principal has entered into a written contract with the Obligee for

RFP NO. 757-2016B

TRANSIT BUS MAINTENANCE AND REPAIR GARAGE EXPANSION DESIGN – BUILD PROJECT

which is by reference made part hereof and is hereinafter referred to as the “Contract”.

NOW THEREFORE the condition of the above obligation is such that if the Principal shall:

(a) carry out and perform the Contract and every part thereof in the manner and within the times set forth in the Contract and in accordance with the terms and conditions specified in the Contract;
(b) perform the Work in a good, proper, workmanlike manner;
(c) make all the payments whether to the Obligee or to others as therein provided;
(d) in every other respect comply with the conditions and perform the covenants contained in the Contract; and
(e) indemnify and save harmless the Obligee against and from all loss, costs, damages, claims, and demands of every description as set forth in the Contract, and from all penalties, assessments, claims, actions for loss, damages or compensation whether arising under "The Workers Compensation Act", or any other Act or otherwise arising out of or in any way connected with the performance or non-performance of the Contract or any part thereof during the term of the Contract and the warranty period provided for therein;

THEN THIS OBLIGATION SHALL BE VOID, but otherwise shall remain in full force and effect. The Surety shall not, however, be liable for a greater sum than the sum specified above.

AND IT IS HEREBY DECLARED AND AGREED that the Surety shall be liable as Principal, and that nothing of any kind or matter whatsoever that will not discharge the Principal shall operate as a discharge or release of liability of the Surety, any law or usage relating to the liability of Sureties to the contrary notwithstanding.

IN WITNESS WHEREOF the Principal and Surety have signed and sealed this bond the

_____ day of _____ , 20____ .

SIGNED AND SEALED
in the presence of:

_____
(Witness as to Principal if no seal)

_____
(Name of Principal)

Per: _____ (Seal)

Per: _____

_____
(Name of Surety)

By: _____ (Seal)
(Attorney-in-Fact)

FORM H2: IRREVOCABLE STANDBY LETTER OF CREDIT
(PERFORMANCE SECURITY)
(See D12)

_____
(Date)

The City of Winnipeg
Legal Services Department
185 King Street, 3rd Floor
Winnipeg MB R3B 1J1

RE: PERFORMANCE SECURITY – RFP NO. 757-2016B

TRANSIT BUS MAINTENANCE AND REPAIR GARAGE EXPANSION DESIGN – BUILD PROJECT

Pursuant to the request of and for the account of our customer,

_____ ,
(Name of Contractor)

_____
(Address of Contractor)

WE HEREBY ESTABLISH in your favour our irrevocable Standby Letter of Credit for a sum not exceeding in the aggregate

_____

_____ Canadian dollars.

This Standby Letter of Credit may be drawn on by you at any time and from time to time upon written demand for payment made upon us by you. It is understood that we are obligated under this Standby Letter of Credit for the payment of monies only and we hereby agree that we shall honour your demand for payment without inquiring whether you have a right as between yourself and our customer to make such demand and without recognizing any claim of our customer or objection by the customer to payment by us.

The amount of this Standby Letter of Credit may be reduced from time to time only by amounts drawn upon it by you or by formal notice in writing given to us by you if you desire such reduction or are willing that it be made.

Partial drawings are permitted.

We engage with you that all demands for payment made within the terms and currency of this Standby Letter of Credit will be duly honoured if presented to us at:

_____
(Address)

and we confirm and hereby undertake to ensure that all demands for payment will be duly honoured by us.

All demands for payment shall specifically state that they are drawn under this Standby Letter of Credit.

Subject to the condition hereinafter set forth, this Standby Letter of Credit will expire on

_____ .
(Date)

It is a condition of this Standby Letter of Credit that it shall be deemed to be automatically extended from year to year without amendment from the present or any future expiry date, unless at least 30 days prior to the present or any future expiry date, we notify you in writing that we elect not to consider this Standby Letter of Credit to be renewable for any additional period.

This Standby Letter of Credit may not be revoked or amended without your prior written approval.

This credit is subject to the Uniform Customs and Practice for Documentary Credit (2007 Revision), International Chamber of Commerce Publication Number 600.

_____
(Name of bank or financial institution)

Per: _____
(Authorized Signing Officer)

Per: _____
(Authorized Signing Officer)

FORM J: SUBCONTRACTOR LIST
(See D13)

TRANSIT BUS MAINTENANCE AND REPAIR GARAGE EXPANSION DESIGN – BUILD PROJECT

Name	Address

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

E1.1 These Specifications shall apply to the Work.

E1.2 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.

E1.2.1 *The City of Winnipeg Standard Construction Specifications* is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at: http://www.winnipeg.ca/matmgt/Spec/Default.stm.

E1.2.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.

E1.2.3 Further to C2.4(d), Specifications included in the Request for Proposal shall govern over *The City of Winnipeg Standard Construction Specifications*.

Appendix	Title	Document Number
Appendix A	Phase 1 ESA Report	860198-0155(1.0)
Appendix B	Phase II ESA Report	860198-0156(1.0)
Appendix C	Geotechnical Report	860198-0087(1.0)
Appendix D	Legal Description of Property Drawing	860198-0227(1.0)
Appendix E	Typical Bus Turning Radii	860198-0229(1.0)
Appendix F	Typical Bus Dimensions	860198-0157(2.0)
Appendix G	Material Safety Data Sheets	860198-0230(1.0)
Appendix H	Garage Room Data Sheets	860198-0117(5.0)
Appendix I	CONFIDENTIAL – Refer to same appendices table in Confidential Specifications	860198-0161(2.0)
Appendix J	421 Osborne Tree Removal Memo	860198-0207(1.0)
Appendix K	CONFIDENTIAL – Refer to same appendices table in Confidential Specifications	860198-0159(1.0)
Appendix L	CONFIDENTIAL – Refer to same appendices table in Confidential Specifications	860198-0115(2.0) 860198-0116(3.0) 860198-0085(3.0)
Appendix M	Civil Drawing	860198-0158(1.0)
Appendix N	Maintenance Garage Schematic Diagram	860198-0082(3.0)
Appendix O	Upholstery Shop Layout	860198-0208(1.0)
Appendix P	Existing Drawing List Existing Drawings	860198-0191(1.0) 860198-0119(1.0)
Appendix Q	Environmental Report – 566 Brandon Ave Hazardous Materials Survey Assessment	860198-0235(1.0)
Appendix R	Neighborhood Fit (Public Engagement Survey Summary Report)	860198-0236(1.0)
Appendix S	CONFIDENTIAL – Refer to same appendices table in Confidential Specifications.	860198-0215(3.0) 860198-0216(3.0)
Appendix T	CONFIDENTIAL – Refer to same appendices table in Confidential Specifications	860198-0234(2.0)
Appendix U	City of Winnipeg Public Engagement Guidelines	860198-0252(1.0)

E1.3 Drawings of the existing maintenance garage building are considered applicable to the Work - see Appendix P.

E1.4 Drawings, Specifications or appendices marked “CONFIDENTIAL” will be provided in Confidential Specifications through an electronic file transfer link upon written request to the Contract Administrator identified in D4.

E2. CITY SUPPLIED DATA

E2.1 The Proponents will ensure that work is coordinated and all provisions are made in the proposal and construction documents as required to incorporate the requirements, systems, technologies and general recommendations of the City as outlined in this RFP, and as discussed in the subsequent design and construction stages. To the degree that the scope of these services is limited, the selected Proponent will provide all additional selected services necessary to achieve the completion of the project.

E2.2 To the Proponents, the City will provide all available Site data and drawings that pertain to the project at hand including:

(a) All available as-built drawings of the existing garage facility;

(b) CAD versions of drawings listed in E1.3

(c) CAD LBIS data; and

(d) Geo-corrected aerial photos of the Site.

E2.3 No interpretation of the data will be provided. The data is provided as-is and no guarantee is made to its accuracy. It is the responsibility of the Contractor to verify the information provided, and seek out additional information as needed to complete the Project.

E2.4 During the Project the Contractor will carry-out any additional geotechnical, survey, environmental, and/or site assessment information needed for design and/or construction and secure these services as part of the Project.

E3. KEY PROJECT OBJECTIVES

E3.1 The Transit Bus Maintenance and Repair Garage Expansion will be delivered using a design-build delivery methodology, creating a facility that:

(a) Increases the overall garage capacity by including dedicated bus maintenance and repair bays and equipment for the nineteen (19) metre articulated buses;

(b) Addresses traffic movement and improve safety and flow through the garage with the addition of drive-through bays, specifically for the nineteen (19) metre articulated buses;

(c) Provides overall increased capacity to the major repair and overhaul operations with improved equipment to support those functions;

(d) Provides the functional space, building systems and infrastructure to support the relocation of the existing entire body, weld, and upholstery shop and administrative areas to the new expansion;

(e) Increases the overall parts storage capacity for the garage facility;

(f) Improves the functionality for the bus preparation and painting operations with the addition of new facilities;

(g) Incorporates green technologies with the minimum target of LEED® Silver certification;

(h) Provides increased parking capacity by incorporating a permanent new staff parking lot on Brandon Avenue; and

(i) Improves efficiencies and increases operational space for other Transit functions through the interior office fit-up.

E4. BUILDING CODE AND ZONING/BYLAW REQUIREMENTS

E4.1 The Contractor shall comply with all building codes, zoning, traffic, safety codes, rivers and streams approvals, elevation considerations, any and all City of Winnipeg By-laws, conditions or statutes in order to ensure agreement and conformity with all pertinent requirements to the Work.

E4.2 The Contractor is required to make application for, obtain and pay for all required approvals and permits.

E4.3 Specific consideration should be paid to providing a sound pollution management plan which exceeds the minimum standards set by City of Winnipeg By-laws. Such management should consider bus engines as generating a noise level of 102 dBa of sound pressure at a distance of three (3) metres from the bus engine compartment.

E4.4 Specific consideration will need to be given to neighbourhood fit, active transportation, landscape buffering, and snow clearing for the new parking lot. Requirements may evolve with ongoing public consultations and rezoning processes already underway. The Contractor shall be prepared to adjust parking lot plans through design development to suit the outcomes of these regulatory processes.

E4.5 Should any non-conformance to all applicable codes and other requirements of agencies having jurisdiction be identified, the Contractor shall be responsible for any necessary redesign/reconstruction at its sole expense.

E5. CITY OF WINNIPEG UNIVERSAL DESIGN POLICY

E5.1 The City has adopted their own Universal Design Policy and Guidelines. The Proponents will review and use these guidelines along with the National Building Code requirements on Barrier Free Design to develop their Proposal and subsequent contract documents. A copy of the Accessibility Standards can be found at the following url:
http://www.winnipeg.ca/ppd/Universal_Design.stm

E6. PROJECT SIGNS

E6.1 The Contractor shall install two sets of infrastructure signs (four signs), each approximately 120 cm high by 250 cm wide. Infrastructure sign support structures shall be designed by the Contractor to withstand the outside elements for the duration of the Project. The Contractor shall mount each sign securely to a suitable rigid sign support backing material and erect each sign to a suitable sign support structure visible to motorists at Osborne St. and on Brandon Ave, or at locations directed by the City.

E6.2 Any project identification sign proposed for the Site must be submitted to the Contract Administrator and approved by the City.

E6.3 The Contractor shall remove and dispose of the signs and sign support structures when the Contractor has achieved Final Completion of the Project.

E7. OFFICE FACILITIES

E7.1 The Contractor shall supply the City team with a Site office facility meeting the following requirements:

(a) The office shall be conveniently located near the Site of the Work.

(b) The building shall have a minimum floor area of fifteen (15) square metres, a height of 2.4 metres with two (2) windows for cross ventilation and a door entrance with a suitable lock.

(c) The building shall be suitable for all weather use. It shall be equipped with an electric heater and air conditioner so that the room temperature can be maintained between either 16-18˚C or 24-25˚C.

(d) The building shall be adequately lighted with fluorescent or LED fixtures.

(e) The building shall be furnished with one (1) desk, one (1) meeting table, and minimum eight (8) chairs.

(f) A portable toilet shall be located near the field office building; and

(g) The field office building and the portable toilet shall be cleaned on a weekly basis immediately prior to each Site meeting. The Contract Administrator may request additional cleaning when deemed necessary.

E7.2 The Contractor shall be responsible for all installation and removal costs, all operating costs, and the general maintenance of the office facilities.

E7.3 The office facilities will be provided from the date of the commencement of the Work to the date of Total Performance.

E8. GENERAL INSTRUCTIONS TO CONTRACTOR

E8.1 All public communication will be conducted by the designated representative of the City. The Contractor is not permitted to address the media or public regarding this project.

E8.2 The site has limited space, therefore the Contractor shall supply for Contract Administrator's review and approval prior to site mobilization; a site plan depicting information such as, but not limited to: material laydown area, office trailers, washroom facilities, construction site fencing, contractor parking area (street parking will not be permitted), potential craning locations, construction site access, muster points, and designated smoking area.

E8.3 The Contractor shall supply for Contract Administrator's review and approval prior to site mobilization and demobilization; a photographic record of all work areas within the existing building, including tie-in points to the existing building.

E8.4 The existing Fort Rouge Transit base is a twenty-four (24) hour, seven (7) day a week operation. The design and construction must be cognizant of the facility's requirement to remain operational through all phases of the project. Overall facility shutdowns are not permitted, however, system specific shutdowns may be permitted but the number and duration must be kept to a minimum.

E8.4.1 The Contractor shall execute the Work with the least possible interference or disturbance to occupants and normal use of premises.

E8.4.2 The Contractor shall ensure that the Contract Administrator and City staff is aware of all construction activities which will impact the facility's operations. Such activities include but are not limited to:

(a) Work which impacts traffic movement inside and outside the building;

(b) Mechanical systems shutdown including HVAC, plumbing, fuel/fluid distribution systems, air distribution systems etc.; and

(c) Electrical systems shutdown including power and lighting systems, IT, security systems etc.

E8.4.3 The Contractor shall coordinate any contemplated shutdowns with the Contract Administrator and City prior to requesting permission and scheduling the Work. Although the facility operates 24/7, consideration to carry out service interruptions in reduced staffing and work periods (i.e. overnight shift) may be preferred.

E8.4.4 The Contractor shall provide minimum seventy-two (72) hours' notice and obtain required permission from the Contract Administrator and City staff prior to interrupting mechanical or electrical services throughout the course of the Work. Ensure that the specific system impacts and the length of the shutdowns are identified with all such requests to expedite the approval and communication process.

E8.4.5 The City is not responsible for delays in executing the Work due to insufficient notice or information provided by the Contractor for service interruption requests, thereby preventing quick turnaround on approvals on such requests.

E8.4.6 Refer to other sections of this Specification with respect to the tie in requirements for building systems, but the following will apply to all scopes.

(a) Identify and resolve interference problems prior to prefabrication and installation of equipment

(b) Where new work connects with existing and where existing work is altered, cut, patch and restore to match existing work

(c) Demolish work into sections of practical size for removal without alteration or damage to existing building

(d) In existing work, cutting, patching and restoration of finished work to original condition will be carried out

E8.5 The Drawings and Specifications shall be issued in metric notation unless directed otherwise.

E8.6 Design Submissions:

(a) The Contractor must provide relevant and updated documents to the Contract Administrator at the various stages as prescribed below. Document submissions will be reviewed by the Owner's Consultants.

(i) The review by the Owner's Consultants will be to confirm the progressive elaboration of the overall design and for general compliance to the Specifications and requirements of this Request for Proposal and shall not relieve the Contractor's responsibility to meet the requirements of E4.

(ii) The review by the Owner's Consultants shall not in any way be interpreted as final and sufficient for the purposes of obtaining development, building or other permits required to complete the Work

(b) The Contractor should allow ten (10) Business Days for the review of each submission.

(c) Each submission shall include six (6) hardbound copies and an electronic set of the complete documents. There is no maximum number of pages.

(d) Electronic sets shall be submitted on CD or USB key in PDF file format for all documents.

E8.6.1 Design Development (33% construction documents) should include but is not limited to:

(a) drawings (including site plans, floor plans, cross-sections, elevations and details);

(b) 3D representation of the Base Building in high resolution and digital format (JPEG standard);

(c) design brief outlining the integrated design approach, sustainability and energy efficiency features;

(d) code analysis;

(e) LEED scorecard update

(f) building durability plan;

(g) daylighting calculations;

(h) energy model report;

(i) project schedule; and

(j) risk management plan.

E8.6.2 66% construction documents should include but is not limited to:

(a) drawings (including site plans, floor plans, cross-sections, elevations and details);

(b) specifications;

(c) LEED scorecard update

(d) building durability plan;

(e) daylighting calculations;

(f) energy model report;

(g) commissioning plan;

(h) project schedule; and

(i) risk management plan.

E8.6.3 99% construction documents should include but is not limited to:

(a) drawings (including site plans, floor plans, cross-sections, elevations and details);

(b) specifications;

(c) code analysis;

(d) LEED scorecard

(e) building durability plan;

(f) daylighting calculations;

(g) energy model report;

(h) commissioning plan;

(i) erosion and sedimentation control plan;

(j) construction waste management plan;

(k) project schedule;

(l) risk management plan;

(m) options and samples for proposed materials;

(n) construction hazard assessment and site specific safety plan.

E8.7 The Contractor will supply the Contract Administrator and City with construction and commissioning submissions, including but not limited to:

(a) permits issued;

(b) 100% issued for construction set of plans and specifications (6 hardbound copies)

(c) changes prepared - issued as they occur or arise;

(d) testing and inspection reports – issued as they occur;

(e) construction meeting minutes – issued monthly;

(f) reviewed shop drawings and product data sheets – (new documents) issued monthly;

(g) project schedule – issued monthly;

(h) risk management plan – issued monthly;

(i) site specific safety plan – issued quarterly;

(j) building durability inspection reports – issued quarterly;

(k) draft commissioning report;

(l) training plan, issued three months prior to substantial completion.

(m) air balancing report;

(n) air quality test report;

(o) water quality test report;

(p) light-level measurement report for interior and exterior lighting;

(q) Interim Certificate of Completion - signed by Contractor’s representatives of each professional discipline involved in the Work

(r) final commissioning report;

(s) record drawings stamped and signed "as-built";

(t) operations & maintenance manuals; and

(u) Final Certificate of Completion – signed by Contractor’s representatives of each professional discipline involved in the Work

E8.8 The Drawings, Specifications, design, copyright, etc. of all the professional design disciplines for the design of this facility shall become the property of the City.

E8.9 The Contractor shall not provide information whatsoever to any form of media, including but not limited to, radio, print, television, cyber, advertising, etc. without written permission of the City.

E9. NEIGHBOURHOOD FIT CRITERIA

E9.1 The City has hosted pre-construction public engagement sessions and meetings with area business and residents. The intent of these meetings was to share the general scope of the project and to solicit any feedback on items related to the proposed building and parking lot designs.

(a) Feedback from these sessions has been consolidated into a memorandum which is included in Appendix R.

E9.2 The Contractor shall ensure that the overall site, building design for the Bus Maintenance and Repair Garage Expansion and proposed parking lot respect the adjacent residential neighbourhood and incorporate the feedback from area business and residents. Elements that should be considered include, but are not limited to:

(a) Building facades and treatments;

(b) Landscaping – green spaces, plantings, buffering strategies, fencing;

(c) Site and sound attenuation;

(d) Snow clearing and snow stockpile management

(e) Traffic control; and

(f) Lighting strategies.

E9.3 The Contractor shall hold a minimum of one (1) public information session and four (4) stakeholder meetings in coordination with the requirements outlined by the City's Office of Public Engagement. The intent of the session(s) is to present the Contractor's design as submitted in response to this Request for Proposals. The Contractor's responsibilities include but is not limited to:

(a) Issuing invitations to area residents and businesses with an interest in the project. The catchment area for the invitations shall be coordinated with the Office of Public Engagement;

(b) Preparing a presentation utilizing MS PowerPoint, information boards with descriptions, 3D renderings and illustrations of the overall design of the Site, building addition, active transportation path, and parking lot. Coordinate the preparation and review of these boards with the Office of Public Engagement;

(c) Identifying the elements within the design which seek to address the feedback provided by area residents and businesses with respect to the project elements obtained during the City's pre-design public engagement process;

(d) Identifying and providing reasoning where appropriate, any aspects of public feedback which could not be addressed in the design;

(e) Identifying the Contractor's proposed construction plan, site office, parking, laydown and marshalling areas, schedule and sequencing of activities and strategies to mitigate construction impacts on the adjacent neighbourhood;

(f) Ensuring the Contractor's subject matter experts (construction, architectural, engineering etc.) attend the sessions in order to answer questions posed; and

(g) Ensuring a means to which questions, concerns, or other feedback from the public can be received, compiled and summarized. Submit a report to the City outlining the Contractor's findings.

E9.4 Notwithstanding E9.3, the Contractor shall coordinate all activities associated with the public engagement process and adhere to the requirements outlined in the City of Winnipeg Public Engagement Guidelines included in Appendix U.

E10. SITE SERVICES

E10.1 All required site services and utilities with respect to the Project are part of the Contractor's cost and scope.

E10.2 The overall site services may include, but are not limited to the following:

(a) Water supply (both domestic and fire, with backflow prevention);

(b) Sewage disposal (both sanitary and storm, with oil separation);

(c) Storm Water Management;

(d) Telephone system;

(e) Natural gas;

(f) Cable/IT system connection to City;

(g) Electricity supply; and

(h) Lighting/Security.

E10.3 It is the responsibility of the Contractor to arrange and procure service from outside agencies for the installation of site services where necessary.

E10.4 Where existing internal services permit, the services shall be extended from the existing Transit buildings service.

E10.5 No existing/proposed utilities shall be located under the building except required building services (sewer, water, etc.). All existing services/utilities that fall under the building footprint require relocation and/or abandonment as may be required.

E11. HAZARDOUS MATERIALS

E11.1 If asbestos or other hazardous materials are encountered during the Work of the Contract that are not identified in any reports provided with this Request for Proposal, the Contractor shall stop all work and notify the City immediately. Removal of hazardous materials shall be dealt with by the Contractor after further instruction by the Contract Administrator.

E11.2 See Appendix G for all Material Safety Data Sheets of chemicals found and utilized within the existing Bus Maintenance Garage. The Contractor is responsible to ensure the design of the various building, mechanical, electrical, process and equipment areas incorporates the use of these materials within the expanded facility and satisfies the requirements of E4.

E12. ENVIRONMENTAL REPORTS

E12.1 Phase I and Phase II ESA reports have been issued for information only to assist in the understanding of impact to local soils from previous Site use. It is the responsibility of the Contractor to obtain further information as necessary to complete the project.

E12.2 The Phase I and Phase II ESA reports are included in Appendix A and Appendix B respectively.

E12.3 Prior to Site development, a soil management plan is to be developed and implemented to address relocation of excess soil. This would ensure soil material is not transferred to a land use (e.g. Agriculture, residential and commercial) where environmental guidelines would be exceeded or develop a potential environmental liability.

E12.4 The four monitoring wells (MW02, MW05, MW08 and MW09) are to be decommissioned and removed prior to property development to avoid potential contamination of the groundwater from surface run off sources.

E13. GEOTECHNICAL REPORT

E13.1 A geotechnical report has been issued for information only to assist in the understanding of local soils, and design of foundations. Refer to Section E23.1 for specific requirements pertaining to the use and preparation of geotechnical reports.

E13.2 The geotechnical investigation is included in Appendix C.

E14. LEGAL DESCRIPTION OF PROPERTY AND LIMITS OF WORK

E14.1 The legal description of the Site is Lots 4 to 12 and partial lots 13 to 16, Block 5, Plan 301; Lots 4 to 8 and partial lots 9 to 11, Block 6, Plan 301; Lots 21 to 22 and partial lots 17 to 20, Block 11, Plan 319; Parcel E, Plan 49761; Lots 17 and 25, Plan 9757. Property and parcel limits, including adjacent properties are shown in Appendix D.

E14.2 It is proposed that the new parking lot be constructed on Brandon Avenue at Lots 13 to 21, Lot 12 and Lots 9 to 11, Block 6, Plan 1606.

E14.2.1 The City is undertaking the preliminary design, rezoning and subdivision process for the Brandon Avenue lots noted in order to permit the construction of the new parking lot. The City will notify the Contractor when the process is completed.

E14.2.2 The Contractor shall be responsible to further develop the design for the conceptual parking lot included in Appendix R in order to obtain development permits and subsequently construct the parking lot once the rezoning and subdivision process is completed. The Contractor shall be responsible for developing the design based on the concept plan and requirements outlined in sections E15, E16, and E17.

E14.2.3 The Contractor shall consult with the City as it undertakes the design to ensure that information received by the City for the approvals of the rezoning and subdivision process which impact the design of the parking lot is accounted for in the Contractor's design.

E14.3 Parcels not explicitly listed above are not available for this project, although some Site work will be necessary at the south end of Transit's existing maintenance garage area to connect internal roadways to the new Transit Garage Site. Reduction to the size of Transit's existing parking lot and Traffic Service's storage compound immediately west of the maintenance garage is expected, but should be minimized.

E14.4 The Contractor is responsible for all applications for changes to property limits, parcel changes, and building permits.

E15. DEMOLITION AND TREE PROTECTION

E15.1 The existing residence located at 566 Brandon Avenue has been acquired by the City. In order to permit the construction of the new parking lot, the structure will need to be demolished and removed from site. The anticipated date for the transfer of ownership of this home to the City is May 1, 2017.

E15.1.1 Further to C6.12, the Contractor shall carry out all demolition work in strict compliance with all applicable regulations, acts, codes, and by-laws.

(a) Further to E11, a hazardous materials assessment of the residence has been completed. A copy of the report is included in Appendix Q. The Contractor shall comply with all applicable regulations, acts, codes and by-laws and specification for hazardous materials identified in the assessment.

E15.1.2 Further to C6.12, the Contractor shall obtain and pay for a demolition permit in order to carry out the required Work.

E15.1.3 Further to C6.27, during the period between the City's receipt of ownership of the aforementioned property and the actual demolition, the Contractor shall maintain the building in a boarded up state.

E15.1.4 See E16.4 for tree protection, tree removal and tree replacement requirements on site.

E15.1.5 The Contractor shall demolish the existing buildings, structures, fences, sidewalks, etc. on the Site. The Contractor shall completely demolish all buildings and structures/foundations that are above and below ground and remove all debris and rubbish from the Site. The Contractor shall not store or permit debris or rubbish to accumulate on the Site for more than one (1) Working Day. The Contractor shall completely clear the Site except for any existing trees, which the Contractor shall protect from damage.

E15.1.6 The Contractor shall completely remove the basement walls below grade. The floor slab can remain if holes are punched through it to allow for drainage.

E15.1.7 The Contractor shall keep the exposed basement areas of the Site free of water until it has been backfilled to the satisfaction of the Contract Administrator. All equipment, pumps and appurtenances as may be required to keep these areas free of water shall be provided and maintained by the Contractor.

E15.1.8 The Contractor shall fill the area below the existing ground exposed by the demolition with engineered granular fill compacted in 150 mm lifts to a depth of 300 mm above the surface of the existing ground at the Site of the building. The fill material shall be free of debris and rubbish of any kind and be approved by the Contract Administrator. The Contractor shall not place backfill material until the Contract Administrator has inspected the excavation. Should any backfill be placed before the permission of the Contract Administrator has been obtained, the excavation shall be re-opened by the Contractor, at his/her expense.

E15.1.9 The Contractor shall control dust from the demolition operations by suitable means to prevent harm to the work crews and the public to the satisfaction of the Contract Administrator.

E15.1.10 The Contractor shall utilize rubbish chutes to carry down all rubbish from the building under demolition.

E15.1.11 The Contractor shall ensure that the demolition operation be conducted with the minimum interference with streets, sidewalks, etc. No salvage material shall be placed or stored on streets, sidewalks, etc. within or surrounding the Site.

E15.1.12 The Contractor shall protect all existing trees located on the Site or within the street right-of-way from damage during the demolition operation. The Contractor shall not remove existing trees without the written consent of the Contract Administrator.

E15.1.13 The Contractor shall not burn debris or other material on the Site.

E15.1.14 Unless directed otherwise by the Contract Administrator, the Contractor shall haul, deposit all material and pay disposal fees, except as described in Clause E15.4 and E15.5, from the Site to the Brady Road Landfill site.

E15.1.15 The Contractor will be responsible for the garbage and recycling bins and associated hauling and tipping fees for all demolition material not salvaged or recycled by the Contractor or their Subcontractors.

E15.1.16 The Contractor shall submit, within twenty-four (24) hours of a request by the Contract Administrator, how many tonnes of organic/building material and how many tonnes of concrete/rubble the Site is expected to generate. The Contractor shall haul the two materials separately; no mixed loads will be accepted at the Brady Road Landfill site or the concrete crushing plant described in E15.5.

E15.2 Utilities

(a) The Contractor shall arrange and pay for the appropriate utility and subcontractors to disconnect, seal off, and remove from the Site and all adjacent previously demolished properties, all service lines, pipes or conduits that service the building(s) to be demolished

and any service lines, pipes or conduits that are discovered that were demolished or abandoned previously. The Contractor shall also arrange to have the gas and hydro meters removed.

(b) The Contractor shall disconnect, seal off, and remove all sewer and water service connections in accordance and coordination with the appropriate City department(s). If the Contractor is unable, or not licensed to complete this work, the Contractor shall subcontract the work to a subcontractor licensed by the City to do such work on behalf of the Contractor; and

(c) The Contractor shall provide each utility and the City's Water and Waste Department with adequate prior notification as to when they will require these disconnection and sealing off services.

E15.3 Protective Barricades

(a) The Contractor shall provide and erect all protective barricades as required for demolition of buildings in accordance with the requirements of the employment safety regulations under the Workplace Safety and Health Act, Employment Safety Act and the City of Winnipeg By-Law No. 1481/77 pertaining to erection of barricades for protection.

(b) The Contractor shall also provide additional temporary barricades or rope off temporary demolition zones in the street right of way as may be necessary for any dangerous demolition operation in order to keep the public away from the Site. Such temporary barricades shall be removed as soon as possible in order to prevent unnecessary interruption of traffic; and

(c) The Contractor shall be responsible for maintaining all protective barricades, including gates, walks, lights, etc. in a good operating condition for the entire period of the demolition to the satisfaction of the Contract Administrator.

E15.4 Salvaged Materials

(a) All salvaged building materials resulting from the demolition including fixtures, except items noted hereinafter, shall become the property of the Contractor and shall be removed from the Site. All goods and chattels at the Site shall become the property of the City, and shall be removed by the City prior to the demolition and sold to offset the cost of the demolition, unless in the judgment of the Contract Administrator these goods have no reclaimable value, in which case, these items shall be disposed of by the Contractor as refuse.

(b) Service meters shall remain the property of the utility owning service.

(c) The Contractor shall disconnect water meters and return them to the City, Water and Waste Department, Emergency Services, Stores - 552 Plinquet Street, east end of building, within seven (7) days of disconnection; and

(d) The Contractor shall supply the Contract Administrator with the water meter receipt received from the City's Water and Waste Department. The receipt shall accompany the Contractor's invoice.

E15.5 Recycled Concrete

(a) The Contractor shall recycle all rebar, concrete and concrete products by:

(i) removing the rebar and crushing the concrete and concrete products to 100 mm down, utilizing the Contractor's own forces or others, then recycling the material as the Contractor sees fit; or

(ii) stockpiling rebar, concrete and concrete products on the Contractor's own property for future recycling as the Contractor sees fit; or

(iii) loading and hauling the separated rebar, concrete and concrete products directly to Brady Road Resource Management Facility (BRRMF) located at 1901 Brady Road, Winnipeg;

(iv) All loads arriving at the BRRMF must report to the Scale Building, and

(v) Any loads arriving on site at BRRMF that are deemed by the BRRMF Scale Operator to be contaminated with other materials shall be subject to additional charges at the expense of the Contractor.

(b) The Contractor shall not stockpile rebar, concrete or concrete products at the Site.

E15.1 Truck Weight Limits

(a) The City shall not pay for any portion of material which results in the vehicle exceeding the maximum gross vehicle weight allowed under *The City of Winnipeg Traffic By-laws*, unless such vehicle is operating under special permit.

E16. LANDSCAPE ARCHITECTURE

E16.1 Scope and Location of Work

E16.1.1 Work of this contract entails the site development work related to the expansion and redevelopment of the Transit Garage, and the installation of a permanent parking lot on Brandon Avenue in, Winnipeg, Manitoba.

E16.1.2 Scope of work is primarily determined by the requirements of the City of Winnipeg By-laws for buffering and screening of new development especially parking lots to surrounding residential properties.

E16.2 Crime Prevention Through Environmental Design:

E16.2.1 The site development shall conform to Crime Prevention Through Environmental Design (CPTED) principles (http://www.cptedtraining.net/).

E16.2.2 The Contractor shall have conducted a CPTED assessment of the existing site and developed new parking lots, walkways and landscape areas to CPTED standards through a CPTED certified Landscape Architect. Proposals shall include site development schematics with CPTED labels and a narrative describing CPTED solutions.

E16.3 Work in this Contract

E16.3.1 Site work required for this project will include:

(a) Site preparation including clearing and grubbing, tree protection and tree removal, hardscape demolition and removal (where applicable).

(b) Grading and surface drainage. (Refer to Civil for land drainage/storm water management).

(c) CIP concrete approaches, sidewalks and curbs. (Refer to Civil).

(d) Asphalt paving including access roads, parking, and cut repairs.

(e) Line painting. (Refer to Civil).

(f) Topsoil and finished grading.

(g) Sodding and mulching.

(h) Trees, shrubs and groundcovers including tree pit and planting bed excavation.

(i) Site furnishings.

(j) Site carpentry items, including fences, bollards.

(k) Chain link fence (if required).

(l) One year plant warranty and 30 day landscape maintenance.

(m) Site lighting and parking outlets (Refer Electrical).

(n) Parking, regulatory and wayfinding signage; and

(o) LEED® Silver requirements for site work.

E16.4 Site Preparation, Tree Removal and Tree Protection

E16.4.1 Clearing and Grubbing: Removal and disposal of existing trees and plant material as required, including: roots, rocks, debris, weeds, obstacles and impediments to the construction of all site work per standard CWPG construction specifications.

E16.4.2 Refer to LEED® specifications for erosion and sediment control measures to be established for the duration of construction activities.

E16.4.3 The proponent shall protect all existing trees on site that are not impacted by the new site development. Trees within construction and construction access areas shall be protected with 1x6 PT wood strapping from 1 m-1.8 m above the base of the tree around the entire circumference of the trunk. In addition to the strapping, the proponent shall install a 1.2 m high orange snow fence erected directly below the drip line (edge of the tree canopy above) of each tree with a trunk diameter greater than 0.15 m at chest height. Failure to maintain this tree protection and subsequent damage or mortality of trees up to and including mortality two (2) years after substantial performance will require the proponent to provide replacement trees commensurate with the assessed value of the existing tree as assessed by the City of Winnipeg Forestry Department.

E16.4.4 Do not remove or prune elm trees between April 1 and July 31 per City of Winnipeg Dutch Elm Disease regulations: http://winnipeg.ca/publicworks/parksOpenSpace/UrbanForestry/DED.stm.

E16.4.5 One large cottonwood tree at 421 Osborne Street has been identified as a specimen that may potentially need to be removed to accommodate the construction of the new parking lots for this facility (Per memo attached in Appendix J - CWPG 421 Osborne Tree removal memo Nov 9, 2016) If required, this tree must be removed by a certified arborist in accordance with the City of Winnipeg Forestry department regulations. A list of pre-approved contractors for this type of work can be found at http://winnipeg.ca/publicworks/parksOpenSpace/UrbanForestry/Homeowner_Tree_Maintenance_Guidelines.stm.

E16.4.6 Recycle all trees with a trunk diameter larger than 0.15 m at chest height the City of Winnipeg wood recycling depot at Brady Road Landfill or directly to local wood upcycling facilities such as Wood Anchor 204-261-1913 or approved equal. Recycle smaller trees and branches into wood chip mulch for the site or to local landscape companies who produce wood chip product.

E16.4.7 Per the City's assessment (Appendix J) fifteen (15) new trees from the City's approved urban street tree list may be required to be planted to compensate for the necessary removal of the cottonwood, the final parking lot design will determine this requirement. Please refer to http://www.winnipeg.ca/publicworks/parksOpenSpace/UrbanForestry/PDF/Acceptable_Tree_Species_for_Boulevard.pdf for approved species. These fifteen (15) trees must be minimum 2.1 m in height, 50 mm caliper ball and burlap nursery stock. New trees must be installed and maintained per City of Winnipeg standard specifications: http://www.winnipeg.ca/publicworks/parksOpenSpace/UrbanForestry/PDF/Tree_Planting_and_Maintenance_Specification.pdf.

E16.4.8 Contact Chris Lepa Urban Forestry Technical Services to confirm the proposed tree protection, tree removal and tree replacement strategies meet the City's Urban Forestry Department requirements prior to submitting final site construction documents.

E16.5 Subgrade Preparation

E16.5.1 Remove all foreign material, undesirable plants, roots, stones in excess of 25 mm, debris and soil contaminated with oil, gasoline or other harmful substances from site. Remove silt to one (1) metre below final grade of paved surfaces per Geotechnical Report. Grade subgrade to eliminate uneven areas, low spots and ensure positive drainage. Under all sod and planted areas, cultivate and scarify subgrade areas which have been compacted during hauling or spreading, to a depth of 100 mm.

E16.6 Rough Grading

E16.6.1 Rough grade to levels, profiles, and contours allowing for surface treatment in accordance to accepted design and per standard CWPG construction specifications.

E16.6.2 Slope rough grade away from building at a minimum of 2% for soft landscaped areas.

E16.6.3 Slope rough grade away from building at a minimum of 1% for hard surface/paved surfaces.

E16.6.4 Grade swales to depths as indicated with a minimum of 0.5% slope to outlets to ensure proper site drainage.

E16.6.5 Compact filled and disturbed areas as follows:

(a) 95% minimum SPMDD under landscaped areas; and

(b) 100% minimum SPMDD under paved and walk areas.

E16.6.6 Remove surplus material and material unsuitable for fill, grading or landscaping.

E16.6.7 Paving and Site Concrete (Refer to Civil).

E16.6.8 Finish Grading per standard CWPG construction specifications:

E15.6.8.1 Grade to eliminate rough spots and low areas and ensure positive drainage:

(a) Prepare loose friable bed by means of cultivation and subsequent raking; and

(b) Leave surfaces smooth, uniform and firm against deep footprinting.

E16.7 Topsoil & Placement per standard CWPG construction specifications:

E16.7.1 General Purpose, 4-Way prepared soil mixture. Amended as required.

E16.7.2 Dark brown to black, loam textured topsoil mixture, friable when moist, free of living plants and branches. Conductivity value of less than 1.5 ms/cm, pH value 6.0 to 7.5, containing no toxic elements.

E16.7.3 Place topsoil in lifts of no more than 100 mm depth in dry weather on dry unfrozen grade to design lines, grades and elevations. Obtain minimum depth after settlement of 100 mm for all sod areas and 300 mm depth for shrub beds.

E16.7.4 Cultivate topsoil to depth of 100 mm by roto-tilling or by hand methods.

E16.8 Soft Landscaping

E16.8.1 Sod per standard CWPG construction specifications

(a) Mineral soils based, Number One Turf Grass Nursery Sod: sod that has been especially sown and cultivated in nursery fields as turf grass crop as per the City of Winnipeg Standard Construction Specification, CW 3510.

(b) Kentucky Bluegrass Sod: Nursery Sod grown solely from seed mixture of cultivars of Kentucky Bluegrass, containing no less than three (3) named dwarf varieties.

E16.8.2 Trees, shrubs, perennials and groundcovers

(a) Grown in Zone 3A or 3B in accordance with Plant Hardiness Zones in Canada.

(b) Bark Chip Mulch at 75mm depth, 25-50 mm diameter by 12-25 mm thick bark chips from coniferous trees, clean, free of debris, soil and friable material. Dark brown in colour.

E16.8.3 Maintenance

(a) Thirty (30) day minimum maintenance period.

(b) Including mowing, weeding, watering, fertilizing and seasonal clean-up.

E16.8.4 Warranty

(a) One (1) year warranty on major defects or plant death not caused by adverse use or site conditions.

(b) Replacements subject to an additional one (1) year warranty period.

E16.9 Site Furniture

E16.9.1 Site Furnishings: Provide waste receptacles near building exits and bike parking in the new parking lot or adjacent to the new addition.

E16.9.2 Site Signage

(a) Provide wayfinding signage and parking signage to clearly identify staff and visitor parking areas and restrictions.

(b) Provide appropriate regulatory signage including no stopping, fire lanes, designated accessible parking, stop signs, etc.

(c) Aluminum Metal Panel: 1.25 gauge (3 mm) thick metal plate, 5052 H32, sign grade, high tensile strength aluminum panels. Sizes to suit information to be conveyed.

(d) Sheeting: Engineering Grade Reflective Sheeting, or approved equivalent, complete with permanent pressure sensitive adhesive backing. Sheeting colours per City of Winnipeg Accessibility Guideline and ADA recommendations.

(e) Mounting Hardware: Schedule 40, 63 mm square, hot-dipped galvanized sign posts. Hot-dipped galvanized thru bolts capable of securely fixing signage in place. Posts to be driven minimum 1220 mm below grade.

E16.10 Site Carpentry (for light proof fences and parking fences)

(a) Pressure treated timbers and dimensioned lumber to CSA 080, non-incised, ACQ-C treatment.

(b) 190 x 190 timber posts (2.44 m O.C.) and 3 - 38 x 235 P.T. Brown rails for parking/light proof fence.

(c) 190 x 190 timber bollards.

(d) 89 O.D. galv. steel posts with 38 x 140 rails and 19 x 140 boards, screen fence (1.22m height above grade and 1.22m minimum depth below grade).

E16.11 Chain Link Fences and Gates – galvanized chain link fence and vehicle gates as identified on plans (if applicable). Also see E23.17.

(a) Terminal posts to be 90mm outside diameter by 1.82 m high.

(b) Line post to be 60 mm outside diameter by 1.82 m high.

(c) Foundation for terminal and line posts to be cast-in-place concrete foundations of sufficient depth or configuration to prevent frost heave and seasonal movements of the foundation (minimum 1.22 m below grade).

(d) Foundations for gates to be cast-in-place concrete foundations of sufficient depth or configuration to prevent frost heave and seasonal movements of the foundation (spread-bore concrete foundations founded below frost line or minimum 7.5 m straight-shaft pile greased and wrapped cardboard form tube for the top 3.0 m).

(e) Fabric to be no. 9 gauge wire woven into a uniform 50 mm specified. Diameter of wire to be no less than 3.68 mm.

E16.12 Lighting – Site lighting (refer to Electrical).

E17. SITE DEVELOPMENT

E17.1 General

E17.1.1 All site works must meet

(a) Winnipeg Zoning By-law requirements
http://winnipeg.ca/ppd/zoning_bylaw200.stm

(b) Winnipeg Public Works Pedestrian and Cycling Guidelines
http://winnipeg.ca/publicworks/pedestriansCycling/default.stm

(c) Winnipeg Universal Design Standards
http://winnipeg.ca/ppd/Universal_Design.stm

E17.2 Vehicular Access

E17.2.1 All new approaches and access points to public right of ways to be cleared for location and size by public works.

(a) Contact: Doug Binda - Approaches Officer.
o 204-986-5239, c 204-803-0406
d.binda@winnipeg.ca

E17.2.2 Transit buses are not to access Site from Brandon Avenue, or other residential streets to the south of the Site.

E17.2.3 Construction vehicles are not to access Site from Brandon Avenue, or other residential streets to the south of the Site. Provide a construction access and staging plan as per section E8.2

E17.2.4 Transit buses are to access the Fort Rouge Transit Base using existing interior service roads near the existing maintenance building.

E17.2.5 Buses will continue to enter the maintenance garage from the existing eastern entrance. Access to the expansion will be via the existing western door of the existing maintenance garage. An alternate exit lane shall be provided by the Contractor such that buses in the existing maintenance garage facility can exit the building without impacting construction. This alternate exit lane shall be completed prior to the closure of the west exit door due to construction. The alternate exit lane will remain open following construction.

E17.2.6 Exit doors shall be provided at a number of proposed new bus service bays designated to accommodate sixty (60) foot articulated buses to permit direct exit without having to back-out of spaces.

E17.2.7 Adequate bus aprons must be provided at the proposed new exits to facilitate numerous turning movements at any one time.

E17.2.8 A one-way northbound roadway with a minimum width of 3.65 m is to be provided on the west side of the building expansion to allow traffic to access the north end of the site without having to travel around the maintenance building on the south side. This roadway is to remain open throughout construction.

E17.2.9 Maintain access through the new parking lot and Site to VIA compound on west side for VIA personnel vehicles and emergency vehicle access. Maintain access at all times during project construction to the VIA compound. Temporary alternate crossing locations of the rapid transit corridor for VIA vehicles are permitted, but travel on the corridor itself is not. Alternate crossing(s) of the corridor will be at the cost of the Contractor and subject to the approval of the Director of Transit.

(a) VIA vehicles which regularly require access vary from staff vehicles (cars, vans, light trucks) to large semi-tractor/trailer combinations. The Contractor shall ensure the design of the roads and access points will support the required traffic loads.

E17.2.10 Consider and include any code and City of Winnipeg By-law requirements including the provision of a fire lane, if deemed necessary.

E17.2.11 Loading area(s) for supply and equipment deliveries, maintenance and emergency vehicles to be provided.

E17.2.12 The Contractor is responsible for the geometric design of all Site roadways and parking lots, such that the existing Transit fleet, service vehicles, and future fleet vehicles such as articulated buses are able to navigate the Site at a reasonable speed. Typical Transit bus vehicle turning radii are provided in Appendix E. The information is provided as-is and it is

the responsibility of the Contractor to confirm the turning radii and appropriate design vehicles.

E17.2.13 The Contractor is responsible for parking lot design to meet City of Winnipeg Zoning By-laws including provisions for accessible parking stalls, preferred carpool stalls with all related paint markings and signage. Use the 2015 City of Winnipeg Accessibility Design Standards to design fully accessible stalls.

E17.2.14 No additional vehicular access is allowed along the south side of the Site to minimize impact to the adjacent residential neighbourhood.

E17.3 Pedestrian Access

E17.3.1 Maintain existing sidewalks/crosswalks within the Site. Reinstate all existing sidewalks impacted by construction to pre-construction condition or better in accordance with these specifications. Ensure all reinstated and new crossing points have detectable warning surfaces, paraplegic ramps and signage to meet the 2015 City of Winnipeg Accessibility Design Standards.

E17.3.2 Provide new sidewalk/crosswalk from the expanded maintenance facility to the proposed new parking lot located to the south on Brandon Avenue. Provide continuous sidewalk within the parking lot to the main destination per 2015 City of Winnipeg Accessibility Design Standards.

E17.3.3 Relocate the existing Active Transportation pathway and access currently located at the west end of Brandon Avenue to the southern and eastern boundary of the proposed new parking lot.

E17.4 Barriers and Fencing

E17.4.1 Materials, details and heights to meet City of Winnipeg Zoning By-law requirements. Encouraged materials wood, concrete, ornamental steel, rock gabions, and chain-link fencing or chain link with privacy strips.

E17.4.2 Secure site on east and south sides of the proposed new parking lot area with fencing or landscaping to minimize access points for pedestrians. See section E16 above for landscape requirements.

E17.4.3 New full site enclosure is not required beyond existing fencing, barriers and gates and otherwise required as part of the project specified herein.

E17.4.4 Naturalized barriers along the south side of the proposed parking lot area are encouraged. See section E16 for landscape requirements.

E17.4.5 Enclose exterior mechanical equipment. Fencing shall be designed to discourage climbing onto Transit garage.

E17.4.6 Automated Vehicle Access Control Gate at west end of Brandon Avenue

(a) An existing automated gate, actuated by vehicle detection on both sides, is currently installed at the westernmost access point from Brandon Avenue. The intent of the gate is to provide a visual deterrent to vehicles that do not have business with either Transit or VIA. It is not intended to secure the Site. In order to develop a contiguous site with the proposed new parking location, the gate must be relocated eastward on Brandon Avenue to the intersection with the public lane which will provide the east boundary of the proposed parking area. The gate shall have the ability to be disabled and operated manually in an emergency situation. The gate shall automatically open in the event of a power failure or other emergency.

(b) In addition to the City, VIA must be satisfied with the design and operation of the gate before construction commences. A contact at VIA rail is as follows:

(i) Kevin Howard - VIA Rail (Wpg Maintenance Supervisor) (204) 924-4718 kevin_howard@viarail.ca.

(c) The gate must have a structural foundation to prevent movement as per E23.17.

(d) It is the responsibility of the City to produce and erect adequate signage for instruction on accessing VIA and the Transit Site at the gate location (and other areas). Construction signage remains the responsibility of the Contractor under this Contract.

E17.5 Civil Infrastructure Design – Appendix M

E17.5.1 Design features in accordance with City of Winnipeg Standard Construction Specifications as noted in E1.2.1 such as, but not limited to:

(a) Gravity sewers

(b) Water services

(c) Manholes and catch basins

(d) Pavement structures

(e) Earthwork; and

(f) Sidewalks

E17.5.2 Pavement structures shall be adequately designed to provide a minimum thirty (30) years of service without major rehabilitation. Major rehabilitation is defined as requiring more than ten percent (10%) of the pavement surface area to be reconstructed due to pavement cracking, rutting, or sub-base failure.

E17.5.3 Concrete pavements shall be plain dowelled concrete pavements, with concrete thickness a minimum of 230 mm.

E17.5.4 Asphalt pavements shall not be permitted for any pavements utilized by buses or heavy service vehicles.

E17.6 Other

E17.6.1 Channelized runoff such as from downspouts from the building shall not be directed across the surface of roadways/sidewalks as this may cause icing in winter. Consider subsurface drainage solutions or trench drains.

E18. FACILITY/BUILDING PROGRAM & ROOM DATA SHEETS

E18.1 Information or data included in the room data sheets is intended to be complementary to the general performance requirements outlined within the various sections of these Specifications.

(a) Where there is no specific information listed in the room data sheet, the general performance requirements of the Specifications shall govern.

(b) Where there is information contained in the room data sheet, these requirements shall be interpreted to be in addition to the general performance requirements. In the event of conflict between the room data sheets and Specifications, the most stringent requirement shall apply.

E18.2 Please note that the space summary below is to serve as a guideline only. It does not remove the responsibility of Proponents to exercise design due diligence in sizing of spaces. Areas described are measured from the inside face of either wall (or screen). Areas do not include allowances for chases or wall widths. Net to gross factor provides for circulation, chases and wall widths.

E18.3 Refer to the Space Function Relationship Diagram in Appendix H. This table is not to be considered as a minimum requirement.

Space Reference Number and Name	Approx. Square Meter.
A-1.1 Typical Service Bay	368
A-1.2 Refurbishing Service Bay	457
A-1.3 Body Repair Bay	1128
A-1.4 Main Drive Aisle	Varies
A-2.1 Weld Shop	1147 (A2.1/2.2/2.3/6.2)

A-2.2 Body Shop	Included in Weld Shop area
A-2.3 Upholstery Shop – Appendix O	Included in Weld Shop area
A-3.1 Welding Stores	418 min.
A-4.1 Prep. Bay	408
A-4.2 Paint Bay	408
A-4.3 Paint Mix	29
A-5.1 Fluid Room	104
A-6.1 UTR & Washrooms	As per code
A-6.2 Offices	Included in Weld Shop area
A-6.3 Mechanical & Electrical Room	To suit
Subtotal	4438 (plus 1.4/6.1/6.3)
Net to Gross Factor 15%	Approximately 902 m²
Total Estimate Interior Space	Approximately 6013 m²

E19. BUILDING GENERAL REQUIREMENTS

E19.1 Building Services Division is responsible for the short and long term maintenance of all City-owned facilities which emphasizes maximum life cycling of equipment. The various building codes are considered to be a minimum guideline. Where feasible, high quality equipment and construction details are most desirable for all design considerations.

E19.2 The City is currently committed to accessing the Manitoba Hydro Power Smart Program for all potential utility savings (electrical, natural gas or water). All equipment specified must be reviewed and approved by Manitoba Hydro in accordance with the policies of the applicable program.

E19.3 Unless otherwise specified within this RFP, the Proponents shall, at a minimum replicate the building materials and systems, including, but not limited to mechanical systems, electrical systems, process systems (i.e. compressed air), equipment and fluid distribution systems of the existing Maintenance Garage.

E19.4 Consideration of ease of maintenance and accessibility for all equipment installed shall be assessed and form part of the review criteria. At least one enclosed stair to access roof equipment shall be provided.

E19.5 Beyond information provided to the Proponents as part of the RFP process, the Proponent shall be required to obtain all necessary certificates including: “Building Location Certificate”, “Occupancy Load Certificate”, “Occupancy Load Card”, and “Surveyor’s Certificate”.

E19.6 Provide specific information on quality control testing to be carried out by the Contractor including concrete, compaction, pile inspection, pressure testing, building envelope, etc.

E19.7 Beyond lifecycle and replacement assessment, vandal resistance, climbing prevention and graffiti control and removal shall be considered for selection of all building components.

E19.8 A Building Commissioning audit shall be performed upon completion of the facility by a professional recognized agency hired and paid for by the Contractor, agency to be approved by the City. Mechanical and electrical Building Systems Commissioning shall be based on the National Environmental Balancing Bureau (NEBB Procedural Standards 2000).

E19.9 Upon completion of project, a new Fire Safety Plan to meet current Fire Department regulations shall be provided and this plan(s) located within facility at all required locations.

E19.10 Awareness of neighborhood context through materials, products, design and massing shall be incorporated where it is practical and economically feasible for all aspects of the Project.

E19.11 Barrier Free Requirements are as per E5.

E20. LEED® SILVER CERTIFICATION PROCESS

E20.1 The City has already registered the Bus Maintenance and Repair Garage Addition project with CaGBC NC, version 2009. Achieve a minimum level of LEED® Silver certification under this program.

E20.2 The Contractor shall lead the Project though the entire process of LEED® certification, including but not limited to documentation, application and submittals, and any credit interpretations and audits. The Contractor shall be solely responsible to collect and remit all required information from all parties.

E20.3 The Contractor is responsible for all costs associated with the certification process.

E20.4 The Contractor must provide independent third party services including, but not limited to, Building Energy Modeling and enhanced commissioning.

E20.5 The Contractor shall submit all documentation required for certification to the Canada Green Building Council (CaGBC) no later than two months after substantial completion.

E20.6 In the event that LEED®-NC Silver Rating is not obtained within 24 months after the Substantial Completion Date, other than as a direct result of any act or omission of the City, the Contractor shall pay to the City liquidated damages in the amount of two hundred fifty thousand dollars ($250,000). The Parties agree that such liquidated damages are not a penalty but represent a genuine and reasonable pre-estimate of the damages that the City will suffer as a result of the happening of the specified event and would be difficult or impossible to quantify upon the happening of the specified event. Such payment shall constitute full and final settlement of any and all damages that may be claimed by the City as a result of a failure by the Contractor to achieve LEED®-NC Silver Rating. The Parties agree that such liquidated damages shall be payable whether or not the City incurs or mitigates its damages, and that the City shall not have any obligation to mitigate any such damages.

E20.7 LEED® commissioning scope of work

E20.7.1 Background

(a) The Contractor's architect shall engage a qualified consultant to conduct building system commissioning for the transit maintenance garage expansion project and will pursue Canadian Green Building Council's Leadership in Energy and Environmental Design (LEED®) Silver designation. Fundamental building system commissioning is a prerequisite for LEED® certification and is required to verify and ensure that building elements and systems are designed, installed and calibrated to operate as intended. In addition, the Transit Maintenance Garage Expansion Project intends to complete enhanced commissioning as outlined in LEED® EA Credit 3, which calls for the entire building to be designed, constructed and calibrated to operate as intended. The commissioning process should be fully engaged during design, in full conformance with LEED® principles.

E20.7.2 Scope of Work

(a) The consultant will be an independent third-party and as Commissioning Authority, will report directly to the architect, but will be responsible for coordinating its activities with the Contractor on the project. 'Independent' means an employee or subcontractor who is disinterested and is employed by a firm that is not the design or construction firm nor a subsidiary of the design or construction firm (even if separately incorporated).

(b) The Commissioning Authority will, but not necessarily is limited to, perform the following:

(i) Ensure that the design objectives and intent are clearly documented.

(ii) Perform a focused review of design development.

(iii) Develop a Commissioning Plan.

(iv) Conduct a scoping meeting, review commissioning processes with the commissioning team members.

(v) Receive submittals of equipment documentation during normal submittals, including detailed start-up procedures.

(vi) Work with the subcontractors in developing start-up plans and start-up documentation formats.

(vii) Provide checkout and performance verification, with pre-functional checklists completed before functional testing.

(viii) Document that the checklists and start-up were completed according to the approved plans, witness start-up of selected equipment.

(ix) Develop specific equipment and system functional performance test procedures and document procedures executed by the subcontractors.

(x) Review the Operation and Maintenance documentation for completeness. Commissioning is to be completed before Substantial Completion; and

(xi) Review, pre-approve and coordinate the training provided by the subcontractors and verify that it was completed. Upon completion of training, status reports are to be submitted to the Contract Administrator.

E20.7.3 Commissioning Authority Responsibilities

(a) The primary role of the Commissioning Authority is to develop and coordinate the execution of a testing plan, observe and document performance to determine whether systems are functioning in accordance with the documented design intent and in accordance with the Contract Documents. The Contractor will provide all tools or the use of tools to start, check out and functionally test equipment and systems, except for specified testing with portable data-loggers, which shall be supplied and installed by the Commissioning Authority.

(b) The Commissioning Authority is not responsible for design concepts, design criteria, compliance with codes, design or general construction scheduling, cost estimating, or construction management. The Commissioning Authority may assist with problem solving or resolving non-conformance items or deficiencies, but ultimately that responsibility resides with the Contractor.

E20.7.4 Programming and Design Development Phase

(a) LEED® states that, “The Commissioning Authority must conduct, at a minimum, 1 commissioning design review of the City’s project requirements basis of design, and Contractors design documents prior to mid-construction documents phase and back-check the review comments in the subsequent design submission.”

(b) The Commissioning Authority shall review the design, prior to the construction documents phase, to ensure that each commissioned feature or system meets the design intent relative to functionality, energy performance, water performance, maintainability, sustainability, system cost, indoor environmental quality and local environmental impacts. Evidence of this design review must be fully documented in a written report.

(c) Detailed tasks are to include:

(i) Coordinate the commissioning work during design.

(ii) Develop a design-phase commissioning plan.

(iii) Perform a focused design review at the end of Design Development; and

(iv) Assist Contractor in developing their portions of the design intent and approve their submissions.

E20.7.5 Construction Document Phase

(a) The Commissioning Authority shall review the construction documents to ensure that commissioning is adequately specified, that each commissioned feature or system can be commissioned and meets the design intent relative to functionality, energy performance, water performance, maintainability, sustainability, system cost, indoor environmental quality and local environmental impacts. Evidence of this design review must be fully documented in a written report.

(b) Detailed tasks are to include:

(i) Coordinate the commissioning work during this phase.

(c) Perform a focused review of the drawings and specifications (hard copy and electronic format) at the 33%, 66%, and 90% working drawing stages, or other design review milestones approved by the City and Contract Administrator. Allow approximately seven to ten (7 to 15) business days for review.

(d)

(i) Assist, review and approve the development of the design intent and operating parameters documentation by all Contractor team members.

(ii) Develop a draft-commissioning plan for the construction phase of the project.

(iii) Develop full commissioning specifications for all commissioned equipment. The commissioning specification will include a detailed description of the responsibilities of all parties included in the commissioning process; details of the commissioning process; reporting and documentation requirements, including formats; deficiency resolution; pre-functional checklist and start-up requirements; the functional testing process; specific functional test requirements, including testing conditions and acceptance criteria for each piece of equipment being commissioned.

(iv) Have the commissioning specifications approved by the Contract Administrator and included in the construction specifications.

(e) The Commissioning Plan is to be created during the design phase and is to include the following:

(i) An overview of the commissioning process.

(ii) A list of all commissioned features and systems.

(iii) Identification of primary commissioning participants and their responsibilities.

(iv) A description of the management, communication and reporting of the plan.

(v) An outline of the commissioning process scope, including submittal review, inspection, start-up, testing, training, Operation and Maintenance documentation and warranty period activities; and

(vi) A list of the expected written work products, an activity schedule, and a description of the rigor and scope of testing.

E20.7.6 Construction and Acceptance Phases

(a) The following shall be completed on each commissioned component, equipment, system or feature:

(i) Focused Review of Submittals: The Contractor standard submittals of commissioned features and systems shall receive documented review by the Commissioning Authority to ensure that the feature being provided will meet the specifications and design intent, particularly as it relates to the environmentally responsive characteristics.

(ii) Installation Inspections: The Commissioning Authority shall inspect the commissioned features and systems during installation to ensure that they are properly installed according to the contract documents and manufacturer's instructions, and other building systems or components are not compromising the efficacy of the feature.

(iii) Start-up and Checkout: The Contractor completes the start-up and initial checkout of all items listed in the contract documents. The start-up and checkout results must be clearly documented according to the manufacturer's written instruction and the Contractor documents.

(iv) Sampling: The Commissioning Authority is to apply appropriate sampling techniques to verify that start-up and initial checkout of all commissioned equipment is successfully completed. The Commissioning Authority must be reasonably sure based on these sampling techniques that the control system has successfully passed a complete point-to-point checkout and that each

control point is commanding, reporting and controlling according to the intended purpose. The Commissioning Authority must use appropriate sampling techniques to be reasonably sure that all sensors have been calibrated to ensure that the reported value in the control system represents the actual local value. The Commissioning Authority must become reasonably sure using appropriate sampling techniques that all actuators have been adjusted to fully close and open dampers and valves, and that reported values in the control system are correct by verifying through visual observation.

(v) Functional Testing: Written, repeatable test procedures, prepared specifically for each project, must be used to functionally test components and systems. These tests must be documented to clearly describe the individual systematic test procedures, the expected system response or acceptance criteria for each procedure, the actual response or findings, and any pertinent discussion. After the initial checkout has been approved by the Commissioning Authority, the following modes shall be tested by the Contractor:

(vi) Operation and Maintenance Manuals: The Commissioning Authority must review the Operation and Maintenance manuals for all commissioned features and systems for completeness and applicability. The Operation and Maintenance data shall be bound in labeled binders liberally divided with tabs to provide efficient access. Manuals will include: name, address and telephone number of the manufacturer or vendor and installing subcontractor, submittal data, operations, and maintenance instructions with the model and features for this site clearly marked. The manual should only include data for equipment that is actually installed.

- Test each sequence in the sequence of operations and other significant modes. Sequences and control strategies include start-up, shutdown, unoccupied and manual modes, modulation up and down the unit's range of capacity, power failure, alarms, component (unit and pump) staging and backup upon failure, interlocks with other equipment, and sensor and actuator calibrations.
- Test all larger equipment individually. Similar units that are numerous (e.g. many smaller rooftop packaged units, air terminal units, and exhaust fans) may require a specific sampling strategy. Heating equipment must be tested during the winter and air conditioning equipment must be tested during the summer, as appropriate to demonstrate performance under near-design conditions; and

(vii) Training: The Commissioning Authority shall assemble written verifications that training was conducted for all commissioned features and systems. The training shall be performed by qualified individuals for a sufficient duration to ensure that facility staff has all the information they need to optimally operate, maintain and replace the feature or system.

E20.7.7 Commissioning Report

(a) A commissioning report must be presented to the Contract Administrator after all but seasonally deferred functional testing is complete. The report shall include a list of each commissioned feature or system, and the disposition of the commissioning authority regarding the feature or system's compliance with the contract documents.

(b) Required components of the Commissioning Report are as follows:

(i) Meeting design intent

(ii) Meeting specifications

(iii) Ensuring proper installation

(iv) Functional performance and efficiency

(v) Operation and Maintenance documentation; and

(vi) Operator training.

(c) A written list of all outstanding commissioning issues and any testing that is scheduled for a later date, justified by seasonal conditions shall be included. A list of any compromises in the environmentally responsive features shall be provided. All outstanding environmentally responsive feature deficiencies shall have been corrected or listed in the commissioning report. All completed functional tests should be listed in an Appendix to the Commissioning Report.

E20.7.8 Detailed Tasks

(a) Detailed task requirements of the Commissioning Authority are outlined as follows:

(i) Coordinate and direct the commissioning activities in a logical, sequential and efficient manner using consistent protocols and forms, centralized documentation, clear and regular communications and consultations with all necessary parties, frequently updated timelines and schedules and technical expertise.

(ii) Coordinate the commissioning work and, with the Contractor, ensure that commissioning activities are being scheduled into the master schedule.

(iii) Revise, as necessary, the current draft of the construction phase commissioning plan developed during design.

(iv) Plan and conduct a commissioning scoping meeting.

(v) Request and review additional information required to perform commissioning tasks, including Operation and Maintenance materials, subcontractor start-up and checkout procedures.

(vi) Before start-up, gather and review the current control sequences and interlocks and work with subcontractors and design engineers until sufficient clarity has been obtained, in writing, to be able to write detailed testing procedures.

(vii) Review and approve normal Contractor submittals applicable to systems being commissioned for compliance with commissioning needs, concurrent with the architectural and engineering reviews.

(viii) Write and distribute pre-functional tests and checklists.

(ix) Develop an enhanced start-up and initial systems checkout plan with subcontractors.

(x) Perform site visits, as necessary, to observe component and system installations. Attend selected planning and jobsite meetings to obtain information on construction progress. Review construction-meeting minutes for revisions/substitutions relating to the commissioning process. Assist in resolving any discrepancies.

(xi) Witness all or part of the HVAC piping test and flushing procedure, sufficient to be confident that proper procedures were followed. Document this testing and include documentation in Operation and Maintenance manuals. Notify the Contract Administrator of any deficiencies in results or procedures.

(xii) Witness all or part of any ductwork testing and cleaning procedures, sufficient to be confident that proper procedures were followed. Document this testing and include documentation in Operation and Maintenance manuals. Notify Contract Administrator of any deficiencies in results or procedures.

(xiii) Approve pre-functional tests and checklist completion by reviewing pre-functional checklist reports or by direct site observation.

(xiv) Approve system start-up by reviewing start-up reports and by selected site observation.

(xv) Review testing, adjusting and balancing (TAB) execution plan.

(xvi) Oversee sufficient functional testing of the control system and approve it to be used for TAB, before TAB is executed.

(xvii) Approve air and water systems balancing by spot testing and by reviewing completed reports and by selected site observation.

(xviii) With necessary assistance and view from installing subcontractors, write the functional performance test procedures for equipment and systems. This may

include energy management control system trending, stand-alone data-logger monitoring or manual functional testing. Submit to Contractor for review, and approval, if required.

(xix) Analyze any functional performance trend logs and monitoring data to verify performance.

(xx) Coordinate, witness and approve manual functional performance tests performed by installing subcontractors. Coordinate retesting as necessary until satisfactory performance is achieved.

(xxi) Maintain a master deficiency and resolution log and a separate testing record. Provide the Contractor and Contract Administrator with written progress reports and test results with recommended actions.

(xxii) Review equipment warranties to ensure that the City's responsibilities are clearly defined.

(xxiii) Compile and maintain a commissioning record and building systems book(s).

(xxiv) Review and approve the preparation of the Operation and Maintenance manuals; and

(xxv) Provide a final commissioning report as per E20.7.7. Recommendations for improvement to equipment or operations, future actions, commissioning process changes, etc. shall also be listed. Each non-compliance issue shall be referenced to the specific functional test, inspection, trend log, etc. where the deficiency is documented. The functional performance and efficiency section for each piece of equipment shall include a brief description of the verifications method used (manual testing, BAS trend logs, data loggers, etc.) and include observations and conclusions from the testing. Appendices shall contain acquired sequence documentation, logs, meeting minutes, progress reports, deficiency lists, site visit reports, findings, unresolved issues, communications, etc. Pre-functional checklists and functional tests (along with blanks for the operators) and monitoring data and analysis will be provided in a separate labeled binder.

E20.7.9 Recommissioning Management Manual

(a) In addition to the standard Commissioning Report, the Commissioning Authority must develop an indexed Recommissioning Management Manual to be delivered to the Contract Administrator with the Commissioning Report. Some parts may also be in the standard Operation and Maintenance manuals provided by the Contractor.

(b) Required components of the Recommissioning Management Manual are as follows:

(i) Final version of the owner's requirements and design basis narratives, including brief descriptions of each system.

(ii) As-built sequences of operation for all equipment; control drawings.

(iii) A list of time of day schedules and a schedule frequency to review them for relevance and efficiency.

(iv) A description and rationale for all energy and water saving features and strategies with operating instructions and caveats about their function and maintenance relative to energy use.

(v) Guidelines for establishing and tracking benchmarks for whole building energy use and equipment efficiencies of cooling, heating and service hot water equipment.

(vi) Seasonal start-up and shutdown, manual and restart operation procedures, recommendations regarding seasonal operational issues that affect energy use.

(vii) Recommendations for recalibration frequency of sensors and actuators by type and use.

(viii) A list of all user adjustable setpoints and reset schedules with a brief discussion of the purpose of each and the range of reasonable adjustments with energy implications.

(ix) Plans for continuous commissioning or recommended frequency for recommissioning, by equipment type with reference to tests conducted during initial commissioning.

(x) Include a schedule frequency to review the various setpoints and reset schedules to ensure they are at current relevant and efficient values.

(xi) Guidelines for energy accounting including assurance that future renovations and equipment upgrades will not result in decreased energy efficiency and maintaining the City's requirements.

(xii) Lists of diagnostic tools with use descriptions to assist facility staff; and

(xiii) A copy of the Commissioning Report.

E20.7.10 Near-Warranty end of Post-Occupancy Review

(a) Required tasks for the Commissioning Authority to complete Near-Warranty End or Post-Occupancy Review shall include the following:

(i) Coordinate and supervise required seasonal or deferred testing and deficiency corrections and provide the final testing documentation for the commissioning record and Operation and Maintenance manuals.

(ii) Return to the site at 10 months into the 12-month warranty period and review with facility staff the current building operation and the condition of outstanding issues related to the original and seasonal commissioning.

(iii) Interview facility staff and identify problems or concerns they have with operating the building as originally intended.

(iv) Make suggestions for improvements record these changes in the Operation and Maintenance and Recommissioning manuals.

(v) Identify areas that may come under warranty or under the original construction contract; and

(vi) Assist facility staff in developing reports and documents and requests for services to remedy outstanding problems.

E20.7.11 Systems to be Commissioned

(a) The following systems, including all components and controls, will be commissioned:

(i) Central building automation systems, including linkages to remote monitoring and control sites (this excludes any security-related control systems or interlocks).

(ii) All equipment of the heating, ventilating and air conditioning systems; and

(iii) Lighting control systems.

E20.7.12 Required Qualifications

(a) It is the City's desire for the firm designated as the site commissioning authority to satisfy as many of the following requirements as possible:

(i) Acted as the principal commissioning authority for at least three (3) projects over 5000 square metres. Experience related to the specific project type (office, health care, residential, etc.), experience is preferred.

(ii) Acted as the principal commissioning authority for at least two (2) LEED® Certified Projects.

(iii) Extensive experience in the operation and troubleshooting of HVAC systems, energy management control systems, and security systems.

(iv) Extensive field experience is required. A minimum of five (5) full years in this type of work is required.

(v) Knowledgeable in building operation and maintenance and Operation and Maintenance training.

(vi) Knowledgeable in test and balance of both air and water systems.

(vii) Experienced in energy-efficient equipment design and control strategy optimization.

(viii) Direct experience in monitoring and analyzing system operation using energy management control system trending and stand-alone data logging equipment.

(ix) Excellent verbal and writing communications skills. Highly organized and able to work with both management and trade subcontractors.

(x) Experienced in writing commissioning specifications.

(xi) A bachelor's degree in Mechanical Engineering is strongly preferred, and P.Eng. certification is desired, however, other technical training, past commissioning, and field experience will be considered a plus.

(xii) Membership of the Building Commissioning Association will be considered a plus; and

(b) The evaluation of the selected firm(s) will be based on the required expertise of the prime firm submitting proposals. A member of that firm will be the designated commissioning Authority. The Commissioning Authority must be fully qualified to commission most of the above listed systems. If the Commissioning Authority or prime firm does not have sufficient skills to commission a specific system, the prime firm shall subcontract with a qualified party to do so. That party's qualifications shall be included and clearly designated in the response to this RFP.

E20.7.13 The Commissioning Plan shall be based on the version of the rating system in effect at the time of the application of the project for LEED® certification.

E20.8 LEED® requirements and procedures:

E20.8.1 Definitions

(a) LEED®: Leadership in Energy & Environmental Design is a voluntary, consensus-based, and market-responsive set of criteria that evaluate a project's environmental performance from a whole-building perspective.

(b) Canada Green Building Council (CaGBC): A balanced, consensus based not-for-profit organization whose mission is to lead and accelerate the transformation to high-performing, healthy green buildings, homes and communities throughout Canada.

(c) Prerequisite: Defines the minimum requirement in a particular LEED® category. Meeting the requirements of a prerequisite does not contribute points to a project's score however all perquisite requirements must be met for a project to be eligible to receive LEED® Canada certification.

(d) Credit: The fundamental LEED® criteria that describe practices deemed to reduce the project's environmental, health and resource impacts. Each credit in the LEED® rating system has a defined number of possible points that may be awarded upon successful review of submittal documents demonstrating the credits' requirements were followed.

(e) Recycled Content: The total percentage by mass (Post-Consumer + 0.5 Post Industrial) of recycled material that have been recovered or otherwise diverted from the solid waste stream, either after the manufacturing process (post-industrial) or after consumer use (post-consumer). In-house process recycled content will not be included.

(f) Post-Consumer Recycled Content: The percentage by mass of recycled material derived from previously used consumer products (i.e. aluminum and steel cans, glass and plastic bottles, asphalt from demolished sites, paper, carpet etc.)

(g) Post-Industrial Recycled Content: The percentage by mass of recycled material derived from outside industrial sources (i.e. sawmill dust used in MDF board, blast furnace slag in mineral wool insulation, coal fly ash in concrete mixes etc.)

(h) In-House Process Recycled Content: The percentage by mass of in-house material (i.e. trimmings, cutoffs, and scrap) that is returned to the production process as a part of internal housekeeping.

(i) Regional Materials: Materials and products that have been extracted, harvested, recovered and processed within a radius of 800 km or 2,400 km if shipped by rail or water, of the project site.

(j) Manufacturing Location: The last point of processing or assembly (i.e. a sawmill that turns harvested trees into framing lumber which is then used on-site)

(k) Extraction Location: The point(s) of origin for ≥ 80% (by mass) of the material inputs that are transported to Manufacturing Location to create the product (i.e. if 80% of the mass of a concrete batch is aggregate, the extraction location for the concrete is the gravel pit where the aggregate was obtained).

(l) Volatile Organic Compounds (VOCs): Organic chemicals that produce vapors readily at room temperature and normal atmospheric pressure (e.g. gasoline, solvents, etc.). VOCs react with sunlight and nitrogen to form ground-level ozone, a chemical that has detrimental effect on human health, agricultural crops, forests, soil, groundwater and ecosystems.

(m) Carpet and Rug Institute (CRI) Green Label: A program established by the national trade association representing the carpet and rug industry to identify carpet products that have been tested by an independent laboratory and have met the criteria for low VOC emissions.

(n) Urea-Formaldehyde (UF): A combination of urea and formaldehyde the readily decomposes at room temperature. It is found in some glues/resins used to manufacture furniture, composite woods (e.g. particle board), agrifiber products and laminated assemblies. UF has detrimental effect on human health and may include symptoms such as eye, nose, and throat irritation, wheezing and coughing, fatigue, skin rash and severe allergic reaction.

(o) Agrifiber: Recovered agricultural waste fiber, from sources including but not limited to cereal straw, sugarcane bagasse, sunflower husk, walnut shells, coconut husks and agricultural prunings, that are processed and mixed with resins to produce products with characteristics similar to those derived from wood fiber.

(p) Weatherproofing System: A system which protects the building from the exterior environment (wind and water) and is defined as the air barrier within the wall and roof assemblies.

(q) LEED® Divisions: Divisions 2 through 10 (and 12 as directed by the Consultant).

(r) LEED® Total Construction Cost: Cost associated with the LEED® Divisions.

(s) LEED® Total Materials Cost: Actual materials cost (excluding labor and equipment) from the divisions included for calculating the LEED® Total Construction Cost. Project teams can apply a 45% factor to the LEED® Total Construction Cost (including labor and equipment) to establish a LEED® Total Materials Cost; and

(t) Supplementary Cementitious Materials (SCMs): Materials such as fly ash, ground granulated blast furnace slag, and silica fume) used to reduce the amount of Portland Cement in cementitious materials.

E20.8.2 Acronyms

(a) Used in the LEED® Canada-NC Reference Guide for Green Building Design and Construction 2009 and this Section.

ACRONYMS	
SS	Sustainable Sites
WE	Water Efficiency
EA	Energy and Atmosphere
MR	Materials and Resources
EQ	Environmental Quality

ID	Innovative in Design
RP	Regional Priority

E20.8.3 References

(a) Canada Green Building Council: LEED® Canada-NC Reference Guide for Green Building Design and Construction 2009 http://www.cagbc.org

(b) South Coast Air Quality Management District (SCAQMD) Amendment to South Coast Rule 1168, VOC Limits, effective January 7, 2005: South Coast Air Quality Management District http://www.aqmd.gov/rules/reg/reg11/r1168.pdf

(c) Green Seal Standard 36 (GS–36), effective October 19, 2000 http://www.greenseal.org/certification/standards/commercial_adhesives_GS_36.cfm

(d) Green Seal Standard GS–11: Paints http://www.greenseal.org/certification/standards/paints_GS_11.pdf

(e) Green Seal Standard GC–03: Anti-Corrosive Paints http://www.greenseal.org/certification/standards/anti-corrosivepaints.pdf

(f) South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings http://www.aqmd.gov/rules/reg/reg11/r1113.pdf

(g) FloorScore™ Program: Resilient Floor Covering Institute http://rfci.com/index.php?option=com_content&view=article&id=80&Itemid=79

E20.8.4 Objectives

(a) Construct a building that uses land, water, energy and material resources appropriately and efficiently and provides a safe, comfortable and productive indoor environment for building occupants in accordance with LEED® requirements.

(b) To achieve Silver certification under the LEED® Canada-NC Green Building Rating System 2009 meeting the requirements of the LEED® prerequisites and sufficient credits:

(c) No single manufacturer, fabricator, or subcontractor can fulfill the total requirements for LEED® certification for the project. LEED® certification requires the cooperation and diligence of all project participants for a successful application and acceptance for LEED® certification.

(d) Failure to provide products or methods of construction contributing towards LEED® prerequisites will result in the City achieving a Certification less than that specified or none at all. The City reserves the right to seek liquidated damages where failure to achieve Certification is a result of direct neglect or misrepresentation of any material or construction method. E20.6; and

(e) Source and select materials that materials that meet sustainable criteria detailed herein.

E20.8.5 Description of Work

(a) A LEED® Champion (site superintendent or other individual designated by the Contractor) shall be responsible for coordinating all construction activities associated with LEED® certification.

(b) LEED® coordination activities shall include

(i) Coordinating with subcontractors and ensuring the successful implementation of LEED® strategies, programs and plans

(ii) Reporting construction activity progress to the Contract Administrator as it relates to the LEED® aspects of the Project

(iii) Supplying the LEED® documentation and submittals outlined within this specification and related sections to the Contract Administrator to demonstrate that LEED® requirements have been met; and

(iv) Other duties as detailed in the related Sections listed.

(c) The LEED® requirements in this section and the related sections shall apply to all Sections and Work for this Project, whether specifically indicated or not; and

(d) Compliance with requirements needed to obtain LEED® prerequisites and credits will be used as one criterion to evaluate requests for substitutions or alternates.

E20.8.6 LEED® Kick-Off Meeting

(a) Prior to mobilization on-site, the Contractor and the LEED® Champion shall hold a kick-off meeting with the Contract Administrator to review the LEED® requirements. This meeting shall include a review of:

(i) LEED® certification and performance objectives;

(ii) LEED® requirements and procedures; and

(iii) LEED® documentation and submittals.

E20.8.7 LEED® COORDINATION MEETING

(a) Prior to start of construction, the Contractor and the LEED® Champion shall hold a coordination meeting with the construction team to explain the LEED® requirements to the subcontractors. This meeting shall include a review of:

(i) LEED® certification and performance objectives;

(ii) LEED® requirements and procedures; and

(iii) LEED® documentation and submittals.

(b) The Contractor shall ensure that the appropriate subcontractors attend this meeting. If subcontractors are unable to attend this meeting, the Contractor shall make arrangements to host additional LEED® Coordination Meetings to suit.

E20.8.8 Submittals

(a) Provide a LEED® Action Plan a minimum of 14 days prior to construction to the Contract Administrator, a preliminary plan outlining the contribution of each trade to credits MR 4, MR 5 and EQ 4 if pursued.

(i) The plan shall be based on projected materials and budgets

(ii) The plan shall include the following:

i. Temporary Erosion and Sediment Control Plan as required in Section 31 25 00.

ii. Construction Waste Management and Disposal Plan as required in Section 01 74 19; and

iii. Indoor Air Quality Management Plan as required in Section 01 81 19.

(b) Provide a LEED® Progress Report to the Contract Administrator at the end of each month that includes the following items:

(i) Photographs specified in the sections 31 25 00 and 01 81 19. All photos taken for LEED® documentation purposes shall conform to the following requirements:

i. Date Stamp: Standard indicating Year, Month and Day; and

ii. Provide a brief description (a sentence(s) or points) for each photo identifying how LEED® requirements are met.

(ii) Temporary Erosion and Sediment Control inspection logs/reports as required in Section 31 25 00, conducted on a weekly basis or as directed by the Contract Administrator.

(iii) Construction Waste Diversion report as required in Section 01 74 19, including the respective Disposal Tickets indicating weight or volume of materials removed from the site.

(iv) Indoor Air Quality inspection logs/reports as required in Section 01 81 19, conducted on a bi-weekly basis or as directed by the Contract Administrator; and

(v) Ongoing completion of LEED® Letter Templates provided by the Consultant for credits MR 4, MR 5 and EQ 4.

(c) Submit **Schedule S1 – Material Information Data Sheet** and collect supporting documentation (letters from suppliers, MSDSs, product literatures etc.) for all products / materials listed in this Section and requested by the Contract Administrator.

(i) Submit completed schedules and supporting product literature to the Contract Administrator for review at least fourteen (14) days prior to ordering.

(d) Submit the LEED® Canada for New Construction and Major Renovations 2009's *Calculator for Recycled Content Value of Cementitious Materials for Portland Cement Reduction* provided by the Consultant, by listing all concrete mix designs as well as indicating concrete strengths after twenty-eight (28) days, amount of Portland cement used, whether the mix is air entrained, and concrete costs.

(i) Submit completed schedules to the Contract Administrator for all concrete mix designs after the Structural Engineer has approved the designs, and prior to delivery of any concrete to the site; and/or

(ii) A letter signed by the concrete supplier / manufacturer will be accepted that states the total reduction in Portland cement for all concrete used on the project in lieu of submitting Schedule S2 if the documentation is produced in accordance with The Ready Mix Concrete Association Manitoba Technical Bulletin T-030.

(e) The Contractor shall provide vendor invoices for all wood-based products (FSC certified or not) purchased by the Contractor and subcontractor.

(i) Each vendor invoice must include the following with the exceptions under 1.9.5.2:

i. Each wood product must be identified on a line-item basis.
ii. FSC products must be identified as such on a line-item basis.
iii. The dollar value of each line item must be shown; and
iv. The vendor's COC certificate number must be shown on any invoice that includes FSC products.

(ii) In rare instances, it may not be practical for a vendor to invoice wood products on a line-item basis because the invoice would be dozen of pages long. In such cases, the invoice should indicate the aggregate value of wood products sold by the vendor. This compliance path must be approved by the Contract Administrator. If the wood products are FSC certified, comply with the following requirements.

i. The vendor's COC number must be shown on the invoice.
ii. The invoice must be supplemented by a letter from the vendor stating that the products invoiced are FSC certified; and
iii. The invoice or the letter must state whether the products are FSC pure, FSC Mixed Credit or FSC Mixed (NN)%.

(f) The Contractor will complete all LEED® Letter Templates required to document the successful completion of the prerequisites and credits listed under paragraph 1.4.2.

E21. ARCHITECTURAL

E21.1 Administration of Submittals

E21.1.1 Submit to the Contract Administrator submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of contract time and no claim for extension by reason of such default will be allowed.

E21.1.2 Work affected by submittal shall not proceed until review is complete.

E21.1.3 Present shop drawings, product data, samples and mock-ups in metric units.

E21.1.4 Where items or information is not manufactured or produced in metric units, converted values within the measurement tolerances are acceptable.

E21.1.5 Review submittals prior to submission to Contract Administrator. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents.

E21.1.6 Submittals not stamped, signed, dated, identified as to specific project, and attesting to their being reviewed will be returned without being examined and shall be considered rejected.

E21.1.7 Notify Contract Administrator, in writing at time of submission, identifying deviations from requirements of Contract Documents and stating reasons for deviations.

E21.1.8 Verify field measurements and coordinate affected adjacent Work to suit.

E21.1.9 Contractor's responsibility for errors and omissions in submission is not relieved by Contract Administrator’s review of submittals.

E21.1.10 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Contract Administrator’s review.

E21.1.11 Keep one reviewed copy of each submission on site.

E21.1.12 Provide a schedule for Contract Administrator’s review of all shop drawings, product data and samples to be submitted for review by Contract Administrator. Submit this schedule at project start-up.

E21.2 Request for Information (RFI)

E21.2.1 Submit each RFI on a form acceptable to the Contract Administrator.

E21.2.2 RFI form content to include:

(a) Project name
(b) Project number
(c) RFI number
(d) RFI title
(e) Date of RFI
(f) Date response is required
(g) Reference to applicable specification or drawing number
(h) Discipline affected
(i) Priority
(j) Submitted by (name, company, phone number)
(k) Submitted to (name, company, phone number)
(l) Copies to
(m) Design-Builder sign-off
(n) Cost impact (yes / no; dollar amount)
(o) Schedule impact (yes / no; number of days, dollar amount)
(p) Information requested
(q) Requested by
(r) Response
(s) Answered by (name, company) ; and
(t) Date answered

E21.2.3 RFI’s are to be accompanied by a proposed solution where applicable.

E21.2.4 RFI’s to be submitted electronically in PDF format.

E21.2.5 For each RFI review, allow ten (10) Business Days.

E21.3 Shop Drawing and Product Data

E21.3.1 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

E21.3.2 Allow ten (10) Business Days for Contract Administrator's review of each submission.

E21.3.3 Adjustments made on shop drawings by Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Contract Administrator prior to proceeding with Work.

E21.3.4 Make changes in shop drawings as Contract Administrator may require, consistent with Contract Documents. When resubmitting, notify Contract Administrator in writing of any revisions other than those requested.

E21.3.5 Accompany submissions with transmittal letter, containing:

(a) Date.

(b) Project title and number.

(c) Contractor's name and address.

(d) Identification and quantity of each shop drawing, product data and sample.

(e) Other pertinent data.

(f) Submissions shall include:

(i) Date and revision dates.

(ii) Project title and number.

(iii) Name and address of:

i. Subcontractor.
ii. Supplier.
iii. Manufacturer.

(iv) Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents; and

(v) Details of appropriate portions of Work as applicable including, but not limited to:

i. Fabrication.
ii. Layout, showing dimensions, including identified field dimensions, and clearances.
iii. Setting or erection details.
iv. Capacities.
v. Performance characteristics.
vi. Standards.
vii. Operating weight.
viii. Wiring diagrams.
ix. Single line and schematic diagrams.
x. Relationship to other parts of the Work.

E21.3.6 After Contract Administrator's review, distribute copies.

E21.3.7 Submit four (4) prints of shop drawings larger than 11" x 17" and two prints for drawings 11" x 17" or smaller for each requirement requested in specification Sections and as Contract Administrator may reasonably request.

E21.3.8 Electronic submittals shall be permitted on agreement with Contract Administrator and City.

E21.3.9 Supplement standard information to provide details applicable to project.

E21.3.10 If upon review by Contract Administrator, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and re-submission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

E21.4 Samples

E21.4.1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.

E21.4.2 Deliver samples prepaid to Contract Administrator's business address.

E21.4.3 Notify Contract Administrator in writing, at time of submission of deviations in samples from requirements of Contract Documents.

E21.4.4 Where colour, pattern or texture is criterion, submit full range of samples.

E21.4.5 Adjustments made on samples by Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Contract Administrator prior to proceeding with Work.

E21.4.6 Make changes in samples which Contract Administrator may require, consistent with Contract Documents.

E21.4.7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

E21.5 Construction of the new facility shall be coordinated in order to not interfere with normal operations of the existing Site operations to the north, east and west.

E21.6 New contemporary standards of energy efficiency (LEED®) and facility security must be incorporated.

E21.7 Non-climbable Structure (minimize areas of building that can be climbed).

E21.8 Min. finished ceiling heights – interior 2700 mm.

E21.9 Min. exterior height of building – 3600 mm (to reduce vandalism and climbing) unless otherwise required for structural needs.

E21.10 Sump pit to be complete with high level alarm (PIL alarm switch). Ensure adequate numbers of sump pits and minimize long lengths of weeping tile.

E21.11 All exterior windows shall be commercial grade aluminum or fiberglass complete with thermally broken frames.

E21.12 Optimize natural light with high level perimeter windows. No skylights.

E21.13 Steel door & frames shall be heavy-duty grade, minimum 14 gauge welded seams for frames, 16 gauge welded seams for doors (mechanical seams not acceptable).

E21.14 Allow for two garage overhead doors to be overhead, high speed rubber doors that will be used very frequently to accommodate heavy bus traffic on a daily basis. Doors to be TNR Industrial Doors; model HDC – Heavy Duty High Cycle Doors; Springless Design. Other alternatives may be considered provided they meet the minimum specification. See operation requirements as per E21.15.

E21.15 Garage Overhead Doors shall be as Osborne Storage Garage to retain maintenance continuity. Service Door Industries Model HPSD-3.

E21.16 Design a solution to best limit the infiltration of cold air, to protect individuals that work in nearby bays. Air Curtains have not been successful.

E21.17 Covers & Lids for grit interceptors and/or sump pump lids are to either be protected from traffic or a transit grade that will not be damaged.

E21.18 Provide Insulated Hollow Metal (IHM) doors at exterior emergency exits spaced as required by the Authority Having Jurisdiction (AHJ). Painted emergency access aisle to lead to these exit doors.

E21.19 "Best Lock" Exterior, "Schlage" locks Interior, all equipment and fencing that require padlocks shall incorporate the use of "Master Lock" model 3KA. Avoid use of maglocks if at all possible use electric strikes.

E21.20 The keying system for the facility shall be standardized for use of master and sub-master keys for appropriate personnel usage. All keying to match Transit's existing MP35A system.

E21.21 Where drywall panels are specified for high traffic areas, corridors or wall surfaces that are subjected to vandalism. Abuse-resistant VHI Abuse Resistant drywall panel shall be used with a minimum thickness of 19 mm.

E21.22 Concrete masonry unit walls to be 190 mm wide reinforced – grouted with re-bar every second core minimum.

E21.23 Toilet partitions shall be solid core phenolic. Approved manufacturers: Comtec series S200, Capitol Partitions Poly-Pro P3 - Congress Basic, Santana Poly-Mar HD or equal.

E21.24 Sheet Vinyl flooring shall be Tarkett brand, rolled flooring, mechanically seam sealed complete with integrated 102 mm base. Where used in wet areas, flooring shall be slip resistant.

E21.25 All concrete floors shall be sealed.

E21.26 Ceilings in wet areas shall be painted with moisture and mildew resistant paint.

E21.27 Exposed ceilings shall have acoustic treatment as define in the room data sheets.

E21.28 Millwork shall be plastic laminate on 16mm inch plywood substrate. Melamine is not permitted

E21.29 In washrooms, provide collapsible clothes hooks.

E21.30 Contractor to provide 10% inventory of replacement parts and materials for all interior and exterior finishes and door hardware as applicable. Items to be turned over to the City upon Substantial Completion.

E21.31 Provide appropriate sized access doors for servicing of mechanical components.

E21.32 Ensure 50mm curbing or ramping is implemented between occupancies to address adjacencies with Garage Classification as per the Electrical Code. Refer to E5.1.

E21.33 The Typical Bus Service Bays section contains key spatial requirements as follows:

(a) Bus envelope sizes for design purposes:
    (i) A nominal 12-metre (40 feet) bus with bike rack, mirrors and roof mounted Air Conditioning is 12.8m L x 3m W x 3.4m H.
    (ii) A nominal 19-metre (60 feet) articulated bus with bike rack, mirrors and roof mounted Air Conditioning is 19.4m L x 3m W x 3.4m H.
    (iii) Also see Appendix F for design purposes.

(b) Height clearances at ceiling: Bus storage area – see room data sheets Appendix H.

(c) Door height to match existing doors.

(d) Emergency crosswalks – 1.5 meters wide.

(e) Clearance (non-crosswalk) between the front and rear of buses in the storage area – as per room data sheets and varies depending on the type of Service Bay.

(f) Width of buses – See Appendix F.

(g) Length clearances must accommodate the 12.8 meters conventional buses, and the 19.4 meter articulated buses in all bays and areas.

(h) All corridor turns, whether in the repair, the service, or the exterior areas must accommodate the 12.8 m conventional buses, and 19.4 m articulated buses without reversing.

(i) The Welding Stores room should have an overhead door and proper road access to the loading area from the outside for deliveries with a docking capability to unload from trucks; and

(j) Provide bus wash curtain c/w tracks to perimeter of one 19 m bus bay as chosen by the City. Design for support of curtain and track by structural engineer.

E21.34 Acoustical ceilings to be square lay-in tiles in Office areas. NRC of .075 and CAC of 35.

E21.35 Interior doors to be Hollow Metal Doors 18 ga. Frames and Borrowed Lites 16 ga. and Hardware to meet code.

E21.36 Glazing to be 6 mm clear float tempered glass in any unrated interior glass openings.

E21.37 Interior Office Fit-up

(a) CONFIDENTIAL – Refer to same clause number in Confidential Specifications.

(b) CONFIDENTIAL – Refer to same clause number in Confidential Specifications.

E21.37.1 Exterior Walls.

(c) Infill at the Loading dock door is not permitted, even if abandoned in layout.

E21.37.2 Doors and Windows.

(a) All hollow metal doors and frames constructed to ULC requirements; 18 ga. HM doors and 16 ga. pressed steel welded frames; Hardware to meet all applicable code requirements; The City to advise on security requirements; typical sizes: 915mm, 1067 mm, and 1220 mm — refer to Room Data Sheets Appendix I; Double doors where indicated.

E21.37.3 Wood Doors at offices and Boardrooms

(a) Solid maple, premium grade with clear stain. Samples to be submitted for approval.

(b) See Hardware E21.19.

E21.37.4 Sliding Secure Doors

(a) 2440 mm minimum wide at Till Room similar to Vicwest agricultural sliding door packages. Width as per RDS Package. Door to be lockable and secure.

E21.37.5 Garage Doors:

(a) Maintain existing door if possible, or match existing. Use existing door operator and controls if possible. Require four (4) remote controls for courier cars and a central manual button on wall in loading dock.

E21.37.6 CONFIDENTIAL – Refer to same clause number in Confidential Specifications.

(a) CONFIDENTIAL – Refer to same clause number in Confidential Specifications.

E21.37.7 Exterior Glass:

(a) Provide clerestory natural light in office space when possible and desirable to the City. to be Tinted Glass: Double-pane with outer pane of 6 mm AFG Grey Float, inner pane of 6 mm AFG Comfort T.R. with low 'e', argon filled cavity with super spacer or to

match existing. Tempered glass is to be used in all exit doors and sidelights adjacent to exit doors as per building code. Refer also to E21.11.

E21.37.8 Interior Glazing:

(a) CONFIDENTIAL – Refer to same clause number in Confidential Specifications.

E21.37.9 Interior Partitions: Proponent architects to re-evaluate and create own appropriate assemblies.

(a) W-1: Typical Partition to U/S of ACT ceiling at offices: 5/8" gypsum board both sides of 3-5/8" steel studs to underside of ceiling. With 2" mineral wool sound batt insulation within stud cavity.

(b) W-2: Typical Partition to U/S of structure at boardroom and secure rooms, washrooms etc: 3-5/8" steel stud; gage as deemed suitable by structural engineer to u/s structure; 5/8" gypsum board on both sides to u/s structure; 2" mineral wool sound batt insulation within stud cavity; Provide backer rod and caulking at top and bottom of gypsum board.

(c) W-4: Typical Two (2) Hour Fire Rated Partition, Two (2) layers 5/8" type 'X' gypsum board both sides of 3-5/8" steel studs to underside of structure; 2" mineral wool insulation within cavity.

(d) W-5: Furring Wall at Existing Exterior Wall for non -production spaces: 2-1/2" steel stud to u/s ceiling, 5/8" gypsum board one side.

(e) W-6: Concrete masonry unit walls to be 190mm wide reinforced – grouted with re-bar every second core to u/s of structure. Rated where required. Detail to match existing facility.

(f) W-7: Furring wall over CMU in classrooms to hide existing services and allow for new flush mounted switches etc. 19 mm GWB on 92 mm steel studs.

E21.37.10 CONFIDENTIAL – Refer to same clause number in Confidential Specifications.

(a) CONFIDENTIAL – Refer to same clause number in Confidential Specifications.

E21.37.11 Flooring Finishes:

(a) CT- Carpet tile

(i) 24" x 24" minimum, 28 oz. tufted loop construction, solution dyed nylon with low VOC adhesive. For Offices and boardroom and adjacent corridors.

(b) EF - Slip Resistant Epoxy Floor

(i) Epoxy resinous coating nominal 5 mm thick system for Production areas: Stonhard Inc., Stonshield. Install with 152 mm high self-cove base. Final finish to be chosen by user. Provide samples to educate the choice.

(c) RSF-Resilient Sheet Flooring

(i) Vinyl for washrooms storage, lunchroom adjacent corridors etc.: Tarkett Granit or Optima. Install with 152 mm high self-cove base in Interior Fit-up. Use 102mm rubber base in classrooms and instructor areas. Allow for 25% patterning.

(d) C – Concrete

(i) All concrete floors shall be sealed.

E21.37.12 Wall Finishes:

(a) Paint

(i) Eggshell in office and administrative areas.one (1) coat primer sealer; two (2) coats latex eggshell finish.

(ii) Semi-gloss at Washrooms. One (1) coat primer sealer; two (2) coats latex semi-gloss finish.

(iii) Epoxy at Production Areas. One (1) coat epoxy primer; two (2) coats of two (2) component epoxy semi-gloss paint. Acceptable Manufacturers: Glidden Paint, Benjamin Moore, Para Paints, Pratt and Lambert. All paints to be low VOC.

(iv) Ceilings in wet areas shall be painted with moisture and mildew resistant paint.

E21.37.13 Ceilings:

(a) ACT - Acoustical Ceilings

(i) 24" x 24" or 24' x 48" Armstrong Tegular Cirrus or equal – all ceilings except where indicated;

(b) GB - Gypsum Board Ceilings and Bulkheads

(i) 16 mm gypsum board on metal channel suspension system; Painted Flat, Vestibule, washrooms and as per Room Data Sheets.

(c) OP – Open Ceilings

(i) Such as at the loading dock are to be painted Semi-gloss with one (1) coat primer sealer; two (2) coats latex semi-gloss finish.

E21.37.14 Millwork

(a) to be 19 mm Skyblend or approved equal MDF with plastic laminate finish on all exposed surfaces including countertops, gables, shelves, base, cabinet doors, and drawer fronts (estimate four (4) plastic laminate colours in total); Low VOC adhesives.

(b) Solid surface countertops to be solid sheets of natural quartz.

(i) Acceptable manufacturer: Cambria or Cesarstone, natural quartz surface.

(c) Pulls:

(i) Richelieu #71996-195 or approved equal.

(d) Shelf standards and rests:

(i) KV no. 255 c/w no. 256 supports. Nickel finish.

(e) Cabinet locks:

(i) Keyed cylinder, two (2) keys per lock, master keyed, steel with chrome finish.

(f) Catches:

(i) Elbow catch on inactive leaf.

(g) Drawer slides:

(i) Galvanized steel construction, ball bearings separating tracks, full extension type KV 1428, length to suit.

(h) Hinges:

(i) Blum 90 concealed hinges, 176 degree opening, spring closed.

(i) Computer desk grommets:

(i) 50 mm inside dia., circular black plastic.

E21.37.15 Metals

(a) Railings and Stairs:

(i) Steel stairs with concrete filled steel pans, raked finish at concrete, with contrasting grit tape at nosings, closed risers w/ paint finish, metal railings and w/ paint finish.

(b) Wire mesh at cage to be woven similar to McNichol's Quality Square Welded Wire Mesh, Plain Steel Cold Rolled, 2" Square Opening, 0.2500" Wire Diameter, Welded Untrimmed, 77% Open Area

E21.37.16 Deal Tray at vestibule customer counter

(a) To be brushed stainless steel 16" wide and 10" deep/ Drop in -design. Coordinate with laminated glass.

E21.37.17 Locker Units

(a) 305 mm x 305 mm x 1830 mm; single tier; surface mounted; sloped top with closures; 100 mm metal base; provide two double prong wall hooks, rubber bumper, hat shelf. Built in combination lock with 5 changeable combinations with Integral Cylinder Lock master keyed; provide four master keys.

E21.37.18 Security Grille

(a) To be installed at the Vestibule area for after-hours closure.
    (i) Acceptable manufacturers include. Dynamic, EZ Closure, EZ grille.

E21.37.19 Projection Screens, Whiteboards and Tackboards.

(a) Projection screen at Boardroom, to have full wall of Wall Talkers
    (i) Koroseal matte-ritle both projectable and writable. Provide aluminum trim and tray.

(b) Classrooms (2.2 & 2.1) to have full wall of Wall Talkers
    (i) Koroseal matte-ritle both projectable and writable. Provide aluminum trim and tray.

(c) Provide 610x915 White Boards
    (i) Aluminum framed complete with blocking in wall for each instructors office.

(d) Provide 610x915 Tackboards
    (i) Aluminum framed complete with blocking in wall for each instructors office.

(e) Provide larger Tackboard 915x2200
    (i) Aluminum framed complete with blocking in walls in classrooms and P/T instructor rooms

E21.37.20 Toilet partitions

(a) Shall be solid core phenolic.
    (i) Approved manufacturers: Comtec series S200, Capitol Partitions Poly-Pro P3 - Congress Basic, Santana Poly-Mar HD or equal.

E21.37.21 Washroom/Locker room Accessories

(a) to be Bobrick or Frost stainless steel accessories including:
    (i) Mirrors
    (ii) Soap dispenser
    (iii) Surface mounted multi-roll toilet tissue dispenser.
    (iv) Recessed female napkin dispenser.
    (v) Recessed female napkin disposal.
    (vi) Recessed towel dispenser and disposal.
    (vii) Automatic electric hand dryers
    (viii) Barrier free Grab bars.
    (ix) Robe hooks
    (x) Break-away coat hooks (UTR and washroom stalls)
    (xi) Mirrors full width of vanities from 1000mm to 1800mm height; and
    (xii) Break away coat hooks (20 per dressing room and locker room)

E21.37.22 Metal Shelving

(a) CONFIDENTIAL – Refer to same clause number in Confidential Specifications.

E21.37.23 Interior signage

(a) To be a separate contract, tendered separately. Except for Washroom signage to be provided by proponent.

E21.37.24 Corner Guards

(a) CONFIDENTIAL – Refer to same clause number in Confidential Specifications.

E21.37.25 Bollards

(a) CONFIDENTIAL – Refer to same clause number in Confidential Specifications.

E21.37.26 Column Guard:

(a) Omega Industrial Products; 42” high two-piece steel column guard for 200 mm x 200 mm steel column; complete with attachment hardware; traffic safety yellow colour.

E21.37.27 Hydraulic Dock Lifts

(a) To be provided at loading dock to suit the delivery trucks. Provide pit installed, fully hydraulic hinged dock levelers with wall mounted push button control stations with maximum capacity of moving or roll-over live load of 6804 kg (15,000 lb) meeting ANSI MH29.1.

(b) Lift must be able to at minimum:

(i) Lower empty orange bins from dock level to truck level for loading to Transit vehicles

(ii) Raise full orange bins from Transit vehicle to dock level

(iii) CONFIDENTIAL – Refer to same clause number in Confidential Specifications.

(iv) Lift must have ramp to move bins and dolley’s off of the ramp to vehicles and ground level; and

(v) Lift platform must have room for bin or dolley plus two (2) persons

(c) Safety Requirements for Industrial Scissor Lifts. 1830 mm (6’-0”) wide by 1830 mm (6’-0”) long c/w 406 mm (16”) self-retracting hinged lip extension.

E21.37.28 Dock Bumpers

(a) At each bay to be fabricated with individually die cut pieces of recycles truck tires cut to uniform size pads min. to suit the loading dock configuration.

E21.37.29 Window Treatments

(a) Chain operated Roller dual shade, to come with all standard components and optional components as specified; wall mounted with universal brackets Fabric dual rolls: sunscreen 600 – 5% and 0%; fabric; flame retardant construction.

E21.37.30 Furniture

(a) Refer to B13.2.1 for cash allowance value

(b) The Contractor is responsible to work with the City and Contract Administrator to determine final layout and present furniture options for the Interior Fit-up and Garage.

(c) The Contractor may choose to hire an interior designer as part of their team, however the Contractor will be responsible to manage the design, procurement, installation, and warranty of the furniture

(d) Proposed layout; see Appendix T

(e) Acceptable manufacturers and their dealers include:

(i) Teknion via Artz Metz

(ii) Steelcase via BF Workplace

(iii) Haworth via Anthony Allen

(iv) Herman miller via COI

E21.37.31 Fire extinguishers

(a) To be confirmed by mechanical: surface mount in production areas, in cabinets in office areas.

(b) Fire extinguishers both dry chemical and CO2 type.

(c) Mounting bracket: as recommended by fire extinguisher manufacturer.

(d) Cabinets: Flush mounted as recommended by fire extinguisher manufacturer.

E21.37.32 Phasing

(a) The classroom areas need to remain operational during construction. Proponent will need to work with Transit to phase the work accordingly.

E21.37.33 Roofing

(a) Replace existing roof over the entire area of the building containing the interior office fit-up in accordance with E22.

E21.37.34 Interior Fit-up Separate Price

(a) Further to B13.3(e), the Contractor shall provide a separate price to deduct the full scope and cost to design and construct the Work of the interior fit-up as specified in Section E (includes 'CONFIDENTIAL' information within Confidential Specifications).

E22. ROOFING COMPONENTS

E22.1 If used, all flat roof construction shall be SBS modified bitumen, torch-on roofing. New roof to match existing warranted system by Soprema. Colours to match existing complete with red at walkway surfaces. May consider a cap sheet roofing material with an initial solar reflectance index (SRI) of greater or equal to 82 and a three (3) year aged SRI of at least 64.

E22.2 If used, metal roof construction shall incorporate an engineered snow / ice guard system to prevent avalanching to ground. Submit drawings sealed by a Structural Engineer registered in the Province of Manitoba for all snow and ice guard systems.

E22.3 If used, provide commercial grade eaves troughs and downpipes.

E22.4 After placement of mechanical equipment on roof curbs, flood test the equipment to ensure watertight seal.

E22.5 THALER Jack Stacks shall be used on all plumbing vents.

E22.6 THALER fall arrest roof anchors or equivalent (subject to acceptance and approval by Contract Administrator) appropriate to the roof structure and assembly type shall be provided to allow for full fall arrest over all roof areas of the addition or areas affected by the addition that are subject to a fall hazard in accordance with most stringent local requirements and regulations. Provide full testing and certification of each anchor under seal of a Professional Engineer registered in the Province of Manitoba immediately prior to Substantial Performance of the Project and after any construction activity use they may be subjected to whichever is latest. All internal or external fall arrest anchors or systems to accommodate a minimum of two users concurrently.

E22.7 Quality Control: Contractor shall engage an independent roofing consultant to review proposed design and provide assessment of design to the Contract Administrator. Upon acceptance of design, roofing consultant to inspect works in progress (minimum 5 inspections) as well as upon Substantial Performance of roofing and shall provide reports and photographic documentation to the Contract Administrator. Such works found to be unacceptable or deficient shall be remedied to the satisfaction of the roofing consultant and such costs associated to the works borne by the Contractor.

E23. STRUCTURAL BASE BUILDING REQUIREMENTS

E23.1 Geotechnical Report

E23.1.1 The Geotechnical Report attached to this RFP in Appendix C – *'Geotechnical Report – Winnipeg Transit Garage Addition'*, may be referred to by the Proponent for general information only and to obtain a general understanding of the conditions encountered during the investigation.

E23.1.2 In preparing their submission, each Proponent shall engage their own geotechnical engineer, licensed to practice in the Province of Manitoba, to perform their own independent site investigation and to prepare a Geotechnical Report to provide design recommendations that address the proposed foundation piling system alternatives for each type of component to be supported (grade beams, columns, pits, hoists, cranes and all other applicable items), concrete slabs and associated subbase and subgrade design, asphalt and concrete pavement design and the criteria for any other features impacted by the geotechnical conditions. The design recommendations, sealed by the Proponent's geotechnical engineer, are to be included in the Proponent's submission in response to the RFP. The recommendations in the Proponent's Geotechnical Report shall provide equal or better service than the Geotechnical Report attached to the RFP for information only unless the use of reduced criteria can be shown to be strongly beneficial to the City.

E23.1.3 The Proponent's attention is drawn to the existing conditions in the attached Geotechnical Report which indicate the existence of various fill materials, organics and silt.

E23.2 Foundations

E23.2.1 The new building and all related structure shall be supported by a single type or style of pile foundation (pile types are to be the same for the building and related features) unless the use of mixed types can be shown to be strongly beneficial to the City.

E23.2.2 The type of piling and the piling design parameters are to be in accordance with the recommendations of the Proponent's Geotechnical Report and accepted industry standards. The piling type and design criteria shall at least meet the criteria identified in the attached Geotechnical Report provided for information only.

E23.2.3 Cast-in-place reinforced concrete pile caps shall be provided under all interior columns and other features supported on piles that may require pile caps (pits, hoists, etc.).

E23.2.4 Cast-in-place reinforced concrete grade beams shall be provided under all perimeter walls and interior load bearing walls. The minimum grade beam dimensions acceptable on the project are 250 mm wide x 600 mm deep; greater dimensions are to be utilized as required to suit site-specific conditions and/or structural requirements.

E23.2.5 Cast-in-place concrete pilasters are to be provided where required to support perimeter columns, interior wall columns or other areas as required.

E23.2.6 Cast-in-place reinforced concrete pits and trenches and bus/vehicle hoists are to be provided with pile foundations, generally similar to those for the building structure.

E23.2.7 Void form shall be used under all structurally supported slabs, grade beams, pits and trenches and as per the Proponent's Geotechnical Report. Void form material to be cardboard-style under all structural slabs with cardboard style or suitably compressible polystyrene product to be used under other features.

E23.2.8 Sub-surface 'weeping tile" drainage system is to be provided and shall be at least in accordance with the recommendations of the Proponent's Geotechnical Report. The sub-surface drainage system shall be coordinated with the work of other disciplines.

E23.2.9 All cast-in-concrete anchor bolts, weld plates and other embedments that require precise placement for the attachment or support of building elements shall be verified by survey for location and alignment before pouring concrete, sufficiently anchored and supported against movement during concrete pours, and to preserve their position and alignment, and verified by survey once the concrete is set as part of the Proponents Quality Control procedures.

E23.3 Pits and Trenches

E23.3.1 Cast-in-place reinforced concrete pits and trenches are to be provided to meet project requirements and the requirements shown on the Room Data Sheets. Pit and trench walls and bases to be a minimum of 150 mm thick.

E23.3.2 Pit and trench covers are to be solid or grated as noted on architectural and designed for the maximum vehicle traffic or equipment loading in the surrounding building area, whichever is greater. Metal covers and grates are to be hot-dipped galvanized after fabrication or as otherwise noted in the architectural requirements and shall be fabricated in sections able to be safely lifted by one worker without the need for lifting equipment.

E23.3.3 All embedded metal support, framing and cover components to be hot-dipped galvanized after fabrication or stainless steel.

E23.3.4 PVC waterstops with a minimum of 150 mm width, bulb centre feature, factory or shop heat-welded corner joints and field welded straight-line butt joints shall be provided at all pour joints in pits and trenches. Waterstops shall be salt, oil, gasoline and diesel fuel resistant. Reinforcing steel and trench design shall be such that the waterstops can be installed without conflict with reinforcing steel and with no cutting of either required.

E23.3.5 All trenches or pits shall be provided with a surrounding expansion joint to separate them from the adjacent slab or grade beam comprised of 12 mm thick asphalt-impregnated fiber board for the full adjoining depth of the slab-on-grade, grade beam or other feature with a traffic-rated sealant at the surface to seal the joint from moisture infiltration (including provision of a 12 mm deep reglet to accommodate the sealant bead). Sealant shall be salt, oil, gasoline and diesel fuel resistant.

E23.3.6 Pipes connected to pits or trenches shall be connected by means of a stainless steel “spool” piece with integral water block or expansion-style sealing collar around the pipe to prevent leakage into or out of the pit or trench; coordinate with mechanical discipline for piping connections.

E23.4 Floor Slabs

E23.4.1 Minimum floor loadings are identified in the “Design Loads” Clause below. These are minimum requirements, and the Contractor will be required to provide design and construction in excess of these design loads if such is required to meet the Project’s needs.

E23.4.2 If slab-on-grade floor systems are proposed they shall be designed in accordance with the latest edition of “Concrete Floors on Ground” by PCA (Portland Cement Association – EB075). Subgrade Modulus “k” shall be as determined by the Contractor’s Geotechnical Engineer, and must be consistent with the subgrade preparation and engineered fill outlined within the Contractor’s design.

E23.4.3 The minimum allowable slab-on-grade floor thickness, where allowed, shall be 225 mm for all areas. Slab-on-grade thickness may need to be greater than this to meet project needs and such shall be included in Contractor’s design as required.

E23.4.4 Floor slabs shall be designed to accommodate any gantry cranes and other floor mounted equipment required and as shown on the Room Data Sheets.

E23.4.5 The depth of excavation, sub-grade preparation and compaction requirements, geo-textile/geo-grid specifications (as required), silt removal limits (as required), sub-base design parameters, materials, depth, preparation and compaction requirements, base course design parameters, materials, depth, preparation and compaction requirements, concrete thickness, strength, reinforcement, placement and curing requirements shall all be detailed in the Proponent’s Proposal submission.

E23.4.6 All floor slabs shall have non-metallic trowelled-in hardener to provide, as a minimum, protection against high abrasion, high impact and resistance to salt, oils, greases, gasoline, diesel fuel and any other materials that may be encountered in the stated use of the areas including paint, solvents, oils, greases, fluids, etc. Hardener products shall be compatible with products to be used by the City during normal operations.

E23.4.7 Provide structural floor slabs to all non-bus-bay areas including Upholstery Shop, Part Storage Expansion, Shops and New Corridor. The Body Shop and Fluid Room and other minor rooms within the bus-bay zone may have the same floor system as the bus-bay areas.

E23.4.8 Acceptable structural slab systems include:

(a) Cast-in-place reinforced concrete over cardboard void form;

(b) Pre-cast concrete (such as hollowcore with topping) over void space;

(c) An approved equivalent “all-concrete” system.

E23.4.9 CONFIDENTIAL – Refer to same clause number in Confidential Specifications.

E23.5 Minimum Concrete Strengths & Exposure Class in accordance with CAN/CSA-A23.1. All classes of concrete exposed to sulphates shall comply with the minimum requirements of Class S noted in Tables 2 and 3 of CSA A23 1-14

Pile Caps	32 MPa	Class S-2
Grade Beams	35 MPa	Class C-1
Structural Floor Slabs	32 MPa	Class N
Pits & Trenches	35 MPa	Class C-1
Slabs-on-Grade	35 MPa	Class C-1
Exterior Aprons	35 MPa	Class C-1
Sidewalks	35 MPa	Class C-1
Topping	25 MPa	Class N

E23.6 Framing – Non-Bus-Garage Areas

E23.6.1 All wall sections within 1200 mm above the finished floor are to be of robust construction to resist damage from typical heavy shop activities and shall be constructed of reinforced, cast-in-place concrete with suitable architectural finishes including insulation where required.

E23.6.2 Acceptable structural framing elements include steel deck, open web steel joists, structural steel beams, structural steel columns, precast concrete systems (“all precast” or in combination with steel) and cast-in-place concrete.

E23.6.3 Pre-engineered steel buildings, wood framing and/or light gauge steel structures are not acceptable.

E23.6.4 Refer to the Room Data Sheets and relevant discipline Drawings and Specifications for the minimum required clear heights, required clear span, required column free areas, exhaust extraction systems, required equipment and all components to be supported by the structure. Provide for all loads in the structural design.

E23.6.5 Lateral bracing shall be provided as required and shall be designed to accommodate building functions and openings.

E23.7 Framing – Bus Garage Area (including Body Shop, Fluid Room and Ancillary Rooms in Bus Garage)

E23.7.1 All walls that are within 1200 mm from the finished floor are to be of robust construction and shall be constructed of reinforced, cast-in-place concrete with suitable architectural finishes including insulation. Those in bus travel areas are to be capable of withstanding the low speed impact of a transit bus, minimum design impact speed of 10 km/h for a maximum design vehicle weight of 44,100 kg.

E23.7.2 Acceptable structural framing elements include: steel deck, open web steel joists, structural steel beams, structural steel columns, precast concrete systems (“all precast” or in combination with steel), or cast-in-place concrete.

E23.7.3 Pre-engineered steel buildings, wood framing and/or light gauge steel structures are not acceptable.

E23.7.4 All structural components in close proximity to typical bus traffic areas (including overhead door jambs, interior columns, door jambs, wall corners/ends, etc.) are to be protected by minimum 200mm diameter, 12.5 mm thick hot-dipped galvanized concrete-filled steel bollards. Bollards to be embedded in concrete below grade (not bolted to top of floor) with

suitable concrete foundation. Exterior Bollards shall have a foundation that prevents frost heave of the bollards.

E23.7.5 Lateral bracing shall be provided as required and shall be designed to accommodate building functions and openings.

E23.7.6 Refer to the Room Data Sheets and relevant discipline Drawings and Specifications for the minimum required clear heights, required clear span, required column free areas, exhaust extraction systems, required equipment and all components to be supported by the structure. Provide for all loads in the structural design.

E23.8 Fall Arrest/Restraint Systems

E23.8.1 A fall arrest/restraint system capable of use by two (2) persons concurrently is required over each bus location in the bus-bay areas as identified on the Room Data Sheets. The roof structure over all bus-bay areas, as well as any related structures that may be used such as columns, shall be designed to accommodate interior fall-arrest systems (two concurrent users per system) whether or not they are specified to be installed under the RFP. The City may install interior fall arrest systems in these areas at a later date and as such all bus bays must be able to accommodate a fall arrest system. Indicate on structural drawings the allowable loads for all proposed (under this RFP) and future possible fall arrest systems. Refer to Room Data Sheets for locations to be installed under this RFP.

E23.8.2 Roof fall arrest anchors are required on all roof areas that do not have a parapet that meets Building Code requirements for a guard to be used without a fall arrest system. Roof structure shall be designed to accommodate roof-top fall arrest requirements per E21.37. Roof structure over all bus-bay areas shall be designed to accommodate interior fall-arrest systems (two concurrent users per system) whether or not they are specified to be installed under this RFP. The City may install interior fall arrest systems in these areas at a later date and as such all bus bays must be able to accommodate a fall arrest system. Indicate on structural drawings the allowable loads for all proposed (under this RFP) and future possible fall arrest systems. Refer Room Data Sheets for locations to be installed under this RFP.

E23.8.3 Structural systems and components are to be designed to accommodate these systems.

E23.8.4 Internal and roof fall arrest anchors are to be certified by the Contractor and the related documentation provided as part of the Project close-out documentation. Provide full testing and certification of each anchor under seal of a Professional Engineer registered in the Province of Manitoba immediately prior to Substantial Performance of the Project and after any construction activity use they may be subjected to whichever is latest.

E23.9 Overhead Cranes

E23.9.1 Overhead cranes are required in the welding shop, body shop and other areas as identified on the Room Data Sheets and equipment information provided.

E23.9.2 Structural systems are to be designed to accommodate these cranes.

E23.10 Service Hoists/Pits

E23.10.1 In-ground service hoists and/or pits are required in specific areas of the Bus Garage as identified in the Room Data Sheets and equipment information provided.

E23.10.2 Structural systems are to be designed to incorporate these features and all foundations and pits are to meet the general requirements for these features as noted above.

E23.11 New Bus Exit Opening

E23.11.1 A new permanent overhead door opening in the existing south wall is required to be constructed to accommodate bus traffic during construction and beyond. A high-speed rubber door is to be supplied and installed in this opening.

E23.11.2 Provide suitable structural modifications, systems, etc. to provide the opening for this new overhead door including removal of existing structure, new foundations, grade beams,

columns, beams, new steel framing fully around the opening, lintel and supports to mount the door hardware and operators on, modifications to existing framing and walls, new cast-in-place concrete pile foundations as required and all other components and work to provide a finished opening ready for the new overhead door.

E23.11.3 Provide suitable modifications to the existing interior trench at this location to accommodate the largest design vehicle. Provide additional foundations, trench reinforcement, framing, supports, trench covers, etc. as required to provide for the traffic now crossing this trench.

E23.11.4 New trench cover framing, covers and any steel used in this modification shall be hot-dipped galvanized after fabrication.

E23.12 Exterior Generator Foundations

E23.12.1 New electrical generators are to be provided as part of the Contractor's work.

E23.12.2 The new generators shall be installed on a cast-in-place concrete structural slab on void form on pile foundations in accordance with the requirements of this Section. Pile foundations shall be designed to prevent any movement due to frost heave and/or seasonal movement.

E23.13 Door, Wall and Roof Openings

E23.13.1 Provide suitably designed openings for all doors, overhead doors and openings.

E23.13.2 Provide a complete three-sided steel door frame for the overhead doors including suitable mounting location for all door hardware and operators.

E23.13.3 Provide suitable steel framing, lintels, etc. for all other openings.

E23.14 Design Loads

E23.14.1 All building components are to be designed to accommodate "Normal" importance factors.

E23.14.2 Upholstery Shops, Part Storage Expansion, Welding Shop, Body Shop Fluid Room

(a) Shop Areas – Design for the greater of the minimum specified live loads below or greater as required to accommodate equipment and function for each area. Refer to the Room Data Sheets and equipment information provided in the RFP.

(i) Minimum Floor Live Load = 7.2 kPa and as required for equipment and usage

(b) New Corridor

(i) Minimum Floor Live Load = 4.8 kPa

E23.14.3 Bus Garage Area

(a) Ground Floor (all areas) - design to the greater of NBC minimums, the design vehicle loads (any area accessible by the design vehicle(s), or the loads listed below:

(i) Minimum specified uniformly distributed Live Load = 6.0 kPa,

(ii) Minimum specified Live Concentrated Load of 36.0 kN

E23.15 General

E23.15.1 The scope and intent of this document is to convey general design guidance and expectations regarding structural design. This document does address specifics related to design type, selection, and configuration; however the indicated requirements are presented without knowledge of the specific building implementation. It is not within the scope of this document to provide detailed design direction, and it will be the responsibility of the Contractor to fully develop the structural details with general conformance to the concepts presented herein. This standard shall not be construed as comprehensive structural engineering design requirements or negate the requirement for a Professional Structural Engineer's involvement. Any design must be executed under the responsibility and seal of the respective engineer in each instance, and must be performed in

conformance with all applicable codes and standards, as well as good engineering practice.

Existing facilities do not necessarily comply with this standard. The expectations regarding application of this standard to maintenance and minor upgrades at existing facilities must be assessed on a case-by-case basis; however general guidelines for application are presented as follows:

(a) All new buildings are expected to comply with this standard.

(b) All major upgrades to a building are expected to comply with this standard; however in some cases compromise with the configuration of the existing facility design may be required.

(c) All minor upgrades should utilize this standard as far as practical for new work; however in some cases compromise with the configuration of the existing facility design may be required.

E23.15.2 Design Codes and Standards:

Ensure all designs shall comply with municipal, provincial, and national codes and bylaws. This includes but is not limited to:

(a) 2010 National Building Code of Canada with 2011 Manitoba Amendments (NBC) – Normal Category

(b) CSA A23.3-04, Design of Concrete Structures

(c) ACI 350-06, Code Requirements for Environmental Engineering Concrete Structures

(d) CSA S16-09, Limit States Design of Steel Structures

(e) CSA S136-12, North American Specification for the Design of Cold-Formed Steel Structural Members

(f) CSA S157-05, Strength Design in Aluminum

(g) CSA S304.1-04, Design of Masonry Structures

(h) Concrete design shall be in accordance with CSA A23.3, except for facilities or portions of facilities that are considered hydraulic structures. Design hydraulic structures in accordance with ACI 350. Design steel structures in accordance with CSA S16.

(i) Masonry shall be designed in accordance with CSA S304.1

(j) Crane supporting structures shall be designed in accordance to the minimum requirements provided by the latest version of the CISC Guide for the Design of Crane Supporting Steel Structures and as necessary to provide suitable service for the intended uses.

E23.15.3 References:

The following list of references shall be used in the design:

(a) CAC Concrete Design Handbook, latest edition

(b) CISC Handbook of Steel Construction, latest edition

(c) AISC Design Guide 27, Structural Stainless Steel

E23.15.4 The new building shall be supported entirely on new foundations and structure and shall not be supported by any components of the existing building.

E23.15.5 If the new structure impacts the existing structure loading in any way the Contractor shall include all modifications to the existing structure needed to accommodate this impact (such as snow load impacts on roofs if the new structure is higher or other such impacts).

E23.15.6 Provide reinforced, cast-in-place housekeeping pads for all equipment mounted on the floor; minimum thickness to be 100 mm. Pads to be anchored to the floor slab and the joint between the pad and the floor slab sealed with sealant suitable for the area of the pad.

E23.15.7 Provide for all roof or wall mounted or suspended equipment, ductwork, piping, etc. including isolation, anti-vibration and other special requirements that may be identified on Room Data Sheets, discipline drawings or specifications.

E23.15.8 Roof Snow Load as per latest edition of the National Building Code.

E23.15.9 Snow drift loads as per latest edition of the National Building Code and Structural Commentaries.

E23.15.10 Wind loads as per latest edition of the National Building Code and Structural Commentaries for open terrain.

E23.15.11 Consider rain loads associated with blockage of the primary roof drain system where applicable or due to ponding.

E23.15.12 Seismic loads - as per Manitoba Amendment 2(39) to 2010 NBC.

E23.15.13 Impact Loads

Confirm equipment loading, including any impact loads due to equipment, with data sheets requested from the manufacturers and in accordance with the following minimums:

Description	Design Value
Light machinery (shaft or motor driven):	Increased load by 20 percent minimum or manufacturer's recommendation for impact, whichever is greater

E23.15.14 Provide 1.0 kPa surplus collateral load for all roof structures for future use by the City.

E23.15.15 Deflection Criteria:

Description	Load Type	Design Value (Maximum)
Roof Members	Dead + Live	L/240
	Live Only	L/360
	Snow Only	L/360
Floor Members	Dead+ Live	L/240
	Live Only	L/360
Steel Floor Plates and Grating	Live	L/360
Beams and Lintels Supporting Masonry		
Vertical Support	Dead+ Live	Lesser of L/720 or 8 mm
Structural Members bracing out-of-plane loads	Dead+ Live	L/360
Exterior Walls and Interior Partitions	Live, Snow, or Wind	L/240

E23.15.16 Refer to Room Data Sheets and drawings for required special floor loading, explosion-proof areas, special requirements or other specific requirements for each area including Contractor and/or City-supplied equipment and components. Include all required house-keeping pads, pits, trenches, oil/water separators, etc. Coordinate with other disciplines.

E23.15.17 Design Vehicle Loads

Electric Bus Vehicle Weight (approx.) 15,340 kg
Front 5,120 kg

	Rear	10,200 kg
40’ Bus	Vehicle Weight (approx.)	13,350 kg
	Front	4,110 kg
	Rear	9,130 kg
60’ Bus	Vehicle Weight (approx.)	20,000 kg
	Front axle	4,390 kg
	Mid axle	9,470 kg
	Rear axle	10,320 kg

E23.16 Bus Bay and Lane Marking

E23.16.1 Provide a permanent means of marking bus bays and lanes embedded in the concrete floor.

E23.16.2 Marking system to be maintenance-free and easy to clean. Provide details in Proponent submission.

E23.17 Fence and Gate Foundations

E23.18 Chain Link Fences and Gates – 1.82 m high galvanized chain link fence as identified on plans (if applicable). Also see E16.11.

(a) Terminal posts to be 90mm outside diameter by 1.82 m high.

(b) Line post to be 60mm outside diameter by 1.82 m high.

(c) Foundation for terminal and line posts to be cast-in-place concrete foundations of sufficient depth or configuration to prevent frost heave and seasonal movements of the foundation (minimum 1.22 m below grade).

(d) Foundations for gates to be cast-in-place concrete foundations of sufficient depth or configuration to prevent frost heave and seasonal movements of the foundation (spread-bore concrete foundations founded below frost line or minimum 7.5 m straight-shaft pile greased and wrapped cardboard form tube for the top 3.0 m).

(e) Fabric to be no.9 gauge wire woven into a uniform 50 mm specified. Diameter of wire to be no less than 3.68 mm.

E24. EQUIPMENT

E24.1 The Contractor shall be responsible for the design, supply and installation of specialty bus maintenance, repair and shop equipment as identified in the Specifications.

E24.2 The Contractor shall ensure that the equipment are fully operational and functioning as intended by the manufacturer and the City and that training by factory authorized technicians on the operation and maintenance of the equipment to City personnel is completed prior to Substantial Completion.

E24.3 Following Substantial Completion, the Contractor shall ensure that the equipment manufacturer provides at least one qualified technician on site for a minimum of two weeks following Substantial Completion to assist the Contractor and the City to trouble shoot and adjust equipment as needed.

E24.4 A listing of existing equipment and corresponding equipment weights, mechanical/electrical service and functional space requirements (where available) to be included in the design of the new shop spaces is included in Appendix L and the following sections.

E24.4.1 The Contractor shall be responsible to confirm the equipment information provided with the City prior to finalizing the design of the shop spaces. Site reconnaissance is strongly recommended to confirm the information provided within the Specifications reflects all equipment and actual site conditions.

E24.4.2 The Contractor shall review the proposed design and layout of the new shop spaces with the City to ensure the design and location provides the required functionality between

pieces of equipment prior to final placement of equipment and installation of required services.

E24.4.3 The City will undertake the relocation of the existing equipment to the new shop spaces following Substantial Completion or earlier upon agreement with the Contractor. The Contractor is responsible to ensure access to the City and that the required services are installed, tested and ready to receive the individual pieces of equipment.

E24.4.4 The Contractor shall be responsible to connect City relocated shop equipment within the new shop spaces to the mechanical, electrical, or process systems. Start-up equipment and demonstrate operation with the City to ensure proper working operation in accordance with manufacturer's operation manuals.

E24.5 A listing of proposed new bus maintenance and repair equipment to be included in the design of the new process and bus maintenance and repair areas is included in Appendix L and the following sections.

E24.5.1 The Contractor shall be responsible to design and include for the physical spaces, structure, mechanical, electrical and process systems to accommodate the required equipment and associated systems.

E24.5.2 In-Ground Vehicle Lift

(a) Provide modular in-ground vehicle lifts including safety equipment, controls and accessories.

(b) Lifts shall be with two (2) posts or three (3) posts as indicated on the Room Data Sheets and shall be capable of hoisting 40 foot buses (2 posts) and 60 foot articulated buses (3 posts).

(c) Two (2)-post lifts shall have one motor operated moveable post to accommodate the various wheelbases of the 30 foot and 40 foot buses.

(d) Three (3)-post lifts shall have two motor operated moveable posts to accommodate the various wheelbases of the 40 foot and 60 foot buses.

(e) Minimum capacity of lift systems to accommodate bus weights identified in Appendix F.

(f) Installer's qualifications:

(i) Factory trained authorized company.

(ii) Company insured for completed operations of installing lift.

(g) Hoists must be certified by the ALI, to ANSI-ALCTV.

(h) Installation in accordance with ANSI/ALI ALIS 2019.

(i) Acceptable Manufacturer: Rotary MOD35 or approved equal.

E24.5.3 Hose Reel Fluid Dispensing System

(a) Refer to E25.6.14 for requirements on the provision of new and/or expanded bulk fuel dispensing systems.

(b) Hose reel systems to accommodate the required number of fluids at each reel station.

(c) Hose reel systems and distribution piping to be compatible with the new and/or expanded bulk fuel dispensing systems.

(d) Hose reel systems and accessories shall be new and to match the systems in the existing maintenance garage facility to retain continuity for replacement parts storage and maintenance.

(e) Length, diameter and grade of hoses shall be determined based on the fluids being dispensed and the reels being located at the high bay ceiling level as per existing configuration.

E24.5.4 Paint Booth (40 foot Bus):

(a) Quantity – three (3)

(b) Minimum Interior Dimension – 20’ x 60’

(c) Entry/Exit Doors – 16’W x 18’H
  (i) Motorized, Explosion proof
  (ii) 2 push button stations
  (iii) Safety sensing edge

(d) Personnel Doors – 3’W x 7’H
  (i) Quantity – four (4)
  (ii) Each with 18” x 24” tempered glass observation window

(e) Ventilation – Down Draft
  (i) Average velocity = 50 fpm
  (ii) Ceiling type intake plenum
    - High efficiency intake filters
    - Heated air makeup unit supplies outside air
  (iii) Filtered exhaust pit in the floor

(f) Lighting – T8 L.E.D.
  (i) Inside access, 48” 6-tube units
  (ii) Class I, Division 2 rated
  (iii) Interlock disables painting when lighting access door open

(g) Man-lift – 3-Axis
  (i) Quantity – two (2)
  (ii) Booth structure to accommodate

(h) Control Panel:
  (i) 600V 3ph 3 wire
  (ii) Type 12 industrial panel, w/main disconnect and external disconnect handle
  (iii) Control power supply 120vac/24vdc
  (iv) PLC-based control, touch screen operator station
    - Monitors all systems for safety and function
    - Ensure ventilation system operates safely in Spray mode with interlocks per NFPA 33
    - Ensures ventilation system operates safely in Cure mod with interlocks and purging per NFPA 86

(i) Re-circulating Bake Cycle:
  (i) Air replacement unit to discharge 160 degF air into paint booth
  (ii) Damper system to recirculate heated air back into booth

(j) Air Balancing System:
  (i) Monitor interior booth pressure and adjust exhaust fan based on filter performance

E24.5.5 Paint Booth (60 foot Bus)

(a) Quantity – one (1)

(b) Interior Dimension – 20’ x 80’

(c) Entry/Exit Doors – 16’W x 18’H
  (i) Motorized, Explosion proof
  (ii) 2 push button stations
  (iii) Safety sensing edge

(d) Personnel Doors – 3’W x 7’H
  (i) Quantity – four (4)

(ii) Each with 18” x 24” tempered glass observation window

(e) Ventilation – Down Draft
  (i) Average velocity = 50 fpm
  (ii) Ceiling type intake plenum
    - High efficiency intake filters
    - Heated air makeup unit supplies outside air
  (iii) Filtered exhaust pit in the floor

(f) Lighting – T8 L.E.D.
  (i) Inside access, 48” 6-tube units
  (ii) Class I, Division 2 rated
  (iii) Interlock disables painting when lighting access door open

(g) Man-lift – 3-Axis
  (i) Quantity – two (2)
  (ii) Booth structure to accommodate

(h) Control Panel:
  (i) 600V 3ph 3 wire
  (ii) Type 12 industrial panel, w/main disconnect and external disconnect handle
  (iii) Control power supply 120vac/24vdc
  (iv) PLC-based control, touch screen operator station
    - Monitors all systems for safety and function
    - Ensure ventilation system operates safely in Spray mode with interlocks per NFPA 33
    - Ensures ventilation system operates safely in Cure mode with interlocks and purging per NFPA 86

(i) Re-circulating Bake Cycle:
  (i) Air replacement unit to discharge 160 degF air into paint booth
  (ii) Damper system to recirculate heated air back into booth

(j) Air Balancing System:
  (i) Monitor interior booth pressure and adjust exhaust fan based on filter performance

(k) Separation curtain for auto parts painting
  (i) Booth must be equipped with a separation curtain that will allow for reconfiguration of the interior of the booth to allow for painting of a 40’ bus on one side and miscellaneous auto parts on the other.
  (ii) The curtain cannot impede the movement of the man lift along the entire length of the booth.
  (iii) The air supply/exhaust system must be versatile enough to accommodate division of the work envelope without reducing performance or quality of the finished product.

E24.5.6 Prep Booth (40 foot Bus)

(a) Quantity – three (3)

(b) Interior Dimension – 20’ x 60’

(c) Enclosed by 14 oz laminate curtain
  (i) Clear middle section
  (ii) Ceiling mounted track
  (iii) Floor mounted D-rings w/Push button buckles, every 4’
  (iv) Finished curtain to be 3” less in height and 5% wider for overlap

(v) Floor sweep: Velcro removable and replaceable, drops 3” from curtain bottom

(d) Ventilation:
(i) Down draft: Intake plenum at top of enclosure, filtered exhaust pit at floor
(ii) Average volume flow: one (1) air change per minute
(iii) Inlet fans draw shop air into enclosure
(iv) Pit exhaust fans expel 100% of inlet air to outside, exhaust stack to be insulated

(e) Replacement Air System:
(i) Roof mounted direct fired air make-up units

(f) Lighting:
(i) T8 L.E.D., 48” – 6 tube units, Class I, Division 2 rated

(g) Control Panel:
(i) 600V, 3ph – NEMA rated enclosure
(ii) Include main breaker disconnect, magnetic motor starter, motor fuse protection, lighting contactor, lighting fuse protection, terminal strips for field wiring, system operating lights, UL industrial listing

(h) Air balancing system:
(i) System to automatically adjust exhaust fan to changing conditions of exhaust filters.

(i) Particulate extraction:
(i) Tie in to Centralized Vacuum System (see below)

E24.5.7 Prep Booth (60 foot Bus)

(a) Quantity – one (1)

(b) Interior Dimension – 20’ x 80’

(c) Enclosed by 14 oz laminate curtain
(i) Clear middle section
(ii) Ceiling mounted track
(iii) Floor mounted D-rings w/Push button buckles, every 4’
(iv) Finished curtain to be 3” less in height and 5% wider for overlap
(v) Floor sweep: Velcro removable and replaceable, drops 3” from curtain bottom

(d) Ventilation:
(i) Down draft: Intake plenum at top of enclosure, filtered exhaust pit at floor
(ii) Average volume flow: one (1) air change per minute
(iii) Inlet fans draw shop air into enclosure
(iv) Pit exhaust fans expel 100% of inlet air to outside, exhaust stack to be insulated

(e) Replacement Air System:
(i) Roof mounted direct fired air make-up units

(f) Lighting:
(i) T8 L.E.D., 48” – 6 tube units, Class I, Division 2 rated

(g) Control Panel:
(i) 600V, 3ph – NEMA rated enclosure
(ii) Include main breaker disconnect, magnetic motor starter, motor fuse protection, lighting contactor, lighting fuse protection, terminal strips for field wiring, system operating lights, UL industrial listing

(h) Air balancing system:

(i) System to automatically adjust exhaust fan to changing conditions of exhaust filters.

(i) Particulate extraction:

(i) Tie in to Centralized Vacuum System (see below)

E24.5.8 Refurb Booth (40 foot Bus)

(a) Quantity – three (3)

(b) Interior Dimension – 20’ x 60’

(c) Enclosed on two sides and entry by welding curtain

(i) Ceiling mounted track

(ii) Floor mounted D-rings w/Push button buckles, every 4’

(iii) Finished curtain to be 3” less in height and 5% wider for overlap

(iv) Floor sweep: Velcro removable and replaceable, drops 3” from curtain bottom

(d) Ventilation:

(i) Cross draft: Rear wall consists of collector module

(ii) Minimum 22,000 cfm fan

(iii) Cartridge style filtration with self-cleaning function

(e) Lighting:

(i) T8 L.E.D., 48” – 6 tube units, Class I, Division 2 rated

(ii) Mounted off of suspended ceiling

(f) Particulate extraction:

(i) Tie in to Centralized Vacuum System (see below)

E24.5.9 Refurb Booth (60 foot Bus)

(a) Quantity – one (1)

(b) Interior Dimension – 20’ x 80’

(c) Enclosed on two sides and entry by welding curtain

(i) Ceiling mounted track

(ii) Floor mounted D-rings w/Push button buckles, every 4’

(iii) Finished curtain to be 3” less in height and 5% wider for overlap

(iv) Floor sweep: Velcro removable and replaceable, drops 3” from curtain bottom

(d) Ventilation:

(i) Cross draft: Rear wall consists of collector module

(ii) Minimum 22,000 cfm fan

(iii) Cartridge style filtration with self-cleaning function

(e) Lighting:

(i) T8 L.E.D., 48” – 6 tube units, Class I, Division 2 rated

(ii) Mounted off of suspended ceiling

(f) Particulate extraction:

(i) Tie in to Centralized Vacuum System (see below)

E24.5.10 Paint Mix Room

(a) Quantity – two (2)

(b) Interior Dimension – 9’ x 15’

(c) Personnel Door – 3’W x 7’H

(i) Quantity – 1 per room

(ii) Each with 18” x 24” tempered glass observation window

(d) Ventilation:
  (i) Side draft: Intake filters at front of enclosure, exhaust plenum at rear

(e) Work Bench:
  (i) 24” x 108”

(f) Lighting:
  (i) T8 L.E.D., 48” – 6 tube units, Class I, Division 2 rated

(g) Control Panel:
  (i) 600V, 3ph – NEMA-1 rated enclosure
  (ii) Include non-fused disconnect, magnetic motor starter, motor fuse protection, lighting contactor, lighting fuse protection, terminal strips for field wiring, system operating lights, UL industrial listing

E24.5.11 Centralized Vacuum System

(a) Industrial grade dust evacuation system

(b) Combination cyclonic and final cartridge to remove 99% of dust up to 1 micron

(c) Automated compressed air pulse jet cleaning

(d) System to service numerous accessories via ceiling mounted vacuum tubing

E24.5.12 Metal Storage Racking

(a) Contractor to supply and install racking to be approved by the City; refer to Appendix L, Appendix H, and Appendix I.
  (i) 3.65m H x 1.22m L arms and 1.52m column spacing
  (ii) Eight (8) single columns with approximately 9125 lbs capacity
  (iii) All bracing and additional materials included

E24.6 Equipment Separate Prices

E24.6.1 Further to B13.3(a), the Contractor shall provide a separate price to deduct the cost to design, supply and install one (1) pre-manufactured paint booth system for a 40 foot bus as specified in E24.5.4.

(a) The Contractor will still be responsible to design the building and ensure the physical space, structure, mechanical, electrical, process and other associated system capacities are included in the Total Bid Price to allow for future installation of this item at a future date.

E24.6.2 Further to B13.3(b), the Contractor shall provide a separate price to deduct the cost to design, supply and install one (1) pre-manufactured prep booth system for a twelve (12)m bus as specified in E24.5.6.

(a) The Contractor will still be responsible to design the building and ensure the physical space, structure, mechanical, electrical, process and other associated system capacities are included in the Total Bid Price to allow for future installation of this item at a future date.

E24.6.3 Further to B13.3(c), the Contractor shall provide a separate price to deduct the cost if hoist equipment specified in E24.5.2 for a 60 foot bus (3-post system) is substituted with hoist equipment for a 40 foot bus (2-post system).

(a) The location of the substitution will be confirmed by the City; however this is expected to occur at a Typical Service Bay.

(b) The Contractor will still be responsible to design the building and ensure the physical space, structure, mechanical, electrical, process and other associated system capacities are included in the Total Bid Price for a 60 foot bus.

E24.6.4 Further to B13.3(d), the Contractor shall provide a separate price to deduct the cost to design, supply and install one (1) refurb booth system for a 40 foot bus as specified in E24.5.8.

(a) The Contractor will still be responsible to design the building and ensure the physical space, structure, mechanical, electrical, process and other associated system capacities are included in the Total Bid Price to allow for future installation of this item at a future date.

E25. MECHANICAL

E25.1 Definitions

E25.1.1 Notwithstanding any definition elsewhere in the contract documents, wherever the term "Provide" is used in relationship to equipment, piping etc., in this Section, it means "Supply, Install and Connect".

E25.2 Trade Definitions

E25.2.1 All work called for in the Specifications shall be considered to be within the scope of the Contract, and shall be the responsibility of the Contractor.

E25.2.2 The arrangement of the Drawings and Specifications into divisions, sections, and trades is purely arbitrary, with the sole intention of clarifying the scope and content of the Work required to complete the Project. The actual division of the Work amongst the Subcontractors shall be the responsibility of the Contractor, and the actual division of the work between the sub-Subcontractors shall be the responsibility of the Subcontractors.

E25.2.3 The Contractor, at his option and as per his contracts with the Subcontractors, may delegate responsibility to the Subcontractors for the division of the Work.

E25.2.4 The Subcontractors, at their option and as per their contracts with the sub-Subcontractors, may delegate responsibility to the sub-Subcontractors for the division of the Work.

E25.2.5 Sections of the mechanical Specifications, and specific but arbitrary responsibility divisions noted in the mechanical Specifications, are not intended to delegate functions nor to delegate work to any specific trade, but may be useful to the Contractor or Subcontractor when dividing the work amongst the trades and subtrades.

E25.2.6 In the event of a dispute regarding the responsibilities of the various trades and subtrades, the Contractor and Subcontractors may request information or a recommendation from the Contract Administrator. However, the Contractor and Subcontractor shall be responsible for determining the final division of Work.

E25.3 Scope of Work

E25.3.1 Provide (Design, Supply, Install, Connect, Start Up and Commission) a ‘Design Build’ package of mechanical systems to complete the plumbing and HVAC requirements for the proposed building as described herein.

(a) The Contractor will retain the services of a Professional Engineer to design all systems described herein and subject to the Contract Administrator’s review.

(b) Include all items required to provide complete working systems.

(c) ensure complete compliance with the City’s objectives prior to Proposal submission

(d) The selected techniques, methods of fabrication and installation, and the size of the labor force shall be suitable to meet the completion schedule.

(e) The Subcontractors shall be responsible for determining the most appropriate construction techniques and methods of installation for their portions of the work.

(f) Existing plumbing, drainage, sprinkler, heating, ventilation and exhaust, systems, etc. within the boundaries of the renovation and serving the renovated areas shall be removed or recommissioned for reuse where appropriate (i.e. recommissioned HVAC

systems shall be brought back to near new condition with an anticipated lifespan greater than 65% of the ASHRAE published life expectancy). Identify existing openings within remaining structure, walls, etc. that are not being reused for repair by general trades under this Contract. Existing systems and/or components that are located within the boundary of the renovation serving adjacent areas shall remain in service, however may be relocated. Relocate existing services to remain as required to accommodate the new program. Patch and make good all areas adjacent to the renovated boundary affected by any relocation or removal of services.

(g) Ensure compliance with all parts of this RFP.

E25.4 General Requirements

E25.4.1 Allow for general Site conditions and duties as per the requirements set forth for the Contractor, especially with regard to safety, health and LEED® Requirements, and as supplemented below.

E25.4.2 Codes, Permits, Fees and Inspections

(a) Comply with the most stringent requirements of the latest editions of the applicable building codes, local regulations, by-laws, C.S.A. standards, the requirements of the authorities having jurisdiction, federal, provincial and municipal codes, and the applicable standards of the Underwriters' Association. These codes and regulations constitute an integral part of these specifications.

(b) In case of conflict, codes and standards shall take precedence over the minimum requirements of the Contract documents. In no instance reduce the standard or scope of work or intent established by the drawings and specifications by applying any of the codes referred to herein.

(i) It is expected that the minimum code compliance will be superseded by specific requirements laid out in this RFP and in subsequent documentation. The City's requests will not supersede code compliance.

(c) Before starting any work, submit the required number of copies of Drawings and Specifications to the authorities for their approval and comments. Comply with any changes requested as part of the Contract, but notify the Contract Administrator immediately of such changes, for proper processing of these requirements. Prepare and furnish any additional drawings, details or information as may be required. Information such as heat loss calculations, and other data that may be required, must be provided. Should the authorities require the information on specific forms, fill in these forms by transcribing the information as required.

(d) Apply for, obtain, and pay for all required permits, licenses, inspections, examinations, and fees.

(e) Arrange for the inspection of all the work by the authorities having jurisdiction over the work. On completion of the work, present to the Contract Administrator the final unconditional certificate of approval of the inspecting authorities. When the authorities having jurisdiction do not normally issue certificates, provide a declaration confirming that the authorities have inspected and accepted the work.

E25.4.3 Coordination and Cooperation

(a) All Subcontractors are expected to co-operate fully with all other subcontractors whenever necessary.

E25.4.4 Shop Drawings

(a) Provide preliminary information as requested during the Request for Proposal process.

(b) Provide complete Shop Drawings after award of Contract. Shop Drawings shall include all necessary information for a complete review. Shop Drawings shall be provided in a timely fashion.

(c) Shop Drawing Review:

(i) This review by the Contract Administrator, where deemed necessary, is for the sole purpose of ascertaining conformance with the general design concept. The Contract Administrator will provide written review comments as required, however shall not provide confirmation of review for each submission and shall not be considered as a "required" review in the process for completion of design and construction or be considered in the critical path for schedule for overall completion of the Contract.

(ii) This review shall not mean that the Contract Administrator approved the detailed design inherent in the shop drawings, the responsibility for which shall remain with the Contractor/subcontractor submitting same, and such review shall not relieve the Contractor/subcontractor of his responsibility for errors or omissions in the shop drawings, or of his responsibility for meeting all the requirements of the contract documents or the performance requirements herein. The subcontractors are responsible for confirming and correlating dimensions at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation, and for coordination of the work of all sub- trades, as well as compliance with codes and inspection authorities such as C.S.A., etc. Bind one complete set of final shop drawings in each operating and maintenance instruction manual.

E25.4.5 Shop Drawings shall include:

(a) Project Information such as Name and Address

(b) Subcontractor Information such as Name, Address, Phone Numbers

(c) Supplier Information such as Name, Address, Phone Numbers

(d) Confirmation of the Engineer of Record for the project confirming conformance review

(e) A set of Specifications, hardbound, based on the NMS numbering system

(f) A set of drawings, sealed and signed by an Engineer in Good Standing with APEGM, suitable for Permit Application and Construction.

(i) Fire Protection Drawings under separate seal will be acceptable.

(g) A complete List of all Equipment and Devices.

(i) Provide Manufacturers information for a complete review.

(ii) Equipment Identification shall use the same System Name and Identification Number as the Contract Documents. Obtain the City of Winnipeg Transit Standards for naming convention.

(iii) Equipment Information may contain standard manufacturer's brochures, catalogue sheets, schematics, diagrams performance charts, illustrations, etc., but must have:

i. Information which is not applicable crossed off
ii. Available listed options which are being provided clearly marked

(h) A complete controls system description.

(i) Manufacturer's information shall include all Equipment Information required for the Contract Administrator to assess the suitability such as:

(i) Make, Model, Size

i. including schedules where numerous similar items are provided

(ii) Physical Data such as:

i. Dimensions
ii. Materials
iii. Weights
iv. Installation Requirements
v. Installation Clearances

(iii) Performance Data such as:

i. Volume
ii. Pressure
iii. Capacity

iv. Performance Curves (with specified performance clearly marked)

(iv) Motor Data such as:
i. Horse Power
ii. Voltage/Phases
iii. Efficiency

(v) Specialty Items such as:
i. Bearings
ii. Filters
iii. Internal Controls including safety lockouts
iv. Safety Items such as relief valves and regulators
v. Options

(vi) Wiring and Control Diagrams

E25.4.6 As-Built Documentation

(a) Shop Drawings shall be revised at the end of the Project to indicate the 'As Constructed' installation, and shall be dated and labeled as such.

(b) On two sets of white prints, as the job progresses, mark the prints to accurately indicate the installed work. Have the white prints available for inspection at the Site at all times, and present for scrutiny at each job meeting.

(c) At the completion of the work, submit these sets of "as-built" drawings as part of the requirements of E27.1.2.

(d) Naming convention for valves, equipment, and other similar components of the HVAC, plumbing and fire protection systems requiring permanent identification shall be in accordance with the City of Winnipeg Transit Standards.

E25.4.7 Supervision

(a) Maintain at this job site qualified personnel and supporting staff with proven experience in erecting, supervising, testing and adjusting projects of comparable nature and complexity.

(b) Supervision personnel and their qualifications are subject to the approval of the Contract Administrator.

E25.4.8 Engineering Site Review

(a) The Contractor's work shall be reviewed periodically by the Contract Administrator, or their representatives, solely for the purpose of determining the general quality of the work and conformance with the performance documents. No guidance will be offered to the Contractor in regard to interpretation of plans and specifications prepared by the Engineer of Record. The Contract Administrator may advise on observations of potential non-conformance to Building Code or unsafe practices, however this remains the responsibility of the Engineer of Record and the Contractor to resolve.

(b) The Contract Administrator will issue review reports and deficiency lists from time to time as required. All deficiencies shall be cleared up to the satisfaction of the Contract Administrator within a reasonably short time.

E25.4.9 Temporary and Trial Usage

(a) The City has the privilege of trial usage of mechanical systems, or parts thereof, for the purpose of testing and learning the operational procedures.

(b) Assist in the trial usage over a length of time, as deemed reasonable by the Contract Administrator, at no extra cost, and do not waive any responsibility because of trial usage.

(c) Trial usage shall not be construed as acceptance by the City.

(d) Provide and pay for all testing required on the system components where, in the opinion of the Contract Administrator, Manufacturer's ratings or specified performance is not being achieved.

E25.4.10 Temporary Heating and Hoarding

(a) Coordinate and cooperate with all other subontractors in order to provide Temporary Heating and hoarding as required.

(b) Do not use any of the new permanent mechanical systems during construction unless specific written approval is obtained from the Contract Administrator.

(c) The use of permanent facilities for temporary construction service shall not affect, in any way, the commencement date of the warranty period.

(d) If the permanent mechanical systems are permitted to be used during construction, the equipment and systems shall be cleaned and refurbished as required to bring them back to a new/unused condition.

E25.4.11 Standard of Equipment, Materials and Components

(a) Single Source Manufacturer/Supplier

(i) In general, in order to allow for competitive bidding, all manufacturers/suppliers are considered equal, to the point that their equipment is suitable for the intended purpose. To this effect, most equipment Specifications are written generically.

(ii) Certain equipment has been specified by Make and Model in order to match the existing equipment on site, in order to facilitate continuity of the existing maintenance requirements.

i. This equipment must be included in the Bidder's base price.
ii. Alternates to this equipment must be clearly identified as an alternate, with a price value for its substitution.

(b) All equipment, materials and components shall be new and of first class quality.

(c) All equipment, materials and components shall be of proven design, and of current models with published ratings, for which replacement parts are available.

(d) All equipment, materials and components shall be tested, certified and labeled by ULC and/or CSA for use in Canada. The certification and labeling shall be appropriate for the intended function of the item being supplied, as dictated by the relevant codes and standards.

(e) All similar equipment and or materials shall be by the same manufacturer.

(f) The Maximum Design Noise Levels shall be as per ASHRAE Standards as a minimum. Where more stringent standards are required by By-Laws or these performance documents, they shall be met.

(i) All equipment, components and systems shall be selected and installed with the intent of not exceeding these noise levels.

(ii) Where the equipment, components and systems fail to meet the noise level criteria, modifications shall be made as required, at no additional cost to the City.

(g) If required, as determined from the review of the preliminary balancing report, changes to the equipment drives shall be carried out in order to provide balanced systems consistent with the design intent.

(h) Use only Copper, Bronze, Brass and Stainless Steel (no iron) for materials coming in contact with Domestic Water Systems. Galvanized pipe not permitted.

E25.4.12 Preferred Manufacturers

(a) Trane, Lennox, Carrier, Bryant, Modine, Engineered Air, AAON, Keeprite, York.

(i) A minimum 10 year warranty on all equipment installed.

(ii) All equipment shall have lockable doors or vandal resistant locking devices to prevent unauthorized access.

(b) Air Compressors (where required)

(i) Ingersoll Rand

(ii) Atlas Copco

(c) Breathing Apparatus Air Compressors (where required)
(i) Comp Air

(d) Breathing Apparatus Dryers/Filters (where required)
(i) Air Power Products Ltd

(e) Service Reels (Air, Water, Lubricants)
(i) National Energy Reels

(f) Dispensing and Pumping Equipment
(i) Graco to match existing (See product sheets)

(g) Fume Extraction (Fixed Location)
(i) Nederman Exhaust Rail System

(h) Controls (Building Automation)
(i) Johnson Controls (No alternatives permitted)

(i) Particulate Extraction System
(i) Global Finishing Excel Workstation

E25.4.13 Wiring and Electric Motors

(a) Electrically operated equipment shall bear a C.S.A. approval label.

(b) Electric power wiring for equipment provided by mechanical trades is to be provided by the Electrical subcontractor.

(c) Electric power and control wiring for equipment provided by mechanical trades shall meet the requirements of the Electrical Section Specifications, and shall be provided in a continuous system of EMT conduit, or waterproof conduit where applicable.

(d) Generally all motors 375 watt (1/2 H.P.) and smaller to be 120 volt, single phase, 60 cycle. Motors shall meet NEMA standard for maximum sound level ratings under full load and have a 1.15 service factor. Single phase motors to be permanent split capacitor type.

(e) All motors 375 watts to 37.5 kilowatts (1/2 Hp to 50 Hp) supplied under this contract must meet or exceed the following minimum criteria:
(i) Shall be Cema Design Normal torque, low starting current with Class B insulation for operation in maximum ambient of 40°C (105°F).
(ii) Bearings to be rated for minimum B-10 life of 20,000 hours with a V-belt drive.
(iii) Service factor shall be 1.15.
(iv) Motors shall be drip proof unless otherwise specified.

E25.4.14 Air Filters

(a) Unless specifically noted otherwise, all filters shall be replaceable panel type, for slide-in application, into galvanized steel racks.
(i) All equipment outdoor filters shall be of a permanent type, washable and long lasting under normal usage. Provide complete spare set for change-out / wash-down purposes.

(b) All filter panels shall be pleated media type in cardboard frames.

(c) All filter media shall be constructed of unbreakable synthetic micro-fibres in 3 stage variable density media.

(d) Filters shall be listed at least Class II UL flammability.

(e) No filter shall contain asbestos, micro-glass of Urea-formaldehyde.

E25.4.15 Piping

(a) Use all metallic piping, except where explicitly required for a specific fluid. Aluminum pipe is not permitted.

E25.4.16 Valves

(a) It is generally preferable that ball valves and butterfly valves be used in place of gate valves providing they meet the pressure, temperature, and fluid handling requirements of the system.

(b) Provide Drain Down valves with caps and chains.

(c) Natural Gas, Propane and Fuel Oil valves shall be approved plug type.

(d) Provide appropriate Back Flow Prevention where required.

(e) Provide appropriate Pressure and Temperature Relief where required.

E25.4.17 General Installation

(a) Install equipment, ductwork, conduit and piping in a workmanlike manner to present a neat appearance and to function properly. Install ducts and pipes parallel and perpendicular to building planes. Install piping and ductwork concealed in chases, behind furrings or above ceilings in finished occupied areas such as offices, administration, etc. Install exposed systems neatly, and group to present a neat appearance. Ductwork exposed to the outdoors is not permitted (i.e. roof mounted ductwork, exterior duct chases, etc.)

(b) Install all equipment and apparatus requiring wiring, maintenance, adjustment or eventual replacement with due allowance therefore.

(c) Leave space clear and install all work to accommodate future materials and/or equipment, and to accommodate equipment and/or materials supplied by other trades. Verify spaces in which work is to be installed. Install pipe runs etc., to maintain maximum headroom and clearances and to conserve space in shaft and ceiling spaces.

(d) Install control devices to achieve proper sensing. Shield elements from direct radiation and avoid placing them behind obstructions.

(e) Provide access doors as required to install, maintain and adjust equipment and controls.

(i) Size access doors to provide adequate access and commensurate with the type of structure and architectural finish. Demonstrate manner of access for maintenance staff where requested.

(ii) Ensure proper rating of doors in fire separations.

(f) Provide Pipe Accessories such as Strainers, Thermometers, Pressure Gauges, Dielectric Couplings, Unions, Air Vents, Drains, Flow Measurement Venturis, etc.

(i) Air Vents

i. Provide air vents on closed-loop water piping at all high points in the system and at each piece of equipment. Provide shut off cocks to automatic vents.

ii. Provide automatic air vents on piping mains except where a possibility from water damage would occur, in which case, use manual vents.

iii. Provide manual air vents at each piece of equipment.

(g) During construction, open ended Piping and Ductwork shall be temporarily capped to prevent the entry of dirt and debris.

i. On completion, piping systems shall be flushed to remove any foreign material, and ductwork shall be Vacuumed Clean.

(h) Provide Sleeves where pipes and ducts pass through walls and floors. Seal sleeved openings as required, and provide escutcheon plates.

(i) Replace all work unsatisfactory to the Contract Administrator without extra cost.

E25.4.18 Piping Installation

(a) Install all piping in the best workmanlike manner in accordance with the best practices of the trade.

(b) Install brass and copper pipe tubing free from surface damage. Replace damaged pipe or tubing.

(c) Lay copper tubing so that it is not in contact with dissimilar metal and will not be kinked or collapsed.

(d) Steel piping is not permitted to be buried.

(e) Install groups of piping parallel to each other on trapeze hangers, spaced to permit service access, application of insulation, and identification.

(f) Install piping straight, parallel and close to walls and ceilings, with required pitch. Use manufactured fittings for direction changes.

(g) Install piping to avoid any interference with the installation of equipment, other piping, ducts etc. Where it is necessary to offset piping to avoid obstructions, use 45 degree rather than 90 degree elbows.

(h) Provide long turn pipe fittings not less than pipe wall thickness. Provide line size tees, and where branch lines are more than two sizes smaller than the main, weldolets may be used.

(i) Allow for Piping Expansion and Contraction without noise or undue stress on pipe systems.

(j) Install systems so that they can be thoroughly drained and all air eliminated. Install eccentric reducers in horizontal piping to permit drainage and eliminate air pockets.

(k) Provide hose end valves at all low points for complete system drainage.

(l) Slope all condensate drip drains, and provide suitable cleanouts on every other change in direction.

(m) Ream the ends of pipes and tubes before installation. Clean the ends of pipes/tubing, and the recesses of fittings to be brazed or soldered. Assemble joints without binding.

(n) Make all threaded pipe joints using a thread paste or Teflon tape applied to the male thread. Use only non-toxic lubricants which are non-injurious to the gasket material, and suitable for the service for which the pipe is to be used.

(o) Place all valves and specialties to permit easy operation and access.

(p) Install gauges and thermostats to permit easy observance.

(q) Where pipe sizes differ from connection sizes of equipment, install reducing fittings close to equipment. Reducing bushings are not permitted.

(r) Regulate and adjust all packing glands, regulating valves and relief valves on completion of the work.

E25.4.19 Piping System Tests

(a) Do not insulate piping systems until completed, perfected, and proven tight.

(b) Should leaks develop in any part of the piping system, remove and replace defective sections, fittings, etc.

(c) Test piping systems and prove tight.

(i) Test piping system in sections as required by the progress of this, and other subcontractors work, and provides all required isolating valves.

(ii) Test all drain and vent piping pneumatically to a pressure of 14 kPa (2 psi) and prove tight for a period of 1 hour.

(iii) Test all domestic water piping hydraulically to a pressure of 518 kPa (75 psi) and prove tight for a period of 4 hours.

(iv) Test all chilled water, heating water, glycol, steam, and steam condensate piping hydraulically to a pressure of 690 kPa (100 psi) and prove tight for a period of 8 hours.

(v) Test all compressed air piping pneumatically to a pressure of 1035 kPa (150 psi) and prove tight for a period of 4 hours.

(vi) For sprinkler, propane and fuel oil piping, test as required to the satisfaction of the Authorities Having Jurisdiction.

E25.4.20 Chemical Treatment

(a) Provide all required equipment, piping, and chemicals, for the flushing, cleaning and degreasing of all piping systems.

(b) Provide all required equipment, piping, and chemicals, for scale, corrosion, algae, and bacteriological control of closed-loop circulating piping system(s).

(c) Where used, glycol shall be Propylene Glycol, and shall be mixed in sufficient quantity to provide 60% propylene glycol / 40% water solution, suitable for -43□C (-45□F).

E25.4.21 Pump and Equipment Connections

(a) Install piping connections to pumps and all other equipment without strain at the pipe connection to this equipment. Where requested by the Contract Administrator, remove the bolts in flanged connections, or disconnect the piping after the installation is complete, to demonstrate that the piping has been so connected.

(b) Equipment Connections:

(i) All fittings N.P.S. 2 and below connecting to equipment: use unions, extra heavy duty pattern, having ground joints, brass seats and diagonal screw.

(ii) Connections to equipment N.P.S. 2½ and above: Flanged, standard weight provided with ring gaskets.

(iii) Install the shut-off valves and flanges/unions, in locations so as to permit the removal of the equipment without disturbing the piping systems.

E25.4.22 Drains

(a) Pipe all discharge from relief valves to a safe location within 6 inches above the finished floor.

(b) Pipe all discharge from drain pans and drain valves to the nearest floor drain or suitable receptacle.

(c) Provide N.P.S. 3/4 gate valves with hose end outlets at strainers, all low points, at pumps, coils and at each piece of equipment.

E25.4.23 Vibration Isolation

(a) Provide Vibration Isolation for all Motor Driven Equipment.

(i) The work under this section shall include furnishing all labor, materials, tools, appliances and equipment, and performing all operations necessary for the complete execution of the installation of vibration isolation devices and systems as shown, detailed, and/or scheduled on the drawing and/or specified in this section of the specifications. This work in general shall include but not necessarily be limited to the following:

(b) System Design:

(i) All motor driven mechanical equipment shall be isolated from the building structure by means of vibration isolators.

(ii) All piping connected to isolated equipment shall be supported on a minimum of the first three support points by spring hangers or.

(iii) All ductwork connected to isolated equipment shall be isolated using flexible duct connectors.

(iv) The isolation materials manufacturer shall be responsible for the proper selection of isolators to accomplish the specified minimum static deflections, for all isolators, based on the actual weight distribution of the equipment and pipe to be isolated, and the piping layout.

(v) It is a requirement of this Specification that the Mechanical equipment be designed and installed so that the average noise criteria curves as outlined in the latest edition of the ASHRAE guide for this type of project are not

exceeded. Where objectionable noise or vibration is encountered, as determined by the Contract Administrator, make necessary tests, change and provide additional equipment as may be required, without extra charge.

(vi) Give consideration to side loading of equipment when calculating maximum loads on isolators; provide pairs of side snubbers and/or restraining springs where side torque or thrust may develop. When properly adjusted, the equipment shall be level when operating.

(vii) Provide all spring isolators with height and levelling adjustment and set on neoprene anti-sound pads 6 mm (1/4") or thicker. Do not use sponge rubber for side snubbers.

(viii) All hardware shall be corrosion resistant.

E25.4.24 Hangers and Supports

(a) Hanger rods may be attached to beam or joist clamps, brackets, or concrete inserts. Do not weld to structural steel unless the Contract Administrator's approval is given.

(b) Neatly and securely hang from the structure or support all services and equipment. Do not hang Services and Equipment from other services.

(c) Hoisting and placing of mechanical equipment shall be the responsibility of the subcontractor providing the equipment.

(d) Provide adjustable clevis type hangers and horizontal trapeze style supports with redi-rod and angle iron.

(e) On copper piping, provide copper plated type hanger or separate piping from hanger with an integrated plastic coating.

(f) Provide oversized hangers to pass over insulation on all insulated water piping. Use insulation saddles to protect insulation.

(g) All hangers in areas with water usage or high humidity shall be stainless steel. All hangers and rod in other areas shall be hot dipped galvanized.

(h) All exterior pad mounted mechanical equipment shall be located a minimum of 3 feet above grade.

(i) Mechanical Equipment and piping shall be installed in a manner and location that allows regular maintenance without affecting the normal path of travel of the busses.

(i) Roof Mounted Fans and Air Systems permitted. Roof mounted ducts not permitted.

(ii) Catwalks permitted.

(iii) Requirement for scissor lifts that block bus or foot travel is not permitted.

(iv) Floor Drainage System Oil and Grit Separators shall be located in spaces such as column aisleways to allow regular maintenance without encroaching on bus parking/travel.

(v) No switchgear or standpipes in garage area.

E25.4.25 Fire Stopping

(a) Fire Stop Materials such as fire stopping and/or intumescent donuts shall be provided at all penetrations through fire and smoke separations.

(b) Fire Stop Materials shall be as approved by the Authorities Having Jurisdiction.

(c) Fire Stop Material installation shall be as per Manufacturer’s recommendations.

E25.4.26 Thermal Insulation

(a) Insulation thicknesses shall meet the most stringent minimum requirements of the National Energy Code (NECB), ASHRAE 90.1, and any additional requirements for LEED® Certification.

(b) Definitions

(i) The word "exposed" where used in this section means any work which is not concealed in walls, shafts, cavities, ceilings or crawlspaces. Work behind doors, in closets or cupboards, or under counters is considered exposed. Work in Mechanical and Boiler Rooms is considered exposed.

(ii) The term 'cold piping' refers to the following systems: Chilled Water, Well/Ground Water, Domestic Cold Water, Plumbing Vents, and Condensate Drip Drains.

(iii) The term 'hot piping' refers to Domestic Hot Water Supply and Recirc piping, Tempered Water Supply and Recirc piping, High Temperature Domestic Hot Water Supply and Recirc piping, Steam and Steam Condensate piping, Glycol Supply and Return piping, and Heating Water Supply and Return piping.

(c) Pre-Molded Pipe Insulation for Cold Piping

(i) Provide sectional fibreglass pipe insulation in pre-molded sections 900 mm (36") long; split and ready for application; with a maximum "K" factor of 0.035 at 24ºC (75ºF) mean temperature; and be capable of use on service from -40ºC to 260ºC (-40ºF to 500ºF); and with factory applied vapour seal jacket of foil craft laminate with reinforcing of open mesh glass fibre.

(d) Pre-Molded Pipe Insulation For Hot Piping

(i) Provide sectional fibreglass pipe insulation in pre-molded sections 900 mm (36") long; split and ready for application; with a maximum "K" factor of 0.035 at 24ºC (75ºF) mean temperature; and be capable of use on service from -40ºC to 260oC (-40ºF to 500ºF); and with factory applied vapour all service jacket of paper with reinforcing of open mesh glass fibre.

(e) Insulation for Ductwork

(i) General
i. Thickness to suit most stringent requirement of NECB or ASHRAE 90.1, but no less than 25mm (1”) thick or as indicated below.

(ii) Exposed rectangular:
i. Minimum 48 kg/m3 (3.0 lbs/ft3) density, foil faced fibreglass board.

(iii) Concealed rectangular:
i. 48 kg/m3 (3.0 lbs/ft3) density, foil faced fibreglass board; or
ii. 38 mm (1.5") thick, 12 kg/m3 (0.75 lbs/ft3) density, flexible fibreglass blanket with open mesh, glass fibre reinforced, foil facing.

(iv) Round ductwork:
i. 38 mm (1.5") thick, 12 kg/m3 (0.75 lbs/ft3) density, flexible fibreglass blanket with open mesh, glass fibre reinforced, foil facing.

(v) Ductwork handling outdoor air:
i. 48 kg/m3 (3.0 lbs/ft3) density, foil faced fibreglass board.

(f) Insulation for Equipment

(i) Water meters, roof drain bodies, domestic cold water booster pumps, and chilled water pumps:
i. Closed cell, flexible elastomeric rubber, adhesive securement.

(ii) Shell and Tube Heat Exchangers:
i. 50 mm (2") thick, 48 kg/m3 (3.0 lbs./ft3) density, fibreglass board.

(g) Miscellaneous Applications

(i) Provide 'Trap-Wrap' or equal insulation on all P-traps on all Lavatories, whether noted as handicap accessible or not.

(ii) Refrigerant Systems:
i. Pre-formed, 12 mm (1/2") thick, closed cell flexible elastomeric rubber, Armaflex or Imcolock, pipe insulation.

(h) Finishes

(i) Piping (concealed):
i. Factory applied all service jackets with matching white tape.

(ii) Piping (exposed):
  i. PVC with fitting covers. White.
  ii. In wet and harsh locations, provide natural aluminum non-bitumen heavy duty (15.0 mils) adhesive insulation jacket, stainless steel or aluminum jacket.

(iii) Ductwork (concealed):
  i. Factory applied jacket.

(iv) Ductwork (exposed):
  i. Natural aluminum non-bitumen heavy duty (15.0 mils) adhesive insulation jacket.

(v) Ductwork (exposed outdoors):
  i. Not Permitted

(vi) Water meters and pump casings:
  i. factory applied jacket.

(vii) Roof Drain Bodies (exposed):
  i. 170 g/m2 (6 oz/yd2) U.L. labeled canvas.

(viii) Roof Drain Bodies (concealed):
  i. factory applied jacket.

(ix) Shell and Tube Heat Exchangers:
  i. 170 g/m2 (6 oz/yd2) U.L. labeled canvas.

(x) Refrigerant Piping:
  i. none.

(i) Insulation – Installation

(i) Apply insulation at a temperature of approximately 18°C (65°F) over clean, dry surfaces. Butt adjoining sections of insulation firmly together with the longitudinal seam of the jacket located on the bottom half of the pipe.

(ii) On cold piping, insulate and finish all valves, fittings and flanges in the same manner and same thickness as the piping. Use mitered sections of the specified pipe covering.

(iii) On hot piping, do not insulate valves, unions and flanges, and where concealed, do not insulate any fittings - straight runs of pipe only.

(iv) For cold piping, seal longitudinal lap joints with suitable vapour barrier adhesive. Cover all joints with foil faced self-adhesive tape.

(v) For hot piping, seal longitudinal lap joints with a suitable adhesive/cement capable of withstanding the service temperature. Cover butt joints with a strip of the same material as the jacket, and cement as required.

(vi) Concealed insulated items require no further finish than provided in factory applied jacket.

(vii) All adhesives and finishes: Fire retardant or fire resistant when dry, and acceptable to the Authorities Having Jurisdiction.

(viii) For cold piping, seal end joints and perforations with factory furnished 100 mm (4") wide vapour barrier strips applied with the same adhesives and cements as previously specified.

(ix) Seal valves, fittings and flanges on cold piping in a manner as specified for end joints.

(x) On all cold piping where oversized hangers are used: Protect insulation with a sheet metal saddle installed over the vapour barrier. For piping N.P.S. 1.5" and larger, provide a section of rigid insulation or non-compressible material under the vapour barrier, the same length as the saddle.

(xi) Ductwork
  i. Do not insulate ductwork prior to duct sealant being applied.
  ii. Exposed rectangular ductwork: Impale fibreglass board on weld pins and speed washers 300 mm (12") o.c. with a minimum of two rows per side on any side greater than 300 mm (12"). Cut pins flush with surface

of insulation and cover with foil faced tape. Cover all joints with foil faced adhesive tape.

E25.4.27 Identification

(a) Concealed ductwork and exposed round: Apply flexible blanket insulation with an approved adhesive brushed on in 100 mm (4") wide strips 300 mm (12") o.c. and at all joints. Seal all joints and perforations with foil faced adhesive tape.

(b) Where interior lined ductwork is required to be insulated, the thickness of the liner may be deducted from the total thickness of the exterior insulation.

(c) All equipment, including motors shall come with proper nameplates affixed thereto, showing the manufacturer, make, model, size, serial number, horsepower, voltage, cycles, and all other pertinent data usually provided.

(d) Identify all new equipment, panels and controls with lamacoid nameplates indicating Identification Name and Number.

(e) Identify all new piping and ductwork with direction-of-flow-arrows and service.

(f) Identify all new valves with brass or lamacoid numbered tags.

(g) Provide Special Signage as required.

(h) All valve tags, identification, and nameplates shall be in accordance with the City of Winnipeg Transit Standards. Obtain the standards prior to preparation of shop drawings or samples.

E25.4.28 Mechanical Systems Clean-up

(a) Maintain the Worksite in a condition of General Cleanliness and Tidiness.

(b) Neatly store all materials, and clean up refuse on a regular basis.

(c) Protect and maintain all work until the project has been completed and turned over to the City.

(d) At the completion of the project, leave all systems in full operation, the exterior of all new and renovated systems clean, and the work areas cleaned to the satisfaction of the Contract Administrator and City.

(e) The City reserves the right to inspect the Mechanical Systems to determine the effectiveness of the cleaning. Where cleaning is deemed to be unacceptable, the cleaning shall be re-done at no extra charge to the City.

E25.4.29 Safety Device Testing

(a) Make complete inspections of all safety devices such as: back flow preventers, fire extinguishers, hose cabinets; freeze protection devices; fire dampers, smoke dampers, fire stops, and the like to ensure:

(i) That safety devices are complete in accordance with the specifications and Manufacturer's recommendations.

(ii) That the safety devices are connected and operating according to all local regulations and appropriate access is provided.

(b) On completion of the inspections, provide letters and/or certificates, confirming that inspections have been completed. Insert in each Operation & Maintenance Manual.

E25.4.30 Start-up and Commissioning shall include:

(a) LEED® Fundamental and Enhanced Commissioning

(b) Pressure Testing for piping

(c) Start-up, including Factory Representative

(d) Pipe Cleaning and Chemical Treatment

(i) Clean and Degrease all Piping

(ii) Provide complete Chemical Charge

(e) Measurements, adjustments and balancing.

(i) Air balancing is required on all HVAC equipment, and shall conform to ASHRAE Standard 111, SMACNA'S HVAC Systems, Testing, Adjusting and Balancing 2nd Edition.

(ii) After completion of air balancing, mechanically fix the adjusted dampers by securing dampers to prevent tampering or movement.

(f) Load Testing

(g) Operator Training (Include first year operation assistance and operator training)

(h) O & M Manuals, As-built Drawings, and Spare Parts

(i) Furnish Certificates confirming that the work has been done to the satisfaction of the Authority Having Jurisdiction.

E25.4.31 Special Tools and Spare Parts

(a) Prepare a List of Recommended Spare Parts including a list of all Filter types, locations, etc.

(b) Provide enough Spare Parts for a minimum of 1 year of operation.

(c) Provide spare parts as follows:

(i) One set of drive belts for each piece of machinery.

(ii) All required filters, of any size or type used on the project, such that any unit containing filters can be serviced with a complete replacement.

(iii) One set of pump seals for each pump.

(iv) One casing joint gasket for each size of pump.

(v) One head gasket for each Shell and Tube Heat Exchanger.

(vi) One glass for each gauge glass.

(vii) One cartridge for each thermostatic mixing valve.

(viii) Two screens for each size of strainer.

(ix) One spare rim gasket for each Hydraulic Filter Housing Installed.

(d) Identify spare parts containers as to contents and replacement parts number.

(e) Provide one set of all specialized tools required to service equipment as recommended by the Manufacturers.

E25.4.32 Instructions to the City

(a) Documentation and System(s) Acceptance

(i) The Contractor shall prepare a suitable document to be signed by the City or his Contract Administrator, confirming:

(ii) The City has received satisfactory instruction in the operation and maintenance of all equipment and systems.

(iii) The Operation and maintenance manuals have been received and reviewed by the City.

(iv) The "As-Built" drawings have been received and reviewed by the City.

(v) Specified spare parts, components, keys, removable handles, tools and the like, have been accepted by the City.

(vi) Prepare a suitable list/sign-off sheet to indicate the instructions and materials have been provided

(vii) List shall include all Systems.

(viii) List shall include all Materials.

(ix) List shall include spaces for Sign-off Names and Dates for the City's Contract Administrator.

(b) Instruct the City in all aspects of the operation of the systems and equipment.

(c) Arrange and pay for the services of Manufacturers' Representatives required for the instruction on specialized portions of the installation.

(d) Assemble four copies of the final Operation and Maintenance Manuals in three ring binders with index tabs, and present to the City.

(e) Present all copies of the Operation and Maintenance Manuals to the Contract Administrator for review. The Contract Administrator will review the manuals and return them with comments. The subcontractor shall make all requested changes. This process shall continue until the Manuals are deemed complete by the Contract Administrator. The subcontractor shall turn over the completed manuals to the City.

(f) Operation and Maintenance Manuals shall contain the following:

(i) The subcontractors and suppliers names and telephone numbers,

(ii) A complete set of reviewed shop drawings,

(iii) Brochures,

(iv) Data sheets,

(v) Operating, maintenance, and lubricating instructions,

(vi) Valve charts,

(vii) Wiring diagrams,

(viii) Air and water testing and balance reports,

(ix) Controls ‘As-Built’ shop drawings,

(x) Commissioning information,

(xi) Warrantee certificates.

E25.4.33 Warranties

(a) No certificate issued, payment made, or partial or entire use of the system(s) by the City, shall be construed as acceptance of defective work or material.

(b) Include copies of all warranty and guaranty certificates and declarations in the Operating and Maintenance Manuals, in the appropriate sections.

(c) Provide a certificate or declaration indicating the warranty and conditions.

(d) Warranty satisfactory operation of all work and equipment installed under this contract. Repair or replace at no charge to the City, all items which fail or prove to be defective within the Warranty period, provided that the failure is not due to improper usage by the City. Make good all damages incurred as a result of the failure and of the repair of the system(s).

(e) The warranty shall be for all parts and labor. Do not expect any participation from the City's personnel in the correction of warranty related work.

(f) For systems, equipment and components which are used continuously throughout the year, the normal warranty period shall be one calendar year from the date of Substantial Completion. For seasonal equipment, components and systems which are not normally used continuously throughout the year, the warranty period shall include at least one full season of satisfactory operation.

(g) When equipment or systems are put into use subsequent to the acceptance of the building, or a portion of the building, the warranty period for seasonally used equipment and systems shall be deemed to commence from the date of satisfactory operation, not from the date of final acceptance by the City.

(h) The City retains the right to demand, and to receive, an extension of the original construction warranty for any equipment, component or system which consistently fails to perform, or which requires repeated repair or adjustment.

(i) Wherever manufacturer's warranties in excess of the Contractor's warranty are provided, furnish the City with copies of the Certificates, dated and acknowledged, and inserted in the Operation and Maintenance Manuals. The Contractor’s Warranty shall include a list of the Manufacturer's extended warranties.

(j) Warranty work shall be carried out within a reasonable time period following the reporting of the problem. Should the repair time for any failed component be unreasonably long, as determined by the City, make alternate arrangements to have a temporary replacement component made available until such time that the original component is repaired and re-installed. There shall be no additional cost to the City for any temporary replacement component or for any labor required to implement the work.

E25.4.34 Completion

(a) The Contractor shall be aware that it is the Contract Administrator's intention to withhold recommendations for payment of progress claims totaling more than 90% of the mechanical contract until the project is declared Substantially Complete.

(b) Substantial Completion

(i) The project will be ready for a Substantial Completion inspection only when it is ready for the City to occupy and utilize the building for its intended purpose.

(ii) At Substantial Completion, the City will recognize that some deficiencies may still exist.

(iii) In preparation for the inspection to determine Substantial Completion for all or a portion of the project, the Contractor shall ensure and declare in writing that:

i. Except for seasonal deficiencies, the Start-up and Verification of the Commissioning Process has been completed, and all systems are fully functional.
ii. All systems and equipment have been cleaned.
iii. All systems and equipment have been identified and labelled.
iv. The preliminary As-built Drawings have been submitted for review.
v. One set of preliminary Operation and Maintenance Manuals have been submitted for review.
vi. One copy of the preliminary Balancing Report has been submitted for review.
vii. Instructions to the City's Representative have been given.
viii. Maintenance Materials and Spare Parts have been provided.
ix. When the Contractor is satisfied that the entire project is completed, and after making his own inspection, he shall apply, in writing, to the Contract Administrator, for an inspection to determine if the project can be deemed to be Substantially Complete.
x. In the letter of request, a date shall be specified upon which the project can be delivered and be Substantially Complete.
xi. During the inspection, a deficiency list will be compiled and a report will be issued. These deficiencies shall be corrected or completed in a satisfactory and timely manner.
xii. Based on the inspection report, the City will retain a sum of money, sufficient in his estimation to cover the cost of completing the deficiencies.

(c) Total Completion

(i) When the Contractor has determined that the deficiencies noted during the Substantial Completion inspection have been completed or corrected, he shall apply, in writing, to the Contract Administrator, for a final inspection to determine if the project can be deemed to Totally Complete.

(ii) In the letter of request, a date shall be specified upon which the project can be delivered and be Totally Complete.

(iii) In preparation for the inspection to determine Total Completion for all or a portion of the project, the Contractor shall ensure and declare in writing that:

i. All aspects of the Commissioning Process have been completed.
ii. The final Record and As-Constructed drawings have been submitted, reviewed and accepted.
iii. The final Operation and Maintenance Manuals have been submitted, reviewed and accepted.
iv. The final Balancing Reports have been submitted, reviewed and

accepted.

v. The deficiencies noted during the Substantial Completion inspection have been corrected or completed.

(iv) During the inspection, a deficiency list will be compiled and a report will be issued. These deficiencies shall be corrected or completed in a satisfactory and timely manner.

(v) Based on the inspection report, the City will retain a sum of money, sufficient in his estimation to cover the cost of completing the deficiencies.

(vi) Final Payment will only be made after the project has been determined to be Totally Complete, with all deficiencies satisfactorily corrected.

E25.5 General Building Description

E25.5.1 Refer to the Architectural Information provided with this RFP, and modify as required to suit the design-build Proposal.

(a) The New Building is expected to be single-storey.

E25.5.2 The New Building will be described as being 'Building FRG' on the Site.

E25.5.3 The New Building is expected to qualify for LEED® Silver Certification.

E25.5.4 The New Building is expected to operate similar to the existing Transit Operation(s).

E25.5.5 The Interior Fit-up requires no anticipated addition to the existing building structure. Scope of work for this portion will be to renovate the mechanical systems to suit the new purpose.

E25.6 Plumbing

E25.6.1 System shall contribute to requirements for LEED® Silver Certification as required

(a) A Water Use Reduction Credit is expected for low-flow fixtures.

(b) Credit(s) may be available for rainwater harvesting. All work required to achieve this credit is the responsibility of the Contractor.

E25.6.2 Room Data sheets have been prepared as comprehensive data and included in an alternate area of this Specification.

(a) The Room Data Sheets are to be read in conjunction with the information within this Mechanical Specification Section. Requirements of both the Room Data Sheets and these Mechanical Performance Specifications shall be considered complimentary and all conditions met.

E25.6.3 Provide necessary humidification and/or dehumidification as required for occupancy use.

E25.6.4 Plumbing Fixtures may be Water Saving Type, including:

(a) Ultra-low Water Usage

(b) Lavs with electronic metering controls with tempered water mixing valves

(c) Low Flush Toilets (dual-flush not acceptable)

(d) Automatic Electronic Flush with override button for urinals and public water closets

(e) Waterless Urinals are not permitted.

E25.6.5 In addition to Plumbing Fixtures and trim for Standard Washrooms and Change rooms, provide:

(a) Commercial grade fixtures

(b) All plumbing fixtures shall have service valves for maintenance purposes.

(c) Hose Bibbs (both interior and exterior) where shown or deemed required for regular maintenance. Exterior hose-bibs shall be lockable.

(d) Floor Drains for Mechanical Rooms and Locker/Change Rooms

(e) Kitchenette and Bar Sinks for Lunchrooms, Meeting Rooms, First Aid, and other miscellaneous areas.

(f) Mop Sinks with hose end spouts and vacuum breakers

(g) Concealed arm carriers with foot support for all wall mounted lavatories.

(h) Institutional Style Shower Heads, or Handicap Style Shower Wands where required

(i) Pressure balance, scald guard devices for all showers

(ii) Vandal Proof Shower Heads

(i) One-piece acrylic or fibreglass shower surrounds c/w dome and light

(j) Drinking Fountains shall be ADA compliant, refrigerated, with S.S. shrouds and bottle filler. Locate drinking fountains as shown on Room Data Sheets where applicable. There shall be a minimum of 2 drinking fountains located within the new addition and separated to minimize walking from any point within the facility or as indicated.

(k) Combination Hot and Cold Water Hose Bibbs shall have 38mm (1-1/2") inlets, a common hose thread outlet suitable for a fire hose, and shall have backflow prevention. Allow for a minimum of 4 interior hose bibs.

(l) Trench Drains shall have Grate Loading Capacities suitable for Highway Traffic capable of withstanding heavy and continuous loads.

(m) Compressed Air Outlets shall be c/w isolation valve, dirt leg, filter, regulator and quick connect.

(n) Roof Drains shall have cast metal bodies and domes.

(o) Roof Hydrants located to a maximum distance of coverage of 100 feet from the perimeter of the roof in all directions

(p) Emergency eyewash and showers shall be tempered water in accordance with ANSI Standards. Locate emergency showers, eyewash stations, and combination shower/eyewash units in accordance with all applicable Codes and Standards, in accordance with good engineering practice, and as required by Winnipeg Transit Health and Safety Officer. Bottle type eyewash stations are not permitted.

E25.6.6 Provide Service Meters as required

(a) Install all metering equipment in accordance with municipal or utility requirements

E25.6.7 Provide Building or zone Backflow Prevention and Local Backflow Prevention as required.

(a) Provide a new incoming water service(s) for domestic water and/or fire water services or extend from the existing services within the facility where available. Where this Contractor elects to extend from the existing service, the additional capacity shall not affect the performance of the existing system. The extension shall not affect ongoing operations during installation. New services shall be metered as required and meet all municipal requirements.

E25.6.8 Natural Gas:

(a) Natural gas piping shall be schedule 40 steel, with screwed or welded joints and fittings as per CSA B149.1.

(b) New natural gas pipe to serve the addition and/or renovation shall be extended from the existing meter. The existing service is 150 mm (6") at 138 kPa (20 psi) and the current connected load is approximately 2410 cmh (85,000 cfh) operating at approximately 992 cmh (35,000 cfh) peak capacity. It is anticipated that the existing service and meter are sufficient for the new addition, provide downstream PRV, valves, etc. as required to serve the new addition. Coordinate and pay for all new service requirements with the utility where required.

(c) Provide natural gas piping to all gas-fired Equipment

(d) Gas-fired appliances are preferred over Electric.

E25.6.9 Roof Drainage:

(a) Provide Roof Drains on Flat Roofs, with interior Rain Water Leaders.

(b) Consider rainwater harvesting.

(c) Control flow roof drainage not permitted. Provide site storage where required.

(d) Provide a new building storm sewer connection to the storm service to serve the addition.

(e) Roof drainage for the renovated areas are anticipated to remain in place unless required to be relocated to suit the Contractor's layout. Adjust roof slopes as required.

E25.6.10 A Domestic Hot Water System will be required, c/w recirculation.

E25.6.11 Provide weeping Tile Sump Pit(s) with Duplex Pumps.

(a) Sump Pits to be c/w High Level Alarm (separate power circuit)

E25.6.12 Compressed Air Systems for Plant and Breathing Air use are existing. New compressed air for the Interior Fit-up shall be provided as required. The existing plants are anticipated to accommodate the additional connections required for the new addition, however this Contractor shall be responsible to confirm that any additional load meets the requirements of the project and provide necessary upgrades to the compressed air plant(s) as required for complete and operational systems.

(a) Compressed air for breathing air systems shall meet the requirements of CSA Z180.1-13.

(b) Plant Compressed air for process air is required to be distributed to satisfy the pressure requirement shown on the Room Data Sheets. Provide a high pressure loop (1000 kPa/145 psi) and a low pressure loop (758 kPa/110 psi) as required.

(i) High pressure loop preferred product is Trans Air, or approved equivalent upon review by the City.

(c) System primary distribution pipe for each plant compressed air system in the new addition shall be full size for the entire distribution and looped with sectional isolation valves located to limit the potential downtime for maintenance or future expansion to a maximum of 4 bays.

(d) Breathing compressed air main distribution shall be full sized up to the last connection point to serve the new addition with 120% of the design capacity to accommodate future connections. Maximum distance from last connection point to main distribution shall be limited to 10m (33 feet).

(e) Connect to compressed air generation directly downstream of existing receiver tank(s) with dedicated feed mains to serve new addition for each pressure required.

(f) Connect to breathing air compressed air system directly downstream of existing packaged air purification system with a dedicated feed main to serve the new addition.

E25.6.13 Minimum 3/4" Compressed Air Pipe sizing (including outlet drops) in all rooms for any system (High pressure, low pressure, breathing air).

(a) High and low pressure plant air loop pipe and drops shall be extruded aluminum suitable for the purpose to match existing distribution. Colour of pipe to be confirmed with the City.

E25.6.14 Bulk Fluids

(a) New 15W-30 engine oil and lubrication grease systems shall be located in the addition to serve the existing distribution and the new distribution. The new location within addition shall be directly adjacent to the existing bus garage to serve as a central location between the new distribution and the existing distribution to reduce overall system pump pressure. Systems shall connect the new addition and the existing system as required to equalize pressure drop between the two systems.

(b) Provide a minimum of 2 double-wall containment tanks for each 15W-30 engine oil and lubrication grease systems. Volume of systems shall be suitable to allow for a minimum of 2 weeks between bulk deliveries. Provide new tank monitoring to match

existing and provide all necessary components, wiring, etc. for remote interconnection with the existing fluids monitoring system.

(c) Synthetic engine oil, windshield washer fluid, and antifreeze systems shall be expanded from the existing system as required to serve the new addition. Provide upgrade to pumps, etc. as required to satisfy increased pressure requirements and ensure a complete and operational system.

(d) Pumps for new systems as required

(e) Tanks and Pumps shall be the same as existing in order to retain maintenance continuity. Confirm exact makes, models and sizes on site.

E25.6.15 Provide new sanitary building sewer connection to the exterior sanitary sewer to serve the new addition.

E25.7 Fire Protection

E25.7.1 The Entire Building Addition and renovated areas shall be sprinklered.

E25.7.2 A full wet system is expected, with local dry-pipe heads as required to prevent freezing at small individual locations.

E25.7.3 The Sprinkler System shall be Hydraulically Designed by the Contractor, and Sealed and Signed by a Professional Engineer.

E25.7.4 Fire Protection piping shall be metallic, as permitted by code, excluding copper which is not permitted.

E25.7.5 Sprinkler heads shall be recessed type where exposed to the public in finished areas, and upright type where there are no finished ceilings.

E25.7.6 Sprinkler heads shall be chrome plated where exposed to the public in finished areas, and brass in unfinished areas.

E25.7.7 Sprinkler heads shall be installed in even rows and columns. They shall be centered both ways in T-bar ceilings.

E25.7.8 Hand held fire extinguishers shall be provided as required, and shall be 5 lb. ABC dry chemical type. Wall-mounted Cabinets and Recessed Cabinets are to be provided in key areas. Locations and styles shall be clearly marked on floor plans.

E25.7.9 Where dry sprinkler systems are used, they shall be charged and maintained with nitrogen. Compressed air is not permitted.

E25.8 Heating System

E25.8.1 Systems shall contribute to achieve LEED® Silver certification as required

(a) Credits may be available for Low Energy Use due to high-efficiency combustion.

(b) Credit(s) may be available for Energy Recovering Ventilators.

E25.8.2 Room Data sheets have been prepared as comprehensive data and included in an alternate area of this Specification.

(a) The Room Data Sheets are to be read in conjunction with the information within this Mechanical Specification Section. Requirements of both the Room Data Sheets and these Mechanical Performance Specifications shall be considered complimentary and all conditions met.

E25.8.3 Gas-fired appliances are preferred over Electric. Electric resistance heating shall not be permitted.

E25.8.4 Direct Fired make-up units are preferred for the Garage Addition. For renovated areas for the Interior Fit-up, direct fired make-up air units are not permitted. As an alternative, provide glycol based systems served from boiled water. Provide boilers as required.

(a) Energy Conservation must be investigated.

E25.8.5 Snow melting systems and floor warming systems shall be in-slab hydronic type as required and shall have 2 distinct zones inside and outside of bus exit doors.

E25.9 Ventilating and Cooling

E25.9.1 Allow for LEED® Silver Accreditation as required

(a) A Credit for Building Ventilation Flush may be available.

(b) Credit(s) may be available for Energy Recovering Ventilators.

E25.9.2 Design to ASHRAE 62 Ventilation Requirements, and provide calculation chart within the Construction Documents.

E25.9.3 Room Data sheets have been prepared as comprehensive data and included in Appendix H and Appendix I.

(a) The Room Data Sheets are to be read in conjunction with the information within this Mechanical Specification Section. Requirements of both the Room Data Sheets and these Mechanical Specifications shall be met.

(b) Design to ASHRAE 55 for Thermal Comfort for the Interior Fit-up.

(c) Where dedicated exhaust is indicated in the RDS, it shall be independent of all other exhaust systems. General exhaust is permitted to be connected and exhausted through an total energy recovery device for energy conservation.

(d) CONFIDENTIAL – Refer to same clause number in Confidential Specifications.

(e) Existing Heating, Ventilation, and Exhaust systems within the boundaries of the renovation for the Interior Fit-up and serving the renovated areas shall be removed or recommissioned for reuse where appropriate. Identify existing openings within structure, walls, etc. that are not being reused for repair by general trades. Systems that are within the boundary of the renovation serving adjacent areas shall remain. Relocate existing services as required to accommodate the new program.

(f) General office and administration areas shall have a minimum of one temperature control for each 81 square meters (900 square feet) for open office areas (cubicles or desks).

(g) General office and administration areas shall have a minimum of one temperature control for a maximum of 3 private or enclosed office spaces.

E25.9.4 Scope of Work

(a) Provide a Computerized Control System for monitoring and controlling of all space temperature and humidity functions, control of all RTU's, VRF, FCU's and HRV's including CO control of HRV's, and control of Heating system including terminal heat transfer units.

(i) Provide complete integration with Existing Johnson/Metasys Building Control System, and with the City of Winnipeg Pegasus access system.

(b) Provide labour, materials, equipment and services necessary for, and incidental to the supply and installation of the controls systems as required and as described in this specification, so as to leave the City with a complete and fully functioning system.

(i) Provide both office and field engineering to develop a complete and comprehensive control system, based on the outline specifications and system schematics.

(c) In general terms, the scope of work comprises the provision of a complete DDC system, integrated with local electric/electronic controls, and allowing for automatic functioning, manual override, and monitoring of all new equipment.

E25.9.5 Shop Drawings

(a) Submit shop drawings consisting of product and sizing data for all equipment and components, and proposed control software and sequences including, but not limited to:

(i) Schematic diagrams showing the system architecture;
(ii) System schematic diagrams and wiring layouts;
(iii) Sensors and control components;
(iv) Valves, dampers and actuators;
(v) Air Compressor/Dryer;
(vi) Miscellaneous components;
(vii) Control panel locations and layout;
(viii) List of packaged software;
(ix) Detailed written sequences of operation;

(b) Clearly indicate the programming sequences.
(i) Logic flow charts;
(ii) Lists of menus and alarms;
(iii) Sample menu and alarm formats.

(c) Submit with the shop drawings a Project Test Plan, indicating how the installed system will be tested and verified to be found operating in accordance with the plans and specifications. Include a sample of the trend logs and check sheets to be submitted.

(d) The Contractor shall provide two copies of the preliminary shop drawings directly to the Contract Administrator office for review and comment.
(i) Allow for technically qualified personnel to attend meetings at the Contract Administrator's office to discuss and clarify the preliminary shop drawings.
(ii) The review of the shop drawings is for the sole purpose of ascertaining conformance with the general design concept. The review shall not mean approval of the detailed design inherent in the equipment, the responsibility for which shall remain with the Contractor. The review shall not relieve the Contractor of the responsibility to meet the requirements of the contract documents. The Contractor shall remain responsible for confirming and correlating the dimensions on the jobsite, and for information that pertains to the fabrication process, construction techniques, and installation details, and for coordinating the work with the other contractors and subcontractors.

E25.9.6 Operation and Maintenance Data

(a) Provide detailed operation and maintenance data.

(b) The shop drawings shall be enhanced and revised to 'as-built' status, and shall include the following:
(i) List of all software programs including versions and dates;
(ii) One spare copy of all software on diskette;
(iii) Printed copies of all computer programs;
(iv) Details of adjustments of devices and components;
(v) All information necessary for the operation, maintenance, parts procurement and replacement for each component of the entire system;
(vi) Specific part numbers;
(vii) Complete recommended spare parts inventory list, with lead time and expected frequency of use;
(viii) Instructions and schedules for inspection, cleaning, lubrication and calibration.
(ix) At the completion of the installation, provide one marked-up copy of the Proposal drawings for record purposes. Provide operation and maintenance manuals. Pay all costs associated with the production of the "record" drawings and the manuals. Prior to system acceptance testing, submit the documents to the Contract Administrator for review, and make any requested changes before delivering them to the City.

E25.9.7 Instructions to City of Winnipeg Transit's Representatives

(a) Provide the services of qualified personnel to instruct the City's personnel in the complete operation and maintenance of every aspect of the controls systems, including recalibration of sensors.

(b) Review the operation and maintenance of the systems with the City's maintenance personnel and provide written and/or verbal instructions as required.

(c) Within the scope of the contract, on-site instructions are to be scheduled as follows:

(i) For two full working days (total 16 hours) within one month of Final Acceptance. This may be scheduled as two consecutive days, two non-consecutive days, four half days or other as mutually agreeable to suit both parties.

(ii) Follow up instructions of 3 days during the first year following Final Acceptance. This can be done in conjunction with regularly scheduled maintenance service.

(iii) One additional day following the heating season testing and verification.

E25.9.8 System Acceptance

(a) Complete the system installation, start up, calibration and verification prior to acceptance testing by the City. Submit a letter to the Contract Administrator certifying that the controls have been installed, the software programs have been exercised, and requesting system acceptance. Include all verification data and certificates confirming that the work has been installed to the satisfaction of the authorities having jurisdiction.

(b) Acceptance testing will commence on a mutually agreeable time within 14 calendar days of request.

(c) At the time of acceptance testing, turn over to the City the revised Operation and Maintenance data and a pre-paid Warranty and Service Agreement. The system will not be accepted without complete documentation.

(d) Provide operating and maintenance personnel, and tools and material, as required to operate and adjust the system(s), and coordinate with the Contract Administrator, to completely test and verify the operation of the system(s). It is expected that this testing will take place during the cooling season. Allow for additional testing and verification at the beginning of the heating season.

(e) When the system has been deemed satisfactory for beneficial use, the warranty period will commence.

E25.9.9 Warranty/Service Agreement

(a) Provide a written warranty, signed and issued to the City, stating that the control systems are warranted against faulty material and/or workmanship for a period of one (1) year from the date of Final Acceptance.

(b) No certificate issued, payment made, or partial or entire use of the systems by the City, shall be construed as acceptance of defective work or materials.

(c) Promptly correct any defects in workmanship or material during the warranty period at no charge to the City, provided that the failure is not due to improper usage by the City. Make good all damages incurred as a result of the failure and of the repairs. When correcting defects and maintaining the system, take precautions to minimize disruption to the tenants.

(d) Provide preventative maintenance at 3 month intervals. Coordinate exact dates and times with the City, to allow for the maintenance personnel to be present. Maintain a log on site, accessible to authorized personnel, of tasks performed at each visit. The City's representative shall sign the log at the time of the visit as evidence that the Warranty Service Agreement is being maintained.

(e) Incorporate system hardware and software modifications, operating parameter changes and set point changes into the Operating and Maintenance manuals. Save database changes on disk for backup.

(f) Implement software upgrades on the anniversaries of the start of the warranty period. Provide all the enhancements offered by the software manufacturer(s).

(g) Use service personnel directly in the employ of the Controls subcontractor to perform service work.

(h) Provide warranty and maintenance service under ‘emergency repair’ service provisions. Third party service or services only during specific working hours is not acceptable.

(i) Provide 'on-site' service for the computer hardware and software.

E25.9.10 Vandal Proof Covers

(a) Provide vandal proof covers (guards) on all wall mounted controllers.

E25.9.11 Piping/Tubing And Power And Control Wiring And Accessories

(a) Control wiring and conduit shall meet or exceed the requirements of C.S.A., U.L.C., the current edition of the Canadian Electrical Code, and all local Code requirements as well as the requirements as specified in Electrical.

(b) All control wiring, regardless of voltage, shall be installed in a continuous, dedicated system of rigid metal tubing (EMT). Maximum lengths of 7 feet of flexible metal conduit will be accepted for final connections to devices and equipment.

E25.9.12 General Software Requirements

(a) The controls subcontractor performing the supervisory controller installation shall confirm that all devices specified are able to communicate to the proposed devices using the BACnet PIC statement and then supply documentation such that all devices supplied will communicate to each other as required for proper operation of the system.

(b) System Software shall include Password Protection, Multi-level Access Regulation, Interactive Graphics, adjustable setpoints, Run-time Accumulation, Alarm Monitoring and annunciation, Auto-dialer/Modem, and Trend Logging.

(c) Communication shall be password protected with 3 levels:

(i) Level 1 (operator level) shall allow interface to the system for password access, alarm handling, point addressing, manual commands and display of statistical data.

(ii) Level 2 (program level) shall allow operation for command control and definition of energy management parameters.

(iii) Level 3 (configuration level) shall allow database entry and modification.

(d) Point functions and alarm messages shall have English language descriptions.

(e) Each of the controlled systems shall operate independently (i.e.: calls for heat/cool/fan for one system will not affect another system)

(f) Provide a minimum of one O/A temperature sensor.

(g) Provide software for start/stop optimization.

(h) Provide auto restart after power failures.

(i) Provide system viewing and programmable trending analysis as follows:

(i) The status of all setpoints and the readout of all sensors shall be polled every 2 minutes (adjustable) in order to provide a snap-shot view or a trend log of the systems. Status will be monitored without the need to have the Operator’s terminal running;

(ii) Automatic printout will be available for each snap-shot or trend log on an adjustable time schedule;

(iii) Snap-shot views shall be available for each system, providing complete information regarding setpoints and readouts.

(iv) Trend logs shall be available for each controlled point, indicating setpoint and readout.

(j) Provide run time accumulators for all new equipment

(i) Accumulators shall have a range of 0-65,000 hours and shall provide an alarm indication on the operator's terminal at an adjustable trip point selected by the operator.

(ii) Accumulators shall be capable of operation without the operator's terminal being turned on.

(iii) Provide a separate alarm for each accumulator.

(k) Provide alarm monitoring and annunciation as follows:

(i) Alarm functions shall be capable of operation without the operator's terminal being turned on. These alarm conditions shall be immediately annunciated on the local operator terminal and associated alarm printer, or when the terminal is first turned on, if it has been turned off.

(ii) Alarm conditions shall be capable of being deemed 'maintenance' or 'critical' by the Operator. Alarm lists shall be capable of being revised by the Operator.

(iii) Alarm conditions which indicate a serious malfunction of the mechanical systems, which require immediate attention, shall be designated as "Critical Alarms".

(iv) In addition to being annunciated on the local operator terminal, 'critical' alarms shall also initiate the autodial alarm.

(v) Monitor and annunciate alarms for systems, conditions and equipment such as follows:

i. Fan failure (critical);
ii. Heating mode out of nominal range (critical);
iii. Cooling mode out of nominal range (critical);
iv. Low space temperature (critical);
v. High space temperature (critical);
vi. Run time accumulator reached;
vii. Pump failure (critical).

(vi) When the air systems are running, supply air temperatures above 120 deg. F (adjustable) will provide an alarm.

(vii) When the air systems are running, supply air temperatures below 55 deg. F (adjustable) on a call for heat will provide an alarm. Provide adjustable time delay software as required to ensure that false alarms are prevented on initial heating call.

(viii) When the air systems are running, supply air temperatures below 47 deg. F (adjustable) will shut the system down and provide an alarm.

(ix) At any time, when any zone temperature sensor senses temperature below 55 deg. F (adjustable) or above 90 deg. F (adjustable) the DDC system shall signal an alarm. Each sensor shall provide a separate alarm.

(x) When a run time accumulator has reached its setpoint, an alarm shall be signaled. Each accumulator shall provide a separate alarm.

(xi) When a pump is scheduled to be operational, a lack of signal from a current sensing switch will provide an alarm. Provide adjustable time delay software as required to ensure that false alarms are prevented on initial start-up. Each sensor shall provide a separate alarm.

(l) Provide Set Back Thermostats and Spring Wound Timers to override Thermostats.

(m) Ventilation Capacity shall be 1.5 times minimum required for the main garage area and bus service bays. Provide control strategies and equipment suitable for volume reduction to satisfy minimum ventilation requirements while achieving appropriate air distribution and maintaining temperature and pressurization control. Methods may include but are not limited to multiple pieces of equipment, multi-stage and/or variable speed technology, etc...

(i) HOA Controls, including count-down timers, event scheduled timers, and NOX monitoring and CO monitoring, shall be provided in parallel to allow for quiet periods, servicing periods and dispatch periods.

(n) All Controlled equipment shall have the capability of multi-function energizing from such items as count-down timers, event scheduled timers, and NOX monitoring and CO monitoring, controlled in parallel.

E25.9.13 General System Requirements

(a) Generic input/output for Metasys Control.

(b) Controls must be able to interface to MSEA technology on the field device network using either the N2Open or BACnet Protocols.

(c) No LON protocols are to be accepted.

(d) Controls subcontractor to provide commissioning sheets for all points on field devices as well as head end equipment.

(e) Controls subcontractor to communicate with equipment provider to ensure proper field point integration as well as controllability of the equipment, if not package controls.

(f) Controls subcontractor to supply all drawings/graphics/sequence of operations in both a hard and soft copy. Drawings and graphics to be able to be read and modified by City of Winnipeg Staff using Microsoft Visio software.

E26. ELECTRICAL

E26.1 Electrical General Requirements

E26.1.1 General Requirements

(a) Comply with the requirements set out for the Contractor.

E26.1.2 Definitions

(a) Notwithstanding any definition elsewhere in the contract documents, wherever the term "subcontractor" is used in the Electrical outline specifications, it means the firm having a contract with the "Contractor" to perform, supervise and coordinate all work of that particular Division. This subcontractor shall be wholly responsible to the "Contractor" for all work of that Division.

(b) Notwithstanding any definition elsewhere in the contract documents, wherever the term "Provide" is used in relationship to equipment, piping etc., in this Division, it means "Supply, Install and Connect, test, commission and put into working order all materials and necessary equipment, wiring, supports, access panels, etc., as necessary for item or system indicated".

(c) Notwithstanding any definition elsewhere in the contract documents, wherever the term "Inspection Authority" is used in the Electrical outline specifications, agent of any authority having jurisdiction over construction standards associated with any part of electrical work on site.

(d) Notwithstanding any definition elsewhere in the contract documents, wherever the term "Electrical Code" is used in the Electrical outline specifications, it means the Local Code in force at Project location.

(e) Notwithstanding any definition elsewhere in the contract documents, wherever the term "Indicated" is used in the Electrical outline specifications, it means “as shown on contract drawings or noted in Contract Documents”.

E26.1.3 Trade Definitions

(a) All work called for in the outline specifications shall be considered to be within the scope of the Contract, and shall be the responsibility of the Contractor.

(b) Arrangement of Drawings and Specifications into Divisions, Sections, and Trades is arbitrary, with the sole intention of clarifying the scope and content of the work

required to complete the project. The actual division of the work amongst the subcontractors shall be the responsibility of the Contractor, and the actual division of the work between the sub-subcontractors shall be the responsibility of the subcontractors.

(c) The Contractor, at his option and as per his contracts with the subcontractors, may delegate responsibility to the subcontractors for the division of the work.

(d) The subcontractors, at their option and as per their contracts with the sub-subcontractors, may delegate responsibility to the sub-subcontractors for the division of the work.

(e) Electrical outline specifications, and specific but arbitrary responsibility divisions noted in the electrical outline specifications, are not intended to delegate functions nor to delegate work to any specific trade, but may be useful to the Contractor or subcontractor when dividing the work amongst the Trades and subtrades.

(f) In the event of a dispute regarding the responsibilities of the various trades and subtrades, the Contractor and subcontractors may request information or a recommendation from the Contract Administrator. However, the Contractor and subcontractor shall be responsible for determining the final division of work.

E26.1.4 Scope of Work

(a) Provide (Design, Supply, Install, Connect, Start Up and Commission) a 'Design Build' package of electrical systems to provide equipment, wiring, supports, access panels etc. for the proposed building as described herein.

E26.1.5 Electrical Drawings

(a) Provide drawings and book style NMS specifications for the electrical work to convey the scope of work.

E26.1.6 Site Review

(a) Provide review of the subcontractor's work solely for the purpose of determining the general quality of the work.

(b) Provide guidance where required to interpret plans and specifications.

(c) Provide inspection reports and deficiency lists from time to time (a minimum of 1 report per month). All deficiencies shall be cleared up to the satisfaction of the Contract Administrator within a reasonably short time.

E26.1.7 Patents

(a) Pay all royalties and license fees, and defend all suits or claims, for infringement of any patent rights, and save the City and Contract Administrator harmless of loss or annoyance on account of suit, or claims of any kind for violation or infringement of any letters patent or patent rights, by this Contractor or anyone directly or indirectly employed by him, or by reason of the use by him or them of any part, machine, manufacture or composition of matter on the work, in violation or infringement on such letters patent or rights.

E26.1.8 Construction Drawings

(a) Where requested, prepare drawings in conjunction with all trades concerned, showing sleeves and openings for passage through structures, and all inserts, equipment bases, sumps and pits, supports, etc.

E26.1.9 Utility Site Services

(a) Provide all necessary arrangements and coordination with the applicable supply authorities (MB Hydro, MTS/Bell, Shaw Cable, etc.) in order to ensure service availability when required.

(i) Unless instructed otherwise by the Owner, coordinate, arrange, and pay for all utility relocations, terminations and connections as required, complete with all required metering.

(ii) Test all services and provide report(s) as required by the Authorities Having Jurisdiction.

E26.1.10 Codes, Permits, Fees And Inspections

(a) Comply with the most stringent requirements of the latest editions of the applicable C.S.A. standards; NFPA70 and the requirements of the Authorities Having Jurisdiction; Federal, Provincial and Municipal Codes; and the applicable standards of the Underwriters' Association. These codes and regulations constitute an integral part of these specifications.

(b) In case of conflict, the codes take precedence over the Contract Documents. In no instance reduce the standard or scope of work or intent established by the drawings and specifications by applying any of the codes referred to herein.

(c) Before starting any work, submit the required number of copies of Drawings and Specifications to the Authorities for their approval and comments. Comply with any changes requested as part of the contract, but notify the Contract Administrator immediately of such changes, for proper processing of these requirements. Prepare and furnish any additional drawings, details or information as may be required.

(d) Apply for, obtain, and pay for all required permits, licenses, inspections, examinations, and fees.

(e) Arrange for the inspection of all the work by the Authorities Having Jurisdiction over the work. On completion of the work, present to the City the final unconditional certificate of approval of the inspecting authorities. When the Authorities Having Jurisdiction do not normally issue certificates, provide a declaration confirming that the Authorities have inspected and accepted the work.

E26.1.11 Shop Drawings

(a) Provide preliminary information as requested during the Tender and Review Process.

(b) Provide Complete Shop Drawings after award of Contract. Shop Drawings shall include all necessary information for a complete review. Shop Drawings shall be provided in a timely fashion.

(c) Shop Drawings submitted by the Contractor shall contain:

(i) Project Information such as Name and Address

(ii) Contractor Information such as Name, Address, Phone Numbers

(iii) Supplier Information such as Name, Address, Phone Numbers

(iv) A set of Specifications, hardbound, based on the NMS numbering system.

(v) A set of drawings, sealed and signed by an Engineer in Good Standing with APEGM, suitable for Permit Application and Construction.

(vi) All Equipment Information required for the City to assess the suitability such as:

i. Make, Model, Size including schedules where numerous similar items are provided
ii. Physical Data such as: Dimensions, Materials, Weights, Installation Requirements, Installation Clearances
iii. Performance Data such as: Volume, Pressure, Capacity.
iv. Performance Curves (with specified performance clearly marked)
v. Motor Data such as: Horse Power, Voltage/Phases, Efficiency, Wiring and Control Diagrams

(d) Equipment Information may contain standard manufacturer’s brochures, catalogue sheets, schematics, diagrams performance charts, illustrations, etc., but must have:

(i) Information which is not applicable crossed off.

(ii) Available listed options which are being provided clearly marked E25.1.12 Shop Drawing Review

(e) In addition to project identification, date, etc., the form of stamp used in shop drawing review shall contain the following format:

(i) Drawing: Reviewed, Reviewed As Noted, Revise and Re-Submit, Not Reviewed

(f) This review by the Contract Administrator is for the sole purpose of ascertaining conformance with the general design concept.

(g) This review shall not mean that the Contract Administrator approved the detail design inherent in the shop drawings, the responsibility for which shall remain with the subcontractor submitting same, and such review shall not relieve the subcontractor of his responsibility for errors or omissions in the shop drawings, or of his responsibility for meeting all the requirements of the contract documents. The Contractor and subcontractors are responsible for confirming and correlating dimensions at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation, and for coordination of the work of all sub-trades, as well as compliance with codes and inspection authorities such as C.S.A., etc.

(h) Bind one complete set of final shop drawings in each operating and maintenance instruction manual.

(i) Refer to the Architectural General Specifications for additional information.

E26.1.12 Coordination

(a) All subcontractors are expected to co-operate fully with all other subcontractors whenever necessary.

(b) Electrical contractor shall coordinate installation and availability of the new Manitoba Hydro service with Manitoba Hydro team. Coordination shall include but not be limited to:

(i) Attendance of coordination meetings between Manitoba Hydro and Winnipeg Transit / City of Winnipeg.

(ii) Coordination of in-service date with the remainder of the project scope.

(iii) Coordination of Manitoba Hydro service feeder routing throughout the Winnipeg Transit site with Contractor’s trenching.

E26.1.13 Temporary Services

(a) Do not use any of the permanent Electrical systems during construction unless specific written approval is obtained from the City.

(b) The use of permanent facilities for temporary construction service shall not affect, in any way, the commencement date of the warranty period.

(c) If the permanent Electrical systems and/or equipment are used during construction, the equipment and systems shall be cleaned and refurbished as required to bring them back to a new/unused condition.

E26.1.14 Temporary and Trial Usage

(a) The City has the privilege of trial usage of electrical systems, or parts thereof, for the purpose of testing and learning the operational procedures.

(b) Assist in the trial usage over a length of time, as deemed reasonable by the City, at no extra cost, and do not waive any responsibility because of trial usage.

(c) Trial usage shall not be construed as acceptance by the City.

(d) Provide and pay for all testing required on the system components where, in the opinion of the Contract Administrator, Manufacturer's ratings or specified performance is not being achieved.

E26.1.15 Electrical Systems Clean-up:

(a) At the completion of the project, leave all systems in full operation, the exterior of all new and renovated systems clean, and the work areas cleaned to the satisfaction of the City and Occupants.

(b) Clean exposed surfaces of new and renovated electrical equipment, light fixtures, panel boards, control panels, etc.

(c) The level of cleaning shall be consistent with the intended use of the building and the electrical systems.

(d) The City reserves the right to inspect the electrical systems to determine the effectiveness of the cleaning. Where cleaning is deemed to be unacceptable, the cleaning shall be re-done at no extra charge to the City.

E26.1.16 Instructions to City of Winnipeg Transit

(a) Prepare a Suitable List/Sign-off Sheet to indicate the Instructions and Materials provided.

(i) List shall include all Systems.

(ii) List shall include all Materials.

(iii) List shall include spaces for Sign-off Names and Dates for the City's Representative.

(b) Instruct the City's representatives in all aspects of the operation of the systems and equipment.

(c) Arrange and pay for the services of Manufacturers' representatives required for the instruction on specialized portions of the installation.

(d) Present all copies of the Operation and Maintenance Manuals to the City for review. The City will review the manuals and return them with comments. The subcontractor shall make all requested changes. This process shall continue until the Manuals are deemed complete by the City. The subcontractor shall turn over the completed manuals to the City.

(e) Present all copies of the Final As-built Drawings to the City. E25.1.18 Start-up and Commissioning shall include:

(f) LEED® Commissioning

(g) Start-up, including Factory Representative

(h) Load Testing

(i) Operator Training (Include first year operation assistance and operator training)

(j) Operation & Maintenance Manuals, As-built Drawings, and Spare Parts

(k) Furnish Certificates confirming that the work has been done to the satisfaction of the Authority Having Jurisdiction.

E26.1.17 Special Tools and Spare Parts

(a) Prepare a Suitable List/Sign-off Sheet to indicate the Materials provided.

(i) List shall include all Materials.

(ii) List shall include spaces for Sign-off Names and Dates for the Contract Administrator.

(b) Provide spare parts as follows:

(i) Circuit breakers and fuse as indicated in panelboard schedules and single line drawings.

(ii) One (1) Motor starter of each type10% spare luminaires of each type and rating (a minimum of two); and

(iii) Other systems as indicated.

(c) Identify spare parts containers as to contents and replacement parts number.

(d) Provide one set of all specialized tools required to service equipment as recommended by the Manufacturers.

E26.1.18 Warranties

(a) No certificate issued, payment made, or partial or entire use of the system(s) by the City, shall be construed as acceptance of defective work or material.

(b) Include copies of all warranty and guaranty certificates and declarations in the Operating and Maintenance Manuals, in the appropriate sections.

(c) Provide a certificate or declaration indicating the warranty and conditions.

(d) Warranty satisfactory operation of all work and equipment installed under this contract. Repair or replace at no charge to the City, all items which fail or prove to be defective within the Warranty period, provided that the failure is not due to improper usage by the City. Make good all damages incurred as a result of the failure and of the repair of the system(s).

(e) The warranty shall be for all parts and labour. Do not expect any participation from the City's personnel in the correction of warranty related work.

(f) For systems, equipment and components which are used continuously throughout the year, the normal warranty period shall be one calendar year from the date of Substantial Completion. For seasonal equipment, components and systems which are not normally used continuously throughout the year, the warranty period shall include at least one full season of satisfactory operation.

(g) When equipment or systems are put into use subsequent to the acceptance of the building, or a portion of the building, the warranty period for seasonally used equipment and systems shall be deemed to commence from the date of satisfactory operation, not from the date of final acceptance by the City.

(h) The City retains the right to demand, and to receive at no additional cost, an extension of the original construction warranty for any equipment, component or system which consistently fails to perform, or which requires repeated repair or adjustment.

(i) Wherever manufacturer's warranties in excess of the Contractor's warranty are provided, furnish the City with copies of the Certificates, dated and acknowledged, and inserted in the Operation and Maintenance Manuals. The Contractor’s Warranty shall include a list of the Manufacturer's extended warranties.

(j) Warranty work shall be carried out within a reasonable time period following the reporting of the problem. Should the repair time for any failed component be unreasonably long, as determined by the City, make alternate arrangements to have a temporary replacement component made available until such time that the original component is repaired and re- installed. There shall be no additional cost to the City for any temporary replacement component or for any labour required to implement the work.

E26.1.19 Documentation and System(s) Acceptance

(a) The Contractor shall prepare a suitable document to be signed by the City or his Contract Administrator, confirming:

(i) The City has received satisfactory instruction in the operation and maintenance of all equipment and systems.

(ii) The Operation and maintenance manuals have been received and reviewed by the City.

(iii) The "As-Built" drawings have been received and reviewed by the City.

(iv) Specified spare parts, components, keys, removable handles, tools and the like, have been accepted by the City.

E26.1.20 Completion

(a) The Contractor shall be aware that it is the City’s intention to withhold recommendations for payment of progress claims totaling more than 90% of the electrical contract until the project is declared Substantially Complete.

(b) Substantial Completion:

(i) The project will be ready for a Substantial Completion inspection only when it is ready for the City to occupy and utilize the building for its intended purpose.

(ii) At Substantial Completion, the City will realize that some deficiencies may still exist.

(iii) In preparation for the inspection to determine Substantial Completion for all or a portion of the project, the Contractor shall ensure and declare in writing that:

i. Except for seasonal deficiencies, the Start-up and Verification of the Commissioning Process has been completed, and all systems are fully functional.
ii. All systems and equipment have been cleaned.
iii. All systems and equipment have been identified and labelled.
iv. The preliminary As-Built Drawings have been submitted for review.
v. One set of preliminary Operation and Maintenance Manuals have been submitted for review.
vi. Instructions to the City's Representative have been given.
vii. Maintenance Materials and Spare Parts have been provided.

(iv) When the Contractor is satisfied that the entire project is completed, and after making his own inspection, he shall apply, in writing, to the City, for an inspection to determine if the project can be deemed to be Substantially Complete.

(v) In the letter of request, a date shall be specified upon which the project can be delivered and be Substantially Complete.

(vi) During the inspection, a deficiency list will be compiled and a report will be issued. These deficiencies shall be corrected or completed in a satisfactory and timely manner.

(vii) Based on the inspection report, the City will retain a sum of money, sufficient in his estimation to cover the cost of completing the deficiencies.

(c) Total Completion:

(i) When the Contractor has determined that the deficiencies noted during the Substantial Completion inspection have been completed or corrected, he shall apply, in writing, to the City, for a final inspection to determine if the project can be deemed to Totally Complete.

(ii) In the letter of request, a date shall be specified upon which the project can be delivered and be Totally Complete.

(iii) In preparation for the inspection to determine Total Completion for all or a portion of the project, the Contractor shall ensure and declare in writing that:

i. All aspects of the Commissioning Process have been completed.
ii. The final As-Built drawings have been submitted, reviewed and accepted.
iii. The final Operation and Maintenance Manuals have been submitted, reviewed and accepted.
iv. The deficiencies noted during the Substantial Completion inspection have been corrected or completed.

(iv) During the inspection, a deficiency list will be compiled and a report will be issued. These deficiencies shall be corrected or completed in a satisfactory and timely manner.

(v) Based on the inspection report, the City will retain a sum of money, sufficient in his estimation to cover the cost of completing the deficiencies.

(vi) Final Payment will only be made after the project has been determined to be Totally Complete, with all deficiencies satisfactorily corrected.

E26.2 Electrical Materials and Methods

E26.2.1 Quality Assurance

(a) The Contactor to complete all electrical installations in accordance with local standard.

(b) While not identified and specified by number in this Division, comply with CSA Electrical Bulletins in force at time of Proposal submission. Comply with the requirements of all Provincial and local laws, rules, ordinances and codes.

(c) Electrical installation shall be in accordance with the current edition of the Electrical Code, Provincial and other codes, rules and regulations. Supply material and labour required to meet the requirements of these codes, rules and regulations even though the work is not shown on the drawings or mentioned in the specifications. Where the electrical installation calls for better quality materials or construction than the minimum requirements of these codes, rules and regulations, the electrical installation shall be as shown on the drawings and as specified.

E26.2.2 Submittals

(a) Indicate details of construction, dimensions, capacities, weights and electrical performance characteristics of equipment or material.

(b) Where applicable, include wiring, single line and schematic diagrams.

(c) Include wiring drawings or diagrams showing interconnection with work of other Sections.

(d) Submit samples in accordance with General Conditions. Pay all transportation costs to ship samples to the Contract Administrator's office and return. Approved samples will be retained until after Proposal closing, then all samples will be returned except for the sample submitted by the manufacturer who has been listed by the Contractor in the Proposal Documents. This sample will be used for comparison with the actual production run of successful manufacturer.

E26.2.3 Operations and Maintenance Data

(a) Provide operation and maintenance data for incorporation into Maintenance Manuals.

(b) Include details of design elements, construction features, component function and maintenance requirements and schedules to permit effective start-up, operation, maintenance, repair, modification, extension and expansion of any portion or feature of installation.

(c) Include technical data, product data, supplemented by bulletins, component illustrations, exploded views, technical descriptions of items, and parts lists. Advertising or sales literature not acceptable.

(d) Include wiring and schematic diagrams and performance curves.

(e) Include names and addresses of local suppliers for items included in Maintenance Manuals.

(f) Submit Maintenance Manuals to the Contract Administrator for review. Manuals that are incomplete shall be returned to the Electrical Subcontractor for completion. Completed manuals must be submitted, to the satisfaction of the Contract Administrator, before final payment may be considered to be due.

E26.2.4 Maintenance Manuals

(a) Assemble Operation and Maintenance Manuals in three ring binders with index tabs, each containing:

(i) The subcontractors and suppliers names and telephone numbers,

(ii) A complete set of reviewed shop drawings,

(iii) Brochures,

(iv) Data sheets,

(v) Operating, maintenance, and lubricating instructions,

(vi) Wiring diagrams,

(vii) Controls ‘As-Built’ shop drawings,

(viii) Commissioning information,

(ix) Warrantee certificates.

(b) Provide maintenance materials and information as specified.

(c) Turn materials over to the City in an orderly fashion upon completion of installation.

(d) Maintenance manuals shall contain a copy of the final verification report and certificate, as well as a copy of the electrical inspection certificate.

E26.2.5 Pricing of Changes after Proposal

(a) The Contract Administrator reserves the right to review costing using accepted Contractors Pricing Standards.

E26.2.6 Other Trades

(a) Include in cost all work by sub-trades, such as painting, coring, plastering, access doors etc. to restore all finished areas to original finish.

(b) Schedule execution of electrical work with associated work specified in other Divisions.

E26.2.7 Delivery, Storage and Handling

(a) Deliver all materials to Site in an orderly fashion and in accordance with schedule.

(b) Provide additional protection such as tarps, padding, wood skids, etc., where such is required to ensure protection of equipment and as directed by the City.

E26.3 Products

E26.3.1 Materials and Equipment

(a) Provide labour, materials, transportation, equipment and facilities, etc., required for the complete electrical installation as indicated or implied on the drawings and specifications.

(b) Electrical equipment shall be new and of type and quality specified.

(c) Equipment and material to be CSA certified, and manufactured to standards described. Where there is no alternative to supplying equipment which is not CSA certified, obtain special approval from the appropriate Inspection Departments.

(d) Materials and equipment used in the Main Drive Aisle, Service Bay, Repair Bay, Paint Bay, Paint Mix Welding Shop, Body Shop, Upholstery Shop, Prep Bay, and Fluid Room shall be a minimum NEMA4, unless Class 1 Div 2 installation is required by code. All conduit couplings used in the above spaces shall be liquid tight.

E26.3.2 Voltage Ratings

(a) Operating voltages: to CAN3-C235.

(b) Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard. Equipment to operate in extreme operating conditions established in above standard without damage to equipment.

(c) 347V or 600V lighting is not acceptable.

E26.4 Execution

E26.4.1 Inspection

(a) Furnish a Certificate of Acceptance from the Inspection Authorities on completion of work. Copies of Certificate to be included in Maintenance Manuals.

(b) Certificate of Inspection and Approval must be submitted before final payment may be considered to be due.

E26.4.2 Care, Operation and Start-Up

(a) Instruct the Building Manager’s personnel in the operation, care and maintenance of equipment. Arrangement of such instructional sessions to be done at a time convenient to the City.

(b) Arrange and pay for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components.

(c) Provide these services for such a period, and for as many visits as necessary to put equipment into operation, and ensure that operating personnel are conversant with all aspects of its care and operation.

E26.4.3 Finishes

(a) Clean and touch up surfaces of shop-painted equipment, scratched or marred during shipment or installation, to match original paint.

(b) Clean, prime and paint exposed hangers, racks, fastenings to prevent rusting.

(c) Equipment Identification

(d) Identify all electrical equipment with Lamacoid nameplates, including but not limited to the following information (as applicable):

(i) Supply source / circuit number

(ii) Voltage rating / Current rating

(iii) Overcurrent protection rating

(iv) kVA / HP rating

(e) Wording on nameplates to be approved prior to manufacturing. Submit schedule of nameplates and wording to the City.

(f) Use red nameplates with white lettering for fire alarm equipment and emergency power circuits. Use blue nameplates with white lettering for UPS power circuits.

(g) Use heat shrink type markers or CAB-3 cable marking system for all conductors and cables. Mark cables at both ends. Mark fire alarm, card access and LAN cables.

E26.4.4 Location of Outlets

(a) Change location of outlets at no extra cost or credit, providing distance does not exceed 10'-0" (3 m) and information is provided before the commencement of rough-ins.

E26.4.5 Mounting

(a) Where mounting height is indicated, mounting height of equipment shall be from finished floor to the centerline of equipment unless specified or indicated otherwise.

(b) If mounting height of equipment is not indicated, verify with Consultant and coordinate with architectural drawings before proceeding with installation.

(c) Install electrical equipment at the following heights unless indicated or directed otherwise:

(i) Outlets above counters: 6" (150 mm); splashbacks: 4" (100 mm).

(ii) Receptacles in mechanical and shop areas: 40" (1 m).

(iii) Switches, dimmers, push buttons, Luxo bracket: 48" (1.2 m).

(iv) Fire alarm pull stations, thermostats: 47" (1.2 m).

(v) End of line resistors: 64" (1.6 m).

(vi) Fire alarm bells, horns, speakers 90" (2.3 m).

(vii) Fire alarm strobes 80” to 90” (2m to 2.4m).

(viii) Panelboards, annunciators, etc.: 78" (2.0 m) to top.

(ix) Clock outlets: As per Architectural elevations.

(x) Wall mounted telephone: 60" (1525mm).

(d) All transformers, motor control centers and floor-mounted distribution panels shall be mounted on 4" (100 mm) concrete housekeeping pads complete with chamfered edges. The Electrical subcontractor shall be responsible for provision of these pads. Where ceiling heights will not allow housekeeping pads to be installed below distributions, and where pre-approved by the Consultant, 1 ½" (38 mm) galvanized cantruss shall be provided in place of the pad.

(i) Where a new housekeeping pad is supplied adjacent to the existing, the new housekeeping pad elevation shall match existing.

E26.4.6 Fireproofing

(a) Where cables or conduits pass through floors, block or concrete walls and fire rated walls, provide an engineered, UL listed fire stop system to maintain the original fire rating. Acceptable manufacturers are Dow Corning Firestop 2000 Sealant, A/D Fire Barrier Silicone Sealant, Ener Stop - Ancron Corporation. Install fire stop with strict attention to manufacturer's installation instructions. Include a copy of installation instructions in the Operations and Maintenance manual.

(b) Fireproofing of electrical cables, conduits, trays, etc., passing through fire barriers shall conform to local codes and inspection authorities.

E26.4.7 Tests

(a) Perform all testing identified in the ANSI/NETA MTS-2007 standard in addition to the following tests.

(b) Wires and Cables 1000V

(i) Check each feeder for continuity, short circuits and grounds. Ensure resistance to ground of circuits is not less than 50 mega-ohms.

(ii) Insulation resistance is checked phase-to-phase, phase-to-ground, and across open contacts at 1000 VDC.

(iii) Tabulate a list of all feeders and test results, and submit for approval.

(c) Visual and Mechanical Inspection of Switchgear and Switchboard Assemblies

(i) Assemblies shall be inspected for physical damage.

(ii) Bussing compartment inspection shall include the following:

(iii) Check tightness of accessible bolted bus joints by torque wrench method.

(iv) Check insulators for cracks and contamination.

(v) All electrical, key, and mechanical interlock systems shall be verified for correct operation.

(vi) Closure shall be attempted on locked open devices. Opening/withdrawal attempt shall be made on locked closed devices.

(vii) Mechanical operations of circuit breaker in cell shall be checked and auxiliary devices activated.

(viii) Draw-out trays, contact alignment, ease of operation, proper grounding, and interlocks shall be checked.

(ix) Circuit breaker cell shall be inspected for contamination, physical damage, loose hardware, shutter mechanism, control plug, guide rail, floor nameplates, ground bus, auxiliary contacts, and linkages.

(x) Circuit breaker shall be inspected for contamination, physical damage, main finger/stab penetration and secondary connections.

(d) Electrical Tests

(i) Insulation resistance of each bus section shall be measured phase-to-phase and phase-to-ground.

(ii) Over-potential test shall be performed for each bus section, phase-to-phase and phase-to-ground for medium voltage equipment,

(iii) Electrical operation of the circuit breaker shall be checked in the test and connected position.

(iv) The control power source shall be checked.

(v) The circuit breaker control scheme shall be tested.

(vi) A phasing check shall be made on double-ended and/or emergency source switchgear at tie points to ensure correct bus phasing.

(e) Test Values

(i) Bolt torque levels are checked in accordance with manufacturer's specifications.

(ii) Insulation resistance testing is to be performed in accordance with the manufacturer's recommendations.

(f) Circuit Breaker-Low Voltage Draw-out, Or Fixed Insulated Case Visual and Mechanical Inspection

(i) Inspect physical condition, cleanliness and nameplate compliance with single-line diagram.

(ii) Check draw-out mechanism, lubrication and grounding (if applicable).

(iii) Check all indicating devices for proper operation.

(iv) Check cell fit and element alignment.

(v) Check primary stab penetration (if applicable).

(vi) Check secondary connections with the circuit breaker in the connected and test positions (if applicable).

(vii) Bolt torque levels are checked on all accessible hardware in accordance with manufacturer's specifications.

(g) Circuit Breaker-Low Voltage Draw-out, Or Fixed Insulated Case Electrical Tests

(i) Contact resistance is to be measured.

(ii) Insulation resistance is checked phase-to-phase, phase-to-ground, and across open contacts at 1000 VDC.

(iii) Minimum long-time pick-up current is determined when possible; delay time determined at 300% of pick-up by secondary injection.

(iv) Short-time pickup and time delay is determined by secondary injection.

(v) Instantaneous pickup current is determined by secondary injection.

(vi) Ground fault pickup current and time delay is determined by secondary injection.

(vii) Trip unit reset characteristics are verified.

(viii) Final settings are made in accordance with customer's prescribed settings.

(ix) Auxiliary devices, such as under voltage relays, blown main fuse detector, shunt close, shunt trip, spring charging motor, and auxiliary contacts are activated to ensure operation as applicable.

(x) Secondary Current Injection shall be performed on the power circuits.

(h) Circuit Breaker-Low Voltage (Molded Case) Visual and Mechanical Inspection.

(i) Circuit breaker is checked to insure smooth operation.

(ii) The case is inspected for cracks or other defects.

(iii) Bolt torque levels are checked in accordance with CSA Standards or manufacturer's specifications.

(i) Electrical Tests on Breakers of 100 Amps or Larger

(i) Contact resistance is to be measured.

(ii) Insulation resistance is checked at 1000 VDC for one minute from pole to pole and from each pole to ground and across open contacts of each phase.

(iii) Test trip release on each circuit breaker.

(iv) Minimum long-time pick-up current is determined when possible. Long-time delay is determined by secondary current injection method at 300% of rating.

(v) Instantaneous pick-up current determined by secondary injection using run-up or pulse method.

(j) Power and Insulated Case Circuit Breakers-Low Voltage Visual and Mechanical Inspection.

(i) Check mechanical operation.

(ii) Cell fit and element alignment is to be checked.

(iii) Bolt torque levels are checked in accordance with CSA Standards or manufacturer's specifications.

(iv) Check arc chutes for foreign matter, cracks and secure installation.

(v) Clean primary contact surfaces and lubricate if required.

(k) Electrical Tests

(i) Contact resistance is to be measured.

(ii) Insulation resistance is checked at 1000 VDC for one (1) minute from pole to pole and from each pole to ground and across open contacts of each phase.

(iii) Minimum long-time pick-up current is determined when possible; delay time is determined at 300% of pick-up by secondary injection.

(iv) Short-time pick-up and time delay is determined by secondary injection.

(v) Instantaneous pick-up current is determined by secondary injection.

(vi) Ground-fault pick-up current and delay is determined by secondary injection.

(vii) Trip unit reset characteristics are verified.

(viii) Final settings are made in accordance with Engineer's prescribed settings.

(ix) Auxiliary devices, such as under voltage relays, blown main fuse detector, shunt close, shunt trip, spring charging motor and auxiliary contacts are activated to ensure operation as applicable.

(x) All functions of the trip units will be tested with test kits.

(xi) Secondary Current Injection shall be performed on the power circuits.

(xii) Air Switches - Low and Medium Voltage

(l) Visual and Mechanical Inspection

(i) Inspect the switch for physical damage, proper installation, anchorage, and grounding.

(ii) Inspect interior insulation arc chutes and interphase barriers.

(iii) Perform mechanical operator tests. Clean and lubricate as necessary.

(iv) Check blade alignment and arc interrupter operation.

(v) Check the fuse linkage and element for proper holder and current rating. Record the fuse data.

(vi) Check key interlock for safe operation and proper key distribution.

(m) Electrical Tests

(i) Over-potential test voltages are applied phase-to-phase and phase-to-ground.

(ii) Contact resistance is measured across each switch blade and fuse line, measured in micro-ohms.

(iii) Perform insulation resistance test on each phase-to-ground and from phase-to-phase.

(n) Protective Relays Visual and Mechanical Inspection

(i) Inspect relays for physical damage, presence of foreign material and moisture.

(ii) Check conditions of spiral spring, disc clearance and corrosion (if present). Inspect cover glass interior and relay components.

(iii) Check for mechanical freedom of movement, proper travel and alignment, and tightness of mounting hardware and tap screws.

(o) Protective Relays Electrical Tests

(i) This test is only performed on wiring to non-solid state relays

(ii) The following tests are performed at settings specified by the Engineer:

i. Pickup parameters on each operating element.
ii. Timing at three (3) points on the time dial curve.
iii. Pickup target and seal in units.
iv. Operation of restraint, directional, and other elements are checked as required.

(iii) Phase angle and magnitude contribution tests are performed on all differential and directional type relays, once energized, to prove proper polarity and connection.

(p) Instrument Transformers Visual and Mechanical Inspection

(i) Inspect for physical damage and compliance with single-line diagram.

(ii) Check mechanical clearance and proper operation of all disconnecting and grounding devices.

(iii) Verify proper operation of grounding or shorting devices.

(q) Instrument Transformers Electrical Tests

(i) Current transformer ratio is measured by primary current injection, or voltage method.

(ii) Potential transformer ratio is measured.

(iii) Insulation resistance is measured primary to ground, secondary to ground, and primary to secondary.

(iv) Secondary wiring connections are verified by secondary current injection.

(v) Transformer polarity markings are verified.

(r) Grounding Systems Visual and Mechanical Inspection.

(i) Inspect ground system for compliance with plans and specifications.

(s) Grounding Systems Electrical Tests.

(i) The fall of potential test is performed per IEEE Standard No. 81, Section 9.04 on the main ground electrode or system.

(ii) The two (2) point method test is performed per IEEE Standard No. 81, Section 9.03 to determine the ground resistance between the main grounding system and all major electrical equipment frames, system neutral and/or derived neutral points.

(t) Ground Fault Systems Visual and Mechanical Inspection.

(i) Monitor panels (if present) shall be manually operated for both trip test and no trip test.

(u) Ground Fault Systems Electrical Tests.

(i) System neutral insulation resistance is measured to insure no shunt ground paths exist. The neutral ground disconnect link is removed, neutral insulation resistance measured and the link replaced.

(ii) The relay pickup current is determined by primary injection at the sensor and the circuit interrupting device operated.

(iii) The relay timing is tested by injecting one hundred fifty percent (150%) and three hundred percent (300%) of pickup current into sensor. Total trip time is electrically monitored.

(iv) Zone interlock systems are tested by simultaneous sensor current injection and monitoring zone blocking function.

(v) Verify that system will operate at 57% rated control voltage (if applicable).

(v) Test Parameters.

(i) System neutral insulation resistance will be a minimum of preferably one (1) mega-ohm or greater.

(ii) Relay pickup current will be within ten percent (10%) of device dial or fixed setting, and in no case greater than twelve hundred (1200) amperes.

(iii) Relay timing will be in accordance with published time-current characteristic curves, but in no case longer than one (1) second.

(w) Metering and Instrumentation Visual and Mechanical Inspection.

(i) Verify meter connections in accordance with single-line meter and relay diagram.

(ii) Inspect for physical damage.

(x) Metering and Instrumentation Electrical Tests.

(i) Ammeter accuracy is checked using current injection.

(ii) Voltmeter accuracy checked.

(y) Motor Control Centers Visual and Mechanical Inspection.

(i) Inspect the MCC for physical damage, proper anchorage and grounding.

(ii) Compare equipment nameplate data with design plans.

(iii) Compare overload heaters with motor full load current for proper size.

(iv) Bolt torque levels are checked in accordance with manufacturer's or CSA Standards specifications.

(z) Motor Control Centers Electrical Tests.

(i) The following insulation tests are performed:

(ii) Insulation resistance of each bus section is measured phase-to-phase and phase-to-ground for one (1) minute.

(iii) Insulation resistance of each starter section is measured phase-to-phase and phase-to-ground with the starter contacts closed and the protective device open.

(iv) Insulation resistance of each control circuit is measured with respect to ground.

(aa) Motor Control Centers Control devices are initiated to check proper operation.

(bb) Motor Control Centers Motor overload units are to be tested by injecting secondary current through the overload unit and monitoring trip time.

(cc) Transformers-Dry Type Visual and Mechanical Inspection.

(i) Verify the operation of auxiliary devices, such as fans, pumps, sudden pressure device, indicators, tap changer, and gas pressurization system.

(ii) Bolt torque levels are checked in accordance with CSA Standards or manufacturer's specifications.

(iii) Inspect primary and secondary connections for tightness and for signs of overheating.

(iv) Inspect and clean bushings and insulators.

(v) Check fuses for correctness of type and size.

(vi) Check for grounding and neutral continuity between primary and secondary circuits of transformer.

(vii) Tests shall be conducted in accordance with the provisions of ANSI C57.12.91.

(viii) As a minimum perform the following tests:

(ix) Resistance Measurements

(x) Turns ratio test is performed between windings for all tap positions.

(xi) Polarity and phase rotation.

(xii) Excitation Current and no load losses on rated voltage and 110% of rated voltage.

(xiii) Impedance and load loss.

(xiv) Applied potential.

(xv) Induced potential.

(xvi) Pressure test.

(xvii) Core insulation test.

(xviii) Insulation power factor test.

(xix) Insulation resistance tests are performed winding to winding and winding to ground.

(xx) Carry out following insulation tests using a 1,000V megger with 20,000 mega-ohm scale and resulting insulation resistance corrected to base of 20 deg. C. (68 deg. F.).
  i. High voltage to ground with secondary grounded for duration of test.
  ii. Low voltage to ground with primary grounded for duration of test.
  iii. High to low voltage.

(dd) Summarize all results in a report.

(ee) Transformer-Liquid Filled Visual and Mechanical Inspection.
  (i) Verify the operation of auxiliary devices, such as fans, pumps, sudden pressure device, indicators, tap changer, and gas pressurization system.
  (ii) Bolt torque levels are checked in accordance with CSA Standards or manufacturer's specifications.
  (iii) Check all liquid in tank and bushings for proper level.
  (iv) Inspect primary and secondary connections for tightness and for signs of overheating.
  (v) Inspect and clean bushings and insulators.
  (vi) Check oil level and temperature indicators.
  (vii) Check fuses for correctness of type and size.
  (viii) Check for grounding and neutral continuity between primary and secondary circuits of transformer.

(ff) Tests shall be conducted in accordance with the provisions of ANSI C57.12.91.

(gg) As a minimum perform the following tests:
  (i) Resistance Measurements
  (ii) Turns ratio test is performed between windings for all tap positions.
  (iii) Polarity and phase rotation.
  (iv) Excitation Current and no load losses on rated voltage and 110% of rated voltage.
  (v) Impedance and load loss.
  (vi) Applied potential.
  (vii) Induced potential.
  (viii) Pressure test.
  (ix) Core insulation test.
  (x) Insulation power factor test.
  (xi) Insulation resistance tests are performed winding to winding and winding to ground.
  (xii) A sample of the insulation oil to be forward to a laboratory and tested. The results are to be included with the testing reports for the transformer and are to be included in the manuals.
  (xiii) Carry out following insulation tests using a 10,000V megger with 20,000 mega-ohm scale and resulting insulation resistance corrected to base of 20 deg. C. (68 deg. F.).
    i. High voltage to ground with secondary grounded for duration of test.
    ii. Low voltage to ground with primary grounded for duration of test.
    iii. High to low voltage.

(hh) Summarize all results in a report.

(ii) Metal Enclosed Bus Duct - Low And High Voltage Visual and Mechanical Inspection.
  (i) Inspect the bus for physical damage and proper connection in accordance with single-line diagram.
  (ii) Inspect for proper bracing, suspension alignment, and enclosure ground.

(iii) Bolt torque levels are checked in accordance with CSA Standards or manufacturer's specifications.

(jj) Metal Enclosed Bus Duct - Low And High Voltage Electrical Tests

(i) Measure insulation resistance of each bus run phase-to-phase and phase-to-ground for one (1) minute.

(ii) Over potential test voltages are applied on each bus run phase-to-phase and phase-to-ground.

(iii) Phase rotation and phase cross voltage tests are performed on each bus tie section energized by separate sources. (Must be performed when bus sections are de-energized from their permanent sources.)

(kk) Cables - High Medium Voltage Visual and Mechanical Inspection

(i) Inspect exposed cable section for tracking corona or physical damage.

(ii) Inspect shield grounding, cable support, and termination.

(iii) Apply grounds upon completion to drain all absorbed potential to zero volts.

(ll) Cables - High Medium Voltage Pre-acceptance tests:

(i) After installing cable but before splicing and terminating, perform insulation resistance test with 10000 V megger on each phase conductor.

(ii) Check insulation resistance after each splice and/or termination to ensure that cable system is ready for acceptance testing.

(iii) Verify phasing of cabling.

(mm) Cables - High Medium Voltage Acceptance Tests:

(i) Electrical Tests (New continuous cable i.e. Not spliced to old cable)

i. A dc hi-potential to be applied in at least five (5) equal increments until maximum test voltage is reached. DC leakage current to be recorded at each step after a constant stabilization time, consistent with system charging current delay.

ii. Perform shield continuity test.

iii. Terminations to be corona suppressed by guard ring, field reduction sphere or other suitable methods.

iv. Each conductor to be individually tested with all other conductors grounded. All shields are to be grounded.

v. Perform dc hi-potential test using step voltage method. Maximum test voltage shall be in accordance to the ICEA and manufacturer's recommended levels.

(ii) Existing cables insulation resistance to be tested using a 10kV megger before cables are cut into for splicing and again after splicing of new cables is complete prior to being re-energized.

(nn) Adjustable Frequency Drives Visual and Mechanical Inspection.

(i) Inspect controller for physical damage.

(ii) Inspect for proper grounding.

(iii) Check customer cables, power wiring and control wiring to insure correct installation.

(iv) Check for proper heaters used in ISO/Bypass unit.

(v) Check transformer taps for proper connection.

(vi) Check all terminal wiring.

(vii) Verify motor and drive sizing.

(oo) Adjustable Frequency Drives Electrical Tests.

(i) Verify input voltages.

(ii) Verify all transformer output voltages.

(iii) Test all pilot devices, e.g., lights, speed pots, meters.

(iv) Check DIP switches for proper setup.

(v) Calibrate max speed.
(vi) Set up acceleration and deceleration potentiometers to application.
(vii) Set up hand minimum speed.
(viii) Calibrate all meters.
(ix) Align drive to customer's automatic control signal.
(x) Assist in proper connection of alarm, smoke detectors, and remote devices.
(xi) Check for proper motor rotation.
(xii) Set up all option cards.
(xiii) Operate drive at all allowable speed and load conditions.
(xiv) Configure snip out resistors.
(xv) Confirm ISO/Bypass unit operation.

(pp) Infrared Scanning

(i) Two months after the occupancy of the building by the Owner the Contractor is to infrared scan the entire electrical distribution system up to and including all panelboards.
(ii) Contractor to re-scan the entire electrical distribution system up to and including all panelboards two months prior to the completion of the warranty period.
(iii) Contractor to use current infrared detection technology.
(iv) Contractor is to provide a complete report, identifying areas of concern. Contractor to provide copies of all infrared video taken on DVDs to the Owner for their records.
(v) Electrical Contractor is to repair any loose connection/terminations or replace any faulty equipment under warranty.

(qq) Reports

(i) Provide Engineer's Representative with list of test results showing location at which each test was made, circuit tested and result of each test.
(ii) Technical Start-up Contractor shall submit to the consultant a report, in addition to the test reports, summarizing their acceptance that all tests were completed to the satisfaction of the Technical Start-up Contractor following each factory witness test and each on-site test. Append all factory test repots as an appendix to this report.
(iii) Manufacturer is responsible to cover all costs incurred due to failure of equipment during factory testing, including but not limited to, additional travel and accommodation expenses and extra time to witness tests.
(iv) Assemble all testing results into a common binder and organize based on specification sections. Include all manufacturer testing results. Submit 3 copies of this manual along with the Operation and Maintenance manuals.
(v) Carry out tests in presence of Consultant where directed.

(rr) Obtain the approval of the Consultant, Building Manager and the City before arranging for any cutting. Patching shall restore the affected area to the original condition; materials and methods used for patching shall match existing.

E26.4.8 Workmanship

(a) Install equipment, conduit and cables in a workmanlike manner to present a neat appearance to the satisfaction of the Consultant. Install conduit and cable runs parallel and perpendicular to building lines in chases, behind furring or above ceilings, where such concealment is possible. In areas where systems are to be exposed, install neatly and group in a tidy appearance.

(b) Install equipment and apparatus requiring maintenance, adjustment or eventual replacement, with adequate clearances and accessibility for same.

(c) Include, in the work, all requirements shown on the shop drawings or manufacturer's installation instructions.

(d) Replace work unsatisfactory to the Consultant without extra cost.

E26.5 Electrical Systems – Scope of Work

E26.5.1 General

(a) Provide all work and equipment as described in electrical outline specifications.

(b) The project has been registered with the Canadian Green Building Council with the objective of achieving a LEED® certification level of Silver.

E26.5.2 Electrical Utility

(a) Make all necessary arrangements and coordination with the Electrical Supply Authority in order to ensure availability of service throughout the construction period.

(b) Include all utility cost including any primary ducts, cables, trenches, etc: as may be required by the electric utility.

(c) Coordinate the demarcation point and supply / installation of the equipment at the demarcation point with local Utility.

(d) Arrange for, and provide all necessary details for required indoor/outdoor power distribution equipment housekeeping pads.

(e) Provide grounding loop around outdoor equipment pads to utility standards.

E26.5.3 Telephone Utility

(a) Coordinate with Telephone Utility and City of Winnipeg IT to extend existing service (copper and fiber) to the new addition.

(b) Provide one 4'x8' ¾" plywood backboard in Telecommunications Equipment Room. Secure plywood backboard to the wall near or behind the 19" telecommunications rack. Confirm exact location of plywood with City of Winnipeg IT department.

E26.5.4 New Medium Voltage Distribution

(a) The Electrical subcontractor will be responsible for providing medium voltage power distribution loop consisting of outdoor, pad-mounted power centers to provide power to the new addition as well as existing Distribution 2, Distribution 1 and Distribution 3.

(i) Provide a medium voltage outdoor switchgear complete with metering cabinet, protected by concrete filled bollards at the demarcation point between Manitoba Hydro and Winnipeg Transit.

(ii) Output of medium voltage power centers shall be 347/600V 3Ph 4W.

(iii) The switchgear shall be complete with a minimum of three switches, each complete with locking provisions in "ON" and "OFF" positions. Switchgear shall allow for a loop configuration on the load side with two incoming feeds on the line side.

(iv) Two load side switches on the switchgear shall be complete with a Kirk-Key interlock system or equivalent.

(v) Provide a 1" PVC conduit complete with pull string from the metering cabinet to the nearest IT room. Limit number of conduit bends between pull points to two 90 degree bends.

(vi) Coordinate location of incoming feed(s) with Manitoba Hydro

(b) Coordinate the fault current rating of the switchgear with Manitoba Hydro.

(c) Based on coordination with utility, one incoming feed may be reserved for future use. Provisions for future use in the form of a PVC conduit sleeve stubbed out 3m outside of the equipment footprint shall be included in this contract.

(i) Provide four outdoor medium voltage power centers at locations coordinated with Winnipeg Transit.

i. Power centers shall be complete with lockout provisions, protected with

concrete filled bollards.

ii. Provide one 1" conduit from each power center to the respective electrical room. Conduit shall be complete with a pull string, capped at either end. Conduit shall be limited to two 90 degree bends.

(d) Power centers shall be complete with transformers and integral in / out / transformer isolation switches operated using a fiberglass hot stick.

(e) "In" and "Out" Isolation switches shall be complete with a kirk key interlock system or equivalent.

(i) Power center transformers shall be as follows:

- Distribution #1: 1500kVA
- Distribution #2: 1000kVA, secondary conductors sized for a 1600kVA future service upgrade.
- Distribution #3: 750kVA
- Distribution #4: 1500kVA
- Disregarding the above, ensure that each distribution is complete with a minimum of 20% spare capacity.

(ii) Conductors between power centers and the demarcation switchgear shall be installed in Schedule 40 PVC or HDPE at 1000mm below grade or the depth dictated by the Canadian Electrical Code (whichever is greater).

(iii) Switchgear and power centers shall be mounted on fiberglass bases complete with storage void for slack / spare cable.

(f) The Electrical subontractor will be responsible for designing and laying out electrical building systems subject to the Contract Administrator's review.

(g) Include all items required to provide complete working systems.

(h) Ensure complete compliance with the City's objectives prior to Proposal submission.

(i) The selected techniques, methods of fabrication and installation, and the size of the labour force shall be suitable to meet the completion schedule.

(j) The subcontractors shall be responsible for determining the most appropriate construction techniques and methods of installation for their portions of the work.

E26.5.4.1 Main Distribution – Existing

(a) Replace existing main distributions "Distribution 2", "Distribution 1" and "Distribution 3" as follows:

(i) Refurbish Distribution 3 panel tub by replacing all the internal components.

(ii) Replace Distribution 1 with a new 600V distribution. Distribution shall match the upstream equipment and provide a minimum of 20% spare capacity.

(iii) Supply and install new 600V 1600A switchboard cw 1000A 80% rated LSIG breaker in a separate compartment. Switchboard shall accommodate all the existing CDP-MDP2-A breakers, all the remaining Distribution #2 breakers plus four (4) spare 400A-3P breaker slots and two 25A-3P breaker slots.

(b) Main distribution design for the existing distributions "Distribution 2", "Distribution 1" and "Distribution 3" shall incorporate new natural gas stand-by generators mounted on the exterior of the building in a self-contained enclosure.

(i) Generators shall not power life safety systems.

(c) Each new main distribution shall be complete with a stand-alone automatic transfer switch sized based on the downstream distribution.

(d) Replacement of existing distributions shall be complete after the implementation and commissioning of outdoor medium voltage power centers in order to minimize power outages to the existing equipment.

E26.5.4.2 Replacement / refurbishment shall be completed in the following order: "Distribution 1", "Distribution 3", "Distribution 2".

E26.5.5 Main Distribution Replacements

(a) Transfer of equipment between normal power and generator shall occur outside of hours of operation.

(b) Ensure that life safety systems (emergency lighting (including tunnel lighting), fire alarm system, exhaust systems) are provided with a backup power during the distribution outage.

(c) Distribution replacement shall occur on weekends and allow for a limited facility operation as outlined for each distribution.

(d) One week prior to the replacement of the distribution, Contractor shall conduct a meeting with the Owner to ensure that all loads requiring continuous power have been accounted for.

(e) Provide generator backed temporary emergency lighting along paths of egress in the affected areas. Ensure that exit signage in the area of shutdown remains functional.

(f) Contractor shall ensure that backup power can be provided for a minimum of an extra 24 hours in the event of unforeseen circumstances during the distribution replacement.

(g) Prior to transferring Distribution 1, Contractor shall complete the following:

(i) Supply new matching 347/600V 400A 64CCT panel cw main breaker and a mechanically interlocked breaker designed to allow for back-feed;

(ii) Provide a new teck cable from the panel to the existing Distribution #1

(iii) Provide a temporary teck cable from the panel to the temporary location of the generator by the main admin entrance. Connect temporary cable to the interlocked breaker. Lock out the breaker in the “Off” position.

(iv) Transfer lighting panels RA, RE, RH and Panel JJ from Distribution 1 to the new panel. Use new teck cables, sized based on panel loads plus 50% spare capacity, or panel rating (whichever is smaller) to re-feed panels.

(v) Provide temporary generator power to the MCC TT from the generator during the power outage. Exercise care not to damage existing conductors while re-feeding the MCC.

i. Coordinate with the Owner, De-energize any loads that do not need to be energized during the shutdown. Ensure that adequate ventilation is provided to the area.

ii. De-energize all the loads on MCC. Re-energize the necessary mechanical loads one at a time once the generator is online.

(vi) Transfer Panel RL to the UPS feed.

(vii) Provide temporary generator power to the 12kVA UPS for the duration of the normal power outage.

(viii) Transfer new 347/600V panel to UPS for the duration of the normal power outage.

(h) Prior to transferring Distribution 3

(i) Review kitchen loads with the Owner. Provide backup power for all kitchen loads such as freezers and fridges. Kitchen will not be operational during the power outage.

(i) Prior to transferring Distribution 2:

(i) Complete work on Distribution 1 and Distribution 3, including work on backup generators. Distribution 1 and Distribution 3 shall be fed from the new 25kV loop during the outage on Distribution 2.

(ii) Ensure that all garage doors and wireless systems remain operational. Coordinate any outages with the Owner.

(iii) Re-feed existing panels GA, GB, GC, GD, GE, GF, GG, GH, GJ, GK, GL, GM, GQ, GR, GS, GT, GU to panels PP-DD and PP-KK.

(iv) Re-arrange existing breakers in panels PP-DD and PP-KK as required.

(v) Supply new matching breakers in Panels PP-DD and PP-KK as required.

(vi) Coordinate distribution between panels based on the load and location.

(vii) Panels shall be re-fed using an armored teck cable.

(viii) Relocate existing panel CDP-MDP2-A to the South wall in the same room, immediately West of the existing equipment. Provide new housekeeping pad.

(ix) Transfer the remaining loads from the existing Distribution #2 to the CDP-MDP2-A.

(j) Review existing systems connected to each distribution with the City. Coordinate transfer of loads from existing to main distributions to minimize outage of respective systems.

(i) Coordinate locations of replacement distributions with the City. Where possible, locate replacement distributions and associated transfer switches without interfering with existing main distribution.

(ii) Maximum outage on individual loads shall not exceed the timeframe pre-agreed upon and approved by the City.

(iii) Megger existing conductors. Where existing conductors pass megger test and are acceptable to the Authority Having Jurisdiction, conductors may be re-used. Alternatively, provide new conductors sized in accordance with upstream protection and CEC requirements (latest edition).

(iv) Provide splitters to extend existing conductors as required. Match splitter rating to the upstream overcurrent protection.

(v) Maintain logs of megger and torque reports for all conductors and all termination points. Copies of all logs shall be kept on site in a binder. A copy of all logs shall be included in the Operations and Maintenance manual.

(vi) Each distribution shall accommodate all existing peak loads plus 20% spare capacity.

(vii) Provide power metering provisions.

iii. Metering system shall be capable of logging information on peak demand and overall power usage for a minimum period of 12 months, as well as communicate with BMS via RS-485, MODBUS, BACNET, LONWORKS.

iv. Metering shall be capable of monitoring and communicating the following parameters: RMS sensing, line voltage, phase current, frequency, KW, KVA, KW-hours, KVAR, KVAR hours, power factor, Harmonic THD for voltage and current, max/minimum values.

v. Allow one metering point per existing feed on the main distribution.

E26.5.6 Main Distribution – New Addition

(a) Main distribution design for the new addition shall incorporate an emergency generator mounted on the exterior of the building in a self-contained enclosure, as well as automatic transfer switch mounted inside the building. Generator shall not serve life safety systems.

(b) Main service entrance switchboard to incorporate incoming wireway section (underground preferred), fixed main breaker complete with built-in coordinated ground fault and provisions for metering of individual feeds.

(c) Power supply shall be 347/600V 3ph 4W, grounded neutral, 60 Hz. The main distribution shall be sized in accordance to the Canadian Electrical Code (CEC), conforming to classifications for size and usage found in the CEC and the Manitoba Building Code (MBC). Ensure a minimum 20% spare distribution capacity for future expansion. The short Circuit interrupting capacity shall be conforming to final SCCAF study.

(d) The main circuit breaker shall be fixed mounted molded case. Main circuit breaker must be equipped with solid state o/c relay to provide the following time/current curve shaping adjustments: Long Time Pickup Setting, Long Time Delay, Short Time Pickup, Short Time Delay, Ground Fault Pickup, Ground Fault Time Delay, 4 wire residual ground fault, Instantaneous Pickup.

(e) Main breaker shall be set up and adjusted on site by the manufacturer to provide complete selective coordination with upstream transformer, utility line side fusing and all main distribution breakers.

(f) Provide two (3) 4" conduit stub outs from every electrical, mechanical and data rooms for future additions/expansion complete with pull cords and 12 AWG tracer wire.

E26.5.7 Short Circuit, Coordination & Arc Flash

(a) Provide a complete short circuit and coordination study and Arc flash analysis (SCCAF) for the new electrical distribution system including: Determination of maximum available short circuit current at main bus, ensure that equipment supplied under this contract is suitable for required ratings, examine degree of protective coordination for selective tripping for all main feeder breakers, and make all necessary adjustments to devices and submit two copies of short-circuit and coordination study complete with Engineer's seal to the City for their review.

(b) Provide a partial SCCAF for existing main distributions. Analysis shall be limited to medium voltage distribution centers, main distributions and panels fed from respective main distributions.

(c) The short circuit study and SC rating of electrical distribution equipment shall be based on the calculation of the medium voltage power centers with one standard transformer size larger of the actual size and infinite utility bus.

(d) The Coordination study and arc flash analysis shall be based on the actual medium voltage power center sizing, and actual utility fault level availability.

E26.5.8 Sub-Distribution

(a) The distribution section shall consist of a one section distribution (integral with the main breaker) having space for all required branch feeder breakers and a minimum space of four 400A frame breakers.

(b) Feeder breaker equal to 400A or greater to be equipped with solid state o/c relay to provide fully adjustable the following time/current curve shaping adjustments: Long Time Pickup Setting, Long Time Delay, Short Time Pickup, Short Time Delay, Ground Fault Pickup, Ground Fault Time Delay, 4 wire residual ground fault, Instantaneous Pickup

(c) All the primary protective breakers of all transformers 75KVA or greater shall be LSI fully adjustable type and shall be withstand the transformer inrush current.

(d) Branch circuit panels for: site lighting, main garage, lighting/receptacles, public corridor lighting and public air handling and mechanical equipment will be provided electrical room. Each panel will be 120/208V, 225A or 400A, 42 Circuit, will all necessary breakers – plus 20% spare (15A-1P). Panel shall be NBLP or similar type with 1" wide breakers. Load centers are not acceptable for any public panel. KAIC rating shall be based on the SCCAF study as specified in section 5.6.

(e) All electrical panels with carrying capacity of greater 250KVA, electrical panels for lighting, HVAC system, service water heating, elevators and any special equipment or systems more than 20KW must be c/w provision for electrical power monitoring means conforming to National Energy Code of Canada for buildings (NECB).

(f) Provide power metering system for all new panels:

(i) Metering system shall be capable of logging information on peak demand and overall power usage for a minimum period of 12 months, as well as communicate with BMS via RS-485, MODBUS, BACNET, LONWORKS.

(ii) Metering shall be capable of monitoring and communicating the following parameters: RMS sensing, line voltage, phase current, frequency, KW, KVA, KW-hours, KVAR, KVAR hours, power factor, Harmonic THD for voltage and current, max/minimum values.

(iii) Allow one metering point per feed on the main distribution.

E26.5.9 Stand-By Generators

(a) Generators shall be located in close proximity to the respective main distribution. Each main distribution (1, 2, 3 and the new addition) shall have a dedicated generator. Coordinate exact location for each generator with the City.

(b) Generator output shall be 347/600V.

(c) Generator shall be capable of handling all non-life safety loads on the respective distribution, plus 20% spare capacity.

(d) Acceptable fuel shall be diesel.

(e) Generator shall be complete with internal fuel tank, cooling system and heating.

(f) Generator shall be housed in a skin-tight enclosure with provisions for cold climates.

(g) Where applicable, fuel tank shall be sized for a minimum 12 hour operation.

(h) The stand-by generator set design and installation shall be conforming to classification and specification of CSA-C282-09 standard (Emergency Electrical Power Supply for Buildings) and CEC section 46.

(i) Generators shall be Kohler Power Systems or approved equal. If submitting an approved equal. Contractor shall also submit a quote for Kohler Power Systems generator as a separate price.

E26.5.10 Hazardous Areas

(a) All electrical design and installation shall be conforming to CEC rules 20-100 to 20-114 and section 18 inclusively in areas classified as hazardous.

(b) All electrical design and installation in the dispensing and diesel storage areas shall be conforming to hazardous areas as specified in CEC section 18 and section 20.

(c) Provide all necessary bonding/grounding design and installation to prevent ignitions arising due to static and stray current conforming to API 2008 – Protections against Ignitions Arising out of Static, Lightning, and Stray Current.

E26.5.11 Mechanical Equipment Connections

(a) Wire and connect mechanical equipment, including, but not limited to: roof top condensing units, fan coils furnaces, air handling fans, sump pumps, exhaust fans, entrance force flow heaters. See mechanical specification for further details.

(b) Wire and connect all line voltage thermostats for heating and cooling.

(c) Wire and connect variable frequency drives. Provide line and load cabling as required.

(d) Electric space heating devices to be supplied and installed by electrical subcontractor (typically: baseboard heaters, force flow heaters, unit heaters).

E26.5.12 Building Management System

(a) Provide 120VAC power to BMS equipment as required. See mechanical specification for further details.

E26.5.13 Power – Miscellaneous

(a) Dry-type transformers must be supplied to provide 120 V and 208 V power for receptacles, small mechanical fans, lighting and miscellaneous other equipment as required.

(i) Where transformer powers mostly non-linear loads, provide K4 rated transformers.

(b) Panelboards and CDP’s must be the product of one manufacturer. Acceptable manufacturers are Eaton or approved equal. If submitting an approved equal. Contractor shall also submit a quote for Eaton product as a separate price. Provide dedicated neutral for all isolated ground receptacles and dimmer circuit.

(c) Make provisions to wire and connect all pop machines, fridges, microwaves and other kitchen equipment. Coordinate with architectural for the location of equipment and equipment owner requirements.

(d) Provide Dyson Air Blade or Mitsubishi Hand Dryers, or equivalent (Nova not allowed).

(e) Wire and connect all public area equipment, including, but not limited to: integrated shower stall lights, hand dryers and electronically controlled plumbing fixtures.

(f) Conductors in conduits shall be:

(i) Solid copper for #10 AWG and smaller conductors and

(ii) Stranded copper for #8 AWG and larger conductors.

(iii) Conductor insulation shall be cross link polyethylene RW-90 or RWU-90 90˚C, 600 V must be provided as required. The minimum conductor size must be #12 AWG.

(g) Armored cables (AC-90) must be solid copper #10 AWG and smaller and stranded #8 AWG and larger. Insulation cross link polyethylene (XLPE) AC-90 may be used for luminaires drop connections in drop ceilings and receptacles in metal stud walls ONLY.

(h) Armored cables (Teck) must be solid copper #10 AWG and smaller and stranded #8 AWG and larger. Insulation cross link polyethylene (RW-90) 90˚C, 600 V FT6 flame rating must be provided as required, FT4 flame rating otherwise. Cable must be utilized for mechanical equipment connection for vibration isolation and weatherproofing as required. (Watertight flex conduits can also be utilized).

(i) Low voltage cables for systems must be multi-conductor type, and minimum 24 AWG complete with FT4 sheathing (FT6 in Plenum spaces). All conductors must be in conduit.

(j) Allocate no more than two (2) workstations per circuit unless approved otherwise by the Owner.

(k) Do not use quad outlets where multiple outlets are required at the same location. Maintain a minimum of 4” on center between duplex outlets to allow for clearance for plug-in power supplies.

E26.5.14 Fire Alarm System

(a) Extend existing addressable fire alarm system with the following components:

(i) Annunciator panel at the main entrance to the expansion.

(ii) Active graphic display to indicate annunciation zones, smoke management system status where applicable, generator status.

(iii) Manual pull station at all points of egress, and where egress leads from one fire compartment to another.

(iv) Smoke detectors down all corridors and the top of each exit stair shaft (where applicable).

(v) Input/detection module for all sprinkler systems components including flow switches and tamper-proof valve switches. Also for any of the following required sprinkler components: loss of excess water pressure switch. See mechanical for sprinkler details.

(vi) Fan shutdown / on-off control at FACP for each major (public) air handling system.

(vii) Fire alarm – Central Station connection for alarm and trouble.

(viii) Zone separation modules.

(ix) Release of all hold-open or security system held doors on any fire alarm.

(x) Fire alarm speakers or horns c/w strobes, in general are locations throughout the building. All strobes shall be synchronized.

(b) Provide battery back-up and sealed no-maintenance batteries in fire alarm enclosure to provide, upon loss of AC power: 24 hours of supervision on all devices, and full signal output for 30 minutes.

(c) Include all necessary testing and VI reports.

(d) Extended system shall be tied to existing systems.

(e) Extended system shall be interfaced with the building automation system via dry contacts.

E26.5.15 CO Detection System

(a) Supply and install a design fort Carbon Monoxide Alarm/Detection System as required by 6.2.4.2 of the Manitoba Building Code as described below:

6.2.4.2. Carbon Monoxide Alarms — Other Occupancies
a) A building *subject to this Part, but that is not subject to Article 6.2.4.1., must have installed in it a carbon monoxide (CO) alarm that is* installed *in conformance with NFPA-720 Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment, and* interconnected *to the fire alarm system where a fire alarm is required under Article 3.2.4.1.*

(b) The Carbon Monoxide Alarm/Detection System shall be interconnected to and monitored by the fire alarm system.

(c) Carbon Monoxide Detectors shall be installed and located in accordance with NFPA-720, “Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment”.

(i) Note the following excerpts from NFPA-720 regarding locations & installation:

5.5.6.2 Requirements for Carbon Monoxide Detectors.
5.5.6.3 Carbon monoxide detectors shall be installed in accordance with the manufacturer’s published instructions in the following locations:
1. On the ceiling in the same room as permanently installed fuel-burning appliances
2. Centrally located on every habitable level and in every HVAC zone of the building

(ii) Note the following excerpts from NFPA-720 regarding Occupant Notification:

5.5.6.4 Occupant Notification.
5.5.6.4.1 Except as permitted in 5.5.6.2.2, occupant notification shall be throughout the protected premises.
5.5.6.4.2 Where carbon monoxide alarm signals are transmitted to a constantly attended on-site location or off-premises location in accordance with Chapter 7, selective public mode occupant notification shall be permitted to be limited to the notification zone encompassing the area where the carbon monoxide alarm signal was initiated.

E26.5.16 Service Vehicle Parking

(a) No electrical for parking is required

E26.5.17 Emergency Lighting

(a) Provide a complete 24V DC powered battery backup system for the entire building to provide emergency lighting in the event of a loss of AC power to the normal lighting system.

(i) Interlock emergency DC lighting with lighting in each area serviced by the respective battery bank. Provide zone sensing relays as required.

(ii) Aim DC heads to ensure that lighting does not create glare along the path of egress route.

(b) Provide dual head LED type emergency lighting heads at each exit and along all means of egress or access to egress. Energi-lite, Lumacell, Beghelli or approved equal. LED heads shall be 3W, 4W, 5W or 6W, positioned to meet lighting level requirements of the National Building Code along the path of egress.

(c) Provide self-contained battery banks.

E26.5.18 Exit Signs

(a) Running Man pictogram Exit lighting must be provided for the entire building as required by the National Building Code and the City of Winnipeg Information Bulletin 2011-002-B/E. Exit lights must be LED type maximum 2 watts per exit with 25-year life expectancy

(b) Provide self-contained LED type exit signs. Energi-lite, Lumacell, Beghelli or approved equal.

(c) Exit signs must be provided as required by the National Building Code. Must meet CSA-860.

(d) Connect Exit signs to local corridor or general lighting circuit to ensure conformance with CEC Section 46.

E26.5.19 Lighting

(a) Provide high bay LED suspended luminaires in the open floor area.

(i) Take 25 light readings spaced a minimum 3000mm apart in the existing shop area that has been retrofitted with high bay / low bay LED fixtures. Confirm minimum, maximum and average lighting levels in the existing space. Advise Engineer if the average illumination levels are below 40fc. Otherwise match the average illumination levels to the existing space, with a minimum uniformity of 1:4.

(ii) General area shall be broken down into zones. Number of zones shall correspond to the number of bus bays.

(iii) Each zone shall be independently dimmable.

(iv) New luminaires shall match existing LED high bays Holophane Phuzion Model PHZ27L4K12PWM. 347 Volt fixtures are not permitted..

(b) Lighting in offices, storage spaces and other spaces with drywall or ACT ceiling shall consist of 2'x4' or 2'x2' LED volumetric luminaires, achieving 40 foot-candle average illumination levels with minimum 30 foot-candle illumination levels and a minimum uniformity of 1:3.

(i) Fixtures in office spaces shall be dimmable, controlled via an addressable dimmable relay pack and an addressable wall mounted dimmer switch.

(ii) Provide on average one dimming zone and associated controls for six workstations or one cubicle pod (whichever is smaller).

(iii) Fixtures in storage spaces shall be controlled via line voltage wall mounted occupancy vacancy PIR sensors configured for 15 minute delay.

(c) Lighting in corridors complete with ceilings shall be 1'x4' LED surface mounted wrap around luminaires, achieving 25 foot-candle average illumination levels with minimum 10 foot-candle illumination levels and a minimum uniformity of 1:5.

(i) Lighting in corridors shall be controlled via addressable relay packs and addressable ceiling mounted PIR occupancy vacancy sensors.

(d) Lighting in washrooms shall consist of ceiling mounted fixtures as well as surface wall mounted wrap around LEDs above mirrors.

(e) At each exterior door, provide LED wallpack fixture over the door. All exterior fixtures shall be controlled from a common photocell mounted on the North face of the building via a lighting control system.

(f) Provide LED site lighting to ensure an average 1 foot candle horizontal lighting level, 0.5 foot candle minimum vertical lighting level, maximum contrast of 10:1.

(g) Unless specified otherwise, light levels shall be to IES Standards (based on usage criteria – refer to room data sheets).

E26.5.20 Lighting Controls

(a) Supply and install centralized, scalable, addressable lighting control system. System design to conform to ASHRAE Releases 90.1-2010-Part 2.

(i) Lighting control system shall be compatible with existing lighting control system(s) implemented at the facility at the time of the tender.

(b) System shall be compatible with DALI interface.

(c) Where light fixtures are non-addressable, control of lighting fixtures shall be accomplished via relay modules. Modules shall be complete with dimming option where required.

(d) Provide occupancy sensors to control lights in public areas

(e) Use of relay panels is not acceptable.

(f) The system shall utilize BACnet/IP and follows Annex J of the ASHRAE SSPC135 BACnet standard.

(g) The system shall be listed with BACnet Testing Laboratories Listing (BTL).

(h) The system shall be configured to communicate with the existing Building Automation System (Metasys).

E26.5.21 Video Surveillance Systems

(a) Provide cabling and pathways for the owner supplied IP based video surveillance system.

(i) Coordinate final camera locations with the City's video surveillance contractor. Submit a mark-up of camera locations for the City's review prior to commencing rough-ins. See Appendix K for prospective location layout

(ii) Provide continuous rough-ins from camera locations to the nearest network rack. When routed through a concealed, accessible ceiling space, cable may be routed via j-hooks or cable trays. Video surveillance cable may share raceways with other Ethernet and communication cables, provided that all cables have a matching insulation voltage rating.

(iii) Terminate video surveillance cables on color-coded RJ-45 female jacks. Color of the video surveillance cable and video surveillance jack shall be matched, different from all other systems. Confirm the color with the Owner prior to the installation.

(iv) Installation of the CAT6 UTP 23AWG FT4 (FT6 in return air plenums) video surveillance cable shall be done by a TIA certified installer. Installer shall have a valid BICSC, RCDD or equivalent certification. Installation shall be completed under manufacturer's certification program and come with a minimum 20 year system warranty.

(v) Testing of the cable shall be completed in accordance with Section E.25.5.24.

(vi) Cameras shall include high dynamic range to allow functionality both during day and night time conditions. Coordinate camera design with site lighting to ensure against interference between video surveillance and exterior lighting.

(vii) CONFIDENTIAL – Refer to same clause number in Confidential Specifications.

E26.5.22 Card Access System

(a) Extend existing card access system to the new addition. Provide all the necessary hardware, software and licenses required to extend the system to all exterior ingress / egress doors as well as all secured doors identified by the City. System components should include but not be limited to the following:

(i) Proximity type Card Readers (with controllers) at every entrance.

(ii) Door contacts.

(iii) Cards/Tags for access.

(iv) Door Control Modules.

(v) Interface modules for connection to the existing system.

(b) Each access door shall have a flush door contact for monitoring feedback.

(c) 24V electric door strikes for door control. Strikes shall be fail-secure. Magnetic locks not allowed.

(d) Auto-dial up and central reporting features for remote alarm monitoring.

(e) Card access systems to be tied with existing City of Winnipeg Pegasys System.

(f) Cable from doors to door control modules shall be Honeywell Profusion. Cable shall be split to respective devices in a junction box above the door but remain continuous from the door control module to the respective door.

(g) Card Access System subcontractor is subject to approval by the City. Approved subcontractors are INS Group, Static Electric, and McCaine Electric.

(i) Coordinate with other subtrades to ensure that all rough-ins are completed prior to door frames being insulated.

E26.5.23 Public Address System

(a) Provide a centralized public address system throughout the building. The system to be integrated with and controlled by the telephone system.

(b) The system operation to be such that it is accessible from any room in the building. The system shall be zoned for garage and office areas.

(c) The systems shall utilize “BACNet” or “N2Bus” networking technologies. System shall be able to operate as a stand-alone entity with the option of using a web server device so that programming and viewing of status can be accomplished by any PC connected to the same LAN or via the internet.

E26.5.24 Audio Video Equipment

(a) Where room data sheets indicate presence of a projector, the room shall include the following components:

(i) Wall mounted interactive short throw projector (Epson Bright Link Pro series or approved equal)

(ii) Ceiling mounted speakers with an average coverage of one speaker for 15-20 sq.ft. of space.

(iii) Ceiling mounted subwoofer (one per room).

(iv) Audio amplifier, sized to power speakers and subwoofer in the room.

(v) Intercom audio interrupt module

(vi) Wall mounted input control plate complete with 3.5mm audio input port, HDMI input port and VGA input port. Supply HDBaseT video signal extenders as required based on the room layout.

(vii) 19” equipment rack complete with vented shelves. Rack shall be MiddleAtlantic CFR or approved equal, integrated in the millwork within the room. Millwork shall be complete with adequate passive ventilation provisions.

(viii) RS485 based control module to allow for projector control, volume control, video input selection.

(ix) Provisions for connection of Owner supplied PC from the AV equipment rack to the wall mounted projector.

(x) Cable management, wall plates, and any other accessories required for a complete, fully functional system.

(b) System components shall be supplied and installed by a qualified AV contractor. Approved contractors are Advance Pro or approved equals.

E26.5.25 Data/Communication Systems

(a) Coordinate all IT System Requirements and Specifications with:

NAME	ORG/POSITION	PHONE	E-MAIL

Randall P. Wiebe-Dembowski	The City of Winnipeg/Enterprise Network Analyst	(204) 986-6845	RPWiebe@winnipeg.ca

(b) Provide full WiFi coverage throughout entire facility to allow Infodev radio system access for buses.

(c) Refer to room data sheet for additional wireless router requirements for each area.

(d) New network rooms/cabinets to be connected both to 421 Osborne Building-A (basement datacenter) using OM3 50 micron Multimode Fibre Optic Cable.

(e) Telecommunications Cabling Installation General Guidelines:

(i) Data cabling shall adhere to Category 6 UTP distance limitations. Internal layout of the building may require two (2) data distribution cabinets (Telecommunication rooms) in the maintenance garage expansion.

(ii) Any conduit runs through fire rated walls shall be provided with fire stop to maintain rating. See fireproofing section.

(iii) Copper Category 6 UTP FT4 (FT6 in return air plenum spaces) network cabling not to exceed 100m runs including patch cables and service coils.

(iv) Multimode fibre optic cable not to exceed 500m in length (OM3 50ȝm).

(v) Conduits shall be permanently labelled with a designation that indicates the start and end locations of the conduit. Labels at each end of the conduit to be identical.

(vi) Fibre optic cables shall be permanently labelled with a designation that indicates the start and end locations of the cable. The labels at each end of the cable to be identical.

(vii) Fibre optic patch panels shall be permanently labelled and identify each cable and strand number of each cable. A chart shall be attached to the fibre optic enclosure identifying the start and end of each cable and each strand within the cable.

(viii) All copper building cables shall be labelled with a sequential number. Provide a floor plan and indicate all locations of the end points of all cable runs. In a large installation a zone-and-cable number label may be used (eg. 01-23 indicates zone 01 cable #23).Cable numbers shall not be repeated – only sequential numbering throughout the buildings is allowed.

(ix) Copper Cat6 patch panels in the telecommunications room shall be labelled with the sequential numbers identifying the building drop cable. Coordinate the starting number with existing cabling. Confirm the starting number with the Owner prior to commencing the work.

(x) Copper Cat6 work area face plates shall be labelled with the sequential number identifying the building drop cable.

(xi) A labelling naming standard shall be provided to the installer at a later date designating start/end locations and numbering following TIA/EIA-606-A Administration Standard guidelines.

(f) Telecommunication Rooms

(i) Provide at least two (2) wiring distribution locations (Telecommunication Room / Telecommunication Enclosure). New network rooms or cabinets to be connected to 421 Osborne Building-A (basement datacenter) using OM3 50 micron Multimode Fibre Optic Cable.

(ii) Provide a 19” communications rack in each telecommunication room. Secure it to the floor using lug bolts and bond to building ground. With every 19” telecommunication rack, include a 19” x 19” flush mount shelf with minimum 200 lbs. capacity and 6”x6” vertical cable management complete with hinged cover on both sides of the shelf.

(iii) Telecommunications cabling shall be run through EMT Conduit between wiring closets and main Telecommunications room.

(g) Communication cables shall not change direction at pull boxes or junction boxes: all changes in cable directions shall be complete in EMT conduit.

(h) Maximum of two 90 degree bends (or an equal sum of bend angles) are allowed between pull boxes.

(i) Supply pullboxes as required.

(i) All Telecommunication Room shall have environmental controls to maintain normal room temperature for electronic equipment.

(ii) Provide one 4'x8' ¾" plywood backboard in Telecommunications Equipment Room. Secure plywood backboard to the wall near or behind the 19" telecommunications rack to provide a mounting location for telephone BIX blocks and other telecommunications company's demarcation equipment.

(j) Alternatives to standard wiring closets

(k) Standalone network cabinets are allowed. Cabinets shall be easily accessible for changes or servicing of equipment. Environmental controls requirement shall be determined by cabinet location.

(l) In the absence of sufficient environmental controls, hardened network electronics are allowed. Location will determine whether such cabinets will need their own environmental controls.

(i) Provide two separately fused duplex power circuits for telecommunications equipment at each wiring closet.

(ii) Provide additional duplex power outlet for miscellaneous use.

(m) Inside Plant Copper Cabling

(i) Copper Category 6 (CAT6) 24AWG (minimum) UTP FT4 (FT6 in return air plenum spaces) network cabling not to exceed 100m runs including patch cables and service coils.

(ii) Building drop cables shall be terminated in standard 19" wiring racks on RJ45 patch panels.

(iii) Work area jack face plates shall have protective covers against water and dirt. Provide dust plugs (plastic or rubber) for all unused jacks.

(iv) All cables in garage area shall be installed in EMT conduit. The conduit shall be filled no greater than 40% at all times.

(v) Label all pull boxes containing the telecommunications cabling with permanent adhesive labels with the word 'TELECOMMUNICATION'.

(vi) Provide two (2) Cat 6 cable per building drop. Provide the following network cables:

i. One (1) computer workstation at the bus fueling lane (2 cables required).
ii. One (1) computer workstation in the bus parking kiosk (2 cables required).
iii. 1 network access for a stationary revenue vault at the bus fueling lane (2 cables required)
iv. 2 network accesses for fuel meters at the bus fueling lane (4 cables required)
v. 1 computer workstation in the vehicle inspection/repair area (2 cables required)
vi. 6 computer workstations in the dispatch office/driver waiting area (12 cables required)
vii. All of the HVAC and other equipment on Metasys (4 cables required)
viii. Card access (12 cables required)
ix. 12 security cameras along the building exterior (20 cables required)
x. 5 WiFi access spots located to provide full coverage of the garage assuming a maximum 150 ft. radius of coverage (10 cables required)
xi. Wall mounted WiFi hot spots must be on cantilevered arms. Mounting height to be sufficient to avoid any interference with a bus. The arm shall accommodate the antenna to be at least one foot away from the wall.

xii. Provide a 120VAC duplex receptacle adjacent to each network connection. (excludes WiFi hot spots).

(vii) Accurate As-built Drawings shall be provided to the City showing the location of telecommunications ducts/cables.

(viii) CAT6 cables to be tested and certified to CAT6 standards in accordance with ANSI/TIA/EIA-568-B.1 and ISO/IEC 11801, test results to be provided in electronic format (PDF or Word Document). At a minimum, cable certification shall include the following tests:

i. Wire map
ii. Propagation Delay
iii. Delay Sckew
iv. Cable Length
v. Insertion Loss (IL)
vi. Return Loss (RL)
vii. Near-End Crosstalk (NEXT)
viii. Power Sum NEXT (SPNEXT)
ix. Equal-Leve Far-End Crosstalk (ELFEXT)
x. Power Sum ELFEXT (PSELFEXT)

(ix) Ensure that communication cable is stored and handled in accordance with manufacturer's recommendations and within the temperature range specified by the manufacturer.

(x) Arrange for structured cabling installation review by Owner's IT team at 30%, 60%, and 100% of the installation.

(n) Inside Plant Fibre Optic Cabling

(i) Multimode fibre optic cable shall not exceed 500 meters in length (OM3 50 micron).

(ii) All conduit bends, transitions, and pull boxes shall be of sufficient size to maintain the fibre manufacturer's specification for minimum bend radius. In absence of manufacturer's specifications, maintain bending radius at 10 times the outer diameter of the cable.

(iii) Conduits shall not be filled with cabling over 40% at all times (allow 60% spare capacity).

(iv) Label all conduits containing fibre optic cabling with permanent adhesive labels. Provide black lettering on orange background, with the words 'FIBRE OPTIC'. Apply labels at each end of the conduit as well as along the conduit spaced no greater than 10 meters apart. Label all pull boxes containing fibre optic cables in the same fashion.

(v) Use a 24 strand cable of 50/125 ȝm OM3 Multimode Fibre, terminated in a 19" rack mount splice tray, connector type SC.

(vi) After termination, provide OTDR test results, bi-directional, at wavelengths 850nm and 1300 nm, for each strand to be supplied in electronic format (file format *.SOR). Consistent file naming should be used to identify the strand, direction, and wavelength of the test. OTDR tests shall be performed using a launch cable sufficient in length to stabilize the beginning of the trace (100m minimum, 500m recommended).

(vii) The maximum allowable attenuation for any splice or termination is 0.3 dB.

(viii) Tests must ensure that the measured link loss for each strand does not exceed the "worst case" allowable loss defined as the sum of the connector loss (based on the number of mated connector pairs at the EIA/TIA-568 B maximum allowable loss of 0.75 dB per mated pair) and the optical loss (based on the performance standard below)

(ix) OM3 Multimode Fibre 50/125 ȝm

(x) Performance:

i. Wavelength 850nm - Max attenuation 3.0 dB/Km
ii. Wavelength 1,300nm - Max attenuation 0.9 dB/Km

iii. Transmission Properties
iv. Wavelength 850nm - Bandwidth 1500MHz-km
v. Wavelength 1300nm – Bandwidth 500 MHz-km

(o) Connecting the new addition to the City of Winnipeg fibre network

(i) Provide a full 24-strand cable terminated in a fibre splice tray with SC type connectors. Contact Bjorn Radstrom for information on the location of available raceways within the building and the location of termination within the existing building.

(p) Fibre Optic Installation, Test and Certification

(i) The fibre optic cable shall be contained in EMT conduit. Conduit shall be sized with a minimum 40% future fill spare capacity based on BICSI / EIA conduit fill guidelines.

(ii) Provide pull string for future cable pulls. Install a 12-guage tracer wire in the conduit for future location of the conduit.

(iii) All conduit bends, transitions, and pull boxes should be of sufficient size to maintain the fibre manufacturer's specification for minimum bend radius.

(iv) Use a 12 strand cable of OM3 Multimode fibre, terminated in a 19" rack mount splice tray, connector type LC. For Telecommunications Enclosures with no environmental controls, terminating hardware (including fibre patch cords) shall be rated for extreme environments.

(v) After termination, provide OTDR test results bi-directional, at wavelengths 850nm and 1300 nm, for each strand to be supplied in electronic format (file format *.SOR). Consistent file naming should be used to identify the strand, direction, and wavelength of the test. OTDR tests shall be performed using a launch cable sufficient in length to stabilize the beginning of the trace (100m minimum, 500m recommended).

(vi) The maximum allowable attenuation for any splice or termination is 0.3 dB.

(vii) Tests must ensure that the measured link loss for each strand does not exceed the "worst case" allowable loss defined as the sum of the connector loss (based on the number of mated connector pairs at the EIA/TIA-568 B maximum allowable loss of 0.75 dB per mated pair) and the optical loss (based on the performance standard below)

(viii) OM3 Multimode Fiber 50/125 µm Performance:
i. Wavelength 850nm – Max attenuation 3.0 dB/Km
ii. Wavelength 1,300nm - Max attenuation 0.9 dB/Km
iii. Transmission Properties:
iv. Wavelength 850nm – Bandwidth 1500MHz-Km
v. Wavelength 1300nm – Bandwidth 500 MHz-Km
vi. OLTS (Optical Loss Test Set) test results to be provided with an itemized report for each strand on the length and attenuation.

(ix) Provide accurate As-built Drawings showing the routing of the cable through the building.

E26.5.26 Garage Doors:

(a) Ensure operation of garage doors and equip with a warning/pilot light with operations as follows:

(i) Door closed, lights off

(ii) Door operating in opening or closing cycle, red light on

(iii) Door fully open and in hold open position, green light on.

(b) Doors to include an auto setting for normal operations with the automatic door openers.

(c) Include a "manual" setting to allow a person to set the door to open or closed from the controller inside the building adjacent to the door.

(d) Each door shall include a power kill switch with provision for a lock at the door for servicing. A service disconnect shall be accessible at a ground level.

(e) Unless noted otherwise, door operators, controls and interlocks shall match the equipment installed at the existing storage garage at 421 Osborne Street (Manaras Opera Model MGH) Refer to the architectural specification for additional information on garage doors and the associated controls.

(f) Door operators, controls and interlocks shall be the same as the existing storage garage at 421 Osborne Street to retain maintenance continuity, use Manaras Opera Model MGH.

E26.5.27 Power Smart Incentives

(a) Manitoba Hydro Power Smart rebates, where applicable, will be applied for under this contract. The Contractor shall submit all necessary paperwork on behalf of the City, and shall not include this as a credit against the work in this contract. Provide the Contract Administrator with a copy of the application forms, and obtain direction for Payee from the Contract Administrator before making application.

E26.5.28 LEED® Silver Requirements:

(a) Lighting design documentation conforms to Model National Energy Code of Canada for Buildings (MNECB), article 4.2.6.1.

(b) Exterior entrances/exits must meet the requirement of MNECB table 4.2.1.2 and article 4.2.1.2-2.

(c) Exterior lighting and control designs conform to MNECB articles 4.2.1.1, 4.2.1.3-1, and 4.2.2.1-1.

(d) Interior light and controls conform to MNECB articles 4.2.3.1, 4.2.4.2-1, 4.2.4.2-3, 4.2.4.3, 4.2.4.1-3, and 4.2.4.4.

(e) Transformers and their power loss characteristics must comply with equipment efficiency act or CAN/CSA-C802.

(f) Motors must comply with equipment efficiency act or CAN/CSA-C390, article 4.10.

E27. COMMISSIONING AND TRAINING

E27.1 Refer to E25 and E26 for mechanical and electrical commissioning and training requirements. Commissioning and training specified herein do not preclude specific requirements of the LEED® process.

E27.2 Accommodate a maximum of ten (10) Transit employees for their respective training.

E28. PROJECT RECORDS

E28.1 Prior to Total Performance of the contract, the Contractor is to prepare and deliver to the Contract Administrator:

E28.1.1 Operations and Maintenance Manuals

(a) As noted throughout the specifications, four (4) hard copy sets (3 rings binders with index tabs) and one (1) set on electronic media (CD-ROM) in PDF format of operations and maintenance manuals each consisting of installation data, parts list, operating instruction and recommended maintenance procedures.

(b) Four (4) sets of warrantee documents, outlining items warrantied the conditions of the warrantee and the limits of the warrantee.

(c) Manuals to include mechanical and electrical requirements listed in E24.4.32, E24.10.5, E25.1.17, E25.2.3, and E25.2.4.

E28.1.2 As-Built Drawings

(a) Two (2) hard copy sets (paper) and one (1) copy on electronic media (USB 2.0 flash drive) in .dwg and PDF format of all disciplines Architectural, Landscape Architectural, Civil Engineering, Structural, Mechanical, and Electrical.

E28.1.3 Specifications

(a) Two (2) hard copy sets (paper) and one (1) copy on electronic media (USB 2.0 flash drive) in PDF format of all disciplines Architectural, Landscape Architectural, Civil Engineering, Structural, Mechanical, and Electrical.

E28.2 Receipt of these items is mandatory to be awarded Total Performance of the contract.

PART F - SECURITY CLEARANCE

F1. SECURITY CLEARANCE

F1.1 Each individual proposed to perform Work under the Contract shall be required to obtain a Criminal Record Search Certificate from the police service having jurisdiction at his place of residence. This can be obtained from one of the following;

(a) police service having jurisdiction at his/her place of residence; or

(b) BackCheck, forms to be completed can be found on the website at: http://www.backcheck.net/ ; or

(c) Commissionaires (Manitoba Division), forms to be completed can be found on the website at: https://www.commissionaires.ca/en/manitoba/home.

F1.1.1 The cost of obtaining security clearance checks for all individuals proposed to perform Work under the Contract shall be borne by the Contractor.

F1.2 The original Criminal Record Search Certificate (Form P–253) will be provided by the Winnipeg Police Service to the individual applicant. The original has a validation sticker from the Winnipeg Police Service in the top right hand corner. The applicant shall:

(a) Provide the original Criminal Record Search Certificate (Form P–253) to the Contract Administrator.

F1.3 Prior to the award of Contract, and during the term of the Contract if additional or replacement individuals are proposed to perform Work, the Contractor shall supply the Contract Administrator with a Criminal Record Search Certificate obtained not earlier than one (1) year prior to the Submission Deadline, or a certified true copy thereof, for each individual proposed to perform the Work.

F1.4 Any individual for whom a Criminal Record Search Certificate is not provided, or for whom a Criminal Record Search Certificate indicates any convictions or pending charges related to property offences or crimes against another person will not be permitted to perform any Work.

F1.5 Any Criminal Record Search Certificate obtained thereby will be deemed valid for the duration of the Contract subject to a repeated records search as hereinafter specified.

F1.6 Notwithstanding the foregoing, at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated criminal records search. Any individual who fails to provide a satisfactory Criminal Record Search Certificate as a result of a repeated criminal records search will not be permitted to continue to perform any Work.

WINNIPEG POLICE SERVICE
SECURITY CLEARANCE CHECK
SERVICES – DIVISION 30

NAME, TELEPHONE NUMBER AND BUSINESS ADDRESS OF EMPLOYER:	NAME & PHONE NUMBER OF CITY CONTACT PERSON IN CHARGE OF THE PROJECT REQUIRING THE SECURITY CLEARANCE CHECKS

NATURE & LOCATION OF WORK BEING DONE FOR WINNIPEG POLICE SERVICE:

Contract Administrator:

WARNING: ANY FALSE OR INCOMPLETE INFORMATION MAY RESULT IN REJECTION OF THIS APPLICATION INCOMPLETE APPLICATIONS WILL NOT BE PROCESSED

EMPLOYEE INFORMATION

LAST NAME: _____ GIVEN NAMES: _____

BIRTH NAME OR OTHER NAME(S) USED: _____
(if different from above)

☐ MALE ☐ FEMALE DATE OF BIRTH: _____ BIRTH PLACE: _____
Y M D

ADDRESS: _____ CITY: _____ PROVINCE: _____

POSTAL CODE: _____ RESIDENTIAL PHONE: _____

AUTHORIZATION

I, _____ hereby consent to the Winnipeg Police Service collecting my personal information from any public body, person, employer, or government institution for the purpose of conducting a security check in connection with my contract or association with the Winnipeg Police Service. This authorization, including a copy or facsimile thereof, is my consent to any public body, person, employer or government institution to release true copies of any records containing my personal information to the Winnipeg Police Service. **(Security clearance checks expire after a period of one year).**

_____ _____
Signature of Witness Signature of Applicant

This personal information will be collected pursuant to *The Freedom of Information and Protection of Privacy Act* C.C.S.M.cF175 _____ (title, name, phone # of person who) can answer questions about the collection of this information.

_____
Date

WINNIPEG POLICE SERVICE - FOR OFFICE USE ONLY

RESULT OF CHECK:

_____ NO POLICE RECORD OF CRIMINAL CONVICTIONS WAS ASSOCIATED TO ANY SUBJECT WITH THE SAME NAME AND DATE OF BIRTH.

_____ AN OUTSTANDING CRIMINAL CHARGE AWAITING COURT DISPOSITION WAS ASSOCIATED TO A SUBJECT WITH THE SAME NAME AND DATE OF BIRTH.

_____ A POLICE RECORD OF CRIMINAL CONVICTIONS WAS ASSOCIATED TO A SUBJECT WITH THE SAME NAME AND DATE OF BIRTH.

PROCESSED BY: _____ _____
Clerk WPS# Date