



THE CITY OF WINNIPEG

REQUEST FOR PROPOSAL

RFP NO. 199-2012

**REQUEST FOR PROPOSAL FOR PROFESSIONAL CONSULTING SERVICES FOR
DETAILED DESIGN AND CONTRACT ADMINISTRATION SERVICES FOR THE HVAC AND
ELECTRICAL UPGRADES AT 552 PLINGUET STREET WASTEWATER SERVICES
GARAGE AND ADJACENT BUILDINGS**

Proposals shall be submitted to:

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

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 REQUEST FOR PROPOSAL FOR PROFESSIONAL CONSULTING SERVICES FOR DETAILED DESIGN AND CONTRACT ADMINISTRATION SERVICES FOR THE HVAC AND ELECTRICAL UPGRADES AT 552 PLINGUET STREET WASTEWATER SERVICES GARAGE AND ADJACENT BUILDINGS

B2. SUBMISSION DEADLINE

- B2.1 The Submission Deadline is 4:00 p.m. Winnipeg time, March 23, 2012.
- 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 Project Manager 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. SITE INVESTIGATION

- B3.1 The Project Manager or an authorized representative will conduct a Site Investigation tour of the Wastewater Services Garage at 552 Plinguet Street on March 15, 2012, beginning at 9:00 AM
- B3.1.1 Proponents are requested to register for the Site Investigation by contacting the Project Manager identified in D2.
- B3.2 Although attendance at the Site Investigations is not mandatory, the City strongly suggests that Proponents attend.
- B3.3 The Proponent shall not be entitled to rely on any information or interpretation received at the Site Investigation unless that information or interpretation is the Proponent's direct observation, or is provided by the Project Manager in writing.

B4. ENQUIRIES

- B4.1 All enquiries shall be directed to the Project Manager identified in D2.
- B4.2 If the Proponent finds errors, discrepancies or omissions in the Request for Proposal (RFP), or is unsure of the meaning or intent of any provision therein, the Proponent shall promptly notify the Project Manager of the error, discrepancy or omission at least five (5) Business Days prior to the Submission Deadline.
- B4.3 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.
- B4.4 Responses to enquiries which, in the sole judgment of the Project Manager, require a correction to or a clarification of the RFP will be provided by the Project Manager to all Proponents by issuing an addendum.
- B4.5 Responses to enquiries which, in the sole judgment of the Project Manager, do not require a correction to or a clarification of the RFP will be provided by the Project Manager only to the Proponent who made the enquiry.
- B4.6 The Proponent shall not be entitled to rely on any response or interpretation received pursuant to B4 unless that response or interpretation is provided by the Project Manager in writing.

B5. CONFIDENTIALITY

- B5.1 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 Project Manager. 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.
- B5.2 The Proponent shall not make any statement of fact or opinion regarding any aspect of the Request for Proposals to the media or any member of the public without the prior written authorization of the Project Manager.

B6. ADDENDA

- B6.1 The Project Manager 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.
- B6.2 The Project Manager 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.
- B6.2.1 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>
- B6.2.2 The Bidder is responsible for ensuring that it 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.
- B6.3 The Bidder 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.

B7. PROPOSAL SUBMISSION

- B7.1 The Proposal shall consist of the following components:
- (a) Form A: Proposal (Section A) in accordance with B8;
 - (b) Fees (Section B) in accordance with B9;
- B7.2 The Proposal should also consist of the following components:
- (a) Experience of Proponent and Subconsultants (Section C) in accordance with B10;
 - (b) Experience of Key Personnel Assigned to the Project (Section D), in accordance with B11;
 - (c) Project Understanding and Methodology (Section E) in accordance with B12; and
 - (d) Project Schedule (Section F) in accordance with B13.
- B7.3 Further to B7.1, 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.
- B7.4 Further to B7.2, 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.
- B7.5 Proponents should submit one (1) unbound original (marked "original") and six (6) copies for sections identified in B7.1 and B7.2.

- B7.6 Proposal format, including type of binding, number of pages, size of pages and, font, etc., will not be regulated, except that the Proposal should be presented in the Sections identified above. 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.
- B7.7 Proponents are advised that inclusion of terms and conditions inconsistent with the Request for Proposal, will be evaluated in accordance with B20.1(a).
- B7.8 The Proposal shall be submitted enclosed and sealed in an envelope/package clearly marked with the RFP number and the Proponent's name and address.
- B7.9 Proposals submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.
- B7.10 Proposals shall be submitted to:
The City of Winnipeg
Corporate Finance Department
Materials Management Division
185 King Street, Main Floor
Winnipeg MB R3B 1J1
- B7.11 Any cost or expense incurred by the Proponent that is associated with the preparation of the Proposal shall be borne solely by the Proponent.

B8. PROPOSAL (SECTION A)

- B8.1 The Proponent shall complete Form A: Proposal, making all required entries.
- B8.2 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.
- B8.2.1 If a Proposal is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.
- B8.3 In Paragraph 3 of Form A: Proposal, the Proponent shall identify a contact person who is authorized to represent the Proponent for purposes of the Proposal.
- B8.4 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.

B8.4.1 The name and official capacity of all individuals signing Form A: Proposal should be printed below such signatures.

B8.5 If a Proposal is submitted jointly by two 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.

B9. FEES (SECTION B)

B9.1 The Proposal shall include a Fixed Fee for all disciplines and/or phases identified in D4 Scope of Services.

B9.2 Adjustments to Fees will only be considered based on increases to the Scope of Services.

B9.2.1 The City will not consider an adjustment to the Fees based on changes in the Project budget or the Final Total Construction Cost.

B9.3 Notwithstanding C1.1(b), Fees shall include costs for out of town travel, related meals and accommodations for the duration of the Project and shall not be considered an Allowable Disbursement.

B9.4 The Fee Proposal shall also include an allowance for Allowable Disbursements as defined in C1.1(b), but shall exclude the costs of any materials testing, soils and hazardous materials investigation during construction.

B9.5 Allowances for Disbursements for Material Testing have been included in Form B as the City's estimate of costs for these disbursements. These costs are to be included in the Calculation of Total Fees proposed by the Proponent.

B9.6 Notwithstanding C10.1, Fees submitted shall not include the Goods and Services Tax (GST) or Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable.

B9.7 Payments to Non-Resident Consultants are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

B10. EXPERIENCE OF PROPONENT AND SUBCONSULTANTS (SECTION C)

B10.1 Proposals should include:

- (a) details demonstrating the history and experience of the Proponent and Subconsultants in providing programming; design, management of construction and contract administration services on up to three projects of similar size and complexity.

B10.2 For each project listed in B10.1(a), the Proponent should submit:

- (a) description of the project;
- (b) role of the consultant;
- (c) project's original contracted construction cost and final construction cost;
- (d) design and construction schedule (anticipated Project schedule and actual project delivery schedule, showing design and construction separately);
- (e) project owner;
- (f) reference information (two current names with telephone numbers per project).

B10.2.1 Where applicable, information should be separated into Proponent and Subconsultant project listings.

B10.3 The Proposal should include general firm profile information, including years in business, average volume of work, number of employees and other pertinent information for the Proponent and all Subconsultants.

B11. EXPERIENCE OF KEY PERSONNEL ASSIGNED TO THE PROJECT (SECTION D)

- B11.1 Describe your approach to overall team formation and coordination of team members.
- B11.1.1 Include an organizational chart for the Project.
- B11.2 Submit the experience and qualifications of the Key Personnel assigned to the Project for projects of comparable size and complexity, including the principals-in-charge, the Consultants Representative, managers of the key disciplines and lead designers. Include educational background and degrees, professional recognition, job title, years of experience in current position, years of experience in design and construction, and years of experience with existing employer. Roles of each of the Key Personnel in the Project should be identified in the organizational chart referred to in B11.1.1.
- B11.3 For each person identified, list at least two comparable projects in which they have played a primary role. If a project selected for a key person is included in B10, provide only the project name and the role of the key person. For other projects provide the following:
- (a) Description of project;
 - (b) Role of the person;
 - (c) Project Owner;
 - (d) Reference information (two current names with telephone numbers per project).

B12. PROJECT UNDERSTANDING AND METHODOLOGY (SECTION E)

- B12.1 Describe your firm's project management approach and team organization during the performance of Services, so that the evaluation committee has a clear understanding of the methods the Proponent will use in the delivery of this Project.
- B12.2 Methodology should be presented in accordance with the Scope of Services identified in D4.
- B12.3 Describe the collaborative process/method to be used by the Key Personnel of the team in the various phases of the Project.
- B12.4 Proposals should address:
- (a) the team's understanding of the broad functional and technical requirements;
 - (b) the team's understanding of the urban design issues;
 - (c) the proposed Project construction budget;
 - (d) the City's Project methodology with respect to the information provided within this RFP; and
 - (e) any other issue that conveys your team's understanding of the Project requirements.
- B12.5 For each person identified in B11.2, list the percent of time to be dedicated to the Project in accordance with the Scope of Services identified in D4.

B13. PROJECT SCHEDULE (SECTION F)

- B13.1 Proponents should present a carefully considered Critical Path Method schedule using Microsoft Project or similar project management software, complete with resource assignments (key designers), durations (weekly timescale) and milestone dates or events. The schedule should address each requirement of the Scope of Services.
- B13.2 The Proponent's schedule should include critical dates for review and approval processes by the City and other organizations anticipated during the design and tendering phases of the Project. Reasonable times should be allowed for completion of these processes.

B14. QUALIFICATION

B14.1 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;
- (c) have all the necessary experience, capital, organization, and equipment to perform the Services in strict accordance with the terms and provisions of the Contract;
- (d) have or establish and staff an office in Winnipeg for the duration of the Project.

B14.2 The Proponent and any proposed Subconsultant (for the portion of the Services 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>

B14.3 The Proponent and/or any proposed Subconsultant (for the portion of the Services proposed to be subcontracted to them) shall:

- (a) have successfully carried out services for the programming; design, management of construction and contract administration for architectural and/or engineering projects of similar complexity, scope and value; and to those required for this Project; and
- (b) be fully capable of performing the Services 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 the knowledge and resources to administer the requirements of The Workplace Safety and Health Act (Manitoba) during the construction works associated with this Contract; and
- (e) undertake to meet all licensing and regulatory requirements of the appropriate governing authorities and associations in the Province of Manitoba.

B14.4 The Proponent shall submit, within three (3) Business Days of a request by the Project Manager, further proof satisfactory to the Project Manager of the qualifications of the Proponent and of any proposed Subconsultant.

B14.5 The Proponent shall provide, on the request of the Project Manager, full access to any of the Proponent's equipment and facilities to confirm, to the Project Manager's satisfaction, that the Proponent's equipment and facilities are adequate to perform the Services.

B15. OPENING OF PROPOSALS AND RELEASE OF INFORMATION

B15.1 Proposals will not be opened publicly.

B15.2 After award of Contract, the name(s) of the successful Proponent and the Contract amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt>

B15.3 To the extent permitted, the City shall treat all Proposal Submissions as confidential. However, the Proponent is advised that any information contained in any Proposal may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

B15.4 Following the award of Contract, a Proponent will be provided with information related to the evaluation of its submission upon written request to the Project Manager.

B16. IRREVOCABLE OFFER

B16.1 The Proposal(s) submitted by the Proponent shall be irrevocable for the time period specified in Paragraph 10 of Form A: Proposal.

B16.2 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 Services until a Contract for the Services has been duly executed 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.

B17. WITHDRAWAL OF OFFERS

B17.1 A Proponent may withdraw its Proposal without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.

B17.1.1 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.

B17.1.2 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.

B17.1.3 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 of the persons specified in B17.1.3(b), declare the Proposal withdrawn.

B17.2 A Proponent who withdraws its Proposal after the Submission Deadline but before its offer has been released or has lapsed as provided for in B16.2 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.

B18. INTERVIEWS

B18.1 The Project Manager may, in his/her sole discretion, interview Proponents during the evaluation process.

B19. NEGOTIATIONS

B19.1 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.

B19.2 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.

B19.3 If, in the course of negotiations pursuant to B19.2 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.

B20. EVALUATION OF PROPOSALS

B20.1 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 Subconsultants, if any, pursuant to B14: (pass/fail)
- (c) Fees; (Section B) 40%
- (d) Experience of Proponent and Subconsultants; (Section C) 20%
- (e) Experience of Key Personnel Assigned to the Project; (Section D) 20%
- (f) Project Understanding and Methodology (Section E) 15%
- (g) Project Schedule. (Section F) 5%

B20.2 Further to B20.1(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.

B20.3 Further to B20.1(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.

B20.4 Further to B20.1(c), Fees will be evaluated based on Fees submitted in accordance with B9.

B20.5 Further to B20.1(d), Experience of Proponent and Subconsultants will be evaluated considering the experience of the organization on projects of similar size and complexity as well as other information requested.

B20.6 Further to B20.1(e), Experience of Key Personnel Assigned to the Project will be evaluated considering the experience and qualifications of the Key Personnel and Subconsultant personnel on Projects of comparable size and complexity.

B20.7 Further to B20.1(f), Project Understanding and Methodology will be evaluated considering your firm's understanding of the City's Project, project management approach and team organization.

B20.8 Further to B20.1(g), Project Schedule will be evaluated considering the Proponent's ability to comply with the requirements of the Project.

B20.9 Notwithstanding B20.1(d) to B20.1(g), where Proponents fail to provide complete responses to B7.2(a) to B7.2(d), the score of zero will be assigned to the incomplete part of the response.

B21. AWARD OF CONTRACT

B21.1 The City will give notice of the award of the Contract, or will give notice that no award will be made.

B21.2 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.

B21.2.1 Without limiting the generality of B21.2, the City will have no obligation to award a Contract where:

- (a) the prices exceed the available City funds for the Services;
- (b) the prices are materially in excess of the prices received for similar services in the past;
- (c) the prices are materially in excess of the City's cost to perform the Services, 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.

B21.3 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.

B21.4 The form of Contract with the City of Winnipeg will be based on the Contract as defined in C1.1(n).

B21.5 Following the award of Contract, a Proponent will be provided with information related to the evaluation of its Proposal upon written request to the Project Manager.

B21.6 If, after the award of Contract, the Project is cancelled, the City reserves the right to terminate the Contract. The Consultant 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 Consultant Services* (Revision 2010-10-01) are applicable to the Services of the Contract.
- C0.1.1 The *General Conditions for Consultant Services* 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 Consultant Services*.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

D1.1 In addition to the *General Conditions for Consultant Services*, these Supplemental Conditions are applicable to the Services of the Contract.

D2. PROJECT MANAGER

D2.1 The Project Manager is:

Doug Berg, C.E.T.

Email: DBerg@winnipeg.ca

Telephone No. (204) 986-4452

Facsimile No. (204) 986-5345

D2.2 All correspondence or contact by Proponents with the City in respect of this RFP must be directly and only with the City's Project Manager. Failure to restrict correspondence and contact to the Project Manager may result in the rejection of the Proponents Proposal Submission.

D2.3 At the pre-commencement meeting, the Project Manager will identify additional personnel representing the Project Manager and their respective roles and responsibilities for the Services.

D3. BACKGROUND

D3.1 The Wastewater Services' Garage building and the adjacent Water Services' Shops building are located at the Water and Waste Department's 552 Plinguet Street compound. The original building is a large single storey building assumed to have been constructed in the 1950's, an addition to the west end of the Wastewater Services Garage was built at sometime later in the same style as the original building. The building usage spaces from east to west are: Meter Shop, Hydrant Shop and Equipment Service Garage (complete with a vehicle wash bay).

D3.2 Due to the multiple uses within the building and its age, there are concerns with the indoor air quality and high moisture levels. The building's existing HVAC and electrical power distribution systems are obsolete and no longer provide adequate service for the intended uses of the building and the Department staff who occupy it. Major upgrades to these components are now required to provide dependable and safe operational service for many years to come.

D3.3 No existing mechanical or electrical record drawings are available for this building complex.

D3.4 An assessment report of the existing building roof structure, prepared by MMM Group, is included in Appendix "A" of this document for information purposes only.

D3.5 An assessment report of an indoor air quality HVAC review, prepared by SMS Engineering Ltd., is included in Appendix "B"

D3.6 The detailed design stage for this project will largely involve upgrading the mechanical and electrical components within the building relating to HVAC and electrical power distribution systems including any required instrumentation. There may also be some structural modifications required to the building in order to accommodate these upgrades.

D3.7 The mechanical and electrical upgrades to this building complex will generally consist of the following work:

- (a) Provision of detailed design services for the replacement and/or revision of the existing mechanical HVAC system to address air quality and moisture problems in all areas of the building complex identified.
- (b) Provision of detailed design services to replace and/or revise the existing electrical panels and distribution system to support the required upgrades to the HVAC system.
- (c) Provision of detailed design services to increase electrical power in the Hydrant shop to run all shop tools. This area is affected by frequent electrical power shortages depending on the usage of shop tools.
- (d) Provision of all specifications and technical drawings in preparation of a Bid Opportunity for the required work.
- (e) Provision of miscellaneous upgrades to include lighting and receptacles.
- (f) Provision of resident and non-resident contract administration services.
- (g) Provision of asbuilt record drawings upon completion of work.

D4. SCOPE OF SERVICES

D4.1 The Services required under this Contract shall consist of providing the detailed design, tendering and contract administration services for work to upgrade the 552 Plinguet Street Wastewater Services Garage, Hydrant Shop and Meter Shop building in accordance with the following:

D4.1.1 General

- (a) These Terms of Reference are supplemental to the Standard Terms and Conditions of Consultant Services and the "Definition of Standard Consulting Engineering Services" required by the City of Winnipeg.
- (b) The consulting services described herein will be provided for the Water and Waste Department (the Department).
- (c) The following engineering services are required for the building upgrades:
 - HVAC engineering design, including instrumentation if required.
 - Electrical engineering design, including Arc Flash Hazard ratings if required.
 - Structural engineering design to any building modifications required to accommodate the HVAC and electrical upgrades.
 - Increase electrical power distribution to Hydrant Shop.
 - Install additional interior lighting where required.
 - Install additional electrical receptacles where required.
 - Preparation of Bid Opportunity documents.
 - Review and approval of Shop Drawing submissions.
 - Resident and non-resident Contract Administration services
- (d) The Department will provide assistance towards the following services:
 - Coordinate temporary changes to normal operational activities conducted in the building to facilitate upgrade work.

D4.1.2 Orientation Meeting

- (a) Attend a mandatory meeting with the Design & Construction and Wastewater Services Branches of the Department to review project expectations and limits.

D4.1.3 Review Engineered Reports

- (a) The Consultant shall review the Engineered Reports attached in Appendix A and B and will meet with City Staff to verify design criteria to proceed with detailed design upgrades for the Building.

D4.1.4 Design Services

(a) General

- (i) All required technical specifications complete with Form B: Unit Prices, to be included with the Bid Opportunity documents and construction drawings package.
- (ii) A pre-tender estimate must be provided to the Department's contact person for review at least fifteen (15) calendar days prior to tendering. **The project shall not be tendered without this review.**
- (iii) Construction drawings are to have a Department drawing number assigned before the work is tendered. Drawing numbers shall be requested from the Department's contact person.
- (iv) Review and approval of shop drawings submitted by the Contractor and/or Supplier(s).
- (v) Digital files of the construction drawings shall be provided to the Department's contact person when the work is tendered.
- (vi) Provision of appropriate response to bidders and advice to the Department during the period of tender call and, subject to acceptance by the Department, issuing addenda to the Bid Opportunity documents.
- (vii) Review Bid submissions for completeness and prepare Bid submission tabulation
- (viii) If required, arrange for a pre-award meeting(s) with the Department and the lowest qualified Bidder for which the purpose is:
 - To establish that the Contractor has received all addenda.
 - To ascertain that the Contractor understands the scope of work in the Bid Opportunity.
 - To determine that the Contractor is capable of meeting the obligations of the detailed in the Bid Opportunity.
 - To secure advisement by the Contractor of intended methods, materials, stages, timelines or sequences of the Contract that are of interest to the Department.
 - To afford the opportunity for each participant to fulfil the obligation of disclosing any known obstacle(s) to the conduct of the Contract, or of any expectation of significant revision thereof, if known at that time.
- (ix) Preparation of a report containing recommendation regarding award of contract and identifying reasons thereof, including identifying and explaining any variations in cost from the original engineer's estimate to the submitted Contract cost.
- (x) Provide the Contractor with assistance in obtaining any required permits necessary for the commencement of construction.
- (xi) Coordinate with the Contractor, the Department and other relevant parties any commissioning activities required before any components of the building can be put into active service.
- (xii) Provide an AACE Class 4 cost estimate for the proposed work before tendering.

(b) HVAC Engineering

- (i) Determine if an all-in-one ventilation system for all areas identified in the building or individual ventilation systems for each specific area will be used.
- (ii) Meter Shop
 - Retain existing unit heater and provide a heat recovery ventilator sized for the minimum outdoor air requirement of 200 cfm.
 - Provide for provision of external vented exhaust.
 - Provide manual override of ventilation fan motor.

- Does not require air-conditioning.
- (iii) Hydrant Shop
- Provide a new mixed air unit and exhaust fan to meet ventilation requirements.
 - Fresh air supply and return to be set to provide the minimum ventilation requirement of 460 cfm and capable of providing 1,870 cfm upon detection of gas emissions monitored by carbon monoxide and nitrogen dioxide sensors.
 - Supply air to be introduced on one side of the space and removed from the opposite side via externally vented exhaust.
 - Provide external vented exhaust in adjacent washroom.
 - Provide exhaust system to externally vent vehicle emissions from one vehicle inside this space.
 - Provide manual override of ventilation fan motor.
 - Does not require air-conditioning.
- (iv) Wastewater Services Garage
- Remove the existing make-up air unit and exhaust system and provide a new mixed air unit with economizer and exhaust fan to meet ventilation requirements.
 - Determine if the existing ceiling suspended natural draft gas fired heaters are suitable for continued use, if not; provide recommendation for alternate heat supply.
 - Fresh air supply and return to be set to provide the minimum ventilation requirement of 1,970 cfm and capable of providing 8,320 cfm upon detection of gas emissions monitored by carbon monoxide and nitrogen dioxide sensors.
 - Supply air to be introduced on one side of the space and removed from the opposite side via externally vented exhaust.
 - Provide new separate exhaust system for the Welding Shop area in this space.
 - Does not require air-conditioning.
- (c) Electrical Engineering
- (i) Determine, based on service loading information available, if the main electrical service is large enough to accommodate the recommended HVAC revisions.
- (ii) Replace existing panel boards PA and PB in the adjacent Stores Office area with a twin 60 circuit (120 circuits total) panel board rated at 400A, 120/207V, 3 phase, 4 wire to allow full utilization of the 75 kVA transformer load and also to allow for future expansion.
- Remove the existing meter and provide a new 300A (minimum) feeder from the existing 75 kVA transformer secondary to the new panelboard.
 - Provide Arc Flash Hazard ratings if required.
- (iii) Replace the existing panelboard in the Hydrant Shop with a 200A 120/208V, 3 phase, 4 wire panelboard fed from a 3P125 breaker in panelboard PB in the Stores Office
- Panel to be a 60 circuit NEMA 3R rated panel with a gasketed cover and new 125A 4 wire feeder
 - Provide 36kW of available load to the Meter Shop.
 - Test existing circuits to verify the loads on them, any overloaded circuits to be split into multiple circuits.
 - Provide emergency exit lighting over exterior person doors.

- Provide additional two wall plug outlets on the south wall of the Hydrant Shop.
 - Provide Arc Flash Hazard ratings if required.
- (iv) Verify existing loads connected to the main panelboard in the Wastewater Service Garage as to their function and usage. All loads no longer required to be disconnected, wiring removed back to panel and breakers tagged as spares.
- Revise and upgrade existing panel schedule to reflect new loads and re-label.
 - Provide emergency exit lighting over exterior person doors.
 - Provide additional overhead fluorescent lighting along the north wall in the welding shop area.
 - Provide Arc Flash Hazard ratings if required.
- (v) Provide all conduits, cables and switches required for proper installation and operation of HVAC equipment. Any existing conduits, cables and switches no longer in use to be removed.
- (vi) All electrical code requirements to be satisfied.
- (vii) Provide a P&ID diagram of the new ventilation system and associated controls for the HVAC upgrades.

SUBMISSIONS PRIOR TO START OF SERVICES

D5. AUTHORITY TO CARRY ON BUSINESS

- D5.1 The Consultant 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 Consultant does not carry on business in Manitoba, in the jurisdiction where the Consultant does carry on business, throughout the term of the Contract, and shall provide the Project Manager with evidence thereof upon request.

D6. INSURANCE

- D6.1 The Consultant shall procure and maintain, at its own expense and cost, insurance policies with limits no less than those shown below.
- D6.2 As a minimum, the Consultant shall, without limiting its obligations or liabilities under any other contract with the City, procure and maintain, at its own expense and cost, the following insurance policies:
- (a) Comprehensive or Commercial General Liability Insurance including:
- (i) an inclusive limit of not less than \$2,000,000 for each occurrence or accident with a minimum \$2,000,000 Products and Completed Operations aggregate and \$5,000,000 general aggregate;
 - (ii) all sums which the Consultant shall become legally obligated to pay for damages because of bodily injury (including death at any time resulting therefrom) sustained by any person or persons or because of damage to or destruction of property caused by an occurrence or accident arising out of or related to the Services or any operations carried on in connection with this Contract;
 - (iii) coverage for Products/Completed Operations, Blanket Contractual, Contractor's Protective, Personal Injury, Contingent Employer's Liability, Broad Form Property Damage, Employees as Additional Insureds, and Non-Owned Automobile Liability;
 - (iv) a Cross Liability clause and/or Severability of Interest Clause providing that the inclusion of more than one Insured shall not in any way affect the rights of any other Insured hereunder in respect to any claim, demand, suit or judgment made against any other Insured;

- (v) if applicable, Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Consultant directly or indirectly in the performance of the Services. The Limit of Liability shall not be less than \$2,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence.
 - (b) Professional Errors and Omissions Liability Insurance including:
 - (i) an amount not less than \$5,000,000 per claim and \$5,000,000 in the aggregate.
- D6.2.1 The Consultant's Professional Errors and Omissions Liability Insurance shall remain in force for the duration of the Project and for twelve (12) months after total performance.
- D6.3 The policies required in D6.2(a) to D6.2(a)(iv):
- (a) shall provide that the City is named as an Additional Insured thereunder and that said policies are primary without any right of contribution from any insurance otherwise maintained by the City.
- D6.4 The Consultant shall require each of its Subconsultants to provide comparable insurance to that set forth under D6.2(a) and D6.2(b).
- D6.5 The Consultant shall provide the Project Manager with a certificate(s) of insurance for itself and for all of its Subconsultants, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Services, but in no event later than the date specified in C4.1 for the return of the executed Contract. Such Certificates shall state the exact description of the Services and provide for written notice in accordance with D6.10.
- D6.6 The Consultant may take out such additional insurance as it may consider necessary and desirable. All such additional insurance shall be at no expense to the City.
- D6.7 All insurance, which the Consultant is required to obtain with respect to this Contract, shall be with insurance companies registered in and licensed to underwrite such insurance in the Province of Manitoba.
- D6.8 If the Consultant fails to do all or anything which is required of it with regard to insurance, the City may do all that is necessary to affect and maintain such insurance, and any monies expended by the City shall be repayable by and recovered from the Consultant.
- D6.9 The failure or refusal to pay losses by any insurance company providing insurance on behalf of the Consultant or any Subconsultants shall not be held to waive or release the Consultant or Subconsultants from any of the provisions of the insurance requirements or this Contract. Any insurance deductible maintained by the Consultant or any Subconsultants under any of the insurance policies is solely for their account and any such amount incurred by the City will be recovered from the Consultant as stated in D6.8.
- D6.10 The Consultant shall not cancel, materially alter, or cause any policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the City.

SCHEDULE OF SERVICES

D7. COMMENCEMENT

- D7.1 The Consultant shall not commence any Services until it is in receipt of a notice of award from the City authorizing the commencement of the Services.
- D7.2 The Consultant shall not commence any Services until:
- (a) the Project Manager has confirmed receipt and approval of:
 - (i) evidence of authority to carry on business specified in D5;
 - (ii) evidence of the insurance specified in D6;

- (b) the Consultant has attended a meeting with the Project Manager, or the Project Manager has waived the requirement for a meeting.

D8. CRITICAL STAGES

D8.1 The Consultant shall achieve critical stages for this Contract in accordance with the following requirements:

- (a) Final design completed and accepted by the City no later than June 30, 2012.
- (b) Bid Opportunity closing no later than July 16, 2012.
- (c) Commencement of construction after August 1, 2012.
- (d) Substantial Performance by November 1, 2012.
- (e) Total Performance by November 15, 2012

D9. PROJECT CLOSEOUT

D9.1 Final Inspections and Project Acceptance

- (a) As coordinated with the Department's contact person and the Contractor, provide inspection of the completed Works to establish the project milestones of Substantial Performance, Total Performance and Final Acceptance of the completed project.
- (b) Complete and submit record drawings of the completed mechanical (HVAC) and electrical work to the Department within two (2) months of the date for Substantial Performance of the Work.

D9.2 Record Drawings

- (a) The preliminary record drawing submission is to consist of a drawing transmittal letter to the Department's Supervisor of Drafting and Graphic Services, copied to the Department's contact person, and along with one (1) complete set of full size (A1) drawings for the Works.
- (b) Record drawings are to include all construction details and materials of the completed Works, including the following:
 - All construction details,
 - Complete material lists for each component installed,
 - Date of installation of Works (Substantial Performance),
 - Installation Contractor.
- (c) The reviewed record drawings will be returned with comments (if any) for completion. Once all revisions have been made, submit one (1) complete set of full sized (A1) drawings for the Works, complete with preliminary prints with comments, and the digital file for each as constructed drawing to the Department's Supervisor of Drafting and Graphic Services. The digital drawing file must have the Water and Waste Department drawing number assigned to that drawing.

APPENDIX A – BUILDING ROOF SUMMARY REPORT

MMM Group Limited
Suite 111-93 Lombard Avenue
Winnipeg, MB R3B 3B1
t: 204.943.3178 | f: 204.943.4948

www.mmm.ca

August 25, 2008

Ref. No. 5541885.101.710

Mr. Kas Zurek, P.Eng.
Design & Construction Engineer
City of Winnipeg, Water and Waste Department
Engineering Division, Design and Construction Branch
110 – 1199 Pacific Avenue
Winnipeg MB R3E 3S8

Dear Mr. Zurek:

Re: 552 Plinquet – Building Roof Retrofit Summary Report

As a follow-up to our letter report dated July 29, 2008, we are pleased to provide the Water and Waste Department with the final analysis report of one of the buildings located at 552 Plinquet Street.

The Water and Waste complex at 552 Plinquet Street consists of several buildings that include offices and garages. We understand that one of these buildings has a history of unusually high interior condensation and heat loss, and that Water and Waste is working with Wheat City Roofing to mitigate this problem by installing supplementary insulation. MMM Group Limited was asked to visit the site and advise whether the overall concept of the retrofit appears to be reasonable.

Retrofit

The roof retrofit involves overlaying the existing roof with the following construction material:

- torch on cap sheet;
- peel and stick base sheet;
- 2" colgrip A 2";
- 2" PolYiso; and
- 3.5" eps filler foam.

The final weight of the supplemental insulation and roofing is estimated to be 4.5 psf (0.22 kPa).

Analysis

The existing structure is assumed to be constructed in the 1950s and the framing appears to consist of prefabricated steel frames. Building codes have been updated since the time of the structure's construction and the latest iteration used in the analysis of the building is the 2005 National Building Code (NBC).

With the proposed retrofit loading applied to the existing roof, the purlins are overloaded and cannot handle the additional weight. This can be resolved by placing additional purlins in between the existing purlins to reduce the load in each member through further load distribution. However, the increased number of purlins also increases the dead load acting on the main steel beams and as a result overloads the steel beams.

An initial assessment of the strength capacity of the roof beams was conservative using expected low-grade steel (230 MPa) for structures during that period, resulting in inadequate load resistance from the steel-framing members. In order to be certain of the strength of the existing steel, 197mm x 44.5mm (7-3/4" x 1-3/4") samples were removed from three (3) beams and sent to an independent laboratory testing facility to verify the actual steel strength. See Figure 1. The holes in the beams were repaired by welding oversized pieces on top of the holes followed by priming the steel with paint. See Figure 2.

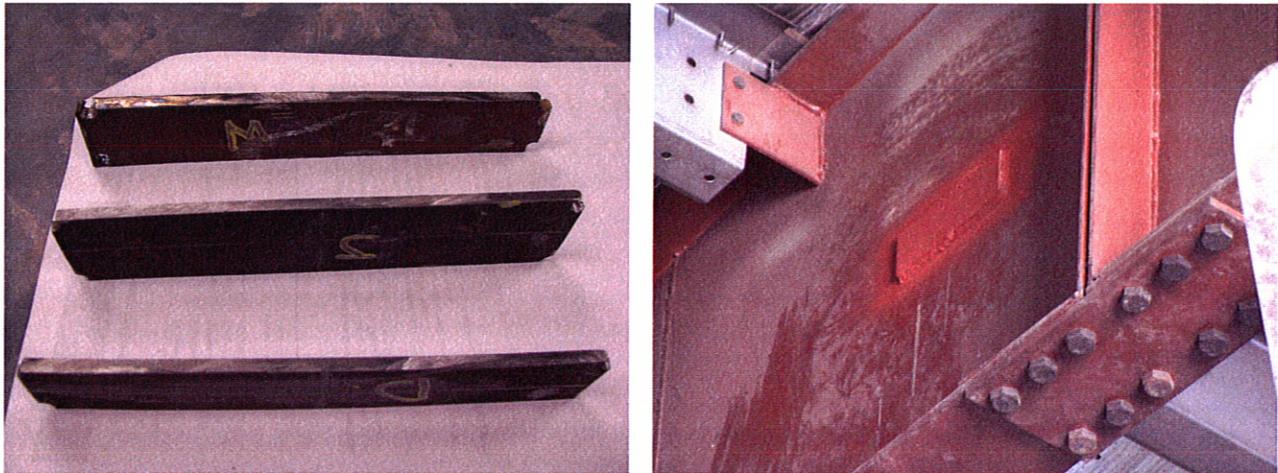


Figure 1. Samples cut from existing roof beams. **Figure 2.** Roof beam after repair work.

The results of the laboratory testing for the samples determined the yield strength of the beams on the east side of the building to be approximately 303 MPa. The yield strength of the beams on the west side of the building was determined to be approximately 316 MPa.

The results from the testing were used to establish the design yield strength as 300 MPa. The following table summarizes the stresses in the roof beams with the proposed roof retrofit:

Table 1. Calculated Roof Member Loads

<i>Element</i>	<i>Load Type</i>	<i>% of Allowable Stress</i>	<i>Result</i>
West Roof Beam	Bending Moment	116 %	Inadequate
East Roof Beam	Bending Moment	130 %	Inadequate
East Column	Bending Moment	121 %	Inadequate
East Column	Axial Load	16.2 %	Adequate

Notes: Load case includes 0.22 kPa (4.5 psf) from the new roof, and load from additional purlins, and snow load. No live load included. Loads calculated using the 2005 NBC.

The beams in the west portion of the structure are stronger than those in the west because the west beams appear to be installed more recently as an add-on to the structure. The different shape and stronger steel in the west beams also make the beams stronger, but also heavier. See Figures 3 and 4.

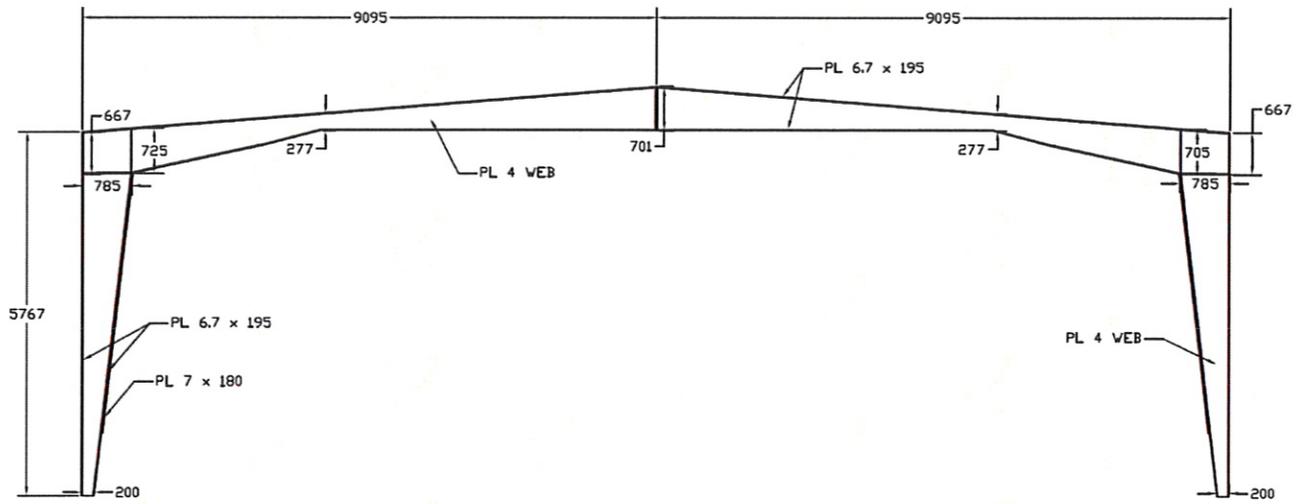


Figure 3. East structure roof steel framing

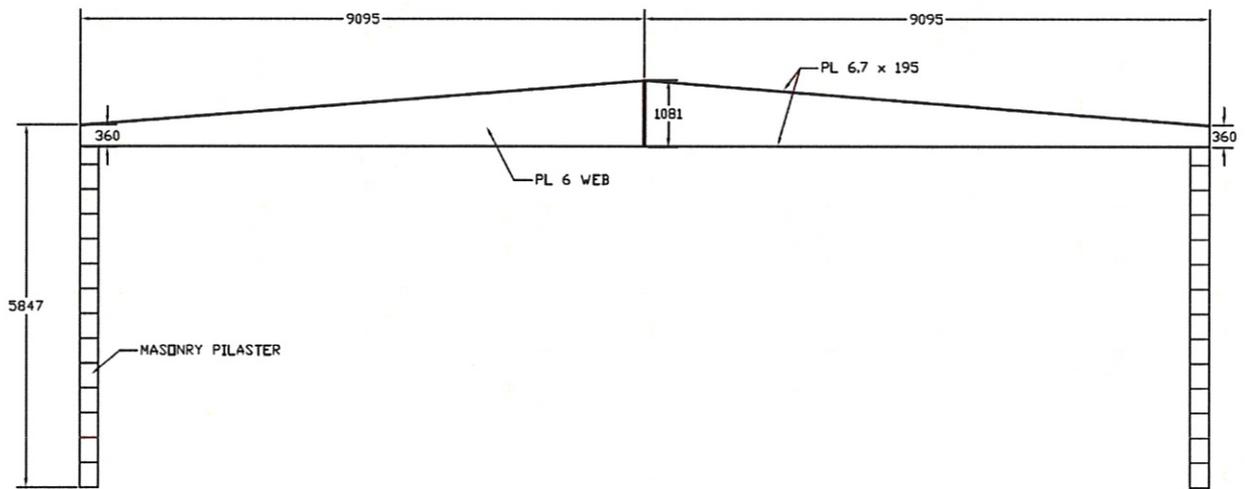


Figure 4. West structure roof steel beam

Conclusions/Recommendations

1. The existing structure is incapable of carrying any additional loading based on the 2005 NBC.
2. Any roof retrofit will require removal of the existing insulation and metal roof, or strengthening of the existing roof purlins and beams.

If you are interested in pursuing strengthening of the existing framing members, we would be pleased to provide assistance in this matter.

We trust this report provides you with an understanding of the condition and performance of the existing roof structure such that you can decide on a suitable work program based on the needs of the structure.

If you have any questions or comments please call us at 943-3178.

Regards,

MMM Group Limited



Edmund Ho, P.Eng.
Design Engineer, Structures

EH/dt

41885 080825 552 plinquet roof final report

Winnipeg
AUG 22 2008

PM&N
 RST
 BW
 Other
 Other
 Other
 File

Mechanical Test Laboratory Report

Prepared for: Mr Edmund Ho
Structural Engineer, Bridges and Structures
MMM Group
Suite 111 - 93 Lombard Ave.
Winnipeg MB R3B 3B1

Report No: **12533-1**
Date: 19 Aug 2008
Phone: (204) 943-3178
Fax: (204) 943-4948



Sample Description: Steel Samples (W-Beams)
Standard/Specification: ASTM E8: ✓ Test Methods for Tension Testing of Metallic Materials
Tests accredited by the Standards Council of Canada to ISO/IEC 17025 indicated with ✓.

Test Results

Table 1: Tensile Test Results

Specimen ID	Thickness (in)	Width (in)	Yield Strength (ksi)	Tensile Strength (ksi)	Modulus (Mpsi)	Elongation (%)
M	0.240	0.503	45.9	61.5	28.6	31.6
D	0.175	0.506	44.0	66.0	51.6	31.6
J	0.172	0.511	44.5	64.1	30.1	35.9

End of Report

Prepared by: *Daniel D. Godin*
Daniel D. Godin, C.E.T.
Mechanical Test Technologist

Reviewed by: *Michael Thomlinson*
Michael Thomlinson, M. Sc. P.Eng.
Mechanical Engineer

- Notes**
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APPENDIX B – 552 PLINGUET STREET HVAC REVIEW

**CITY OF WINNIPEG
552 PLINGUET STREET
INDOOR AIR QUALITY
HVAC REVIEW**

Project Number: 10-132-01

Prepared for:
City of Winnipeg
Water and Waste Department
Water Services Division
552 Plinguet Street
Winnipeg, Manitoba
R2J 0G1

Prepared by:
SMS Engineering Ltd.

Draft – March 1, 2011

March 1, 2011

MECHANICAL

ELECTRICAL

Prepared by:

David Hawkes, EIT

Terry Jenkins, CET
Sumitech Services Ltd.

Approved by:

Helmut Waedt, P.Eng.
Principal

Brian Lesko, P.Eng.
Partner

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1 Introduction and Scope of Report

1.1 Introduction

- .1 The building complex is comprised of multiple spaces housing stores and maintenance areas for the City of Winnipeg Water and Waste Department. The original building was constructed in the early 1980's and is an elongated shape, high ceiling, single storey metal building which has undergone multiple renovations since the original construction. An addition was built in the mid 1990's following a similar style as the original with a second storey level incorporated within the Stores area. The building spaces from East to West are; Truck Wash, Warehouse, Stores Office and Loading/ Unloading Area, Meter Test Shop, Hydrant Shop, Wastewater Staff Area and Wastewater Services Shop.
- .2 The areas under review, to assess indoor air quality concerns, are as follows:
 - .1 Stores Office Area – This area includes a 1,250 sqft Office and parts supply, a 2,290 sqft Loading/ Unloading space with overhead door to the exterior and a 3,540 sqft second level. The second level is at two different heights corresponding with the main level room split and is for the most part an open space.
 - .2 Meter Test Shop – This area includes a 1,050 sqft Test Shop with small overhead doors to the Stores Loading/ Unloading area and Hydrant Shop.
 - .3 Hydrant Shop – This area includes a 2,425 sqft Test Shop with small washroom located within. The shop has a small overhead door to the Meter Test Shop and an overhead door to the exterior.
 - .4 Wastewater Service Shop – This area (10,800 sqft) includes a main floor truck parking area with two overhead doors to the exterior, Welding Shop area and a small mezzanine level over the staff area with exercise equipment.
 - .5 All above square footages are estimated.
- .3 No mechanical or electrical record drawings were available.

1.2 Scope

- .1 The scope of this report for the above mentioned areas was to:
 - .1 Review indoor air quality concerns and provide recommendations for mechanical HVAC upgrades to address the indoor air quality problems in four areas of the building complex.
 - .2 Review electrical distribution systems to assess electrical distribution system capacities to handle the mechanical HVAC upgrade recommendations. Provide electrical recommendations to accommodate the mechanical HVAC upgrades.
 - .3 Review possible electrical power shortages in the Hydrant Test Shop that appears to require a gas powered service vehicle to operate to provide power to shop tools. Provide recommendations to increase electrical power in the Hydrant Shop for shop tools.
 - .4 Provide order of magnitude probable cost of installation for the recommendations.

1.3 Exclusions

- .1 No operational checks have been made on any systems or equipment.
- .2 Review of hazardous materials is not included.
- .3 Fire separations not reviewed.

2 Summary

2.1 Stores Office Area, Meter Test Shop and Hydrant Shop

- .1 The stores office area, meter test shop and hydrant shop are all unventilated. Except for the Stores Office space two main HVAC options were reviewed to provide adequate ventilation for these spaces. The main difference between the two options was whether to provide an all in one ventilation system (Option 1) or individual ventilation systems (Option 2) for each specific area. Based on reduced costs, maintenance and amount of equipment required it is recommended to proceed with Option 1, a combined ventilation system for these spaces.

- .2 Two options were reviewed for the Stores Office space. The main difference between the options was whether to provide a ventilation system which would also replace the existing heating and cooling equipment (Option 1) or to provide a ventilation system to work in conjunction with the existing heating and cooling equipment (Option 2). Based on improved thermal comfort and enhanced temperature control it is recommended to proceed with Option 1, a new furnace system which replaces existing heating and cooling equipment in the space.
- .3 It was determined through review of the National Building Code of Canada that the Hydrant Shop is considered a Storage Garage and will require specific ventilation needs in order to prevent build up of vehicle emissions in the space. The existing Hydrant Shop exhaust fan and air intake appears non operational. This ventilation requirement was incorporated into the HVAC options for this space.
- .4 In order to incorporate the HVAC upgrades it is recommended to replace the electrical distribution system feeding the Stores Office area, Meter Test Shop and Hydrant Shop. The new electrical distribution system will rectify electrical shortcomings experienced in the Hydrant Shop and will also remove the need for running a service truck in the Hydrant Shop to power tools.

2.2 Wastewater Service Shop

- .1 It was determined through review of the National Building Code of Canada that the Wastewater Service Shop is considered a Storage Garage and will require specific ventilation needs in order to prevent build up of vehicle emissions in the space. The existing Wastewater Service Shop exhaust fan system appears non operational. This ventilation requirement was incorporated into the recommended HVAC solution for this space.
- .2 It is recommended that a separate specific exhaust system be installed for the welding shop area within the Wastewater Service Shop to provide additional safety.

2.3 Main Electrical Service

- .1 Based on service loading information provided, it appears that the main electrical service is large enough to handle the recommended HVAC revisions.

3 Mechanical and Electrical Systems Description

3.1 Stores Office Area

.1 Existing conditions:

- .1 The Stores Office, Loading/ Unloading space and second level are unventilated.
- .2 Occupancy of the main level Stores Office is 3 people. The Loading/ Unloading space and second level are considered unoccupied.
- .3 The main level Stores Office is heated by means of electric baseboard radiation and a small electric ceiling hung unit heater.
- .4 The main level Loading/ Unloading area is heated by means of two forced draft gas fired unit heaters located on the second level and ducted down. The same unit heaters also provide heat to the second level.
- .5 According to the owner, no heating complaints have been reported.
- .6 The main level Stores Office is air conditioned by means of a ceiling hung split system air conditioner, a self contained through the wall air conditioner exhausted into the Loading/ Unloading area and a standup portable air conditioner unit exhausted into the Loading/ Unloading area.
- .7 No air conditioning is provided to the Loading/ Unloading area and second level.
- .8 A ceiling prop fan is located in the Loading/ Unloading area.
- .9 According to the owner, a possible future conversion of the second level to office space is under consideration.
- .10 The Stores Office, Loading/ Unloading space and second level area are serviced by a 75kVA 600V/120/208V/3phase 4wire transformer, separate meter & FPE 42 circuit, 120/208V, 3phase, 4wire panelboard with a 3P225A main breaker. There are 5 available spaces on this panel (tagged "PB"). Adjacent to this panel is a 30 circuit 120/208V, 3 phase, 4wire FPE panelboard (tagged as "PA"). There are

no spaces left for breakers on this panel. The feeder and breaker servicing both the Meter Test Shop and Hydrant Shop are located in panel PB.

.2 Comments:

- .1 Based on the use and occupancy, the estimated minimum outdoor air required for the Stores Office is 165 cfm.
- .2 Based on the use and occupancy, the estimated minimum outdoor air required for the Loading/ Unloading area is 275 cfm.
- .3 Based on the use and occupancy, the estimated minimum outdoor air required for the second level is 425 cfm. If in future the second level is converted to office space, the above minimum ventilation rate should be more than adequate for the change in use and occupancy.
- .4 The existing heating system appears adequate for the space.
- .5 Air conditioning is required only for the Stores Office and possible future second level office space.
- .6 The condition of panel PA and PB is good and the amount of heat emanating from the transformer indicates a light electrical load on this service.
- .7 Lack of breaker space in the existing panelboards presents a problem for adding any additional loads to this area.

3.2 Meter Test Shop

.1 Existing conditions:

- .1 The Meter Test Shop is unventilated.
- .2 Occupancy of the Meter Test Shop is 1 person.
- .3 Two ceiling prop fans and a portable floor prop fan are located in the Meter Test Shop.
- .4 The Meter Test Shop is not air conditioned.

-
- .5 The Meter Test Shop is heated by means of a single natural draft gas fired unit heater. According to the owner, no heating complaints have been reported.
 - .6 Due to the work performed in the Meter Test Shop, the humidity level is high.
 - .7 Service vehicle exhaust emissions are infiltrating the Meter Test Shop during vehicle operation from the adjacent Hydrant Shop through a small overhead door adjoining the two areas. The existing Hydrant Shop exhaust system is undersized and currently not in use resulting in the air becoming entrained. The adjoining overhead door straddles a drain catch basin and will not be capable of creating a complete seal allowing the entrained air in the Hydrant Shop to mix with the air in the Meter Test Shop resulting in poor air quality within the Meter Test Shop. Closing the adjoining overhead door to reduce the transfer of exhaust emissions also prevents travel through to the Stores Office area from the Hydrant Shop and Wastewater Service areas and results in extreme high temperatures in the Meter Test Shop due to lack of ventilation, high humidity and no air conditioning.
 - .8 Both the Meter Test Shop and the Hydrant Shop are serviced by an ITE 36 circuit 200A, 120/208V, single phase, 3W panel located in the Hydrant Shop which is fed by a 2P100 breaker in panelboard PB in the stores area. There are no spaces in this panel and it is a standard NEMA 1 panel not suitable for the damp area in which it is located. This panel is overloaded with the circuits it feeds in these two areas. The client has indicated that they have to run a separate small generator in the Hydrant Shop to operate tools. This condition may be an individual circuit overload problem or an overall panelboard overload.
- .2 Comments:
- .1 Based on the use and occupancy, the estimated minimum outdoor air required is 200 cfm.
 - .2 The existing heating system appears adequate for the space.
 - .3 Air conditioning is not a requirement for this space.

- .4 Lack of breaker space in the existing panelboard presents a problem for adding and additional loads to this area.

3.3 Hydrant Shop

.1 Existing conditions:

- .1 The Hydrant Shop is unventilated. There is a small sidewall exhaust fan and blocked off outdoor air intake located in close proximity to each other on the exterior wall. The fan and outdoor air intake do not appear to be currently in use.
- .2 Occupancy of the hydrant shop is 2 people.
- .3 A service vehicle is parked in the Hydrant Shop during hydrant refurbishment work. The vehicle engine is being operated to provide power to shop tools. Vehicle exhaust emissions are entering the Hydrant Shop and adjoining Meter Test Shop.
- .4 Three ceiling prop fans are located in the Hydrant Shop.
- .5 The Hydrant Shop is not air conditioned.
- .6 The Hydrant Shop is heated by means of two natural draft gas fired unit heaters. According to the owner, no heating complaints have been reported.
- .7 A small washroom is located within the hydrant shop space. The washroom ceiling exhaust is discharged into the Hydrant Shop.
- .8 Both the Meter Test Shop and the Hydrant Shop are serviced by an ITE 36 circuit 200A, 120/208V, single phase, 3W panel located in the Hydrant Shop which is fed by a 2P100 breaker in panelboard PB in the stores area. There are no spaces in this panel and it is a standard NEMA 1 panel not suitable for the damp area in which it is located. This panel is overloaded with the circuits it feeds in these two areas. The client has indicated that they have to run a separate small generator in the Hydrant Shop to operate tools. This condition may be an individual circuit overload problem or an overall panelboard overload.

.2 Comments:

- .1 Based on the use and occupancy, the estimated minimum outdoor air required is 460 cfm.
- .2 The Hydrant Shop is used for the storage or parking of motor vehicles and contains no provision for the repair or servicing of such vehicles. By the National Building Code of Canada, the Hydrant Shop is considered a Storage Garage and requires ventilation based on clause 6.2.2.3. The estimated mechanical ventilation required is 1,870 cfm (0.77 cfm/ sqft). The existing exhaust fan and air intake appears inadequate to accommodate Code requirements.
- .3 Service vehicles are powered by either gasoline or diesel fuelled engines. Both carbon monoxide and nitrogen dioxide sensors will be required.
- .4 The existing heating system appears adequate for the space.
- .5 Air conditioning is not a requirement for this space.
- .6 Lack of breaker space in the existing panelboard presents a problem for adding and additional loads to this area.

3.4 Wastewater Service Shop

.1 Existing conditions:

- .1 Occupancy of the Wastewater Service Shop is 2 people.
- .2 The Wastewater Service Shop is being used to store service vehicles over night in order to prevent the service vehicles piping systems from freezing and cracking. Several trucks are parked overnight and during the day.
- .3 Prior to renovations, the Wastewater Service area was used for servicing of vehicles. An exhaust system is currently in place complete with a direct gas fired make up air unit and two exhaust fans to evacuate vehicle exhaust emissions. The two exhaust fans are located on the East side of the space at the mezzanine level. The exhaust fan on the South side of the mezzanine appears to be abandoned in place and not functioning. The exhaust fan on the North side of the mezzanine exhausts air from the wastewater service area and a partially enclosed area used for welding. It is

unclear if this exhaust fan is operational. The make up air unit which works in conjunction with the exhaust fans appears in good condition however it is unclear if this unit is performing as intended since the exhaust fans appear non operational. The make up air unit and exhaust fans appear to be undersized to handle the ventilation requirements due to the space conditions increasing in size since their initial installation which is apparent by the half wall remaining in the space.

- .4 There are multiple ceiling prop fans located in the Wastewater Service Shop.
- .5 The Wastewater Service Shop is not air conditioned.
- .6 The Wastewater Service Shop is heated by means of seven natural draft gas fired unit heaters. The unit heaters in this space are experiencing failed pilot lights and it has been discussed to ascertain if there is adequate gas service available to this area.
- .7 There have been reports of water dripping from the ceiling in the Wastewater Services area. This is due to condensation forming on the inside of the roof structure. There are current plans to replace the existing roof and to add roof insulation in the wastewater service shop.
- .8 The main electrical distribution for the entire facility is located in the machinist's shop in the Wastewater Service area. The building has a 225A 347/600V, 3phase, 4wire service fed from the main complex service. This consists of a 3P225 main incoming breaker feeding a 4wire 225A 600V splitter which sub-feds several small loads and an FPE NHDP 200A 42 circuit, 347/600V, 3phase, 4wire panelboard. This main panelboard feeds the majority of the sub-service in the facility including the Stores Office service transformer and the newer East section of the facility. There is a minimal amount of electric heat in the facility and based on its area the service should suffice. There is no space left in the main panelboard to add breakers, however a number of the breakers are turned off and taped off. These breakers can be removed and replaced with new breakers in the future to suit future loads.

.2 Comments:

- .1 Based on the use and occupancy, the estimated minimum outdoor air required is 1,970 cfm.
- .2 The Wastewater Services area is used for the storage or parking of motor vehicles and contains no provision for the repair or servicing of such vehicles. By the National Building Code of Canada, the Wastewater Services area is considered a Storage Garage and requires ventilation based on clause 6.2.2.3. The estimated mechanical ventilation required is 8,320 cfm (0.77 cfm/ sqft). The existing exhaust fans and make up air system appear inadequate to accommodate Code requirements.
- .3 Service vehicles are powered by either gasoline or diesel fuelled engines. Both carbon monoxide and nitrogen dioxide sensors will be required.
- .4 From site observations and discussions with personnel, the cause of the unit heater pilot light failure has been concluded to be caused by a lack of combustion air. It was determined that the combustion air intake had been blocked to prevent cold air infiltration. The cover has since been removed and according to owner the unit heaters have been operating adequately. The gas service provided to this space has thereby been deemed to be sufficient. The existing heating system appears adequate for the space.
- .5 Air conditioning is not a requirement for this space.
- .6 Service loading for the facility was provided by the City of Winnipeg and based on the information provided, it appears that there is only one meter for the whole complex. The peak demand meter reading for the past five years is 238kVA registered in January of 2006. The average electrical demand for the past two years is 151kVA and the yearly demand decreased by an average of 15kVA from 2009 to 2010.
- .7 The electrical service in the Wastewater shop has a capability of $225A \times 80\% \times 600V \times 1.732 = 187kVA$ capacity. Given the area of the Wastewater Shop relative to the office areas in the facility north of the Shop we are assuming a usage ratio of 60% for the Wastewater Shop and 40% for the office area which would set our Wastewater Shop

service demand at $151\text{kVA} \times 60\% = 91\text{kVA}$. This would allow for an additional demand capacity of 96kVA off of the present service in the Wastewater Shop.

- .8 The maximum loading for all options would be an increase of 30kVA total which would work within the current service size and still allow 66kVA spare capacity for future load addition.

4 Recommendations and Cost Estimates:

4.1 Recommended Electrical Distribution System

- .1 To handle the recommended HVAC and future load additions, it would be necessary to replace existing panel boards PA and PB in the Stores Office area with a twin 60 circuit (120 circuits total) panelboard rated at 400A, 120/208V, 3 phase, 4wire which will allow full utilization of the 75kVA transformer load and will allow for future circuit expansion. The existing breakers would be replaced with new and the existing circuits reconnected and tagged on the panel schedule. The existing meter would be removed and a new 300A minimum feeder would be installed from the existing 75kVA transformer secondary to the new panelboard. The estimated cost of these revisions would be in the order of magnitude of \$10,000.
- .2 The existing panelboard in the Hydrant Shop could be replaced with a 200A 120/208V, 3phase, 4Wire panelboard fed from a 3P125 breaker in panelboard PB in the stores office. This can be facilitated if the service panel upgrade is undertaken as recommended above. This panel would be a 60 circuit NEMA 3R rated panel with a gasketed cover fed with a new 125A 4wire feeder. This would provide 36kW of available load for the Water Test Shop and Hydrant Shop as opposed to the approximate 16kW available presently. The existing circuits should be tested to verify the loads on them during testing and any overloaded circuits would be split into multiple circuits to ensure future overloading. The estimated cost of these revisions would be in the order of magnitude of \$13,000.
- .3 Total order of magnitude probable cost for electrical distribution system upgrade is \$23,000.

4.2 Stores Office Area (Office Only)

- .1 Option 1:
 - .1 Remove the existing heating units and air conditioning within the Stores Office and provide a gas-fired furnace with outdoor air intake, DX cooling, and exhaust fan sized for the minimum ventilation air rate (165 cfm). Supply air would be ducted to the occupied zone, and air would be exhausted from the opposite end of the room. This option would result in a greater sense of airflow in the space, and better temperature control through the use of a heat/cool

thermostat automatically controlling the heating and cooling cycles. Order of magnitude probable cost of installation is \$12,000.

- .2 A 208V service from the upgraded electrical distribution system in the Stores Office will be required for this ventilation system. Order of magnitude probable cost of installation is \$3,000.
- .3 Total order of magnitude probable cost for mechanical and electrical for Option 1 is \$15,000.

.2 Option 2:

- .1 Retain the existing heating and air conditioning, and provide a heat recovery ventilator sized for the minimum outdoor air requirement (165 cfm). It is estimated that a 3kW electric duct heater would be required to ensure reasonable supply air temperatures are provided. This option would reduce energy use, but the airflow throughout the space would be reduced. The space temperature control would not be improved with the continued use of existing equipment. A 208V service from the recommended electrical distribution system in the Stores Office will be required for this ventilation system. Order of magnitude probable cost of installation is \$6,000.
- .2 A 208V feeder from the upgraded electrical distribution system in the Stores Office will be required for this ventilation system. Order of magnitude probable cost of installation is \$3,000.
- .3 Total order of magnitude probable cost for mechanical and electrical for Option 2 is \$9,000.

- .3 Option 1 above is recommended. This option would provide efficient space heating and cooling, provide the required ventilation air, and enhance temperature control.

4.3 Stores Office Area (Loading/ Unloading area and second level only),
Meter Test Shop and Hydrant Shop

- .1 Both the Loading/ Unloading area and second level are currently performing similar use and occupancy and therefore have been combined for this report. A furnace system for these spaces is not

being considered at this time due to lack of occupancy in these spaces.

.2 Option 1:

.1 This option combines the Loading/ Unloading and second level Stores area and the Meter Test Shop and Hydrant Test Shop ventilation requirements into one system to minimize equipment and in turn maintenance.

.2 Combine the Loading/ Unloading and second level Stores area, Meter Test Shop and Hydrant Shop ventilation requirements into one system. Retain the existing unit heaters supplying heat into these spaces. Provide a two speed indirect gas fired make up air unit to meet code requirements. The low speed setting would be for the base building condition and will account for the minimum ventilation requirements of the Loading/ Unloading and second level Stores area, Meter Test Shop and Hydrant Shop (1,360 cfm total). The high speed setting will activate upon detection of vehicle emissions and will account for minimum ventilation requirements of the Loading/ Unloading and second level of the Stores area, the Meter Test Shop and the garage storage ventilation rate requirement of the Hydrant Shop (2,770 cfm total).

Supply air is to be supplied to one side of each room and exhausted from the opposite side to create preferred air movement in the spaces. Supply air will be ducted with motorized dampers to modulate between the two speed settings in order to maintain ventilation requirements of each space.

Provide an exhaust fan for the Loading/ Unloading and second level Stores area sized for the minimum ventilation air rate (700 cfm). It is possible to combine this exhaust requirement with the exhaust requirement in Option 1 of the Stores Office above to eliminate the need for two exhaust fans.

Provide relief air in the Meter Test Shop to the minimum ventilation rate of the space (200 cfm).

Provide a sidewall exhaust fan complete with VFD control in the Hydrant Shop to vary from the minimum ventilation rate of the Hydrant Shop (460 cfm) to the maximum required

(1,870 cfm) upon detection of gas emissions. Locate carbon monoxide and nitrogen dioxide sensors in the Hydrant Shop to signal the make up air unit and Hydrant Shop exhaust fan to operate at high speed settings. Order of magnitude probable cost of installation is \$80,000.

- .3 Providing a new combined ventilation system for the Loading/ Unloading area, second level and Water Test Shop and Hydrant Shop will require a 600V feeder from the main service in the Wastewater Service Shop. The cost would be in the order of magnitude of \$10,000.
- .4 Total order of magnitude probable cost for mechanical and electrical for Option 1 is \$90,000.

.3 Option 2:

- .1 This option provides the Loading/ Unloading and second level Stores area and the Meter Test Shop and Hydrant Test Shop with separate ventilation systems to meet ventilation requirements.
- .2 Loading/ Unloading area and second floor.
 - .1 Retain the existing unit heaters and provide a heat recovery ventilator sized for the minimum outdoor air requirement (700 cfm). It is estimated that a 10kW electric duct heater would be required to ensure reasonable supply air temperatures are provided. This option benefits from keeping the Stores Office areas separated from the Meter and Hydrant shops. This option reduces energy use however heat recovery ventilator defrost cycles may cause pressure differentials in the space. Order of magnitude probable cost of installation is \$12,000.
 - .2 Providing a heat recovery ventilator ventilation system will require a 208V feeder from the upgraded service in the Stores Shop area and a 600V service from the main service in the Wastewater Service Shop for the electric duct heating coil. Order of magnitude probable cost of installation is \$13,000.
 - .3 Total order of magnitude probable cost for mechanical and electrical for installation of a new heat recovery ventilation system is \$25,000.

.3 Meter Test Shop

- .1 Retain the existing unit heater and provide a heat recovery ventilator sized for the minimum outdoor air requirement (200 cfm). It is estimated that a 3kW electric duct heater would be required to ensure reasonable supply air temperatures are provided. This option benefits from keeping the Meter Test Shop separated from the Stores area and Hydrant Shop. This option reduces energy use however heat recovery ventilator defrost cycles may cause pressure differentials in the space. Order of magnitude probable cost of installation is \$8,000.
- .2 Providing a new heat recovery ventilation system would require a 208V feeder from the upgraded panel in the Hydrant Shop. Order of magnitude probable cost of installation is \$3,000.
- .3 Total order of magnitude probable cost for mechanical and electrical for installation of a new heat recovery ventilation system is \$11,000.

.4 Hydrant Shop

- .1 Provide a new mixed air unit and exhaust fan to meet ventilation requirements. The indirect gas fired mixed air unit is to be capable of providing 100% fresh air and shall be sized to the minimum Code requirement (1,870 cfm). Fresh air and return dampers are to be set to provide the minimum ventilation requirement (460 cfm). Provide an exhaust fan with VFD control to correspond with the fresh air rates supplied by the mixed air unit. Upon detection of gas emissions by the carbon monoxide or nitrogen dioxide sensors the mixed air unit dampers are to modulate to provide 100% fresh air. Supply air shall be introduced on one side of the space and removed from the opposite side to create desired air movement. Order of magnitude probable cost of installation is \$40,000.
- .2 Providing a new mixed air ventilation system would require a 600V service from the main service in the Wastewater Service Shop. Order of magnitude probable cost of installation is \$7,000.

- .3 Total order of magnitude probable cost for mechanical and electrical for installation of a new mixed air ventilation system is \$47,000.
- .5 Total order of magnitude probable cost for mechanical and electrical for Option 2 is \$83,000.
- .4 Option 1 above is recommended. This option combines ventilation requirements of the Loading/ Unloading and second level Stores area, Meter Test Shop and Hydrant Test Shop into one system thereby reducing the amount of equipment and in turn maintenance required.
- .5 Additional Recommendations
 - .1 Possible future conversion of the second level of the Stores Office into office space can be accomplished without affecting either of the above ventilation options. Modifications that would be required are; removal of the second floor unit heaters serving this space, relocation of the unit heaters serving the Loading/ Unloading area to the Loading/ Unloading space and installation of a Mitsubishi Slim style heat pump system to provide heating and cooling for the second level. Order of magnitude probable cost of installation is \$14,000 including electrical.
 - .2 It is recommended to replace the existing washroom exhaust system in the Hydrant Shop and extend the ductwork to exhaust outside the building. Order of magnitude probable cost of installation is \$2,200 including electrical.

4.4 Wastewater Service Shop

- .1 Remove the existing make up air unit and exhaust system and provide a new mixed air unit with economizer and exhaust fan to meet ventilation requirements. The indirect gas fired mixed air unit is to be capable of providing 100% fresh air and shall be sized to the minimum Code requirement (8,320 cfm). Fresh air and return dampers are to be set to provide the minimum ventilation requirement (1,970 cfm). Provide an exhaust fan with VFD control to correspond with the fresh air rates supplied by the mixed air unit. Upon detection of gas emissions by the carbon monoxide or nitrogen dioxide sensors the mixed air unit dampers are to modulate to provide 100% fresh air. Supply air shall be introduced on one side of the space and removed from the opposite side to

create desired air movement. Order of magnitude probable cost of installation is \$91,000.

- .2 Providing a new make up air unit and exhaust for the Wastewater Service Shop would require 600V services from the existing main distribution and would cost in the order of magnitude of \$8,000.
- .3 Total order of magnitude probable cost for mechanical and electrical for installation of a new make up air and exhaust system is \$99,000.
- .4 Provide new separate exhaust system for the Welding Shop area. Order of magnitude probable cost of installation is \$8,000.
- .5 Providing a new separate exhaust system for the Welding Shop area would require a 600V service from the existing main distribution and would cost in the order of magnitude of \$3,500.
- .6 Total order of magnitude probable cost for mechanical and electrical for a new separate exhaust system for the Welding Shop area is \$11,500.
- .7 We would recommend that existing loads connected to the main panelboard be verified as to their function and usage. All loads which are no longer in use would be disconnected, wiring removed back to the panel and the breakers tagged as spares. The existing panel schedule would be upgraded to reflect the accurate loads and re-typed. The estimated cost of these revisions would be in the order of magnitude of \$4,000.
- .8 Total order of magnitude probable cost for mechanical and electrical for all Wastewater Service Shop recommendations is \$114,500.

4.5 Total Probable Costs Based on Recommended Options

.1	Electrical Distribution System:	\$23,000
.2	Stores Office Area (Office Only) Option 1:	\$15,000
.3	Stores Office Area (Loading/ Unloading area and second level only), Meter Test Shop and Hydrant Shop Option 1:	\$90,000
.4	Hydrant Shop washroom exhaust :	\$2,200
.5	Wastewater Service Shop (Including welding shop exhaust):	\$114,500
.6	Total:	\$244,700