

**MARKET BUILDING INTERIOR RENOVATIONS  
21 Market Street E., Woodstock, ON N4S 1C4**

**for**

**CITY OF WOODSTOCK  
City Project #11220**

**Prepared by**

**Pow Peterman Consulting Engineers  
50 Samnah Crescent, Ingersoll, ON N5C 3J7**

**Project No.: 22-05-0014**

**Issued for Tender: August 4, 2023**

## Table of Contents

**22-05-0014**

### **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

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#### **Section**

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00100	Instructions to Bidders	1 - 11
00300	Tender Form	1 - 8
00800	Supplementary General Conditions	1 - 13
01005	General Instructions	1 - 15
01010	Scope of Work and Scheduling	1 - 2
01012	Materials Schedule	1 - 10
01013	Room Finish Schedule	1 - 10
01020	Allowances	1 - 2
01100	Alternatives and Substitution Procedures	1 - 2
01300	Submittals	1 - 7
01400	Quality Control	1 - 4
01500	Construction Facilities	1 - 12
01600	Materials and Equipment	1 - 4
01700	Contract Close Out	1 - 4
02110	Demolition	1 - 3
03300	Cast in Place Concrete	1 - 14
03355	Patching of Existing Concrete	1 - 5
04200	Masonry	1 - 9
05100	Structural Steel	1 - 10
05500	Miscellaneous Metal Fabrication	1 - 5
06100	Rough Carpentry	1 - 4
06180	Glue Laminated Structural Units	1 - 3
06192	Prefabricated Wood Trusses	1 - 3
06200	Finished Carpentry	1 - 6
07900	Sealants, Caulking and Firestopping	1 - 5
08110	Hollow Metal Doors, Frames and Screens	1 - 7
08210	Wood Doors	1 - 3

## Table of Contents

**22-05-0014**

### **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

#### **Section**

---

08710	Finish Hardware	1 - 4
08800	Glass and Glazing	1 - 10
09111	Metal Stud Systems	1 - 3
09130	Suspension System for Acoustic Ceilings	1 - 3
09250	Gypsum Board	1 - 5
09330	Tile Work	1 - 8
09511	Acoustical Panels and Tiles	1 - 3
09660	Resilient Tile Flooring	1 - 5
09680	Carpeting	1 - 5
09900	Painting	1 - 12
10161	Laminated Plastic Toilet Partitions	1 - 2
10800	Washroom Accessories	1 - 4
12500	Manual Roller Shades	1 - 4
14210	LULA Hole-Less Hydraulic Elevator	1 - 9

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2021 01 05

---

**1 INVITATION****1 TENDER CALL**

- 1 The intent of this tender call is to obtain an offer to perform work to complete Market Building Interior Renovations, 21 Market Street E., Woodstock, Ontario, N4S 1C4, for a stipulated price in accordance with the contract documents.
- 2 The Contractor must meet the qualifications as indicated in these contract documents.
- 3 **Offers signed under seal, executed and dated, will be received by the Owner, via Electronic Proposal only, before 2:00 PM local time, on August 29, 2023.**

To ensure receipt of the latest information and updates via email regarding this bid or if a bidder has obtained this Tender Document from a third party, the onus is on the Bidder to create a Bidding System Vendor account at <http://cityofwoodstock.bidsandtenders.ca> and register as a Plan Taker for the bid opportunity.
- 4 The contract documents are identified as Project Number: 22-05-0014, dated August 4, 2023 as prepared by Pow Peterman, Consulting Engineers, 50 Samnah Crescent, Ingersoll, Ontario, Canada
- 5 The owner requires that the work under this contract be substantially completed by March 24, 2024. This is a condition of submission of this tender. If the Owner decides to proceed with the project a contract will be awarded on or before September 15, 2023. Extensions in the award of contract will extend the completion date by the same number of working days. The total length of these extensions shall be limited to the time limit of the offer.

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**2 TENDER REQUIREMENTS****1 SUBMISSION**

- 1 Bidders will be solely responsible for the delivery of their tenders in the manner and time prescribed.
- 2 Amendments to the submitted price will be permitted if received in writing prior to tender closing and if endorsed by the same party or parties who signed and sealed the offer.
- 3 Submit one copy of the executed tender on the forms provided, signed and corporate sealed together with the required security. The required documentation shall be uploaded as prescribed to the Bidding System.

**22-05-0014****Market Building Interior Renovations****City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 4 Unless otherwise stated herein or by written addendum, Fax submissions or amendments ARE NOT acceptable.
- 5 Bidders may withdraw their tender submissions prior to the closing date and time. up to the closing time indicated. However, it is the sole responsibility of the bidder to ensure the re-submission has been received by the Bidding System no later than 2:00PM local time on the bid closing date.

**2 TENDER INELIGIBILITY**

- 1 Tenders not submitted in compliance with the indicated manner and time prescribed shall not be accepted.
- 2 Tenders that are unsigned, improperly signed or sealed, illegible, obscure, contain arithmetical error, erasures, alterations, or irregularities of any kind will be considered informal and shall not be accepted.
- 3 Submissions will be declared informal if Tender forms are improperly prepared or incomplete including but not limited to the following items:

Failure to complete all required information on the tender form including pricing, addenda, names, etc.

Failure to apply corporate seal

Failure to indicate all pricing in Appendix C – Unit Prices

Failure to supply pricing for all Separate Prices requested on Appendix E. Please note that the failure to provide separate prices indicated elsewhere in contract documents will make the submission informal or incomplete.

Failure to submit with the stipulated deadline after tender opening any documentation requested within the tender documents

- 4 Failure to provide the indicated security deposit, bonding or insurance submissions will result in the tender being declared informal.
- 5 Provide complete list of qualified Subcontractors as required in Appendix B (a submission may be rejected if it is determined that it indicates more than one Subcontractor in each category, a non qualified Subcontractor or lists own forces which are not qualified for the work proposed).

**22-05-0014****Market Building Interior Renovations****City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

**3 QUALIFICATIONS OF BIDDERS AND SUBCONTRACTORS**

- 1 The Owner requires Bidders and Subcontractors that have the proven ability to complete the type of project indicated in the tender documents. They shall be limited to ones approved by the manufacturers where indicated in the documents or those prequalified prior to the tender. The Owner reserves the right to review the experience of any bidder or proposed Subcontractor.
- 2 The bidder and the indicated Subcontractors shall have operated under the listed corporate identity for a minimum of five years. At the Owner's discretion mitigating circumstances may be considered.
- 3 The bidder and the indicated Subcontractors' shall have experience in successfully completing projects of a similar size to the project of this tender call. For the purposes of this tender call the term 'similar size' shall be defined as a value 50% greater or less than this project's estimated value.
- 4 Projects valued from \$500,000.00 to \$1,500,000.00
- 5 The bidder and the indicated Subcontractors' shall have experience in successfully completing projects of a similar nature to the project of this tender call. For the purposes of this tender call, the term 'similar nature' shall be defined as:

Projects used for the same purpose as proposed for this tender

Projects involving the similar working conditions to that indicated within the contract documents (e.g.: on an occupied site, predefined construction schedule, etc.)

Projects involving similar specialized construction types or procedures indicated in the contract documents (e.g.: public building with fire rated assemblies, historic restoration, etc)

- 6 The bidder shall have successfully completed within the 519 telephone area code.

**4 REVIEW PROCESS FOR QUALIFICATIONS**

- 1 Nothing in this document shall relieve the Bidder or Contractor from providing Subcontractors that are qualified to complete the work and meet the requirements and standards of this document.

**22-05-0014****Market Building Interior Renovations****City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 2 At the owner's request, any bidder or any of the listed Subcontractors shall supply, in the form of a completed CCDC 11 document including a list of at least five projects completed by the corporate identity under which the tender is submitted.

State:

- 1) the name of the project
  - 2) a brief description of the work completed
  - 3) cost of the work completed under the bidders contract
  - 4) month and year work commenced and was completed
  - 5) name of the owner/client
  - 6) name of the owner's consultant
  - 7) name, address and telephone number of a contact person
- 3 The submission shall be reviewed using the criteria indicated in this Section
  - 4 The Owner and Consultant reserve the right to contact any of the supplied references or any others that may assist in the Owner's assessment of the Bidder's qualifications to complete the proposed work. References contacted will be asked to comment on the bidders ability to complete the work within schedule, the quality of work, coordination ability, fairness of values of changes to contract and whether the reference would prefer to work with the bidder again.
  - 5 The Owner reserves the right to consider past projects of either the Owner or the projects consultants.
  - 6 Information received in this process is confidential.
  - 7 The Owner's decision as to the suitability of the bidder or Subcontractor is final and irrevocable.

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**3 TENDER ENCLOSURES****1 SECURITY DEPOSIT**

- 1 The tender shall be accompanied by a security deposit in the form of a Bid Bond in the amount of  
ONE HUNDRED THOUSAND DOLLARS (\$100,000.00)
- 2 Endorse the bid bond in the name of the owner as obligee, signed and sealed by the General Contract bidder and surety.

**22-05-0014**

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 3 The security deposit will be returned after delivery to the owner of the signed contracts and the required Performance, Labour and Material Payment Bonds by the accepted bidder.

- 4 If no contract is awarded, all security deposits will be returned.

**2 CONSENT OF SURETY TO BOND**

- 1 The tender shall be accompanied by a "Consent of Surety" stating that the Surety, supplying the bid bond, is willing to provide the Performance, Labour and Materials Payment Bonds required.
- 2 The accepted bidder shall provide Performance, Labour and Materials Payment bonds stated in the Supplementary General Conditions.
- 3 Include the cost of bonds in the tender price.

**3 INSURANCE**

- 1 Upon request, the bidder shall provide proof of insurance as required by the contract documents.
- 2 The accepted bidder shall provide Insurance as stated in the Supplementary General Conditions.
- 3 Include the cost of Insurance in the tender price.

**4 TENDER SIGNING**

- 1 The tender shall be signed under seal by the bidder.
- 2 Sole Proprietorship: Signature of sole proprietor in the presence of a witness who will also sign. Insert the words "Sole Proprietor" under signature. Affix seal.
- 3 Partnership: Signature of all partners in the presence of a witness who will also sign. Insert the words "Partner" against each signature. Affix seal against each signature.



**22-05-0014****Market Building Interior Renovations****City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 4 Limited Company: Signature of all duly authorized signing officer in their normal signatures. Insert the officer capacity in which the signing officer acts against each signature. Affix Corporate seal. If the tender is signed by official other than President and Secretary of the company or the President-Secretary-Treasurer of the Company, a copy of the by-law resolution of the Board of Directors authorizing them to do so, must also be submitted with the tender.
- 5 If bidder is a joint venture, each party to the joint venture shall execute the tender under seal in the manner appropriate to such party.

**5 COST BREAKDOWNS**

- 1 Provide all separate prices as requested.
- 2 At the request of the Owner provide a summary of HST taxes included in the submission.

**6 SELECTION CRITERIA**

- 1 The Criteria for selection in the order they will be considered is as follows:
  - 1) COMPLIANCE WITH INSTRUCTIONS TO BIDDERS - including the submission of all documentation indicated therein.
  - 2) ACCEPTABLE EXPERIENCE RECORD - Consideration will be given to how well the submitted documentation reflects the criteria listed in the QUALIFICATIONS OF BIDDER AND Subcontractors clauses within this Section. The Owner reserves the right to reject a bidder as per Section 00800.8 GC3.8. SUBCONTRACTOR AND SUPPLIERS  
Owner has the right to reject an otherwise qualified Subtrade for performance concerns or completeness of the price submitted. If a Subcontractor is rejected for this reason, the Bidder/Contractor has the right to compensation to include the next lowest acceptable Subcontractor. However the Owner has the right to consider these additional costs as part of the tender price selection criteria. (Rationale: A low bidder carries who carries a subtrade not carried by most of other bidders merely for the purposes of lowering the tender price submitted).
  - 3) TENDER PRICES - including the value of unit rates and accepted extras or credits.
  - 4) LENGTH OF CONSTRUCTION - Indicated time from commencement of work to substantial completion. Preference will be given to tenders indicating a shorter period of construction.
  - 5) BUDGET AND COMPLETION DATE - The Owner reserves the right to accept or reject any or all tenders that do not meet the Owner's budget or time constraints

**22-05-0014****Market Building Interior Renovations****City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

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**4 PROCEDURES DURING TENDERING**

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**1 DEFINITIONS**

- 1 Contract Documents: Defined in CCDC 2, Definitions with General Conditions.
- 2 Tender Documents: Contract documents supplemented with Instruction to Bidders, Tender, tender securities.
- 3 Tender: Act of submitting an offer under seal.
- 4 Alternate or Alternative: Products or systems identified as 'alternate' or 'alternative' are NOT APPROVED EQUALS and can not be substituted for base specified products without the permission of the Consultant. If the Consultant or Contractor wish to substitute an alternate product or system for reasons of cost, availability, or ease of construction, a request must be made, a contemplated change order issued and if accepted a change order issued before the substitution can be made. Submission or review of a shop drawing shall not constitute a request or approval of an alternate. The value of any change to the contract shall include all coordination necessary to incorporate the alternate into the work.
- 5 Approved Equal: Within this contract a product, procedure or system that is identified as 'approved equal' can be substituted for the product or system identified in the base specification. However the contractor assumes all responsibility for design changes, engineering, coordinating the work as may be required, ensuring the identified finishes and colours are provided and that the product or system is able to be supplied within the project schedule. No increase in contract price will be considered.

**2 CONTRACT DOCUMENT AVAILABILITY**

- 1 Tender documents are available on-line from the City of Woodstock web-site under Bids and Tenders. Please follow instructions. Tender takers must register on-line and addendums are also sent to them on-line. Contractors wishing to submit a tender for this project must obtain the official tender documents from the City of Woodstock as noted above.

**3 EXAMINATION**

- 1 Tender documents are available for view on the City of Woodstock Bids & Tender website.
- 2 Tender documents will be on display at the offices of the London Construction Association.

**22-05-0014****Market Building Interior Renovations****City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 3 Upon receipt of tender documents, verify documents are complete. Notify the Consultant should documents be incomplete.
- 4 Immediately notify the Consultant upon finding discrepancies or omission in the tender documents.

**4 QUERIES/ADDENDA**

- 1 Direct questions to Pow Peterman, Consulting Engineers, telephone number (519) 425-5000, or email Chris Willie at [chris.willie@pow.ca](mailto:chris.willie@pow.ca)
- 2 Addenda may be issued during the tender period. All addenda become part of the contract documents and will only be issued to registered plan takers through the City of Woodstock Bidding System.
- 3 Verbal answers are only binding when confirmed by written addendum.
- 4 Clarifications requested by the bidders will be in writing or on telephone not less than seven (7) days before date for receipt of bids. The reply will be made in the form of an addendum, a copy of which will be posted on the City of Woodstock Bidding System.
- 5 With the exception of an addendum delaying or cancelling the tender, Addenda will not be issued within 48 hours of the tender closing.

**5 PRODUCTS/SYSTEM OPTIONS**

- 1 The contractor and subcontractors are responsible for providing the materials, equipment and procedures as specified within these documents, including the specification, drawings or addenda. It is the responsibility of this contract to provide all materials available on the date the contract was signed. Products no longer available or discontinued before the contract date will be subject to revision by a Change Order. Products discontinued or no longer available subsequent to the contract date shall be substituted with the Consultant's approval by the Contractor for products of similar or superior quality at no additional cost.
- 2 Bidders are responsible for ensuring material, equipment and procedures as specified are available at the time of tender. When specifications are out of date the Consultants shall be notified and shall be responsible for issuing direction in the form of an addendum.
- 3 This contract is not responsible for cost incurred as a result of material, equipment and procedures that cease to be available between the time the tender was submitted and the date the project contract is signed.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2021 01 05

- 4 Approved Equal: Within this contract a product, procedure or system that is identified as 'approved equal' can be substituted for the product or system identified in the base specification. However the contractor assumes all responsibility for design changes, engineering, coordinating the work as may be required, ensuring the identified finishes and colours are provided and that the product or system is able to be supplied within the project schedule. No increase in contract price will be considered.
- 5 Alternate products will be considered if submitted as an attachment to the tender form. However, only specified products or those approved equal by written addendum may be included in the prices requested by this tender call.
- 6 Submission shall provide sufficient information to enable Consultant to determine acceptability of such products.
- 7 Provide complete information on required revisions to other work to accommodate each alternate, the dollar amount of addition to or reductions from the tender price, including required revisions to other work.
- 8 Unless alternates are submitted in this manner and subsequently accepted, provide products as specified.
- 9 Approval to submit alternates prior to submission of bids is not required.

**6 SITE EXAMINATION**

- 1 A site meeting with the architect is scheduled for **Wednesday, August 16th, 2023 at 9:00 AM**. Although this site meeting is not mandatory, it will be the only opportunity to visit the site.
- 2 The bidder shall be responsible for all on site conditions, considered by the consultant, visible during the on site examination including those revealed through accessible ceilings, floors and access panels.

**5 OFFER ACCEPTANCE/REJECTION****1 ACCEPTANCE OF TENDER SUBMISSIONS**

- 1 It is the sole responsibility of the bidder to deliver the tenders to the correct location before the stipulated deadline. Receipt of tenders at the wrong location does not constitute a correct submission or any responsibility by the individual or corporation receiving it.

**22-05-0014****Market Building Interior Renovations****City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 2 It is the sole responsibility of the owner to determine which tenders are acceptable. The owner's decision is final.

**2 DURATION OF OFFER**

- 1 Tenders shall remain open to acceptance and shall be irrevocable for a period of sixty (60) days after the bid closing date.
- 2 This condition shall also apply to any or all Separate or Alternate Prices submitted. The Owner therefore reserves the right to accept the modification(s) to the Base Bid at the stipulated price(s) within sixty (60) days from tender closing, regardless of the date the contract may be signed.

**3 PROCESS FOR REDUCING COSTS OF OVERBUDGET TENDERS.**

- 1 If the lowest tender is within 10% of the Owner's budget amount (when the tenders are received) the Owner has the right to reject all tenders or negotiate with the low bidder. If the process fails to successfully reduce the project cost to an acceptable level, the Owner has the right to use alternative methods indicated herein.
- 2 If the lowest tender is more than 10% higher than the Owner's budget amount the Owner has the right to reject all prices, negotiate with the lowest bidder or request potential cost savings from the three lowest bidders and any other bidders who prices are within 10% of the lowest received. All requests and submissions shall be made in writing. Listed sub trades may not be substituted in this process.
- 3 Once potential cost savings have been identified the Owner has the right to request a final revised base bid submission of the bidders.
- 4 Requests for potential cost savings shall be limited to deletions from the scope of work and associated changes OR changes of materials and finishes. The Owner shall not request pricing of significant design modifications without the approval of the bidder(s).

**4 ACCEPTANCE OF OFFER**

- 1 The Owner reserves the right to reject any or all offers. The Owner also reserves the right to not award the project for reasons of budget, deferral, an insufficient number of acceptable bids or confusion in the any or all submissions that would not allow the Owner to make a fair decision. In the absence of an Owner's policy to the contrary, the Owner may exercise the option of rejecting all offers if less than three acceptable bids are received.

**22-05-0014****Market Building Interior Renovations****City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 2 Municipal Freedom of Information and Protection of Privacy Act (MFIPPA):  
In accordance with the Municipal Freedom of Information and Protection of Privacy Act, this is to advise that the personal information Bidders provide is being collected under authority of the Municipal Act and will be used exclusively in the selection process. All bids submitted become the property of The Corporation of the City of Woodstock. Because of MFIPPA, Bidders are reminded to identify in their bid material any specific scientific, technical, commercial, proprietary, or similar confidential information, the disclosure of which could cause them injury. Complete bids are not to be identified as confidential. The City reserves the right to discuss any and all bids, to request additional information from bidders and to accept or reject any and all bids.
- 3 The Consultant, on behalf of the Owner, will issue to the successful bidder, a letter indicating that the Owner intends to enter into contract.
- 4 After a contract has been signed or the project deferred, all tender securities shall be returned to the unsuccessful bidders.

**5 CONFIRMATION OF THE OWNER'S FINANCE**

- 1 Upon request by the Contractor, the Owner shall provide a register statement by a qualified banking or lending institution that sufficient funds are available for the project.
- 2 This request is to be made by the Contractor at the announcement of the Owner intent to entry into a contract for the project.

**Tender Form**  
**Section 00300**

22-05-0014

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2020 04 29

**Project Location** 21 Market Street E., Woodstock, Ontario, N4S 1C4

**Submitted to** City of Woodstock Bidding System at <http://cityofwoodstock.bidsandtenders.ca>

**Owner** City of Woodstock  
500 Dundas Street, Woodstock, Ontario, N4S 1C4

**We,**

Company Name

**of,**

Business Address

**Having examined the documents dated as listed in Appendix "A" to this tender issued by Pow Peterman,**

**AND**

**Having examined the addenda issued for this tender by Pow Peterman, Consulting Engineers**

List total number of addenda received

**AND**

**Having visited the project site, hereby offer to enter into a contract to perform the work required by the tender documents for the stipulated price of:**

Written Submitted Price in Canadian Dollars

**This value shall include all specified cash and contingency allowances and applicable taxes in force at this date except as may be otherwise provided in the tender document.**

CONTRACT PRICE (excluding H.S.T.)

Value of H.S.T.

TOTAL VALUE OF CONTRACT (as written above)

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2020 04 29

### DECLARATIONS

We hereby declare that:

(a) We have reviewed the deadlines required by this project and agree to substantially complete the work by March 24 2024. In addition we offer to complete the work in a shorter period of time as indicated below.

☐

Unless otherwise indicated here, construction will commence within 5 working days after the award of contract

☐

weeks after award of contract that construction will be substantially complete. (Insert a number here ONLY if there is an offer to complete the work sooner than required).

(b) No person, firm or corporation other than the undersigned has any interest in this tender or in the proposed contract for which this tender is made.

(c) The information submitted on all Appendices to this Tender: Sub-trades, Unit Prices, Alternative Prices and Separate Prices form an integral part of this tender.

(d) This tender is open to acceptance for period of Sixty (60) Days from the date of tender closing.

### SIGNATURES:

Signed, sealed and submitted for on behalf of:

Name of Company

Street Address or Postal Box

City, Province & Postal Code

Telephone

Fax

Email

Signature:

Name & Title:

Dated: Month/Day/Year

Apply Seal above



22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2020 04 29

### **APPENDIX "A" TO TENDER**

### **LIST OF TENDER DOCUMENTS**

The following is the list or description of the tender documents referred to in the tender for the project.

#### **1 Standard Construction Document CCDC 2**

#### **2 Specifications Dated**

August 4, 2023

#### **3 Drawings: Dated**

August 4, 2023

##### **Architectural:**

A1.1 to A1.5 inclusive;  
A2.1 to A2.6 inclusive;  
A3.1 to A3.5 inclusive;  
A4.1 to A4.4 inclusive;  
A5.1 only;  
A6.1 to A6.2 inclusive.

##### **Structural**

S0.0 only;  
S2.0 to S2.3 inclusive.

##### **Mechanical:**

M1.1 to M1.2 inclusive;  
M2.1 to M2.2 inclusive;  
M3.1 to M3.3 inclusive;  
M4.1 only.

##### **Electrical:**

E0.1 to E0.2 inclusive;  
E1.1 only; E2.1 only;  
E3.1 only;  
E4.1 to E4.4 inclusive.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2020 04 29

### APPENDIX "B" TO TENDER

### LIST OF PROPOSED SUBCONTRACTORS

- 1 The submission of this appendix is required as necessary information attached to the bid. It is intended to propose subtrades qualified to complete the work. The appendix must include subcontractors that are specifically listed in this document or where manufacturer approved subtrades are required. Nothing in these documents is intended to bind the bidder/contractor to use of any specific company unless specifically stated in these documents.
- 2 Substitution of subcontractors is permitted but only with the Owner's knowledge and approval. Substitutions must meet all qualifications of these documents. Agreement to a substitution is done without change to the tender or contract price.
- 3 The owner reserves the right to be informed of any changes and the right of refusal under the requirement of Section 00100 of this document. No compensation will be permitted for exchange of unqualified listed Subcontractors either found at time of tender or discovered during the execution of the work.
- 4 The work of this project must be completed by qualified Subcontractors (a submission may be rejected if it is determined that it indicates more than one Subcontractor in each category, a non qualified Subcontractor or lists own forces which are not qualified for the work proposed).
- 5 The following are the subcontractors we propose to use for the Divisions or Sections of work listed hereunder.

Demolition

Concrete Work

Masonry

Structural Steel

Miscellaneous Metal

Rough Carpentry

Finished Carpentry

Sealant & Caulking

Wood Doors

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2020 04 29

**Glass & Glazing**

**Metal Studs & Drywall**

**Acoustic Ceiling**

**Tile Work**

**Resilient Tile Flooring**

**Painting and Finishing**

**Washroom Accessories**

**Toilet Partitions**

**Elevator**

**Mechanical**

**Control Systems**

**Electrical**

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2020 04 29

### APPENDIX "C" TO TENDER

### LIST OF UNIT PRICES

The following are our Unit Prices of work listed hereunder. The Unit Price listed applies only to perform the Units of the work during the time schedule for such work in the project schedule. The Unit Price shall include all overhead and profits and shall be net to the Owner for work in place. Please note that these prices are to exclude H.S.T.

### UNIT PRICE

DESCRIPTION

ADDITION (\$)

DELETION (\$)

### HOURLY RATES FOR CHANGE DIRECTIVES

Indicate the following hourly rates. Please note that this amount should include wages and benefits for work related to Change Directives or approved Delays of Project. All stipulated overhead and profit percentages are not to be included in this amount but will be covered in Supplementary General Conditions Section 00800.

- 1 On-site Superintendent's Hourly Charge

\$

- 2 Qualified Tradesmen under the Direct Employ of the Contractor

\$

- 3 Labourer

\$

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

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### APPENDIX "D" TO TENDER

### ALTERNATIVE PRICES

- 1 The following are our prices for the alternative work listed hereunder. The prices shall include all overhead and profits and shall be net cost of the Owner for the work in place. Please note that these prices are to exclude H.S.T.
- 2 The Owner reserves the right to accept or reject any alternate prices up to Sixty (60) days from tender closing, regardless of the date the contract may be signed.
- 3 Alternative prices are listed here at the discretion of the bidder. However all submitted prices are binding.
- 4 These prices are offered under the conditions of Section 01100 - Alternatives and Substitution Procedures

	DESCRIPTION	ADDITION (\$)	DELETION (\$)
1			
2			
3			
4			
5			
6			

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2020 04 29

### APPENDIX "G" TO TENDER

#### NOT PART OF THE TENDER DOCUMENTS

### SUBMISSION CHECKLIST

- 1 This appendix contains a list of tender items quite often overlooked in tender submissions. It is not intended to be a complete list nor does it form any part of the contract documents. Bidders are not required to complete or submit this Appendix

☐

**Tender Documents** - all required sections of the documents have been completed including Appendices B, C, E and as request Appendix F

☐

**Subcontractors** - all listed subcontractors meeting the conditions of the contract documents. Bidders can use 'own forces' only if they meet the requirements listed

☐

**Materials** - all listed subcontractors have confirmed to the bidder that it is their intent to use the specified materials and procedures

☐

**Bonding** - as stipulated in the documents

☐

**Addendum** - The content of all addenda has been reviewed and accounted for in the submission

☐

**Allowances** - All allowances including the Contingency Allowance have been included in the submission

**Supplementary General Conditions**  
**Section 00800**

**22-05-0014**

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

**CONTRACTOR**

**ADDRESS**

**BUS. PHONE**

**FAX PHONE**

**PROJECT & #**

**DRAW #**

**DATE**

Allowances and Subtrades	Original Contract Value	% Complete	Complete	Previous Payment	This Draw
<b>General Requirements</b>					
<b>Cash Allowance</b>					
<b>Demolition</b>					
<b>Grading &amp; Seeding</b>					
<b>Excavation &amp; Backfill</b>					
<b>ETC.</b>					
<b>Sub-Total</b>					
<b>Change Order #1</b>					
<b>Change Order #2</b>					
<b>ETC.</b>					
<b>SUBTOTAL</b>					
<b>H.S.T.</b>					
<b>VALUE OF CONTRACT</b>					
<b>LESS 10% HOLDBACK</b>					
<b>LESS TOTAL INVOICED TO DATE</b>					
<b>AMOUNT REQUESTED</b>					

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

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### 1 GENERAL

---

- 1 General Conditions of the Contract for Stipulated Price Contract, Document CCDC2, is a part of this contract and is incorporated herein as fully as if herein set forth.
- 2 The following supplements modify, change, delete or add to the General Conditions of CCDC 2. Where any part of the General Conditions are not modified or voided by this Section, the unaltered provisions or that part shall remain in effect.

### 2 ARTICLE A-6 RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING

---

- 1 The following shall be part of Clause 6.1:  
No other address, facsimile number, or email address other than those listed in this section shall be valid for communications dealing with
  - changes to the contract
  - request, approval or denial of payment
  - submission of requested information regarding contemplated changes to the contract
  - formal minutes of meetings
  - stop work orders
  - issues related to disputes
  - termination of contract
- 2 The following shall be part of Clause 6.2:  
Facsimile or other form of electronic communication shall be deemed to be received only based on electronic confirmation that the facsimile has been successfully sent or by electronic confirmation that the electronic confirmation has been opened. It is the responsibility of the sender to ensure the correspondence has been successfully sent and confirmation received.

### 3 ARTICLE A-7 LANGUAGE OF THE CONTRACT

---

- 1 The language of this contract is English.

### 4 DEFINITIONS

---

- 1 Add the following to Definition 4 : Consultant  
For the purposes of this document the term **Architect** is considered a Consultant.
- 2 Add the following to Definition 21  
The list of subcontractors is to include all those stipulated in the contract documents and stipulated by the Owner to perform work under the Allowances. For the purposes of this document the term SUBCONTRACTOR and Subcontractor are interchangeable.



22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 3 Add the following Definition 29

**Approved Equal:** Within this contract a product, procedure or system that is identified as 'approved equal' can be substituted for the product or system identified in the base specification. However the contractor assumes all responsibility for design changes, engineering, coordinating the work as may be required, ensuring the identified finishes and colours are provided and that the product or system is able to be supplied within the project schedule. No increase in contract price will be considered.

- 4 Add the following Definition 30

**Alternate or Alternative:** Products or systems identified as 'alternate' or 'alternative' are NOT APPROVED EQUALS and can not be substituted for base specified products without the permission of the Consultant. If the Consultant or Contractor wish to substitute an alternate product or system for reasons of cost, availability, or ease of construction, a request must be made, a contemplated change order issued and if accepted a change order issued before the substitution can be made. Submission or review of a shop drawing shall not constitute a request or approval of an alternate. The value of any change to the contract shall include all coordination necessary to incorporate the alternate into the work.

- 5 Add the following Definition 31

**Subtotal:** The tender amount plus the total amount of all change orders. This amount will include all taxes but exclude HST.

- 6 Add the following Definition 32

**% Complete and Value of Work Complete:** The total value of all work completed in the total contract by the Contractor and by each Subcontractor. This information is required as a percentage of the total value of the Subcontractor's work and as a dollar value. As part of the certification process, the Consultant's evaluation of the percentage of the work complete will be based on the total current value of the contract minus the value of any unspent (or unapproved) allowances.

## **5 GC 1.1 CONTRACT DOCUMENTS**

---

- 1 Change paragraph 1.1.5 to include:

If there is a conflict within the Contract Documents

- .1 the order of priority of document, from the highest to lowest, shall be
  - the agreement between the Owner and the Contractor
  - the Definitions
  - Supplementary Conditions
  - the General Conditions

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

**Added the following:**

**For material and equipment sizes of civil, structural, mechanical, electrical systems the most related civil, structural, mechanical or electrical documents shall govern. where there is a conflict in thickness, weight or size of material the largest shall apply.**

**Where there is a conflict in the quality of a material specified the best quality shall apply. For this purpose the best quality shall be considered the most costly to supply and install.**

Division 1 of the Specifications  
Technical Specifications  
Material and Finishing Schedules  
Drawings

**Added the following:**

**In the absence of any specified material or process the work shall be completed in compliance with applicable government requirements, the manufacturers' guidelines for specified systems, industry reference standards indicated in Section 01600 and general construction practices.**

- 2 Add paragraph 1.1.12 to read:

Nothing in these documents overrides governmental requirements including the current requirements of the Ministry of Labour and the Ontario Building Code.

## **6 GC 1.1 CONTRACT DOCUMENTS**

---

- 1 Add to paragraph 2.2.12:

.....the consultant to furnish instructions within 15 working days.....

## **7 GC3.1 CONTROL OF THE WORK**

---

- 1 Add the following clauses 3.1.3:

When a project occurs on a site where the owner requires access or needs to maintain operations, the contractor shall maintain safe access, egress, and provide temporary facilities and services as required. The Contractor shall schedule work to permit the owner's normal operations and coordinate the work with the Owner's on site representative on a weekly basis as it may relate to these operations.

The Contractor shall provide complete list of all personnel on site during times the property is to be occupied by the Owner or the Owner's tenants. The Owner has the right to refuse access to the site to any of the proposed personnel for security reasons without indicating the cause. The Contractor shall be responsible for maintaining a daily log of the personnel on site.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

The Owner and Consultant will each designate a representative(s) who will have the authority to issue site instructions. The contractor will not accept any direction from others with the exception of government agents having authority such as Building Inspectors, Ministry of Labour representatives etc. Subconsultants and testing agencies do not have authority to directly make changes to the contract. Any change by and representatives having authority must be done in writing to take effect.

On a site occupied by others the Owner will designate an on site representative. That representative will have no authority to make changes to the contract, with the exception of stop work on the property beyond the construction area that is felt to be unsafe.

No representative of the Owner or Consultant is authorized to give direction to a Subcontractor.

- 2 Add the following paragraph 3.1.4:

The contractor shall fulfill the requirements of Section 01500 as part of the control of the work.

---

**8 GC3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS**

---

- 1 Add to 3.2.1 the following:

Work conducted under Cash Allowance indicated under Section 01020 shall not be considered a separate contract or subject to the conditions of GC3.2.

- 2 Add the following to paragraph 3.2.2.2:

The Owner will assume and assign this responsibility but only for work by Owner or other contractors that have not been listed in the Contract Documentation.

- 3 Add the following paragraphs to 3.2.3.:

The Contractor shall assume responsibility for compliance with the applicable health and construction safety legislation at the Place of the Work including the work of the Owner and other contractors listed in the Contract Documentation.

The Contractor shall assume responsibility for compliance with the applicable health and construction safety legislation at the Place of the Work for additional work of the Owner and other contractors NOT listed in the Contract document. HOWEVER the will be considered a CHANGE IN THE WORK.

**22-05-0014****Market Building Interior Renovations****City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 4 Change 3.5.1.3. to read:

The Construction Schedule including the dates of SUBSTANTIAL PERFORMANCE and READY FOR TAKE OVER may not be changed without the Owner's approval or as provided for under Section GC6.5 DELAYS or as approved under Part 6 of the General Conditions - CHANGES IN THE WORK.

**9 GC3.4 CONSTRUCTION SCHEDULE**

---

- 1 Add 3.4.1.4:

Provide an approved schedule on a monthly basis as an appendix to Application for Payment.

- 2 Add 3.4.1.5:

Any work unfinished at the time the project is scheduled for substantial completion shall be completed in coordination with the owner to insure the building and site can be used for its intended purpose. The contractor shall provide temporary services and facilities necessary for the owners operation of the project if these services are not complete. The contractor shall permit the owner to move into the facility at the scheduled date of substantial completion and arrange for the relocation of the owner's equipment and furniture required to complete any unfinished work.

**10 GC3.5 SUPERVISION**

---

- 1 Modify clause 3.5.1 to include:

.....Supervisor shall not be changed from the commencement of the project to the date the project is READY FOR TAKE OVER without the written approval of the Owner.

**11 GC3.6 SUBCONTRACTORS AND SUPPLIERS**

---

- 1 Add the following to paragraph 3.6.3.:

The Bidder/Contractor has no right of compensation if it is found that a Subcontractor is not qualified in compliance with the contract, listed, or manufacturer approved. This approval must have been in place at the time of tender.

- 2 Include the following conditions as paragraph 3.7.7:

After signing of the contract, the contractor may request a change of subcontractor or supplier if they fail to meet the obligations prescribed to the contractor in CCDC 2, or they are unable to complete the project within the agreed schedule of work, or it is proven that their qualifications, workmanship or materials do not meet the specifications.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2021 01 05

When a Subcontractor or supplier is considered for replacement, the contractor shall notify the consultant in writing. Either a letter from the Subcontractor or supplier indicating a desire to withdraw or a copy and receipt of a registered letter to the Subcontractor or supplier shall accompany this written request.

The Owner has the right to know who are the subtrades and suppliers for this project and be ensured they meet the requirements of the contract documents. Replacement of listed subcontractors or suppliers can be made only with the Owner's written acceptance of the proposed alternate subcontractor or supplier. Agreements made or proposed to perform work of this contract between the contractor or one of the listed Subcontractors and any other company shall be considered a change of Subcontractor and require the Owners approval. No change of subcontractor or supplier requested by the Contractor shall increase the contract price.

**12 GC3.8 SHOP DRAWINGS**

---

- 1 Add the following to 3.8.1:

All Shop Drawings and their submissions shall conform to Section 01300.

- 2 Add the following to 3.8.4:

Review of these documents does not imply approval of changes that might be the consequence. They are intended to adhere to not modify the contract documents

- 3 Add the following to 3.8.5:

Acceptance of indicated deviations does not imply an agreement to a change in contract price.

- 4 Add to 3.12.1 the following:

Where cutting and remedial work is required specifically for the work of any section of this contract, it shall fall under the responsibility of that section.

**14 GC3.13 CLEAN-UP**

---

- 1 Add a new paragraph 3.13.4:

In addition to the requirements of CCDC 2, complete the requirements of Section 01700.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

### **15 GC5.2 APPLICATIONS FOR PROGRESS PAYMENT**

---

- 1 Modify clause 5.2.1 to read:

.....payment shall be made monthly as the work progresses until the substantial performance of the work. At that time no further invoices will be accepted until the final invoice is applied for and the work is deemed by the Consultant to be ready for take over. The only exception shall be a request for release of holdback upon expiration of the lien period.

- 2 Modify paragraph 5.2.5:

The schedule of values shall be made out in a form as indicated the enclosed appendix to this Section

- 3 Add the following to paragraph 5.2.6:

Each application shall also include an approved schedule (as may be revised under GC3.5 of CCDC2) indicating status of work to the date of application. No payments will be certified unless the Consultant assesses the work is being completed as per the approved Construction Schedule.

- 4 Add the following paragraph 5.2.9:

Every application for payment shall be accompanied by a construction schedule. Under the terms of this contract, the contractor shall indicate that all work is being completed as scheduled on the date of this application. No payments will be certified unless the Consultant assesses the work is being completed as per the approved construction schedule. The Consultant will return to the contractor all applications for payment not complying with this requirement.

- 5 Add the following paragraph 5.2.10:

For the purposes of this contract the close out requirements indicated in Section 01700.2 shall have an agreed value of 5% of the total construction cost. Certification of this value shall be made only when all conditions indicated in Section 01700.2 have been completed.

### **16 GC5.4 SUBSTANTIAL PERFORMANCE**

---

- 1 Add the Following clause 5.4.5:

However there will be no progressive release of holdback on project with initial schedules of less than 12 months. All conditions of the Construction Act are considered as part of this contract. The Contractor shall be responsible for all related administration including publication and publication cost for the notification of substantial completion.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2021 01 05

- 2 Add the Following clause 5.4.6:

This job shall not be deemed to be substantially complete until the conditions of Section 01700 Contract Close Out have been met.

### **17 GC5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE**

---

- 1 Add the following clause 5.5.5:

Meet all requirements of the Construction Act including publishing a statement in the Daily Commercial News as follows at the contractor's cost:

**THIS FORM HAS BEEN INSERTED FOR THE CONVENIENCE OF THE CONTRACTOR AND IS NOT CONSIDERED PART OF THE CONTRACT DOCUMENTS. THE INFORMATION SUPPLIED IN ANY PUBLICATION MUST BE DONE IN COMPLIANCE WITH APPLICABLE GOVERNMENT REGULATIONS.**

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2021 01 05

### CERTIFICATE OF SUBSTANTIAL PERFORMANCE OF THE CONTRACT

UNDER SECTION 32 OF THE CONSTRUCTION LIEN ACT

(County; District or Regional Municipality; City; in which premises are situated)

(address, city, postal code)

This is to certify that the contract for the following improvement:

**Market Building Interior Renovations**

to the above premises was substantially performed on

(date Certificate signed)

**Certified by Chris Willie**

1 Owner: **City of Woodstock**

(Name of Owner)

**500 Dundas Street, Woodstock, Ontario, N4S 1C4**

(Address for service)

2 Contractor:

(Name of Contractor)

**Contractor's Address**

(Address for service)

3 Certifier **Pow Peterman, Consulting Engineers**

(Name of Payment Certifier)

**50 Samnah Crescent, Ingersoll, Ontario, Canada**

(Address)

4 Identification of premises for preservation of liens:



22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2021 01 05

### 18 GC6.2 CHANGE ORDERS

---

- 1 Add the following new paragraph 6.2.3:

All alterations and/or revisions in excess of the total value of the indicated allowances shall be charged as follows.

For work by the forces of the General Contractor, the General Contractor shall charge the net price of material and labour, plus 10% overhead, 5% profit.

On work of a Subcontractor the subcontractor shall charge the net price of materials and labour plus 10% overhead and 5% profit. The Contractor shall add to this cost, 10% overhead/profit.

For the purposes of this contract the work 'overhead' shall be interpreted as all on site supervision, all office administration and all reimbursable related to the change. The Phrase 'net price' shall refer to the cost of all materials delivered to the site and all labour costs required for the actual installation but shall not include any of the overhead charges. This condition does not apply to prices identified at the time of tender for the full indicated value will be applied.

Where the Contractor or a Subcontractor's price quotation for a Change Order results in a net decrease in price before adjustment for fees for overhead and profit, such a price quotation shall be for the net decreases without any adjustment for fees for overhead

### 19 GC6.3 CHANGE DIRECTIVE

---

- 1 Add the following clauses 6.3.14

Unless an on site Change Directive is issued, the Owner and Consultants assume that there is no change in the contract price as a result of their comments. Verbal instructions are to be confirmed in writing within 24 hours. If the Contractor does not receive that confirmation, the contractor shall notify in writing within 30 days that it is their intention to complete the indicated scope of work and that it will involve a change to the contract. In the absence of a written instruction or a notification received and approved by the Consultant, no change to the contract will be considered.

No changes in contract price will be considered for changes implied or requested by anyone other than the authorized representatives.

Unless otherwise approved all quotations for changes must be submitted within 30 days of the request.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2021 01 05

**20 GC6.5 DELAYS**

---

- 1 Add a new condition to be 6.5.6 as follows:

The Owner has the right to reduce the value of the contract by the actual value of costs related to unapproved construction delays. The Owner shall be required to provide complete documentation of such costs which will be limited to:

Providing temporary facilities or storage for proposed uses of the building

All consultant(s) time after the agreed completion date

All additional moving and relocation charges necessitated by the late completion of the work

Where it can be documented, the loss of income due to the unavailability of the building

**21 GC9.2 TOXIC AND HAZARDOUS SUBSTANCES**

---

- 1 Replace clause 9.2.3 with the following:

**The Owner shall supply the Contractor with all available documentation of Hazardous Materials. The Contractor** shall take all reasonable steps to ensure that no person suffers injury, sickness or death and that no property is injured or destroyed as a result of exposure to, or the presence of, toxic or hazardous substance or materials which were at the *Place of the Work* prior to the *Contractor* commencing the Work

- 2 Modify clause 9.2.4 to read:

**The Contractor** shall be responsible to taking all necessary steps in accordance with legal requirements, to dispose of, store or otherwise render harmless toxic or hazardous substances or materials which were present at the *Place of the Work* prior to the *Contractor* commencing the Work. **All additional removal or protection of hazardous material requiring specialized trades, other than those that are identified in these documents, will be completed under this contract through a change to the contract and using personnel approved by the Owner.**

**22 GC10.1 TAXES AND DUTIES**

---

- 1 The contract price shall include all taxes and customs duties in effect at the time of the bid closing. Value Added Taxes shall in indicated as stipulated in Article A-4 of the Agreement - CONTRACT PRICE.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2021 01 05

**23 GC10.2 LAWS, NOTICES, PERMITS & FEES**

---

- 1 Make the following change to 10.2.2:

The contractor, not the owner, shall be responsible to obtain and pay for the Building Permit. The Owner shall pay for permanent easements and rights of servitude.

- 2 Add the following to 10.2.2:

The contractor shall be responsible for all initial fees of operating licenses as required for inspections, or commissioning of any portion of the work.

**24 GC11.1 INSURANCE**

---

- 1 Add to 11.1.1.1 the following:

The Contractor shall secure and maintain, during the full term of this contract, Liability insurance coverage for the business to the extent of at least \$10,000,000.00 per incident and commercial general automobile liability insurance to the extent of \$10,000,000.00 per incident for all licensed vehicles provided, however, that if the Contractor has already such coverage on his business in the said amount, he shall not be required to place additional coverage. The Owner and Consultant shall be designated as a named insured on any policy.

**25 GC11.2 CONTRACT SECURITY**

---

Add to the contract the following requirements for contract security.

- 1 The Contractor shall, as part of the tender submission provide proof of surety and prior to commencement of the work provide to the Owner the following:

Performance Bond:

The successful General Contractor shall furnish to the Owner, a guarantee bond covering the faithful performance of the contract in the amount of 50% of the contract amount. The bond shall be in the form as approved by the Ontario Construction Act

Labour and Materials Payment Bond:

The successful General Contractor shall furnish to the Owner, a guarantee bond covering the payment of labour and materials in the amount of 50% of the contract amount. The bond shall be in the form as approved by the Ontario Construction Act

- 2 All required bonds shall be issued by a duly licensed surety company authorized to transact the business of surety in the province or territory of the Place of Work and shall be maintained in good standing until the fulfillment of the Contract.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

### **1 DESCRIPTION OF WORK**

---

- 1 The work of this contract includes all permits, taxes, services, labour, material, supervision, and administration required to complete the scope of work of this project.
- 2 Unless indicated to remain, unfinished or to be supplied by others, this project is considered to include complete and operable mechanical, plumbing and electrical systems. The construction shall be weather tight with all exposed surfaces finished as specified or to match adjacent areas. All required fire separations and enclosures shall be provided.
- 3 Nothing within these documents or stated by the Owner or consultants shall override or imply non compliance with regulations governing the work of this project. The contractor shall give notification of any conflicts and receive written confirmation before proceeding with any affected work.
- 4 The intent of the drawings and specification is to describe special materials and construction methods required for this project. They are not intended as a manual of construction for every possible construction condition. The contractor is required to use subtrade companies and tradesmen qualified to construct, assemble or install materials specified herein. The contractor is required to provide quality work using methods and personnel approved by;  
  
governing regulations.  
specified trade, engineering and testing organizations.  
manufacturers guidelines.
- 5 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.
- 6 The contractor and subcontractors are responsible for providing the materials, equipment and procedures as specified within these documents, including the specification, drawings or addenda. It is the responsibility of this contract to provide all materials available on the date the contract was signed. Products no longer available or discontinued before the contract date will be subject to revision by a Change Order. Products discontinued or no longer available subsequent to the contract date shall be substituted with the Consultant's approval by the Contractor for products of similar or superior quality at no additional cost.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 7 Work shall include in general but shall not be limited to the Scope of Work as indicated in Section 01010.

## **2 DOCUMENTS REQUIRED**

---

### **1 Maintain at job site, one copy each of the following:**

- 1 Ministry of Labour Notice of Project complete with a copy of all reports
- 2 Municipal Building Permit complete with permit set of construction documents and all reports
- 3 Contract drawings.
- 4 Specifications.
- 5 Addenda.
- 6 Approved Construction Schedule
- 7 Copies of all project meeting minutes
- 8 Revised shop drawing.
- 9 Change orders.
- 10 Other modifications to the contract.
- 11 Field test report.
- 12 Copy of approved work schedule.
- 13 Manufacturer's installation and application instructions.
- 14 WHMIS standards for products used on site.
- 15 When requested under special circumstances, provide Standard listed in Part I of specification sections under references standards.
- 16 Asbestos Report
- 17 Environment Assessment
- 18 Copies of company health and safety policies of the Contractor and all Subcontractors as required by the Ministry of Labour
- 19 Copies of safety and trade certifications for all those on site as required by this contract and by government statute
- 20 Copies of all required government statutes and document, including but not limited to:  
The Ontario Building Code  
The Ontario Fire Code  
Construction Safety Handbook
- 21 Testing Agency reports on any listed assemblies, systems or products.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

### **3 PRODUCTS SUPPLIED BY OWNER**

---

- 1 Unload and handle at site.
- 2 Promptly inspect delivered products, and give written to Consultant on condition of all items.
- 3 Install, connect and finish products as specified.

### **4 WORK SCHEDULE**

---

- 1 Provide within ten (10) working days after award of contract, a weekly construction schedule using either a bar graph method related to Subcontractors or a critical path diagram related to construction tasks. This schedule shall be completed in consultation with Subcontractors and material suppliers for this project. Any submitted schedule shall be considered by the Owner and the Consultants as approved not only by the Contractor, but as well as Subcontractors and suppliers of materials.
  - Construction schedule shall indicate the following:
    - Commencement of construction
    - Progress of all phases of on site construction
    - Dates of submission for all shop drawings, samples, warranties and manuals.
  - This schedule shall include deadlines for return of approved shop drawings to the Contractor by the Consultants, allowing for the period of review indicated in the Section.
  - Dates of completion of all on site mock-ups
  - Coordination dates for items that affect the ongoing operation of existing facility including electric power shut-downs, water shut-offs, road closures, and other item that may disrupt or provide a safety concern to the Owner.
  - Date of Substantial Performance (March 24, 2024)
  - Date of Ready for Takeover
- 2 Refer also to GC3.5 Construction Schedule.
- 3 Interim review of work progress based on work schedule will be conducted as determined by the Consultant. No schedule shall be revised without the written approval of the Owner through the consultants as per GC Part 6 of CCDC 2.
- 4 Refer also to GC6 for the approval process to extend construction times and penalties related to late completion of the work.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2021 01 05

### 5 COST BREAKDOWN

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- 1 Before submitting first progress claim, submit breakdown of contract prices in detail as directed by Consultant and aggregating contract price. After approval by the Consultant, cost breakdown will be used as basis for progress payment.

### 6 CONTRACTOR'S USE OF SITE

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- 1 Do not unreasonably encumber site with materials or equipment.
- 2 Move stored products or equipment which interfere with operation of work.
- 3 Obtain and pay use of additional storage or work areas needed for operations.

### 7 PARTIAL OCCUPANCY THROUGH CONSTRUCTION

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- 1 Where a building remains occupied throughout the construction the Contractor shall:

Proper fire separated, dust tight, insulated barriers be provided between the construction and occupancy

Ensure that all means of egress, annunciation, systems are maintained or alternative coordinated with the local building official in compliance with Section 01010

Ensure that all security, electrical, and HVAC systems are maintained in occupied areas

Work is coordinated weekly with the Users to minimize noise

Necessary construction use of occupied space is coordinated with Users. That extension of systems or finishes into the occupied areas be coordinated and performed outside normal hours of operation

### 8 PARTIAL OCCUPANCY OR USE (EARLY OCCUPANCY BY THE OWNER)

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- 1 The Owner has the right to use the facility for its stated purpose upon the scheduled date of READY FOR TAKE OVER. In the event that work is behind schedule the contractor shall have the following responsibilities:

All coordination and costs related ensuring that the agreed areas be available for occupancy, including coordination with local building officials and charges related to additional consultants services.

All temporary measures to ensure that occupancy including physical barriers, temporary components.

Provide additional certifications of systems required for partial occupancy

All additional moving and cleaning costs that result from the delay.

All related costs for construction work that must happen outside normal hours of building operation as required to complete the project.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

### **9 CODES AND STANDARDS**

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- 1 Perform work in accordance with all applicable governmental regulations including, Ontario Building Code, Ontario Fire Code, Ministry of Labour requirements and any other local codes or bylaws provided that in case of conflict or discrepancy, more stringent requirements shall apply.
- 2 Meet or exceed requirements for specified standards, codes and reference documents.
- 3 The contractor, not the owner, shall be responsible to obtain and pay for the Building Permit. The Owner shall pay for permanent easements and rights of servitude.
- 4 The contractor shall register this project with the Ministry of Labour. Registration forms of Constructors and Employers of Workers are available from the Ministry of Labour offices.
- 5 The Construction Project Managers shall coordinate arrangements for the contractor to be briefed on Fire Safety at their pre-work conference by the Fire Chief before any work is commenced.
- 6 Provide all street and sidewalk closings, as required by the work, in compliance and with the co-ordination with the municipality or the related governing authority.
- 7 Provide the Authority having Jurisdiction a copy of all official job minutes and other documentation as required by legislation.
- 8 Notify the appropriate government authorities when site reviews are required by governing regulations. Maintain a log of all notifications, site visits, and verbal directives given by these authorities. Notify the Consultant in writing of any directives given.
- 9 Maintain on site a record of all written reports and directions given by these authorities. Provide a copy to the Consultant within 48 hours of receipt.
- 10 At the completion of the project include in the close out documentation a copy of all permits, the log notes of notification, site visits and site reports by governmental authorities.

### **10 PROJECT MEETINGS**

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- 1 Attend all regular project meetings.
- 2 Notify Subcontractors and suppliers concerned of meetings.



22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 3 Distribute minutes to all Subcontractors and suppliers within 24 hours of receipt of minutes.
- 4 Meeting agenda format
  - Construction Safety
  - Review of site visit direction from government agencies.
  - Review of previous minutes
  - Review of work completed since last meeting
  - General review of schedule status along with specific work to be completed by the next meeting
  - Review of submittals and contemplated change order status
  - Field Observations
  - Request for information and or changes

### **11 SETTING OUT OF WORK**

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- 1 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.
- 2 Provide devices needed to layout and construct work.
- 3 Supply such devices as straight edges and templates required to facilitate Consultant's inspection of work.
- 4 Supply stakes and other survey markers required for laying out work.

### **12 CO-ORDINATION**

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- 1 Ensure co-operation to workers in laying out work. Maintain efficient and continuous supervision. One supervisor, who the Owner agrees to, shall be provided by the Contractor. That supervisor shall be on site during all construction from commencement of work to substantial completion. Substitution of this supervisor can be made only through the mutual consent of the Owner and Contractor.
- 2 Be responsible for co-ordination and placement of openings, sleeves and accessories.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 3 Contractor will coordinate all work provided under the Allowances. Contractor shall employ companies and individuals under these Allowances as approved by the Architect. Testing agencies shall provide a schedule of fees in an effort to manage the testing allowance budget. If unexpected soils conditions require testing, the contractor shall be responsible and be permitted to coordinate additional testing. Results and recommendations of this testing must be forwarded onto the Architect before any change to the building design can be made.
- 4 Coordinate with the Owner's representative on a weekly basis and as required to ensure the ongoing operation of the building. The Owner has the right to refuse disruption of services or the use of power impact tools during normal hours of building operation.

### **13 LOCATION OF EQUIPMENT AND FIXTURES**

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- 1 Location of equipment, fixtures and outlet indicated or specified are to be considered as approximate.
- 2 Locate equipment, fixtures and distribution system to provide minimum interference and maximum usable space and in accordance with manufacturers recommendations for safety, access and maintenance.
- 3 Submit field drawing to indicate relative position of various services and equipment when required by the Consultant.

### **14 CONCEALMENT**

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- 1 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

### **15 CUTTING, FITTING AND PATCHING**

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- 1 Execute cutting (including excavation), fitting and patching required to make work fit properly together.
- 2 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.
- 3 Obtain Consultant's approval before cutting, boring or sleeving load-bearing members.
- 4 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 5 Unless otherwise specified all cutting and patching shall be the responsibility of the Subcontractor who will provide qualified tradesmen to complete the necessary patching.
- 6 In areas otherwise unaffected by the work of this contract, Subcontractors that are required to disturb existing finishes shall patch the existing surfaces and provide new finishes to the entire wall or ceiling surface to an appropriate existing seam or corner, i.e. where cutting or patching is required to an existing wall, the entire wall will be painted; or where ceiling tile has to be disturbed, the existing ceiling tile will be reused - ceiling tile will be found to match the existing tile in colour and texture, or all new ceiling tile will be provided.

### **16 EXISTING SERVICES**

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- 1 Where work involves breaking into or connecting to existing services, carry out work at times directed by governing authorities, with minimum of disturbance to pedestrian and vehicular traffic.
- 2 Before commencing work, establish location and extent of service lines in area of work and notify the Consultant of findings.
- 3 Submit schedule to and obtain approval from Consultant for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to effected parties.
- 4 Where unknown services are encountered, immediately advise Consultant and confirm finding in writing.
- 5 Remove abandoned service lines within 2 metres of structure. Cap or otherwise seal lines at cut-off points as directed by the Consultant.
- 6 Record locations of maintained, re-routed and abandoned service lines.

### **17 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING**

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- 1 Execute work with least possible interference or disturbance to occupants, public and normal use of premises. Arrange with Consultant to facilitate execution of work.
- 2 Where security has been reduced by work of contract, provide temporary means to maintain security.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

### **18 INITIAL SITE MEETING AGENDA ITEMS**

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Nothing in this agenda shall supersede the requirements of the contract indicated elsewhere

#### **1 GENERAL**

- 1 The Consultant shall conduct the site meetings and provide the official minutes.
- 2 The Consultant shall distribute to the following:
  - The Owner's representative
  - The local building official
  - The Contractor
  - All subconsultants of the Consultant
  - Any others requested by the Owner
- 3 The Contractor shall be responsible for the distribution of minutes to all Subcontractors and suppliers
- 4 The contractor shall ensure that all major Subcontractors (determined in discussion with the Consultant) are present for this meeting.

#### **2 NOTICES IN WRITING**

- 1 The owner, contractor and consultant shall each assign a representative for all contract administration in accordance with Article A-6 of CCDC 2. As this contract now permits facsimile and electronic communication as being official, each party will assign an official email address, facsimile, phone number and postal address to which all correspondence shall be sent. Each party shall be responsible for ensuring the communication as been sent and received as per Section 00800. No other addresses shall be used for this formal communication. All of the following communications shall be sent to the assigned address:
  - Changes to the contract
  - Request, approval or denial of payment
  - Submission of requested information regarding contemplated changes to the contract
  - Formal minutes of meetings
  - Stop work orders
  - Issues related to disputes
  - Termination of contract

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

### **3 CHAIN OF AUTHORITY**

- 1 When a project occurs on a site where the owner requires access or needs to maintain operations, the contractor shall maintain safe access, egress, and provide temporary facilities and services as required. The Contractor shall schedule work to permit the owner's normal operations and coordinate the work with the Owner's on site representative on a weekly basis as it may relate to these operations.
- 2 The Owner and Consultant will each designate a representative(s) who will have the authority to issue site instructions. The contractor will not accept any direction from others with the exception of government agents having authority such as Building Inspectors, Ministry of Labour representatives etc. Subconsultants and testing agencies do not have authority to directly make changes to the contract. Any change by and representatives having authority must be done in writing to take effect.
- 3 On a site occupied by others the Owner will designate an on site representative. That representative will have no authority to make changes to the contract, with the exception of stop work on the property beyond the construction area that is felt to be unsafe.
- 4 No representative of the Owner or Consultant is authorized to give direction to a Subcontractor.

### **4 CONSTRUCTION SAFETY**

- 1 Construction safety should be the first topic on subsequent site meeting agenda.
- 2 The contractor shall apply to the Ministry of Labour for the Notice of Project and to the municipality for a Building Permit. Post the documents and provide the Consultant with a copy. The contractor shall provide a written copies of all site visit reports and verbal commands.
- 3 The contractor is responsible for safety within the project limits and as required to provide access over the site to it. The contractor shall secure the site and maintain all barriers in good condition.
- 4 The contractor has sole right to limit access to the property. The Owner's staff have no right to access the property without the knowledge of the Owner's representative and the approval of the contractor. The Owner shall notify their staff of this condition.
- 5 The Owner's representative shall have the right to request to stop the work that poses a safety concern outside the area of construction. The Consultant shall be notified of this action immediately

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 6 Where the remainder of the site is in use by others, the Contractor does not have the right of unlimited access across the property. All access must be coordinated with the Owner.
- 7 The Owner shall provide all available information on hazardous material contained within the building. The contractor shall review all available documentation regarding such substances that may be present in this building, including reports as appended in Section 01010. The contractor shall be solely responsible for the construction and all workers using the effected areas. The contractor shall not commence work until satisfied that these reports are complete and all those on site have been fully instructed in safety procedures.
- 8 The Contractor shall ensure that these reports are available to all employees and Subcontractors that are on site during the project. The Contractor shall keep a record signed by each employee and Subcontractor indicating that they are aware of the reports and their contents.
- 9 Contractor is responsible for construction safety on this site including the safe disposal of all hazardous materials identified for removal and associated contaminated material. All removal, verification of condition shall be completed by qualified personnel registered with the Ministry of Labour. This personnel shall be responsible for evaluating the removal requirements, erecting all safety precautions and supplying a air quality test and Certificate of Removal upon completion. Obtain and submit copy of necessary permits for transporting and disposal of waste.

### **5 COORDINATION**

- 1 Before commencing work:

The Contractor shall provide a complete list of emergency contacts including local emergency services, existing building security monitoring company, existing building custodial staff contact, owner's representative, contractor's representative, contacts for mechanical and electrical subtrades. A copy of this will be distributed to the Owner and Architect. This list will be posted on site next to the Building Permit.

The Contractor shall provide complete list of all personnel on site during times the property is to be occupied by the Owner or the Owner's tenants. The Owner has the right to refuse access to the site to any of the proposed personnel for security reasons without indicating the cause. The Contractor shall be responsible for maintaining a daily log of the personnel on site.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

Submit a completed sign off list provided when a hazardous material report is available for the site indicating that all trades have reviewed and understood the document.

- 2 Provide within ten (10) working days after award of contract, a weekly construction schedule using either a bar graph method related to Subcontractors or a critical path diagram related to construction tasks. This schedule shall be completed in consultation with Subcontractors and material suppliers for this project. Any submitted schedule shall be considered by the Owner and the Consultants as approved not only by the Contractor, but as well as Subcontractors and suppliers of materials.
- 3 The Contractor shall identify items with long delivery times and factor this information into the schedule.
- 4 At the beginning of the project the Contractor shall schedule all inspection, reviews and certifications that are required for the occupancy of the project or use of the equipment. The dates of these reviews shall be included as critical deadlines within the overall construction schedule.  
These reviews shall include but are not limited to:
  - Fire alarm verification
  - Electrical reviews and verification
  - Elevating device reviews and certification
- 5 The Contractor shall ensure timely production and review of all shop drawings and samples.
- 6 The Contractor is required to complete the work according to this schedule and will be responsible under the terms of the contract for costs incurred by the Owner for late completion.
- 7 When a project occurs on a site where the owner requires access or needs to maintain operations, the contractor shall maintain safe access, egress, and provide temporary facilities and services as required. The Contractor shall schedule work to permit the owner's normal operations and coordinate the work with the Owner's on site representative on a weekly basis as it may relate to these operations.
- 8 Where a project is on a site that is occupied by others, the Contractor's superintendent shall arrange and conduct a weekly meeting with the Owner's on site representative. The purpose of this meeting is to discuss, safety and noise issues, the weekly scope of work, coordination of issues that effect the site beyond the construction area and personal issues.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 9 The contractor shall notify all regulating authorities of the commencement of work. Notification shall also be given the police department to make them aware of the potential of vandalism.
- 10 Contractor will coordinate all work provided under the Allowances. Contractor shall employ companies and individuals under these Allowances as approved by the Architect. Testing agencies shall provide a schedule of fees in an effort to manage the testing allowance budget. If unexpected soils conditions require testing, the contractor shall be responsible and be permitted to coordinate additional testing. Results and recommendations of this testing must be forwarded onto the Architect before any change to the building design can be made.
- 11 The fire department shall be notified and any encumbrances to their access plan to and within the building discussed.

### **6 PRE CONSTRUCTION REVIEW**

- 1 The Owner assumes that unless otherwise noted in the contract documents that the site, building and finish conditions both on the site and on neighbouring public and private lands are in a good state of repair. Therefore the full restoration of any area damaged by the work of this contract shall be the responsibility of the Contractor unless the following steps are taken.
- 2 The Contractor shall review all existing conditions that are to remain unchanged by the work but could be affected during construction (i.e.: sidewalks, curbs, fences, adjacent walls etc). The Contractor shall arrange for such access to adjacent lands as may be required to adequately review and document suspect conditions.

### **7 INSURANCE**

- 1 The Contractor shall supply proof of insurance as required by this contract

### **8 MONTHLY INVOICING PROCESS**

- 1 The Contractor shall submit a cost breakdown which will form the basis of the progress invoices.
- 2 In order to facilitate timely payments the Consultant requests of the contractor a draft of each draw in order that it can be reviewed in conjunction with a regular site visit before the formal invoice is submitted. The date of the formal submission should be coordinate to allow for timely payment by the Owner in consideration of their payment procedures.



22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

### **9 CHANGES TO THE CONTRACT**

- 1 Unless an on site Change Directive is issued, the Owner and Consultants assume that there is no change in the contract price as a result of their comments. Verbal instructions are to be confirmed in writing within 24 hours. If the Contractor does not receive that confirmation, the contractor shall notify in writing within 30 days that it is their intention to complete the indicated scope of work and that it will involve a change to the contract. In the absence of a written instruction or a notification received and approved by the Consultant, no change to the contract will be considered.
- 2 No changes in contract price will be considered for changes implied or requested by anyone other than the authorized representatives.
- 3 Unless otherwise approved all quotations for changes must be submitted within 30 days of the request.

### **10 PROJECT CLOSE OUT**

- 1 Items required for occupancy shall include but will not be limited to the following:
  - Electrical Safety Authority review and report
  - Fire Alarm Verification
  - Air Balancing Report
  - All exit doors must be complete with glazing and hardware including power door operators for accessibility entrances
  - All venting windows must be operating or the mechanical system must be running
  - Water purity test completed and verified
  - All ventilation, plumbing and electrical systems must be operational
  - All washroom accessories to accessible washrooms must be installed
  - Fire rated ceilings complete including fire dampers, flaps and enclosures around light fixtures
  - All fire rated walls must be complete with doors, fire rated glazing screens, hardware, fire stopping to all holes.
  - In renovation work the fire stopping is not limited to holes created by the project, but also existing defects.
  - All handrails, guards, toe kicks.
- 2 The project will not be considered substantial complete until
  - The project meets the requirements of the Construction Lien Act and Section 01700 of the contract documents
  - All manuals have been received and accepted
  - All as built drawings have been received and accepted
  - All warranties have been submitted and accepted

**22-05-0014**

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

All allowances have been balanced

All system certifications have been done and report received for items required for occupancy including the air balancing and fire alarm verification

An occupancy permit is granted by the municipality.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2013 04 30 tm

### **1 GENERAL**

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#### **1 RELATED REQUIREMENTS**

- 1 Section 01012: Materials Schedule
- 2 Section 01013: Room Finish Schedule
- 3 Section 01015: Standard Details
- 4 Section 01500: Safety Measure for an Existing Occupied Facility

#### **2 REPORTS AND ATTACHMENTS APPENDED TO THIS CONTRACT**

- 1 Asbestos Report

### **2 SCOPE OF WORK**

---

#### **1 General**

- 1 This scope of work is intended as a general guideline and does not limit the contractor's responsibility to complete the work in compliance with ALL requirements of the contract.

#### **2 Temporary Means of Egress**

- 1 Unless otherwise indicated all corridors, stairwells and exterior exit doors shall be considered means of egress and shall be maintained during construction. Provide engineered hoarding to provide a safe means of access to all doors and corridors to remain fully accessible during construction. Where it is indicated within the contract that means of egress corridors and doors are for emergency purposes only, through a construction area, provide a continuous safe egress path free of obstacles. Provide engineered guards next of excavations. Provide engineered temporary egress across all excavations. Temporary excavation access is not necessary if work is phased to ensure continuous egress or if work is commenced AND completed outside the hours of normal building occupancy. All temporary measures shall comply with Ministry of Labour requirements.

#### **3 Asbestos Removal**

- 1 In all work to existing buildings, the contractor must assume that asbestos and other hazardous materials are present. The contractor shall request and review any available studies and assessments on the building. The contractor shall insure that all concealed areas exposed during the work of this contract are inspected for hazardous materials before the work in those areas commence.
- 2 Contractor is responsible for construction safety on this site including the safe disposal of any asbestos as required by this contract. All removal, verification of condition shall be completed by qualified personnel registered with the Ministry of Labour.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2013 04 30 tm

- 3 Where the report indicates that asbestos occurs within the construction area, but has been encapsulated, and does not require modifications under this contract, the Contractor shall clearly identify these areas and instruct all personnel as to its location.
- 4 Maintain copies of reports and tests related to hazardous substances including all inspections by testing companies, consultants and government representatives on site during the duration of the project. Return reports to Owner and provide copies of all reports or notices issued during the project as part of the project commissioning.
- 5 Where removal of asbestos bearing material is indicated as part of the work of this contract, the Contractor shall engage properly trained personnel registered with the Ministry of Labour. This personnel shall be responsible for evaluating the removal requirements, erecting all safety precautions and supplying a air quality test and Certificate of Removal upon completion.
- 6 Where materials that are discovered and are suspected of containing asbestos, but not indicated within these documents to be removed or modified, the Contractor shall immediately cease work in the affected area and notify the Consultant and the Ministry of Labour verbally and in writing. This material will be dealt with under direction by the Owner.

### **4 Fire Separations**

- 1 Unless otherwise indicated provide 3/4 hour separation around all corridors.
- 2 Unless otherwise indicated provide a 1 hour separation around all mechanical and electrical areas
- 3 Unless otherwise indicated provide a 1 hour separation between floors and a 3/4 hour separation around stairwells and to the roof structure.
- 4 All walls of separations as required by the building code or indicated in these documents shall be fully extended to the structural deck above with all openings fire stopped. Review location of structural elements that might conflict with these separations. Notify Consultants of conflicts before commencing working.

### **5 Modifications to Existing**

- 1 Interior office renovations complete with new finishes and elevator as per drawings and specifications.

### **6 Scheduling of Work**

- 1 All work shall be substantially complete by March 24, 2024

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Number	Section	Item	Item
01005	General Instructions		The contractor and subcontractors are responsible for providing the materials, equipment and procedures as specified within these documents, including the specification, drawings or addenda. It is the responsibility of this contract to provide all materials available on the date the contract was signed. Products no longer available or discontinued before the contract date will be subject to revision by a Change Order. Products discontinued or no longer available subsequent to the contract date shall be substituted with the Consultant's approval by the Contractor for products of similar or superior quality at no additional cost.
02110	Demolition	Temporary Structures including shoring, scaffolding, false work, hoarding and bracing	Temporary Structures including shoring, scaffolding, false work, hoarding and bracing: to Ministry of Labour standards and CSA guidelines  Shop Drawings: Provide engineered shop drawings in accordance with Section 01300
02110	Demolition	Demolition	Demolition: to National Building Code of Canada 1995, Part 8 Construction Safety Measures
03300	Cast in Place Concrete	Normal Density Concrete	Normal Density Concrete: to CSA-A23.1-14 Unless otherwise specified in Structural Drawings provide; Type 10 cement to give minimum compressive cylinder strength of 25 MPa in 28 days for Class F-2 (footings and foundation walls) N (concrete slab on grade, no air content) exposure with 19 mm coarse aggregate, slump at point and time of discharge max. 80mm, ± 20 mm, air content 5 to 8%. Chemical Admixtures: Type WN.
03300	Cast in Place Concrete	Falsework	Falsework:  Shop Drawings: Provide engineered shop drawings in accordance with Section 01300
04200	Masonry	Grout	Grout: to CSA A179M-04 Table 3
04200	Masonry	Mortar for exterior loadbearing and all interior masonry above grade	Mortar for exterior loadbearing and all interior masonry above grade: to CSA A179-04 (R2014) Type 'S' based on proportional specifications  Colour: as selected by Architect from Northern Pigments full range (different colours for each masonry colour) Finish: Exposed joints are concave unless otherwise indicated
04200	Masonry	Concrete Block	Concrete Block: to CSA A165.1M, Type H/15/B/M autoclaved to CSA A165.4-M85 Richvale York Block Inc. - Standard block or an equivalent product approved equal by the Architect.  Thickness / Size: Metric modular in thicknesses as indicated Finish: Smooth Faced Mockups / Samples: 920mm x 1220mm (3'-0" x 4'-0")

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Number	Section	Item	Item
05100	Structural Steel	Structural Steel	Structural Steel: to CSA G40.21-13 (R2018) Type 350W  Shop Drawings: Provide engineered shop drawings in accordance with Section 01300
05100	Structural Steel	Powder Coating	Powder Coating: to Gloss - ASTM D523; Adhesion - ASTM D3359; Bending - ASTM D522; Impact - ASTM D2794; Hardness - ASTM B3363; Humidity ASTM D2247; Acid Salt ASTM G85 Tiger Drylac Canada Inc. - Special Series 49 polyester TGIC or an equivalent product approved equal by the Architect.  Colour: Bronze, 09 / 60600 Batch PA639CD Hybrid Metallic Shop Drawings: in accordance with Section 01300 Mockups / Samples: provide samples in full range of colours and finishes for specified products
05500	Miscellaneous Metal Fabrication	Interior Aluminum and Glass Railing System - Railing & Post	Interior Aluminum and Glass Railing System - Railing & Post: C.R. Laurence Company - CRS Component Railing System complete with Fascia Mount Brackets for stringers, Post Base Plate for landings with Plate Cover Canopy and 1.9" (48mm) o.d. Schedule 40 Stainless Steel Pipe, Round Cap Rails and Round Z-series Glass Clamps for 1/2" Clear Tempered Glass or an equivalent product approved equal by the Architect.  Thickness / Size: 48mm (1.9") o.d. capable of receiving indicated glazing Colour: Brushed Stainless Steel Shop Drawings: Provide engineered shop drawings in accordance with Section 01300
05500	Miscellaneous Metal Fabrication	Interior Aluminum and Glass Railing System - Handrail	Interior Aluminum and Glass Railing System - Handrail: C.R. Laurence Company - CRS Component Railing System 1.9" (48mm) o.d. Stainless Steel Railing complete with End Caps, Corners and Post Standoffs as indicated or an equivalent product approved equal by the Architect.  Thickness / Size: 48mm (1.9") o.d. to match railing system Colour: Brushed Stainless Steel Shop Drawings: Provide engineered shop drawings in accordance with Section 01300
06100	Rough Carpentry	Lumber	Lumber: to CAN/CSA 0141-05 (R2009), NLGA Standard Grading Rules for Canadian Lumber, 1987 Douglas Fir grade # 1/2 softwood S4S (surfaced four sides), moisture content 19% or less
06100	Rough Carpentry	Structural Composite Lumber	Structural Composite Lumber: to CSA 086.1S1-98 supplement n°1 to CSA 0.86.1-94 Tembec Forest Products Group - LVL: Selectem Grade 2.0E or an equivalent product approved equal by the Architect.  Thickness / Size: Refer to Structural Drawings.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Number	Section	Item	Item
06100 Rough Carpentry	Structural Composite Lumber	Structural Composite Lumber: to CSA 086.1 Jager Building Systems Inc. - Wood I-Joist: JSI Joist or an equivalent product approved equal by the Architect.  Thickness / Size: Refer to Structural Drawings. Shop Drawings: Provide engineered shop drawings in accordance with Section 01300	
06100 Rough Carpentry	Structural Composite Lumber	Structural Composite Lumber: to CSA 086.1 Trus-Joist Macmillan - PSL: Parallam Grade 2.0E or an equivalent product approved equal by the Architect.  Thickness / Size: Refer to Structural Drawings. Shop Drawings: Provide engineered shop drawings in accordance with Section 01300	
06100 Rough Carpentry	Glue-laminated Timber	Glue-laminated Timber: to to CSA 0122-06 Douglas Fir-Larch, Spruce-Pine; Stress Grade 24 F-E, 20 F-E	
06200 Finished Carpentry	Casework	Casework: Natural Finished Maple  Finish: Refer to Room Finish Schedule Shop Drawings: in accordance with Section 01300 Mockups / Samples: provide samples in full range of colours and finishes for specified products	
06200 Finished Carpentry	Countertops	Countertops: Plastic Laminate  Finish: Refer to Room Finish Schedule Shop Drawings: in accordance with Section 01300 Mockups / Samples: provide samples in full range of colours and finishes for specified products	
06200 Finished Carpentry	Cabinetry	Cabinetry: Plastic Laminate on partial board core 19mm (¾") medium density particle board.  Colour: as selected by Architect Finish: Refer to Room Finish Schedule Shop Drawings: in accordance with Section 01300 Mockups / Samples: provide samples in full range of colours and finishes for specified products	

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Number	Section	Item	Item
<b>07900 Sealants, Caulking and Firestopping</b>		Removable Firestopping	Removable Firestopping: to CAN/ULC -S115M, ASTM E814 Tremco - TREMstop PS or an equivalent product approved equal by the Architect.  Colour: Silver Shop Drawings: in accordance with Section 01300
<b>08110 Hollow Metal Doors, Frames and Screens</b>		H.M. Steel Doors, Frames & Screens	H.M. Steel Doors, Frames & Screens:  Thickness / Size: see Door Schedule Shop Drawings: in accordance with Section 01300
<b>08210 Wood Doors</b>		Solid Core Wood Doors Non-Fire Rated Solid Core	Solid Core Wood Doors Non-Fire Rated Solid Core: Baillargeon - Series 8500 ME/AF (urea-formaldehyde free) or an equivalent product approved equal by the Architect.  Thickness / Size: 44.5mm (1.75") thick Colour: Factory Finished, Nutmeg Finish: White Oak Veneer, Plain Sliced Shop Drawings: in accordance with Section 01300 Extended Warranty: 10 years
<b>08210 Wood Doors</b>		Solid Core Wood Doors 45 Minute Fire Rated Door	Solid Core Wood Doors 45 Minute Fire Rated Door: Baillargeon - Series AF45-MO/VE - urea-formaldehyde free or an equivalent product approved equal by the Architect.  Thickness / Size: 44.45mm (1.75") thick Colour: Factory Finished, Nutmeg Finish: White Oak Veneer, Plain Sliced Shop Drawings: in accordance with Section 01300 Extended Warranty: 10 years
<b>08800 Glass and Glazing</b>		Architectural Window Film	Architectural Window Film: Solyx Decorative Films - Solyx SXJ-0582 window film with silicone liner or an equivalent product approved equal by the Architect.  Thickness / Size: 2mil Colour: SXJ-0582 Matte Dual Dot Gradient
<b>08800 Glass and Glazing</b>		Non Wired Fire Rated Glass	Non Wired Fire Rated Glass: to CAN4 S-104 AND 106, ASTM E 119 The Pilkington Group - Pyrostop fire-rated, safety-rated, heat barrier ceramic glass or an equivalent product approved equal by the Architect.  Thickness / Size: thickness as per engineered shop drawings Colour: Clear unless otherwise specified Shop Drawings: Provide engineered shop drawings in accordance with Section 01300 Mockups / Samples: 305mm x 305mm (12" x 12") Extended Warranty: 5 years



22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Number	Section	Item	Item
09130	Suspension System for Acoustic Ceilings	T-Bar Suspension	<p>T-Bar Suspension: to ASTM C635-78. Armstrong - Prelude XL 24mm (15/16") Exposed Tee Grid or an equivalent product approved equal by the Architect.</p> <p>Colour: White Mockups / Samples: provide samples in full range of colours and finishes for specified products</p>
09250	Gypsum Board	Gypsum Board	Gypsum Board:
09330	Tile Work	Ceramic Tile Wall - Type 1	<p>Ceramic Tile Wall - Type 1 : Centura - York or an equivalent product approved equal by the Architect.</p> <p>Thickness / Size: 300mm x 600mm (12" x 24") Colour: as selected by Architect Finish: Matte Mockups / Samples: provide samples in full range of colours and finishes for specified products</p>
09330	Tile Work	Ceramic Tile Wall - Type 2	<p>Ceramic Tile Wall - Type 2 : Centura - Lanse or an equivalent product approved equal by the Architect.</p> <p>Thickness / Size: 50mm x 250mm (2" x 10") Colour: as selected by Architect Finish: Matte Mockups / Samples: provide samples in full range of colours and finishes for specified products</p>
09330	Tile Work	Ceramic Tile Floor - Type 1	<p>Ceramic Tile Floor - Type 1: Centura - Purestone or an equivalent product approved equal by the Architect.</p> <p>Thickness / Size: 300mm x 600mm x (12" x 24") Colour: as selected by Architect Finish: Natural Mockups / Samples: provide samples in full range of colours and finishes for specified products</p>
09330	Tile Work	Ceramic Tile Floor - Type 2	<p>Ceramic Tile Floor - Type 2: Olympia - Uptown or an equivalent product approved equal by the Architect.</p> <p>Thickness / Size: 300mm x 600mm (12" x 24") Colour: as selected by Architect Finish: Matt Mockups / Samples: provide samples in full range of colours and finishes for specified products</p>

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Number	Section	Item	Item
09330	Tile Work	Base to match Wall - Type 1	Base to match Wall - Type 1: Centura - York or an equivalent product approved equal by the Architect.  Thickness / Size: 300mm x 600mm (12" x 24") Colour: as selected by Architect Finish: Matt Mockups / Samples: provide samples in full range of colours and finishes for specified products
09330	Tile Work	Base to match Floor - Type 1	Base to match Floor - Type 1: Centura - Purestone or an equivalent product approved equal by the Architect.  Thickness / Size: 150mm (6") Colour: to match tile Finish: to match tile Mockups / Samples: provide samples in full range of colours and finishes for specified products
09330	Tile Work	Base to match Floor - Type 2	Base to match Floor - Type 2: Centura - Uptown or an equivalent product approved equal by the Architect.  Thickness / Size: 150mm (6") Colour: to match tile Finish: to match tile Mockups / Samples: provide samples in full range of colours and finishes for specified products
09511	Acoustical Panels and Tiles	Acoustical Panels Type 1	Acoustical Panels Type 1: Armstrong - Type 3150PB, Optima PB, Square Lay-In or an equivalent product approved equal by the Architect.  Thickness / Size: 610mm x 1219mm x 16mm (24" x 48" x 5/8") Colour: White Finish: Square Edge Mockups / Samples: provide samples in full range of colours and finishes for specified products
09511	Acoustical Panels and Tiles	Acoustical Panels Type 2	Acoustical Panels Type 2: Armstrong - Type 3150PB, Optima PB, Square Lay-In or an equivalent product approved equal by the Architect.  Thickness / Size: 610mm x 610mm x 16mm (24" x 24" x 5/8") Colour: White Finish: Square Edge Mockups / Samples: provide samples in full range of colours and finishes for specified products

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Number	Section	Item	Item
09660	Resilient Tile Flooring	Luxury Vinyl Tile	<p>Luxury Vinyl Tile: Gerflor - Creation 70 or an equivalent product approved equal by the Architect.</p> <p>Thickness / Size: 2.5mm (0.10") thick, 184mm x 1219mm (7.25" x 48") Colour: as selected by Architect</p>
09660	Resilient Tile Flooring	Base	<p>Base: Johnsonite - Rubber or an equivalent product approved equal by the Architect.</p> <p>Thickness / Size: 102mm (4") high as indicated Colour: as selected by Architect Mockups / Samples: 305mm (12")</p>
09660	Resilient Tile Flooring	Tactile Walking Surface Indicators (TWSI)	<p>Tactile Walking Surface Indicators (TWSI): Kinesik - Stainless Steel Tactile domes with concentric ring pattern or an equivalent product approved equal by the Architect.</p> <p>Thickness / Size: 22mm dia. Colour: Stainless steel 316L</p>
09660	Resilient Tile Flooring	Rubber Stair Treads	<p>Rubber Stair Treads: to ISO/FDIS 23599 Johnsonite - Angle Fit Rubber Stair Tread with Integrated Riser in Raised Round Finish with Solid Colour Rubber Insert for the visually impaired or an equivalent product approved equal by the Architect.</p> <p>Thickness / Size: lengths to match or exceed full tread width and depth Colour: colour of tread and contrast strip as selected by Architect from complete and extended colour range</p>
09680	Carpeting	Carpet - Type 1 (Tile)	<p>Carpet - Type 1 (Tile): Centura - KOOL or an equivalent product approved equal by the Architect.</p> <p>Thickness / Size: 20 oz. (500mm x 500mm) 19.68" x 19.68" Colour: 15408 Houle</p>
09680	Carpeting	Carpet - Type 2 (Broadloom)	<p>Carpet - Type 2 (Broadloom): Centura - Contrax II HD Broadloom or an equivalent product approved equal by the Architect.</p> <p>Thickness / Size: 79.25" Broadloom Colour: 60013 Blue Zircon</p>

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Number	Section	Item	Item
09680	Carpeting	Riser and Stair Nosing	<p>Riser and Stair Nosing: Johnsonite - Double Undercut Carpet (VIVCD) Vinyl Stair Nosing or an equivalent product approved equal by the Architect.</p> <p>Thickness / Size: 81mm (3 3/16") tread depth Colour: Colour as selected by Architect Finish: 50mm (2") wide co-extruded strip of contrasting material Mockups / Samples: 305mm (12")</p>
09680	Carpeting	Carpet to Painted Floor Transition Moulding	<p>Carpet to Painted Floor Transition Moulding: Johnsonite - EG-XX-H: transition reducer with undercut for 6mm (1/4") glue down carpet, or an equivalent product approved equal by the Architect.</p> <p>Thickness / Size: 32mm (1 9/32") Colour: Colour as selected by Architect Mockups / Samples: 305mm (12")</p>
09900	Painting	Gloss	<p>Gloss: to All paint manufacturers and products used shall be as listed under the Approved Product List section of the MPI Painting Manual. Benjamin Moore - DTM Acrylic Gloss Enamel M28 or an equivalent product approved equal by the Architect.</p> <p>Colour: as selected by Architect Mockups / Samples: provide samples in full range of colours and finishes for specified products</p>
09900	Painting	Semi-gloss	<p>Semi-gloss: to All paint manufacturers and products used shall be as listed under the Approved Product List section of the MPI Painting Manual. Benjamin Moore - Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01 or an equivalent product approved equal by the Architect.</p> <p>Colour: as selected by Architect Mockups / Samples: provide samples in full range of colours and finishes for specified products</p>
09900	Painting	Egg shell	<p>Egg shell: to All paint manufacturers and products used shall be as listed under the Approved Product List section of the MPI Painting Manual. Benjamin Moore - Architectural Coatings Regal Aquavelvet 319-01 or an equivalent product approved equal by the Architect.</p> <p>Colour: as selected by Architect Mockups / Samples: provide samples in full range of colours and finishes for specified products</p>

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Number	Section	Item	Item
09900 Painting		Flat	<p>Flat: to All paint manufacturers and products used shall be as listed under the Approved Product List section of the MPI Painting Manual. Benjamin Moore - Moorespec Interior Acrylic Latex Flat 564 or an equivalent product approved equal by the Architect.</p> <p>Colour: as selected by Architect Mockups / Samples: provide samples in full range of colours and finishes for specified products</p>
09900 Painting		Natural Finish	<p>Natural Finish: to All paint manufacturers and products used shall be as listed under the Approved Product List section of the MPI Painting Manual. Benjamin Moore - Stays Clear Satin 423 or an equivalent product approved equal by the Architect.</p> <p>Colour: as selected by Architect Mockups / Samples: provide samples in full range of colours and finishes for specified products</p>
10161 Laminated Plastic Toilet Partitions		Laminated Plastic Toilet Partitions	<p>Laminated Plastic Toilet Partitions: Buddsteel Architectural Products Limited. - P.lam. scratch resistant floor mounted, overhead braced. Panels, pilasters and doors are to be 19mm (3/4") thick rigid particleboard cores covered with P.lam. thermally fused to cores or an equivalent product approved equal by the Architect.</p> <p>Thickness / Size: to sizes indicated on drawings Colour: Selected by Architect from a full range of Arborite, Formica or Wilsonart colours and patterns Shop Drawings: in accordance with Section 01300</p>
10800 Washroom Accessories		Washroom Accessories	<p>Washroom Accessories: Frost - Products as specified in the Section or an equivalent product approved equal by the Architect.</p> <p>Colour: Stainless steel 304 finish unless otherwise specified Shop Drawings: in accordance with Section 01300 Extended Warranty: 5 years</p>
12500 Manual Roller Shades		Manual Shading System	<p>Manual Shading System: to CAN/ULC-S109 Solarfective Products Limited - Manually operated, chain and sprocket roller shade system, with infinite positioning; each shade unit consisting of two end brackets, shade tube, extruded aluminum fascia, hembar and fabric; or an equivalent product approved equal by the Architect.</p> <p>Colour: as selected by Architect Finish: as selected by Architect Extended Warranty: 5 years</p>

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Number	Section	Item	Item
12500	Manual Roller Shades	Sun Control Fabric	<p>Sun Control Fabric: to CAN/ULC-S109-03, CAN/ULCCGSB2-4, 162-M80, ASTM G21-96, AATCC 174-1998 Part II &amp; III</p> <p>Semi-transparent shade fabric</p> <p>Colour: as selected by Architect from manufacturer's full range</p> <p>Finish: 5% openness as selected by Architect</p> <p>Extended Warranty: 5 years</p>
12500	Manual Roller Shades	Fascia	<p>Fascia: to ASTM B221M</p> <p>6063 allow, T5 temper</p> <p>Colour: as selected by Architect</p> <p>Finish: Anodized, painted or wrapped in fabric to match colour selected by Architect</p> <p>Extended Warranty: 5 years</p>

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Apr 05 22 ms

Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.

The contractor and subcontractors are responsible for providing the materials, equipment and procedures as specified within these documents, including the specification, drawings or addenda. It is the responsibility of this contract to provide all materials available on the date the contract was signed. Products no longer available or discontinued before the contract date will be subject to revision by a Change Order. Products discontinued or no longer available subsequent to the contract date shall be substituted with the Consultant's approval by the Contractor for products of similar or superior quality at no additional cost.

The intent of this section is to indicate basic or default finishes to areas being architecturally modified. It must be read in conjunction with all drawings and other contract documents that may indicate different finish treatments in specific areas of rooms or to the exterior. Existing rooms affected only by cutting and patching of Mechanical or Electrical trades are not listed in this section and shall be repaired to match existing finishes.

<b>E1</b>	<b>LULA Hole-Less Hydraulic Elevator</b>		
	<b>Floor</b>	Luxury Vinyl Tile: Gerflor Creation 70 2.5mm (0.10") thick, 184mm x 1219mm (7.25" x 48")	as selected by Architect
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
<b>E2</b>	<b>Machine Room</b>		
	<b>Floor</b>	Sealed Concrete:	as selected by Architect
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
<b>100</b>	<b>Vestibule</b>		
	<b>Floor</b>	Ceramic Tile Floor - Type 1: Centura Purestone 300mm x 600mm x (12" x 24")	as selected by Architect
	<b>Base</b>	Base to match Floor - Type 1: Centura Purestone 150mm (6")	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Doors</b>	Strip and Refinish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Doors (2)</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
<b>101</b>	<b>Elevator Lobby</b>		
	<b>Floor</b>	Ceramic Tile Floor - Type 1: Centura Purestone 300mm x 600mm x (12" x 24")	as selected by Architect
	<b>Base</b>	Base to match Floor - Type 1: Centura Purestone 150mm (6")	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Apr 05 22 ms

<b>102</b>	<b>Lobby</b>		
	<b>Floor</b>	Luxury Vinyl Tile: Gerflor Creation 70 2.5mm (0.10") thick, 184mm x 1219mm (7.25" x 48")	as selected by Architect
	<b>Floor (2)</b>	Carpet - Type 1 (Tile): Centura KOOL 20 oz. (500mm x 500mm) 19.68" x 19.68"	15408 Houle
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Walls (2)</b>	RealStone:	as selected by Architect
	<b>Ceiling</b>	Acoustical Panels Type 2: Armstrong Type 3150PB, Optima PB, Square Lay-In	White
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Manual Roller Shades	
<b>103</b>	<b>Office</b>		
	<b>Floor</b>	Carpet - Type 1 (Tile): Centura KOOL 20 oz. (500mm x 500mm) 19.68" x 19.68"	15408 Houle
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Acoustical Panels Type 2: Armstrong Type 3150PB, Optima PB, Square Lay-In	White
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Manual Roller Shades	
<b>104</b>	<b>Media Room</b>		
	<b>Floor</b>	Luxury Vinyl Tile: Gerflor Creation 70 2.5mm (0.10") thick, 184mm x 1219mm (7.25" x 48")	as selected by Architect
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Acoustical Panels Type 2: Armstrong Type 3150PB, Optima PB, Square Lay-In	White
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect



22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Apr 05 22 ms

<b>105</b>	<b>Office</b>		
	<b>Floor</b>	Carpet - Type 1 (Tile): Centura KOOL 20 oz. (500mm x 500mm) 19.68" x 19.68"	15408 Houle
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Acoustical Panels Type 2: Armstrong Type 3150PB, Optima PB, Square Lay-In	White
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Manual Roller Shades	
<b>106</b>	<b>Closet</b>		
	<b>Floor</b>	Luxury Vinyl Tile: Gerflor Creation 70 2.5mm (0.10") thick, 184mm x 1219mm (7.25" x 48")	as selected by Architect
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Acoustical Panels Type 2: Armstrong Type 3150PB, Optima PB, Square Lay-In	White
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
<b>107</b>	<b>Existing Storage</b>		
	<b>Floor</b>	Existing to Remain:	as selected by Architect
	<b>Base</b>	Existing to Remain:	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Doors</b>	Paint Eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Frames</b>	Paint Eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
<b>108</b>	<b>Office</b>		
	<b>Floor</b>	Carpet - Type 1 (Tile): Centura KOOL 20 oz. (500mm x 500mm) 19.68" x 19.68"	15408 Houle
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Acoustical Panels Type 2: Armstrong Type 3150PB, Optima PB, Square Lay-In	White
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Manual Roller Shades	

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Apr 05 22 ms

<b>109</b>	<b>Office Floor</b>	Carpet - Type 1 (Tile): Centura KOOL 20 oz. (500mm x 500mm) 19.68" x 19.68"	15408 Houle
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Acoustical Panels Type 2: Armstrong Type 3150PB, Optima PB, Square Lay-In	White
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Manual Roller Shades	
<b>110</b>	<b>Office Floor</b>	Carpet - Type 1 (Tile): Centura KOOL 20 oz. (500mm x 500mm) 19.68" x 19.68"	15408 Houle
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Acoustical Panels Type 2: Armstrong Type 3150PB, Optima PB, Square Lay-In	White
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Manual Roller Shades	
<b>111</b>	<b>Meeting Room Floor</b>	Carpet - Type 1 (Tile): Centura KOOL 20 oz. (500mm x 500mm) 19.68" x 19.68"	15408 Houle
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Manual Roller Shades	
<b>112</b>	<b>Meeting Room Floor</b>	Carpet - Type 1 (Tile): Centura KOOL 20 oz. (500mm x 500mm) 19.68" x 19.68"	15408 Houle
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Manual Roller Shades	

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

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<b>113</b>	<b>Corridor</b>		
	<b>Floor</b>	Ceramic Tile Floor - Type 1: Centura Purestone 300mm x 600mm x (12" x 24")	as selected by Architect
	<b>Base</b>	Base to match Floor - Type 1: Centura Purestone 150mm (6")	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Doors</b>	Strip and Refinish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Doors (2)</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
<b>114</b>	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Women's Washroom</b>		
	<b>Floor</b>	Ceramic Tile Floor - Type 1: Centura Purestone 300mm x 600mm x (12" x 24")	as selected by Architect
	<b>Base</b>	Base to match Wall - Type 1: Centura York 300mm x 600mm (12" x 24")	as selected by Architect
	<b>Walls</b>	Ceramic Tile - Wall: Centura York 300mm x 600mm (12" x 24")	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
<b>115</b>	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Washroom Accessories Wall Tile Grout: Floor Tile Grout: P.Lam Toilet Partitions	
	<b>Men's Washroom</b>		
	<b>Floor</b>	Ceramic Tile Floor - Type 1: Centura Purestone 300mm x 600mm x (12" x 24")	as selected by Architect
	<b>Base</b>	Base to match Wall - Type 1: Centura York 300mm x 600mm (12" x 24")	as selected by Architect
	<b>Walls</b>	Ceramic Tile - Wall: Centura York 300mm x 600mm (12" x 24")	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Washroom Accessories Wall Tile Grout: Floor Tile Grout: P.Lam Toilet Partitions	

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Apr 05 22 ms

<b>116</b>	<b>Vestibule</b>		
	<b>Floor</b>	Ceramic Tile Floor - Type 1: Centura Purestone 300mm x 600mm x (12" x 24")	as selected by Architect
	<b>Base</b>	Base to match Floor - Type 1: Centura Purestone 150mm (6")	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
<b>117</b>	<b>Open Room</b>		
	<b>Floor</b>	Luxury Vinyl Tile: Gerflor Creation 70 2.5mm (0.10") thick, 184mm x 1219mm (7.25" x 48")	as selected by Architect
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Millwork</b>	Countertops: Plastic Laminate	as selected by Architect
	<b>Millwork (2)</b>	Millwork: Plastic Laminate on partial board core 19mm (¾") medium density particle board.	as selected by Architect
<b>118</b>	<b>Kitchenette</b>		
	<b>Floor</b>	Ceramic Tile Floor - Type 1: Centura Purestone 300mm x 600mm x (12" x 24")	as selected by Architect
	<b>Base</b>	Base to match Floor - Type 1: Centura Purestone 150mm (6")	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Walls (2)</b>	Ceramic Tile - Wall: Centura Lanse 50mm x 250mm (2" x 10")	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Millwork</b>	Countertops: Plastic Laminate	as selected by Architect
	<b>Millwork (2)</b>	Millwork: Plastic Laminate on partial board core 19mm (¾") medium density particle board.	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Backsplash Tile Grout: Floor Tile Grout:	

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

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<b>119</b>	<b>Universal Washroom</b>		
<b>Floor</b>	Ceramic Tile Floor - Type 1: Centura Purestone 300mm x 600mm x (12" x 24")	as selected by Architect	
<b>Base</b>	Base to match Wall - Type 1: Centura York 300mm x 600mm (12" x 24")	as selected by Architect	
<b>Walls</b>	Ceramic Tile - Wall: Centura York 300mm x 600mm (12" x 24")	as selected by Architect	
<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect	
<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect	
<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect	
<b>Comments</b>	Washroom Accessories Wall Tile Grout: Floor Tile Grout:		
<b>120</b>	<b>Mop Room</b>		
<b>Floor</b>	Ceramic Tile Floor - Type 1: Centura Purestone 300mm x 600mm x (12" x 24")	as selected by Architect	
<b>Base</b>	Base to match Floor - Type 1: Centura Purestone 150mm (6")	as selected by Architect	
<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect	
<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect	
<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect	
<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect	
<b>ST1</b>	<b>Stair 1</b>		
<b>Floor</b>	Ceramic Tile Floor - Type 1: Centura Purestone 300mm x 600mm x (12" x 24")	as selected by Architect	
<b>Floor (2)</b>	Carpet - Type 2 (Broadloom): Centura Contrax II HD Broadloom 79.25" Broadloom	60013 Blue Zircon	
<b>Base</b>	Base to match Floor - Type 1: Centura Purestone 150mm (6")	as selected by Architect	
<b>Base (2)</b>	Wood natural finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect	
<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect	
<b>Walls (2)</b>	RealStone:	as selected by Architect	
<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect	
<b>Casework</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect	
<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect	
<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect	
<b>Comments</b>	Stainless Steel & Glass Guards & Handrail System Stainless Steel Tactile Indicators		

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

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<b>ST2</b>	<b>Stair 2</b>		
	<b>Floor</b>	Luxury Vinyl Tile: Gerflor Creation 70 2.5mm (0.10") thick, 184mm x 1219mm (7.25" x 48")	as selected by Architect
	<b>Floor (2)</b>	Rubber Stair Tread: Johnsonite Angle Fit Rubber Stair Tread with Integrated Riser in Raised Round Finish with Solid Colour Rubber Insert for the visually impaired lengths to match or exceed full tread width and depth	colour of tread and contrast strip as selected by Architect from complete and extended colour range
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Painted Handrails & Guards Stainless Steel Tactile Indicators	
<b>200</b>	<b>Second Floor Lobby</b>		
	<b>Floor</b>	Luxury Vinyl Tile: Gerflor Creation 70 2.5mm (0.10") thick, 184mm x 1219mm (7.25" x 48")	as selected by Architect
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Millwork</b>	Countertops: Plastic Laminate	as selected by Architect
	<b>Millwork (2)</b>	Millwork: Plastic Laminate on partial board core 19mm (¾") medium density particle board.	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
<b>201</b>	<b>Office</b>		
	<b>Floor</b>	Carpet - Type 1 (Tile): Centura KOOL 20 oz. (500mm x 500mm) 19.68" x 19.68"	15408 Houle
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Manual Roller Shades	

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

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<b>202</b>	<b>Office</b>		
	<b>Floor</b>	Carpet - Type 1 (Tile): Centura KOOL 20 oz. (500mm x 500mm) 19.68" x 19.68"	15408 Houle
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Manual Roller Shades	
<b>203</b>	<b>Washroom</b>		
	<b>Floor</b>	Luxury Vinyl Tile: Gerflor Creation 70 2.5mm (0.10") thick, 184mm x 1219mm (7.25" x 48")	as selected by Architect
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Millwork</b>	Countertops: Plastic Laminate	as selected by Architect
	<b>Millwork (2)</b>	Millwork: Plastic Laminate on partial board core 19mm (¾") medium density particle board.	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
<b>204</b>	<b>Corridor</b>		
	<b>Floor</b>	Luxury Vinyl Tile: Gerflor Creation 70 2.5mm (0.10") thick, 184mm x 1219mm (7.25" x 48")	as selected by Architect
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Washroom Accessories	
<b>205</b>	<b>Office</b>		
	<b>Floor</b>	Carpet - Type 1 (Tile): Centura KOOL 20 oz. (500mm x 500mm) 19.68" x 19.68"	15408 Houle
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Manual Roller Shades	

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Apr 05 22 ms

<b>205.1</b>	<b>Closet</b>		
	<b>Floor</b>	Luxury Vinyl Tile: Gerflor Creation 70 2.5mm (0.10") thick, 184mm x 1219mm (7.25" x 48")	as selected by Architect
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
<b>206</b>	<b>Office</b>		
	<b>Floor</b>	Carpet - Type 1 (Tile): Centura KOOL 20 oz. (500mm x 500mm) 19.68" x 19.68"	15408 Houle
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Manual Roller Shades	
<b>207</b>	<b>Meeting Room</b>		
	<b>Floor</b>	Carpet - Type 1 (Tile): Centura KOOL 20 oz. (500mm x 500mm) 19.68" x 19.68"	15408 Houle
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Casework</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Manual Roller Shades	
<b>208</b>	<b>Meeting Room</b>		
	<b>Floor</b>	Carpet - Type 1 (Tile): Centura KOOL 20 oz. (500mm x 500mm) 19.68" x 19.68"	15408 Houle
	<b>Base</b>	Rubber Cove Base: Johnsonite Rubber 102mm (4") high as indicated	as selected by Architect
	<b>Walls</b>	Paint eggshell: Benjamin Moore Architectural Coatings Regal Aquavelvet 319-01	as selected by Architect
	<b>Ceiling</b>	Drywall, painted: Benjamin Moore Moorespec Interior Acrylic Latex Flat 564	as selected by Architect
	<b>Casework</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Doors</b>	Stained finish: Benjamin Moore Stays Clear Satin 423	as selected by Architect
	<b>Frames</b>	Paint semi gloss: Benjamin Moore Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01	as selected by Architect
	<b>Comments</b>	Manual Roller Shades	



**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **1 REQUIREMENTS INCLUDED**

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- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.
- 2 As indicated in Part 4 of CCDC 2, the indicated value of allowances in this Section shall not include H.S.T. or overhead and profit percentages which shall be included as part of the stipulated price base bid amount.
- 3 Unless indicate otherwise in this section, the indicated allowances do no pertain to any product or procedure that are specified within the contract documents
- 4 All allowances are work within the scope of this contract. The contractor shall be responsible for all coordination and payment. All allowances shall be spent only with the approval of the Architect, who has the right to define materials, techniques, suppliers and personnel to complete the work as indicated in the section.

### **2 CONTINGENCY ALLOWANCE**

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- 1 Refer to CCDC2
- 2 Include in the contract price a stipulated sum of \$75,000.00.

### **3 CASH ALLOWANCES**

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- 1 Refer to CCDC2.
- 2 Section 08710 Hardware: Include the stipulated sum of \$115,000.00. This allowance shall include the following:
  - Coordination Meeting with trades installing door and frames, installing hardware, making electrical and electronic connections.
  - Supply of all lock cylinders to aluminum door systems. The supply and installation of electronic devices to aluminum doors and frames
  - The supply and installation of hardware to doors using electronic components.
  - Supply of all hardware to all other door systems
  - Supply only of all millwork hardware
  - A complete review and report of all hardware installations as part of the substantial completion review.
  - Complete a final review of all deficiencies. Provide all necessary manuals to the Contractor and instruct the Owner's representative in the proper use and maintenance of all material and systems provided.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 3 Hazardous Materials: Include the stipulated sum of \$2,000.00 for removal of asbestos not identified for removal within the contract documents
- 4 Signage: Include the stipulated sum of \$5,000.00 for the supply and installation of signage as required by Owner.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

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### 1 REQUIREMENTS INCLUDED

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- 1 Product installation alternative to base bid work.
- 2 Incorporation of accepted alternatives in agreement.

### 2 RELATED REQUIREMENTS

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- 1 Section 00100: Instructions to bidders, Product/System Options.

### 3 REQUIREMENTS

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- 1 The contractor and subcontractors are responsible for providing the materials, equipment and procedures as specified within these documents, including the specification, drawings or addenda. It is the responsibility of this contract to provide all materials available on the date the contract was signed. Products no longer available or discontinued before the contract date will be subject to revision by a Change Order. Products discontinued or no longer available subsequent to the contract date shall be substituted with the Consultant's approval by the Contractor for products of similar or superior quality at no additional cost.
- 2 Alternate or Alternative: Products or systems identified as 'alternate' or 'alternative' are NOT APPROVED EQUALS and can not be substituted for base specified products without the permission of the Consultant. If the Consultant or Contractor wish to substitute an alternate product or system for reasons of cost, availability, or ease of construction, a request must be made, a contemplated change order issued and if accepted a change order issued before the substitution can be made. Submission or review of a shop drawing shall not constitute a request or approval of an alternate. The value of any change to the contract shall include all coordination necessary to incorporate the alternate into the work.
- 3 Approved Equal: Within this contract a product, procedure or system that is identified as 'approved equal' can be substituted for the product or system identified in the base specification. However the contractor assumes all responsibility for design changes, engineering, coordinating the work as may be required, ensuring the identified finishes and colours are provided and that the product or system is able to be supplied within the project schedule. No increase in contract price will be considered.
- 4 Reference specification sections stipulate pertinent requirements for products and methods to achieve the work stipulated under each alternative. ALTERNATIVES listed in the sections of this contract do not indicate that they are APPROVED EQUALS or can be substituted without the Consultant's written approval.
- 5 Co-ordinate affected related work and modify surrounding work to integrate the work under each alternative.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

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### 4 AWARD/SELECTION OF ALTERNATIVES

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- 1 If the contractor wishes to use an alternate system, product or method to what is specified, the Consultant shall be contacted and if an alternate can be considered the contractor shall provide a written request that includes the following information for both what is being proposed and what was originally specified.

The name of the specified and proposed system, product or method.

The reason for the request (i.e.: cost, availability, etc).

Product or system identification of both proposed and specified.

Industry design classifications of both indicating any differences and how the proposed is equal to or surpasses the specified.

Conformance diagrams of each indicating differences and proposed changes required to incorporate the alternative.

Warranties for each indicating how the proposed equals or surpasses the specified.

The contractor shall indicate how the use of the alternate will affect the construction schedule. Alternates that delay the work will not be considered.

Indicate the variation in price offered or requested as a result of using the alternate. The price shall include the values of all related changes required.

- 2 The Consultant shall have 5 working days to consider and render a recommendation to the Owner.
- 3 Shop Drawings shall be submitted only for specified materials or approved alternates. Submission or review of shop drawings does not supersede the approval process for Alternates.
- 4 Clearly indicate all related changes caused by the use of this alternative. Coordinate affected related work and modify surrounding work to integrate the work under each alternative.

### 5 ALTERNATIVES

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- 1 See Appendix "D" attached to the tender form.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

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**1 GENERAL**

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**1 RELATED REQUIREMENTS**

- 1 Section 01010: Submission of schedules.
- 2 Section 01400: Submission of test and mix design (mill tests).
- 3 Section 01600: Submission of manufacturer's instructions.
- 4 Section 01700: Submission of contract close-out documents.

**2 REQUIREMENTS INCLUDED**

- 1 ADMINISTRATIVE
- 2 PRE CONSTRUCTION CONDITION REVIEW
- 2 SHOP DRAWINGS AND PRODUCT DATA
- 3 SAMPLES
- 4 OPERATING MAINTENANCE MANUALS
- 5 RECORD DRAWINGS AND DOCUMENTS
- 6 WARRANTIES
- 7 Electrical Inspection & Plumbing Reports
- 8 Colour Schedule

**2 REQUIREMENTS**

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**1 ADMINISTRATIVE**

- 1 The contractor and subcontractors are responsible for providing the materials, equipment and procedures as specified within these documents, including the specification, drawings or addenda. It is the responsibility of this contract to provide all materials available on the date the contract was signed. Products no longer available or discontinued before the contract date will be subject to revision by a Change Order. Products discontinued or no longer available subsequent to the contract date shall be substituted with the Consultant's approval by the Contractor for products of similar or superior quality at no additional cost.
- 2 It is the sole responsibility of the Contractor to make submissions for systems, materials or processes that have been specified or approved equal. The Owner and Consultants shall not be responsible for cost or delay as a result of submission of a non approved alternate by the Contractor.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Jul 13 05 tm

- 3 Submit with reasonable promptness and in an orderly sequence so as to not cause delay in the 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.
- 4 The contractor shall allow the following review period by the consultants for all submittals. This period shall commence on the date submittals are received by the prime consultant:  
  
five working days for all work requiring the review of only the prime consultant.  
  
ten working days for all reviews for all other submittals (i.e. electrical light fixtures, etc.)
- 5 At the prime consultants option, specific items for review of other items may be sent directly to them to speed the construction process. These concerns should be discussed with the consultants before the construction schedule is finalized.
- 6 Work affected by the submittal shall not proceed until review is complete.
- 7 Submittals not stamped, signed, dated and identified as to the specific project will be returned without being examined and shall be considered rejected. No extension of the contract schedule will be permitted as a result of rejection of any submittal.
- 8 Verify field measurements and coordinate with affected adjacent work.
- 9 Adjustments made on shop drawings by the Consultant are not intended to change the Contract Price. If adjustments affect the value of work, state such in writing to the Consultant prior to proceeding with the work.
- 10 Contractor's responsibility for errors, omissions or deviations from requirements of Contract Documents is not relieved by any review by the Consultant.
- 11 Keep one reviewed copy of each submission on site.

**2 ALTERNATIVE PRODUCTS AND SYSTEMS**

- 1 No substitution of products that are not identified in this contract is permitted unless approved by the Architect.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Jul 13 05 tm

- 2 Shop drawings are reviewed based on the assumption that they relate to the specified product or system. Alternative products or systems shall not be proposed or identified in shop drawings. If the Contractor wishes to propose an alternative it must be done in writing separately and before the preparation of the shop drawings.
- 3 The Architect will consider a substitution for the following reasons:
  - That the specified product is no longer made or available in Canada
  - That there is a concern that the product specified will not perform as required
  - That there is a significant cost savings to the owner to change to another product
  - That the specified product will cause a delay in completion.
- 4 It is the responsibility of the Contractor and the related Subcontractor to provide all necessary information including technical support to support the request.
- 5 No compensation will be considered if date of the submission is in any part the cause of a construction delay.

**3 PRE CONSTRUCTION CONDITION REVIEW**

- 1 The Owner assumes that unless otherwise noted in the contract documents that the site, building and finish conditions both on the site and on neighbouring public and private lands are in a good state of repair. Therefore the full restoration of any area damaged by the work of this contract shall be the responsibility of the Contractor unless the following steps are taken.
- 2 The Contractor shall review all existing conditions that are to remain unchanged by the work but could be affected during construction (i.e.: sidewalks, curbs, fences, adjacent walls etc). The Contractor shall arrange for such access to adjacent lands as may be required to adequately review and document suspect conditions.
- 3 The Contractor shall produce a condition report to highlight any suspect areas that show existing damage and indicate any concern in areas where additional measures are necessary to stabilize suspect conditions. Where the report contains a visual record of these conditions, the location of each image shall be identified and keyed to a reference drawing.
- 4 The Consultant shall review the report. Once this review is complete copies of the final documentation shall be supplied to the Owner, Consultant, and where off site conditions are recorded, to the Municipality and the effected land owner. The Contractor shall retain a copy of the report as part of the on site documents.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Jul 13 05 tm

### 4 SHOP DRAWINGS AND PRODUCT DATA

- 1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by the Contractor to illustrate how specific details are being provided to meet the requirements of the contract and the intent of the design. These documents in no way supersede the contract documents and their review is not to be considered as an approval to deviate from them. If the contractor wishes to deviate from the contract document, approval must be first obtain through the Alternative price process.
- 2 Shop Drawings shall be submitted only for specified materials or approved alternates. Submission or review of shop drawings does not supersede the approval process for Alternates.
- 3 Shop Drawings shall be highlighted to clearly indicate;
  - where and how the drawings deviate from contract documents.
  - where further clarification of construction details and materials are required.
  - request for specified post tender information (i.e., colour, pattern, style).
  - indicate materials, methods of construction and attachment or anchorage, temporary shoring and support, 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 the Section under which the adjacent items will be supplied and installed.
  - cross references to design drawings and specifications.
  - include the review, certification and stamp of an engineer qualified and register in the Province of Ontario for temporary or permanent elements of structural, electrical/electronic, mechanical, chemical, civil design.
- 4 Submit electronically or six (6) prints of shop drawings for each requirement requested in specification sections and as the Consultant may reasonably request.
- 5 The Consultant receives shop drawings for record and to answer specific questions that are clearly marked. If errors are noticed, the Consultant may request revised shop drawings. The Consultant shall return shop drawings electronically or 3 copies to the Contractor.
- 6 Neither the receipt nor the review of shop drawings by the Owner or Consultant-Engineer shall relieve the Contractor from errors or omissions which may occur, even though the work is done in accordance with shop drawings. Errors or omissions shall be made good by the Contractor as soon as discovered irrespective of the receipt and review of the drawings by the Owner or Consultant-Engineer.



22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Jul 13 05 tm

- 7 Make changes in shop drawings as the Consultant may require, consistent with Contract Documents. When resubmitting, notify the Consultant in writing of any revisions other than those requested.
- 8 The contractor shall clearly indicate in their submission and be responsible for any collateral alterations as a result of changes related to the building configurations, systems used or products installed as a result of the shop drawing process.
- 9 When shop drawings require an engineer's review, the contractor shall provide this review as part of the contract. The engineer shall be licensed within the Province of Ontario for the discipline required. Shop drawings shall clearly indicate the firm name, business address, telephone number and email address of the certifying engineer. As part of the shop drawing process, a letter of compliance from this certifying engineer shall be provided clearly indicating the product and/or work has been completed in compliance with the shop drawings. When a system is installed within the project, the letter of compliance shall be supplied before a payment application can be made. The contract shall include all costs related to review and preparation of compliance letter.

**5 SAMPLES**

- 1 Samples shall be submitted only for specified or approved alternates.
- 2 Submit for review samples in duplicate as requested in respective specification sections. Label samples as to origin and intended use in the work.
- 3 Deliver samples prepaid to Consultant's business address.
- 4 Notify the Consultant in writing, at the time of submission of deviations in samples from requirements of Contract Documents.
- 5 Make changes in samples which the Consultant may require, consistent with Contract Documents.

**6 OPERATING MAINTENANCE MANUALS**

- 1 Prepare a comprehensive operation and maintenance manual in the language of the contract.
- 2 Two (2) weeks prior to Substantial Performance of the work, submit to the Consultant, two (2) copies of operating and maintenance manuals; one (1) hard copy, and one (1) electronic copy. NOTE: SUBSTANTIAL COMPLETION WILL NOT BE GRANTED UNTIL MANUALS ARE SUBMITTED.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Jul 13 05 tm

- 3 Manuals to contain operational information on equipment, cleaning and lubrication schedules, filters, overhaul and adjustment schedules and similar maintenance information. Instructions in this manual shall be in simple language so as to guide the owner in the proper operation and maintenance of building components.
- 4 Bind contents in a black three-ring, hard covered, plastic jacketed binder. Organize contents into applicable categories of work, parallel to specifications sections. Place all "as-builts" folded in pocket of back sleeve of binder. Provide two copies of black binders.
- 5 In addition to information specified, include the following:
  - Title sheet, labeled "Operating and Maintenance Instructions", containing project name and date.
  - List of names, addresses and phone numbers subcontractors and suppliers who can effect repair of maintenance on equipment.
  - List of contents.
  - Final shop drawings, product data of equipment, and letters of compliance for all engineered shop drawings.
  - Record drawings of concealed components of mechanical and electrical services.
  - Full description of building systems and operation.

**7 RECORD DRAWINGS AND DOCUMENTS**

- 1 After award of Contract the Consultant will provide a set of printed drawings for the purpose of maintaining record drawings. Accurately and neatly record deviations from Contract Documents caused by site conditions and changes ordered by the Consultant.
- 2 Record locations of concealed components of mechanical and electrical services.
- 3 Identify drawings as "Project Record Copy". Maintain in new condition and make available for inspection on site by Consultant.
- 4 Return Owner's copies of all reports and tests. Provide copies of all inspection reports and certifications by testing companies and independent consultants. Provide copies of all reports and orders from and all correspondence to government representatives that occurred relative to the project.
- 5 Two (2) weeks prior to Substantial Performance of the work, submit to the Consultant. NOTE: SUBSTANTIAL COMPLETION WILL NOT BE GRANTED UNTIL RECORD DRAWINGS ARE SUBMITTED.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Jul 13 05 tm

**8 AS BUILT DOCUMENTS**

- 1 Provide a set of documents indicating changes made, alternative used. Changes should be indicated on hard copy document printed for the purpose. Do not use these drawings for construction purposes.
- 2 Clearly label each drawing as 'AS BUILT DOCUMENTS'. Record information concurrently with construction process. Do not conceal work until required information is recorded.
- 3 Record actual construction including:
  - Measured depths of elements of foundations in relation to finish first floor datum.
  - Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - Measured locations of pipes, ducts, conduits, outlets, fixtures, access panels, and appurtenances, reference to visible and accessible feature of construction.
  - Field changes of dimension and detail.
  - Changes made by Change Orders and Supplemental Instructions.
  - References to Shop Drawings, where Shop Drawing show more detail.

**9 WARRANTIES**

- 1 Provide to the Consultant, two (2) copies of warranties and bond fully executed and notarized; one (1) hard copy, and one (1) electronic copy. NOTE: SUBSTANTIAL COMPLETION WILL NOT BE GRANTED UNTIL WARRANTIES ARE SUBMITTED.
- 2 Ensure that all warranties including extended warranties meet the intent of the contract.
- 3 Submit a statement from the manufacturer certifying the warrant for equipment put into use during construction. Unless otherwise agreed to by the Owner, this certification and the warranty should indicate the commencement of the warranty period as the date of Substantial Performance.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

May 15, 2009

### 1 GENERAL

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#### 1 RELATED REQUIREMENTS

- 1 Section 01020: Allowances
- 2 Section 01300: Submittals
- 3 Section 01600: Materials and Equipment

#### 2 REQUIREMENTS INCLUDED

- 1 Inspection and testing, administrative and enforcement requirements.
- 2 Tests and mix designs.
- 3 Mock-ups.
- 4 Mill tests.
- 5 Equipment/system adjust and balance.
- 6 Commissioning

#### 3 INDEPENDENT INSPECTION AGENCIES

- 1 Independent Inspection, Testing and Commissioning Agencies will be engaged and coordinated by the Contractor using an agency approved by the Consultant for the purpose of inspection and/or testing portions of the work. Costs shall be allocated as set out in Section 01020, Allowances.
- 2 Provide equipment required for executing inspection and testing by the appointed agencies.
- 3 Employment of inspection/testing agencies does not relax the responsibility to perform work in accordance with the Contract Documents.
- 4 If defects are revealed during inspection and/or testing, the appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defects and irregularities as advised by Consultant at no cost to the Owner. Pay costs for retesting and re-inspection.
- 5 Testing of the following components is required

Concrete Strength  
Steel welding and erection  
Steel doors and frames thickness and galvanizing  
Glass sealed units and thickness

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

May 15, 2009

### **4 ACCESS TO WORK**

- 1 Allow inspection/testing agencies access to the work, off-site manufacturing and fabrication plants.
- 2 Co-operate to provide reasonable facilities for such access.

### **5 PROCEDURES**

- 1 Notify the appropriate agency and Consultant in advance of the requirement for the tests, in order that attendance arrangements can be made. Recommendations of the agency or subconsultants must be forwarded on to the Architect for consideration. The consulting team will then issue direction on how to proceed with the work and issue a site directive if required.
- 2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in the work.
- 3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

### **6 REPORTS**

- 1 Submit two (2) copies of inspection and test reports promptly to the Consultant.
- 2 Provide copies to Subcontractor of work being inspected/tested.

### **7 TESTS AND MIX DESIGNS**

- 1 Furnish test results and mix designs as may be requested.
- 2 The cost of tests and mix designs beyond those called for in the Contract Documents or beyond those required by the Law of the Place of Work shall be appraised by the Consultant and may be authorized as recoverable.

### **8 MOCK-UPS**

- 1 Prepare mock-ups for work when requested by the Consultant.
- 2 Construct in locations acceptable to the Consultant.
- 3 Prepare mock-up for Consultant review with reasonable promptness and in an orderly sequence, so as not to cause any delay in the work.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

May 15, 2009

- 4 Failure to prepare mock-ups 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.
- 5 Remove mock-ups at conclusion of work.

### **9 MILL TESTS**

- 1 Submit mill test certificates as may be requested.

### **10 EQUIPMENT/SYSTEMS**

- 1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.

### **11 COMMISSIONING**

- 1 The following requirements for the commissioning of the project shall be the responsibility of the Contractor. None of the work indicated in this Section is part of a stipulated allowance.
- 2 Engage a commissioning agent as approved by the Owner to oversee project close out and confirm systems are operation to the specifications and intent of the project design.
- 3 DESCRIPTION: Conform to the requirements of Divisions 15 and 16, Mechanical and Electrical Provisions. Perform commissioning of the complete Building Control System (BCS) including every device input and output. A Commissioning Agent (CA) will be engaged by the General Contractor to verify commissioning has been performed in accordance with the requirements of this Section. Attend all commissioning meetings and perform all commissioning responsibilities assigned by the CA at those meetings.
- 4 TEST EQUIPMENT: Provide all test equipment necessary to fulfill testing and calibration requirements of this Division. Provide two-way radios for use by CA during commissioning, if required.
- 5 SUBMITTALS: Provide two copies of Record Drawings and Shop Drawings for the CA's review and use. Inform CA of any differences between actual systems and systems described in Shop Drawings. On one of the Record Drawing sets, mark the locations of network panels and interconnecting wiring. Indicate wiring types on Drawings.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

May 15, 2009

- 6 TEST PROCEDURES: A test form or checklist will be provided by the CA for each Mechanical and Electrical equipment item controlled or monitored by the BCS. Prior to commissioning, test and calibrate all control devices, inputs and outputs, verify correct operation of devices and controls sequences and complete test forms. Use a skilled technician who is familiar with the building to perform this work. Submit test forms to the CA for review. Test forms will generally include the following:
  1. Calibration of all inputs and devices
  2. Check of points list stored in each panel
  3. Operational check of all valves and dampers
  4. Check that all specified sequences are set up, debugged and fully operable
  5. Check of battery backup and power up after power failure restart functions
  6. Check of trending and graphing features
  7. Check of global commands features
  8. Check of schedules and alarms
  9. Synchronization of workstation and field panel clock settings
  10. Check that all graphic screens and value readouts are completed
  11. Check of setpoint changing features and functions.
  12. Check of night setback, morning warm-up operation
  13. Check of communications to remote sites
  14. Check of fire alarm interlocks
  15. Check of optimum start/stop and sequential equipment staging/alternating
- 7 Prior to testing, ensure all wiring connections for all voltages are properly terminated, ensure all wiring is properly identified, and ensure all wiring requirements are met.
- 8 COMMISSIONING: When the CA is satisfied the testing is complete, commissioning will be scheduled. Commissioning will consist of verification of operation of all points, sequences and features, witnessed and directed by the CA and the Owner's representative. Commissioning to be performed by the same technician who performed the testing described in Clause 11.5. Allow a minimum of five days for assisting CA during commissioning. This does not include time spent in verification and testing described in Clause 11.5 above.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

### **1 GENERAL**

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#### **1 RELATED REQUIREMENTS**

- 1 Section 02110: Temporary Structural Supports
- 2 Section 02110: Temporary Partitions
- 3 Section 01010: Owners Current Asbestos Report
- 4 Section 03300: Construction of Falsework

#### **2 SUBMISSIONS**

- 1 Engineered drawings for all temporary supports and bracing as required
- 2 Engineered drawings for all scaffolding as required
- 3 Copy of municipal approval of all hoarding as required by the governing authority
- 4 Copy of notification of project from the Ministry of Labour
- 5 Copy of any on site report by the Ministry of Labour
- 6 Copy of any written correspondence with the Fire Department
- 7 Copy or an Ministry approved report indicating that the site is clear of contamination as the result of accidents or specific construction procedures

### **2 TEMPORARY UTILITIES**

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#### **1 INSTALLATION AND REMOVAL**

- 1 Provide temporary utilities controls in order to execute work expeditiously.
- 2 Remove from site all such work after use.

#### **2 DEWATERING**

- 1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

#### **3 SANITARY FACILITIES**

- 1 Provide sufficient sanitary facilities for workers in accordance with local health authorities and the Ministry of Labour.
- 2 Maintain in clean condition.



22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

### **4 WATER SUPPLY**

- 1 The contractor shall be allowed to connect to and use the existing service. However all expenses of providing and disconnecting a temporary connection is the responsibility of the Contractor. No connection shall disrupt the service to occupied areas of the building or ongoing equipment needs.

### **5 TEMPORARY HEATING**

- 1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- 2 Permanent HVAC systems cannot be used in areas of construction without approval of the Owner. All related costs of any approved use of these systems is assumed by Contractor including energy costs, maintenance costs. No use of these systems with limit or reduce the full requirements or commencement date of all warranties.
- 3 After the building is enclosed, maintain interior temperature of 10 degrees C (50 degrees F)
- 4 In areas occupied by the Owner or tenants during construction the Contractor shall ensure heating, venting, cooling system provide for an interior temperature of 20 degrees C (68 degrees F). Existing system may be used but must be modified to isolate occupied areas from the construction.
- 5 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders not permitted.
- 6 Maintain required temperatures in areas where construction is in progress.
- 7 Ventilate heated areas keep building free of exhaust or combustion gases.
- 8 Permanent heating system of building, or portions thereof, may not be used when available.
- 9 Be responsible for damage to work due to failure in providing adequate heat and protection during construction.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

### **6 TEMPORARY POWER AND LIGHT**

- 1 The contractor shall be allowed to connect to and use the existing service. However all expenses of providing and disconnecting a temporary connection is the responsibility of the Contractor. No connection shall disrupt the service to occupied areas of the building or ongoing equipment needs.
- 2 Provide and maintain temporary lighting throughout project.

## **3 TEMPORARY FACILITIES**

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### **1 INSTALLATION AND REMOVAL**

- 1 Provide construction facilities in order to execute work expeditiously.
- 2 Remove from site all such work after use.

### **2 SCAFFOLDING**

- 1 Provide and maintain scaffolding, ramps, ladders, platforms, temporary stairs.
- 2 Provide engineered drawings for all scaffolding as required by the regulating authorities. Provide drawings, as prepared by a structural engineer registered to practice in the Province of Ontario, for all temporary structures including scaffolding as required by the governing regulations, including the Construction Safety Act.

### **3 HOISTING**

- 1 Provide, operate and maintain hoists, and cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.
- 2 Hoists and cranes shall be operated by qualified operator.

### **4 SITE STORAGE/LOADING**

- 1 Do not load or permit to load any part of work with a weight or force that will endanger the work.

### **5 CONSTRUCTION PARKING**

- 1 Limited parking will be permitted on site in areas designated by the Owner.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

### **6 SECURITY**

- 1 If the Consultant assesses that construction conditions warrant, provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

### **7 OFFICES**

- 1 Provide and maintain in clean condition during progress of work, adequately lighted, heated and ventilated Consultant's temporary office and Contractor's office with space for filing and layout of Contract Documents and Contractor's normal site office staff.
- 2 Provide adequate required aid facilities.
- 3 Subcontractors may provide their own offices as necessary. Direct location of these offices.

### **8 EQUIPMENT, TOOL AND MATERIALS STORAGE**

- 1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- 2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

### **9 CONSTRUCTION SIGN**

- 1 Provide and erect within three weeks of signing Contract, a project sign in a location designated by Consultant with Contractor's name, Consultants' names and project title. Size to be 4' x 8' unless otherwise directed by the Consultant.
- 2 Maintain sign in good condition for duration of work. Clean periodically.
- 3 No other signs or advertisements, other than warning signs, are permitted on site.

### **10 ELEVATORS**

- 1 Elevators may NOT be used by construction personnel and transporting of materials.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

### **4 TEMPORARY CONTROLS**

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#### **1 INSTALLATION AND REMOVAL**

- 1 Provide temporary controls in order to execute work expeditiously.
- 2 Remove from site all such work after use.

#### **2 HOARDING**

- 1 Erect hoarding where indicated on drawings to protect the public, workers, public and private property from injury or damage.
- 2 Provide hoarding as required by the governing agencies or where no other guidelines govern, with a chain link fence, 1.5m high, protecting public and private property from injury or damage. Provide lockable gates within hoarding for access to site by workers and vehicles.
- 3 Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to building.
- 4 Provide barriers around trees and plants designated to remain. Protect from damage.

#### **3 GUARD RAILS AND BARRICADES**

- 1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.

#### **4 WEATHER ENCLOSURES**

- 1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.
- 2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.

#### **5 DUST TIGHT SCREENS**

- 1 Provide dust tight screens or partitions to localize dust generating activities, and for the protection of workers, finished areas of work and the public.
- 2 Maintain and relocate protection until such work is complete.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

### **6 ACCESS TO SITE**

- 1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to the work.

### **7 PUBLIC TRAFFIC FLOW**

- 1 Provide and maintain flag persons, traffic signals, barricades and flares, lights, or lanterns as required to perform the work and protect the public.
- 2 Provide all street and sidewalk closings, as required by the work, in compliance and with the co-ordination with the municipality or the related governing authority.

### **8 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY**

- 1 Protect surrounding private and public property from damage during performance work.
- 2 Be responsible for damage incurred.
- 3 Provide preconstruction condition documentation as required by Section 01300

### **9 PROTECTION OF BUILDING FINISHES AND EQUIPMENT**

- 1 Provide protection for finished and partially finished building finishes and equipment during performance of work.
- 2 Provide necessary screens, covers, and hoardings as required.
- 3 Be responsible for damage incurred due to lack of or improper protection.

### **10 CLEANING**

- 1 Maintain the work in tidy conditions, free from the accumulation of waste products and debris, other than that caused by the owner or other contractor not employed by the Contractor.
- 2 Remove waste material and debris from the site and deposit in waste container at the end of each working day.
- 3 Clean interior areas prior to start of finish work, maintain areas free of dust and other contamination during finishing operations.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

### **11 TEMPORARY STRUCTURAL SUPPORTS**

- 1 Ensure no part of work is subjected to a load which will endanger its safety or will cause permanent deformation.
- 2 Do not cut, drill or sleeve any load bearing structural members unless specifically indicated, without written approval of the Consultant.
- 3 Design and construct false work and scaffolding in accordance with current CSA and Ministry of Labour requirements. Provide copies of engineered drawings for temporary support of any altered building component within or supporting an occupied portion of any building, or as required by governing regulations.

### **12 ENVIRONMENTAL PROTECTION**

- 1 Disposal of all material resulting from normal construction or due to spills or other accidents shall be as per the regulations of the Ministry of the Environment and the Municipality. Provide a report by a testing agency, qualified by the governing authorities and approved by the Consultant, to indicate that the site is clear of any environmental hazardous material. Cost of testing and preparation of the report is the responsibility of the contractor and not considered an expense of the owner or part of any stated allowance.
- 2 Fires and burning of rubbish on site is not permitted.
- 3 Do not bury waste rubbish and waste materials on site unless approved by Consultant.
- 4 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary systems.
- 6 Do not pump water containing suspended materials into waterways, sewer or drainage systems.

### **13 OCCUPATIONAL HEALTH & SAFETY ACT AND REGULATIONS**

- 1 Refer to GC3.6 Construction Safety.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 2 The Owner shall consider the work of this contract to be a "project" under the terms of the Occupational Health & Safety Act. The contractor shall be solely responsible for the safety of the construction site and all personnel therein, including but not limited to the requirements of the aforementioned Act and its regulations. The contractor shall also be responsible for the safety of the owner and the owner's staff and the public in buildings where there are ongoing operations and shall have the right to refuse admittance to any individual not complying with these Ministry regulations.
- 3 Observe and enforce construction safety measure required by Canadian Construction Safety Code and Workmen's Compensation Board. In event of conflict between any provision of above authorities the most stringent provision will apply.
- 4 The contractor shall have in his possession a copy of the most recent requirements of this Act and shall make all workers and others on site aware of its requirements.
- 5 The contractor shall register this project with the Ministry of Labour. Registration forms of Constructors and Employers of Workers are available from the Ministry of Labour offices.
- 6 The contractor shall file this notice with a Director of the Ministry before beginning work on a project. If the work at a project is not expected to take more than fourteen days, a constructor shall, before the work begins, provide by telephone to an inspector at the nearest office of the Ministry of Labour the information required under subsection (5) for the project.
- 7 The contractor shall provide a copy of all correspondence with the Ministry within ten days of issue or receipt to the Consultant. This includes the Notice of Project.

### **14 ASBESTOS AND OTHER TOXIC AND HAZARDOUS SUBSTANCES**

- 1 The Owner shall provide all available information on hazardous material contained within the building. The contractor shall review all available documentation regarding such substances that may be present in this building, including reports as appended in Section 01010. The contractor shall be solely responsible for the construction and all workers using the effected areas. The contractor shall not commence work until satisfied that these reports are complete and all those on site have been fully instructed in safety procedures.
- 2 Maintain copies of reports and tests related to hazardous substances including all inspections by testing companies, consultants and government representatives on site during the duration of the project. Return reports to Owner and provide copies of all reports or notices issued during the project as part of the project commissioning.

**22-05-0014**

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 3 In all work to existing buildings, the contractor must assume that asbestos and other hazardous materials are present. The contractor shall request and review any available studies and assessments on the building. The contractor shall insure that all concealed areas exposed during the work of this contract are inspected for hazardous materials before the work in those areas commence.



22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

4 The Contractor is responsible for the construction safety on this site including the handling and disposal of all hazardous materials.

5 The Contractor's responsibilities for dealing with hazardous material include the follow categories.

**6 Identify hazardous materials to remain:**

Where the reports indicate that hazardous materials occur within the construction area, but have been encapsulated, and does not require modifications under this contract, the Contractor shall clearly identify these areas and instruct all personnel as to its location.

**7 Removal of identified hazardous materials:**

Contractor is responsible for construction safety on this site including the safe disposal of all hazardous materials identified for removal and associated contaminated material. All removal, verification of condition shall be completed by qualified personnel registered with the Ministry of Labour. This personnel shall be responsible for evaluating the removal requirements, erecting all safety precautions and supplying a air quality test and Certificate of Removal upon completion. Obtain and submit copy of necessary permits for transporting and disposal of waste

**8 Identification and handling of hazardous material not identified in these documents:**

It is assumed that during any renovation project hazardous materials other than those previously identified may be present. Materials are discovered that are suspected of containing asbestos or other hazardous materials, but not indicated within these documents, the Contractor shall immediately cease work in the affected area and notify the Architect and the Ministry of Labour verbally and in writing, and take all precautions required by the related governmental statues and guidelines. This material will be dealt with by the Owner and the Owner's cost using the stipulated allowance under Section 01020

9 Provide written report by qualified supplier that air quality upon completion of the work, meets the requirements of the Ministry of Labour.

10 Where hazardous materials have been removed or modified the Owner's reports shall be updated as part of the as built drawing submission.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

### **5 FIRE SAFETY REQUIREMENTS**

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#### **1 FIRE SAFETY PLAN**

- 1 Contractors and their personnel will be familiar with this section and its requirements.

#### **2 FIRE DEPARTMENT BRIEFING**

- 1 The Construction Project Managers shall coordinate arrangements for the contractor to be briefed on Fire Safety at their pre-work conference by the Fire Chief before any work is commenced.
- 2 The fire department shall be notified and any encumbrances to their access plan to and within the building discussed.
- 3 The contractor shall provide a copy of all correspondence with the Ministry within ten days of issue or receipt to the Consultant. This includes the minutes of the required coordination meeting.

#### **3 REPORTING FIRES**

- 1 Know the location of nearest fire alarm box and telephone, including the emergency phone number.
- 2 Report immediately all fire incidents to the Fire Department as follows:  
Activate nearest fire alarm box or telephone
- 3 Person activating fire alarm box shall remain at the box to direct Fire Department to scene of fire.
- 4 When reporting a fire by telephone, give location of fire, name or number of building and be prepared to verify the location.

#### **4 INTERIOR AND EXTERIOR FIRE PROTECTION AND ALARM SYSTEMS**

- 1 Fire protection and alarm systems shall not be:  
Obstructed  
Shut-off  
Left inactive at the end of a working day or shift without notification and authorization from the Fire Chief or his representative.
- 2 Fire hydrants, standpipes and hose system shall not be used for other than fire fighting purposes unless authorized by the Fire Chief.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

### **5 FIRE EXTINGUISHERS**

- 1 The Contractor shall supply fire extinguishers, as scaled by the Fire Chief, necessary to protect, in an emergency, the work in progress and the contractors physical plant on site.
- 2 The Contractor shall notify the Fire Chief of the location of any asphalt kettles and the dates that the kettles will be in use. The Contractor, in the course of roofing work, shall ensure that he and/or his personnel use and take the following precautions:

### **6 BLOCKAGE OF ROADWAYS**

- 1 The Fire Chief shall be advised of any work that would impede fire apparatus response. This includes violation of minimum overhead clearance, as prescribed by the Fire Chief, erecting of barricades and the digging of trenches.

### **7 SMOKING PRECAUTIONS**

- 1 ABSOLUTELY NO SMOKING OR VAPING IS ALLOWED.

### **8 RUBBISH AND WASTE MATERIALS**

- 1 Extreme care is required where it is necessary to store oily waste in work areas to ensure maximum possible cleanliness and safety.
- 2 Greasy or oily rags or materials subject to spontaneous combustion shall be deposited and kept in an approved receptacle and removed as required in 9.3.1.

### **9 FLAMMABLE LIQUIDS**

- 1 The handling, storage and use of flammable liquids are to be governed by the current National Fire Code of Canada.
- 2 Flammable liquids such as gasoline, kerosene and naphtha may be kept for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable liquids exceeding 45 litres for work purposes, requires the permission of the Fire Chief.
- 3 Transfer of flammable liquids is prohibited within buildings.
- 4 Transfer of flammable liquids shall not be carried out in the vicinity of open flames or any type of heat-producing devices.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2021 01 05

- 5 Flammable liquids having a flash point below 38°C such as naphtha or gasoline shall not be used as solvents or cleaning agents.
- 6 Flammable waste liquids, for disposal, shall be stored in approved containers located in a safe ventilated area. Quantities are to be kept to a minimum and the Fire Department is to be notified when disposal is required.

### **10 HAZARDOUS SUBSTANCES**

- 1 If the work entails the use of any toxic or hazardous materials, chemicals and/or explosives, or otherwise creates a hazard to life, safety or health, work shall be in accordance with the National Fire Code of Canada.
- 2 The Fire Chief is to be advised, and a "Hot Work" permit issued in all cases involving welding, burning or the use of blow torches and salamanders, in buildings or facilities. Special precautions are necessary to safeguard life and property from damage by fire or explosives.
- 3 Wherever work is being carried out in dangerous or hazardous areas involving the use of heat, fire watchers, equipped with sufficient fire extinguishers shall be provided. The determination of dangerous or hazardous areas along with the level of precaution necessary for Fire Watch shall be at the discretion of the Fire Chief. Contractors are responsible for providing fire watch service for their work on a scale established and in conjunction with the Fire Chief at the pre-work conference.
- 4 Where flammable liquids, such as lacquers or urethane are to be used, proper ventilation shall be assured and all sources of ignition are to be eliminated. The Fire Chief is to be informed prior to and at the cessation of such work.

### **11 QUESTIONS AND/OR CLARIFICATION**

- 1 Any questions or clarification on Fire Safety in addition to the above requirements shall be directed to and cleared through the Fire Chief.

### **12 FIRE INSPECTIONS**

- 1 The Base/Station Fire Chief shall be allowed unrestricted access to the work site.
- 2 The Contractor shall co-operate with the Fire Chief during routine inspections of the work site.
- 3 The Contractor shall immediately remedy all unsafe fire situations observed by the Fire Chief.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

### 1 REQUIREMENTS INCLUDED

- 1 Reference standards.
- 2 Product quality, availability, storage, handling, protection, transportation.
- 3 Manufacturer's instructions.
- 4 Workmanship, co-ordination, cutting, fastenings.

### 2 RELATED REQUIREMENTS

- 1 Section 01400: Quality control and inspection of work.

### 3 REFERENCE STANDARDS

- 1 Within the text of the specifications, reference may be made to the following standards:

<b>ACI</b>	American Concrete Institute
<b>AISC</b>	American Institute of Steel Construction
<b>ANSI</b>	American National Standards Institute
<b>ASTM</b>	American Society of Testing and Materials
<b>CEC</b>	Canadian Electrical Code (published by CSA)
<b>CEMA</b>	Canadian Electrical Manufacturer's Association
<b>CGSB</b>	Canadian General Standards Board
<b>CISC</b>	Canadian Institute of Steel Construction
<b>CLA</b>	Canadian Lumberman's Association
<b>CPCA</b>	Canadian Painting Contractors' Association
<b>CPCI</b>	Canadian Prestressed Concrete Institute
<b>CRCA</b>	Canadian Roofing Construction Association
<b>CSA</b>	Canadian Standards Association
<b>FM</b>	Factory Mutual Engineering Corporation
<b>IEEE</b>	Institute of Electrical and Electronic Engineers
<b>IPCEA</b>	Insulated Power Cable Engineers Association
<b>NAAMM</b>	National Association of Consultantural Metal Manufacturers
<b>NBC</b>	National Building Code
<b>NEMA</b>	National Electrical Manufacturer's Association Ontario Hydro
<b>TTMAC</b>	Terrazzo, Tile and Marble Association of Canada
<b>ULC</b>	Underwriters' Laboratories of Canada

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 2 Conform to these standards, in whole or in part, as specifically requested in the specification. Where an updated standard is available, both standards shall be considered by the contractor in the completion of the work of this contract. Where there is a conflict between these two guidelines, the most recent version shall be followed.
- 3 If there is question as to whether any product or system is in conformance with application standards, the Consultant reserves the right to have such products or systems tested to prove or disprove conformance.
- 4 The cost for such testing will be borne by the Owner in the event of conformance with Contract Documents or by the Contractor in the event of non-conformance.

## **4 PRODUCTS AND MATERIALS**

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### **1 QUALITY**

- 1 Products, materials, equipment and articles (referred to as products throughout the specification) incorporated in the work shall be new, not damaged or defective, and of the best quality (compatible with specifications) for the purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- 2 Defective products, whenever identified prior to the completion of work, will be rejected, regardless of previous inspections. Inspection by the Consultants or Owner does not relieve responsibility error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- 3 Should any dispute arise as to the quality or fitness of products, the decision rests strictly with the Consultant based upon the requirements of the Contract Documents.
- 4 Unless otherwise indicated in the specifications, maintain uniformity of manufacture for any item throughout the building.
- 5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instruction, or when located in mechanical or electric rooms.
- 6 Unless otherwise indicated in the specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instruction directly from manufacturer.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 7 Notify the Consultant in writing, of conflicts between the specifications and manufacturer's instructions, so that the Consultant may establish the course of action.
- 8 Improper installation or erection of products, due to failure in complying with these requirements, authorize the Consultant to require removal and re-installation at no increase in Contract Price.

### **2 AVAILABILITY**

- 1 The contractor and subcontractors are responsible for providing the materials, equipment and procedures as specified within these documents, including the specification, drawings or addenda. It is the responsibility of this contract to provide all materials available on the date the contract was signed. Products no longer available or discontinued before the contract date will be subject to revision by a Change Order. Products discontinued or no longer available subsequent to the contract date shall be substituted with the Consultant's approval by the Contractor for products of similar or superior quality at no additional cost.
- 2 Immediately upon signing Contract, review Product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of products are foreseeable, notify the Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of work.

### **3 SUBSTITUTIONS**

- 1 When a substitution has been permitted the Contractor shall coordinate related work to ensure compatibility and completion within original stated tolerances.

### **4 STORAGE, HANDLING AND PROTECTION**

- 1 Handle and store products in a manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- 2 Store packaged or bundled products in original and undamaged condition with manufacturer's seals and labels intact. Do not remove from packaging or bundling until required in the work.
- 3 Store products subject to damage from weather in weatherproof enclosures.
- 4 Store cementitious products clear of earth or concrete floors, and away from walls.
- 5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 6 Store material and equipment in accordance with supplier instructions.
- 7 Store and mix paints in a heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- 8 Remove and replace damaged products at own expense and to the satisfaction of the Consultant.

## **5 WORKMANSHIP**

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### **1 GENERAL**

- 1 Workmanship shall be the best quality, executed by workers experienced and skilled in the respective duties for which they are employed. Immediately notify the Consultant if required work is such as to make it impractical to produce required results.
- 2 The Consultant reserves the right to require the dismissal from the site, workers deemed incompetent, careless, insubordinate or otherwise objectionable.
- 3 Decisions as to the quality or fitness of workmanship in cases of dispute rest solely with the Consultant, whose decision is final.

### **2 FASTENINGS**

- 1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated.
- 2 Prevent electrolytic action between dissimilar metals and materials.
- 3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in the affected specification section.
- 4 Space anchors within their load limit or shear capacity and ensure they provide permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- 5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- 6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.



**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **1 RELATED REQUIREMENTS**

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- 1 Section 01300: Provide to the Consultant, one (1) copy of warranties and bond fully executed and notarized plus one (1) scanned electronic copy. NOTE: SUBSTANTIAL COMPLETION WILL NOT BE GRANTED UNTIL WARRANTIES ARE SUBMITTED.
- 2 Section 01500: Progressive site cleaning.
- 3 General conditions of the contract, Fiscal provision, Legal submission, and other administrative requirements.

### **2 CONTRACT CLOSE OUT TO BE COMPLETED AS PART OF SECTION 00800 GC5.2.5**

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- 1 For the purposes of this contract the close out requirements indicated in Section 01700.2 shall have an agreed value of 5% of the total construction cost. Certification of this value shall be made only when all conditions indicated in Section 01700.2 have been completed.

### **1 FINAL CLEANING**

- 1 Remove surplus products, tools, construction machinery and equipment not required for the performance of the remaining work.
- 2 Remove waste products and debris other than that caused by the Owner, other contractors or their employees, and leave the work clean and suitable for occupancy by owner.
- 3 Remove surplus products, tools, construction machinery and equipment. Remove waste products and debris other than that caused by the owner or other contractors.
- 4 Remove waste material and debris from the site at regularly scheduled times or dispose of as directed by the Architect. Do not burn waste materials on site, unless approved by the Architect.
- 5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- 6 Leave the work broom clean before the inspection process commences.
- 7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, mechanical and electrical fixtures, furniture fittings, walls, and floors.
- 8 Vacuum clean and dust building interiors, behind grilles, louvers and screens.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 9 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- 10 Broom clean and wash exterior walks, steps and surfaces.
- 11 Remove dirt and other disfigurations from exterior surfaces.
- 12 Sweep and wash clean site paved areas.
- 13 Clean equipment and fixtures to a sanitary condition, clean or replace filters of mechanical equipment.

### **2 SYSTEM DEMONSTRATION**

- 1 Prior to final inspection, demonstrate operation of each system to Owner and Architect including his Consultants.
- 2 Instruct personnel in operation, adjustment, and maintenance data as the basis for instruction.

### **3 DOCUMENTS**

- 1 All documentation shall be submitted in the fashion indicated in Section 01300
- 2 Provide warranties and bond fully executed and notarized. Submit documents in the fashion indicated in Section 01300
- 3 Submit a statement from the manufacturer certifying the warranty for equipment put into use during construction. Unless otherwise agreed to by the Owner, this certification and the warranty should indicate the commencement of the warranty period as the date of Substantial Performance.
- 4 At the completion of the project include in the close out documentation a copy of all permits, the log notes of notification, site visits and site reports by governmental authorities.
- 5 Submit Occupancy Permit from governing authority
- 6 Submit required documentation such as statutory declarations, Workers' Compensation Certificate, warranties, certificates of approval or acceptance from regulating bodies.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 7 Review maintenance manual contents (operating, maintenance instructions, record "as built" drawings, spare parts, materials) for completeness. Turn over 2 copies of manuals to Architect as per Submittals Section 01300.
- 8 Collect and assemble the required submissions as per Sections 01010 and 01300 from sub-trades, suppliers, and manufacturers including letters of compliance related to engineered shop drawings.
- 9 Execute transition of Performance and Labour and Materials Payment bond to warranty period requirements.
- 10 Submit all outstanding Contemplated Change Order price requests and values of all outstanding change directives. Review cash and contingency allowances in relation to contract price, change order, hold-back and other contract price adjustments. Architect will issue a final change order reflecting approved adjustments to contract sum not previously made.
- 11 Submit required documentation such as statutory declarations, Workers' Compensation Certificate.

#### **4 INSPECTION/TAKE-OVER PROCEDURES**

- 1 Review commissioning, inspection and testing reports to verify conformance to the intent of the documents and that changes, repairs or replacements have been completed.
- 2 Carefully inspect the work and ensure that previously identified construction deficiencies are complete and/or corrected and the building is clean and condition for occupancy. Notify the Architect in writing of satisfactory completion of the work and request an inspection.
- 3 Coordinate a deficiency review by the Owner, Architect and Consulting Engineer's. Distribute the tabulated list of deficiencies and defects to Subcontractors and suppliers. Before applying for a Certificate of Substantial Performance, correct all deficiencies that in the Architect's opinion does not allow safe occupancy of the building.
- 4 Only when the Architect considers outstanding deficiencies and defects fall within the requirements of the Ontario Construction Act shall the certification of Substantial Performance be given.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **3 TOTAL PERFORMANCE REQUIREMENTS INCLUDED IN THIS SECTION**

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**Before the final payment is made the following conditions must be met**

#### **1 COMPLETION OF THE WORK**

- 1 Co-ordinate owner's moving-in of staff, furnishing, equipment with building accessibility, traffic, cleaning and sub-Subcontractor's cleaning-up and cleaning activities, all to suit Owner's work schedule and not to disrupt owner's productivity.
- 2 Expedite and complete deficiencies and defects identified by the Architect.
- 3 Review condition of equipment (heating system, elevators) which have been used in the course of the work to ensure turning over at completion in "as new condition" with warranties, dated and certified from time of substantial performance of work.
- 4 When the work is totally performed, remove surplus products, tools, construction machinery and equipment. Remove waste products and debris other than that caused by the owner or other contractors.

### **4 REQUIREMENTS DURING WARRANTY PERIOD INCLUDED IN THIS SECTION**

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- 1 Provide on-going review, inspection and attendance to building call-back, maintenance and repair problems during the warranty period.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 06 03

### **1 GENERAL**

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#### **1 RELATED REQUIREMENTS**

#### **2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.
- 2 Complete all removal and demolition work as indicated on the drawings.
- 3 All Asbestos removal shall be completed by qualified persons certified by the Province of Ontario.

#### **3 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified

#### **3 EXAMINATION**

- 1 Visit and examine the site and note all characteristics and features affecting the work of this contract.
- 2 No allowances will be made for any difficulties encountered or any expenses incurred by this trade on account of any conditions of the site, or any item existing therein which is visible or known to exist at the time the tender for this work is submitted.

#### **4 PROTECTION**

- 1 Execute demolition work to protect adjacent structure, property and public against damages which might occur from falling debris or other causes.
- 2 Erect temporary fences, barriers, fire rated dust screens and protection that may be required during demolition and thereafter, by the Owners and/or Municipal authorities.
- 3 In the execution of barricades and fences, demolition, removals and shoring, the Contractor must take all precautions for the protection of life and property as he will be held responsible and liable for all accidents or injury to workmen or other persons as well as property.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 06 03

- 4 Do not obstruct entrances and sidewalks, without permission of the Architect. Do not place or store debris in any of these locations but remove directly from the site.

- 5 **Temporary Structures including shoring, scaffolding, false work, hoarding and bracing: to Ministry of Labour standards and CSA guidelines**

**Shop Drawings: Provide engineered shop drawings in accordance with Section 01300**

### **5 REGULATORY AUTHORITIES**

- 1 **Demolition: to National Building Code of Canada 1995, Part 8 Construction Safety Measures**

## **3 EXECUTION**

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### **1 DEMOLITION**

- 1 Execute demolition in an orderly, careful manner with due consideration for adjacent structures and finishing.
- 2 During demolition operations, keep work wetted down thoroughly, if required, to prevent dust and dirt from rising. Water can be taken from the existing premises for this purpose, using existing exterior hose bibs.
- 3 All building materials resulting from the demolition work will become property of the Contractor and shall be removed from the premises unless otherwise specified herein or shown on the drawings.
- 4 Take all necessary precautions to guard against movement or settlement of remaining structure. Provide all necessary bracing of shoring that is required.

### **2 REMOVALS**

- 1 Remove all obstacles which interfere with the construction of the building and other work of the contract herein included, as shown on drawings as being removed.

### **3 DEBRIS**

- 1 Remove as it accumulates, all debris resulting from demolition operations. Do not store or permit debris to accumulate on site. If contractor fails to remove excess debris promptly, Architect may order same to be removed at Contractor's expense.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 06 03

- 2 The contractor shall be responsible for removing all surplus material from the site and disposing it in accordance with municipal and Ministry of the Environment guidelines.

#### **4 ASBESTOS REMOVAL**

- 1 The contractor shall be responsible for the identification and protection of all asbestos in areas affected by the work of this project.
- 2 All removal or modifications of asbestos material shall be completed by qualified trades. The contractor shall submit the credentials of all asbestos removal subtrades.
- 3 Where areas of asbestos are uncovered that have not been identified for removal, the architect shall be notified and the area sealed and protected until the proper course of action has been identified.
- 4 The contractor shall complete all work outside the normal hours of operation of the building where the building continues to be occupied by the Owner.
- 5 The contractor shall be responsible for all disposal of material and certification that the areas affected are clean and ready for use by the Owner and/or other subtrades in the completion of the project.
- 6 The contractor shall also be responsible for amending the owner's asbestos studies and reports to reflect the changes completed under this contract.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

### **1 GENERAL**

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#### **1 RELATED REQUIREMENTS**

- 1 Section 05500: Miscellaneous Metal Fabrication
- 2 Division 15: Mechanical equipment

#### **2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.

#### **3 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified licensed under the requirements of the governing authority.

#### **4 REFERENCE STANDARDS**

- 1 **Engineered Concrete Formwork : to CSA-A23.1-14; Materials to CSA S269.1-16 Table 1; Wood formwork materials to CAN S69.3-M92 (R2013); Ministry of Labour requirements; Loads and lateral pressures outlined in the ACI publication "Formwork for Concrete SP4"**

**Shop Drawings: Provide engineered shop drawings in accordance with Section 01300**

- 2 Formwork shall be designed for the loads, lateral pressures and wind pressures and allowable stresses as shown in the current Ontario Building Code (Ontario Regulation 413/90) and in accordance with applicable reference standards.

- 3 **Cast In Place Concrete: to CSA-A23.1-14**

**Shop Drawings: Provide engineered shop drawings in accordance with Section 01300**

- 4 **Reinforcing: to CSA-A23.1-14; Lap lengths and bar development lengths to CSA-A23.3-14; Reinforcing Steel Manual of Standard Practice - Metric Supplement 1977 by Reinforcing Steel Institute of Ontario; Welding of reinforcing to CSA-W186-M1990 (R2016)**

**Shop Drawings: Provide engineered shop drawings in accordance with Section 01300**



22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

### **5 Testing: to CSA-A23.2-14**

## **5 SHOP DRAWINGS**

- 1 Submit shop drawings in accordance with Section 01300. All structural drawings must have an Engineer's stamp.
- 2 Clearly indicate bar sizes, spacing, location and quantities of reinforcement, mesh, chairs, spacers and hangers with identifying code marks to permit correct placement without reference to structural drawings.
- 3 Detail placement of reinforcing where special conditions occur.
- 4 Design and detail lap lengths and bar development lengths unless otherwise specified on drawings.

## **6 QUALITY CONTROL**

- 1 Minimum 4 weeks prior to starting concrete work, submit to the Engineer the manufacturers test data and certification by qualified independent inspection and testing laboratory that following materials will meet the specified requirements:

**Cement: to CSA A179-04 (R2014)**

**Blended hydraulic cement.**

**Supplementary cementing materials.**

**Grout.**

**Air Entraining Admixture: to Refer to Cementitious Materials Compendium CSA A3000-13**

**Chemical Admixtures: to Refer to Cementitious Materials Compendium CSA A3000-13**

**Pozzolanic Mineral Admixture: to Refer to Cementitious Materials Compendium CSA A3000-13**

**Water, Fine and Course Aggregates: to CSA-A23.1-14**

**Fine Aggregates: to CSA-A23.1-14, Table 1**

**Waterstops.**

**Waterstop joints.**

**Joint filler.**

- 2 Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with reference standards

**22-05-0014**

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

- 3 Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of indicated reference standards
- 4 In case of doubt as to the quality of the concrete provided by the proposed supplier, the Engineer may, at his option, order the Contractor not to use the concrete on the Work from such proposed supplier and the Contractor shall arrange for another acceptable source of supply.
- 5 Equipment used for mixing or agitating concrete shall be clean and in good mechanical condition. Trucks may be subject to examination and individual approval by the Engineer to check for accumulation of hardened material, blade wear, water gauging, general condition and efficiency, etc.
- 6 The proportions of materials shall be such as to produce a mixture that will work readily into the corners and angles of the forms and around the reinforcement. The mix proportions shall be such that the concrete will not easily segregate or cause excess free water to collect on the surface.
- 7 The slump test shall be used as a guide to workability, and to control the consistency of the concrete, especially from batch to batch. The value of slump for reinforced concrete within vertical formwork such as walls or beams shall be 75mm (3") plus or minus 25mm (1"), and for all other concrete shall be 64mm (2 ½") plus or minus 25mm (1") unless otherwise approved by the Engineer.
- 8 All concrete sampling and testing shall be carried out by an independent inspection and testing company appointed by the Engineer, and paid from the Testing Allowance Section 01020. Send copies of the concrete test reports to the concrete supplier, the Contractor, and the Engineer.
- 9 During the progress of the Work, make concrete compression test specimens from concrete being used in the construction. Store, cure, and test specimens to reference standards
- 10 For each strength test, make three compressive strength test cylinders. Test one cylinder at 7 days; test the remaining two cylinders at 28 days.
- 11 If the 7-day strength of any test specimen falls below 75% of the specified 28-day strength, the Engineer will inform the Contractor and may require that additional curing operations be implemented immediately on those portions of the structure represented by that specimen. The cost of any additional such curing shall be borne entirely by the Contractor.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Nov 14 03 tm

- 12 If, after the above requirements have been carried out, and the Engineer is not satisfied that the concrete in the structure is of the specified quality, he may demand a strengthening or replacement of those portions in which the concrete failed to develop the required strength. The costs of such strengthening or replacement shall be borne entirely by the Contractor.

## 2 PRODUCTS

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### 1 FORMWORK

- 1 **Falsework Materials and Formwork lumber:** All formwork shall be in good condition able to provide a smooth finish free of defects and wood grain appearance. Material shall comply with reference standards. Materials shall bear grade marks, or be accompanied with certificates, test reports or other proof of conformity.
- 2 **Form release agent:** W.R. Meadows Duogard 11 (water-based) or Duogard Eco-Coat (vegetable oil based) form release agent or approved equal.
- 3 **Form ties:** Adjustable snap ties, formed to break 25mm (1") from surface of concrete after form removal, with a minimum working strength of 13kN (3000 spi). Do not use wire ties

### 2 REINFORCING STEEL

- 1 **Reinforcing bars:** billet steel, grade 400, deformed bars to CAN/CSA G30.18-09 (R2014) unless indicated otherwise.
- 2 **Cold-drawn steel wire for concrete reinforcement:** to CSA G30.3-M1983 (R1998)
- 3 **Welded steel wire fabric:** to ASTM A185/A185M-07 or ASTM A497/A497M-07
- 4 **Chairs, bolsters, bar supports, spacers:** adequate for strength and support of reinforcing construction conditions.

### 3 ACCESSORIES

- 1 **Premoulded joint fillers:** W.R. Meadows Eco Joint (100% recycled resin rubber expansion joint filler)
- 2 **Waterstops:** extruded PVC, ribbed type and of sizes as shown with shop welded corner and intersecting pieces.
- 3 **Dovetail Anchor Slots:** minimum 0.6mm galvanized steel with insulation filled slots.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Nov 14 03 tm

### 4 CONCRETE

- 1 **Cement:** to CSA A179-04 (R2014)
- 2 **Water, Fine and Course Aggregates:** to CSA-A23.1-14
- 3 **Fine Aggregates:** to CSA-A23.1-14, Table 1
- 4 **Air Entraining Admixture:** to Refer to Cementitious Materials Compendium CSA A3000-13
- 5 **Chemical Admixtures:** to Refer to Cementitious Materials Compendium CSA A3000-13
- 6 **Pozzolan Mineral Admixture:** to Refer to Cementitious Materials Compendium CSA A3000-13
- 7 **Non-shrink grout:** M.R. Meadows CG-86 premixed compound consisting of metallic aggregate, cement, water reducing and plasticizing agents, of pouring consistency, capable of developing compressive strength of 66.2 MPa at 28 days.
- 8 **Dry pack:** premixed or non-premixed composition of non-metallic aggregate, cement and sufficient water for the mixture to retain its shape when made into a ball by hand and capable of developing compression strength of 50 MPa at 28 days.

### 5 CONCRETE MIXES

- 1 **Normal Density Concrete:** to CSA-A23.1-14  
**Unless otherwise specified in Structural Drawings provide; Type 10 cement to give minimum compressive cylinder strength of 25 MPa in 28 days for Class F-2 (footings and foundation walls) N (concrete slab on grade, no air content) exposure with 19 mm coarse aggregate, slump at point and time of discharge max. 80mm,  $\pm$  20 mm, air content 5 to 8%. Chemical Admixtures: Type WN.**
- 2 At the Engineer's request provide certification that plant, equipment and all materials to be used in concrete work comply with the requirements of CSA-A23.1-14
- 3 Obtain Engineer's approval before using chemical admixtures other than those specified.
- 4 Use of calcium chloride not permitted.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

### **3 EXECUTION**

#### **1 FORMWORK DESIGN AND ERECTION**

- 1 The design and engineering of the formwork, as well as its' construction, shall be the responsibility of the Contractor. Forms shall be of sufficient strength and rigidity to support all concrete and construction loads and wind, taking into account proposed rate and method of pouring concrete to the shapes, lines and dimensions of the members shown on the drawings.
- 2 Verify lines, levels, and column centres before proceeding with formwork and ensure dimensions agree with drawings.
- 3 Construct forms to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerance required by reference standards
- 4 Construct falsework to applicable reference standards
- 5 All footings must be formed. Earth will not be considered acceptable to form the sides of footings.
- 6 Align form joints and make watertight. Keep form joints to minimum.
- 7 Use 25 mm (1") chamfer strips on external corners of beams, joints and columns.
- 8 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- 9 Leave formwork in place for following minimum periods of time after placing concrete:
  - Three (3) days for walls and sides of beams.
  - Three (3) days for columns.
  - Twenty-eight (28) days when replaced immediately with adequate shoring to standard specified for falsework.
- 10 Handle and store forming materials on the job site in such a manner that no damage will be caused the material, to existing structures on the site, and to the work of other trades in progress.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

- 11 Forms shall conform to the shape, line and dimensions of the members called for on the plans. They shall be substantial and sufficiently tight to prevent the leakage of mortar, and shall be properly supported, braced and tied , so as to maintain position and shape to a tolerance or plus or minus 3mm (1/8") for columns and beams and a non-accumulative tolerance of 3mm (1/8") in 3m (10'-0") for walls and floor slabs.
- 12 All forms shall be constructed with a stiff framing member in two directions. Horizontal walers shall be at least double 38x89 (2 x 4) at the top of forms and in all tie positions.
- 13 Supports for forms shall be constructed so that they will not deflect under the weight of the wet concrete or other loads incidental to construction. Shores supporting forms for slabs, beams, girders or arches shall be set on wedges of other approved supports in order that they may be removed without producing undue strains or shock in the superstructure.
- 14 Surfaces of formwork, which will be in contact with concrete, shall be coated with parting agent before reinforcing steel is placed. Take care to ensure that no parting agent comes in contact with reinforcing steel or embedded inserts.
- 15 Immediately prior to pouring, all forms shall be inspected by the Engineer to ensure that they are properly placed, sufficiently rigid and tight, thoroughly clean, properly treated and free from snow, ice or other foreign material.

## **2 REINFORCING STEEL FABRICATION**

- 1 Fabricate reinforcing to applicable reference standards
- 2 Fabrication tolerances for reinforcing steel to "Reinforcing Steel Manual of Standard Practice" metric supplement 2004 by Reinforcing Steel Institute of Ontario.
- 3 Obtain Engineer's approval for locations of reinforcement splices other than shown on steel placing drawings.
- 4 Ship bundles of bar reinforcement, clearly identified in accordance with bar list.

## **2 PLACING REINFORCEMENT**

- 1 Obtain Engineer's approval of reinforcing steel and position before placing concrete.
- 2 Clean reinforcing before placing concrete.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

- 3 Handle and store reinforcing steel on the job site so that no damage will be caused to the material, to the existing structures on the site, and to the work of other trades in progress. Store reinforcing steel on wood blocking above ground and keep free of mud, oil and other foreign matter.
- 4 Clean reinforcing steel of dirt, scale or other coatings that will destroy or reduce the bond at the time of concrete placement. Where there is a delay in placing of concrete and reinforcing steel shall be re-inspected by the Engineer and cleaned when necessary.
- 5 Place reinforcing steel to reference standards unless otherwise indicated on reviewed shop drawings. Place reinforcing steel accurately and secure in position adequately using concrete or steel chairs or spacers and annealed iron tie wires.
- 6 Splices shall meet all reference standard requirements and provide sufficient lap to transfer the stress between bars bond and shear. The clear distance between bars shall also apply to the clear distance between a contact splice and adjacent contact splices or bars. In slabs, beams and girders avoid splices of reinforcing at points of maximum stress.
- 7 The minimum clear distance between parallel bars, except in columns, shall equal the nominal diameter of the bars. In no case shall the clear distance between be less than 25mm (1") nor less than one and one third times the maximum size of the course aggregate.
- 8 Concrete cover for reinforcing steel shall in all cases be at least equal to the diameter of the round bars.

### **3 INSERTS**

- 1 Set sleeves, ties, anchor bolts, and other inserts, openings and sleeves, in concrete floors and walls, as required by other trades. Sleeves, openings, etc., greater than 100 x 100 mm (4" x 4") not indicated on structural drawings must be approved by the Engineer.
- 2 No sleeves, ducts, pipes or other openings shall pass through joists, beams or columns, except where expressly detailed on structural drawings or approved by Engineer. Obtain Engineer's permission before framing openings in concrete joists, beams or columns not indicated.
- 3 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of all modifications from Engineer before placing of concrete.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

- 4 Check locations and sizes of sleeves, openings, etc., shown on structural drawings with architectural, mechanical and electrical drawings.
- 5 Set inserts according to design drawing as required by Non-Destructive Method for Testing Concrete.
- 6 Bend reinforcing steel accurately to suit the concrete dimensions indicated on the drawings and the protective cover requirements of this specification. Make all bends cold.
- 7 Minimum inside radius of bends for stirrups, and beam and column ties shall equal one bar diameter.

### **4 JOINT FILLERS**

- 1 Locate and form isolators as indicated. Install joint filler.
- 2 Use 12 mm thick joint filler to separate slab-on-grade from vertical surface and extend joint filler from bottom of slab to within 12 mm of finished slab surface unless indicated otherwise.

### **5 ANCHOR SLOTS**

- 1 Install continuous vertical anchor slot to form where masonry intersects concrete wall, columns or piers.
- 2 Install continuous anchor slots at 800 mm (31.5") o.c. where concrete walls are masonry faced.

### **6 WATERSTOPS**

- 1 Install waterstops to provide continuous water seal. Do not distort or pierce waterstop to hamper performance. Do not displace reinforcement when installing waterstop. Use equipment manufacturer's requirements to field splice waterstop. Tie waterstops rigidly in place.
- 2 Only straight heat sealed butt joints permitted in field. Use factory welded corners and intersections.

### **7 INSTALLATION OF VAPOUR RETARDING BARRIER**

- 1 Where neither waterproofing or damproofing is specified, install vapour retarder on compacted fill under slab on grade.



**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

- 2 Surface Preparation: Level, tamp or roll earth or granular material beneath the slab base as specified by supplied architectural drawings. Follow ASTM E-1643-18a (Standard practice and procedure for installation of vapor retarder used in contact with earth or fill under concrete slabs).
- 3 Horizontal Application: Unroll vapour retarder over the area where the slab is to be poured. Cut to size, if necessary. vapour retarder should completely cover the pour area. All joints/seams, both lateral and butt, should be overlapped 152mm (6") and taped using 100mm (4") wide vapour retarder tape. The vapour retarder tape area of adhesion should be free from dust, dirt and moisture to allow maximum adhesion of the pressure sensitive tape.
- 4 Place vapour retarder on top of the footing and against the vertical wall to sandwich vapour retarder between the footing, vertical wall and poured concrete floor.
- 5 Before placing concrete slab, make sure all penetrations, blockouts and damaged areas are repaired/addressed.
- 6 Seal all protrusions. Cut a slit around pipes, ductwork, rebar, and wire penetrations to place the initial layer of vapour retarder. To further protect the concrete slab from external moisture sources, use a piece of vapour retarder and place a collar around these as well.
- 7 Cut a piece of vapour retarder a minimum of 300mm (12"). The length should be 1-1/2 times the pipe circumference. With a roofer's knife or scissors, cut "fingers" half the width of the film.
- 8 Wrap around and tape the collar onto the pipe and completely tape fingers to the bottom layer of vapour retarder.
- 9 In the event that vapour retarder is damaged during or after installation, repairs must be made. Cut a piece of vapour retarder large enough to cover any damage by a minimum overlap of 152mm (6") in all directions. Clean all adhesion areas of dust, dirt and moisture. Tape down all edges using vapour retarder tape.
- 10 Provide vapour retarder tape as supplied by membrane manufacturer to seal vapor retarder seams and attachment to footings, protrusions, etc.
- 11 Provide termination bars as supplied by membrane manufacture in 3m (10'-0") lengths to attach vapour retarder to vertical walls as a protection course for vertical wall waterproofing applications.

**22-05-0014**

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

**8 CONCRETE**

- 1 Obtain Engineer's approval before placing concrete. Provide 24 hours notice prior to placing of concrete.
- 2 Deliver the concrete to the site of the work and complete the discharge in accordance with CSA specified herein. In hot weather, or under conditions contributing to quick stiffening of the concrete, or where high early cement is used, or where the temperatures of the concrete is 27 degrees C or above, this time shall not exceed 45 minutes.
- 3 Install sluices to limit height of free fall of concrete to 1220mm (4'-0") maximum. Pace concrete to prevent layering and segregation and vibrate sufficiently to ensure thorough compaction, maximum density and according to the CSA/CAN regulation specified herein. Hand spade concrete adjacent to forms and metal spatulas.
- 4 When the concrete is mixed in a truck mixer, the mixing operation shall begin within 30 minutes after the cement has been intermingled with aggregates.
- 5 When concrete pumps are used to place concrete, the required slumps as specified in this section may be increased 25mm (1") for each 30m (100'-0") of piping through which the concrete is pumped, but the maximum slump measured at the pump shall not exceed 150mm (6"). The Contractor shall arrange with the ready mix supplier, and pay any additional costs required, for mix designs that will maintain the required strength of concrete pumped at high slump.
- 6 Wet down all forms thoroughly before depositing concrete, except in freezing weather. Do not use chemicals to free ice from the hardened concrete in the forms.
- 7 Deposit concrete in the forms as nearly as practicable in its final position to avoid rehandling, and in approximately horizontal layers. The vertical height of free fall shall not exceed 1500mm (5'-0").
- 8 Carry on the concreting as such a rate that the concrete is at all times plastic and flows readily into the spaces between reinforcing steel. No concrete that is partially hardened or has been contaminated by foreign material shall be deposited in the work, nor shall retempered concrete be used. Do not deposit concrete during rain unless adequately protected, and in any case the concrete shall be protected from rain until it has cured sufficiently so that it will not be damaged.

**22-05-0014**

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

- 9 Carry on the concreting as a continuous operation until the placing of the panel or sections is completed in such a manner that fresh concrete will not be deposited on concrete which has hardened sufficiently to cause formation of seams and planes or weakness within the section. Maintain the top surface generally level. Make construction joints as required, in accordance to this section.
- 10 Compact all concrete thoroughly by suitable means during placing, and compact around the reinforcing steel and embedded fixtures and into the corners of the forms.
- 11 Compact all concrete (unless otherwise permitted by the Engineer) by mechanical vibrators for internal use in the forms. Where walls are thin, or heavy reinforcement obstructs the use of an internal vibrator, or for surfaces relatively inaccessible from within, use external vibrators. Maintain at least one extra vibrator on the site as a standby unit. If vibrators are electrically powered, a standby generator will be required.
- 12 Operate internal vibrators at a speed of not less than 3600 impulses per minute. Apply vibrators at the points of deposit and in the area of the freshly placed concrete. Allow vibrator to sink of its own weight in the concrete until it penetrates to the previous layer of concrete; withdraw immediately at the same speed at which it sank, and then move about 300mm (12") to a new location, and repeat the process. Take care that the reinforcing steel and attached fittings are not disturbed.
- 13 External vibrators may be chipping hammers applied to the walls of the forms, and moved progressively as the forms are filled with concrete. Fit the chipping hammers with a 50mm x 50mm (2" x 2") steel plate to bear against the forms.
- 14 Take care that vibration of concrete is not continued after capillary continuity has been achieved as indicated by the glistening of a film of water at the top surface of the concrete.
- 15 Do not use the vibrators to move the fresh concrete within the forms.
- 16 Ensure reinforcement and inserts are not disturbed during concrete placement.
- 17 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

- 18 Saw cut floor maximum 3600 (12'-0") on centre each way within 12 hours of initial concrete pour.
- 19 Wet cure concrete floor continuously for at least 17 days to prevent curling and shrinkage. Place water over entire slab and cover with plastic.

### **9 CONSTRUCTION JOINTS**

- 1 Locate joints not indicated on the drawings so as to least impair the strength and appearance of the structure. The location of construction joints subject to the approval of the Engineer.
- 2 Where a joint is to be made, the surface of hardened concrete shall be roughened and thoroughly cleaned of foreign matter and laitance, and shall be thoroughly wetted with water but not saturated, and the forms retightened against the face of the hardened concrete before depositing additional concrete. An excess of mortar on hardened surfaces shall be secure by first placing a 50mm (2") layer of cement-sand mortar. Into this mortar layer, the regular mix concrete shall be deposited immediately. The cement-sand mortar shall be of the same proportions as the regular concrete mix, except that the coarse aggregate is omitted.
- 3 Construction joints in walls shall be vertical and located so as to least impair the strength of the structure. Bulkheads forming construction joints shall be tight and truly vertical. Vertical construction joints in walls shall be made at control joints, if control joints are indicated on the drawings.

### **10 FINISHING UNFORMED SURFACES**

- 1 Tops or other exposed unformed surfaces of concrete placed in all types of structures shall conform accurately to the grades and elevations shown on the drawings.
- 2 Finish all unformed surfaces by screeding followed by floating.
- 3 Floor Finish of slab exposed in the finished work: Screed, float and trowel interior concrete slabs to smooth, level and dense surfaces free from trowel marks, ridges and depressions. Maximum variation of concrete slab shall not exceed 6mm in 3M (0.25" in 10'-0") non accumulative from datum line. Upon completion of work, survey floor with respect to the conformance to the specified tolerance.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

- 4 At the Contractor's expense, rectify areas that do not meet the required surface accuracy as follows: grind down any areas higher than 3mm (1/8") above the correct surface. Correct any areas lower than 3mm (1/8") below the correct surface by grinding down the adjacent high areas. All grinding shall be carried out by an approved machine of a type and capacity suitable for the total area of grinding involved until the surface meets the specified requirements.
- 5 Screeding shall consist of moving a straight edge or template with a sawing motion along wood or metal strips established as guides. This shall be done immediately after consolidation of the concrete to give the surface its approximate shape and elevation.
- 6 After screeding, bring the surface to the specified uniformity and accuracy with a wood float held in a floating position and worked in a circular or sawing motion slowly from one side of the surface to the other and back again.

### **11 REMOVAL OF FORMWORK**

- 1 Forms and shoring shall not be removed until the concrete has gained the strength to carry its own weight together with any superimposed load that may come upon it.
- 2 Vertical forming such as wall, column, and beam and girder side forming shall be left in place for at least 48 hours (with the exception of slip forms).

### **12 FINISHING**

- 1 Finish concrete to reference standards
- 2 Rub exposed sharp edges of concrete with carborundum to produce 3 mm (1/8") radius edges unless otherwise detailed.

### **13 DEFECTIVE CONCRETE**

- 1 Remove defective concrete, blemishes and embedded debris and repair as directed by the Engineer.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2015 05 25

### 1 GENERAL

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#### 1 RELATED WORK SPECIFIED ELSEWHERE

- 1 Section 09330: Tile Work
- 2 Section 09660: Resilient Tile Flooring
- 3 Section 09680: Carpeting

#### 2 GENERAL REQUIREMENTS

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.
- 2 **Use of this product is not a substitute or approved equal for replacement of defective or unacceptable concrete work**
- 3 Before using, user shall determine the suitability of the product for its intended use the installer alone assumes all risks and liability whatsoever in connection therewith.
- 4 Refer to the MSDS for specific data related to VOCs, health and safety, and handling of product.
- 5 **Product Performance Properties**
  - Pot life 20 minutes
  - Open time 5 to 20 minutes after applying. Open times vary based on temperature, humidity, substrate, application techniques and jobsite conditions.
  - Application temperature range 41°F to 95°F (5°C to 35°C)
  - Initial set 35 to 40 minutes
  - Final set 50 minutes
  - Drying time 16 hours (curing time)
  - Compressive strength (ASTM C109)
    - 4 hours > 1,650 psi (11,4 MPa)
    - 24 hours > 2,700 psi (18,6 MPa)
    - 7 days > 3,700 psi (25,5 MPa)
    - 28 days > 4,000 psi (27,6 MPa)
  - Flexural strength (ASTM C348-02)
    - 28 days > 1,200 psi (8,28 MPa)
  - Color Natural gray

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2015 05 25

Protect containers from freezing in transit and storage. Provide for heated storage on site and deliver all materials at least 24 hours before work begins.

### 6 Shelf Life and Application Properties

1 year when stored in original, unopened container at 73°F (23°C) in a dry, heated area

6 months when stored in original, unopened container at 73°F (23°C) in a dry, heated area. The product should be stored wrapped at all times.

## 2 MATERIALS

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### 1 PRODUCT

- 1 Mapecem Quickpatch by Mapei for the patching of interior/exterior concrete surfaces

#### WHERE TO USE

Patching concrete floors

Patching exterior concrete, sidewalks and driveways

Smoothing and ramping elevation changes

Patching finished concrete surfaces where concrete's natural gray color is desired

- 2 **Primer for nonporous substrates (ceramic, quarry tile, terrazzo, or when used as a final finished surface:** Mapei Primer L™ for porous substrates, and or Mapei Primer T™

- 3 **Primer for porous substrates:** Mapei Primer T™

- 4 for nonporous substrates (see primer's Technical Data Sheets for instructions).

- 5 **Leveler:** MAPEI Ultra SkimCoat™

## 3 EXECUTION

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### 1 LIMITATIONS

- 1 Do not install over substrates containing asbestos.
- 2 Can be installed from featheredge to 3" (7.50 cm) neat in confined areas.
- 3 Apply from 41°F to 95°F (5°C to 35°C). Allow for extra cure time when temperatures are below 65°F (18°C). Follow ACI guidelines when installing above 85°F (29°C).
- 4 **SUITABLE SUBSTRATES:** Sound, stable, clean, horizontal interior and exterior concrete surfaces, properly prepared terrazzo, ceramic, stone and quarry tile. Consult manufacturer's installation recommendations regarding substrates and conditions not listed.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2015 05 25

### **2 SURFACE PREPARATION**

- 1 All substrates must be structurally sound, stable and clean.
- 2 Thoroughly clean the surface of any substance that could interfere with the bond or the installation material including dirt, paint, tar, asphalt, wax, oil, grease, latex compounds, sealers, curing compounds, form release agents, laitance, loose toppings, foreign substances and adhesive residues.
- 3 Concrete substrate and ambient temperatures must be specified temperature range before application. Temperatures must be maintained within this range for at least 4 hours after the installation. Protect from rain and fluid for 24 hours after application, and from freezing 24 hours after application.
- 4 Mechanically remove weak concrete surface down to solid concrete, meeting at least 175 psi (1,21 MPa) tensile bond strengths.
- 5 If using for a final finished surface, repair all cracks in the substrate using conventional repair techniques before applying product. Use appropriate manufacturer's product for crack repair (see Technical Data Sheet for instructions).
- 6 For best results, some porous or very dry substrates should be SSD (saturate surface-dry) with water. Do not apply on a wet surface.

### **3 MIXING**

- 1 Into a clean mixing container, pour the required amount of cool, clean potable water. Depending on application and desired consistency, mix with 0,77 to 0,95 L of water per 4.54-kg. Place water in mixing pail and mix product while slowly adding powder. The mixing ratio must remain consistent. Do not overwater material. Mix with medium-speed drill (at 550 to 800 rpm), with a box or other appropriate paddle for at least 2 to 3 minutes, ensuring lump-free consistency.
- 2 Use Mapei Planicrete® UA to increase performance and durability (refer to TDS for Planicrete UA). Do not add cements.
- 3 Do not mix more material than can be applied in 15 to 20 minutes. Do not re-temper or add more mix water. Choose all appropriate safety equipment before use. Refer to MSDS for more information.

### **4 PRODUCT APPLICATION**

- 1 Read all installation instructions thoroughly before installation.



**22-05-0014**

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2015 05 25

- 2 Before application, test all surface treatments on a small sample area to ensure the desired results.
- 3 Do not apply over wet surfaces.
- 4 Do not apply when rain is expected before sealing the surface or until the product is well-cured.
- 5 Primer is not required over clean, dry, well-prepared concrete substrates.
- 6 Provide primer for nonporous substrates like ceramic, quarry tile, terrazzo, or when used as a final finished surface and porous substrates (see primer's Technical Data Sheets for instructions).
- 7 Immediately after mixing, pour onto the surface and work it in to obtain an excellent mechanical bond. Allow the product to set before finishing.
- 8 When using as a final wear surface, apply an appropriate finish (such as a broom finish) shortly after the material has been placed.
- 9 Material can be covered with leveler, tile-setting materials and other adhesives in as soon as 45 to 60 minutes (depending on temperature) after application.
- 10 Wood floors and adhesives sensitive to moisture can be installed after 16 hours. Always use standard ACI and ICRI guidelines for best results.
- 11 Mixing Ratio; 4.54 kg with 0.77 to 0.95 L. of water

**5 EXPANSION AND CONTROL JOINTS**

- 1 Honor all expansion and control joints. Cut joints as soon when cured hard enough to walk on without damaging the surface.
- 2 Do not bridge any moving expansion joint.
- 3 For repairs subject to high loads or heavy traffic, follow ACI and ICRI guidelines.

**6 CURING**

- 1 Allow self-curing as per manufactures directions, do not use a dampcuring method.

**22-05-0014**

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2015 05 25

- 2 Where intended as an exposed wear surface seal with Mapefinish Wet Look 3 hours after material dries (when temperatures are above 70°F [21°C]). If a solvent-based sealer is used, allow the application to dry for 7 days before application of the sealer.
- 3 Avoid walking on the installed surface for at 45 to 60 minutes after installation, depending on temperature and humidity conditions.

**7 CLEANUP**

- 1 Wash hands and tools with water promptly before material hardens. Cured material must be mechanically removed.

**8 PROTECTION**

- 1 Protect from traffic, dirt and dust and moisture until cured.
- 2 Do not expose installation to rolling or dynamic loads for at least 24 hours after installation.  
Note: Cooler conditions require longer curing times before exposing to significant traffic.
- 3 Test all surface treatments on a small sample area, before application, to ensure the desired results.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

**1 GENERAL****1 RELATED REQUIREMENTS**

- 1 Section 05100: Structural Steel
- 2 Section 05500: Miscellaneous Metal Fabrication

**2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.
- 2 The contractor and subcontractors are responsible for providing the materials, equipment and procedures as specified within these documents, including the specification, drawings or addenda. It is the responsibility of this contract to provide all materials available on the date the contract was signed. Products no longer available or discontinued before the contract date will be subject to revision by a Change Order. Products discontinued or no longer available subsequent to the contract date shall be substituted with the Consultant's approval by the Contractor for products of similar or superior quality at no additional cost.
- 3 Items covered by this section include but are not limited to load bearing and non load bearing concrete block masonry walls including the supply and erection of concrete block masonry units, mortar materials, grout fill for hollow units and lintel blocks, reinforcing materials, and masonry anchors.
- 4 Build in all items supplied by others which are required to be built into masonry as the Work progresses, including but not limited to door frames, anchors, bolts, sleeves, electrical outlet boxes, inserts, loose lintels, shelf angles, loose door jambs and guards, panels and any other items required to be built into masonry work.
- 5 Upon request, make available to the Architect, laboratory test reports certifying compliance of masonry units and mortar ingredients with specification requirements.

**3 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified as approved by the manufacturer.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

**4 REFERENCE STANDARD**

- 1 At the Architects request submit laboratory test reports certifying compliance of masonry units and mortar ingredients with specification requirements.
- 2 Do masonry work to CSA3-S304-04 and CSA-A371-04 (R2014).
- 3 For clay units, in addition to requirements set out in reference CSA and ASTM standards, include data indicating initial rate of absorption for units proposed for use.
- 4 Do masonry mortar and grout work to CSA A179M-04 except where specified otherwise.

**5 SAMPLES AND MOCKUPS**

- 1 Submit samples in accordance with Section 01300.

**6 PRODUCT DELIVERY, STORAGE AND HANDLING**

- 1 Ensure that materials are delivered to job site in dry condition.
- 2 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

**7 COLD WEATHER REQUIREMENTS**

- 1 When air temperature is below 5°C take following precautions in preparing and using mortar: Heat sand slowly and evenly but do not scorch. Do not use scorched sand, having a reddish cast, in mortar. Heat water to 70°C. After combining heated ingredients maintain temperature of mortar between 5°C and 50°C until used. Protect mortar from rain and snow.
- 2 When air temperature is below -4°C protect and heat masonry to maintain air temperature above 0°C on both sides of walls during operations and for period of 48 hours after.
- 3 When air temperature is above -4°C, erect windbreaks to prevent differential freezing of walls.
- 4 Maintain dry beds for masonry and use dry masonry units only. Do not wet masonry units in winter.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

**8 HOT WEATHER REQUIREMENTS**

- 1 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.

**9 PROTECTION**

- 1 Until completed and protected by flashing or other permanent construction, keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain.
- 2 Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.
- 3 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.

**10 CO-ORDINATION**

- 1 This sub-trade shall co-ordinate with precast concrete units sub-trade.

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**2 PRODUCTS****1 MORTAR**

Supplement CSA A179-04 (R2014) as follows:

- 1 **Coloured mortar:** use colouring admixture not exceeding 10% of cement content by mass, or integrally coloured masonry cement to produce coloured mortar to match approved sample. Use coloured mortar all exposed unpainted masonry.
- 2 **Additive to improve resistance to dirt and water:** 'Addiment Mortar Tite' as distributed by Form and Build or approved equal.
- 3 When 6 mm thick joints are specified, use aggregate passing No. 16 sieve.
- 4 Use same brands of materials and source of aggregate for entire project to ensure uniformity of coloration and other mix characteristics.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Nov 14 03 1m

**2 MORTAR TYPES**

- 1 **Mortar for exterior loadbearing and all interior masonry above grade: to CSA A179-04 (R2014)**

Type 'S' based on proportional specifications

Colour: as selected by Architect from Northern Pigments full range (different colours for each masonry colour)

Finish: Exposed joints are concave unless otherwise indicated

- 2 **Grouted reinforced masonry:** 15 MPa

- 3 **Grout:** to CSA A179M-04 Table 3

**3 ACCESSORIES**

- 1 **Control joint filler:** made of high synthetic rubber compound with durometer hardness to ASTM D-2000 2A-A805 and size to suit masonry wythes and thickness.
- 2 **Nailing inserts:** 0.6 mm thick purpose-made galvanized steel inserts for setting in mortar joints.

**4 REINFORCING AND TIES**

- 1 **Horizontal Reinforcing:** Duro-wall truss type, 3.65mm (9 gauge) corrosion resistant deformed rod.
- 2 Composite wall ties: Fero Block Shear connectors to accommodate block and insulation size. Constructed of 16 gauge hot dipped galvanized complete with V Tie and insulation support. Other manufacturers of similar structural systems will be considered by the Architect. Two inch thicker concrete block backup and non-structural ties of corrosion resistant 4.76 mm (3.16).

**5 CONCRETE BLOCK**

- 1 **Concrete Block:** to CSA A165.1M, Type H/15/B/M autoclaved to CSA A165.4-M85 Richvale York Block Inc. - Standard block or an equivalent product approved equal by the Architect.

Thickness / Size: Metric modular in thicknesses as indicated

Finish: Smooth Faced

Mockups / Samples: 920mm x 1220mm (3'-0" x 4'-0")

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

- 2 **Units:** shall be autoclave. Approved manufacturers are as follows:  
Richvale York Block Inc.  
Boehmers  
Concrete blocks manufactured by Shouldice are approved equal.

**3 EXECUTION**

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**1 GENERAL**

- 1 Build masonry plumb, level and true to line with vertical joints in proper alignment.
- 2 Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.
- 3 Maintain cavity free of mortar.
- 4 All walls of separations as required by the building code or indicated in these documents shall be fully extended to the structural deck above with all openings fire stopped. Review location of structural elements that might conflict with these separations. Notify Consultants of conflicts before commencing working.

**2 TOLERANCE**

- 1 Walls to receive thinset ceramic tile: plumb within 1:600.
- 2 Deviation in joint thickness: +3mm (1/8").
- 3 Elements are to be constructed to ensure a maximum width of caulked joint: 6.25mm (0.25") for work related to Sections 06200 and 08110. Unless other wise indicated 20mm (0.75")

**3 EXPOSED MASONRY**

- 1 Remove chipped, cracked and otherwise damaged units in exposed masonry and replace with undamaged units.

**4 JOINTING**

- 1 Where concave joints are specified, allow joints to set just enough to remove excess mortar, then tool with round jointer to provide smooth, compressed, uniform concave joints.
- 2 Where raked joints are specified, allow joints to set just enough to remove excess mortar, then rake joints uniformly to 6mm (1/4") depth and compress with square tool to provide smooth, compressed, raked joints of uniform depth.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

- 3 Where joints are concealed in walls and where walls are to receive plaster, tile, insulation or other applied material except paint or similar thin finish coating, strike flush.

**5 JOINING OF WORK**

- 1 Where necessary to temporarily stop horizontal runs of masonry, and in building corners, step-back masonry diagonally to lowest course previously laid. Do not "tooth" new masonry. Fill in adjacent courses before heights of stepped masonry reach 1220 mm (4'-0").

**6 CUTTING**

- 1 Cut out neatly for electrical switches, outlet boxes, and other recessed or built-in objects.
- 2 Make cuts straight, clean and free from uneven edges. Use masonry saw where necessary.

**7 BUILDING-IN**

- 1 Build in items provided by other Sections, including steel doorframes, anchor bolts, sleeves, inserts, loose lintels, steel beams, access panels and other such items. Build in items to present a neat rigid, true and plumb installation. Leave wall openings required for ducts, grilles, pipes, and other items.
- 2 Fill voids between masonry and metal frames with masonry mortar.
- 3 Set wall plates on masonry in nonshrink grout in accordance with manufacturer's instructions.
- 4 Prevent displacement of built-in items during construction. Check for plumb, alignment, and correctness of position as work progresses.
- 5 Brace door jambs to maintain plumb. Fill spaces between jambs and masonry with mortar.

**8 SUPPORT OF LOADS**

- 1 Except where drawing requirements are more stringent, comply with CSA-S304-04
- 2 Where masonry walls support beams, joists, lintels, the top 2 courses of block under bearing shall be solid, or the cells shall be filled solid with 30 MPa concrete, unless noted otherwise on structural drawings.



22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

- 3 Install building paper below voids to be filled with concrete; keep paper 25 mm back from faces of units.

**9 PROVISIONS FOR MOVEMENT**

- 1 Leave 3 mm (1/8") space below shelf angles.
- 2 Leave 12mm (1/2") space and do not use wedges between tops of non-load bearing walls and partitions and structural elements.

**10 LOOSE STEEL LINTELS**

- 1 Install loose steel lintels. Centre over opening width.

**11 CONTROL JOINTS**

- 1 Provide continuous vertical control joints in exterior masonry walls at maximum of 12.2m (40'-0") or as shown.

**12 MORTAR: MEASUREMENT AND MIXING**

- 1 Supplement clause 5 of CSA A179M-1994 as follows: Mix grout to semi-fluid consistency. Incorporate colour into mixes in accordance with manufacturer's instructions. Use clean mixer for coloured mortar. Prehydrate pointing mortar by mixing ingredients dry, then mix again adding just enough water to produce damp unworkable mix that will retain its form when pressed into ball. Allow to stand for not less than one hour nor more than 2 hours then remix with sufficient water to produce mortar of proper consistency for pointing.

**13 NAILING INSERTS**

- 1 Install nailing inserts in mortar joints at 400 mm (16") o.c. each way, for attachment of wall strapping where required.

**14 AIR BARRIER**

- 1 Install Air Barrier to specifications indicated in related section to all areas of masonry backup and all other wall surfaces to receive brick veneer.

**15 HORIZONTAL MASONRY REINFORCING**

- 1 Provide masonry reinforcing in every second block course of all block walls. Provide prefabricated reinforcing corners in every second block course at intersecting block walls.
- 2 Reinforce over all openings and in the first two courses under beam bearings and extending 900mm (3 feet) on each side of bearings unless otherwise noted on the structural drawings.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

**16 BONDING AND TYING IN COMPOSITE WALLS**

- 1 For walls of two wythes, install ties at 800mm (32") O.C. horizontally and 400mm (16") O.C. vertically. Provide vertical spacing:
  - a) First row of connectors at 200 mm from top and bottom of wall.
  - b) Second row of connectors at 400 mm from first row of connectors top and bottom.
  - c) Balance of connectors at 600 mm centres.
- 2 Fasten ties to studs/masonry and embed in mortar joint to within at least 1½" (40mm) of the outer face of the masonry.

**17 BONDING AND TYING IN STUD WALLS**

- 1 Install ties at 800 mm (32") o.c. horizontally and 400 mm (16") o.c. vertically. Masonry veneer ties to backup shall be installed at 600 mm (24") vertical intervals and 400 mm (16") horizontal intervals.
- 2 Fasten ties to studs/masonry and embed in mortar joint to within at least 40mm (1½") of the outer face of the masonry.

**18 LAYING OF CONCRETE MASONRY UNITS**

- 1 Bond: running stretcher.
- 2 Coursing height: 200mm (8") for one block and one joint.
- 3 Jointing: concave unless otherwise indicated.
- 4 Provide special shapes and sizes as required such as halves, jambs, lintels, solids, semi-solids, corners, bullnose units, etc.
- 5 All masonry units are to be laid in full beds of mortar. Completely fill vertical joints between flanges of adjacent block. Space between face brick and insulation must be free of mortar in cavity walls.
- 6 Lay blocks with shells and webs aligning over each other. Horizontal and vertical masonry joints shall be uniform in thickness with vertical joints of alternate courses aligning.
- 7 Lay work to minimize cutting.
- 8 Use power-driven abrasive cutting disc or diamond cutting wheel for flush-mounted electrical outlets, grilles, pipes, conduit, etc., leaving 3mm (1/8") maximum clearance.

**22-05-0014****Market Building Interior Renovations****City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 14 03 tm

- 9 No chases shall be formed in any bearing wall that is less than 300mm (12") thick or shall be more than 1/3 the thickness of any wall greater than 300mm (12"). In no case shall any two chases be closer than 21.3m (7 feet). No horizontal chases shall be allowed.
- 10 All walls shall be carried up in a uniform manner, no portion being raised more than 300mm (1 foot) above another at one time.

**19 CLEANING**

- 1 Allow mortar dropping on unglazed concrete masonry to partially dry then remove by means of trowel, followed by rubbing lightly with small piece of block and finally by brushing.

**20 TESTING**

- 1 Inspection and testing of masonry and masonry units, if requested by the Architect, will be carried out by testing laboratory designated by the Architect.
- 2 The costs of testing will be paid from the cash allowances.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 28 03 tm

### **1 GENERAL**

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#### **1 RELATED REQUIREMENTS**

- 1 Section 03300: Cast in Place Concrete
- 2 Section 03300: Cast in Place Concrete
- 3 Section 04200: Masonry
- 4 Section 05500: Miscellaneous Metal Fabrication
- 5 Section 09900: Painting

#### **2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.
- 2 Structural steel items provided under this section include but are not limited to: anchor bolts and other anchorage devices for steel structural members, bearing plates, base plates, columns, beams, lintels, bracing and all other steel framing items and their attachments shown on the drawings.
- 3 Supply all structural steel items required to be built-in with the work of other trades as the work of other trades progresses, and provide all necessary instructions for setting these items.

#### **3 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified licensed under the requirements of the governing authority.

#### **3 REFERENCE STANDARDS**

- 1 **Canadian Standards Association (CSA).**
  - Hot Dip Galvanizing of Irregularly Shaped Articles: to CSA-G164-18**
  - Limit States Design of Steel Structures: to CSA-S16-14**
  - Cold Formed Steel Structural Members: to CSA-S136-16**
  - Certification of Companies for Fusion Welding of Steel Structures: to CSA W47.1-09 (R2014)**

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 28 03 tm

**Electrodes: to CSA W48 -18.**

**Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings: to CSA W55.3-08 (R2018).**

**Welded Steel Construction, (Metal Arc Welding), Metric: to CSA W59-18**

- 2 **Canadian General Standards Board (CGSB).**  
**Primer Structural Steel, Oil Alkyd Type:** to CAN/CGSB-1.40-M97.  
**Painting:** to CAN/CGSB-85.100-93.
- 3 **The Society of Protective Coatings (SSPC)**  
Commercial Blast Cleaning: to SSPC-SP3
- 4 Powder coating shops shall submit a list of five references of similar projects in southern Ontario completed within the last five years. Expertise to the satisfaction of the Architect is a prerequisite

#### **4 SOURCE QUALITY CONTROL**

- 1 Inspection and testing of materials and shop fabrication of Work of this Section, and field quality control specified elsewhere in this Section, may be performed by an Inspection and Testing Company appointed by Consultant.
- 2 Review provided by Inspection and Testing Company does not relieve Contractor of his sole responsibility for quality control over Work. Performance or non-performance of Inspection and Testing Company shall not limit, reduce, or relieve Contractor of his responsibilities in complying with the requirements of the Specification.
- 3 Inspection and Testing Company shall be certified by Canadian Welding Bureau, in Category 1, Buildings, under CSA W178.1.
- 4 Welding inspectors and supervisors shall be certified by Canadian Welding Bureau to CSA W178.2, to minimum level 2 certification.
- 5 Payment for specified Work performed by Inspection and Testing Company will be made from cash allowance specified in Section 01020.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 28 03 tm

- 6 Inspection and Testing Company when appointed shall carry out shop inspection to verify:

Structural materials and paint conform to specifications. Mill test reports, properly correlated to the materials, will be accepted in lieu of physical tests of structural materials.

Fabrication and welding conforms to Specifications and dimensioned shop drawings.

Shop painting, and cleaning and preparation for same, conform to specified requirements.

For surfaces painted with zinc-rich paint or zinc primer, specified surface preparation is followed, and specified paint thickness is applied.

Non-destructive Testing of Welded Connections:

Carry out non-destructive testing of welded connections chosen at random as follows:

100% of moment connections involving use of fillet welds, by magnetic particle inspection.

All moment connections and all connections in direct tension involving use of Full Penetration Groove welds, by ultrasonic testing.

Where moments are transferred by either fillet welds or groove welds into end plates in "T" joint configurations, examine base metal for lamellar tearing or cracking, by ultrasonic testing.

10% of other welded connections, by magnetic particle inspection.

100% visual review of welds used on gymnasium trusses.

- 7 Inspection Procedure and Reports: the Inspection and Testing Company shall:

Submit to Consultant procedure which shall be followed to verify compliance with the Drawings and Specifications. Include details of any random sampling procedures. General instructions given to inspectors and special instructions pertaining to aspects peculiar to this Project. Submission of this procedure shall not relieve Inspection and Testing Company of responsibility to confirm that completed structural steelwork complies with above requirements.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 28 03 tm

Submit reports at least weekly when shop and site work is in progress.

Distribute inspection reports as follows:

- 2 copies to Consultant;
- 1 copy to Consulting Structural Engineer;
- 1 copy to Contractor;
- 1 copy to Steel Fabricator.

Sign report by inspector who performs inspection, and describes progress of Work, deficiencies found and corrective actions taken.

Include deficiency list of outstanding items from previous reports, and comment on status.

### **5 DESIGN DETAILS AND CONNECTIONS**

- 1 Design details and connections to resist forces, moments and shears indicated on the drawings. The fabricator shall be responsible for design and detailing.
- 2 On erection drawings, indicate all details and information necessary for assembly and erection purposes such as, description of methods, sequence of erection, type of equipment used in erection and temporary bracings.
- 3 If connection for shear only, (standard connection), is required: Select framed beam shear connections from an industry accepted publication such as "Handbook the Canadian Institute of Steel Construction".
- 4 If shears are not indicated, select or design connections to support reaction from maximum uniformly distributed load that can be safely supported by beam in bending, provided no point loads act on beam.
- 5 For non-standard connections, submit sketches and design calculations stamped and signed by qualified professional engineer licensed in Province of Ontario, Canada.
- 6 Design details and connections in accordance with reference standard requirements to resist forces, moments and shears indicated, unless otherwise noted or indicated on the Drawings.
- 7 For standard connections, select details from CISC Handbook of Steel Construction to ensure structural adequacy.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 28 03 tm

### **6 SHOP DRAWINGS/SUBMITTALS**

**1 Liability Insurance:**

In the case that the connection design engineer is a professional engineer providing design services for in-house design and fabrication, and does not provide engineering services for clients outside of his/her fabrication business, provide proof of current product liability insurance. In the case that the connection design engineer is a professional engineer providing engineering services for anyone other than his/her own in-house fabrication business, i.e. offers design services to the public, provide proof of current professional liability insurance and a current Certificate of Authorization from the Professional Engineers of Ontario.

**2 Calculations:**

Submit design calculations if requested by Consultant.

**3 Shop Drawings:**

1. Submit for review typical details of connections and any special connections, before preparation of shop drawings.

2. Professional Engineer responsible for connection design shall either sign and seal each shop drawing submitted, or shall submit a signed and sealed letter at commencement of shop drawing preparation stating he will assume responsibility for compliance of connections with this Specification.

3. Where new Work connects to existing construction, determine existing conditions and all dimensions on site, including verification of all dimensions on Drawings. Report any necessary adjustment to Consultant.

4. Submit erection diagrams and shop details, fully detailed and dimensioned, with complete information necessary so that steel may be fabricated and erected without reference to Drawings.

5. Include whether snug-tight or pre-tensioned high-strength bolts are to be used, and whether threads are to be excluded from shear plane.

6. Show splice locations and details.

7. Submit typical details of connections and any special connections for review before preparation of shop drawings.



22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 28 03 tm

8. Prior to submission to Consultant, Contractor shall review all shop drawings. By this review, Contractor represents to have determined and verified all field measurements, site conditions, materials, catalogue number and similar data, and to have checked and coordinated each shop drawing with the requirements of Work and of Contract Documents. Contractor's review of each shop drawing shall be indicated by stamp, date and signature of a responsible person.

9. At time of submission, Contractor shall notify Consultant in writing of any deviations in shop drawings from requirements of Contract Documents.

10. Consultant will review and return shop drawings in accordance with an agreed schedule. Consultant's review will be for conformity to design concept and for general arrangement, and shall not relieve Contractor of responsibility for errors and omissions in shop drawings or of responsibility for meeting all requirements of Contract Documents.

11. Contractor shall make changes on shop drawings that Consultant may require, consistent with Contract Documents and resubmit unless otherwise directed by Consultant. When resubmitting, Contractor shall notify Consultant in writing of revisions other than those requested by Consultant.

12. Submit shop drawings as follows:

4 copies of erection diagrams and shop drawings for review before any Work commences

3 additional copies of shop drawings for distribution as directed by Consultant

2 copies of erection diagrams to Inspection and Testing Company

4 Paint Performance:

If requested by Consultant, submit paint manufacturer's certification that paint conforms to LCISC/CPMA Standard specified.

5 Erection Procedures:

Submit to Consultant or regulatory authorities for review, diagrams showing methods of erection proposed, if so directed by Consultant or regulatory authorities

## **2 PRODUCTS**

### **1 MATERIALS**

- 1 **Structural Steel: to CSA G40.21-13 (R2018)**  
**Type 350W**

**Shop Drawings: Provide engineered shop drawings in accordance with Section 01300**

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 28 03 tm

### **2 FABRICATION**

- 1 Fabricate structural steel as indicated to and in accordance with shop drawings.
- 2 Provide wall anchors for wall bearing beams unless otherwise indicated.
- 3 Provide punched holes from 11 to 27 mm (½" to 1 1/16") in diameter for attachment of other work. Refer to drawings for details and locations.
- 4 Reinforce openings to maintain required design strength.
- 5 All new members to receive either intumescent coating or factory applied finish coatings shall be commercial blast cleaned (SSPC-SP6 / NACE No.3) by this section. All pit marks shall be filled and the structural members ground. All welds shall be continuous full ground to a full concave seam no more than 6.35mm (0.25") diameter and filled. Weld flashes should be ground smooth prior to commencement of application to primer and finished coats.
- 6 Continuously seal members by continuous welds, where indicated.
- 7 Fabricate structural steel, as indicated, in accordance with CSA-S16.1 and CSA-S136 with CSA S136.1, and in accordance with reviewed shop drawings. Saw-cut or machine column ends to a tolerance of 1:500 and mill bearing plates if necessary to provide even contact.
- 8 All welding shall conform to CSA W59. Grind smooth all welds, trade names and identification marks exposed to view.

### **3 CONNECTION TO EXISTING WORK**

- 1 Verify dimensions of existing work before commencing fabrication.

### **4 SHOP PAINTING**

- 1 Clean, prepare surfaces and shop prime structural steel except where member to be cast in concrete.
- 2 Clean all members, remove loose mill scale, rust, oil, dirt and other foreign matter. Prepare surface according to SSPC SPI (brush) blast.
- 3 Apply one coat of CISC/CMPD2-75 primer in shop to all steel surfaces to achieve minimum dry film thickness of 1 to 2 mils.
- 4 Maintain dry condition and 5°C minimum temperature until paint is thoroughly dry.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 28 03 tm

- 5 Structural steel not exposed to the weather or other corrosive environment in the completed structure shall receive one shop coat of interior grade primer.
- 6 Structural steel which will be left exposed on the exterior and unheated interior of the completed structure shall receive one shop coat of zinc-rich paint primer no less than 0.5 mils in thickness.
- 7 Structural steel which will be left exposed to view in the completed structure shall be carefully shop primed and shall be free of all drips, runs, and other surface imperfections and the finish shall be suitable for application of finish paint coats.
- 8 All prefinished steel shall be factory powder coated.

### **5 MARKING**

- 1 Mark the materials in accordance with reference standards. Do not use die stamping. If steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.
- 2 Match marking: shop mark bearing assemblies and splices for fit and match.

## **3 EXECUTION**

---

### **1 ERECTION**

- 1 Erect structural steel as indicated to and in accordance with shop drawings.
- 2 Before commencing erection work, verify the locations and elevations of concrete foundations, anchor bolts for column bases, and the work of other trades. Immediately notify the Engineer of any failure of the building components to fit together properly. Corrective measures shall be undertaken only as approved by the Engineer. Obtain written permission of Engineer prior to field cutting or altering of structural members that are not shown on shop drawings.
- 3 Make adequate provision for horizontal and vertical erection loads and for sufficient temporary bracing to keep the structural steel frame plumb and in true alignment until the completion of erection, and installation of masonry and concrete walls, and floor and roof decks which provide the necessary permanent bracing. Slender bracing members shall be given sufficient initial pre-stress to maintain straightness without causing deflections in other structural members.
- 4 Column base plates shall be left supported on shim plates or levelling nuts with a gap of about 1" (25 mm) between the supporting concrete and the base plate for application of grout by others.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 28 03 tm

- 5 Clean with mechanical brush and touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.
- 6 Seal members with continuous welds where indicated.
- 7 Obtain written permission of the Architect and Engineer prior to field cutting or altering of structural members.
- 8 Touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.

### **2 FIELD QUALITY CONTROL**

- 1 Inspection and testing of materials and workmanship may be carried out by testing company designated by the Architect. Cost of testing shall be paid under cash allowance. If strength of materials and quality of workmanship is proven to be inadequate, then this trade shall be responsible for cost of testing.
- 2 Inspection and Testing Company, when appointed as specified in Source Quality Control elsewhere in this Section, shall perform:
- 3 Inspection of erection and fit-up, including placing, plumbing, leveling and temporary bracing and conformance with specified tolerances.
- 4 Inspection of bolted connections, including verification that A307, A325/A325M snug tight only bolts, and A325/A325M pretensioned bolts have been used appropriately, and that threads are excluded from shear plane where required.
- 5 Inspection of welded joints, including slag removal.
- 6 General inspection of field cutting and alterations; report immediately to Consultant, alterations or cutting not shown on reviewed shop drawings.
- 7 General inspection of shop coating touch-up.
- 8 Inspection of zinc primer and zinc-rich paint, including surface preparation and coating thickness.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

*Nov 28 03 tm*

### **3 FRAMING TO MECH/ELEC OPENINGS IN ROOF AND FLOOR ASSEMBLIES**

- 1 Unless otherwise specified, provide a 50mm x 50mm x 6.4mm (2" x 2" x 1/4") steel angle support around all floor and roof penetrations that exceed 152 mm (6") in diameter. This framing shall be secured to structural members on either side and shall be continuous around the opening.

### **4 CLEAN UP**

- 1 On completion of the work of this section, all protection erected under this section shall be removed, all damage to this work and to the work of other trades resulting from the execution of the work of this section shall be made good, and all surplus materials, debris, tools, plant, and equipment shall be removed from the premises, and the building(s) and site left in a condition satisfactory to the Engineer.

### **5 DEFECTIVE WORK**

- 1 Variations in excess of specified tolerances, and failure of materials or workmanship to meet requirements of this specification, and which cannot be repaired by approved methods, will be considered defective Work performed by this Section.
- 2 Replace defective Work, as directed by Consultant.
- 3 Contractor shall pay for additional inspection and testing, redesign, corrective measures, and related expenses if Work has proven to be deficient.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Nov 19 03 tm

### 1 GENERAL

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#### 1 RELATED REQUIREMENTS

- 1 Section 03300: Cast in Place Concrete
- 2 Section 04200: Masonry
- 4 Section 06200: Finished Carpentry
- 5 Section 08110: Hollow Metal Doors, Frames and Screens
- 6 Section 09900: Painting

#### 2 GENERAL

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any subtrade or supplier to complete the full scope of the work indicated in the contract documents as a whole.
- 2 Review the drawings thoroughly and provide miscellaneous metals whether or not specified herein.

#### 3 QUALIFICATIONS

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified licensed under the requirements of the governing authority.

#### 4 SOURCE QUALITY CONTROL

- 1 Refer to Section 05100 for standards of inspection and testing of materials and shop fabrication of work of this contract.

### 2 PRODUCTS

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#### 1 MATERIALS

- 1 **Steel sections and plates:** to CSA G40.21-04 (R2009), Type 300W.
- 2 **Steel pipe:** to CSA B63-1966 series 40 pipe standard weight.
- 3 **Stainless steel:** to CSA G110.6-1968 Type 302, exposed surfaces to have No. 4 brushed finish.
- 4 **Welding materials:** to CSA W59-03 (R2008).
- 5 **Bolts and anchor bolts:** to ASTM A307-07b A325M-09.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Nov 19 03 tm

- 6 Interior Aluminum and Glass Railing System - Railing & Post:  
C.R. Laurence Company - CRS Component Railing System complete with Fascia Mount Brackets for stringers, Post Base Plate for landings with Plate Cover Canopy and 1.9" (48mm) o.d. Schedule 40 Stainless Steel Pipe, Round Cap Rails and Round Z-series Glass Clamps for 1/2" Clear Tempered Glass or an equivalent product approved equal by the Architect.

Thickness / Size: 48mm (1.9") o.d. capable of receiving indicated glazing

Colour: Brushed Stainless Steel

Shop Drawings: Provide engineered shop drawings in accordance with Section 01300

- 7 Interior Aluminum and Glass Railing System - Handrail:  
C.R. Laurence Company - CRS Component Railing System 1.9" (48mm) o.d. Stainless Steel Railing complete with End Caps, Corners and Post Standoffs as indicated or an equivalent product approved equal by the Architect.

Thickness / Size: 48mm (1.9") o.d. to match railing system

Colour: Brushed Stainless Steel

Shop Drawings: Provide engineered shop drawings in accordance with Section 01300

## 2 FABRICATION

- 1 Build work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- 2 Fabricate items from steel unless otherwise noted.
- 3 Use self-tapping shake-proof countersunk flat headed screws on items required to be assembled by screws or as indicated.
- 4 Where possible, work to be fitted and shop assembled, ready for erection.
- 5 Exposed welds to be continuous for length of each joint. File or grind exposed welds smooth and flush to completely conceal any welded butt joints and to make a smooth curved transition between other joints of not more than 4.8mm (3/16") in either direction.
- 6 Grind all miscellaneous steel surfaces remaining after construction to ensure a perfectly smooth surface ready to be painted.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Nov 19 03 tm

### 3 SUPPORT BRACKETS FOR COUNTERTOPS

- 1 Supply all steel brackets below countertops where shown on drawings. Brackets to be 50mm (2") wide x 6mm (1/4") thick with one 50mm (2") wide x 6mm (1/4") thick diagonal brace between the two legs. Legs to be as long as what is necessary for countertop depth. Diagonal bracing is not to interfere with knee space below countertop. Submit 5 copies of Shop Drawings.

### 4 SHOP PAINTING

- 1 Apply one shop coat of primer to metal items, with exception of stainless steel, aluminum and those to be galvanized or encased in concrete.
- 2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces free from rust, scale, grease. Do not paint when temperature is lower than 7°C.
- 3 Clean surfaces to be field welded; do not paint.

### 5 MISCELLANEOUS ALUMINUM

- 1 Provide aluminum components indicated on drawings. The intent of these documents is to show general configurations only of aluminum elements required. Submit engineered shop drawings that show:
  - structural and erection detailing of all elements including the support of all other elements (i.e.: glazing) as required by the design.
  - indicate that all elements have designed to accept all dead and live loads required herein and by all applicable regulations.
  - indicate finished weight of each element.
  - review the design of the substrate mounting provided for and provide written comments of any concern to the Architect before submitting the shop drawings.
  - indicate all connection detailing to substrates including consideration of isolating dissimilar material to avoid corrosion.
  - Ensure proper drainage of all components constructed of hollow aluminum sections.
  - Design and fabricate all elements as indicated in these documents. The creation of additional joints or multiple components for each element is not permitted.
- 2 Field measure and construct full size templates to ensure accuracy. All work to have a tolerance of not more than 1:200. Site modifications to the sections of the work is not permitted.
- 3 Strength Design in Aluminum: CAN3-S157-M83 (R2001), Welded Aluminum Construction: W59.2-M1991 (R1998)



22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Nov 19 03 tm

- 4 Construct decorative metal elements of steel plate and sections in thickness and sizes indicated on drawings. All pit marks shall be filled and the structural members ground smooth.
- 5 All welds shall be continuous, full ground to a full concave seam no more than 6.35mm (0.25") diameter and filled. Weld flashes should be ground smooth prior to commencement of finishing.
- 6 All connections shall be made using bolts welded in place and bronze acorn cap nuts and lock washers finished to match brackets
- 7 Unless otherwise specified all aluminum surfaces to receive an anodized finish as selected by the Architect.

### 6 HANDRAILS AND GUARDS

- 1 Provide purpose built handrails to fully glazed guards at front entrance stairs. Install to manufacturers specifications and using manufacturer supplied fasteners. Coordinated work with Section 08810 Glazing.
- 2 Provide engineered shop drawings.

## 3 EXECUTION

---

### 1 ERECTION

- 1 Erect metalwork square, plumb, straight and true, accurately fitted, with tight joints and intersections.
- 2 Provide suitable and acceptable means of anchorage, such as dowels, anchor clips, bar anchors, expansion bolts and shields, toggles.
- 3 Make field connections with high tensile bolts, or weld to reference standards.
- 4 Hand items to be cast into concrete or built into masonry over to appropriate trades together with setting templates.
- 5 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection.
- 6 Do all cutting, drilling and fitting necessary to match adjoining work.
- 7 Prime base metal surfaces, field welds, damaged and abraded primed surfaces and surfaces not previously primed. Leave ready for finish painting under Section 09900.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Nov 19 03 tm

### 2 LOOSE STEEL LINTELS

- 1 Supply all loose angle lintels over door openings, built-in cabinets, all duct and pipe openings,
- 2 Loose Lintels to be hot dip galvanized.
- 3 Unless noted otherwise on structural drawings, use the following chart:

Angle Sizes	Max. Clear Masonry Opening Width	Min. End Bearing
<b>89mm x 89mm x 6mm</b> <b>(3½" x 3½" x ¼")</b>	1194mm (3'-11")	152mm (6")
<b>89mm x 76mm x 8mm</b> <b>(3½" x 3" x 5/16")</b>	1499mm (4'-11")	178mm (7")
<b>100mm x 89mm 8mm</b> <b>(4" x 3½" x 5/16")</b>	1803mm (5'-11")	203mm (8")
<b>114mm x 89mm x 8mm</b> <b>(4½" x 3½" x 5/16")</b>	2108 (6'-11")	203mm (8")
<b>127mm x 89mm x 8mm</b> <b>(5" x 3½" x 5/16")</b>	2388mm (7'-10")	203mm (8")
<b>127mm x 89mm x 9.5mm</b> <b>(5" x 3½" x 3/8")</b>	2692mm (8'-10")	203mm (8")
<b>152mm x 102mm x 9.5mm</b> <b>(6" x 4" x 3/8")</b>	2997mm (9'-10")	203mm (8")

- 2 The angle leg 89mm (3½") to be horizontal. Provide one angle for each 100mm (4") nominal

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **1 GENERAL**

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#### **1 RELATED REQUIREMENTS**

- 1 Section 06200: Finished Carpentry
- 2 Section 09250: Gypsum Board

#### **2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.

#### **3 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified licensed under the requirements of the governing authority.

#### **4 PRODUCT HANDLING**

- 1 Co-ordinate delivery with construction schedule. Protect materials from weather while in transit and on job site.

#### **5 QUALITY ASSURANCE**

- 1 Grade stamp lumber prior to delivery. Lumber must bear grading stamp of manufacturer.

### **2 PRODUCTS**

---

#### **1 MATERIALS**

- 1 **Lumber: to CAN/CSA 0141-05 (R2009), NLGA Standard Grading Rules for Canadian Lumber, 1987**  
**Douglas Fir grade #1/2 softwood S4S (surfaced four sides), moisture content 19% or less**
- 2 For rough carpentry such as wood block, rough bucks, strapping grounds and nailing strips: S2S (surfaced two sides) is acceptable for nailing strips, grounds, and sleepers; otherwise uses S4S. All material to be Douglas Fir #1 or 2 with preservative applied to cuts and the whole assemble sprayed with preservative prior to installation. Well seasoned stock, free from large loose resinous knots, shakes, splits, dry rot or other defects which would impair its strength or durability.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

- 3 **Structural Composite Lumber:** to CSA 086.1S1-98 supplement n°1 to CSA 0.86.1-94 Tembec Forest Products Group - LVL: Selectem Grade 2.0E or an equivalent product approved equal by the Architect.

**Thickness / Size:** Refer to Structural Drawings.

- 4 **Structural Composite Lumber:** to CSA 086.1 Jager Building Systems Inc. - Wood I-Joist: JSI Joist or an equivalent product approved equal by the Architect.

**Thickness / Size:** Refer to Structural Drawings.

**Shop Drawings:** Provide engineered shop drawings in accordance with Section 01300

- 5 **Structural Composite Lumber:** to CSA 086.1 Trus-Joist Macmillan - PSL: Parallam Grade 2.0E or an equivalent product approved equal by the Architect.

**Thickness / Size:** Refer to Structural Drawings.

**Shop Drawings:** Provide engineered shop drawings in accordance with Section 01300

- 6 **Glue-laminated Timber:** to CSA 0122-06 Douglas Fir-Larch, Spruce-Pine; Stress Grade 24 F-E, 20 F-E

### 3 FASTENERS

- 1 **Nails, spikes and staples:** to CSA B111-1974.
- 2 **Bolts:** 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.
- 3 **Proprietary fasteners:** toggle bolts, expansion shields and lag bolts, screws and lead to inorganic fibre plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.
- 4 **Galvanizing:** to CSA G164-M1992, use galvanized fasteners for exterior work, interior highly humid areas, pressure-preservative, or fibre-retardant treated lumber.
- 5 **Power fasteners:** power staplers and explosive impact fasteners are not permitted.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **3 EXECUTION**

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#### **1 WORKMANSHIP**

- 1 Ground nailing strips, rough bucks, etc., shall be accurately set as required, or as detailed and securely fastened.

#### **2 WOOD FRAME CONSTRUCTION**

- 1 Comply with requirements of Section 4.3.1 of Ontario Building Code or as indicated on the drawings.

#### **3 FASTENINGS**

- 1 Complete in accordance with details. Where not detailed, use best standard practice and Ontario Building Code.
- 2 Maximum spacing of members 400 mm o.c. Work closely fitted, accurately set and tightly secured.
- 3 Blocking, grounds, strapping, rough buck, anchors, shown on drawings are guides to work only, and are not necessarily complete. Location, method of securing is optional.
- 4 Erect as indicated or required to provide true, plumb, rigid, secure support with all joints location over solid bearing.
- 5 Anchor rough bucks with 12.7mm (1/2") bolts at 1200 mm o.c. unless indicated otherwise.
- 6 Provide blocking, beveled 100 mm (4") (nominal) high wood cant strips as indicated or required for roofing and sheet metal flashings.
- 7 Construct roof curbs around roof fans, ventilation ducts and all other electrical and mechanical equipment placed on roof and as shown on drawings.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 8 Construct and install skids for roof mounted air conditioning units as detailed. Bolt securely together.
- 9 Provide rough frames as required for openings in masonry.
- 10 Provide sill seal below all base plates secured to concrete slabs and foundation walls.

### **4 TEMPORARY PROTECTION**

- 1 Provide and place all temporary protection required in order to keep building weatherproof. Provide and place all temporary doors and windows required to enclose and lock up building.

### **5 HOLLOW METAL FRAMES AND SCREEN**

- 1 Set and brace all hollow metal frames and screens supplied under Section 08111.

### **6 ENGINEERED WOOD BEAMS**

- 1 Engineered wood beams prior to installation, shall be stored on level supports and protected from the weather. They shall be handled with care so it is not damaged. These members are to be erected and installed in accordance with the plans, and installation information in the current Manufacturer's Design Manual. Temporary construction loads which cause stresses beyond design limits are not permitted. Erection bracing is to be provided to keep the members straight and plumb during erection and to assure adequate lateral support for the entire system until the structural framing is complete. The contractor will give notification to the Project Engineer prior to enclosing the system, to allow for site reviews of the installation.

### **7 ENGINEERED WOOD JOISTS**

- 1 Prior to installation, joists shall be stored in a vertical position and protected from the weather. They shall be handled with care so they are not damaged. Joists are to be erected and installed in accordance with the plans and installation information in the current Manufacturer's Design Manual. Temporary construction loads which cause stresses beyond design limits are not permitted. Erection bracing is to be provided to keep joists straight and plumb during erection and to assure adequate lateral support for the entire system until the permanent sheathing material has been applied. The contractor will give notification to project engineer prior to enclosing system to allow site review of the installation.

### **8 CLEAN UP**

- 1 Remove all debris and surplus material.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **1 GENERAL**

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#### **1 RELATED REQUIREMENTS**

- 1 Section 06100: Rough Carpentry
- 2 Section 05100: Structural Steel
- 3 Section 09900: Painting

#### **2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.

#### **3 REFERENCE STANDARDS**

- 1 CAN/CSA G40.21, Structural Quality Steels
- 2 CAN/CSA-0.86.1-94, Engineering Design in Wood
- 3 CSA 0112 Series-M, Wood Adhesives
- 4 CSA-01222-M, Structural Glued-Laminated Timber
- 5 CSA-0177-M, Qualification Code for Manufacturers of Structural Glued-laminated Timber

#### **4 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified licensed under the requirements of the governing authority.
- 2 Manufacture structural glued-laminated timber members in a plant certified as conforming to requirements of CSA 0177, Class XH.
- 3 Submit certificate of conformance in accordance with CSA 0177, Appendix B at completion of supply contract.
- 4 Fabricator for steel connections to be certified in accordance with CSA W47.1.
- 5 Manufacture structural glued-laminated timber members in a plant certified as conforming to requirements of CSA 0177, Class XH.
- 6 Submit certificate of conformance in accordance with CSA 0177, Appendix B at completion of supply contract.
- 7 Fabricator for steel connections to be certified in accordance with CSA W47.1.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

### 5 SHOP DRAWINGS

- 1 Submit shop and erection drawings in accordance with Section 03100 - Submittals.
- 2 Shop drawings for glued-laminated structural units to indicate stress grade, service grade and appearance grade, shop applied finishes, camber, cuts, holes and steel connection details.
- 3 Each erection drawing submitted shall bear the stamp of a qualified professional engineer registered in the province of Ontario, responsible for the design of items supplied by the manufacturer.

### 6 DELIVERY AND HANDLING

- 1 Wrap premium appearance members prior to leaving the plant with a moisture resistance barrier.
- 2 Receiver on site to check bill of materials with shipping receipt and immediately note any discrepancies to the transport company.
- 3 Use padded, non-marring slings for handling glued-laminated members.
- 4 Protect corners from crushing with wood blocking.
- 5 Store glued-laminated timber, blocked off the ground and separated with wood strips, in a neat pile away from high traffic area. Ensure air may circulate around all faces of members.
- 6 Split underside of moisture resistant barrier during storage on site. Do not deface member.
- 7 Maintain moisture resistant barrier until members are completely installed, then remove wrappings completely.

## 2 PRODUCTS

---

### 1 MATERIALS

- 1 **Laminated stock:** Lodgepole pine and/or spruce to CSA 0122. (Alternate: Douglas fir/larch)
- 2 **Adhesive:** to CSA 0112 Series, waterproof, exterior grade.
- 3 **Steel for connections:** to CSA G40-21, Type 300W
- 4 **Shop coat primer for steel:** to CGSB 1-GP-40M.
- 5 **Galvanizing for steel:** to CSA G164, hot dipped, minimum zinc coating of 600g./sq.m.



22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **2 FABRICATION**

**Manufacture members to the following grades:**

- 1 **Glue-laminated Timber:** to to CSA 0122-06  
Douglas Fir-Larch, Spruce-Pine; Stress Grade 24 F-E, 20 F-E
- 2 **Service grades:** Exterior
- 3 **Appearance grades:** Unless otherwise specified - Quality (Industrial, Commercial as indicated)
- 4 Mark laminated members for identification during erection to correspond with shop drawings. Marks must be concealed in final assembly. Clearly mark top surface of beams.
- 5 Steel connectors to be manufactured by Simpson or MGA.

### **3 EXECUTION**

---

#### **1 ERECTION**

- 1 Erector to have minimum 5 years experience in glued-laminated timber construction.
- 2 Erect glued-laminated members in accordance with approved, final, for construction issue shop drawings.
- 3 Make adequate provisions for erection stresses.
- 4 Splice and join members only at locations as indicated on final shop drawings.
- 5 Do not field cut or alter members without consultant's written approval. Note any discrepancies immediately.
- 6 Brace and anchor members adequately until permanently secured by decking.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

### 1 GENERAL

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#### 1 RELATED REQUIREMENTS

- 1 Section 06100: Rough Carpentry

#### 2 GENERAL

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.

#### 3 REFERENCE STANDARDS

- 1 Do fabrication of wood trusses in accordance with CSA3-086-01 (R2006), except where specified otherwise.
- 2 Do load test procedure of fabricated wood trusses to CSA S307-M1980.

#### 4 QUALIFICATIONS

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified licensed under the requirements of the governing authority.

#### 5 DESIGN CRITERIA

- 1 Professional engineer roof trusses, including all bracing, bridging, connectors in accordance with CSA 086-01 (R2006), to safely carry live loads as indicated, equipment loads, wet service conditions, and snow and drift loads for building locality as ascertained by OBC 2006, Climatic Information for Building Design in Canada.
- 2 Where plaster or gypsum board ceilings are hung directly from trusses, limit live load deflection to L/360th of span.
- 3 Limit live load deflections to (L/240th) of span.
- 4 Provide chamber for trusses as indicated

#### 6 SOURCE QUALITY CONTROL

- 1 Identify lumber by grade stamp of an agency certified by Canadian Lumber Standards Administration Board.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 2 Certify (preservative) and (fire retardant) treated wood in accordance with CSA 080-Series-08

**7 SHOP DRAWINGS**

- 1 Submit shop drawings in accordance with Section 01300.
- 2 Each shop drawing submitted shall bear the stamp of a qualified professional engineer registered in the Province of Ontario.
- 3 Indicate species, sizes, and stress grades of lumber used as truss members. Show pitch, span, camber configuration and spacing of trusses.
- 4 Submit stress diagram indicating design load on each truss member, special loads, allowable stress increase and deflection limits.
- 5 Submit print-out of computer design.
- 6 Indicate arrangement of webs or other members to accommodate ducts and other specialties.
- 7 Show lifting points for storage, handling and erection and show location of lateral bracing for compression members.

**8 DELIVERY AND STORAGE**

- 1 Store trusses on job site in accordance with manufacturer's instructions. Provide bearing supports and bracings to prevent bending or overturning of trusses during transit and storage.

**2 PRODUCTS****1 MATERIALS**

- 1 **Lumber:** spruce/pine/fir grade #2 or better, (softwood), (S4S), with maximum moisture content of (19)% at time of fabrication and in accordance with the following standards:

CSA 0141-05 (R2009)

NLGA Standard Grading Rules for Canadian Lumber, 1980.

- 2 **Fastenings:** to CSA-086-01 (R2006), hot dipped galvanized to CAN/CSA-G164, 600 g/m<sup>2</sup>

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 3 **Hangers:** as designed by truss manufacturer for intended purpose. It is the responsibility of the truss manufacturer to provide all truss to truss and truss and beam connections and hangers.

**2 FABRICATION**

- 1 Fabricate wood trusses in accordance with reviewed shop drawings.
- 2 Cut truss members to accurate length, angle, and size to assure tight joints for finished trusses.
- 3 Assemble truss members in design configuration by securing tightly in jigs or with clamps.
- 4 Provide for design camber when positioning truss members.
- 5 Connect members using metal connector plates.

**3 WOOD TREATMENT**

- 1 Apply wood treatment in accordance with CSA 086-01 (R2006)

**3 EXECUTION**

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- 1 Lifting points, as indicated, shall be used to hoist trusses into position.
- 2 Exercise care to prevent out-of-plane bending of trusses.
- 3 Install temporary horizontal and cross bracing to hold trusses plumb and in safe condition until permanent bracing is installed.
- 4 Install permanent bracing and related components prior to application of loads to trusses.
- 5 Trusses with loose connector plates are not acceptable.
- 6 Restrict construction loads to prevent overstressing of truss members.
- 7 Do not cut or remove any truss material.
- 8 Remove with fine sandpaper, chemical deposits on treated wood to receive applied finishes.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **1 GENERAL**

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#### **1 RELATED REQUIREMENTS**

- 1 Section 05500: Miscellaneous Metal Fabrication
- 2 Section 06100: Rough Carpentry
- 3 Section 08210: Wood Doors
- 4 Section 08710: Finish Hardware
- 5 Section 09330: Tile Work
- 6 Section 09900: Painting

#### **2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.

#### **3 REFERENCE STANDARDS**

- 1 Millwork shall be in accordance with the Architectural Woodwork Manufacturers Association of Canada's (AWMAC) Quality Standards Manual, current edition, for custom grade at time of tender.

#### **4 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified

#### **5 SHOP DRAWINGS**

- 1 Submit shop drawings in accordance with Section 01300.

#### **6 PRODUCT HANDLING**

- 1 Do not deliver finished materials during rain or damp weather. Keep all materials dry during delivery and on the job site.
- 2 Prevent damage to materials during handling and storage.
- 3 Do not deliver finished millwork to job until all openings are glazed.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

## 2 PRODUCTS

### 1 CABINETY MATERIAL

- 1 **Low Urea-Formaldehyde particle core for plastic laminate work:** Nu Green particle board by Uniboard or approved equal to ANSI - A208.1-99 Grade M-2 standards having a minimum core density of 635 kg/m<sup>3</sup> average (39.6 lb/ft<sup>3</sup> average )and formaldehyde emissions of 0.00 - 0.01 ppm (Comply CARB Phase I and II)
- 2 **Laminated Plastic for Postforming work:** to CAN3-A172-M79. Unless otherwise specified laminate shall be solid colour scratch resistant finish, moulding grade 0.8mm (0.032") thick. Economy grade plastic laminates are not acceptable. Colour shall be as selected later by the Architect.
- 3 **Approved Manufacturer:** Arborite, Formica, and Wilson Art.
- 4 **Laminated Plastic for Flatwork:** to CAN3-A172-M79. Unless otherwise specified laminate shall be solid colour scratch resistant finish, standard grade 1mm (0.04") thick. Economy grade laminated plastic are not acceptable. Colour shall be as selected later by the Architect.
- 5 **Approved Manufacturer:** Wilson Art, Arborite and Formica, Tafisa.
- 6 **Laminated Plastic Liner:** by the same manufacturer as facing sheet, not less than 0.51mm (0.020"), white colour.
- 7 **Laminated Backing Sheet:** for plastic laminate work - by same manufacturer as facing sheet, not less than 0.51 mm (0.020") thick, sanded one side.
- 8 **Low Formaldehyde Adhesive:** GREENGUARD® Certified Wilsonart Adhesives or equal by approved laminate plastic manufacturer. The VOC content of adhesives and sealants used must be less than the current VOC content limits of South Coast Air Quality Management District Rule #1168, and all sealants used as fillers must meet or exceed the requirements of the Bay Area Air Quality Management District Regulation 8, Rule 51.
- 9 **Sealer:** approved type water resistant sealer.

### 2 LAMINATED CABINETY

Unless otherwise indicated all cabinetry to be:

- 1 **Counter Top:** plastic laminate - scratch resistant

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

- 2 **Cabinetry:** 19mm (¾") medium density particle with melamine finish and plastic laminated edges. All exterior surfaces to be plastic laminate.

### 3 WOOD TRIM AND SPECIALTIES

- 1 **Pine:** kiln dried grade "C" or better select Eastern White pine to CLA rules.
- 2 **Kiln dried, clear, first grade.**
- 3 **Paint grade wood trim:** clear, kiln dried pine or tulip wood
- 4 **Wood Base:** to match existing stain grade wood.
- 5 **Wood Door and Window trim:** to match existing stain grade wood.

### 4 LAMINATED PLASTIC APPLICATION

- 1 Form shape profiles and bend as indicated, using postforming grade laminated plastic.
- 2 Use straight self-edging strip for all flatwork to cover exposed edge of core. Chamfer exposed edges of laminate uniformly at approximately 20°. Do not mitre laminate edges.
- 3 Apply backing sheet to underneath side of the core of all plastic laminate work.
- 4 Provide cut-outs as required for inserts, grilles, appliances, outlet boxes and other fixtures. Round internal corners. chamfer edges and seal core.
- 5 Unless otherwise indicated, all counter tops shall be post-formed and shall have furniture finish.
- 6 Apply laminated plastic lining sheet to interior of cabinet work where indicated.

### 5 CABINET WORK CONSTRUCTION

- 1 Fabricate casework to AWMAC conventional construction, custom grade. Unless indicated as painted or stained, all cabinets to be finished in plastic laminate.
- 2 Properly construct cabinet with all components adequately glued. All joints shall be properly flushed. Set nails and screws. Apply stained plain wood filler to indentations. Sand smooth and leave ready to receive finish. Each unit sanded before leaving shop.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 3 Apply 9.5mm (3/8") hardwood to all exposed edges of veneer board. When visible on the exterior of the cabinet, wood to match stained exterior faces. Otherwise wood edges are to be maple.
- 4 All knee space exceeding 900mm (36") wide to have 38mm x 38mm (2x2) steel angle reinforcing welded at corners (including premoulded vanities).
- 5 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures whether or not shown on the drawing. Where wiring access is required through countertops or other exposed surfaces to electrical receptacles below, provide prefinished aluminum 38mm (1½") diameter access covers.
- 6 Shop assemble work for delivery to site in size easily handled and ensure passage through building openings.
- 7 Install cabinet hardware for doors, shelves and drawers.

### **3 EXECUTION**

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#### **1 WORKMANSHIP**

- 1 Construct finished carpentry and finish in accordance with best practice for first class workmanship.
- 2 Sand and clean materials after erection. Accurately fit joints, coped where possible and glue. End grain wood is not accepted on finished surfaces.
- 3 Set and conceal nail heads in a finished surface in a satisfactory manner. In stained work, countersink screws and bolts and cover with side grain plugs.
- 4 Tolerance of chalk joint to work by other sections or existing conditions: 6.25mm (0.25"). Scribe to meet requirement

#### **2 INSTALLATION**

- 1 All dimensions to be site verified, any discrepancy must be reported to the Architect prior to any construction or fabrication. Dimensions are nominal. Contractor to provide clearance as required for cupboards, drawers, doors, etc.
- 2 Install all cabinet-work in locations as shown, level and plumb and fixed and bolted in place. Furnish and drill for all screws, expansion shields, toggle bolts, shims, etc.



**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 3 Install cabinet-work and equipment in close co-operation and coordination with all other trades involved. Provide all necessary cut-outs for service and other inserts as required by other trades.
- 4 All work to be left complete, accurate to line, of sound construction and good workmanship and include all work shown on the drawing.
- 5 Site apply laminated plastic to unit as indicated. Adhere laminated plastic over entire surface. Joints where required or indicated shall be hairline.
- 6 Apply small bead of sealant at junction of wall finish and splash-back.
- 7 After installation, fit and adjust operating hardware for doors, drawers and shelves.

### **3 CASEWORK**

- 1 Coordinate installation of rough blocking for casework to be installed under this section. All fastening to metal stud construction of work to be stained must have continuous wood blocking.
- 2 All trims must be one piece or 3.0m (10'-0") min. lengths between butt joints. All butt joints shall be mitred or biscuit jointed. All interior corners may be coped. All other corners shall be mitred. All joints shall be glued and finished nailed.
- 3 Finish nail trim at 200mm (8") o.c. to solid block or screw mount trim at 16" where solid blocking is not provided (i.e.: chair rails). Countersink and provide side grain plugs of similar material.
- 4 Where wood trim to windows or wood door frames is required provide solid wood jamb extensions. Install trim exposing 3mm (1/8") of jamb extension edge.
- 5 Wood trim to metal frames shall consist of wood finished trim cut to expose 25mm (1") of metal frame face and a back strip of 12mm (1/2") thick solid wood spacer laminated to outer edge of trim.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 6 Unless otherwise specified, all windows to have plastic laminate window stools scribed to window with 38mm (1½") face of hardwood in clear stain grade maple or to wood to match the specified millwork in the room. The plastic laminate shall cover the top of the base material and the hardwood edge, covering the joint between base and material. The facing edge of wood and plastic laminate shall then be chamfered 0.25" top and bottom. Exposed outer edges shall be rounded. The hardwood edge shall be stained and finished to Type (5) Natural Finish as per Section 09900. Sills to extend past side trims or when there is no trim past the finished opening 25mm (1"). Cope wood sill and skirt return to wall to match face profile.
- 7 Where wood sills are indicated, provide one piece sill with 32mm (1¼") bullnosed edge extending 25mm (1") beyond casing below. Provide skirt casing below to match window/door casing, or when no casing is specified, provide 50mm (2") contemporary shaped wood trim. Sills to extend past side trims or when there is no trim past the finished opening 25mm (1"). Cope wood sill and skirt return to wall to match face profile.
- 8 Unless otherwise indicated, stained window stools are to be constructed of stained sills and skirts.

### **4 HARDWARE**

- 1 Supply all necessary rough hardware for execution of work of this contract, such as nails, spikes, bolts, nuts, washers, screws, etc.
- 2 Finish hardware shall be supplied under section 08710 and installed under this section. Also install hardware related to H.M. and wood doors.
- 3 Install hardware in accordance with manufacturer's instructions using special tools, etc. This trade shall be responsible for damaging hardware due to faulty installation.

### **5 MILLWORK GENERALLY**

- 1 Examine drawings and furnish all finished carpentry items required for the proper execution of this project. Each item shall be complete with all required anchorage and such accessories as necessary for proper installation and for co-relation with adjoining work.
- 2 Extent of finished carpentry work shall include specified items but shall not be limited to items listed below:

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **1 GENERAL**

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#### **1 RELATED REQUIREMENTS**

- 1 Section 08110: Hollow Metal Doors, Frames and Screens
- 2 Section 09250: Caulking at Gypsum Drywall
- 3 Division 15: General Mechanical Provisions
- 4 Division 16: General Electrical Provisions

#### **2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.
- 2 The contractor and subcontractors are responsible for providing the materials, equipment and procedures as specified within these documents, including the specification, drawings or addenda. It is the responsibility of this contract to provide all materials available on the date the contract was signed. Products no longer available or discontinued before the contract date will be subject to revision by a Change Order. Products discontinued or no longer available subsequent to the contract date shall be substituted with the Consultant's approval by the Contractor for products of similar or superior quality at no additional cost.
- 3 Elements are to be constructed to ensure a maximum width of caulked joint: 6.25mm (0.25") for work related to Sections 06200 and 08110. Unless other wise indicated 20mm (0.75")

#### **3 SCOPE OF WORK**

- 1 Supply and install all caulking as shown on drawings, under thresholds, around door frames, louvred windows, below sill to masonry, control joints expansion joints, etc., to ensure a waterproof building.

#### **4 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

- 2 Arrange and pay for supply and installation of sealants and caulking work by recognized specialist applicator having at least five years of proven satisfactory experience and having skilled mechanics thoroughly trained and competent in all phases of caulking work.

### 5 PRODUCT HANDLING

- 1 Deliver sealant materials to site and store in their original containers in undamaged condition, sealed, with labels intact and showing manufacturer's name, brand, colour, etc.
- 2 Store materials in a dry location in such manner that no damage will be done to materials or building.

### 6 WARRANTY

- 1 Provide written warranty stating that caulking work is guaranteed against leakage, cracking, crumbling, melting, shrinkage, running loss of adhesion, or staining adjacent surfaces in accordance with GC 24, but for two years.
- 1 Apply sealants only to completely dry surfaces, and at air and material temperatures above minimum established by manufacturer's specifications.

### 7 SUBMITTALS

- 1 Submit samples of sealant and backing, if requested, for Architect's approval.

## 2 PRODUCTS

---

### 1 MATERIALS

- 1 **Primers:** are to be type recommended by sealant manufacturer, for the appropriate sealant and corresponding substrate.
- 2 **Joint fillers:** compatible with primers and sealants.
- 3 **Sealant:**  
Type 1: CAN/CGSB-19.0-M Test Methods. Use at all exterior locations, except where another is specified.
  - a) Dymonic FC by TremcoOR
  - b) One part silicone rubber sealant.  
Dow corning 790 bond to concrete.  
Dow corning 795 bond to steel

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Type 2: Use at interior joint between windows door frames and screens.

Acrylic solvent release one part sealant CGSB Specification 19-GP-5M Tremflex 834 by Tremco or Dow Corning 999.

Type 3: Silicone Sealant for plumbing fixtures, vanity tops, mildew resistant.

One part sealant CGSB specification 19-GP-9Ma, Tremsil 200 Silicone by Tremco or Dow Corning 786.

Type 4: Sealant for exterior paving slabs or interior parking garage and horizontal traffic joints, Vulkem 45SSL self leveling poly-urethane OR Spectrum 800/900SL low modulus silicone by Tremco, Dow Corning 888 or approved equal.

Type 5: a) Fire separation caulking - one part water-based, acrylic elastomeric sealant Tremco Tremstop Acrylic. To be used to seal opening in fire separations, around piping, conduit, ductwork and building elements.

b) Fire separation backing - 22.23mm (0.875") nominal diameter polyurethane backer rod. Installation to meet ULC standard rated assemblies. Unless otherwise indicated, for two hour rating provide two layers of friction fitted on top of each other into gap. For one hour system, bond breaker tape is to be applied.

c) All firestop materials and/or systems must conform to CAN/ULC S115M, ASTM E814.

4 **Bond Breaker:** where joint configuration does not allow for proper depth/width ratio with the use of joint fillers (See Section 3.1, item 3.1.5) - a pressure sensitive plastic tape such as 3M #226 or 481 or approved equal shall be placed at the back of the joint which will not bond to the sealant.

5 **Colours of sealant:** to the approval of the Architect, and matching the predominant material to which the sealant is applied.

6 **Removable Firestopping:** to CAN/ULC -S115M, ASTM E814  
Tremco - TREMstop PS or an equivalent product approved equal by the Architect.

Colour: Silver

Shop Drawings: in accordance with Section 01300

### 3 EXECUTION

#### 1 PREPARATION

1 Remove dust, paint, loose mortar and other foreign matter and dry joint surfaces.

**22-05-0014**

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 2 Remove rust mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.
- 3 Remove oil, grease and other coatings from non-ferrous metals with xylol, toluol or methyl-ethyl-ketone.
- 4 Prepare concrete, masonry, glazed and citreous surfaces as recommended by sealant manufacturer.
- 5 Examine joint sizes and correct to achieve depth ratio 1/2 of joint width with minimum width and depth of 6.25mm (0.25") maximum width 20mm (0.75").
- 6 Install continuous joint filler to achieve correct joint depth to all joints more than 6.25mm (0.25") .
- 7 Where necessary to prevent staining, mask adjacent surfaces with tape prior to priming and sealing.
- 8 Apply bond breaker tape where required in accordance with manufacturer's directions.
- 9 Prime sides of joints in accordance with manufacturer's directions immediately prior to caulking.
- 10 Before any caulking or sealing is commenced, a test of the material shall be made for indications to staining or poor adhesion.

**2 APPLICATION**

- 1 Apply sealants in accordance with manufacturer's directions, using a gun with proper size nozzle. Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.
- 2 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities. Neatly tool surface to a slight concave joint.
- 3 Clean adjacent surfaces immediately and leave work neat and clean. Remove excess and droppings, using recommended cleaners as work progresses. Remove masking tape after tooling of joints.
- 4 In masonry cavity construction, vent caulked joints from cavity to 3mm (1/8") beyond external face of wall by inserting 3mm (1/8") diameter plastic tubing at bottom of each joint and 1524mm (5'-0") o.c. max. vertically.

**22-05-0014**

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 5 Seal all basement floor joints with Type 1 caulking.
- 6 In fire separations install backing material Type 5b and caulk both sides of separation with Type 5A to an approved ULC design. Provide fire stopping and caulking to all joints in rated and non rated separations between dissimilar material including but not limited to:
  - penetrations by mechanical, electrical or structural elements
  - joints between dissimilar roof and/or wall materials
  - control joints
- 7 Unless indicated otherwise in this section or elsewhere in the contract documents all separations shall maintain a one hour fire rating.

**3 REMOVABLE FIRE STOPPING**

- 1 Provide removable fire stopping to all cable tray penetrations in fire separations and elsewhere as indicated.
- 2 All fire stopping to be installed to manufacturer's specification and ULC HWD 001 6. Unless otherwise indicated achieve the following rating.

# Hollow Metal Steel Doors, Frames & Screens

## Section 08100

22-05-0014

### Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

TYPE	MINIMUM GAUGE OF SHEET METAL		
	Gauge	Gauge Thickness	
		Imperial	Metric
Exterior Door Frames	14	.075"	1.9mm
Interior Door Frames (unless otherwise specified)	16	.060"	1.6mm
Doors - Honeycomb Core Construction			
Face Sheets	16	.060"	1.6mm
Top and bottom channels	16	.060"	1.6mm
Accessories (Doors & Frames)			
Lock and strike reinforcements	16	.060"	1.6mm
Hinge reinforcements	10	.135"	3.4mm
Flush Bolt reinforcements	16	.060"	1.6mm
Reinforcements for surface applied hardware	12	.015"	2.7mm
Glass mouldings (non-fire rated doors)			
Formed steel (screw fixed or snap-on type)	20	.036"	0.90mm
Glass mouldings (Fire-rated doors)			
Formed steel	20	.036"	0.90mm
Mortar Guard Boxes	22	.030"	0.80mm
Jamb Floor anchors	14	.075"	1.9mm
Anchors			
T - Strap type	14	.075"	1.9mm
L - Type	18	.048"	1.2mm
Wire Type	0.156 DIA		4.0mm DIA
Stirrup-Strap Type (2'x 10" Min.)			
(50 mm x 250 mm)	14	.075"	1.9mm
Stud Type	18	.048"	1.2mm
Jamb Spreaders	18	.048"	1.2mm



22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

### 1 GENERAL

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#### 1 RELATED REQUIREMENTS

- 2 Section 05500: Miscellaneous Metal Fabrication
- 3 Section 06100: Rough Carpentry
- 4 Section 06200: Finish Carpentry
- 5 Section 07900: Sealants, Caulking and Firestopping
- 6 Section 08210: Wood Doors
- 7 Section 08710: Finish Hardware
- 8 Section 08800: Glass and Glazing
- 9 Section 09111: Building-in frames into steel stud walls
- 10 Section 09900: Painting

#### 2 GENERAL

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.
- 2 Supply all door and frames as shown on the drawings, door schedule and/or specified herein.

#### 3 QUALIFICATIONS

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified
- 2 Arrange and pay for supply and installation of sealants and caulking work by recognized specialist applicator having at least five years of proven satisfactory experience and having skilled mechanics thoroughly trained and competent in all phases of caulking work.

#### 4 REGULATORY AUTHORITY

- 1 Canadian Steel Door and Frame Manufacturer's Association.

#### 5 SHOP DRAWINGS

- 1 Submit shop drawings in accordance with Section 01300.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

- 2 Clearly indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings, electrical conduit/boxes and finishes.
- 3 Coordinate shop drawings with Section 08710 to ensure proper preparation of doors and frames.

### 6 TESTING

- 1 Coordinate and provide confirmation before installation that coatings and thickness comply with specification for materials provided to site. Testing shall be provided and stipulated under Testing Allowance in Section 01020

## 2 PRODUCTS

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### 1 MATERIALS

- 1 Steel: galvanized steel ASTM A653-B A40 (ZF120) 0.40 oz./sq. ft. coating

### 2 HOLLOW METAL TYPE STEEL DOORS

- 1 Flush Type: Flush type doors shall be hollow steel construction or honeycomb core construction tack welded edge seams at 150mm (6") maximum o.c., ground, filled and sanded smooth/flush
- 2 Interior Doors: shall be 1.5mm (16 ga.) honeycomb core material laminated under pressure to face sheets. Suitable reinforcing for application of the hardware as specified herein shall be provided. Surface sheets for doors shall consist of two formed steel sheets of thicknesses as specified in table. Top and bottom of the door shall be closed with recessed continuous welded channel end closures. Provide flush steel top caps seaded in place only at doors receiving recessed door contacts.
- 3 Labeled Fire Doors: Labeled doors shall be provided for those openings requiring fire protection ratings as determined and scheduled by the Architect. Such doors shall be in accordance with manufacturer's standard and/or type of construction as tested and approved by a nationally recognized testing agency having a factory inspection service.
- 4 Exterior Doors: Exterior Doors shall be 1.5mm (16ga.) steel stiffened with laminated core construction and insulated. All interior voids of the door shall be filled with a fibreglass insulation. Provide flush steel top caps welded in place.

22-05-0014

### Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 5 Finishing: Doors manufactured from C.R.S. shall be finished with a corrosion resistant steel primer. Doors manufactured from zinc wipe coated galvanized steel shall have a factory applied touch-up at those areas where coating has been removed due to grinding.
- 6 Mortise, reinforce, drill and tap doors and reinforcements to receive hardware using templates provided by Finish Hardware supplier. Refer to Section 01014 for Hardware Groups.
- 7 All doors requiring glass to have narrow-lite above and below latch. Size of opening to be appropriate size for G.P.W. glass in a fire rating.

### 3 HOLLOW METAL FRAMES

- 1 Interior frames shall be of welded or where indicated "knocked-down" type construction.
  1. Welded Type: shall be made from 16 gauge (1.5mm). Frames shall be galvanized, either mitred or mechanically jointed and securely welded on the inside of the profile. Welded joints to be ground to a smooth, uniform finish.
  2. Labeled Fire Frames: Labeled frames shall be provided for those openings requiring fire protection ratings as determined and scheduled by the Architect. Such frames shall be tested in conformance with CAN4-S104 "Standard Method of Fire Tests of Door Assemblies".
  3. Exterior Welded Type: shall be made from 14 gauge (1.5mm). Frames shall be galvanized, either mitred or mechanically jointed and securely welded on the inside of the profile. Welded joints to be ground to a smooth, uniform finish. Frames shall be supplied insulated.
  4. Thermally Broken Frame: shall be made from 14 gauge (1.9mm) galvanized steel for strength and corrosion resistant with rigid vinyl extrusion to provide positive thermal break. Frames shall be supplied insulated.
- 2 Mortise, reinforce, drill and tap frames and reinforcements to receive hardware using templates provided by finish hardware supplier. Refer to typical hardware groups in Section 01014.
- 3 Frames shall be reinforced when required for surface mounted hardware. (Drilling and tapping in field by others.) See table for minimum gauges.

22-05-0014

### Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

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- 4 Each door opening to be prepared for single rubber bumpers, three (3) for single door openings, two (2) for double door openings. Two (2) channel or angle spreaders to be welded to door jambs at bottom of door opening to ensure proper alignment.
- 5 Shop Priming: Frames manufactured from C.R.S. shall be chemically treated for good paint adhesion and ship coated with a corrosion resistant steel primer. Frames manufactured from zinc wipe coated galvanized steel shall have a factory-applied touch up at those welded areas where coating has been removed due to disc sanding.
- 6 Provide concealed conduit and concealed boxes to all electrical and electronic devices incorporated in the frames.

#### 4 ANCHORS

- 1 Provide anchors as per standard of Canadian Steel Door and Frame Manufacturer's Association to suit wall construction.
- 2 Frames to be anchored to previously placed concrete, masonry or structural steel shall be provided with anchors of suitable design as shown on approved shop drawings (Fasteners for such anchors shall be provided by others).
- 3 Floor anchors shall be securely attached to the inside of each jamb profile.

#### 5 GLAZED OPENINGS (HOLLOW METAL SCREENS)

- 1 Butt joints of mullions and transoms shall be coped accurately, securely welded, and ground.
- 2 Glazing bead at openings shall be formed channel, minimum 16mm (5/8") high. Glazing bead shall be accurately fitted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws at 460 mm (18") O.C. maximum, 50mm (2") from each end. Install glazing beads at an appropriate distance from the stop to suit the glass thickness being provided.

### 3 EXECUTION

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#### 1 SITE STORAGE AND PROTECTION OF MATERIALS

- 1 It shall be the responsibility of the General Contractor to see that any scratches or disfigurement caused in shipping or handling is promptly cleaned and touched up with rust-inhibitive primer; and that materials are properly stored on planks, free from damage, out of water, and covered to protect them from damage due to any cause.

**22-05-0014**

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 2 Doors shall have their wrapping or coverings removed upon arrival at the building site and shall be stored in a vertical position, spaced by blocking to permit air circulation between them. Store in a controlled area to protect from damage.

**2 INSTALLATION**

- 1 Set frames at correct elevation. Install work plumb, square, level, free from warp, twist and superimposed loads.
- 2 Secure anchorages and connections to adjacent construction in manner not restricting thermal movement. Finalize anchor settings after alignment.
- 3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.
- 4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
- 5 Unless otherwise indicated install all hardware supplied under Section 08710. Install doors and hardware in accordance with hardware templates and manufacturers' instructions.
- 6 Adjust operable parts for correct function.
- 7 Exterior door frames shall be insulated by the section before installation
- 8 All exterior frames to be equipped with full frame width aluminum drip cap.
- 9 Installation shall be by knowledgeable and experienced personnel. Manufacturer installation recommendations must be followed.
- 10 All welds to be ground smooth with no sharp edges, burrs, depressions or voids. All welds to be primed.
- 11 Install hardware in accordance with templates and hardware manufacturer's instructions.
- 12 Work site must be kept neat and clean at all times and a thorough clean up must be performed immediately upon completion.
- 13 Make allowances for deflection of structure to ensure that structure loads are not transmitted to aluminum/metal work.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

- 14 Provide structural steel reinforcement as required for adequate strength, stiffness and connections. Weld threshold to base of jambs for rigid four corner frame construction.
- 15 Accurately fit intersecting members of flush hairline, weather tight joints and mechanically interlock together except where specified.
- 16 Conceal fastenings (except where exposed fastenings are indicated) wherever possible.
- 17 All doors to be prepped as required and reinforced at all panic, closer, hinge and latch locations complete as per the approved finishing hardware schedule.

### 3 CAULKING AND INSULATION

- 1 Prior to exterior caulking, completely fill cavity between exterior frames and rough opening with insulation.
- 2 Seal between members of aluminum work to provide a weatherproof installation.
- 3 Conceal sealant within aluminum work except where exposed use is permitted.
- 4 Apply sealant to joints between door frames and adjacent building components around perimeter of every external door opening.
- 5 Apply sealant using gun with proper size nozzle. Fill voids and joints to be solid. Superficial pointing with skin bead not acceptable.
- 6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities. Neatly tool surface to a tight concave joint.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **1 GENERAL**

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#### **1 RELATED REQUIREMENTS**

- 1 Section 04200: Masonry
- 2 Section 06100: Rough Carpentry
- 3 Section 06200: Finish Carpentry
- 4 Section 07900: Sealants, Caulking and Firestopping
- 5 Section 08110: Hollow Metal Doors, Frames and Screens
- 6 Section 08210: Wood Doors
- 7 Section 08710: Finish Hardware
- 8 Section 08800: Glass and Glazing
- 9 Section 09111: Metal Studs System
- 10 Section 09900: Painting

#### **2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.

#### **3 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified as approved by the manufacturer.
- 2 Manufacturer shall have not less than five years experience in fabrication of heavy intermediate steel windows.

#### **4 SHOP DRAWINGS**

- 1 Submit shop drawings in accordance with Section 01300.

#### **5 SCHEDULES**

- 1 Door numbers, types, sizes, glass, louvers, etc., and finishes are shown on Door Schedule on drawings.
- 2 Door sizes listed in Door Schedule are nominal sizes only. Door manufacturer shall make all necessary allowances for clearances.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **6 DELIVERY, STORAGE AND HANDLING**

- 1 Deliver, store and handle doors in a manner to prevent damage and deterioration.
- 2 Store doors upright in a protected dry area at least one inch or more off ground and at least 6mm (1/4") space between individual pieces.

### **7 GUARANTEE**

- 1 Guarantee wood doors not to warp, twist, show core ghost lines, split, delaminate or sag under normal usage for a minimum of ten (10) years.

## **2 PRODUCTS**

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### **1 MATERIALS**

- 1 **Solid Core Wood Doors Non-Fire Rated Solid Core:**  
**Baillargeon - Series 8500 ME/AF (urea-formaldehyde free) or an equivalent product approved equal by the Architect.**

**Thickness / Size: 44.5mm (1.75") thick**

**Colour: Factory Finished, Nutmeg**

**Finish: White Oak Veneer, Plain Sliced**

**Shop Drawings: in accordance with Section 01300**

**Extended Warranty: 10 years**

- 3 **Solid Core Wood Doors 45 Minute Fire Rated Door:**  
**Baillargeon - Series AF45-MO/VE - urea-formaldehyde free or an equivalent product approved equal by the Architect.**

**Thickness / Size: 44.45mm (1.75") thick**

**Colour: Factory Finished, Nutmeg**

**Finish: White Oak Veneer, Plain Sliced**

**Shop Drawings: in accordance with Section 01300**

**Extended Warranty: 10 years**

- 4 **Finishes:** Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing. Finish faces, all 4 edges if back is visible or 3 edges if back not visible, edges of cut-outs and mortises.



**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **2 CUT OUTS**

- 1 Hardware Preparation: Provide all cutout, reinforcing and other preparation for hardware. Unless otherwise indicated all latching device will be full concealed mortise systems.

## **3 EXECUTION**

---

### **1 INSTALLATION**

- 1 Install hardware in accordance with hardware templates and manufacturer's instructions.
- 2 Adjust operable parts for correct function.
- 3 Install all doors at a time when adequate protection for them is provided by other trades.
- 4 Install doors and frames as noted to be supplied by Owner.

### **2 PROTECTION**

- 1 Protect installed doors from damage from weather and other construction work.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **1 GENERAL**

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#### **1 RELATED REQUIREMENTS**

- 1 Section 06100: Rough Carpentry
- 2 Section 06200: Finished Carpentry
- 3 Section 08110: Hollow Metal Doors, Frames and Screens
- 4 Section 08210: Wood Doors
- 5 Division 16: General Electrical Provisions

#### **2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.
- 2 The scope of work in this section shall include both the supply and installation of all hardware required to complete the work and ensure all doors, and millwork is finished in operating condition unless the supply and/or installation is included in the allowance as indicated in Section 01020. The allowance shall not include or will be assigned to any work beyond the scope indicated in Section 01020
- 3 The scope of work shall include the coordination, installation and review of hardware supplied but not installed under Section 01020 Allowances, and providing onsite instruction and review of all hardware installed by others.
- 4 The work of this contract shall include the supply and installation of all hardware indicated within this Section

#### **3 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified only by prequalified trades as listed herein:  
JPW Systems

#### **4 HARDWARE SCHEDULE**

- 1 Submit for approval, schedules for all hardware provided under the allowance or indicated in this section, including detailed list of finished hardware complete with description, purpose and location of each hardware item. Revise hardware schedules as often as required by Architect.
- 2 Include a delivery schedule of hardware as part of all submissions, highlighting long delivery items.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **5 TEMPLATES**

- 1 Upon award of Contract, furnish promptly to applicable trades, any patterns, templates, template information and manufacturer's literature required for proper preparation for and application of hardware, in ample time to facilitate progress of work.

### **6 PRODUCT HANDLING**

- 1 Deliver and store materials undamaged in original wrappings or containers with manufacturer's labels and seals intact.
- 2 Pack finishing hardware for each door, etc., where possible, in same carton complete with all screws, expansion shields and necessary fittings for fixing same.
- 3 Clearly label cartons and packages designating contents and locations for which each item is intended. Packing memos shall indicate carton in which each item is packed.

### **7 MAINTENANCE**

- 1 Brief maintenance staff regarding proper care of hardware such as lubrication of locksets, adjustments of door closures, cleaning, general maintenance, etc.

### **8 CASH ALLOWANCE**

- 1 See Section 01020 - Allowances - for hardware allowance. The allowance shall include the following:
- 2 Coordination Meeting with trades installing door and frames, installing hardware, making electrical and electronic connections.
- 3 The supply and installation of hardware to doors using electronic components.
- 4 Supply of all hardware to all other door systems
- 5 Supply only of all millwork hardware
- 6 A complete review and report of all hardware installations as part of the substantial completion review.
- 7 Complete a final review of all deficiencies. Provide all necessary manuals to the Contractor and instruct the Owner's representative in the proper use and maintenance of all material and systems provided.
- 8 The scope of the allowance shall not include installation or coordination of any hardware unless specifically indicated. No additional cost for hardware supplied and/or installed under this section will be permitted without the approval of the Architect.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

## **2 PRODUCTS**

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### **1 QUALITY**

- 1 In every case, hardware shall be of quality, design and finish suitable for purpose of which it is intended.

### **2 FINISHES**

- 1 Type and finish of hardware shall be in accordance with, and equal in all respects to samples of hardware and finishes approved by the Architect.
- 2 Metal finishes shall be free from defects, clean and unstained, and of uniform colour and finish for each type of finish required.

### **3 FASTENINGS**

- 1 Hardware shall be complete with screws, bolts, expansion shields and other fastening devices as required for satisfactory installation and operating of hardware.
- 2 Fastening devices shall be of same finish as hardware that is to be fastened.
- 3 Unless otherwise indicated all latching devices shall require doors to be prepared for full mortise hardware.

## **3 EXECUTION**

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### **1 INSTALLATION**

- 1 Carefully follow manufacturer's instructions for installation of finish hardware.
- 2 Provide on site training for the installation of hardware by others.
- 3 Coordinate with electrical subtrade all electrical and electronic connections with other systems within the project. Make all final connection to electrical or electronic hardware and ensure they are in working order.
- 4 Refer to Paragraph 1.1 for installation of hardware specified elsewhere.

### **2 FINAL ADJUSTMENT**

- 1 The hardware supplier shall provide services of a competent mechanic, without additional cost to Owner. This mechanic shall inspect installation of all hardware furnished under this Section and supervise all adjustments (by trades responsible for fixing) which are necessary to leave hardware in perfect working order.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **3 FINISH HARDWARE**

Be prepared to install hardware on all doors and millwork unless otherwise indicated in the Section 01020 Allowances or approved by the Consultant in shop drawing review process.

#### **1 Millwork to be installed under Section 06200**

**Doors:** Three way adjustable fully concealed door hardware opening to a minimum 100 degrees, complete with "D" 152mm (6") pulls, fully recessed door and drawer locks

**Drawers:** Fully concealed ball bearing steel drawer hardware permitting full extension of the drawer, complete with "D" 152mm (6") pulls, fully recessed door and drawer locks

**Shelving:** Fully recessed metal pilaster strips with metal clips to support adjustable shelves.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2019 03 15 tm

### 1 GENERAL

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#### 1 RELATED REQUIREMENTS

- 1 Section 08110: Hollow Metal Doors, Frames and Screens
- 2 Section 08210: Wood Doors

#### 2 GENERAL

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.
- 2 All glazing units shall be sized and designed by a Professional Engineer registered in the Province of Ontario.

#### 3 QUALIFICATIONS

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified as approved by the manufacturer.
- 2 **Installer Qualifications:** Minimum five (5) years documented experience installing products specified in this section, and approved by fabricator.

#### 4 MATERIAL STANDARDS

- 1 ANSI Z97.1 - American National Standard for Glazing Materials Used in Buildings -- Safety Performance Specifications and Methods of Test.
- 2 ASTM C 162 - Standard Terminology of Glass and Glass Products.
- 3 ASTM C 864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
- 4 ASTM C 1036 - Standard Specification for Flat Glass.
- 5 ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass -- Kind HS, Kind FT Coated
- 6 ASTM C 1193 - Standard Guide for Use of Joint Sealants.
- 7 ASTM E 283 - Standard Test Method For Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- 8 ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- 9 ASTM E 773 - Standard Test Method for Seal Durability of Sealed Insulating Glass Units.
- 10 ASTM E 774 - Standard Specification for Sealed Insulating Glass Units.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2019 03 15 tm

- 11 ASTM E 1300 - Standard Practice for Determining the Minimum Thickness and Type of Glass Required to Resist a Specified Load.
- 12 GANA (GM) - FGMA Glazing Manual; Glass Association of North America.
- 13 GANA (SM) - FGMA Sealant Manual; Glass Association of North America.

### **5 DESIGN REQUIREMENTS**

- 1 Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass in accordance with the Ontario Building Code.

- 2 Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass to a design pressure in accordance with ASTM E 1300 as follows

Exterior Window Glazing - 1.20 kPa (25 psf)

Exterior Curtainwall - 1.20 kPa (25 psf)

Sloped Glazing - 1.68 kPa (35 psf)

- 3 Limit glass deflection to 19mm (3/4") or flexure limit of glass with full recovery of glazing materials, whichever is less.

### **6 PROTECTION**

- 1 After all glass is set in building, place a patch of whiting on same. Maintain this patch until glass is to be cleaned.

### **7 BREAKAGE**

- 1 Glazier shall be responsible for replacement of all broken glass installed under this section until satisfactory completion of work as specified herein, from which time the contractor shall be responsible for such replacement.

### **8 DELIVERY, STORAGE AND HANDLING**

- 1 Deliver, store, and handle materials under provisions of Section 01600. Deliver all materials to the job site in their original unopened containers, with all labels intact.
- 2 Deliver materials to specified destination in manufacturer's or distributor's packaging, undamaged, complete with installation instructions. Store materials in strict accordance with manufacturer's recommendations.
- 3 Do not expose material to temperatures greater than 48.9 degrees C (120 degrees F) during storage and transportation.
- 4 Store off ground, under cover, protected from weather and construction activities.
- 5 Do not expose the non-PVB side of glass to UV light.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2019 03 15 tm

### **9 SAMPLES AND SHOP DRAWINGS**

- 1 Submit engineered shop drawings with type and placement of materials for approval.

Product Data: Flat glass materials manufacturer's descriptive literature indicating conformance to specified performance requirements for specified flat glass materials.

- 2 Design Data: Glass size calculations, prepared in accordance with specified method.

- 3 Certificates: a. Contractor's certification that:

Products of this section, as provided, meet or exceed specified requirements.

Fabricator of sealed insulating glass units meets specified qualifications.

Installer of products of this section meets specified qualifications.

- 4 Submit samples of each type of glass as indicated:

Flat Glass Materials: Two 102mm (4") by 102mm (4") samples of each glass type specified.

Sealed Insulating Glass Units: Two 305mm (12") by 305mm (12") samples representative of unit construction.

Opacifier for Spandrel Glass: Indicated match to Architect's color selection.

### **10 ENVIRONMENTAL CONDITIONS**

- 1 Glaze with compounds, sealants, or tapes only when glazing surfaces are at temperature is below that recommended by sealant manufacturer. Obtain approval of glazing methods and protective measures which will be used during glazing operations from the Architect.

### **11 TESTING**

- 1 A minimum of two units selected at random by the testing company shall be examined to ensure construction matches the specifications. This testing will be completed by a testing company selected by the Owner under the Testing Allowance - Section 01020
- 2 Failure of either unit to meet specification will require further testing as determined by the Architect. All further testing will be done at no expense to the contract.

### **12 QUALITY ASSURANCE**

- 1 Glazing Standards: FGMA Glazing Manual and Sealant Manual.
- 2 Each lite shall bear permanent, nonremovable label of UL or WHI certifying it for use in tested and rated fire resistive assemblies.
- 3 Permanently label each piece of Pilkington Pyrostop with the Pyrostop logo, UL and/or WHI logo and fire rating in sizes up to 2.77sq. m. (4,290 sq. in.)



22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2019 03 15 tm

### 13 WARRANTY

- 1 Provide a warranty for 10 years to include all material and labour required for the replacement of sealed glass units exhibiting seal failure, interpane dusting or misting.
- 2 Provide a warranty for 10 years to include all material and labour required for the replacement of laminated glass exhibiting delamination.

## 2 PRODUCTS

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### 1 MATERIALS

- 1 **Sheet Glass:** 'B' quality glass of weights and thickness as indicated below, and used for glazed screens with sills above 1067mm (42"), glazing above 2134mm (84") in screens or otherwise specified or detailed.

Each light shall be labeled showing quality of glass and indicating direction of draw lines

Supply all glass so that draw lines will run horizontally when installed. Labels shall remain on glass until final cleaning and inspection of same is made before building is turned over to Owners. All sheet glass shall be in accordance with CAN/CGSB Specification 12.2.

#### Maximum Square Footage for Annealed Units

6mm - 6.51sq.m. (70.00 sq.ft.)

Panes over 6.51sq.m. (70.00 sq.ft.) - the manufacturer shall provide engineered shop drawings.

- 2 **Polished Plate Glass:** standard glazing quality 6 mm (1/4") thick, with edges clean cut, but not nipped. Plate or float glass shall be in accordance with CAN/CGSB 12.3.
- 3 **T.P.G. - Tempered Plate Glass:** 6 mm (1/4") Herculite as manufactured by Canadian Pittsburgh Industries Ltd. or 6mm (1/4") conforming to CAN/CGSB 12.1.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2019 03 15 tm

- 4 **Non Wired Fire Rated Glass:** to CAN4 S-104 AND 106, ASTM E 119  
The Pilkington Group - Pyrostop fire-rated, safety-rated, heat barrier ceramic glass or an equivalent product approved equal by the Architect.  
  
**Thickness / Size:** thickness as per engineered shop drawings  
**Colour:** Clear unless otherwise specified  
**Shop Drawings:** Provide engineered shop drawings in accordance with Section 01300
- 5 **Laminated Glass:** incorporating an interlayer of 0.762mm (0.030"), or greater, to meet or exceed ASTM 1036-90, Consumer Product Safety Commission (CPSC) Standard for Architectural Glazing Materials 16 CFR 1201 Category I & II, CAN/CGSB 12.1, Guidelines of LSGA, UL 752, UL 972, ANSI Z97.1-1984 Specification for Safety Glazing.
- 6 **Heat Strengthened Glass:** in thicknesses indicated herein or indicated within approved engineered shop drawings. Meeting the the requirements of ASTM C 1036-90, ASTM C 1048-90, CAN/CGSB 12.3
- 7 **Architectural Window Film:**  
Solyx Decorative Films - Solyx SXJ-0582 window film with silicone liner or an equivalent product approved equal by the Architect.  
  
**Thickness / Size:** 2mil  
**Colour:** SXJ-0582 Matte Dual Dot Gradient
- 8 **Mirror:** Type 1A-float glass, conforming to CAN/CGSB 12.5.

## 2 GLAZING MATERIALS

- 1 **Setting Blocks:** ASTM C 864, neoprene, 80 to 90 Shore A durometer hardness; length 4 inches (100 mm), width of glazing rabbet space less 1.5mm (1/16 inch), height required for glazing method, pane weight, and pane area.
- 2 **Spacer Shims:** ASTM C 864, neoprene, 50 to 60 Shore A durometer hardness; length 75mm (3 inches), one half height of glazing stop, thickness required for application , one face self-adhesive.
- 3 **Glazing Tape:** Butyl compound tape with integral resilient tube spacer, 10 to 15 Shore A durometer hardness, black color, coiled on release paper; widths required for specified installation.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2019 03 15 tm

- 4 **Glazing Tape:** Closed cell polyvinyl chloride foam, maximum water absorption by volume 2 percent, designed for 25 percent compression percent for air barrier and vapor retarder seal, black color, coiled on release paper over adhesive on two sides; widths required for specified installation.
- 5 **Glazing Splines:** ASTM C 864, resilient polyvinyl chloride, extruded shape to fit glazing channel retaining slot; black color.
- 6 **Glazing Gaskets:** ASTM C 864, resilient polyvinyl chloride, extruded shape to fit glazing channel retaining slot; black color.
- 7 **Glazing Clips:** Manufacturer's standard type.
- 8 **Sealants:** Specified in Section 07900.
- 9 Ensure that glazing sealants used are compatible with insulating glass sealant.

### **3 GLAZING COMPOUND FOR FIRE-RATED GLAZING MATERIALS**

- 1 Glazing Tape: Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent, designed for compression of 25 percent to effect an air and vapor seal.
- 2 Silicone Sealant: One-part neutral curing silicone, medium modulus sealant, Type S; Grade NS; Class 25 with additional movement capability of 50 percent in both extension and compression (total 100 percent); Use (Exposure) NT; Uses (Substrates) G, A, and O as applicable. Available Products: Dow Corning 795 or as approved by glass manufacturer
- 3 Setting Blocks: Hardwood, glass width by 100mm (4") by 5mm (3/16") thick.
- 4 Spacers: Neoprene or other resilient blocks of 40 to 50 Shore A durometer hardness, adhesive-backed on one face only, tested for compatibility with specified glazing compound.
- 5 Cleaners, Primers, and Sealers: Type recommended by manufacturer of glass and gaskets.

### **4 GLAZING SCHEDULE**

- 1 Glazing in all exterior and interior non rated doors shall be tempered.
- 2 All glazing panels in exterior and interior non rated frames lower than 1070mm (42") to the finished floor shall be tempered.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2019 03 15 tm

- 3 **Glass Railings:** 12mm (1/2") clear tempered.
- 4 **Interior Glazing in Fire Rated Doors and Frames:** unless otherwise specified all fire rated glazing shall be wireless as specified
- 5 **All Other Glazing:** Polished plate glass

### **5 FABRICATION**

- 1 **Heat-Strengthened Glass:** Cut float glass materials to indicated sizes and provide cut-outs and holes, if indicated, before heat strengthening. Heat strengthen float glass materials in accordance with ASTM C 1048, Kind HS.
- 2 **Tempered Glass:** Cut float glass materials to indicated sizes and provide cut-outs and holes, if indicated, before heat strengthening. Fully temper float glass materials in accordance with ASTM C 1048, Kind FT.
- 3 **Laminated Glass:** Cut float glass materials to indicated sizes and provide cut-outs and holes, if indicated, before heat strengthening. Heat strengthen float glass materials in accordance with ASTM C 1048, Kind HS. Laminate plastic interlayer between glass panes in accordance with ASTM C 1172. Laminated glass to conform to GANA (LGDG) and requirements of ANSI Z97.1.

## **3 EXECUTION**

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### **1 GENERAL**

- 1 Install materials in accordance with manufacturer's specifications ensuring that each material in the glazing system is compatible with the others.
- 2 Verify that glazing channels and recesses are clean and free of obstructions, that weeps are clear, and that channels and recesses are ready for glazing.
- 3 All surfaces receiving glazing materials shall be thoroughly wiped with a clean cloth and dampened with the appropriate cleaner, as approved by the sealant manufacturer. Special precautions must be taken in cold weather to ensure the surfaces are free from frost.
- 4 Verify that openings for glazing are correct size and within tolerance.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2019 03 15 tm

- 5 Erect windows and entrances in openings complete with all necessary reinforcing and incidental components.
- 6 Seal all joints between frames and adjacent surfaces to provide a completely weather tight enclosure.
- 7 A full size detail of the glazing and metal system must be submitted for approval prior to start of job. Metal die drawings are required when applicable. Placement of materials must be shown on the detail. If sash from the fabricator differs from the submitted detail, the principal parties must resolve differences before proceeding.
- 8 Glazing to be undertaken at temperatures recommended by manufacturer of glazing materials.

## **2 GLAZING**

- 1 Size glass units to accurately fit openings with clearances according to glass manufacturer's recommendations.
- 2 Tape shall be cut to proper length prior to application.
- 3 Each tape section shall butt the adjoining tape and be united with a tool or coin to eliminate any opening. Dab the butted tape joint with sealant for maximum leak-proof security.
- 4 Where the glazing channel is offset, the difference in the rabbet width should be compensated by employing different sizes of exterior glazing material. The difference should be equal to size of the offset.
- 5 Immediately prior to setting glass, paper backing shall be removed from the glazing tape. Dab the butted tape joint with sealant.
- 6 Locate setting blocks in the sill member at quarter points. Setting blocks must be set equal distant from centre line of the glass and 1.5 mm (1/16") less than full rabbet width and high enough to provide the recommended bite and edge clearances. Set edge block according to glass manufacturer's recommendations.
- 7 Set glass. The glass shall be pressed firmly against the tape to achieve full contact. Tape compression can be achieved with a compression tool prior to installing the interior stop or with a PVC wedge after the interior stop has been placed. This is mandatory when polyshim tape is used to obtain full compression of the unit to the shim.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2019 03 15 tm

- 8 A cap bead of silicone is required when using banded sealed units.

### **9 Glazing Gasket**

.1 The gasket shall be cut approximately 1.6 mm (1/16") per 305 mm (1') longer than the respective channel. Cut ends of gasket to be about a 45° angle so that top is longer than the base.

.2 In setting the gasket into the channel between the glass and removable stops, the horizontal strips (head and sill) shall be set first, then the vertical (jamb) strips.

## **3 SEALING**

- 1 Seal all joints between frames and adjacent surfaces and where indicated, provide a completely weather tight and airtight enclosure.
- 2 Application of sealant shall be in strict accordance with manufacturer's printed direction. The sealant shall be applied to a clean, dry, grease and oil-free surface. Sealant shall be smooth, free from ridges, wrinkles and embedded foreign materials.
- 3 Remove excess sealant droppings, which would set up or become difficult to remove from the surfaces. Chemicals, scrapers or other tools, which would effect finished surfaces, shall not be used for such removal. Finished surfaces damaged due to this work shall be replaced at this section's expense to the satisfaction of the Architect.

## **4 INSTALLATION OF FIRE RATED GLAZING**

- 1 Comply with referenced FGMA standards and instructions of manufacturers of glass, glazing sealants, and glazing compounds.
- 2 Protect glass from edge damage during handling and installation. Inspect glass during installation and discard pieces with edge damage that could affect glass performance.
- 3 Cut glazing tape to length and set against permanent stops, flush with sight lines to fit openings exactly, with stretch allowance during installation.
- 4 Place hardwood setting blocks located at quarter points of glass with edge block no more than 152mm (6") from corners.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2019 03 15 tm

- 5 Glaze vertically into labeled fire-rated metal frames or partition walls with same fire rating as glass and push against tape for full contact at perimeter of pane or unit.
- 6 Place glazing tape on free perimeter of glazing in same manner described above.
- 7 Do not remove protective edge tape.
- 8 Install removable stop and secure without displacement of tape.
- 9 Do not pressure glaze.
- 10 Glaze exterior openings with PVB layer toward the exterior of the building.
- 11 Knife trim protruding tape.
- 12 Apply cap bead of silicone sealant along void between the stop and the glazing, to uniform line, with bevel to form watershed away from glass. Tool or wipe sealant surface smooth.
- 13 Provide minimum 5mm (3/16") edge clearance.
- 14 Install in vision panels in fire-rated doors to requirements of NFPA 80.
- 15 Install so that appropriate UL & Pilkington Pyrostop markings remain permanently visible.

### **7 SCOPE OF GLAZING WORK**

- 1 Installation of glazing in handrails and guards is specified in Section 05500.
- 2 Installation of glazing in steel doors and borrowed-lite partitions is specified in Section 08110.
- 3 Installation of glazing in flush wood doors is specified in Section 08211.

### **8 CLEANING**

- 1 Remove glazing materials from finish surfaces.
- 2 Remove labels after glass installation is complete.
- 3 Clean glass surfaces and adjacent surfaces.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Jul 27 04 tm

### 1 GENERAL

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#### 1 RELATED REQUIREMENTS

- 2 Section 05500: Miscellaneous Metal Fabrication
- 3 Section 06100: Rough Carpentry
- 4 Section 09250: Gypsum board
- 5 Section 09250: Gypsum Board

#### 2 GENERAL

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.

#### 3 QUALIFICATIONS

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified licensed under the requirements of the governing authority.

### 2 PRODUCTS

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#### 1 MATERIALS

- 1 **Non-load bearing channel stud framing:** to ASTM C645-76 stud size as noted on the drawing, roll formed from 0.5 mm (25 gauge) thickness electro galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 460 mm centres.
- 2 **Floor and ceiling tracks:** to ASTM C645-76, in width to suit stud sizes, 30 mm flange height. 50 mm flange height where specifically called for.
- 3 **Metal channel stiffener:** 40 mm size, 2 mm thick cold rolled steel, coated with rust inhibiting coating.
- 4 **Acoustical sealant:** to CGSB 19-GP-21M.
- 5 **Metal Strapping:** Galvanized steel hat section horizontal strapping by Vic Westeel shall be a minimum of 19mm (0.75") thick.



22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Jul 27 04 tm

### **3 EXECUTION**

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#### **1 ERECTION**

- 1 All walls of separations as required by the building code or indicated in these documents shall be fully extended to the structural deck above with all openings fire stopped. Review location of structural elements that might conflict with these separations. Notify Consultants of conflicts before commencing working.
- 2 Align partition tracks at floor and ceiling and secure at 600 mm O.C. maximum. For exterior wall, apply two rows of caulking strips before installation of track.
- 3 Place studs vertically at 400 mm O.C. and not more than 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.
- 4 Erect metal studding to tolerance of 1:1000.
- 5 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.
- 6 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other sections.
- 7 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50 mm apart, using column clips or other approved means of fastening placed alongside frame anchor clips.
- 8 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.
- 9 Provide 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.
- 10 Install steel studs or furring channel between studs for attaching electrical and other boxes.
- 11 Extend partitions to ceiling height except where noted otherwise on drawings.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Jul 27 04 tm

- 12 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use 50 mm leg ceiling tracks.
- 13 Install continuous insulating strips to isolate studs from uninsulated surfaces.
- 14 Install two continuous beads of acoustical sealant behind studs and tracks around perimeter of sound control partitions.

### **2 REINFORCING TO DOOR FRAMES**

- 1 Unless other reinforcing is indicated all metal door openings in a metal stud walls shall have both jambs reinforced as indicated in this section. Reinforcing shall comply with Section 05500. Reinforcing shall be contained within the wall structure and run continuous from the floor to the roof or floor structure above.

For reinforcing greater than 3m (10'-0") in height: HSS 75 x 75 x 6 mm

For reinforcing less than 3m (10'-0") in height where steel studs and drywall are not continuous to deck above: Steel angle 75 x 75 x 6 mm

All other situations shall be reinforced based on stud manufacturers specifications

- 2 Where double metal door openings are indicated greater than 1.83m (6'-0") provide head reinforcing: Steel angle 75 x 75 x 6 mm
- 3 Secure reinforcing top and bottom to permit design deflection in structure.

**22-05-0014**

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Feb 07 06 tm

**1 GENERAL**

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**1 RELATED REQUIREMENTS**

- 1 Section 06100: Rough Carpentry
- 2 Section 06200: Finished Carpentry
- 3 Section 09250: Gypsum Board
- 4 Section 09511: Acoustical Panels and Tiles
- 5 Section 09900: Painting
- 6 Division 15: General Mechanical Provisions
- 7 Division 16: General Electrical Provisions

**2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.
- 2 The contractor and subcontractors are responsible for providing the materials, equipment and procedures as specified within these documents, including the specification, drawings or addenda. It is the responsibility of this contract to provide all materials available on the date the contract was signed. Products no longer available or discontinued before the contract date will be subject to revision by a Change Order. Products discontinued or no longer available subsequent to the contract date shall be substituted with the Consultant's approval by the Contractor for products of similar or superior quality at no additional cost.

**3 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified licensed under the requirements of the governing authority.

**4 REFERENCE STANDARDS**

- 2 Installation: to ASTM C636-76 except where specified otherwise.

**5 DESIGN CRITERIA**

- 1 Maximum deflection: 1/360th of span to ASTM C635-78 deflection test.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

*Feb 07 06 tm*

### **6 SAMPLES**

- 1 Submit one representative model of each type of ceiling suspension system in accordance with Section 01300.
- 2 Ceiling system to show basic construction and assembly, treatment at walls, recessed fixtures, splicing, interlocking, finishes, acoustical unit installation.

## **2 PRODUCTS**

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### **1 MATERIALS**

- 1 **T-Bar Suspension: to ASTM C635-78.**  
**Armstrong - Prelude XL 24mm (15/16") Exposed Tee Grid or an equivalent product approved equal by the Architect.**

**Colour: White**

**Mockups / Samples: provide samples in full range of colours and finishes for specified products**

- 2 Basic materials for suspension system: commercial quality cold rolled steel, zinc coated.
- 3 Exposed tee bar grid components: enamel finish. Components die cut. Main tee with double web, rectangular bulb and 25mm rolled cap on exposed face. Cross tee with rectangular bulb; web extended to form positive interlock with main tee webs; lower flange extended and offset to provide flush intersection.
- 4 Hangers: galvanized soft annealed steel wire, 3.6mm thick for access tile ceilings. Secure to structure.
- 5 Accessories: splices, clips, wire ties, retainers and wall moulding to compliment suspension system components, as recommended by system manufacturer.

### **2 MANUFACTURERS**

- 1 Armstrong

## **3 EXECUTION**

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### **1 INSTALLATION**

- 1 Do not erect ceiling suspension system until anchors, blocking, sound or fire barriers, electrical and mechanical work above ceiling have been inspected and approved by the Architect.
- 2 Lay out system according to reflected ceiling plan.

**22-05-0014**

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

*Feb 07 06 tm*

- 3 Ensure suspended system is coordinated with location of related components.
- 4 Install wall mould to provide correct ceiling height. Finished ceiling system to be level within 1:1200.
- 5 Support suspension system main runners at 1.2 m o.c. maximum with hanger wire from building structural system. The suspension system shall not be supported from ductwork, conduit, or piping. Completed assembly to support super-imposed loads, such as lighting fixtures, diffusers, grilles and speakers.
- 6 Support light fixtures with supplemental hangers within 150mm of each corner and at maximum 600mm around perimeter of fixture.
- 7 Interlock cross member to main runner to provide rigid assembly.
- 8 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.

**2 CLEANING**

- 1 Touch up scratches, abrasions, voids and other defects in painted surfaces.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2017 02 10

### **1 GENERAL**

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#### **1 RELATED REQUIREMENTS**

- 1 Section 06100: Rough Carpentry
- 2 Section 09111: Metal Stud Systems
- 3 Division 15: General Mechanical Provisions
- 4 Division 16: General Electrical Provisions

#### **2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.

#### **3 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified

#### **4 REFERENCE STANDARDS**

- 2 Do work to CSA A82.31-1977 except where specified otherwise.

### **2 PRODUCTS**

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#### **1 GYPSUM BOARD**

- 1 **Non Rated Drywall:** to CSA A82.27-M91 standard, 1200mm wide x maximum practical length, ends square cut, edges tapered.  
Walls: 15.9 mm thick (5/8") or as indicated. Refer to drawings.  
Ceiling: 15.9 mm thick (5/8") or as indicated. Refer to drawings.
- 2 **Fire rated Drywall:** conforming specifically to ULC 40 U 18.23 and generally to CSA A82.27-M91, 15.9mm 5/8" thick 1200mm wide x maximum practical length.
- 3 **Impact Resistant:** CGC Fiberock VHI, 15.9 mm (5/8") thick
- 4 **Water Resistant Drywall:** to CSA A82.27-M91, standard 12.7mm thick, 1220mm (48") wide x maximum practical length.
- 5 **Cement Board:** Standard Durock by C.G.C. for interior use only.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2017 02 10

- 6 **Plywood Sheathing to Interior Walls:** Various thicknesses to be used, where noted. Typically Douglas fir plywood is recommended and typically G1S. (Good One Side)

### **2 METAL FURRING CHANNELS**

- 1 Metal furring channels, inserts, anchors: to CSA A82.30-M1980.
- 2 Drywall furring channels: 0.5mm core thickness galvanized steel channels for screw attachment of gypsum board.

### **3 FASTENINGS AND ADHESIVES**

- 1 Nails, screws and staples: to CSA A82.31-1977.
- 2 Stud adhesive: to CGSB 71-GP-25M.
- 3 Laminating compound: to CSA A82.31-1977 asbestos free.

### **4 ACCESSORIES**

- 1 **Casing, beads, corner beads fill type:** 0.5mm base thickness commercial grade sheet steel with G90 zinc finish to ASTM A5250-78a; perforated flanges; one piece length per location.
- 2 **Cornice cap:** 12.7mm deep x partition width, of 1.6mm base thickness galvanized sheet steel.
- 3 **Shadow mould:** 35mm high, snap-on trim, of 0.6mm base steel thickness galvanized sheet prefinished in satin enamel white colour.
- 4 **Acoustic sealant:** to CGSB 19-GP-21M.
- 5 **Vapour Barrier:** to CAN 2-51.33-M77, Type 2, 10 mil.
- 6 **Insulating strip:** rubberized, moisture resistant, 3mm closed cell neoprene strip, 12mm wide, with self sticking permanent adhesive on one face; length as required.
- 7 **Joint Compound:** to CSA A82.31-1977, asbestos free.

### **5 BATT INSULATION**

- 1 **Mineral Wool:** ROXUL a mineral wool fibre insulation made from basalt rock and steel slag by Roxul Canada Limited. To be used where noted.
- 2 **Fiberglass:** Full framing thickness Acoustic Fiberglas Batt manufactured by Fiberglas Canada Ltd. (regular building insulation) in walls unless otherwise specified

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2017 02 10

### **3 EXECUTION**

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#### **1 DRYWALL SCHEDULE**

- 1 Provide the following material to areas to receive drywall unless otherwise specified.
- 2 Ceilings and walls - 15.5mm (5/8") fire rated unless indicated otherwise.
- 3 All washroom walls - 12.7mm (1/2") water resistant drywall unless indicated otherwise.
- 4 Walls covered in tile - 50mm (1/2") interior cement board.
- 5 All walls of separations as required by the building code or indicated in these documents shall be fully extended to the structural deck above with all openings fire stopped. Review location of structural elements that might conflict with these separations. Notify Consultants of conflicts before commencing working.
- 6 Unless otherwise specified all interior walls shall extend fully, including finished drywall to the underside of the deck above. All deck cavities shall be stopped and joints in exterior walls sealed to maintain the vapour barrier.

#### **2 WALL FURRING**

- 1 Install wall furring for gypsum board wall finishes in accordance with CSA A82.31-M1980, except where specified otherwise.
- 2 Frame openings and around built-in equipment, cabinets, access panels, on four sides, extend furring into reveal. Check clearance with equipment supplier.
- 3 Furr duct shafts, beams, columns, pipes and exposed services where indicated.

#### **3 GYPSUM BOARD APPLICATION**

- 1 Do not apply gypsum board until bucks, anchors, blocking, electrical and mechanical work is approved.
- 2 Apply single layer gypsum board to wood or metal furring or framing using screw fasteners. Maximum spacing of screws 300mm o.c.
- 3 Apply single layer gypsum board to concrete and or concrete block surfaces, where indicated, using laminating adhesive.



**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2017 02 10

- 4 Apply Fire Rated gypsum board where indicated, to obtain specified fire separations.
- 5 Apply water resistant gypsum board to wall and ceilings of all washroom/bathroom areas not to be tiled.
- 6 Apply 12mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts in partitions.

### **4 INSTALLATION OF BATT INSULATION**

- 1 Install insulation between studs to stud thickness.

### **5 ACCESSORIES**

- 1 Erect accessories straight, plumb, or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges.
- 2 Install casing beads around perimeter of suspended ceilings.
- 3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.
- 4 Install insulating strips continuously at edges of gypsum board or casing beads abutting metal window or exterior door frames, to provide thermal break.

### **6 CONTROL JOINTS**

- 1 Construct control joints of two back-to-back casing beads set in gypsum board facing and supported independently on both sides of joint.
- 2 Provide continuous polyethylene dust barrier behind and across control joints.
- 3 Locate control joints at changes in substrate construction.
- 4 Install control joints straight and true.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2017 02 10

### **7 ACCESS DOORS**

- 1 Install access doors to electrical and mechanical fixtures specified in respective sections.
- 2 Rigidly secure frames to furring or framing systems.

### **8 TAPING AND FILLING**

- 1 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.
- 2 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
- 3 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after painting is completed.
- 4 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- 5 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for painting.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2019 03 28

**1 GENERAL****1 RELATED REQUIREMENTS**

- 1 Section 06100: Rough Carpentry
- 2 Section 09250: Gypsum Board
- 3 Section 09330: Stair Nosings and Tactile Strips

**2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.
- 2 The contractor and subcontractors are responsible for providing the materials, equipment and procedures as specified within these documents, including the specification, drawings or addenda. It is the responsibility of this contract to provide all materials available on the date the contract was signed. Products no longer available or discontinued before the contract date will be subject to revision by a Change Order. Products discontinued or no longer available subsequent to the contract date shall be substituted with the Consultant's approval by the Contractor for products of similar or superior quality at no additional cost.

**3 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified only by prequalified trades as listed herein:

Andrigo Tile, London  
Bernardo Group; London  
Dave Scholten Flooring  
Decortile, St. Jacobs  
Flatout Flooring, London  
Flooring and Design Centre, London  
Floorsource, London  
Grand Valley Tile, Kitchener  
Great Floors Ingersoll Inc., Ingersoll  
I.C.I. Marble and Tile, Cambridge  
Interior floor and Wall Covering Ltd., London  
New Hamburg Flooring, New Hamburg  
Superior Flooring, London  
The Classic Touch, London  
Twin City Tile Co., Kitchener  
Volls Contract, Elmira

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2019 03 28

- 2 Work shall be carried out by a recognized specialist firm in accordance with Manual 200 1979 of Terrazzo Tiles and Marble Association of Canada.
- 3 The installer must employ skilled mechanics/applicators trained and experienced in terrazzo work. Company must be registered as members in good standing with the Terrazzo, Tile and Marble Association of Canada, with a minimum of three years proven experience. If requested by Consultant, submit a listing of at least three previously completed projects of similar size and scope.

### **4 REFERENCE STANDARDS**

- 1 Manual 200 1979 of TTMAC.

### **5 SAMPLES**

- 1 Submit samples of tiles in colour and types selected to Architect for approval.
- 2 No materials shall be purchased until approval is given.
- 3 Approval of samples shall not be construed as an acceptance of work subsequently carried out.

### **6 MAINTENANCE DATA**

- 1 Provide data for recommended cleaning/maintenance methods and materials for incorporation into Manufacturer's Data Book specified in Section 01700.

### **7 ENVIRONMENTAL CONDITIONS**

- 1 Commence work after areas are 'closed in' and conditions will allow proper curing.
- 2 Maintain building temperature of 13°C. (53°F) minimum and 24°C. (75°F) maximum for 72 hours prior, during and after application.
- 3 Avoid concentrated or irregular heat during drying. Provide ventilation to dry tile work properly.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2019 03 28

## 2 PRODUCTS

### 1 MATERIALS

- 1 **Tiles:** shall be first quality material. Tiles installed outside shall be frost free and with no more than 3% water absorption.

- 2 **Ceramic Tile Wall - Type 1 :**  
Centura - York or an equivalent product approved equal by the Architect.

Thickness / Size: 300mm x 600mm (12" x 24")

Colour: as selected by Architect

Finish: Matte

Mockups / Samples: provide samples in full range of colours and finishes for specified products

- 3 **Ceramic Tile Wall - Type 2 :**  
Centura - Lanse or an equivalent product approved equal by the Architect.

Thickness / Size: 50mm x 250mm (2" x 10")

Colour: as selected by Architect

Finish: Matte

Mockups / Samples: provide samples in full range of colours and finishes for specified products

- 4 **Ceramic Tile Floor - Type 1:**  
Centura - Purestone or an equivalent product approved equal by the Architect.

Thickness / Size: 300mm x 600mm x (12" x 24")

Colour: as selected by Architect

Finish: Natural

Mockups / Samples: provide samples in full range of colours and finishes for specified products

- 5 **Ceramic Tile Floor - Type 2:**  
Olympia - Uptown or an equivalent product approved equal by the Architect.

Thickness / Size: 300mm x 600mm (12" x 24")

Colour: as selected by Architect

Finish: Matt

Mockups / Samples: provide samples in full range of colours and finishes for specified products

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2019 03 28

**6 Mortar for Stone, Marble, Granite or Ceramic Tile:**

H.B, Fuller Construction Products Inc. TEC 383 for interior use

H.B, Fuller Construction Products Inc. TEC 3N1 Performance Mortar for exterior use

Mapei Kerapoxy

Mapei Keralastic/Kerabond mortar system. Note: NOT TO BE USED FOR GRANITE, MARBLE OR OTHER NATURAL STONES.

**7 Grout for Interior or Exterior Ceramic Floor Tile:**

H.B, Fuller Construction Products Inc. TEC Power Grout. Colour to be chosen by Architect.

Mapei Keracolor Floor Grout complete with Mapei Plastijoint acrylic latex additive. Colour to be chosen by Architect.

**8 Grout for Stone, Marble, Granite or Ceramic Tile:** Mapei Kerapoxy. Colour to be chosen by Architect. Note: MUST BE USED ON WALL APPLICATIONS.

**9 Sound Deadening Underlayment:** Mapei Kerafonic - two component mortar used. Kerafonic liquid to dampen surfaces as required.

**10 Base to match Wall - Type 1:**

**Centura - York or an equivalent product approved equal by the Architect.**

**Thickness / Size: 300mm x 600mm (12" x 24")**

**Colour: as selected by Architect**

**Finish: Matt**

**Mockups / Samples: provide samples in full range of colours and finishes for specified products**

**11 Base to match Floor - Type 1:**

**Centura - Purestone or an equivalent product approved equal by the Architect.**

**Thickness / Size: 150mm (6")**

**Colour: to match tile**

**Finish: to match tile**

**Mockups / Samples: provide samples in full range of colours and finishes for specified products**

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2019 03 28

**12 Base to match Floor - Type 2:****Centura - Uptown or an equivalent product approved equal by the Architect.****Thickness / Size: 150mm (6")****Colour: to match tile****Finish: to match tile****Mockups / Samples: provide samples in full range of colours and finishes for specified products****13 Tile Adapters:**

1. Tile to wall: Schluter Rondec-AE, satin anodized aluminum.
2. Tile to flooring - Schluter Schiene-AE - satin anodized aluminum

**3 EXECUTION****1 PREPARATION**

- 1 Thoroughly cure and dry concrete surfaces for quarry or ceramic tile finish. Brush with a soft broom to remove loose particles of dust, dirt, concrete and mortar.

**2 WORKMANSHIP**

- 1 Surfaces to receive tile shall be firm, smooth, level, plumb, square.
- 2 Install tile according to best practice of trades. All faces and joints shall be plumb and true. Form intersections, corners and returns accurately.
- 3 Carry out all work in strict accordance with lines and dimensions shown on drawings. Check all dimensions on site.
- 4 Finished joints shall be completely filled, uniform in appearance without voids. It shall be clean, without excess mortar or grout.

**3 ACOUSTICAL UNDERLAYMENT**

- 1 Underlayment is to be installed on concrete floor cured for a minimum of 28 days, or solid substrate of cement board or plywood. Ensure substrate is solid before commencing work.
- 2 Store and mix underlayment to manufacturer's instructions. Install underlayment to a minimum thickness of 10mm (3/8") using gauging strips. Where necessary, dampen dry porous surfaces with dampening liquid before installing underlayment
- 3 Proceed in limited section approximately 1sq.m. (12 sq.ft.) at a time

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2019 03 28

- 4 Finished surface to be level to a tolerance of 3mm (1/8") in 3m (10'-0") and minimum thickness indicated.
- 5 Provide expansion joints where specified. Do not cover joints with mortar.

**4 INSTALLATION OF TILE**

- 1 Use the recommended notched trowel with sufficient depth to ensure proper epoxy mortar transfer, covering 100% of the tile back.
- 2 Using the flat or straight edge of the trowel, apply a thin, pressure-applied coat to the substrate. Follow immediately with proper and thorough beat-in to flatten the ridges or notches into a continuous bed, allowing at least 25% of the thickness of each tile to be embedded into the epoxy mortar. Following this procedure will minimize air bubbles from reaching the surface and causing pinholes during grouting.
- 3 The entire substrate should be covered, leaving no bare areas between the ridges.
- 4 Do not spread more epoxy mortar than can be covered with ceramic tiles immediately. Set tiles dry (do not soak tiles before application).
- 5 Place tiles firmly into position with a slight twisting motion to ensure good contact with the epoxy mortar.
- 6 Follow immediately with proper and thorough beat-in to flatten ridges or notches into a continuous bed, allowing at least 25% of the thickness of each tile to be embedded into the mortar.
- 7 Make all alignments or adjustments immediately following beat-in.
- 8 Remove smudges from the tile face immediately with a clean sponge and water.
- 9 Do not disturb grout or walk over tiles for at least 24 hours.
- 10 Wash tools and hands immediately with water while material is still fresh.

**5 EXPANSION AND CONTROL JOINTS**

- 1 Provide for expansion and control joints where specified.
- 2 Do not cover or bridge any expansion joints with epoxy mortar.



22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

2019 03 28

- 3 Plan installation so tiles line up on one side of the control or expansion joints.
- 4 Protect tilework with metal strips along both edges or structural building expansion joints.
- 5 Insert sealant manufacturer's specified compressible bead and sealant for expansion and control joints.

**6 APPLICATION AS A GROUT**

- 1 Both the application and clean-up procedures for an entire kit typically should not exceed 45 minutes to one hour at room temperature.
- 2 Do not disturb grout or walk over tiles for at least 24 hours after setting.
- 3 Tile surfaces must be clean, dry and free of any debris.
- 4 All joints must be clean and free of excess setting material, standing water, dust and foreign substances.
- 5 Surface temperature should be maintained between 15°C ( 60°F) and 32°C (90°F) for best results. Cold weather formula 4°C (40°F) and 15°C (60°F).
- 6 Prepare and mix grout as recommended.
- 7 Using a hard green rubber float, force the grout into the joints in a continuous manner, leaving it flush with the tile edge.
- 8 Be certain all joints are well-compacted and free of voids and gaps. Fill the joints with the maximum amount of grout possible.
- 9 Thoroughly remove excess grout from the face of the tile before it loses its plasticity or begins to set. This is most easily accomplished by holding the rubber float at a 90° angle to the tile surface and proceeding diagonally to the joint surface and proceeding diagonally to the joint line, leaving as little epoxy grout on the tile surface as possible.
- 10 Clean tiles immediately after applying each unit of Kerapoxy. Grout and clean in small areas. Do not attempt to use more than one unit before cleaning tiles.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

2019 03 28

**7 CLEANING OF GROUT**

- 1 Before grout hardens on the tile surface, apply a liberal amount of water (cold water is acceptable) to the freshly grouted area and scrub the tile surface diagonally to the joint line using a non-woven nylon scouring pad. Apply a minimum amount of pressure on the pad, rinsing it frequently while cleaning. Always keep a lot of water on the surface being cleaned, but be careful not to get any water in the ungrouted joints ahead.
- 2 Remove the remaining water and residue with a damp, firm cellulose sponge, applying no pressure, and move diagonal to the joint line. Rinse the sponge often and keep rinsing water clean to avoid residue build-up.
- 3 Final clean-up is best accomplished with the use of a towel and two pails of clean water. Dampen the towel in one of the pails of water.
- 4 Drape the clean, damp towel over the newly grouted surface. Holding two corners of the towel, drag it over the tiles. The weight of the damp towel will help to remove any epoxy film still remaining.
- 5 Thoroughly rinse the towel in the second pail of water. Then dampen the towel again in the pail of clean water. Repeat.
- 6 Change the cleaning water often to maintain cleanliness.
- 7 Do not step on freshly cleaned tiles. Permanent damage to grout could result.
- 8 Do not allow surplus epoxy to stain in joints of adjacent areas.
- 9 Do not allow excess water, foam or film to remain on the tile surface. It will be very difficult to remove any spears once hardened. Check the installation the following day to make sure it is completely clean. If the surface has any tacky residue, a neutral cleaner or mild solution of detergent and water is recommended for removal.

**8 TREADS, NOSINGS AND TACTILE STRIPS**

- 1 The work of this section shall include all cutting and levelling required to prepare for this work completed under Section 09660
- 2 Ensure that flooring surfaces are level

**9 CLEAN UP**

- 1 Remove all rubbish and unused material from the site after completion of this work.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **1 GENERAL**

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#### **1 RELATED REQUIREMENTS**

- 1 Section 09130: Suspension System for Acoustic Ceilings

#### **2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.
- 2 The contractor and subcontractors are responsible for providing the materials, equipment and procedures as specified within these documents, including the specification, drawings or addenda. It is the responsibility of this contract to provide all materials available on the date the contract was signed. Products no longer available or discontinued before the contract date will be subject to revision by a Change Order. Products discontinued or no longer available subsequent to the contract date shall be substituted with the Consultant's approval by the Contractor for products of similar or superior quality at no additional cost.

#### **3 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified

#### **4 ENVIRONMENTAL CONDITIONS**

- 1 Commence installation after building enclosed and dust generating activities complete.
- 2 Permit wet work to dry before commencement of installation.
- 3 Maintain uniform minimum temperature of 15°C and humidity of 20 - 40% before and during installation.
- 4 Store materials in work area 48 hours prior to installation.

#### **5 MAINTENANCE MATERIALS**

- 1 Deliver two cartons of acoustical units for maintenance use. Store where directed. Clearly identify contents.
- 2 Maintenance materials to be same production run as installed materials.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

## 2 PRODUCTS

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### 1 MATERIALS

- 1 **Acoustic Materials:** shall be asbestos free and manufacturer shall provide a documented proof.

- 2 **Acoustical Panels Type 1:**  
Armstrong - Type 3150PB, Optima PB, Square Lay-In or an equivalent product approved equal by the Architect.

Thickness / Size: 610mm x 1219mm x 16mm (24" x 48" x 5/8")

Colour: White

Finish: Square Edge

Mockups / Samples: provide samples in full range of colours and finishes for specified products

- 2 **Acoustical Panels Type 2:**  
Armstrong - Type 3150PB, Optima PB, Square Lay-In or an equivalent product approved equal by the Architect.

Thickness / Size: 610mm x 610mm x 16mm (24" x 24" x 5/8")

Colour: White

Finish: Square Edge

Mockups / Samples: provide samples in full range of colours and finishes for specified products

## 3 EXECUTION

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### 1 INSTALLATION

- 1 Install panels in grid.
- 2 Cut panels to fit neatly around grilles, light fixtures, columns, etc.
- 3 Install box around recessed light fixtures and diffusers etc., in fire rated ceiling.

### 2 INSTALLATION OF ACOUSTIC TILE

- 1 Remove existing wood fibre tile.
- 2 Repair any damaged surface.
- 3 Install adhesive bonded to clean, dry and firm substrate. Gypsum board is to be primed prior to installation as per manufacturer's instructions.

**22-05-0014**

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 4 Install acoustic tiles parallel to building lines with pattern running in the same direction.
- 5 Scribe acoustic tiles to fit adjacent work. Butt joints tight and terminate edges with plastic moulding.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **1 GENERAL**

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#### **1 RELATED REQUIREMENTS**

- 1 Section 09330: Tile Work
- 2 Division 15: General Mechanical Provisions

#### **2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.
- 2 The contractor and subcontractors are responsible for providing the materials, equipment and procedures as specified within these documents, including the specification, drawings or addenda. It is the responsibility of this contract to provide all materials available on the date the contract was signed. Products no longer available or discontinued before the contract date will be subject to revision by a Change Order. Products discontinued or no longer available subsequent to the contract date shall be substituted with the Consultant's approval by the Contractor for products of similar or superior quality at no additional cost.

#### **3 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified only by prequalified trades as listed herein:

Andrigo Tile, London  
Bernardo Group; London  
Dave Scholten Flooring  
Decortile, St. Jacobs  
Flatout Flooring, London  
Flooring and Design Centre, London  
Floorsource, London  
Grand Valley Tile, Kitchener  
Great Floors Ingersoll Inc., Ingersoll  
I.C.I. Marble and Tile, Cambridge  
Interior floor and Wall Covering Ltd., London  
New Hamburg Flooring, New Hamburg  
Superior Flooring, London  
The Classic Touch, London  
Twin City Tile Co., Kitchener  
Volls Contract, Elmira

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 2 Installers of treads, nosings and tactile walking surface indicator must have an understanding of the governing regulations and inform the Architect of any issues that might not allow compliance.

### **4 MAINTENANCE DATA**

- 1 Provide data for maintenance of resilient flooring for incorporation into Maintenance Manual specified in Section 01700.

### **5 MAINTENANCE MATERIALS**

- 1 Provide the Owner with one full carton of each of tile used for the project, for a maximum of three colours.
- 2 Maintenance materials to be same production run as installed materials.

### **6 ENVIRONMENTAL REQUIREMENTS**

- 1 Provide dehumidification, heat and enclosures required to ensure the substrate is cure and floor installation can be completed within the agreed construction schedule.
- 2 Maintain minimum 20°C air temperature at flooring installation area for three (3) days before, during and for 48 hours after installation.

## **2 PRODUCTS**

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### **1 MATERIALS**

- 1 **Luxury Vinyl Tile:**  
**Gerflor - Creation 70 or an equivalent product approved equal by the Architect.**

**Thickness / Size: 2.5mm (0.10") thick, 184mm x 1219mm (7.25" x 48")**  
**Colour: as selected by Architect**

- 2 **Base:**  
**Johnsonite - Rubber or an equivalent product approved equal by the Architect.**

**Thickness / Size: 102mm (4") high as indicated**  
**Colour: as selected by Architect**  
**Mockups / Samples: 305mm (12")**

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

top set, 3mm (1/8") thick, coloured rubber, including premoulded end stops, external corners and manufacturer approved adhesive. Toeless base in carpeted areas. Cove base to all other areas. Colour to selected by Architect. Approved Manufacturer: Flexco; Johnsonite and Flextile will be considered if selected colour is available.

**3 Tactile Walking Surface Indicators (TWSI):**

**Kinesik - Stainless Steel Tactile domes with concentric ring pattern or an equivalent product approved equal by the Architect.**

**Thickness / Size: 22mm dia.**

**Colour: Stainless steel 316L**

**4 Rubber Stair Treads: to ISO/FDIS 23599**

**Johnsonite - Angle Fit Rubber Stair Tread with Integrated Riser in Raised Round Finish with Solid Colour Rubber Insert for the visually impaired or an equivalent product approved equal by the Architect.**

**Thickness / Size: lengths to match or exceed full tread width and depth**

**Colour: colour of tread and contrast strip as selected by Architect from complete and extended colour range**

**5 Primers and adhesives:** (waterproof): recommended by flooring manufacturer for specific material on applicable substrate, above, at or below grade.

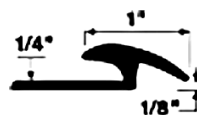
For all new concrete substrate or existing floors with a relative humidity exceed 50% relative humidity but less than 90% relative humidity install flooring using products designed specifically for high humidity including Henry 430 Clear Pro from the W. W. Henry Company or as approved the Architect.

[www.wwhenry.com](http://www.wwhenry.com)

**6 Sub-floor filler:** white premix latex requiring water only to produce cementitious paste.

**7 Metal edge strips:** aluminum extruded, smooth, mill finish with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

**8 Vinyl Transition strips:** Johnsonite CTA-XX-C: 6.35 mm (0.25") carpet to 3.18 mm (0.125") resilient materials



**9 Sealer:** type recommended by flooring manufacturer.



**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **3 EXECUTION**

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#### **1 INSPECTION**

- 1 Ensure concrete floors are dry by using test methods recommended by tile and adhesive manufacturers, and exhibit negative alkalinity, carbonization or dusting.

#### **2 SUB-FLOOR TREATMENT**

- 1 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.
- 2 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured.

#### **3 TILE APPLICATION**

- 1 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturer's instructions. Do not spread more adhesive than can be covered by flooring before initial set takes place.
- 2 Lay flooring with joints parallel to building lines to produce symmetrical tile pattern. Border tiles minimum half tile width.
- 3 Install flooring to square grid pattern with all joints aligned.
- 4 As installation progresses, roll flooring with 45 kg. clean roller to ensure full adhesion.
- 5 Cut tile and fit neatly around fixed or excessively heavy objects.
- 6 Install feature strips and floor markings where indicated. Fit joints tightly.
- 7 Install flooring in pan type floor access covers. Maintain floor pattern.
- 8 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.
- 9 Terminate flooring at centre line of door in openings where adjacent floor finishes or colours are dissimilar.
- 10 Where tile finish is indicated on stairs, install stair nosing in one piece and lay tile before installing one between riser material.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 11 Install metal edge strips at unprotected or exposed edges where flooring terminates.

### **4 STAIR NOSINGS AND TREADS**

- 1 Ensure substrate meets manufacturers specifications before commencing
- 2 Unless otherwise indicated install single piece to match full width and depth of treads.
- 3 Unless otherwise indicated install a single piece to match tread size to mid and floor landings. Provide specified nosing only as indicated on drawings
- 4 Adjacent to back edge of treads to landing provide a 300mm wide (or as otherwise indicated) and the full width of the tread

### **5 DETECTABLE INDICATOR STRIP**

- 1 Provide pathways of indicator strip material as indicated
- 2 Ensure tile pattern is correctly orientated to indicate direction of path

### **6 BASE APPLICATION**

- 1 Set base in adhesive tightly against wall and floor surfaces. Use lengths as long as practicable and not less than 0.5 m long.
- 2 Install straight and level to variation of 1:1000.
- 3 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush doorframes.
- 4 Mitre internal corners. Use premoulded sections for external corners.
- 5 Install toeless type base before installation of carpet on floors.

### **7 CLEANING**

- 1 Remove excess adhesive from floor, base and wall surfaces without damage.
- 2 Clean floor and base surface to flooring manufacturer's instructions.

### **8 PROTECTION OF FINISHED WORK**

- 1 Prohibit traffic on floor for 48 hours after installation.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **1 GENERAL**

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#### **1 RELATED REQUIREMENTS**

- 1 Section 09660: Resilient base
- 2 Division 15: General Mechanical Provisions

#### **2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.
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#### **3 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified as approved by the manufacturer.
- 2 The installer shall be experienced in performing work of this section and who is specialized in the installation of work similar to that required for this project for a minimum of 5 years. Upon request provide the Architect with confirmation from the manufacturer that installers have received installation training.

### **2 PRODUCTS**

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#### **1 CARPET**

- 1 **Carpet - Type 1 (Tile):**  
**Centura - KOOL or an equivalent product approved equal by the Architect.**

**Thickness / Size: 20 oz. (500mm x 500mm) 19.68" x 19.68"**  
**Colour: 15408 Houle**

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

All carpet rolls are to be marked on the back with the direction of the nap.

- 2 **Carpet - Type 2 (Broadloom):**  
**Centura - Contrax II HD Broadloom or an equivalent product approved equal by the Architect.**

**Thickness / Size: 79.25" Broadloom**

**Colour: 60013 Blue Zircon**

- 3 **Adhesive:** as recommended by carpet manufacturers.

### **1 ACCESSORIES TO STAIRS AND RISERS**

- 1 **Riser and Stair Nosing:**  
**Johnsonite - Double Undercut Carpet (VIVCD) Vinyl Stair Nosing or an equivalent product approved equal by the Architect.**

**Thickness / Size: 81mm (3 3/16") tread depth**

**Colour: Colour as selected by Architect**

**Finish: 50mm (2") wide co-extruded strip of contrasting material**

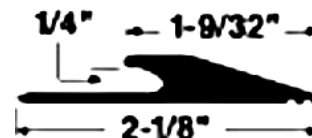
**Mockups / Samples: 305mm (12")**

- 2 **Carpet to Painted Floor Transition Moulding:**  
**Johnsonite - EG-XX-H: transition reducer with undercut for 6mm (1/4") glue down carpet. or an equivalent product approved equal by the Architect.**

**Thickness / Size: 32mm (1 9/32")**

**Colour: Colour as selected by Architect**

**Mockups / Samples: 305mm (12")**



- 3 **Adhesive: Johnsonite #945 Contact Bond Adhesive**  
Application - Brush or roller. (approx. coverage 360 sq. ft./gallon.)
- 4 **Johnsonite #930 Two-Part Epoxy Caulking Compound.**  
Approx. coverage 250 linear ft./gallon of mixture or 50 linear feet of 6mm (1/4") diameter bead with 13-1/2 ounce cartridge

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **3 EXECUTION**

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#### **1 CARPET FINISH**

- 1 Carpet must be installed by tradesmen approved by the manufacturer and the manufacturer shall approve method of installation.
- 2 The finished carpeted areas shall present a smooth wearing surface free from burring or other faults, or embedded foreign material.

#### **2 PREPARATION**

- 1 Surfaces to receive carpet finish shall be thoroughly dry, clean and cured to a hard, non-powdery finish.
- 2 All ridges and high spots shall be ground smooth and cracks filled and depressions leveled.
- 3 Thoroughly vacuum and damp mop area to receive carpet.

#### **3 INSTALLATION**

- 1 Apply adhesive as specified by the manufacturer.
- 2 Embed carpet into adhesive and ensure that all air bubbles in carpet are eliminated.
- 3 Check that seams are tightly fitted at each step and remove any excess adhesive from pile with recommended solvent.
- 4 Roll complete cemented area to obtain maximum bond.
- 5 Install carpet as per approved layout, in as large sections as possible. Where seams are necessary, these shall be located in light traffic areas.
- 6 The carpet in each area shall be from the same dye lots.
- 7 The pile direction of the various widths in any one area shall be the same.
- 8 In all doorways where carpet is jointed, the seam shall be located under the door in its closed position.
- 9 Where carpet meets hard surface flooring, threshold binder bars shall be installed.
- 10 Install carpet on wall where noted on drawings.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **4 CARPET BASE INSTALLATION**

- 1 Where noted on drawings install carpet base to match adjacent carpet flooring complete with binding tape to exposed edges in a colour to compliment or as directed by the Architect, filling all gaps between floor and drywall.

### **5 INSTALLATION OF NOSINGS**

- 1 Provide nosing to all carpeted steps and risers in the auditorium including:
  - stairs from balcony level to second floor foyer,
  - stairs to balcony boxes,
  - all nosings in balcony aisles
  - entire length of nosing to carpeted cross aisle in balcony
  - nosings of steps to exterior on main level of auditorium
- 2 Nosings to all stairs and aisle shall be one piece. On steps in aisles, mitre top, bend face and return nosing along sides.
- 3 Installation should not begin until the work of all other trades has been completed, especially overhead trades.
- 4 Areas to receive stair nosings shall be clean, fully enclosed, weather tight, and maintained at a uniform temperature of at least 21 degrees C (70 degrees F) for 24 hours before, during, and after the installation is completed. The stair nosings and adhesives shall be conditioned in the same manner.
- 5 Stair steps shall be smooth, flat, level, permanently dry, clean and free of all foreign material, such as dust, paint, grease, oils, solvents, curing and hardening compounds, sealers, asphalt, and old adhesive residue.
- 6 Stair Nosings may be installed on any smooth, dry interior step.
- 7 Stair shape shall conform closely to stair nosing contour. An epoxy caulking nose filler shall be applied to ensure a tight fit and eliminate any open spaces between the step edge and stair nosing.
- 8 Stair Nosings shall be trimmed to within 1.6mm (1/16") of the stringer to allow for expansion. Adhesives shall be applied to the stair step surface and the back and nosing area of the stair nosing.
- 9 Stair Nosings shall be rolled, with a J-hand roller, after installation, to ensure proper bonding.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 10 After installation, the photo luminescent material must be thoroughly cleaned with a solution of warm water and a neutral detergent. Apply the solution utilizing a deck brush. Rinse the surface and allow to dry.
- 11 When dry, apply 2 to 3 coats of an acrylic floor finish to the photo luminescent surface. (i.e.: Taski's Brilliant or S.C. Johnson's Showplace or Pronto). The stair nosings should be damp-mopped daily and any build-up of dirt, grease, or other foreign material be removed to ensure the proper operation of the photo luminescent material.
- 12 For spot cleaning or to remove stains, use denatured alcohol with a clean, white cloth or a small brush. Reapply acrylic floor finish as required depending on traffic conditions.

### **6 INSTALLATION ACCESSORIES**

- 1 Provide transition strips to all carpet edge not abutting a wall or nosing, including edges at each riser.
- 2 All transition strips are to be one piece and installed using adhesive in a similar fashion to nosings.

### **7 PROTECTION OF FINISHED WORK**

- 1 Vacuum carpets clean. Protect traffic areas of carpeted floors with polyethylene drop sheets. Tape joints to prevent shifting.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

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**1 GENERAL****1 RELATED REQUIREMENTS**

- 1 Section 05500: Miscellaneous Metal Fabrication
- 2 Division 15: General Mechanical Provisions

**2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.
- 2 Supply all labour, materials, tools and other equipment necessary for completion of this work.
- 3 Examine the specifications for the various other trades and become thoroughly familiar with all their provision regarding their painting. All surfaces that are left unfinished by the requirements of other specifications shall be painted or finished as part of this work.
- 4 The latest edition of the following reference standards shall govern all painting work:

Architectural Painting Specification Manual by the Master Painters Institute (MPI), including Identifiers, Evaluation, Systems, Preparation and Approved Product List. (hereafter referred to as the **MPI** Painting Manual) as issued by the local **MPI** Accredited Quality Assurance Association having jurisdiction.

Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings) of the Environmental Protection Agency (EPA).

National Fire Code of Canada.

**3 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified



22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

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Apr 01 22 ms

- 2 This Contractor shall have a minimum of five (5) years proven satisfactory experience and shall show proof before commencement of work that he will maintain a qualified crew of painters throughout the duration of the work. When requested, Contractor shall provide a list of the last three comparable jobs including, name and location, specifying authority / project manager, start / completion dates and value of the painting work.
- 3 Only qualified journeypersons, as defined by local jurisdiction shall be engaged in painting and decorating work. Apprentices may be employed provided they work under the direct supervision of a qualified journeyperson in accordance with trade regulations.

**4 QUALITY ASSURANCE**

- 1 All paint manufacturers and products used shall be as listed under the Approved Product List section of the **MPI** Painting Manual.
- 2 All materials, preparation and workmanship shall conform to requirements of the latest edition of the Architectural Painting Specification Manual by the Master Painters Institute (**MPI**) (hereafter referred to as the **MPI** Painting Manual) as issued by the local **MPI** Accredited Quality Assurance Association having jurisdiction.
- 3 All materials used shall be exactly as specified in brand and quality. At the request of the Architect provide written verification from the supplier.
- 4 No claim by the painting trade to the unsuitability or unavailability of any material specified, or his willingness to use same, will be entertained unless such claims have been made in writing and submitted at the time of tender.
- 5 All paints, varnishes, enamels, lacquers, stains, paste filler and similar materials shall be delivered in the original containers with the seal unbroken and label intact.
- 6 Before proceeding with any painting, prepare and finish a sample room, complete or in part, as directed by the Architect. Finish all areas or items in accordance with the specifications and colours selected by the Architect.
- 7 Sample areas or items will be inspected by the Architect and/or his representative. If such areas or items are not approved, finish workmanship, appearance and materials approved for similar areas or items throughout the project must be corrected.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Apr 01 22 ms

- 8 Examine sub surface conditions. Report or repair on defects or anything considered unsuitable. Commencement of work indicates acceptance of related work or site conditions. Defect in substrate or work completed by this section shall be repaired and then refinished at no additional cost to the Owner.
- 9 Installers of faux, bronzing and electrostatic finishes must have a minimum of 5 years of experience in the process. Submission of a portfolio of work and references is required.
- 10 Provide samples as indicated in Section 01012.
- 11 Testing required identified herein is within the scope and responsibility of this section and NOT Section 01020

**5 PRODUCT DELIVERY**

- 1 Deliver paints and enamels ready-mixed to job site. All material must be delivered in their original containers with labels intact.
- 2 All materials used on the job shall be stored in a designated place. Such storage place shall be kept neat and all damage thereto or its surroundings shall be made good by the painting trade. All soiled or used rags, waste and trash must be removed from the building every night and every precaution taken to avoid the danger of fire. Latex paint must be stored above freezing temperature.

**6 JOB CONDITIONS**

- 1 CLEANING  
Areas to be painted shall be clean and free of dust and shall remain in that condition throughout the painting process.
- 2 ENVIRONMENTAL REQUIREMENTS  
When surface temperature is below 10°C (50°F) do not apply paint, varnish or special coatings unless otherwise specified. Do not paint exterior during frosty or rainy weather. Avoid painting surfaces while they are exposed to hot sun. Do not apply paint to areas where dust is being generated.

**7 PROTECTION**

- 1 The painter shall not only protect his own work all of the time, but shall also protect all adjacent work and materials by suitable covering or other method during progress of the work.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Apr 01 22 ms

**2 PRODUCTS****1 ACCEPTABLE MANUFACTURERS**

- 1 Benjamin Moore products are specified.

**2 MATERIALS**

- 1 Materials shall be of the specified manufacturer. No combination of products from different manufacturer will be permitted.
- 2 Use products of the same manufacture for each system.

**3 COLOURS**

- 1 All colours to be selected and approved by the Architect.

**4 PAINTING SCHEDULE (Interior finish unless otherwise indicated)****1 Type 1 (Gloss) - MPI Gloss Level 6**

Concrete Block Interior (MPI# INT 4.2A)

1 coat Moorcraft Super Craft Latex Block Filler 285-01 (MPI# 4)

2 coats Ultra Spec HP DTM Acrylic Gloss Enamel M28 (MPI# 114)

Drywall and Plaster (MPI# 9.2A)

1 coat Moorespec Interior Acrylic Latex Primer Sealer 586-00 (MPI# 50)

2 coats Ultra Spec HP DTM Acrylic Gloss Enamel M28 (MPI# 114)

Woodwork (Exterior) (MPI# EXT 6.3L)

1 coat Fresh Start All Purpose Alkyd Primer 024-00 (MPI# 6)

2 coats Impervo Alkyd High Gloss Enamel 133 1B

Metal (Exterior, Galvanized) (MPI# Ext 5.3)

1 coat (MPI# 134)

2 coats Impervo Alkyd High Gloss Enamel 133 1B (MPI# 9)

Metal (Interior) (MPI# Int 5.1Q)

1 coat IronClad Alkyd Low Lustre Metal &amp; Wood Enamel C163 (MPI# 79)

2 coats DTM Acrylic Gloss Enamel M28 (MPI# 114)

Floor (Interior or Exterior) (MPI# INT 6.5G or EXT 6.5A)

1 coat Fresh Start All Purpose Alkyd Primer 024-00 (MPI# )

2 coats (MPI# 60)

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Apr 01 22 ms

**2 Type 2 (Semi gloss) MPI Gloss Level 5**

Concrete Block Interior (MPI# INT 4.2A)

1 tinted coat Moorcraft Super Craft Latex Block Filler 285-01 (MPI# 4)

2 coats Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01 (MPI# 54)

Drywall and Plaster (MPI# INT 9.2A)

1 tinted coat Moorespec Interior Acrylic Latex Primer Sealer 586-00 (MPI# 50)

2 coats Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01 (MPI# 54)

Metal (Interior) (MPI# Int 5.1Q)

1 tinted coat IronClad Alkyd Low Lustre Metal &amp; Wood Enamel C163 (MPI# 79)

2 coats Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01 (MPI# 54)

Woodwork (MPI# INT 6.4A)

1 tinted coat Moorcraft Super Spec alkyd Primer Sealer C245 (MPI# 45)

2 coats Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01 (MPI# 54)

Old Work

1 coat (MPI# 39 INT 6.4R)

2 coats Moorecraft Super Spec Latex Semi-Gloss Enamel 276-01 (MPI# 54)

**3 Type 3 (Eggshell) MPI Gloss Level 3**

Concrete Block Interior (MPI# INT 4.2A)

1 tinted coat Moorcraft Super Craft Latex Block Filler 285-01 (MPI# 4)

2 coats Architectural Coatings Regal Aquavelvet 319-01 (MPI# 52)

Drywall and Plaster (MPI# INT 9.2A)

1 coat Moorespec Interior Acrylic Latex Primer Sealer 586-00 (MPI# 50)

2 coats Architectural Coatings Regal Aquavelvet 319-01 (MPI# 52)

Plaster (MPI# INT 9.2K)

1 coat Benjamin Moore Alkyd Enamel Underbody Primer 217

2 coats Benjamin Moore Collection Acrylic Latex Eggshell Finish 319 (MPI# 44)

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

Apr 01 22 ms

**4 Type 4 (Flat) MPI Gloss Level 1**

Drywall and Plaster (MPI# 9.2)

1 coat Moorespec Interior Acrylic Latex Primer Sealer 586-00 (MPI# 50)

2 coats Moorespec Interior Acrylic Latex Flat 564 (MPI# 53)

Plaster (MPI# INT 9.2K)

1 coat Moorcraft Super Craft™ Latex Block Filler 285 (MPI# 50)

2 coats Regal Wall Satin Latex Interior Flat 215 (MPI# 53)

**5 Type 5 (Natural Finish)**

Woodwork (interior) (MPI# 6.4U)

1 coat Benwood Interior Penetrating Stain C234 (MPI# 90)

2 coats Stays Clear Gloss 422 (MPI# 130)

1 coat Stays Clear Satin 423 (MPI# 128)

Interior Wood Floors (low lustre where indicated, gloss otherwise) (MPI# 6.5J)

2 coats Benwood Interior Penetrating Stain C234 (MPI# 90)

3 coats Moisture Cured Urethane Clear M78-00 (MPI# 56)

1 coat (MPI# 57)

**3 EXECUTION****1 INSPECTION**

- 1 Examine the work of other trades prior to the application of any paint or finishing materials. If any surface to be finished cannot be put in proper condition for finishing by customary cleaning, sanding and puttying operations, notify the General Contractor immediately in writing.
- 2 Do not proceed with finishing until surface is acceptable. Application of paint or finish to surface constitutes acceptance of the surface.
- 3 Substrates must be dry and have received the necessary surface preparation to ensure adequate adhesion. The durability and appearance of any finished paint system is directly related to quality and thoroughness of the surface preparation.

**2 GENERAL SURFACE PREPARATION**

- 1 Surface to be painted shall be clean as well as floors and adjacent surfaces.
- 2 Mildew, efflorescence and all foreign material shall be removed from surfaces by appropriate methods.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Apr 01 22 ms

- 3 To achieve an even appearance on certain woods when using a stain or stain/varnish system, a very thin coat of shellac (I.e. 1 part shellac to 8 parts alcohol) can be used to even out the porosity of the wood before application.
- 4 On concrete, masonry units, wood, plaster and gypsum board, stucco, cementitious composition board and clay masonry units: If sprayed, the first coat application must be back rolled/brushed to ensure good penetration of primer (or paint) into the substrate.
- 5 On any surface previously painted with alkyd (oil based) paint apply prime coat of manufacturer approved primer before applied the required number of top coats

**3 pH TESTING**

- 1 Test interior concrete and masonry surfaces for alkalinity prior to the application of any finishing system. Dampen the surface area and apply a small strip of pH indicator paper. A value of 7 on the pH scale represents neutrality. Values below 7 indicate an acid conditions and above 7 indicate an alkali condition.
- 2 Normal painting procedures are suitable for alkali values of 7 to 8.5 pH. When a solvent based system is specified and the pH is above 8.5, the surface must be neutralized using a zinc sulfate wash treatment. The surface must be allowed to dry out thoroughly before painting is commenced. Any residual zinc sulfate crystals left on the surface shall be brushed off. An alkali resistant primer sealer (solvent based) shall then be applied. Latex paints shall not be used over zinc sulfate treated surfaces.

**4 PLASTER PREPARATION**

- 1 Newly applied plaster must cure a minimum of 30 days at 24°C (75°F).
- 2 The surface must then be tested for alkalinity. Wash and neutralize high alkali surfaces where they occur. Where plaster 'hot spots' or questionably cured plaster surfaces are encountered, the use of an alkali resistant sealer, such as MPI #3 is recommended.
- 3 Any imperfection in the plaster must be corrected by the plaster trade. Large holes, cracks, joints and other visible imperfections must be corrected before surfaces will be accepted.
- 4 Paint shall not be applied until repaired surfaces are completely dry. Moisture readings must be taken to assure that no more than 12% moisture is in the plaster at the time of the coatings application. Environmental conditions before and during application and during drying shall be as outlined.
- 5 After the application of the primer coat, fill minimal cracks, holes and imperfections and sand smooth to match adjoining surfaces. Porous areas that show suction spots must be double primed.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Apr 01 22 ms

**5 DRYWALL PREPARATION**

- 1 Fill all scratches, nicks and uneven areas with spackling compound and sand flush with the surface.
- 2 Remove sand, dust, dirt, oil, grease, wax, silicone, glue and all other foreign matter. The resulting surface must be made acceptable to the Painting Contractor before application of the paint commences.
- 3 Joint compound shall be tested for alkali content. The architect shall receive a written report and notified of any concern before work commences

**6 CONCRETE PREPARATION**

- 1 Remove all nibs from surface.
- 2 Fill all holes and cracks with approved patching material.
- 3 Etch dense, smooth and surface hardened concrete before applying paint.

**7 CONCRETE MASONRY PREPARATION**

- 1 Epoxy block filler should be used unless otherwise specified. The exception is where a natural finish coating is desired and a water repellent, clear, coating is used.
- 2 Efflorescence shall be removed, before a finish schedule is put into operation. This is done by scraping and wire brushing, and an acid etch as necessary. Allow sufficient time (at least one week) to elapse, to see if the efflorescence reappears. If it does, the cause shall be remedied before painting is attempted.
- 3 Mortar joints must cure for not less than 28 days. Remove all dirt, loose mortar and splatters, residues, powder, oil and grease, etc. (i.e. any other foreign matter). If rust or any stains are present, they shall be removed, often by chemical cleaning. Oil and grease shall be removed by a TSP wash (50 grams per liter or ½ lb. per gallon, plus or minus, depending upon requirements) or the use of an emulsifying cleaner, followed by thorough rinsing with clean water. The surface must be allowed to dry completely.
- 4 Cracks, holes, broken off corners, joints and other surface imperfection must be repaired and filled with concrete-based patching material. All patches to be made flush with the adjoining surfaces and must be dry and fully cured before application of block filler. Patching must be completed prior to acceptance of the surface by the Painting Contractor. After surface repairs have been carried out, one coat of masonry block filler will bring the surface up to a reasonably smooth and level condition, ready for painting.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Apr 01 22 ms

- 5 In certain instances, abrasive blast cleaning may be required. In these cases, standard blast cleaning equipment is normally used. Only highly qualified personal shall be assigned this work.
- 6 Environmental conditions before and during application and during drying shall be as outlined.

**8 METAL PREPARATION**

- 1 To remove rust stains on exposed surfaces use a mixture of 425 grams oxalic acid per 4.5 litres (1.5 oz/gallon) of warm water. Mixing should be carried out in glass or plastic containers or enamel coated pails. The solution is to be left on the surface until the stain is no longer visible. Repeat as many times as necessary when stubborn stain marks are encountered. The areas must be thoroughly rinsed to remove all traces of acid. Only qualified tradespersons shall carry out this work.
- 2 Ferrous metal shall be washed with mineral spirits to remove oil, grease and dirt.
- 3 Remove rust and scale by scraping and wire brushing. Clean all welds and abrade with power tools. Spot prime all areas at once.

**9 GALVANIZED METAL PREPARATION**

- 1 Untreated galvanized metal, when exposed to the environment, does not necessarily render a good paint surface. Therefore weathering is not to be accepted in place of proper surface preparation.
- 2 The galvanized metal supplier shall disclose to the general and/or managing contractor and painting contractor any pre-treatment and temporary coatings which have been applied.
- 3 Galvanized metal that has been treated by the manufacturer with hexavalent chromium in solution or other similar passivation treatment to prevent humid storage stains, is difficult to coat satisfactorily. The passivation treatment shall first be removed. In such cases, refer to the manufacturer for surface preparation and painting instructions, however, in no case shall the pre-treatment be considered as a primer.
- 4 Wiped zinc coated metal (due to the thinner zinc film) does not resist prolonged exterior exposure (particularly in chemical environments) and shall be primed with the specified galvanized metal primer as soon as is possible. The specified primer shall be top coated within the recoat window of the primer as stipulated by the primer manufacturer.



22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Apr 01 22 ms

- 5 Different types of galvanized metals (i.e. zinc metals) are available (eg mechanically coated, hot dip, different spangle size, etc.). None are considered paint ready, and all require proper surface preparation and the appropriate coating selection. Proper surface preparation is the responsibility of the painting contractor.
- 6 Environmental conditions before and during application and during drying shall be as outlined.

**10 WOOD PREPARATION**

- 1 Sand smooth the surface to be painted or varnished before applying the prime coat and once again before applying the first top coat. Clean surface from all sanding dust before applying coating.
- 2 Polyurethane coatings shall not be applied over sealers containing zinc stearate.
- 3 A full paint system is required, as well on the tops and bottoms of doors.
- 4 All wood surfaces such as windows sills and equipment mounting panels, etc., must be back primed before installation.
- 5 All surfaces must be free of dust, dirt, oil, grease, silicone, wax, and other foreign matter.
- 6 For surfaces to be painted, holes, cracks and points are to be filled with an appropriate filler level with the surrounding surfaces. Knots must be sealed, and pitch must be removed. The affected areas must be sealed.
- 7 Pine and other softwoods containing sap or pitch must be cleaned of all residues. All knots, pitch pockets, and sap-affected areas must be sealed with clear shellac or an appropriate sealer. The shellac must be applied after the stain has been applied and allowed to fully dry. All discolourations such as water stains, scuff marks, pencil marks, etc., must be removed from the surface. Sand before and between coats, with a fine grade of sandpaper to maintain a smooth surface. Tack rag surfaces to remove all sanding debris.
- 8 Open grained wood surfaces that are to receive a clean or stain system require MPI #91 paste type wood filler to fill the pores. Sand before and between coating applications to maintain a smooth surface. All sanding must be done in the direction of the grain, particularly when a stain or varnish system is specified. Cross sanding the grain creates scratches that will absorb stain or finish unevenly. Tack rag surfaces to remove all sanding debris. Any discolouration must be removed from the surface (eg scuff marks, water stains, pencil marks).

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Apr 01 22 ms

- 9 For 'factory-primed' material, the manufacturer/supplier shall provide certification that the specified surface preparation and priming has been performed utilizing the appropriate MPI approved primer.
- 10 Environmental conditions before and during application and during drying shall be as outlined.

**11 REFINISHING EXISTING MILLWORK**

- 1 The intent is to refinish the existing millwork without major upgrades or repairs. Report delamination or need for major repairs to existing millwork to the architect, as work requiring major restoration is not to be in the base contract and will be covered under allowance.
- 2 Remove existing finish and prepare existing surface smooth as per manufacturer's recommendations. Sand bare wood smooth. Set existing nails below surface and fill flush with compatible wood filler. Sand and make smooth jagged or damaged edges. Provide stain colour within the first two coats of applied finish. The third and final coat is to be applied clear without stain. Finished stain colour is to be darker than existing as determined by the architect. Provide test areas not less than four square feet on each condition for review by architect prior to commencement of work.

**12 APPLICATION**

- 1 Apply paint in accordance with the manufacturer's direction. Use the techniques and application best suited for type of material being applied.
- 2 Apply all material under adequate illumination. Spread evenly and flow on smoothly without runs or sags.
- 3 All coats must be thoroughly dry before applying the succeeding coats.
- 4 Back prime interior or exterior trim before installation with primer specified.
- 5 Finish tops of upper sash and bottoms of lower sash same as interior finish. After doors are fitted, finish tops, bottoms and edges same as face and back.
- 6 Cover surfaces to be stained with uniform coat and wipe off, if required.
- 7 Between coats, sand enamel or varnish finish applied to wood or metal with sandpaper and clean to produce an even, smooth finish.
- 8 Finish inside of drawers with one coat of sanding sealer and one coat of varnish.

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Apr 01 22 ms

- 9 Unless otherwise indicated herein or in the manufacturer's written specification, apply conventional paints in uniform coats at a rate of approximately 8 to 10 square meters/liter (320-400 square feet/gallon) to attain a 4-5 mils wet film thickness. This does not include Elastomeric and high-build specialty coatings specifically designed for thick film application, and thin coat lacquers, which shall be applied in strict conformance. In all cases, follow specific manufacturer's recommendations of thickness of application.
- 10 Allow the manufacturer's recommended dry time between coats. If required provide the application of a test patch of the next coat to determine if the cure is complete. If lifting or wrinkling is visible in the test patch the previous coating shall be given more time to cure fully.
- 11 Ensure subsequent coats be applied within the time period specified by the manufacturer to assure proper inter coat adhesion, especially when epoxy, polyurethane and alkyd systems are used. If the time period is not met, additional sanding (or otherwise lightly abrading the previous coating) will be required before application of the next coat.

**13 CLEAN UP**

- 1 Upon completion of the work, remove all paint and varnish spots from the floors, glass and other surfaces. Remove from the premises all rubbish accumulated and leave the work in clean, orderly and acceptable condition.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

### 1 GENERAL

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#### 1 RELATED REQUIREMENTS

- 1 Section 06200: Finish Carpentry
- 2 Section 10800: Washroom Accessories

#### 2 GENERAL

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.

#### 3 QUALIFICATIONS

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified

#### 4 SHOP DRAWINGS

- 1 Submit shop drawings in accordance with Section 01300.
- 2 Clearly indicated fabrication details, plans, elevations, hardware and installation details.

#### 5 MAINTENANCE DATA

- 1 Provide maintenance data for maintenance of plastic laminate work.

#### 6 PROTECTION

- 1 Protect finished laminated plastic surfaces during shipment and installation by approved means.

#### 7 WARRANTY

- 1 The contractor shall warrant laminated plastic work against warping and delamination in accordance with GC24, but for period of two (2) years.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

## **2 PRODUCTS**

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### **1 MATERIALS**

**1 Laminated Plastic Toilet Partitions:**

**Buddsteel Architectural Products Limited. - P.lam. scratch resistant floor mounted, overhead braced. Panels, pilasters and doors are to be 19mm (3/4") thick rigid particleboard cores covered with P.lam. thermally fused to cores or an equivalent product approved equal by the Architect.**

**Thickness / Size: to sizes indicated on drawings**

**Colour: Selected by Architect from a full range of Arborite, Formica or Wilsonart colours and patterns**

**Shop Drawings: in accordance with Section 01300**

- 2 Hardware: All exposed hardware other than pilaster shoes shall be polished chrome plated heavy cast non-ferrous metal. Pilaster shoes shall be 75mm (3") high of 0.31 stainless steel 302.**

## **3 EXECUTION**

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### **1 PARTITION ERECTION**

- 1 Install partitions secure, plumb and square.**
- 2 Leave 12 mm space between wall and panel or end pilaster.**
- 3 Attach fixing brackets securely to masonry/concrete surfaces using screws and shields: to hollow walls using bolts and toggle type anchors, to steel supports with bolts in threaded holes.**
- 4 Attach panel and pilaster to brackets with through type sleeve bolt and nut.**
- 5 Provide adjustment of floor variations with screw jack through steel saddles made integral with pilaster. Conceal floor fixings with stainless steel shoes.**

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 03 03 tm

**1 GENERAL**

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**1 RELATED REQUIREMENTS**

- 1 Section 06100: Rough Carpentry
- 2 Section 08800: Glass and Glazing

**2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.

**3 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified as approved by the manufacturer.

**4 SHOP DRAWINGS**

- 1 Submit shop drawings or catalogue illustrations in accordance with Section 01300.
- 2 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors for grab bars.

**2 PRODUCTS**

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**1 GENERAL**

- 1 All units shall be obtained from same manufacturer. For design and quality, Frost has been specified. Bobrick products are approved equal. Products by other companies shall be considered as an alternative to the base bid.

**Washroom Accessories:****Frost - Products as specified in the Section or an equivalent product approved equal by the Architect.****Colour: Stainless steel 304 finish unless otherwise specified****Shop Drawings: in accordance with Section 01300****Extended Warranty: 5 years**

22-05-0014

**Market Building Interior Renovations**

City of Woodstock

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 03 03 tm

**2 FIXTURES**

- 1 Toilet Tissue Dispenser: Supplied by Owner, Installed by GC.
- 2 Mirror: Frost, 6mm electrolytically copper plated and guaranteed for five years against silver deterioration, complete with .6mm thick one piece polished stainless steel channel frame, stainless steel shelf and heavy gauge galvanized steel back for positive tamperproof mounting device.
  - M1 - 400mm W x 762mm H (16" w x 30" h)
  - M2 - 400mm W x 762mm H (16" w x 30" h) fixed tilted mirror, Frost #941FT
  - M3 - 1524mm W x 1066mm H (60" w x 42" h) #941 60x42
- 3 Single Safety Coat Hook: Frost Code 1150 white hook with stainless steel base. Hook will not support loads in excess of 11 kilograms (25 lbs.)
- 4 Grab Bar: Frost, 32mm (1¼") diameter concealed flange-peened grip, 1.2mm thick stainless steel No. 304. Provide one 600mm (2'-0") long horizontal bar behind each accessible toilet as well as one 750mm x 750mm (30" x 30") 'L' angled bar to the side. Provide one 750mm (30") swing up grab bar beside each toilet.
- 5 Sanitary Napkin Disposal: Frost, model 662 surface mounted, fabricated from 0.8mm (22 gauge) type 304 stainless steel complete with self closing door.
- 6 Paper Towel Dispenser: Supplied by Owner. Installed by GC.
- 7 Surface Wall Mounted Waste Receptacle: Frost Code 303-3 NL: stainless type 304 No. 4 finish
- 8 Auto Air Hand Dryer: Refer to Electrical Specifications.
- 9 Steel Shelf: Frost Model #950-18"
- 12 Soap Dispenser: Supplied by Owner. Installed by GC.

**3 EXECUTION****1 INSTALLATION**

- 1 Install and secure fixtures rigidly in place as follows:
  - .1 Stud walls: install steel back-plate to stud prior to plaster or drywall finish. Provide plate with threaded studs or plugs.
  - .2 Hollow masonry units or existing plaster/drywall: use toggle bolts drilled into cell/wall cavity.
  - .3 Solid masonry, marble, stone or concrete: use bolt with lead expansion sleeve set into drilled hole.
  - .4 Toilet/shower compartments: use male/female through bolts.

**22-05-0014****Market Building Interior Renovations****City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

Nov 03 03 tm

- 2 Use tamper-proof screws/bolts for fasteners.
- 3 Fill units with necessary supplies shortly before final acceptance of building.
- 4 Install dual model sanitary napkin in partition between two cubicles.
- 5 Install grab bars in handicapped toilet stall. One at the back of w.c. and one 'L' shaped on side of w.c.

**2 MOUNTING HEIGHTS**

- 1 Unless otherwise indicated install the indicated accessories to the following heights
  - Toilet tissue dispenser - 762mm (30")
  - Towel Dispenser - 1118mm (44") to bottom of unit
  - Sanitary Napkin Disposal - 660mm (26") to top of unit
  - Mirrors - 990mm (39") to bottom of unit or 6" above sink
  - Hand Dryer 965mm (38") to bottom of mounting bracket
  - Wall Mounted Receptacle - 1220mm (42") to centre of inlet panel
  - Soap dispenser - 38" to dispenser valve

**3 LOCATION AND QUANTITY**

- 1 Public Washrooms (female)
  - toilet tissue dispenser - 1 in each stall
  - towel dispenser - 1
  - hand dryers – one for every two sinks
  - mirror - 1 (M3) over vanity
  - single robe hook - 1 on each stall door
  - soap dispenser - 1 for each wall hung sink
  - grab bars - 1 set of two to handicap stalls only
  - sanitary napkin disposal - 1 in each stall
  - waste receptacle - 1
  - hand dryers – one for every two sinks



22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

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- 2 Public Washrooms (male)
  - toilet tissue dispenser - 1 in each stall
  - towel dispenser - 1
  - hand dryers – one for every two sinks
  - mirror - 1 (M3) over vanity
  - single robe hook - 1 on each stall door
  - soap dispenser - 1 for each wall hung sink
  - grab bars - 1 set of two to handicap stalls only
  - waste receptacle - 1
  - hand dryers – one for every two sinks
- 3 Staff Washrooms - 1 of each unless otherwise indicated
  - toilet tissue dispenser
  - towel dispenser
  - mirror - 1 (M1) over sink
  - single robe hook - 1 mounted on door
  - soap dispenser - 1 to each sink
  - sanitary napkin disposal
  - waste receptacle
- 4 Universal Washroom
  - toilet tissue dispenser
  - towel dispenser
  - mirror - 1 (M2) tilt over sink
  - single robe hook - 1 mounted on door
  - soap dispenser - 1 to each sink
  - grab bars - 1 set of three (includes swing up grab bar next to toilet)
  - sanitary napkin disposal
  - waste receptacle
  - stainless steel shelf

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

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### 1 GENERAL

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#### 1 RELATED REQUIREMENTS

- 1 Section 06100: Rough Carpentry
- 2 Section 09250: Gypsum Board

#### 2 GENERAL

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.

#### 3 QUALIFICATIONS

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified only by prequalified trades as listed herein:
  - Blind & Drapery Co. Ltd., London
  - Blinds by Design, London
  - Blissful Blinds, Goderich
  - Shuttercraft Window Coverings, Stratford

#### 4 SAMPLES

- 1 Submit manufacturer's descriptive literature indicating material, finishes, construction and installation instructions.
- 2 Submit 600mm x 600mm sample of each fabric required.
- 3 Submit 50mm x 100mm sample of each metal finish and colour required.
- 4 Submit shop drawings in accordance with Section 01300.
- 5 Provide layout, details of track and operating hardware, installation requirements and detailed list of the components.

#### 5 QUALITY ASSURANCE

- 1 Shade manufacturer shall furnish all shades and accessories for a complete installation and single source responsibility.

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

### 6 OPERATIONAL & MAINTENANCE DATA

- 1 Provide operation and maintenance data for operating instructions, care, maintenance and cleaning fabric, for incorporation into the maintenance manual.

### 7 WARRANTY

- 1 Provide a written warranty, signed and issued in the name of the Client and Project, stating that the Contractor, Sub-contractor and/or manufacturer jointly and severally warrant the complete manual shading system against defects and malfunction under normal usage in accordance with GC 12.3 as amended by the Supplementary General Conditions, but for a period of five (5) years.

### 8 EXAMINATION

- 1 This trade shall visit the building and take on-site measurements before fabricating the manual roller shades.

### 9 WORKMANSHIP

- 1 Work shall be carried out by a respectable firm employing skilled workers.

## 2 PRODUCTS

---

### 1 MANUAL ROLLER SHADE:

- 1 **Manual Shading System: to CAN/ULC-S109**  
Solarfective Products Limited - Manually operated, chain and sprocket roller shade system, with infinite positioning; each shade unit consisting of two end brackets, shade tube, extruded aluminum fascia, hembar and fabric; or an equivalent product approved equal by the Architect.

Colour: as selected by Architect

Finish: as selected by Architect

Extended Warranty: 5 years

- 2 **Sun Control Fabric: to CAN/ULC-S109-03, CAN/ULCCGSB2-4. 162-M80, ASTM G21-96, AATCC 174-1998 Part II & III**  
Semi-transparent shade fabric

Colour: as selected by Architect from manufacturer's full range

Finish: 5% openness as selected by Architect

Extended Warranty: 5 years

22-05-0014

## Market Building Interior Renovations

City of Woodstock

Project Date: August, 4, 2023

Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)

- 3 **Fascia: to ASTM B221M**  
**6063 alloy, T5 temper**

**Colour: as selected by Architect**

**Finish: Anodized, painted or wrapped in fabric to match colour selected by Architect**

**Extended Warranty: 5 years**

- 4 **Shade Tube:** Shall be extruded aluminum tube to ASTM B221M, 6063 alloy, T5 temper. 38mm (1.5") O.D. tube, 1.52mm thick with three internal continuous fins 4.82mm high, for strength and drive capabilities when attached to the nylon sprocket. The fins shall be spaced 120 degrees apart.
- 5 **End Brackets:** Shall be two piece molded ABS construction with a 64mm diameter nylon drive sprocket, 77x96mm.
- 6 **Fascia:** Shall be extruded aluminum to ASTM B221M, 6063 alloy, T5 tempered. Fascia shall fit on the extruded aluminum mounting clips and brackets without any exposed fastening devices. Fascia will not cover the top of the bracket when fitted in place so as to ensure airflow over the top of the shade and bracket assembly.
- 7 **Closure and Hanger:** Shall be extruded aluminum to ASTM B1221M, 6063 alloy, T5 temper, closure hanger and closure cover fastened inside the pocket.  
.1 Pocket and blocking shall be supplied by others.
- 8 **Centre Support Assembly:** Shall be 3mm (1/8") thick steel bracket with vertically adjustable plastic saddle and aluminum connector axle.  
.1 At each "bay", two (2) shade panels shall be driven by one operator through universal
- 9 **Hembar:** Shall be extruded aluminum to ASTM B221M, 6063 alloy, T5 tempered with steel inserts and end caps. Exposed Type.
- 10 **Drive Assembly:** Shall be factory set for size and travel of shades, field adjustable; complete with built-in shock absorber design to prevent chain breakage.
- 11 **Drive Chain:** Shall be No. 10 stainless steel bead chain, continuous loop type long enough to operate, with hold-down, tested for 41kg of force.

22-05-0014

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

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### **3 EXECUTION**

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#### **1 PREPARATION**

- 1 Consult the drawings and take accurate site measurements for the work of this Section.
- 2 Provide fastenings and anchors required to be built in to adjacent work to other Sections.
- 3 Fabric shall hang flat without buckling or distortion. The edge, when trimmed, shall hang true and straight without shifting sideways more than 3mm (1/8") in either direction due to warp of weave design.

#### **2 INSTALLATION**

- 1 Install shades in rooms as per room finish schedule.
- 2 Install shades level and plumb and in accordance with the manufacturer's product data and accepted Shop Drawings.
- 3 Conceal brackets and rollers with closure panels for full width of opening.
- 4 All metal work shall be free of dents, waves or other detrimental defects.

#### **3 ADJUSTMENT AND CLEANING**

- 1 Verify that shades and hardware function properly and adjust them accordingly to ensure satisfactory operation.
- 2 Refinish damaged or defective work so that no variation in surface appearance is discernable. Refinish specialty products at site only approved.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **1 GENERAL**

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#### **1 RELATED REQUIREMENTS**

- 1 Section 03300: Building of Poured Concrete Hoistway
- 3 Section 05500: Miscellaneous Metal Fabrication
- 4 Section 09660: Resilient Tile Flooring
- 5 Division 15: General Mechanical Provisions
- 6 Division 16: General Electrical Provisions

#### **2 GENERAL**

- 1 Requirements of Division 0, 1 and all contract drawings shall apply to all sections of this document. These sections have been created in order to organize the contract documents. It can not be assumed in any way that they limit the responsibility of the contractor, any Subcontractor or supplier to complete the full scope of the work indicated in the contract documents as a whole.
- 2 This specification is based on a Delta 2000 vertical wheelchair lift
- 3 Include cost of all applicable inspections and permits etc.
- 4 The lift shall be complete with machine, controls, cab, signal and safety devices, electric wiring and all necessary fittings to provide an operating unit in compliance with applicable codes

#### **3 QUALIFICATIONS**

- 1 Provide for all work to be done by individuals skilled and experienced in the trade and specializing in the type of work specified licensed under the requirements of the governing authority.

#### **4 GENERAL INFORMATION**

- 1 The manufacturer shall be company specializing the manufacturing elevator equipment of a similar nature for a period of at least the last ten (10) years. Installation crews to have at least on Technical Standards and Safety Authority (TSSA) Elevating Device Mechanic - Class A, licensed technician. All installers shall be permanent employees of the manufacturer.
- 2 Shop drawings are prepared by the equipment manufacturer, using good drafting procedures, and are submitted to the Architect for approval prior to installation. Approved shop drawings are submitted by Concord to the applicable enforcing authority with any required fees.
- 3 License fees for the first year of operation are the responsibility of the Contractor and after that period are the responsibility of the Owner.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 4 As part of this contract the lift contractor will provide twelve (12) months of regular service and maintenance from date of approval by inspectors. Inspections shall be performed once every two month minimum
- 5 As part of this contract the lift contractor will provide emergency service 24 hour per day, 365 days per year for the warranty period.
- 6 The entire lift and all components parts carry a one (1) year guarantee.
- 7 The guarantee shall be for the replacement, at not cost of defective parts, provided the lift is properly used.
- 8 The car speed is approximately 0.1 mps in both directions while carrying rated load, or to maximum permitted by the code.

### **5 REGULATORY REQUIREMENTS**

- 1 The elevator shall conform to CAN/C.S.A. B 355-94 "Lifts for Person With Physical Disabilities"
- 2 Code classification: Type C. Principal application being the vertical transportation of the disabled. Light freight may also be transported with an attendant.

## **2 PRODUCTS**

---

### **1 GENERAL**

- 1 Rated Load: 635 kg. (1,400 lbs.)
- 2 Rated Speed: 0.15m/sec. (29.5 ft./min.).
- 3 Approximate Travel Distance: 4.19m (13.75 ft) - Maximum travel permitted 9m (29.52 ft.)
- 4 Maximum floor shall be 2.0 sq.m. (21.5 sq. ft.) constant pressure loading and car controls, automatic levelling.
- 5 Car Dimensions: 1067mm wide x 1524 mm deep. Specifications are based on DELTA Model 4260F
- 6 Operation: Automatic. Down Collective.
- 7 Car Controls: Illuminated Type with faceplate in Stainless Steel #4 Finish.
- 8 Hall Call Stations: Illuminated Type. Stainless steel #4 Cover Plates.
- 9 Entrance Type: Two speed sliding

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

- 10 Floors served: 2, main and second floor
- 11 Cab Openings Required: 1
- 12 Power Supply: 208V 3 phase 60 Hz fused with 12 amp type D fuses.
- 13 Lighting Supply: 120V, 60 Hz, 15 amp.
- 14 Jack Type: Hole-less Hydraulic

### **2 CAR CAB FEATURES**

- 1 Shell Enclosure:
  - Car Top: Minimum 1.5mm (16 ga.) steel, white enamel finish
  - Shell Walls: 1.5mm (16 ga.) steel - cage frame type construction.
  - Strike Column: 1.5mm (16 ga.) stainless steel #4
  - Fascia: 1.5mm (16 ga.) stainless steel #4
  - Car doors: 1.5mm (16 ga.) stainless steel #4 car door
- 2 Side Walls: Raised plastic laminate hang on panels
- 3 Ceiling: Stainless steel #4 panel with compact LED down lights
- 4 Front Return: Stainless steel #4
- 5 Car Door: Stainless steel #4
- 6 Base: Stainless steel #4
- 7 Reveals: Stainless steel #4
- 8 Finished Flooring: to be supplied and installed by flooring contractor
- 9 Hoistway doors and frames: At all floors: Stainless steel #4
- 10 Car sill: Extruded aluminum
- 11 Overall Height: 2134mm (7'0") 2134mm clear inside
- 12 Car operating Station: Top row of buttons located in compliance with CSA B44 Elevator Code Appendix E for accessibility.
- 13 Handrail: Located on all non-entrance walls: 6mm x 63mm flat stainless steel #4
- 14 Pad Hooks: Included



**22-05-0014**

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

15 Protective Pads: Yes - one set

16 Certificate Frame: Mounted on elevator cab wall.

**3 PUMPING UNIT AND CONTROLLER**

- 1 The jack(s) shall be designed and constructed in accordance with the applicable requirements of the CSA B44 Elevator Code. It (they) shall be of sufficient size to lift the gross load the height specified, and shall be factory tested to insure adequate strength and freedom from leakage.
- 2 The jack unit(s) shall consist of the following parts: A plunger of heavy seamless steel tubing accurately turned and polished; a stop ring electrically welded to the plunger to prevent the plunger from leaving the cylinder; a package seal of suitable design and quality; a drip ring around the cylinder top; a cylinder of steel pipe complete with a pipe connection and air bleeder.

**4 ROPED HYDRAULIC FEATURES**

- 1 Safety: An instantaneous safety shall be provided which will be actuated by a friction governor and governor tension sheave. The instantaneous safety shall be automatic, and reset by running the car in the up direction.
- 2 Governor: The governor shall be located in the hoistway overhead. The governor shall include an electrically activated means of manually tripping the governor from the machine room for annual noload and five-year full-load safety tests. The design shall not require a governor access door.
- 3 Plunger(s), Cylinders(s), and Sheave(s): A sheave shall be located at the top of each plunger and shall be guided through its travel by a set of plunger rails. Each plunger and cylinder shall be installed plumb and shall operate freely with minimum friction.
- 4 Ropes: Minimum two (2) 9.5 mm aircraft cables. Ropes shall be fastened to the top of the cylinder jack stands, travel over the plunger sheave(s) and attach to the bottom of the elevator car frame.

**5 PUMPING UNIT**

- 1 The pumping unit shall be a unit of integral design and shall include an electric motor connected to a pump, a hydraulic control system, a storage tank, necessary piping connections, and a controller, all compactly designed as a single self-contained unit. The motor and pump assembly shall be mounted on a rubber isolated inner base.

**6 PUMP**

- 1 The pump shall be a positive displacement screw type to give smooth operation and shall be designed and manufactured for elevator service.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

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### **7 MOTOR**

- 1 The motor shall be of the alternating current, single or polyphase squirrel cage induction type and shall be of a design adapted to electro-hydraulic requirements.

### **8 HYDRAULIC CONTROL SYSTEM**

- 1 The hydraulic control system shall be of compact design suitable for operation under the required pressures. The control valve shall be a manifold with up, down, and check valve sections. A control section including solenoid valves will direct the main valve and control up and down starting, transition from full speed to levelling speed, up and down stops, pressure relief and manual lowering. Down speed and up and down levelling will be controlled at the main valve sections. All of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions. All control systems shall be pre-adjusted at the factory.
- 2 The manual lowering feature shall permit lowering the elevator at slow speed in the event of power failure or for adjusting purposes.

### **9 LEVELLING DEVICE**

- 1 The elevator shall be provided with an automatic levelling device which brings the car to a stop within 6 mm (1/4") of the landing level regardless of load or direction of travel. Landing level will be maintained within the levelling zone irrespective of the hoistway doors being open or closed.

### **10 STORAGE TANK**

- 1 The storage tank shall be constructed of steel, and shall be provided with a cover and a filter screen mounted over the suction inlet. Tank design shall incorporate a reserve capacity. An initial supply of oil sufficient for proper operation shall be provided.

### **11 PIPING**

- 1 Pipe of adequate size and thickness shall be installed between the pumping unit and the cylinder head. A shut off valve shall be provided for maintenance and adjusting purposes.

### **12 CONTROLLER**

- 1 A microprocessor controller shall be provided, including necessary starting switches of adequate size together with all relays, switches and hardware required to accomplish the operation specified. Overload protection shall be provided to protect the motor against overloading

### **13 CAR STALL PROTECTIVE CIRCUIT**

- 1 A protective circuit shall be provided which will stop the motor and the pump and return the car to its lowest landing in the event the car does not reach its designed landing with a predetermined time interval. This circuit will permit a normal exit from the car but prevent further operation of the elevator until the issue has been corrected.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

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### **14 WIRING**

- 1 All wiring and electrical interconnections shall comply with the governing codes. Insulated wiring shall have flame retardant and moisture proof outer covering, and shall be run in conduit, tubing or electrical wire-ways. Travelling cables shall be flexible and suitably suspended to relieve strain on individual conductors.

### **15 HOISTWAY OPERATING DEVICES**

- 1 Normal terminal stopping devices shall be provided. When an emergency terminal stopping device is also required, it shall be furnished and the controller switches and circuitry arranged in accordance with the requirements of the CSA B44 Elevator Code.

### **16 PIT SWITCH**

- 1 An emergency stop switch shall be located in the pit.

### **17 PIT MAINTENANCE STAND**

- 1 Provide a non-removable means to mechanically hold the car above the pit floor to provide an area in the pit for maintenance and inspection as per requirements of the CSA B44 Elevator Code.

### **18 PLATFORM**

- 1 The car platform shall have a fabricated frame of formed and structural steel shapes, rigidly welded. Sub-flooring shall be wood floor. The underside of the platform shall be fireproofed. The platform shall be manufactured by a CWB certified shop and be equipped with an aluminium threshold.

### **19 CAR FRAME**

- 1 A suitable car frame fabricated from formed or structural steel members shall be provided with adequate bracing to support the platform and car enclosure. The crosshead or rope connection member shall be of sufficient strength to lift the fully loaded car.

### **20 LANDING ENTRANCES**

- 1 Complete entrance assemblies shall carry a fire label from UL/ULC certifying that they have been tested and approved for minimum fire separation of 1-1½ hours.
- 2 Approved interlocks shall maintain the doors in a closed and locked position when the lift platform is not at the landing. Interlocks shall be provided with an electrical contact, which will interrupt the power to the control mechanism, if any door is in the open position or not securely closed and locked with the car out of the door zone. Doors to be manual swing type.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

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- 3 The door locking mechanism (beak) shall be of the 'hidden mounting' type, fastened to a reinforcement plate on interior of the leading edge of the swing door. It shall be mounted at least 1980 mm from the floor and shall be CSA approved. The hall station controls shall consist of a mushroom head call button and key switch and there shall be lift-operating instructions at each entrance. The key shall be removable only in the OFF position.

### **21 CAB ENCLOSURE**

- 1 The cab enclosure shall consist of 13mm melamine panels fastened to a welded steel frame, trimmed with stainless steel edging and kickplates on all walls. The cab shall have enclosed sides which are a minimum of 2030 mm high. Other standard features of the cab enclosure include:
  1. Emergency lights to automatically operate in the event of a power failure.
  2. Audible alarm to operate when STOP button is pressed.
  3. Alarm to remain operational in the event of a failure in the normal building power supply.
4. Battery powered emergency lowering will allow the lift to move in a down direction in event of a building power failure.
5. Cab shall have removable panels for ease of access of all serviceable components from inside the cab enclosure.
6. Limit and leveling switches shall be behind the removable cab walls in a vandal resistant location.
7. Key switch and stop button to be pre-assembled, mounted and pre-wired to the cab enclosure.
8. Traveling cable to be pre-wired to cab enclosure.
9. To prevent interference with the persons using the lift, the cab key switch, when activated, will prevent the hall buttons from operating.
10. The cab platform shall be constructed of a steel frame with all welding to be done by Canadian Welding Bureau certified welders. The cab platform and sling shall be of steel, cantilever designed and securely bolted together plumb and square.

### **22 GUIDES AND BRACKETS**

- 1 Guide brackets shall be of steel and securely fastened to the building structure. Brackets shall securely hold the guides in a plumb and straight position regardless of cab loading. Guide shoes shall be elevator duty, metal with replaceable nylon inserts, for long life, smooth ride and ease of repair. Guides shall be firmly attached to the hoistway walls and shall be of an elevator duty machined T-section type for smooth operation.

### **23 TELEPHONE**

- 1 An ADA-approved AUTODIAL telephone shall be furnished and installed as part of the car station. A separate phone line to the elevator controller shall be provided and located in the elevator machine room under another section of the specifications.

**22-05-0014**

## **Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

### **24 NON-PROPRIETARY CONTROLS**

- 1 Elevating device control equipment must be non-proprietary. If a site specific service tool or onboard diagnostic tool is required to render the control equipment non-proprietary, it must be provided with the elevating device. The tool must allow full access to fault codes and maintenance related parameters and must allow complete and thorough maintenance service to be performed by any properly licensed and qualified Elevator Contractor. The tool must come with a user's manual that also defines and explains all error codes, including required fixes. The service tool must remain property of the building owner.

## **3 EXECUTION**

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### **1 EXAMINATION**

- 1 Verify that the hoistway, pit and machine room are ready for equipment installation and are constructed as per elevator manufacturer's shop drawings.
- 2 Verify that the shaft and openings are of correct size and within tolerances as indicated on elevator manufacturer's shop drawings.
- 3 Confirm that electrical power is available and of correct characteristics per elevator manufacturer's shop drawings.
- 4 Report defects to the Project Manager.

### **2 INSTALLATION**

- 1 The installation is to be carried out by competent mechanics in the employ of the vertical wheelchair lift contractor. The manufacturing company shall have at least ten (10) years experience in the manufacturing, installation and maintenance of vertical wheelchair lifts.
- 2 Install in accordance with CAN/CSA-B355-94, "Lifts for Persons With Physical Disabilities" safety standards for elevating devices.
- 3 Provide conduit, boxes, wiring and accessories to complete the installation.
- 4 Install hoistway door sills, frames, and headers in hoistway walls ready for masonry work by others.

**22-05-0014**

**Market Building Interior Renovations**

**City of Woodstock**

Project Date: August, 4, 2023

**Pow Peterman, Consulting Engineers (reproduction without the author's written permission is prohibited)**

**3 TOLERANCES**

- 1 Cab movement on guide rails: smooth movement with little lateral or oscillating movement or vibration.
- 2 Guide rail alignment: plumb and parallel within 3mm in 50m of vertical distance.

**4 ADJUSTMENTS**

- 1 Adjust for smooth acceleration and deceleration of car so as not to cause passenger discomfort.
- 2 Adjust floor-leveling feature to bring car to within 10mm of level.

**5 OWNER'S INSTRUCTION**

- 1 After installation is completed, the contractor shall instruct the Owner in the proper use, operation and maintenance requirements of the vertical wheelchair lift. Instruction to also include emergency procedures and safety rules and precautions.

**6 INSPECTION AND CLEANING**

- 1 Complete all of the work to leave the vertical wheelchair lift in full and satisfactory working operation.

# Market Building Interior Renovations

21 Market Street East  
Woodstock, Ontario

## Mechanical Specifications

DMDS Project No. 00623  
August 2023

Prepared by:  
DMDS Ltd.  
153 Norman St. Stratford  
519-505-3938  
[info@dmdsdesign.ca](mailto:info@dmdsdesign.ca)

## **1. GENERAL REQUIREMENTS**

### **1.1 Contract Documents:**

- .1 The mechanical Specification and the mechanical drawings are an integral part of the Contract Documents and are to be read accordingly.
- .2 Comply with the conditions of Division 0 and Division 1.
- .3 These specifications are to be considered an integral part of the plans which accompany them. Neither the plans nor the specifications shall be used alone. Any item or subject omitted from one but which is mentioned or reasonably implied in the other shall not relieve this Trade of responsibility for completing the Work as intended.
- .4 Wherever differences occur in the contract documents, the maximum conditions will govern and shall be allowed for in the tender price. The items to be incorporated will be at the option of the Consultant.

### **1.2 Code Compliance:**

- .1 All work shall be executed and all materials shall conform to and be inspected in strict accordance with all the laws, rules, and regulations of the local and provincial codes and all other authorities having jurisdiction, including but not limited to the Ontario Building Code (OBC), Canadian Gas Association (CGA), Technical Standards and Safety Authority (TSSA), Natural Gas And Propane Installation Code, National Fire Protection Association (NFPA), Canadian Standards Association (CSA), Ontario Fire Code, Ontario Electrical Safety Code (OESC), all Municipal regulations and any authorities having jurisdiction.
- .2 Where any Code, Regulation, By-law, or Standard is quoted it means the current enforced edition including all revisions or amendments at the time of the Contract. Where references are made to printed directions or recommendations, it means the current enforced edition of such directions and recommendations.
- .3 All mechanical piping system work, including equipment, must comply in all respects with requirements of the Ontario Technical Standards and Safety Authority. Where required, fittings, valves, equipment, etc., must bear a CRN number.
- .4 All electrical items associated with mechanical equipment are to be CSA (or equivalent agency) certified, or bear a stamp to indicate ESA approval.
- .5 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 required as part of the Contract but notify the Consultant immediately of such changes for proper processing of these requirements. Prepare and furnish any additional drawings, details or information as may be required.
- .6 Arrange for inspection of all Work by the authorities having jurisdiction. Obtain unconditional certificates of approval, acceptance and compliance with rules and regulations for authorities having jurisdiction. The Work will not be considered complete until such certificates have been delivered to the Owner.
- .7 Attend promptly to any deficiencies reported. Request final review when the completed installation has been checked and all deficiencies have been rectified.



- .8 All changes and alterations required by an authorized inspector of any authority having jurisdiction shall be carried out without charge or expense to the Owner unless otherwise approved by the Consultant.

### 1.3 Deficiencies:

- .1 All deficiencies as identified in Field Review Reports or Commissioning Reports shall be corrected by the applicable Trade in a timely manner after being made aware of said deficiencies.
- .2 This Section shall subsequently inform the Consultant that deficiencies have been corrected in writing.

### 1.4 Scope of Work and Intent:

- .1 It is the intent of these specifications to provide a complete mechanical system as more thoroughly defined in each section of this specification. All materials and equipment as hereinafter specified and/or shown on the drawings shall be furnished and installed in such a manner as to leave the Work complete and in satisfactory operating condition.
- .2 The contract documents are not intended to enumerate each and every detail which may be necessary to furnish and install the complete system ready for operation. The tender price shall include all such details, and all associated labour and materials, to provide a complete and working system. The omission of any details in the contract documents shall not be a warrant for poor workmanship or the omission of such details.
- .3 The mechanical drawings are performance drawings, diagrammatic, and show approximate locations for equipment and materials. The drawings are intended to convey the scope of work and do not necessarily show all relevant details. The locations of materials and equipment shown may be altered to meet requirements of the material and/or equipment, other equipment and systems being installed, and of the building (provided revised layouts for approval where directed by the Consultant). Provide all fittings, offsets, transformations, and similar items required as a result of obstructions and other architectural or structural details.
- .4 Where dimensions are indicated on the drawings, said dimensions shall be checked and verified in the field.
- .5 This Contractor shall make, without additional charge or expense to the Owner, any necessary changes or additions to accommodate project conditions. The Consultant shall be notified immediately and their authority secured in writing for such revisions before proceeding with the Work.
- .6 Supply any miscellaneous equipment / materials / tools / instruments not herein listed necessary for the proper installation and operation of the Work.
- .7 All of the equipment and materials required for the Work shall be new, the best of their respective kinds and installed in a first class manner. Similar equipment and plumbing fixtures / trim shall be of the same manufacturer unless noted otherwise.
- .8 Provide means to supply and install the products specified. The Work means the total construction required by the Contract Documents and includes all labour and Products. Products means all materials and equipment forming the completed Work as required by the Contract Documents.

- .9 Where the Drawings or Specifications assign Work to a particular trade, this is intended to be used as a guide only to assist the Contractor with the preparation of the tender price. The final decision as to which trade provides the required labour or materials rests solely with the Contractor. Extra payments will not be considered based on a difference in interpretation of the contract documents as to which trade involved provides materials or labour for specific items of work. The Consultant will not enter into such discussions.

1.5 Qualification of Tradesmen:

- .1 All Work shall be carried out by qualified Contractors and Sub-Trades with established reputations for the type of work involved and performed to good industry standards.
- .2 This Contractor shall supply Certified Mechanics and Apprentices in accordance with current Ministry of Labour regulations.
- .3 Maintain at the job site, at all times, qualified personnel and supporting staff, with proven experience in installing, supervising, testing and adjusting projects of comparable nature and complexity.
- .4 All apprentices must always be supervised by a qualified journeyman.

1.6 Examination of Site and Contract Documents:

- .1 This Contractor shall visit the site, examine the existing conditions and make necessary allowances for removal, relocation, re-routing, reconnection of existing mechanical and electrical equipment / systems as may be necessary for the execution and completion of this project. No extras will be allowed for failure to properly evaluate conditions which affect the scope of the work included in this contract.
- .2 Arrangements for a site inspection may be made as described in Division 0.
- .3 It is the responsibility of the Contractor to carefully review the drawings, specifications and other instructions and notify the Consultant in writing of any errors, omissions and discrepancies prior to closing of tenders. The Contractor shall abide by the decision given in writing. The Work as shown is intended to be completed in all respects and that failure to notify the Consultant of any discrepancies will not relieve the Contractor of responsibility for completing the Work as intended. In no case shall the Contractor proceed in uncertainty.
- .4 Examine the architectural, structural, and electrical drawings / specifications in conjunction with the mechanical drawings / specifications and be satisfied that the mechanical work (Work) as shown / specified can be performed without changes.
- .5 Examine all Sections and Divisions of the specification and all other related contract documents. This specification is to be read in conjunction with all other Sections and Divisions of the specification.
- .6 Unless exceptions are specifically noted at the time of tender, the submission of a Tender confirms that the Contractor has accepted all specifications, drawings, contract documents and conditions without qualification. The Owner may not approve any extra charges subsequent to acceptance of the Tender.
- .7 Mechanical Drawings shall not be scaled. Refer to Architectural Drawings for all dimensions and where critical provide site verification.

1.7 Co-Operation:

- .1 This Contractor shall be expected and required to confer and co-operate with the other trades in order to eliminate any unnecessary delays to any Work.
- .2 Co-operate fully with all trades in such a manner as to not interfere with other Work being carried on in the building. Where other work and equipment has to be installed along with mechanical Work, arrange with other trades to install this Work to best suit the particular condition.
- .3 Store materials neatly and out-of-the-way and clean up all refuse caused by the Work daily.

1.8 Protection:

- .1 This Contractor shall protect finished and unfinished work of this section and other Subcontractors from damage due to carrying out Work (of this section) and be responsible for restoring any subsequently damaged materials / equipment.
- .2 This Contractor shall be responsible for the condition of all materials and equipment supplied under this contract and shall provide all necessary protection for same. This Contractor shall be responsible for the protection and maintenance of the Work (of this section) until the building / project has been completed and accepted.
- .3 This Contractor shall provide adequate protection to existing mechanical / sprinkler / electrical / structural systems, pavement, curbs, walks, sodding, shrubs, building construction, building contents, etc. throughout the project and where items have become exposed to potential damage in the course of the Work. This Contractor shall be responsible for restoring to its original condition or replacing any mechanical / sprinkler / electrical / structural systems, pavement, curbs, walks, sodding, shrubs, building construction, building contents, etc. removed or damaged in connection with the Work unless otherwise directed by the Consultant.
- .4 Protect the existing roofing system from any damage at all times. Provide plywood work platforms / walkways as required.

1.9 Work in Existing Building:

- .1 Perform all work in the existing building indicated on the drawings, specified herein, and as may be necessary to carry out the work of this Contract.
- .2 This Section shall be responsible for revisions to and for the complete removal of mechanical systems to permit the new Work, all as shown on the drawings or described in the specification. This includes removal of materials from the site. All disposal costs shall be included in the tender price.
- .3 Materials / equipment being removed shall become the property of the Owner unless shown otherwise, and if the Owner has no use for it, it shall be disposed of by this Contractor. The Contractor shall include in the tender price for the disposal of all materials / equipment.
- .4 Where domestic water piping is indicated to be removed, disconnect and cap all piping at active mains so that all remaining piping is self-draining without dead pockets. All required draining and filling of piping systems shall be a part of this Work.

- .5 Where ductwork is indicated to be removed, disconnect and cap all ductwork at the active mains. Where duct mains are thermally / acoustically insulated, the caps at the duct mains shall also be thermally / acoustically insulated to match the adjacent main.
- .6 Demolished materials / equipment shall not be reused unless noted otherwise.
- .7 Any materials / equipment indicated to be reused shall be carefully removed and stored. Any component which forms a part of the equipment to be reused which is lost or damaged, or is not suitable for re-use, shall be replaced with a new component.
- .8 Make certain that all services affected by Work are cut off and are properly capped or diverted.
- .9 Do not make interruption of services to or within existing building without prior consultation with the Owner and Consultant.
- .10 Undertake all necessary measures required by the Work to maintain adequate security of the existing building at all times and to prevent the intrusion of weather.
- .11 Where required by the Work, existing furnishings shall be removed / replaced by the Mechanical Contractor (furnishings may be temporarily stored within the building, outside of the area of Work).

1.10 Liability and Property Insurance:

- .1 Comply with the requirements of Division 0, Division 1 and Section GC 11.1 of CCDC 2 - 2020.

1.11 Indemnification Claims:

- .1 This Contractor shall indemnify and save harmless the Owner and its respective officers and agent from all claims relating to labour and material furnished or supplied in executing the Contract and from and against all claims, demands, losses, costs, damages, actions, suits or proceedings by whomsoever made, brought or prosecuted in any manner based upon, arising out of, relating to, occasioned by or attributable to the activities or omissions of the Contractor or those for whom the Contractor is at law responsible in performing the Contract.
- .2 Comply also with Section GC 13.1 of CCDC 2-2020.

1.12 Workplace Safety:

- .1 Comply with requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding the use, handling, storage and disposal of hazardous materials.
- .2 Submit WHMIS MSDS (Material Safety Data Sheets) for all products where required, and maintain one copy at the site in a visible and accessible location and available to all personnel.
- .3 Comply with all requirements of Ontario Regulation 213/91, Occupational Health and Safety Act and Regulations for Construction Projects.
- .4 This Contractor shall produce a Workplace Safety and Insurance Board Certificate of Clearance Form at each draw and prior to final payment under the Contract.

1.13 Schedule:

- .1 The permitted work periods and required project completion date shall be as described in Division 0.
- .2 This Contractor shall make all allowances for premium time labour, allowing for after hours, weekend and holiday labour requirements.

1.14 Payment Certification:

- .1 Submit monthly draws to the Consultant for review and certification. Draws shall provide a complete breakdown of project costs in a manner acceptable to the Consultant. Submit sample progress draw form to Consultant within one week of award of contract for review and acceptance.

1.15 Extras and Credits:

- .1 Only extras and credits approved by the Consultant will be allowed. They shall be priced individually with a complete breakdown clearly indicating labour costs, itemized material cost, mark-up and taxes.
- .2 In the event of additional work of any nature being required, this Contractor must state in writing the costs of such extras, and unless any such extras are approved, they will not be allowed.
- .3 In the event of omissions, a fair and reasonable adjustment will be made to the contract price by negotiation with the Consultant. Such an adjustment to the contract shall not in any way be construed to render the contract invalid.
- .4 Labour rates for extras and credits shall be identical.
- .5 Only the net difference between an extra and a credit will subject to overhead and profit mark-up.
- .6 Labour rates shall be valued at payroll cost plus a % mark-up for burden as stipulated in Division 0.
- .7 Material and equipment prices shall be trade price less the standard trade discount.

1.16 Fees:

- .1 Apply for, obtain and pay for all permits, licenses, inspections, examinations and fees required, including but not limited to the following:
  - a. Unless otherwise indicated, fees required for the approval and inspection of any portion of the mechanical system by any government agency, department or authority shall be included in the tender price. TSSA inspection fees (if applicable) shall be billed as an extra to the contract.
  - b. Fees required for the approval and inspection of the sprinkler system shall be included in the tender price.
  - c. The building permit complete with all associated fees shall be by the General Contractor.

1.17 Alternate / Equal Equipment and Services:

- .1 Unless noted otherwise, the price submitted for this contract may be based on the use of products or services equal to those specified herein. Where equals or approved service providers are listed, only equipment and/or services from these manufacturers / service providers may be used in the tender price. Where approved equals are not listed, any manufacturer / service provider may be used in the tender price.
- .2 This Contractor shall ensure that all equal and alternative equipment or services meet the mechanical specification, are similar in dimensions, stability, quality, weight, ease of maintenance, performance, etc. and that the equipment will fit into the space allocated. The Contractor shall be responsible for preparing revised design drawings (if directed by the Consultant) and shall carry all costs required to accommodate the equal / alternative equipment or services INCLUDING ALL COSTS INCURRED BY OTHER TRADES. The Consultant shall be the sole judge of what is acceptable equal quality.

1.18 Shop Drawings:

- .1 Submit for review shop drawings and data sheets covering all items or equipment to be installed under the Contract. Shop drawings shall show all relevant performance and installation information. The drawings and data required for materials / equipment shall generally be as outlined below but shall not be restricted to the items listed.
- .2 Equipment will not be accepted on site until approval of shop drawings. Shop drawings designated as "Reviewed as Noted" are conditionally approved such that this Trade shall ensure equipment satisfies all Contract requirements. Delivery of equipment may proceed but final, corrected shop drawings must be submitted prior to completion of Contract.
- .3 Equipment with long delivery dates that are critical for the progress of the work are to be followed closely by the Contractor. Submit these shop drawings as soon as possible, separating them from the bulk of all other equipment, and identify with "Urgent" on the transmittal.
- .4 Shop drawings shall be submitted electronically in Adobe Portable Document Format (.pdf). Reviewed shop drawings shall be returned electronically.
- .5 All submitted shop drawings must have been reviewed in detail by this Trade prior to submission to the Consultant and must bear his stamp. Should the drawings not have been reviewed and stamped, they will be returned to the Contractor.
- .6 Show on each submittal the "Tag Number" used to designate each piece of equipment.
- .7 Clearly indicate manufacturer, model, performance data, materials of construction, dimensions, shipping and operating (wet) weights, colours (or colour selection chart if choice available), electrical characteristics and supplied options.
- .8 Show applicable standards such as CSA, ULC, FM, etc.
- .9 Clearly indicate any discrepancies between the specified and supplied equipment, particularly those that affect the performance of the equipment.
- .10 Provide wiring diagrams and control schematics when applicable.

- .11 Shop drawings shall be submitted for all equipment, fixtures, trim and accessories.

1.19 Record Drawings:

- .1 Record, as the Work progresses, work constructed differently than shown on Contract Documents. Record all changes in the Work caused by site conditions, by Owner / Consultant / Contractor / Subcontractor originated changes, and by site instructions / supplementary instructions / field orders / change orders / addendums / correspondence / direction of jurisdictional authorities. Accurately record location of mechanical and electrical services, ductwork, dampers, piping, valves, conduits, pull boxes, junction boxes and similar work, especially services which are not clearly in view.
- .2 Do not conceal critical work until its location has been recorded.
- .3 White prints shall be obtained and paid for by the Mechanical Contractor. Record changes in the Work on these prints in red ink.
- .4 Dimension location of concealed work in reference to building walls, and elevation in reference to floor elevation. Indicate at which point dimension is taken to concealed work. Dimension all terminations and offsets of runs of concealed work.
- .5 Make records in a neat and legibly printed manner with a non-smudging medium.
- .6 Identify each record drawing as "Project Record Copy".
- .7 Maintain drawings in good condition and do not use them for construction purposes.
- .8 Maintain Project record drawings in a state current to Project. Such state will be considered a condition precedent for validation of applications for payment. The Consultant's visual inspection will constitute proof that record drawings are current.
- .9 Take special care to indicate buried drains, inverts (shown at main reference points) and dimensioned distances from visible reference points such as walls or columns.
- .10 At the completion of the project, these plans shall be converted to electronic AutoCAD (release 2019 or later) drawing format.
- .11 Submit to the Consultant for approval one complete set of as-built drawings (hard copy) at project completion. The approved record drawings shall then be submitted to the Owner in both hard copy (one copy) and electronic format.

1.20 Identification:

- .1 Identification Plates:
  - a. Identification plates shall be engraved two-ply plastic, 0.125" (3mm) thick, 1.0" (25mm) high with 3/4" (19mm) white characters on black background and length as required. Locate in a conspicuous location and secure to equipment with stainless steel self-tapping sheet metal screws except that nameplates which are not exposed to outdoor conditions may be secured with double sided adhesive tape.
  - b. All starters shall be identified by the Electrical Contractor.
  - c. Verify all identification labels / tags on site with the Owner / Consultant prior to installation and adjust as directed.

- d. Provide identification plates for the following:
  - i. Identify all exhaust fans having capacities greater than 150 CFM (70 L/S) as EF-\_\_.
  - ii. Provide additional miscellaneous identification labels as described on the drawings or in other sections of this specification.
- .2 Pipe Identification:
  - a. Identify new piping described below by means of pressure sensitive adhesive labels. Markers and flow arrows shall be in accordance with ANSI/ASME A13.1 latest edition. Identify medium by lettered legend and direction of flow by arrows.
  - b. Provide labels as follows:
    - i. At intervals not greater than 50 ft. (15m), changes of direction, upstream of major manually / automatically operated isolation / control valves, at all branch pipe connections, behind all access doors and on both sides where pipes pass through walls. Use approximate spacing intervals of 25 ft. (7.6m) for all piping running through suspended ceiling spaces.
    - ii. Labels shall be sized as follows (pipe diameter includes insulation where applicable):
      - 1) 0.75" (19mm) to 1.25" (32mm) piping: Minimum 8" (200mm) long label with minimum 0.5" (13mm) letter height.
      - 2) 1.5" (38mm) to 2" (50mm) piping: Minimum 8" (200mm) long label with minimum 0.75" (19mm) letter height.
      - 3) 2.5" (63mm) to 6" (150mm) piping: Minimum 12" (300mm) long label with minimum 1.25" (32mm) letter height.
      - 4) 8" (200mm) to 10" (250mm) piping: Minimum 24" (600mm) long label with minimum 2.5" (63mm) letter height.
      - 5) Over 10" (250mm) piping: Minimum 32" (800mm) long label with minimum 3.5" (88mm) letter height.
    - iii. All identification labels shall be easily and accurately readable from usual operating areas, plane of legend to be approximately at right angles to most convenient line of sight.
    - iv. Wording of all labels shall match existing where applicable and shall be approved by the Consultant prior to manufacture.
  - c. Identify the following new piping systems:
    - i. Domestic hot and cold water.
- .3 Valve identification is not required for this project.
- .4 All equipment, valves, manual / motorized control dampers, miscellaneous controls / transformers, etc. located above acoustic tile ceilings shall be identified with 0.25" (6mm) diameter coloured markers with adhesive backing. Colour of markers shall be red.

#### 1.21 Maintenance Manuals:

- .1 Provide an Operation and Maintenance Manual in electronic PDF format on a suitably sized USB thumb drive. Manuals shall include all reviewed shop drawings, permits, approvals, balancing report, wiring diagrams, water treatment data (hot water heating



system), manufacturers' equipment start-up sheets (where applicable), letter of guarantee / warranties / certificates, as applicable for the project. Also provide a single set of hard copy manuals for school use

- .2 For additional maintenance and operating instruction requirements, refer to other Sections of this specification.

#### 1.22 Owner's Instruction:

- .1 This Section is to supply the services of a knowledgeable mechanic to thoroughly explain each new mechanical system and associated equipment, its operation and its maintenance to the full satisfaction of the Consultant and Owner's representative.
- .2 At the discretion of the Consultant, a manufacturer's service representative shall provide instruction for specialized equipment.

#### 1.23 Cutting, Patching and Refinishing:

- .1 The Mechanical Contractor shall allow for cutting and patching pertaining to the associated Work unless noted otherwise. This shall include cutting and patching of new and existing roofs (roof deck only), interior / exterior walls, ceilings and floors. Cutting and patching shall be performed by workers specialized in this type of work and capable of performing to good commercial standards. All Work shall be to the approval of the General Contractor and Architect / Consultant and Owner.
- .2 Openings required for louvres and ductwork in new interior / exterior masonry walls shall be provided by the General Contractor and openings in existing masonry walls shall be by the Mechanical Contractor. All openings in new / existing drywall walls shall be by the Mechanical Contractor.
- .3 Framed openings in the new and existing roof, wall and floor joists / studs to accommodate installation of the Work shall be by the General Contractor except as otherwise indicated on the drawings.
- .4 All required structural supports / lintels for openings shall be by the General Contractor.
- .5 Cutting and patching of the slab-on-grade floor complete with the finish flooring shall be by the Mechanical Contractor except that patching of the finish flooring shall be by the General Contractor.
- .6 Cutting and patching of the existing roof insulation and waterproofing system as required for mechanical Work shall be by the General Contractor.
- .7 Protect the existing roofing system from any damage at all times. Provide plywood work platforms / walkways as required.
- .8 Conduct photo survey of existing conditions both inside and outside the building, and of the ceiling immediately below the new Work. Immediately notify the Consultant if any resemblance of water leakage or damage is found.
- .9 Patching shall be done using materials to match existing and so as to maintain fire separations, sound transmission class ratings, vapour retarder performance, insulation values, etc. Ensure all openings in the exterior envelope are made weather tight.

- .10 Seal any resulting voids caused by removal of any existing work. Stuff all such voids and annular spaces at service penetrations with Roxul (not pink) batt insulation and caulk seal both the interior and exterior joints. Ensure all openings are made weather tight.
- .11 New finishes required due to demolition work and cutting / patching, and finishes damaged by the mechanical Work shall be made good by the Mechanical Contractor to the approval of the Consultant after installations are complete unless these surfaces are noted on the Architectural drawings to be refinished by the General Contractor, unless noted otherwise or unless alternate arrangements are made between the Mechanical / Sprinkler and General Contractors. All finishes shall match existing.
- .12 All cutting shall be performed in a neat and accurate manner. No cutting of the building envelope or structural elements shall be done without permission from the General Contractor and Architect / Consultant. All work shall be carried out to the satisfaction of the Architect / Consultant.
- .13 Where wall openings resulting from removal of thermostats are not covered by new wall finishes (refer to Architectural drawings) or new control devices, the Temperature Control Contractor shall provide stainless steel coverplates.

1.24 Concrete:

- .1 Patching of concrete floors / walls shall utilize 25 MPa concrete having a smooth trowel finish. Thickness shall match that of the existing floor / wall.

1.25 Sleeves:

- .1 Provide sleeves for piping and ductwork as follows:
  - a. For all copper pipe penetrations of masonry, poured concrete and precast structures where required to prevent direct contact of the masonry / precast / poured concrete with the copper piping. Sleeves are not required provided that direct contact of copper and masonry / precast / poured concrete is prevented and provided the openings comply with the firestop manufacturer's requirements (where applicable).
  - b. Where required for proper installation of pipe firestop systems.
  - c. Where required for proper installation of fire dampers.
- .2 Pipe sleeves shall be Schedule 40 steel.
- .3 Duct sleeves shall be manufactured of galvanized sheet steel of at least the same gauge as duct penetrating wall and shall be reinforced so as not to be deformed by the placement of the concrete. Comply also with the fire damper manufacturer's recommendations.
- .4 For sleeves used with fire dampers, comply also with the fire damper manufacturer's recommendations.

1.26 Firestopping and Sound Packing:

.1 Quality Assurance:

- a. Fire-Test-Response Characteristics: Provide through-penetration fire stop systems that comply with specified requirements of tested systems.
- b. Firestop system installation must meet requirements of CAN/ULC-S115:2018 tested assemblies that provide a fire rating as described elsewhere in this specification.
- c. Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.
- d. Firestop systems do not re-establish the structural integrity of load bearing partitions/assemblies, or support live loads. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.
- e. For those firestop applications that exist for which no ULC or cUL tested system is available through a manufacturer, a manufacturer's engineering judgment derived from similar ULC or cUL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineering judgment drawings must follow requirements set forth by the International Firestop Council.

.2 Submittals:

- a. Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of ULC or cUL firestop systems to be used and manufacturer's installation instructions.
- b. Manufacturer's engineering judgment identification number and drawing details when no ULC or cUL system is available for an application. Engineered judgment must include both project name and contractor's name who will install firestop system as described in drawing.
- c. Submit material safety data sheets provided with product delivered to job-site.
- d. Where applicable, submit certificate by firestopping manufacturer proving that the products supplied comply with LEED requirements for indoor environmental quality credit including printed statement of VOC.

.3 Delivery, Storage and Handling:

- a. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and ULC or cUL label where applicable.
- b. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.
- c. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements.
- d. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.
- e. Do not use damaged or expired materials.

.4 Project Conditions:

- a. Do not use materials that contain flammable solvents.
- b. Schedule all Work according to manufacturer's recommendations.
- c. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

- d. Weather conditions: Do not proceed with installation of firestop materials when temperatures are not within the manufacturer's recommended limitations for installation printed on product label and product data sheet.
- e. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

.5 Product Performance Requirements:

- a. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.
- b. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.
- c. Penetrations in fire resistance rated walls: Provide firestopping with ratings determined in accordance with CAN/ULC-S115:2018.
- d. For combustible pipe penetrations through a fire separation, provide a firestop system with a "F" Rating as determined by ULC or cUL which is equal to the fire resistance rating of the construction being penetrated.
- e. Penetrations in horizontal assemblies: Provide firestopping with ratings determined in accordance with CAN/ULC-S115:2018. For penetrations through a fire wall or horizontal fire separation, provide a firestop system with a "FT" Rating as determined by ULC or cUL which is equal to the fire resistance rating of the construction being penetrated.
- f. Provide a firestop system with an assembly rating as determined by ULC-S115 which is equal to the time rating of construction joint assembly.
- g. Penetrations in smoke barriers: Provide firestopping with ratings determined in accordance with CAN/ULC-S115:2018.
  - i. L-Rating: Not exceeding 5.0 cfm/sq. ft. (0.22 lps/sq.m.) of penetration opening at both ambient and elevated temperatures.
- h. Mold Resistance: Provide penetration firestopping with mold and mildew resistance rating of 0 as determined by ASTM G21.
- i. Rain and water resistance: provide perimeter joint sealant tested in accordance with ASTM D 6904 with less than 1 hour tack free time as tested in accordance with ASTM C 679.

.6 Product Manufacturer:

- a. The firestop manufacturer shall be Hilti or approved equal except that all firestop materials shall be modified on site to be of the same manufacturer as that used by the General Contractor. Co-ordinate on site.

.7 Materials:

- a. Use only firestop products that have been ULC or cUL tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.
- b. Accessories: provide components for each firestopping and smoke seal systems that are needed to install fill materials. Use only components specified by

firestopping material manufacturer and approved by the qualified testing agency. Accessories include, but are not limited to, the following items:

- i. Permanent forming, damming and backing material.
  - ii. Temporary forming material.
- c. Pre-formed firestop devices for use with non-combustible and combustible pipes (closed and open systems), conduit and/or cable bundles penetrating concrete floors and/or gypsum walls, the following products are acceptable:
- i. Hilti Speed Sleeve (CP 653) for use with cable penetrations.
  - ii. Hilti Firestop Drop-In Device (CFS-DID) for use with noncombustible and combustible penetrants.
  - iii. Hilti Firestop Block (CFS-BL).
- d. Sealants or caulking materials for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:
- i. Hilti Intumescent Firestop Sealant (FS-ONE MAX).
  - ii. Hilti Fire Foam (CP 620)/CP 660.
  - iii. Hilti Flexible Firestop Sealant (CP 606).
  - iv. Hilti Firestop Silicone Sealant Gun Grade (CFS-S SIL GG).
  - v. Hilti Firestop Silicone Sealant Self Leveling (CFS-S SIL SL).
- e. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:
- i. Hilti Firestop Silicone Sealant Gun Grade (CFS-S SIL GG).
  - ii. Hilti Firestop Silicone Sealant Self Leveling (CFS-S SIL SL).
  - iii. Hilti Flexible Firestop Sealant (CP 606).
  - iv. Hilti Intumescent Firestop Sealant (FS-ONE MAX).
- f. Intumescent sealants or caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:
- i. Hilti Intumescent Firestop Sealant (FS-ONE MAX).
- g. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems) tested to 50 Pa. pressure differential, the following products are acceptable:
- i. Hilti Firestop Collar (CP 643N).
  - ii. Hilti Wrap Strips (CP 648E/648S).
- h. Materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
- i. Hilti Firestop Block (CFS-BL).
  - ii. Hilti Composite Sheet (CFS-COS).
  - iii. Hilti Firestop Mortar (CP 637).

- iv. Hilti Fire Foam (CP 620)/660.
- v. Hilti Firestop Board (CP 675T),
- i. Non-curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
  - i. Hilti Firestop Block (CFS-BL).
  - ii. Hilti Firestop Board (CP 675T)

.8 Preparation:

- a. Verification of conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
- b. Verify penetrations are properly sized and in suitable condition for application of materials.
- c. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.
- d. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
- e. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.
- f. Do not proceed until unsatisfactory conditions have been corrected.

.9 Co-ordination:

- a. Coordinate construction of openings, penetrations to ensure that the fire stop systems are installed according to specified requirements.
- b. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration fire stop systems.
- c. Coordinate fire stopping with other trades so that obstructions are not placed to interfere with the installation of the fire stop systems.
- d. Do not cover up through-penetration fire stop and joint system installations that will become concealed behind other construction until each installation has been examined by the building inspector.

.10 Installation:

- a. Regulatory requirements: Install firestop materials in accordance with ULC Fire Resistance Directory or UL Products Certified for Canada (cUL) Directory or Omega Point Laboratories Directory.
- b. Manufacturer's Instructions:
  - i. Comply with manufacturer's instructions for installation of through-penetration materials.
  - ii. Seal all holes or voids made by penetrations to ensure an air and water resistant seal.
  - iii. Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of ULC or cUL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.
  - iv. Protect materials from damage on surfaces subjected to traffic.

- c. Where pipes / ducts / conduits / services pass through non-rated walls, pack around pipe / duct / conduit / penetrating item with mineral wool filler to reduce noise transmission.

#### 1.27 Cements and Primers

- .1 All cements, primers, etc. shall be low volatile organic compound type, tested to meet the requirements of SCAQMD rule 1168, Test Method #316A (South Coast Air Quality Management District).

#### 1.28 Pipe Escutcheons:

- .1 Provide proper chrome plated steel escutcheon plates for exposed uninsulated piping penetrating walls / floors / ceilings except where openings around piping have been filled to the approval of the Consultant.
- .2 Pipe escutcheons shall be one piece type with set screws for installation at plumbing fixtures. Elsewhere use chrome plated slit type with substantial hinges, positive latches and set screws.
- .3 Size plates so that they are tight against the wall, floor or ceiling surface concerned; outside diameter to cover opening or sleeve and inside size to fit around finished pipe.

#### 1.29 Access Doors For Walls and Ceilings:

- .1 Provide to the General Contractor for installation access doors for concealed mechanical equipment requiring accessibility for service and maintenance. These items should be grouped wherever possible in order to reduce the number of panels required. Doors shall be sized to ensure adequate accessibility, shall be a minimum size of 8" x 8" (200 x 200mm) and shall be a minimum size of 24" x 18" (600 x 450mm) where head and shoulders access is required unless otherwise noted. Doors shall be complete with positive locking self-opening screwdriver lock. The exact size of access doors shall be as recommended by the manufacturer to suit the application.
- .2 Doors shall be manufactured by Acudor or approved equal and shall be of the following types (Contractor to choose applicable type):
  - a. Drywall / Block Walls or Ceilings: Model UF-5000 having the following features:
    - i. Uninsulated steel construction.
    - ii. Doors up to 16"x16" (400x400mm) shall have 16 gage doors and 18 gage mounting frame.
    - iii. Doors over 16"x16" (400x400mm) shall have 14 gage doors and 16 gage mounting frame.
    - iv. Door shall be flush to frame with rounded safety corners.
    - v. A one piece outer flange shall be welded to the mounting frame.
    - vi. Continuous concealed hinge.
    - vii. Stainless steel screwdriver operated cam latch.
    - viii. Prime coat of white alkyd baked enamel.
  - b. Fire Rated Drywall / Block Walls: Model FW-5050 having the following features:
    - i. Insulated steel construction.
    - ii. ULC 2.0 hour B label.

- iii. Doors shall be 20 gage and mounting frames shall be 16 gage.
- iv. Doors shall be filled with 2" (50mm) thick fire rated insulation.
- v. Door shall be flush to frame with reinforced edges, flange to be 1" (25mm) wide.
- vi. Self-closing and self-latching.
- vii. Inside latch release.
- viii. Concealed hinge.
- ix. Universal self-latching bolt latch, operated by a flush key.
- x. Prime coat of white alkyd baked enamel.

#### 1.30 Dissimilar Metals:

- .1 Separate dissimilar metals by means of gaskets or shims of approved material in order to prevent electrolytic action. Where piping of dissimilar metals is connected, use approved dielectric unions or flanges. A brass fitting or brass valve may also be used in making connections between copper and steel piping.
- .2 Where supporting copper pipe, isolate pipe from hanger with electrolytic action tape or equivalent or use copper / plastic coated supports. Direct contact between copper piping and concrete, masonry or precast construction will not be permitted.

#### 1.31 Flashings:

- .1 All flashings and counter flashings required for mechanical Work shall be supplied and installed by the General Contractor / Roofing Sub-Contractor.

#### 1.32 Excavating & Backfill:

- .1 This Contractor shall do all excavation, trenching, removal, disposal, backfill and compaction in connection with his Work.
- .2 Before commencing with Work, investigate locations, arrangements and conditions of all previously installed / existing underground services. Protect existing structures and services as required.
- .3 Grade bottom of trenches to maintain design slopes.
- .4 The bottoms of trenches shall be excavated so that pipes shall be supported on a solid bed of undisturbed earth. In competent undisturbed soil, lay pipes directly on the soil.
- .5 For trenches excavated too deep, where rock or other materials may cause damage to piping or have diameters larger than 1" (25mm), and where required by manufacturer's installation recommendations to prevent damage to piping, excavate to 6" (150mm) below pipe and backfill with bedding sand or limestone screening power tamped to 95% MMDD.
- .6 Backfill to 12" (300mm) above pipe with bedding sand or limestone screening power tamped to 95% MMDD. The remaining backfill material shall be as outlined in Division 2 but carried out by this Contractor. Provide compactions tests where directed by the Consultant, General Contractor or Architect.
- .7 Keep sides of trenches vertical to a minimum depth of 20" (500mm) over pipe to maintain load within pipe design limits. Minimum width of trench shall be pipe diameter plus 18" to 24" (450 to 600mm).



- .8 Carefully backfill both sides of tanks, pits and piping simultaneously to prevent movement or displacement.
- .9 All excavations shall be protected with guard rails, plywood covering or equivalent protective devices. Remove all protective devices before backfilling or when the necessity for protection ceases.
- .10 All excavation work shall comply with the latest edition of the Occupational Health and Safety Act of Ontario.
- .11 All piping shall be tested before backfilling. The inspection will be by the Consultant or the local authority.

1.33 Work Performed by the General Contractor:

- .1 The following Work shall be performed by the General Contractor:
  - a. Provision of furred in duct / pipe spaces.
  - b. Openings in new interior / exterior masonry walls for louvres / ductwork (openings in existing walls by the Mechanical Contractor).
  - c. Framed openings in the new and existing roof, wall and floor joists / studs to accommodate mechanical Work.
  - d. Lintels / structural supports for all wall / floor / roof openings.
  - e. Unless noted otherwise, all painting associated with the mechanical systems installation.
  - f. Roof flashings for new mechanical systems.
  - g. All patching of finish flooring.
  - h. All cutting and patching of the existing roof insulation and waterproofing system.

1.34 Paint:

- .1 Paint for new finishes shall be good quality commercial grade of a type to suit the application. Apply according to manufacturer's recommendations. All painted surfaces shall have a minimum of one primer coat and two finish coats unless otherwise directed by the Paint Manufacturer.

1.35 Installation Requirements:

- .1 Ensure that equipment and material manufacturers' installation instructions are followed unless specified herein or on the drawings, and unless such instructions contradict governing codes and regulations.
- .2 Install services as follows:
  - a. Unless otherwise specified, install horizontal pipes and ducts above the ceilings on the floors on which they are shown, arranged so that under consideration of all other work in the area, the maximum ceiling height and / or usable space is maintained.
  - b. Install all pipes and ducts parallel to building lines.
  - c. Neatly group and arrange all exposed Work, centered between building structure, lights, etc. where possible.
  - d. Install piping, fittings, valves, strainers, backflow preventers, cleanouts, dampers, etc. in conveniently accessible locations to facilitate easy maintenance.

- e. Locate all valves, dampers and any other equipment which will or may need maintenance / repairs / replacement, and which are installed in inaccessible construction, to be easily accessible from access doors.
- f. Install piping and ductwork which are to be insulated so that they have sufficient clearance to permit insulation to be applied continuously and unbroken around the pipe or duct.
- g. In accordance with the manufacturer's requirements and / or recommendations.
- h. Provide all supports, hangers and fasteners except as otherwise noted.
- i. Do not support piping or ductwork from equipment.
- j. Secure all products and services so as not to impose undue stresses on the structure or systems.
- k. Carefully clean all ducts, venting, piping and fittings prior to installation. Temporarily cap / seal all open ends of new / affected ductwork, venting, piping and conduits to prevent entrance of foreign matter.
- l. Do not install piping in a location or manner which might result in freezing.
- m. Support of ductwork, piping, equipment, etc. from the roof / floor deck will not be permitted except as otherwise noted.

.3 Equipment Installation:

- a. Handle equipment carefully to prevent damage, breaking, denting and scoring. Damaged equipment / components shall not be installed. Replace damaged parts with new supplied by the manufacturer.
- b. If equipment is to be stored prior to installation, store in a clean, dry place. Protect from weather, dirt, fumes, water, physical damage, etc.
- c. Comply with the manufacturers rigging and installation instructions for unloading and moving into final location.
- d. Level equipment according to manufacturer's recommendations, and to permit proper condensate drainage where applicable.
- e. Assemble and install equipment according to manufacturer's recommendations.
- f. Provide adequate / manufacturer's recommended clearances to permit servicing and maintenance of equipment.

.4 Fastening and Securing Hardware:

- a. Provide all fastening and securing hardware required for mechanical Work to maintain installations attached to the structure or to finished floors, walls and ceilings in a secure and rigid manner capable of withstanding the dead loads, live loads, superimposed dead loads, and any vibration of the installed products.
- b. Use fasteners compatible with structural requirements, finishes and types of products to be connected. Do not use materials subject to electrolytic action or corrosion where conditions are liable to cause such action.
- c. Where the floor, wall or ceiling construction is not suitable to support the loads, provide additional structural framing or special fasteners to ensure proper securement to the structure. Provide reinforcing or connecting supports where required to distribute the loading to the structural components.
- d. Obtain written consent before using explosive actuated fastening devices. If consent is obtained, comply with requirements of CSA Standards CAN3-Z166.1 and 2-M85.

1.36 Start-Up and Adjusting:

- .1 Lubricate all bearings; adjust and set all direct drives and 'V' belt drives and drivers for proper alignment and tension; calibrate and adjust all thermostats, sensors, linkages and dampers; operate and test all motors and speed switches for correct wiring sequences; check all overload heaters in motor starters; clean the fan wheels, heating / cooling coils; fasten all loose and rattling pieces of equipment.
- .2 Start-up equipment according to manufacturer's recommendations. Complete all manufacturers' start-up literature (where applicable) and include in the operating / maintenance manuals.
- .3 Confirm that equipment is operating as intended without undue noise and vibration.
- .4 This Contractor shall be in charge of the mechanical system during tests and shall assume responsibility for damage in the event of injury to personnel, building, and equipment, and shall bear all costs for liability, repairs, and restoration in this connection.
- .5 This Section shall provide acceptance tests to demonstrate that the equipment and systems actually meet the specified requirements. Tests may be conducted as soon as conditions permit. Make all changes, adjustments or replacements required as the preliminary tests may indicate prior to final tests. In testing, vary loads to confirm start-up sequence, normal shut down, and simulate emergency conditions for safety shut down with automatic and manual reset.
- .6 This Contractor shall give the Consultant advance notice in writing that the preliminary tests have been completed and that he is prepared to carry out final tests. Final tests shall be conducted in the presence of the Consultant where directed.
- .7 Enter or adjust all controller set-points as required to meet specific project requirements.
- .8 Prepare test and inspection reports.
- .9 The final balancing of the air systems and water systems shall be conducted by a company specializing in testing, adjusting and balancing. Notwithstanding the testing and balancing being performed by a specialist, the Mechanical Contractor shall still bear full responsibility for the proper operation of all mechanical systems.
- .10 This Section is to operate all the equipment for a minimum period of five days after final acceptance date. Defects disclosed must be repaired and tests repeated until pronounced satisfactory.

1.37 Testing, Balancing and Adjusting:

- .1 General:
  - a. Retain the services of an independent Balancing Contractor to test and balance the systems and include for the provision of a balancing report.
  - b. All Work shall be performed in compliance to the requirements of the National Environmental Balancing Bureau (NEBB) or Associated Air Balance Council (AABC) and the Contractor shall be certified with one of these agencies.

- c. The following is a list of the approved Balancing Contractors whom may quote on the balancing of the systems:
    - i. Air Audit Inc.
    - ii. Air Velocities
    - iii. Clark Balancing Ltd.
  - d. The Balancing Contractor shall provide all necessary precision instruments for measuring and adjusting. Use instruments which are of correct scale and accurately calibrated.
  - e. The Mechanical Contractor shall confirm that the mechanical systems are all connected and operating as outlined in the specification and shown on the drawings before balancing Work commences.
  - f. The Mechanical Contractor shall co-operate with the Balancing Contractor to facilitate the balancing Work and provide mechanical tools, equipment, etc. as required.
  - g. All balancing shall be done in a manner to minimize throttling losses and using speed adjustment to meet design flowrates. Final flowrates shall be within ten percent (10%) of specified value.
  - h. Test and adjust blower rpm to design requirements. All required pulleys shall be supplied / installed / adjusted by the Balancing Contractor.
  - i. Start balancing only when the Work is essentially completed, including:
    - i. Installation of ceilings, doors, windows and other construction affecting testing and balancing,
    - ii. Application of sealing, caulking and weatherstripping.
    - iii. Normal operation of mechanical / electrical / control systems affecting testing and balancing.
    - iv. Thermal overload protection in place for electrical equipment.
    - v. Air filters clean and in place.
    - vi. Duct systems clean of debris.
    - vii. Correct fan rotation.
    - viii. Fire and volume dampers in place and open.
    - ix. Coil fins cleaned.
    - x. All duct outlets installed and connected.
    - xi. Access doors closed.
    - xii. Ductwork installation complete.
- .2 The Test and Balance Agency shall perform the following Work in regards to the air systems:
- a. Test and adjust system / equipment for design air flows.
  - b. Equipment requiring air balancing shall be as follows:
    - i. All new supply and exhaust fans having capacities greater than 150 CFM (70 L/S).
    - ii. Existing rooftop units.
  - c. Confirm that all fan belts are set to the manufacturer recommended tension and include a confirmation statement in the balancing report.
  - d. Locations of systems measurements / adjustments shall include but not be limited to the following as appropriate:

- i. Each duct run-out (or grille / diffuser) having an indicated airflow on the drawings.
    - ii. Each VVT automatic temperature control damper.
    - iii. Make pitot tube traverse of main supply / return / exhaust duct to verify design airflows at equipment.
  - e. Adjust grilles and diffusers to obtain optimum air distribution patterns. Also adjust to suit the Consultant.
  - f. For VVT temperature control systems, perform the following to ensure excessive noise is not generated:
    - i. For each VVT system, the Test and Balance Agency shall measure the static pressure in the main duct at the location of the bypass damper using a manometer when the system is in fixed mode (all zone dampers are full open and the bypass damper is full closed). This information shall be included in the Balancing Report and shall be given to the Mechanical Contractor for verification that the VVT system is properly calibrated.
    - ii. For each VVT system, 10% of the dampers shall be set to the full open position and 90% shall be set at their minimum position. When operating with these damper positions, the static pressure in the main duct at the location of the bypass damper shall again be measured by the Test and Balance Agency using a manometer to ensure it remains at the value measured when in the fixed mode. This information shall be included in the Balancing Report and shall be given to the Mechanical Contractor for verification that the VVT system is operating correctly and is properly calibrated.
    - iii. During balancing procedures, set controls to a fixed mode (bypass damper locked fully closed and all zone dampers locked fully open) to prevent any changes during the balancing procedure. In the fixed mode, only the system manual balancing dampers shall be used to achieve the indicated balancing airflows.
- .3 Submit one copy of the final system balancing report in hard cover 3-ring binder complete with index page and index tabs and certified by balancing specialist. Handwritten data will not be accepted. Include types, size, manufacturer, serial numbers and dates of calibration of all instruments used. The format shall be in accordance with the Canadian AABC or NEBB Report Form and approved by the Consultant. In addition to the hard copy report, provide the complete report in electronic PDF format, arranged in the same manner, on a suitably sized USB thumb drive. The balancing report shall include:
  - a. Project record drawings.
  - b. System schematics.
  - c. All measured / adjusted values (include initial and final readings).
  - d. Measured motor brake horsepower or full load amps.
  - e. An assessment of the filter cleanliness.
  - f. All pertinent information regarding balanced equipment shall be listed, such as:
    - i. Designation of equipment.
    - ii. Location of equipment.
    - iii. Manufacturer.
    - iv. Model number.
    - v. Motor characteristics (manufacturer, horsepower, frame size, RPM, etc.).
    - vi. Voltage and phase.
    - vii. Motor full load amps and service factor.
    - viii. Type of overload protection (if applicable).
    - ix. Fans:

- 1) RPM.
  - 2) Flowrate.
  - 3) Static pressure, including inlet and outlet pressure.
  - 4) Fan / motor pulley size / type and setting.
  - 5) Quantity and size of belts.
- .4 During system testing and balancing procedures, the Mechanical and Temperature Control Contractors shall be present, shall fully demonstrate the operation of all controls and shall make adjustments as often as necessary to satisfy the Balancing Contractor. The Balancing Contractor shall verify control system operation and report on any installation problems observed. Physical changes to the control system shall be performed by the Mechanical / Temperature Control Contractor. The Balancing Contractor shall work closely with Mechanical and Temperature Control Contractors to identify and correct problems.
- .5 All Testing and Balancing Work associated with both the air and water systems shall be performed under the HVAC sub-contract.

#### 1.38 Trial Usage

- .1 It is especially understood and agreed that the temporary and trial usage by the Owner of any mechanical device, machinery, apparatus, equipment or any other work or materials, supplied under this contract, before the date of Substantial Completion and written acceptance by the Consultant, is not to be construed as evidence of the acceptance of same by the Owner. It is further understood and agreed that the Owner shall have the privilege of such temporary and trial usage as soon as this Trade shall claim that the said work is completed and in accordance with the drawings and specifications for such reasonable length of time and as the Consultant shall deem to be sufficient for making a complete and thorough test of the same.
- .2 No claims for damage shall be made by this Trade for the injury to or breaking of any parts of such work which may be so used whether caused by weakness or inaccuracy of parts; or by defective material or quality of work of any kind whatsoever.
- .3 All equipment used on a temporary basis must be brought back to new condition by the Contractor and new full guarantee period to begin on the date the building / project is accepted by the Owner.
- .4 The Contractor shall supervise and maintain responsibility for the systems during the period of trial usage.

#### 1.39 Cleaning:

- .1 The Contractor shall keep the premises in a clean and orderly condition during construction. All waste and unusable materials associated with the Work shall be promptly removed from the site.
- .2 Upon completion of the Work, this Section shall:
- a. Go over the entire installation and clean all new or affected fixtures, equipment, ductwork, piping, building finishes, building contents, etc. soiled by the Work.
  - b. Remove all surplus materials and rubbish of every description, incident to this work, leaving the installation neat and orderly and in completely satisfactory working conditions subject to the approval of the Consultant.

- c. Replace all new / existing air filters which have been soiled by the Work.

1.40 Guarantee and Warranties:

- .1 This Contractor, as a condition precedent to final payment, shall execute a guarantee to the Owner in writing warranting all apparatus furnished under this Section to remain in serviceable and perfect condition for a period of one (1) year from date of final acceptance of the Work, unless specified otherwise. Any imperfections, as a whole, or in part, by reason of defective quality of work, defective materials, defective arrangement of the various parts, or materials damaged as a result of these defects or repairs, shall be made good to the satisfaction of the Consultant at this Contractors expense without undue delay.
- .2 Guarantee shall include all costs including material and labour, and any necessary cutting, patching and refinishing necessitated by these operations.

**END OF SECTION**

## **2. MECHANICAL INSULATION**

### **2.1 General Insulation Requirements:**

- .1 All insulation shall be applied in general accordance with TIAC National Insulation Standards Manual, manufacturer's published instructions / recommendations and these specifications.
- .2 Apply covering in a neat workmanlike manner so that finished job is uniform and smooth in finish.
- .3 All insulation and components shall have maximum flame and smoke spread ratings of 25 and 50 respectively.
- .4 Ensure that all piping (including valves and fittings), ductwork and equipment are dry and clean before applying covering.
- .5 Do not apply insulation until the items to be covered have been tested against leakage.
- .6 Butt joints firmly together. Stagger joints in multiple layer construction.
- .7 Locate longitudinal seams so as to be invisible.
- .8 Cover ALL joints with self-sealing 3" (75mm) wide vapour barrier tape.
- .9 Install pipe insulation continuous through barriers (walls, floors and similar obstructions).
- .10 Install duct insulation continuous through barriers (walls, floors and similar obstructions) except at fire dampers.
- .11 For all domestic cold water piping and for all duct thermal insulation, maintain integrity of vapour barrier jacket over all insulation, taking special precaution at fittings, valves, strainers, supports, etc. For these systems:
  - a. Install insulation directly over pipes and not over hangers / supports.
  - b. Ensure duct and pipe insulation is not broken at supports and standing duct seams. Where required, provide manufacturer supplied vapour barrier tape to maintain the integrity of the vapour barrier jacket at these locations.
  - c. Finish insulation ends with self-sealing 3" (75mm) wide vapour barrier tape.
- .12 Protect insulation passing through floors, walls and similar barriers to prevent damage.
- .13 Install insulation over equipment which may require service / replacement by maintenance staff (valves, backflow preventers, strainers, unions etc.) to be easily removable / replaceable without damage to adjacent insulation (use only pre-fabricated type insulation).
- .14 Valves, strainers, unions and backflow preventers which are 1" (25mm) and smaller in domestic and heating hot water systems are not required to be insulated.
- .15 Existing pipe / duct insulation shall remain unchanged except that all existing insulation damaged during installation of new Work shall be repaired. Match material type, thickness and finish covering of existing insulation.



## 2.2 Pipe Insulation:

- .1 Piping:
  - a. Rigid Piping:
    - i. Johns Manville Micro-lok or approved equal pre-moulded, glass fiber, rigid, sectional sleeve type insulation with a K factor of 0.23 Btu-in/hr.-sq.ft.-deg.F (0.033 W/m.-deg.C) at a mean temperature of 75 deg. F. (24 deg. C.) and jacketed with a factory applied reinforced vapor retarder facing having a longitudinal acrylic adhesive closure system. Thickness and application shall be as specified below.
- .2 Valves and Fittings:
  - a. Fittings:
    - i. Pre-formed fittings or mitred segments shall match adjacent pipe insulation and components.
    - ii. If fitting insulation is covered with a PVC jacket, insulation may be revised to Johns Manville type 150 Micolite or approved equal formaldehyde-free, flexible glass fiber, blanket type insulation with a K factor of 0.24 Btu-in/hr.-sq.ft.-deg.F (0.035 W/m.-deg.C) at a mean temperature of 75 deg. F. (24 deg. C.) and a factory applied FSK vapour barrier facing having a 2" (50mm) stapling tab.
  - b. Valves / Strainers / Unions:
    - i. Pre-formed fittings only.
- .3 Insulation Thickness for Piping, Valves and Fittings:
  - a. Copper Type Domestic Cold Water: 0.5" (13mm) with the following exceptions:
    - i. The heat trap at the inlet to the water heater and all downstream piping shall be provided with 1" (25mm) insulation rather than the 0.5" (25mm) insulation as specified.
  - b. Plastic Type Domestic Cold Water: no insulation required with the following exceptions:
    - i. The heat trap at the inlet to the water heater and all downstream piping shall be provided with 1" (25mm) insulation.
    - ii. Straight type PEX tubing shall be provided with 0.5" (13mm) insulation (coil type PEX tubing and CPVC plastic tubing does not require insulation).
    - iii. Any metal components in the piping system, such as valves, fittings, backflow preventers, etc., shall be provided with 0.5" (13mm) insulation.
  - c. Copper and Plastic Type Domestic Hot Water: 1" (25mm) with the following exceptions:
    - i. Piping 1.5" (38mm) and larger shall be provided with 1.5" (38mm) insulation.

- ii. Plastic piping which does not form a portion of the recirculating water system is not required to be insulated (copper piping is still required to be insulated).
  - d. Plastic Type Domestic Hot Water: no insulation required except that the first 8'-0" (2.44m) of hot water piping from domestic water heaters shall be provided with 1" (25mm) insulation.
  - e. Repair of Existing Insulation: match thickness of existing insulation.
- .4 Installation:
- .5 Install fiberglass type insulation according to manufacturer's recommendations and as follows:
- a. Apply the SSL smoothly and securely as per the manufacturer's recommendations, ensuring all contacting surfaces are kept clean.
  - b. Apply insulation on fittings / valves / backflow preventers / strainers / unions before straight run insulation.
  - c. All insulation for fittings shall be cut to suit the length of the body plus 2" (50mm) at each end.
  - d. Any void between the insulation on fittings / valves / backflow preventers / strainers / unions and the straight run insulation shall be filled with insulation segments cut to fit the gap.
  - e. If a continuous vapour barrier is specified, finish insulation ends with self-sealing 3" (75mm) wide vapour barrier tape.

### 2.3 Finish Covering for Pipe Insulation:

- .1 All exposed pipe insulation shall be complete with PVC jacketing which is supplied and installed according to manufacturer's recommendations, and as follows:
- a. For piping, provide Proto Cut & Curl Losmoke with self-sealing tape or approved equal, 0.02" (0.5mm) thick.
  - b. The system shall consist of one piece and two piece pre-molded high impact, LoSMOKE PVC fitting covers with all required accessories, which include elbows / tee / valves / end caps / mechanical line couplings / specialty fittings, tank end panels, tack fasteners, tapes and specialty items.
  - c. The jacket shall be white.
  - d. Jacketing shall have 25 / 50 flame spread / smoke developed ratings and a bright high-gloss colour.
  - e. The jacketing shall be designed for indoor and outdoor use when white in colour and shall be UV resistant.
  - f. The jacketing shall not promote the growth of fungi or bacteria.
  - g. Where desired by the Contractor, fiberglass inserts which comply with the insulation specifications may be provided by the PVC jacket manufacturer at supports.
  - h. Apply according to manufacturer's recommendations.
- .2 A finish covering on concealed insulation is not required. Note that insulation located within suspended ceiling spaces, walls and cabinet spaces will be considered concealed.

## 2.4 Duct Thermal Insulation:

- .1 Johns Manville type 75 Micolite XG or approved equal formaldehyde-free, flexible glass fiber, blanket type insulation with a K factor of 0.27 Btu-in/hr.-sq.ft.-deg.F (0.039 W/m.-deg.C) at a mean temperature of 75 deg. F. (24 deg. C.) and a factory applied FSK vapour barrier facing having a 2" (50mm) stapling tab. Provide 1.5" (38mm) thickness for all ductwork where indicated on the drawings unless otherwise noted.
- .2 Where thermal insulation is indicated on the drawings for exposed rectangular ductwork, insulation shall be 2" (50mm) thick Johns Manville 800 Series Spin Glas or approved equal rigid board type insulation, 3.0 lb./cu.ft. (48.1 kg./cu.m.) density, with a K factor of 0.23 Btu-in/hr.-sq.ft.-deg.F (0.035 W/m.-deg.C) at a mean temperature of 75 deg. F. (24 deg. C.) and a factory applied FSK facing.
- .3 Insulation fasteners shall be 12 gauge (2mm) zinc coated steel pins at 16" (400mm) to 18" (450mm) on center complete with minimum 1.5" (38mm) square plastic or zinc plated steel self-locking washers. Alternatively, use Continental spindle anchors held in place with Tac Two or approved equal adhesive at 16" (400mm) to 18" (450mm) on center.
- .4 Insulation self-adhesive tape shall be MacTac Canada Ltd. or Venture Tape, ULC listed.
- .5 Flexible duct wrap insulation shall be applied as follows:
  - a. Cut to have a 3" (75mm) minimum overlap.
  - b. On round ductwork, provide one row of welded or glued on spindle anchored pins on the top or side section at 12" (300mm) centers (length of pins shall suit ductwork). Proper washers shall be pressed on the pins and the ends of the pins cut before sealing with a piece of 4" (100mm) tape. On round ductwork 14" (350mm) and smaller, 0.5" (13mm) wide 20 gauge stainless steel banding may be used as an alternate to the anchoring pins (install bands at 12" (300mm) on center).
  - c. On rectangular ductwork, apply as specified for round ductwork where dimensions do not exceed 16" (400mm) in total on the four sides. On larger ductwork, the sides and bottom shall have stud welded pins or spindle anchored pins glued on at 16" (400mm) to 18" (450mm) on center.
  - d. All pin penetrations or punctures and all circumferential and longitudinal joints in jacket shall be sealed with a 4" (100mm) vapour barrier tape.
  - e. Refer also to manufacturer's recommendations.
- .6 Rigid board type insulation shall be applied as follows:
  - a. Cut to fit between standing seams and stiffeners.
  - b. Apply welded or glued on pins installed at maximum 18" (450mm) on center. Apply pins with reduced clearances where necessary to properly secure insulation.
  - c. Apply to top of duct first, with edges of insulation even with edges of ductwork.
  - d. Next apply to sides of duct by cutting board to run from the top edge of top of duct insulation and to terminate flush with the bottom edge of the duct.
  - e. Next apply to bottom of duct by cutting board to be even with the outside edges of the side insulation.
  - f. Mechanical washers shall be applied as the board is being installed. Cut the remainder of the unnecessary pins.
  - g. At corner joints and washers, a 4" (100mm) tape shall be used to seal all joints and maintain integrity of vapour barrier jacket.

- h. Where elbows occur, slit board at 1" (25mm) centers in a AV@ type cut where necessary to soften the board.
  - i. Provide drywall type metal corner beads on edges of insulation, secured in place with tape.
  - j. Refer also to manufacturer's recommendations.
- .7 Thermal insulation shall be applied where indicated on the drawings and including the following locations:
  - a. All supply air ductwork running in ceiling spaces, bulkheads or furred enclosures not used as a return air plenum shall be covered in thermal insulation where not acoustically insulated.
  - b. All supply air ductwork running in spaces that are not air conditioned shall be covered in thermal insulation where not acoustically insulated.
  - c. Where ductwork penetrates outside walls / roofs / attics, insulate all interior ductwork within 8'-0" (2.4m) of wall / roof / attic penetration to prevent condensation. Thermal insulation not required where ductwork is acoustically lined unless otherwise noted.
  - d. All outdoor air intake ductwork running within the building shall be thermally insulated.
  - e. Any portion of wall boxes located on the warm side of the building insulation shall be thermally insulated.

**END OF SECTION**

### **3. PLUMBING AND DRAINAGE**

#### **3.1 Supports:**

- .1 Provide all required pipe hangers and supports.
- .2 Pipe hanger and support materials, including accessories, shall be in accordance with:
  - a. The Manufacturers Standardization Society (MSS) Standard Practice Manual ANSI/MSS SP- 58, Pipe Hangers and Supports – Materials, Design and Manufacture.
  - b. Code requirements.
  - c. Good commercial standards.
- .3 Provide supports to secure pipes, prevent pipe vibration, maintain required grading, allow for expansion and contraction and produce a neat appearance. Design for strength and rigidity to suit loading and services, prevent undue stress to structural members and with provision for vertical adjustment after piping is erected.
- .4 Offset hanger pipe and structural attachments in such a manner that rod is vertical when piping is hot and is subject to tensile loading only.
- .5 Adjust hanger rods to equalize load.
- .6 Support of piping larger than 1" (25mm) / equipment from the roof / floor deck will not be permitted.
- .7 For all piping systems specified to have insulation with a continuous vapour barrier (refer to 'Mechanical Insulation'), oversize pipe hangers and supports to accommodate insulation.
- .8 Provide supplementary structural steelwork where structural bearings do not exist or are inadequate.

#### **3.2 Domestic Water Piping:**

- .1 Above Ground (Contractor to choose desired type):
  - a. 3" (75mm) and under: type "L" hard copper tubing with sweat wrought copper pressure type solder joint fittings. Alternatively, grooved piping and fittings may be used as specified elsewhere in this specification.
  - b. 3" (75mm) and under, PEX plastic as follows:
    - i. Tubing:
      - 1) Tube shall be cross-linked polyethylene (PEX) manufactured by PEX-a or peroxide method, Uponor Aquapex or approved equal.
      - 2) All PEX tubing, rings and fittings shall be from the same manufacturer and shall be tested / certified as a system.
      - 3) Tubing shall be ASTM F876 tested and approved for excessive temperature and pressure for 725 hours at 210 deg. F. (99 deg. C.) at 150 Psig (1035 Kpa).

- 4) Tubing shall be manufactured in accordance with ASTM F876, ASTM F877 and CAN/CSA-B137.5. The tube shall be listed to ASTM by an independent third party agency.
- 5) Tubing shall have Standard Grade hydrostatic design and pressure ratings of 200 deg. F. (82 deg C.) at 80 psi (551 kPa), 180 deg. F. (82 deg. C.) at 100 psi (689 kPa), and 73.4 deg. F. (23 deg. C.) at 160 psi (1102 kPa). Temperature and pressure ratings shall be issued by the Plastic Pipe Institute (PPI), a division of the Society of the Plastic Industry (SPI).
- 6) Minimum bend radius for cold bending of the PEX tubing shall not be less than six (6) times the outside diameter. Bends with a radius less than stated shall require the use of a bend support as supplied by tube manufacturer.
- 7) Tubing dimensions shall be in accordance with ASTM F876 and ASTM F877.
- 8) Tube Listings shall include the following:
  - I Fire rated assemblies: CAN/ULC-S101.
  - II Fire stop: CAN/ULC-S115.
  - III Flame spread / smoke developed: CAN/ULC-S102.1.
  - IV PEX plumbing: CAN/CSA-B137.5.
  - V NSF/ANSI 14 and 61.
  - VI All PEX tubing, rings and fittings shall be tested together and CSA certified as a system.
- 9) Tubing shall have maximum flame spread / smoke developed ratings of 25 / 50 respectively (required for this project unless noted otherwise) provided the tubing is installed as follows:
  - I 1/2" (13mm) uninsulated tubing: No spacing limitations.
  - II 3/4" (19mm) and 1" (19mm) uninsulated tubing: Adjacent pipe runs shall be located at least 18" (450mm) apart.
  - III 1/2" (13mm) through 2" (50mm) water filled uninsulated tubing: No spacing limitations.
  - IV 1/2" (13mm) through 3" (75mm) insulated tubing: No spacing limitations.
- 10) Piping running concealed within a wall or concrete floor slab is not required to have maximum flame spread / smoke developed ratings of 25 / 50 respectively.
- 11) Tubing shall be supplied in coil or straight form except that all exposed tubing shall be straight type only (tubing running below counters in cabinet spaces will not be considered exposed).
- 12) Tubing shall be supplied in coil or straight form as follows:
  - I Branch tubing serving only one fixture, hose bibb, riser and water heater shall be coiled type. This tubing shall run within the floor joist space where possible.
  - II Branch tubing serving multiple fixtures, hose bibbs, risers and water heaters shall be coiled type only if running with the floor joist space.
  - III Tubing mains running below the floor joists and serving multiple fixtures, hose bibbs, risers and water heaters shall be straight type.

- IV Branch tubing located downstream of Suite / Washroom isolation valves may be coiled or straight type where running concealed.
- V Branch tubing serving a single fixture / device may be coiled or straight type where running concealed.
- VI All riser piping and piping mains running in the Corridors shall be straight type.
- VII All exposed piping shall be straight type.

ii. Fittings:

- 1) Fittings shall be Uponor ProPEX or approved equal.
- 2) PEX-a cold expansion type fittings shall be an assembly consisting of an insert and a PEX-a cold expansion ring.
- 3) Fittings shall be manufactured of Engineered Polymer (EP) except that lead free brass materials shall be allowed only for transition fittings.
- 4) Fitting connections shall be made to the requirements of ASTM F1960.

iii. Accessories:

- 1) Brackets designed for wall membrane penetrations shall be supplied by PEX tubing manufacturer, Uponor ProPEX Out-of-the-Wall System or approved equal.
- 2) All horizontal pipe supports for straight type tubing shall be galvanized steel channels, self-gripping, supplied by the PEX tubing manufacturer, Uponor PEX-a Pipe Support or approved equal.
- 3) All PEX riser clamps shall be epoxy coated.

iv. Warranty:

- 1) PEX tubing and fittings shall carry a twenty-five (25) year non-prorated warranty against failure due to defect in material or workmanship.
- 2) All tubing manufacturer's valves and stops shall carry a one (1) year non-prorated warranty against failure due to defect in material or workmanship.
- 3) The assembly of manufacturer's tubing and fittings shall carry a twenty-five (25) year non-prorated warranty on maintaining a leak-proof seal.
- 4) Warranty shall provide for repair or replacement of any tube, fittings or connection, which are proven to be defective and pay for consequential damages.
- 5) Warranty shall be transferable to subsequent owners.
- 6) The effective warranty shall be the current manufacturer's warranty at the time of installation.
- 7) Warranty Period: Warranty shall commence on Date of Substantial Completion.

.2 Connections:

- a. Lead-free solder for Type L copper except that grooved connections will be permitted for piping 2.5" (63mm) and over.
- b. Silfos or silver solder for Type K copper.
- c. For PEX piping, provide mechanical connections according to manufacturer's recommendations. TUBE FITTINGS WILL NOT BE PERMITTED BELOW THE FLOOR SLAB WITHIN THE BUILDING.

3.3 Sanitary Drain and Vent Piping:

.1 Below Ground (Contractor to choose desired type):

- a. 2" and under: type "DWV" hard copper with cast brass or wrought copper fittings.
- b. Over 2": Cast iron with "MJ" fittings.
- c. All sizes inside the building: ABS DWV pipe with injection-molded socket fittings.
- d. 6" (150mm) and under inside the building: PVC-SDR-35 with injection-molded socket fittings.
- e. All pipe and fittings outside of the building shall be to local authorities' specifications.

.2 Above Ground (Contractor to choose desired type):

- a. 2" and under: type DWV hard drawn copper tube with cast brass alloy drainage fittings.
- b. Over 2": Cast iron pipe with "MJ" fittings or DWV copper tubing with cast alloy drainage fittings.
- c. All sizes: PVC DWV pipe with injection-molded socket fittings. Pipe shall be suitable for use in non-combustible building construction (IPEX System 15 or approved equal). For piping running through return air ceiling plenums, piping shall have a maximum smoke developed rating of 50 (IPEX System XFR 15-50 or approved equal).

.3 Connections:

- a. 50-50 lead-tin solder for DWV copper.
- b. Stainless steel screw clamps and elastomer sleeve for mechanical joint cast iron soil pipe, Bibby-Ste-Croix series 2000 or approved equal.
- c. Solvent weld all socket fittings according to manufacturer's recommendations.

.4 All piping shall conform to or be certified by the appropriate CSA standard according to OBC requirements.

.5 Exposed plastic piping will not be permitted at fixture connections (piping within cabinet spaces is not considered exposed). Use only fixture trim components as specified in the Equipment Schedule or, if not specified, copper piping.

.6 Plastic piping will not be permitted for individual piping branches to floor drains which could receive discharge from hot water heater / relief valves etc. (to prevent pipe damage from extreme temperatures of waste discharge). Use only copper or cast iron piping for these applications for a minimum distance of 15'-0" (4.5m) from the floor drain outlet.



### 3.4 Relief Piping:

- .1 Piping, fittings and connections shall be as specified for domestic water piping except that indirect drain / relief piping shall be copper type only (plastic not permitted).
- .2 Relief piping shall be type M copper, hard drawn with sweat wrought copper pressure type solder joint fittings. Connections shall be made using lead-free solder. Pipe to discharge to floor drain / floor level as noted on the drawings.
- .3 Use lead-free solder for Type M copper.

### 3.5 Sanitary Cleanouts:

- .1 Zurn or approved equal of the following types (Contractor to choose applicable type):
  - a. At the base of each vertical stack and rainwater leader, provide Z-1445 with dura coated cast iron body and gas and watertight ABS tapered thread plug.
  - b. In ceramic tile and vinyl floor areas, provide ZN-1602 complete with dura coated cast iron body, neoprene body sleeve, polished nickel bronze adjustable head and round top.
  - c. In unfinished floor areas, provide ZXN-1612 with dura coated cast iron body, neoprene body sleeve, polished nickel bronze adjustable head and heavy duty scoriated top.
  - d. In waterproof areas, revise drain type to equivalent Z-1400-KC series complete with flange and clamp collars.
  - e. In sheet flooring or equivalent areas, provide ZN-415-R6-ST complete with dura coated cast iron body, combination invertible membrane clamp and adjustable collar with 6" (150mm) diameter polished nickel solid top.
  - f. In piping systems not terminating through building finishes, provide compatible cleanout fittings as manufactured by the pipe manufacturer. Access doors shall be provided as specified elsewhere in the specification.
- .2 Install floor cleanouts where shown on the drawings and where required, with top edge flush or maximum 0.125" (3.1mm) below finished floor elevation.

### 3.6 Floor Drains:

- .1 Zurn or approved equal of the following types (Contractor to choose applicable type):
  - a. In vinyl tiled and ceramic floor areas, provide ZN-211-B5-P complete with dura coated cast iron body, bottom outlet, adjustable 5" (125mm) diameter polished nickel bronze round strainer and trap primer connection.
  - b. In unfinished concrete floor areas, provide ZX-211-A5-P complete with dura coated cast iron body, bottom outlet, adjustable with 5" (127mm) diameter 0.5" (13mm) thick cast iron heavy duty round strainer and trap primer connection.
  - c. In sheet flooring or equivalent areas, provide ZN-415-R6-P complete with dura coated cast iron body, combination invertible membrane clamp and adjustable collar with 6" (150mm) diameter polished nickel bronze strainer (surface ring and grate) and trap primer connection.
  - d. In waterproof areas, revise drain type to equivalent 415 series complete with flange and clamp collar.

- .2 Install floor drains where shown on the drawings with top edge flush or maximum 0.125" (3.1mm) below finished floor elevation. Co-ordinate the exact location of all floor drains on site and adjust to suit the floor slopes as directed by the General Contractor. Co-ordinate the exact location of all funnel floor drains on site and adjust to suit equipment drains.

### 3.7 Valves:

- .1 General
  - a. All valves shall have a pressure rating suitable for the system operating pressure.
  - b. Similar valves shall be of the same manufacturer.
  - c. Provide stem extensions / extended necks as required to suit insulation thickness.
- .2 Fixtures:
  - a. Each fixture supply shall have a shut-off valve. Exposed valves and piping to be chrome plated.
- .3 Isolation Valves (Domestic Hot and Cold Water):
  - a. Sizes 0.5" (13mm) to 2" (50mm): Lead free ball valve complete with 2 piece forged brass body, silver nickel plated forged brass C49300 vented solid ball, blowout proof stem, PTFE seats, maintenance free double o-ring stem seals, lever handle and full port design. Valves shall be rated for a 600 Psig (4135 Kpa) cold working pressure and certified to NSF/ANSI Standard 61, Annex G.
    - i. Threaded valves: Kitz 858 or approved equal.
    - ii. Soldered valves: Kitz 859 or approved equal.

### 3.8 Shock Absorbers:

- .1 Shock absorbers shall be located and sized in accordance with Plumbing and Drainage Institute standard no. WH201-PD-1 and in accordance with the manufacturer's recommendations. Absorbers shall be Zurn Wilkins 1250XL series or approved equal, lead-free construction.

### 3.9 Thermometers:

- .1 Terice BX9 or approved equal, industrial variable angle type, complete with 9" (225mm) scale length, dual scale (imperial and metric - deg. F. / Deg. C.), aluminum case, ultraviolet protected acrylic window, lens front magnifying type tube, aluminum stem, ABS top plate and organic fluid. Provide standard range so that operation is at midpoint of scale and brass thermometer well complete with extension where installed through insulation.
- .2 Locate thermometers so that they can be easily read from the floor.

### 3.10 Trap Seal Primers:

- .1 Traps and trap seal primers shall be provided for all floor drains / standing wastes according to OBC requirements (traps and primers not shown on drawings).

- .2 Trap seal primers shall be as follows (Contractor to choose desired type):
- a. Trap seal primer valves and distribution units shall be Precision Plumbing Products Inc. or approved equal. Provide model P2-500 primer valve for one or two drains, Model P1-500 primer valve for one to four drains. Install according to manufacturer's recommendations and as follows:
    - i. Primer valves to be installed with Precision Plumbing Products DU series distribution units.
    - ii. On an active domestic cold water main (1.5" (38mm) or smaller) where pressure fluctuations will ensure proper operation of the primer. The branch piping running to the primer shall connect to the top of the cold water main only (to prevent debris from entering the primer).
    - iii. With a minimum elevation above the floor drain as directed by the manufacturer.
    - iv. With a maximum pipe distance from the primer to the floor drain of 20'-0" (6.0m) and with the piping sloped to drain to the floor drain.
    - v. With an isolation valve immediately upstream of each primer.
    - vi. Install the primer and distribution unit level.
  - b. ProVent Systems Trap Guard or approved equal mechanical trap seal device of a type to suit the floor drain.
- .3 All buried trap seal primer piping shall be PEX tubing and all above ground piping shall be as specified for domestic water piping. The minimum size of all trap seal piping shall be 0.375" (9.4mm).

### 3.11 Piping Installation Requirements:

- .1 Piping shall be installed according to good commercial standards and approximately as follows:
- a. All piping running vertically shall run concealed in wall construction / furred enclosures unless noted otherwise on the drawings.
  - b. Use compression joints, unions or grooved joints in sufficient quantities to facilitate removal of equipment, fixtures, valving, etc. without removal of long lengths of pipe.
  - c. Install eccentric reducers in horizontal water filled piping to permit drainage and eliminate air pockets.
  - d. Where pipe sizes differ from connection sizes of equipment, install reducing fittings close to equipment. Reducing bushings are not permitted.
  - e. All valves and other pipe accessories shall match the associated pipe size unless noted otherwise.
  - f. Cut ends of pipes square, ream, clean scale and dirt and assemble without binding.
  - g. Install copper tubing so that it is not in contact with dissimilar metal and will not be kinked or collapsed.
  - h. Plug or cap pipe and fittings to keep out debris during construction.
  - i. Run buried drains minimum 8" (200 mm) clear below bottom of concrete slab unless not permitted by invert of building drain.
  - j. All piping shall be laid straight and in true alignment to the required slopes of the pipe.
  - k. Install piping free from strains and with proper allowance and off-sets for thermal expansion and contraction, with anchors placed as required.

- .2 Piping shall be graded as follows:
- a. Water Piping: Minimum 1/20" per foot (0.43mm/100mm) length. Insure all piping can be drained and provide drain valves at all low points.
  - b. Sanitary Drains: Minimum slopes as required by Code or as otherwise noted on the drawings.
  - c. Relief Piping: Minimum 2%.
- .3 Keep all sanitary and water piping clear of outside walls, attic spaces and combustion air openings unless otherwise noted on the drawings / unless otherwise required by site conditions. It is the responsibility of this Contractor to ensure that plumbing piping is installed so that freezing conditions within the pipe do not occur.
- .4 Install plastic piping in accordance with manufacturers product data, including product technical bulletins, installation instructions and product carton instructions for installation.
- .5 Additional installation requirements for PEX piping are as follows:
- a. Do not install PEX tubing within 6" (150mm) of gas appliance vents except that for type 'B' gas vents the minimum clearance shall be 1" (25mm).
  - b. Do not install uninsulated PEX tubing in direct view of fluorescent, LED or any other UV generating device.
  - c. Do not install uninsulated PEX tubing within 12" (300mm) of any recessed light fixture.
  - d. Do not solder within 18" (450mm) of PEX tubing in the same waterline. Make sweat connections prior to making PEX connections.
  - e. Do not apply open flame to PEX tubing.
  - f. Install PEX piping to maintain a maximum 25 / 50 flame and smoke developed rating.
  - g. All manifolds shall be provided with supply water isolation valves.
  - h. Ensure that no glues, solvents, sealants or chemicals come in contact with the tubing without prior permission from the tube manufacturer. In particular:
    - i. Do not allow organic chemicals, strong acids or strong bases to come in contact with the tubing.
    - ii. Do not allow petroleum or solvent based paints, greases or sealants to come in contact with the tubing.
  - i. Use only approved and appropriate firestop materials with PEX tubing.
  - j. PEX tubing passing through structural concrete slabs shall be sleeved with corrugated polyethylene tubing one (1) pipe diameter larger than the PEX tubing.
  - k. PEX tubing passing through metal studs shall use grommets or sleeves at the penetration.
  - l. Protect PEX tubing with sleeves having a flame spread rating less than 25 where abrasion may occur.
  - m. Use strike protectors where PEX tubing has the potential for being struck with a screw or nail.
  - n. Manufacturers bend supports shall be used where bends are less than 6 times outside pipe diameter.
  - o. Do not use PEX tubing between the tub / shower valve and the tub spout.

- p. Supports:
  - i. Horizontal piping shall be supported using hangers and supports designed for use with plastic piping and approved by the PEX tubing manufacturer.
  - ii. Space supports relative to valves, fittings and channels according to manufacturer's recommendations.
  - iii. All exposed horizontal tubing shall be supported by PEX-a galvanized support channels. Provide 300 pound tensile rated stainless steel straps to secure the tubing to the channels, spaced according to manufacturer's recommendations.
- q. All fitting connections to the PEX tubing shall be made to the requirements of ASTM F1960.
- r. PEX tubing shall extend through walls at fixtures connections and all exposed tubing shall be covered with a manufactured supplied chrome sleeve.
- s. Conditioning and Testing:
  - i. Condition all new tubing to 1.5 times the required test pressure for 30 minutes.
  - ii. Pressurize PEX potable water distribution system for testing purposes with air or potable water in accordance with applicable codes or, in the absence of applicable codes, to a pressure of 25 psi (173 kPa) above normal working pressure of the system.
  - iii. Comply with safety precautions when pressure testing. Water shall not be used to pressurize the system if ambient air temperature has the possibility of dropping below 32 degrees F (0 degrees C).
  - iv. Comply also with manufacturers recommendations in regards to pipe conditioning and testing requirements.
- t. Provide manufacturers field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturers instructions. The Contractor shall include in the tender price for a minimum of 3 manufacturers site visits.

### 3.12 Plumbing Fixtures:

- .1 Plumbing fixtures complete with trim shall be of the manufacturer's listed in the Schedule on the drawings or approved equal. Colour of fixtures (except stainless steel fixtures) shall be white.
- .2 Connect plumbing fixtures and equipment to the water supplies, wastes, traps and vents in accordance with the Ontario Building Code. Traps and vents are not shown on the drawings. All fixtures shall be served from wall unless noted otherwise on the drawings.
- .3 Set fixtures level, square and centered with relation to floors, walls, and partitions, a standard height from floor to rim unless otherwise shown on drawings and / or directed by the Consultant. All fixtures designated for barrier free use shall be mounted at the required height (refer to Architectural drawings for additional information regarding required mounting heights).
- .4 Attach plumbing fixtures in an approved manner complete with all required flanges, gaskets, bolts, nuts and other accessories. Seal around all fixtures.

- .5 Branch piping to individual plumbing fixtures shall be sized according to OBC requirements except that the minimum size of any branch water piping running to a fixture shall be 0.5" (13mm).

### 3.13 Heat Traps:

- .1 For non recirculating water systems, provide heat traps in the hot / cold water piping feeds to water heaters serving distribution mains located above the level of the heater. Traps shall be installed as close as possible to the heater connections and shall consist of an arrangement of pipe fittings, such as elbows, connected so that the piping makes vertically upward runs (minimum length shall be 6" (150mm)) just before turning downward to connect to the water heater. Refer also to the detail on the drawings.

### 3.14 Draining Water Systems:

- .1 Drain and refill as applicable all existing water systems as required to permit revisions as indicated on the drawings.

### 3.15 Testing & Inspection:

- .1 Test drainage, vent and domestic water piping to Plumbing Code requirements.
- .2 Repair all leaks to the inspection authority and / or the Consultant's approval.
- .3 All leaks shall be repaired by remaking the joint. After piping systems have been tested and repaired, repeat tests.
- .4 All equipment / devices which may be damaged by test pressures shall be isolated during testing procedures.

### 3.16 Cleaning and Flushing:

- .1 Flush and clean all new and existing affected piping in the following sequence:
  - a. Flush with potable water for a minimum time period of 30 minutes. During flushing and cleaning maintain all isolating valves in the open position. Remove faucet strainers during flushing and replace once flushing is complete.
  - b. Disinfect all new piping for four hours using a 200 ppm chlorine solution. Make all necessary provisions in the piping system for the injection of the chlorine solution.
  - c. After disinfection, flush piping with potable water for a minimum time period of 30 minutes.
  - d. Perform a water quality / bacteria analysis prepared by an independent lab to verify that the domestic water system is clean and suitable for consumption. Take multiple samples at the most downstream ends of each major branch piping circuit.
- .2 All cleaning and flushing of the domestic water site service piping shall be by the Site Service Contractor.

**END OF SECTION**

## **5. HEATING, VENTILATING AND AIR CONDITIONING**

### **5.1 Ductwork:**

- .1 All ductwork shall be G-60 galvanized steel unless noted otherwise, in accordance with ASTM A-653 and A-924. Thickness and fabrication shall be to ASHRAE and SMACNA standards.
- .2 Fittings and joints shall be fabricated and installed to ASHRAE and SMACNA standards. All rectangular branch ducts shall connect to main ducts complete with 45 degree entry. Proprietary duct joints as manufactured by Ductmate Canada Ltd. or approved equal may be used where desired by the Contractor.
- .3 All exposed above ground circular ductwork shall be single wall spiral type as follows:
  - a. Ductwork shall be constructed of Satin Coat steel where not thermally insulated.
  - b. Duct and fittings shall be constructed in accordance with the latest ASTM and SMACNA Standards.
  - c. The straight duct shall be constructed with an interlocking 4-ply helical seam that runs the complete length of the duct (standard flat spiral seam). The grooved seam shall be located entirely on the outside, resulting in a smooth interior for a low friction loss.
  - d. Straight duct-to-duct connections shall be made with a standard spiral duct connector (fitting size connector that slips inside the mating duct sections). A stop bead shall run around the middle of the coupling to center the coupling in the connection.
  - e. Fittings:
    - i. Fittings shall be '1.5D' type unless not possible due to space restrictions.
    - ii. Fittings shall be manufactured with a standard spiral pipe end (slip joint connection).
    - iii. Fittings shall be pressed, elbow lock seam or standing seam gored type.
- .4 Flexible ductwork shall be Flexmaster T/L or approved equal manufactured by using a dead soft aluminum strip which is spirally wound and mechanically joined together forming an air tight and leakproof triple lock seam. Insulated flexible ductwork shall be Flexmaster T/L-M or approved equal. It shall be a self-supporting and corrosive resistant to ULC-S110 and UL181 Class 1 product. Flexible ductwork will not be permitted in attic spaces or in any locations where exposed. Maximum length of flexible ductwork shall be 8'-0" (2.4m).
- .5 Flexible ductwork shall be Flexmaster T/L-A-T/L or approved equal triple lock acoustically insulated type. The flexible duct shall be manufactured by using a dead soft aluminum strip which is perforated, spirally wound and mechanically jointed together. The inner duct shall be covered with thick fiberglass insulation and sleeved by a triple-lock aluminum jacket. The perforated core shall have an open area of 20-25%. Flexible ductwork will not be permitted in attic spaces or in any locations where exposed. Maximum length of flexible ductwork shall be 8'-0" (2.4m).
- .6 All duct runnouts shall have a diameter the same size as the diffuser neck size unless noted otherwise.
- .7 For all grilles mounted directly to side of duct, make duct connection complete with 45 degree entry (this is not required for supply grilles attached to exposed spiral ductwork).

- .8 All supply, exhaust, return, transfer and combustion air ductwork shall be complete with sealed joints as follows:
  - a. Supply and exhaust ductwork located in conditioned spaces within the building shall be Seal Class C as defined in SMACNA standards (transverse joints / connections made airtight with sealing compound, longitudinal seams unsealed).
  - b. Supply, return and exhaust ductwork located outside the building envelope or within the attic space shall be Seal Class A as defined in SMACNA standards (transverse joints / connections, longitudinal seams and duct wall penetrations made airtight with sealing compound).
  - c. Note that spiral ductwork having a sealing gasket requires no sealing compound.
  - d. Exposed ductwork shall be neatly sealed to the approval of the Consultant, without excess caulking.
  - e. Unconditioned spaces are those which are not heated or cooled.
  - f. Return, transfer and combustion air ductwork located in conditioned spaces within the building is not required to be sealed.
- .9 Provide waterproof ducts for goosenecks and ductwork upstream of exhaust louvers. All seams, joints and connections shall be made water tight with sealing compound. Note that B-vent exterior ductwork will be considered waterproof without the application of sealing compound.
- .10 All exposed ductwork located outside of Mechanical / Electrical / Janitor / Storage Rooms shall be manufactured from Satin Coat steel suitable for painting unless otherwise approved by the Painting Contractor.
- .11 Provide suitable sheet metal angle collar for ductwork running exposed through walls, ceilings or floors. Install collar tight against the wall, ceiling or floor and duct, sized to cover opening. Collars shall be manufactured from Satin Coat steel suitable for painting.

## 5.2 Turning Vanes:

- .1 Factory or shop fabricated single or double thickness to recommendations of SMACNA.

## 5.3 Supports:

- .1 All ducts shall be adequately supported using strap hangers or steel angles.
  - a. Maximum size to be supported by a strap hanger shall be 36" (900mm) wide.
  - b. Steel angles shall be complete with threaded rods, locking nuts and washers. Threaded rods shall be sized according to the recommendations of Grinnell to suit the application.
- .2 Hanger spacing shall comply with SMACNA standards. Ducts cannot in any location be supported from the furring or ceiling construction. Also, ducts having areas greater than 1.0 sq. ft. (0.1 sq. m.) cannot in any location be supported from the metal floor / roof deck. Smaller ducts which are permitted to be supported from the metal floor / roof deck shall be fastened to the sides (not bottom) of the flutes and shall be attached with a minimum #10 size screw.
- .3 All pipe and interior equipment supports shall be as follows:



- a. Supports shall be Grinnell or approved equal of spacing and type as recommended by manufacturer, in accordance with Code requirements and in accordance with good commercial standards.
- b. Provide supports to secure pipes / equipment, prevent vibration, maintain required grading, allow for expansion and contraction and produce a neat appearance. Design for strength and rigidity to suit loading and services, prevent undue stress to structural members and with provision for vertical adjustment after piping is erected.
- c. Adjust hanger rods to equalize load.
- d. Provide supplementary structural steelwork where structural bearings do not exist.

#### 5.4 Duct Cleaning:

- .1 This Contractor shall employ the services of a professional duct cleaning company to clean the complete interior of all existing ductwork, grilles and diffusers which are to remain. Where ducts are acoustically insulated, take all necessary precautions to ensure that damage to the insulation does not occur. The cleaning company shall cut and patch all ductwork as required for this work and provide a letter stating that all ducts have been cleaned to good commercial standards. The General Contractor shall cut, patch and refinish all walls / ceilings / floors as required for the cleaning company to gain access to the ductwork.

#### 5.5 Piping Installation Requirements:

- .1 Piping shall be installed according to good commercial standards and approximately as follows:
  - a. All piping running vertically shall run concealed in wall construction / furred enclosures unless noted otherwise on the drawings.
  - b. Cut ends of pipes square, ream, clean scale and dirt and assemble without binding.
  - c. Install copper tubing so that it is not in contact with dissimilar metal and will not be kinked or collapsed.
  - d. Plug or cap pipe and fittings to keep out debris during construction.
  - e. All piping shall be laid straight and in true alignment to the required slopes of the pipe.
  - f. Install piping free from strains and with proper allowance and off-sets for thermal expansion and contraction.

#### 5.6 Duct Sealant:

- .1 Interior duct sealant shall be Bakor Duck-Seal or approved equal having a maximum flame and smoke rating of 25 and 50 respectively. Exterior duct sealant shall be Bakor 530-09 or approved equal having a maximum flame and smoke rating of 25 and 50 respectively.

#### 5.7 Flexible Duct Connections:

- .1 Unless noted otherwise, duct connections to rooftop units, exhaust fans, fan coil units, heat / energy recovery ventilators and make-up air units shall be made using flexible duct connections, Duro-Dyne "Super Metal-Fab" or approved equal having the following features:
  - a. 24 gauge (0.7mm) galvanized steel frame.
  - b. Each frame shall be 3" (75mm) wide and the fabric shall be 6" (150mm) wide.
  - c. Seams: Grip Loc
  - d. Fabric: woven fiberglass complete with a neoprene coating, -40 to 200 deg. F. (-40 to 82 deg. C.) continuous operating temperatures.
  - e. Suitable for pressures from -10" wc. to 15" wc. (-2.5 to 3.7 Kpa) with no tearing or visible separation.
  - f. Airtight and waterproof.
  - g. Designed to meet NFPA 701, 90A and 90B.

#### 5.8 Fire Dampers:

- .1 Fire dampers shall be Nailor series D0100 or approved equal (series D0500 for ratings of 3 hrs. or more), curtain type fire dampers **classified for use in Dynamic Air Systems (systems which remain in operation in the event of a fire) as well as suitable for use in Static Air Systems (systems which shut down in the event of a fire).** Dampers shall be as follows:
  - a. Dampers shall meet the requirements of NFPA 90A and shall be manufactured, tested and labeled in accordance with UL 555 Safety Standard for Fire Dampers - Sixth Edition, June 1999, including Dynamic Closure Test.
  - b. Dampers shall be classified for dynamic closure against an airflow velocity of 2000 fpm (610 mpm) at 4" (100mm) static pressure differential across closed damper.
  - c. Each fire damper shall bear a UL 1.5 hour fire resistance rating label in addition to label verifying the airflow and closure pressure ratings as established by the Dynamic Closure Test. Each fire damper shall also be marked with the words 'For use in dynamic systems'. Dampers marked for use in static systems only are not acceptable.
  - d. Each fire damper shall be complete with a 165 deg. F. (74 deg. C.) UL Listed fusible link.
  - e. Each damper shall include a steel sleeve of appropriate length / gauge and retaining angles on both sides of penetration, field supplied and installed by the Mechanical Contractor.
  - f. Fire dampers shall be labelled for fire rating to suit building construction at point of installation.
  - g. Except as otherwise noted, fire damper configuration shall be type A or B for rectangular ductwork (type shall be selected by the Contractor to suit installation) and type CR for round ductwork. Type A fire dampers will not be permitted to be installed in ducts having a minimum dimension of 8" (200mm) or less.
  - h. Provide multiple damper sections where required by size of duct and assemble according to manufacturer's recommendations.

- .2 Where duct sizes exceed available single section damper sizes for D0100 dampers, Nailor series D1200 or approved equal (series D1200-3 for ratings of 3.0 hours or more) airfoil blade type fire dampers may be used. Dampers shall be as follows:
- a. The frame shall be constructed of 16 ga. (1.6mm) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength.
  - b. Blades shall be 14 ga. (2.0mm) galvanized steel formed double skin, airfoil design, on 5.5" (138mm) centers. Dampers shall be of opposed blade configuration with an interlocking blade design that provides complete flame and smoke seal under fire conditions at an elevated temperature of 2000 deg. F. (1093 deg. C.) when in the closed position.
  - c. Blade axles shall be plated steel, double bolted at each end of blade to ensure positive locking connection. Hex or square friction-fit, or press-fit axles are not acceptable.
  - d. Bearings shall be self-lubricating oilite bronze type.
  - e. Blade linkage shall be zero-maintenance, concealed in frame, out of the airstream.
  - f. Dampers shall meet the requirements of NFPA 90A and shall be manufactured, tested and labeled in accordance with UL 555 Safety Standard for Fire Dampers - Sixth Edition, June 1999, including Dynamic Closure Test.
  - g. Dampers shall be classified for dynamic closure against an airflow velocity of 2000 fpm (610 mpm) at 4" (100mm) static pressure differential across closed damper.
  - h. Each fire damper shall bear a UL 1.5 hour fire resistance rating label (3.0 hour label for D1200-3 dampers) in addition to label verifying the airflow and closure pressure ratings as established by the Dynamic Closure Test. Each fire damper shall also be marked with the words 'For use in dynamic systems'. Dampers marked For use in static systems only are not acceptable.
  - i. Each fire damper shall be complete with a 165 deg. F. (74 deg. C.) UL Listed fusible link that will cause the damper to close and lock in the closed position by means of an over-center / knee lock linkage for assured closure.
  - j. Each damper shall be supplied with an internal manual quadrant(s) for setting and locking of blades in the desired position.
  - k. Each damper shall include a steel sleeve of appropriate length / gauge and retaining angles on both sides of penetration, field supplied and installed by the Mechanical Contractor.
  - l. Fire dampers shall be labeled for fire rating to suit building construction at point of installation.
  - m. Fire damper configuration shall be type A or B for rectangular ductwork (type shall be selected by the Contractor to suit installation) and type C for round ductwork.
  - n. Provide multiple damper sections where required by size of duct and assemble according to manufacturer's recommendations. .
  - o. Where installed at return air grilles, utilize a type 'A' configuration and turn the retaining angles inward on the 'room side' of the fire damper. Any portion of the retaining angles which are visible within the room shall be painted in a colour to match the grille.
- .3 Where fire dampers are installed at grilles, dampers shall be Nailor series D0110G or approved equal, type 'A' configuration, dynamic type as follows:
- a. Fire dampers shall meet the requirements of NFPA 80, 90A and 101 and shall be manufactured, tested and labeled in accordance with UL 555, including a Dynamic Closure Test.

- b. Each damper shall bear a UL1 1/2 hour fire resistance rating label and in addition, a label verifying the airflow and closure pressure ratings as established by the Dynamic Closure Test. Dampers shall be classified for dynamic closure against a minimum airflow velocity of 2000 fpm (10.2 mps) at 4" (100mm) w.g. static pressure differential and shall be marked with the words "For use in dynamic systems". Dampers marked "For use in static systems only" are not acceptable.
  - c. Damper shall be tested and approved for vertical mounting.
  - d. Damper shall be provided from the factory in an integral 22 ga. (0.85) galvanized steel sleeve of appropriate length with Nailor 'Quick-Set' retaining angles to ensure proper installation in accordance with damper manufacturer's instructions and 3/4" (19) wide grille mounting tabs specially designed for use with a 26 ga. steel grille.
  - e. Frame shall be constructed of 22 ga. (0.85) roll formed G60 galvanized steel and blades shall be curtain type interlocking blades constructed of 22 ga. (0.85) roll formed G60 galvanized steel.
  - f. Damper shall be complete with stainless steel closure springs, galvanized steel locking ramps and a 165 deg. F (74 deg. C) UL Listed fusible link.
- .4 Install all dampers according to Code requirements and manufacturer's installation instructions.

#### 5.9 Manual Dampers:

- .1 Splitter dampers shall not be used.
- .2 For spin-in collars, single blade butterfly dampers shall be of same material as duct. Metal construction and damper configuration to recommendations of SMACNA. Balancing dampers shall have handle and locking device.
- .3 For round ductwork 20" (500mm) diameter and less, provide single blade butterfly dampers, Nailor model 1890 or approved equal. Dampers shall be constructed and configured to the recommendations of SMACNA. Provide the following construction features:
- a. 22 gauge (0.86mm) galvanized steel frame with roll-formed stiffening beads up to 12" (300mm) diameter, 20 gauge (0.91mm) over 12" (300mm) diameter.
  - b. 22 gauge (0.86mm) galvanized steel blade up to 12" (300mm) diameter, 20 gauge (1.0mm) over 12" (300mm) diameter.
  - c. Blade axle / drive shaft shall be 0.25" (6mm) square plated steel.
  - d. Hand locking quadrant.
  - e. Where dampers are installed in thermally insulated ductwork, provide 2" 950mm) stand-off bracket for hand quadrant.
- .4 For rectangular ductwork, provide single blade dampers for ducts sizes up to 24" x 12" (600x300mm), Nailor model 1870 or approved equal. Dampers shall be constructed and configured to the recommendations of SMACNA. Provide the following construction features:
- a. 18 gauge (1.3mm) galvanized steel frame with structural ribs for maximum strength and low profile for maximum free area.
  - b. 20 gauge (1.0mm) galvanized steel blades up to 24"x12" (600x300mm) complete with structural ribs for extra strength.

- c. Blades shafts shall be 0.25" (6mm) square plated steel complete with a hand locking quadrant.
  - d. Where dampers are installed in thermally insulated ductwork, provide 2" (50mm) stand-off bracket for hand quadrant.
  - e. For dampers installed in aluminum ductwork, provide aluminum frame and blades with stainless steel linkage, bearings, axles and related hardware.
- .5 Where manual balancing dampers are installed in exposed locations, the damper operator shall be installed on the top of the duct.

5.10 Grilles and Diffusers:

- .1 Krueger or approved equal. Refer to Diffuser and Grille Schedule on drawings for model and type.
- .2 All aluminum grilles shall be fastened with stainless steel screws.

5.11 Duct Acoustic Insulation:

- .1 Johns Manville Linacoustic RC or approved equal flexible duct liner made with glass fibers bonded with a thermosetting resin. The airstream surface shall be protected with a Permacote acrylic coating with a flexible glass cloth reinforcement. A factory applied coating shall be applied to the edges of the liner core.
- .2 Unless noted otherwise on the drawings, provide 0.5" (13mm) thickness having an R value of 2.2 hr.-sq.ft.-deg.F / Btu (0.38 sq.m.-deg.C/W) for all ductwork where indicated on the drawings. NOTE: WHERE ACOUSTIC LINING IS INSTALLED, SIZE OF DUCTWORK IS ACTUAL OUTSIDE DIMENSION OF DUCT.
- .3 All portions of duct designated to receive duct liner shall be completely covered with liner. Transverse joints shall be neatly butted and there shall be no interruptions or gaps. The liner surface designed to be exposed shall face the air stream. Duct liner shall be adhered to the sheet metal with 100% coverage of adhesive and all exposed leading edges and all transverse joints coated with adhesive. The liner shall be additionally secured with weld-on pins which shall compress the duct liner sufficiently to hold it firmly in place.
- .4 Duct liner shall be cut to assure overlapped and compressed longitudinal corner joints. For velocities to 2,500 ft./min. (762 m/min.) the weld-on pins shall start within 3" (75 mm) of the transverse edges of the liner. Space with a maximum separation of 12" (300 mm) around the perimeter of the duct except that pins shall be a maximum of 4" (100mm) from a corner break. Elsewhere they shall be a maximum of 18" (450 mm) o.c.. All transverse edges shall be coated with adhesive.
- .5 All insulation shall be applied according to manufacturer's recommendations.
- .6 All insulation and components shall have maximum flame and smoke spread ratings of 25 and 50 respectively.

5.12 Louvres (Less Than 4 sq ft - 0.37 sq m):

- .1 Ventex or approved equal model 2220 / 2225, 2" (50mm) deep, 45 degree storm proof blades at 3.125" (79mm) centers.
- .2 Provide channel or flange frame to suit application.
- .3 Frame and blades shall be constructed of extruded aluminum 6063-T5. Minimum thickness of frame and blades shall be .062" (1.5mm). Blades shall have a weather stop.
- .4 Louvre shall be assembled with cadmium plated steel screws.
- .5 Provide Polyester baked enamel finish of colour to suit Architect selected from standard colours.
- .6 Provide 0.5" x 0.5" (13x13mm) 19 gauge galvanized birdscreen mounted to inside face in removable frame, extended sill for channel frames and extended sleeve where required by ductwork configuration.

**END OF SECTION**

## **6. WIRING FOR MECHANICAL SYSTEMS**

### **6.1 Wiring Practices:**

- .1 Unless noted otherwise, power wiring for mechanical equipment shall be provided by the Electrical Contractor and the Mechanical Contractor shall provide all controls complete with all low voltage wiring (less than 50V).
- .2 The Electrical Contractor shall provide starters, overload protection and disconnects for equipment supplied by the Mechanical Contractor unless noted otherwise. Refer to Electrical drawings for detailed requirements.
- .3 Line and low voltage electrical work provided by the Mechanical Contractor shall be done in accordance with and to the standards outlined in the Electrical Specification.
- .4 Control wiring and transformers (where required) shall be class 1 or 2 as required by the Ontario Electrical Safety Code (OESC) to suit system operating voltages and currents.
- .5 Control wiring shall be the shielded type and of a type as recommended by the manufacturer. Wiring running concealed shall not run in conduit unless otherwise required by the OESC. Take all necessary precautions to ensure electromagnetic interference from other wiring systems within the building does not affect the operation of the mechanical control systems. Power and control wiring shall not run in the same conduit.
- .6 Where control wiring is installed in return air plenums, use wiring having maximum flame and smoke ratings of 25 and 50 respectively.
- .7 Wiring sizes and transformer capacities shall be suitable to service all control equipment and to accommodate voltage drops in wiring systems.
- .8 Control wiring shall run concealed except as follows:
  - a. In the following locations, wiring may run exposed on surface in conduit. All conduit shall be supplied and installed by the Mechanical Contractor.
    - i. Wiring running on walls or ceilings in Mechanical / Electrical Rooms.
    - ii. Wiring running on ceilings in spaces having no suspended ceilings.
  - b. Exposed control wiring will not be permitted (run in conduit as described above).
  - c. Where not possible to run concealed in spaces other than listed above, surface mount in wiremold. All wiremold shall be supplied and installed by the Mechanical Contractor and shall be of a type approved by the Consultant.
- .9 For all thermostats mounted on concrete block walls, the Mechanical Contractor shall be responsible for installing conduit in walls for control wiring.

**END OF SECTION**

## **7. FIRE PROTECTION - SPRINKLER SYSTEM**

### **7.1 General:**

- .1 This Work consists of revisions to an approved, hydraulically designed automatic sprinkler system.
- .2 This Work shall include:
  - a. All design calculations, approved working drawings, installation, flushing and testing, certification and guarantee as generally outlined in these specifications.
  - b. All piping, valves, sprinkler heads, spare sprinkler head cabinet (including spare heads and wrenches) etc.
  - c. Include the costs for all permits, approvals, inspections, etc. except that all fees required for the review of the system by the Owner's Underwriter shall be paid by the Owner directly to the Underwriter.
- .3 The working drawings and calculations shall be certified by a certified Professional Engineer licenced to practice in the Province of Ontario and carrying liability insurance. The Contractor shall be responsible for all certification costs.
- .4 Upon completion of the Work, the Professional Engineer retained by the Sprinkler Contractor shall provide a letter indicating the design limitations of the system including, hazard classification, etc. and certifying that the Work has been installed in conformance with all applicable Codes / Standards and governing authorities. This letter shall be provided in time to allow the issuance of the Building Code Compliance letter by DMDS Ltd. when directed by the Owner / General Contractor.
- .5 The complete sprinkler system shall be approved by the Owner's Underwriter, the local Fire Department and the local Building Authority. Supply and install in accordance with NFPA 13, OBC, Provincial Fire Marshall and all applicable Codes / Standards. This Contractor shall investigate and determine all compliance issues prior to submission of tender and carry all cost associated with any and all additional requirements as deemed necessary by the above Standards and/or Authorities.
- .6 Hazard Classification:
  - a. The system design shall be based on the "Hazard" classifications to suit NFPA, the Owners Underwriter and all applicable Codes and Standards. For additional details regarding the intended use of the building, refer to the mechanical / architectural drawings.
- .7 The Sprinkler Contractor shall be responsible for obtaining all necessary information regarding the available water supply to the building prior to submitting the tender price. This shall include all static pressures and flow characteristics.
- .8 The information shown on the drawings is intended to show critical information required for the design of the sprinkler system, such as approximate locations / types of sprinkler heads and piping mains (branch piping has not been shown). The drawing is not intended to be used as a working drawing. The drawing shall only be used to assist the Sprinkler contractor in the preparation of their layouts. The full responsibility for the design and installation of a working sprinkler system in compliance with all Code and Underwriter's requirements rests solely with the Sprinkler Contractor. Note that the indicated sprinkler head locations are to be used as a guide only and may be revised as required to suit the



sprinkler system design. Required offsets in piping to avoid obstructions have not been indicated but shall be provided by the Contractor as required without extra cost.

- .9 Prior to submitting a tender price, the Sprinkler Contractor shall visit the site to determine the existing conditions and examine all Architectural, Structural, Mechanical and Electrical drawings. The Sprinkler Contractor shall ensure complete familiarity with all drawings and building construction / systems prior to submitting the tender price.
- .10 Locations of all sprinkler system components, including piping and sprinkler heads, shall be coordinated on site so as not to interfere with the Work of other trades and to be compatible with the mechanical / electrical / structural / architectural layouts shown on the drawings.
- .11 No material shall be purchased nor shall any work be done until approval on the sprinkler drawings and calculations has been granted by the Consultant, Owner's Underwriter, local Building Authority and the local Fire Department. Any revisions to the working drawings after Owner's Underwriter and local Authorities approval or during construction shall be identified on the drawings and re-submitted for approval and record before proceeding with the Work.
- .12 The Sprinkler Contractor shall bid directly to the General Contractor.
- .13 All equipment and controls shall have ULC or CSA approval.

#### 7.2 Piping:

- .1 All piping, valves, fittings and associated materials and equipment shall be new and furnished and installed in accordance with Owner's Underwriter requirements and all applicable Codes and Standards.
- .2 Sprinkler piping shall be ferrous to NFPA 13 specifications.
- .3 Fittings and joints for all sprinkler lines shall be screwed, flanged or rolled grooved to NFPA 13 specifications.
- .4 Additional requirements for rolled grooved piping shall be as follows:
  - a. The grooved piping shall be installed in accordance with the manufacturer's guidelines and recommendations. All grooved couplings, fittings, valves, and specialties shall be supplied by a single manufacturer. Grooving tools shall be supplied by the same manufacturer as the grooved components. The gasket style and elastomeric material (grade) shall be verified as suitable for the intended service as specified. Gaskets shall be molded and produced by the grooving system manufacturer. Grooved end shall be clean and free from indentations, projections, and roll marks in the area from pipe end to groove for proper gasket sealing.
  - b. Victaulic or approved equal fittings for roll or cut grooved steel piping systems shall be ULC listed and FM approved, ASTM A536 ductile iron, short radius, FireLock fittings or standard ductile iron or steel fittings designed to accept Victaulic couplings.
  - c. Victaulic or approved equal couplings shall consist of two ASTM A536 ductile iron housing, pressure-responsive, synthetic rubber gasket (FlushSeal design required for dry systems) and plated steel bolts and nuts.

- i. Rigid Type: Housings shall be cast with offsetting, angle-pattern bolt pads to provide system rigidity and support and hanging in accordance with NFPA 13. Victaulic FireLock EZ Style 009 'Installation Ready' stab-on coupling (1 1/4" (32mm) to 4" (100mm) ) and Victaulic FireLock Style 005 standard rigid coupling (5" (125mm) and Larger).
  - ii. Flexible Type: Use in seismic areas where required by NFPA 13. Victaulic Style 75 or 77.
  - iii. Victaulic flange adapters shall be ASTM A536 ductile iron, flat faced, designed for incorporating flanged components with ANSI Class 125 and 150 bolt-hole patterns to a grooved piping system. Victaulic Style 741 or 744.
- .5 Hangers and riser clamps shall be ULC listed for fire protection and installed to NFPA 13 and OBC requirements. Where the building structure does not provide adequate support points, provide supplementary structural steelwork for pipe support.

### 7.3 Sprinkler Heads:

- .1 Provide spray type fusible sprinkler heads to NFPA 13 requirements, ULC listed for fire service and of types to suit application. Sprinkler heads in all cases to be of the proper degree of fusibility for the locations and hazards involved.
- .2 General use sprinklers shall be Victaulic model V27, V36, V38 or approved equal UL listed, with frame of die cast brass, Teflon encapsulated Belleville spring seal, and frangible glass bulb. The bulbs shall be standard or quick response type with temperature rating to suit application. Provide additional specialty type heads to suit the requirements of this specification.
- .3 Provide standard recessed pendant or upright sprinkler heads as required and as shown on plans.
- .4 Sprinkler head finishes shall match existing.
- .5 Where possible, sprinkler heads shall be centered in T-bar ceiling tiles in the 2'-0" (600mm) dimension and centered or installed at quarter points in the 4'-0" (1200mm) dimension.
- .6 Furnish one approved metal cabinet containing a minimum of two spare sprinkler heads of each type (maximum of 12 spare heads total) and temperature rating and necessary tools for replacing same. For exact requirements refer to NFPA 13. Locate in the Sprinkler Room adjacent to the incoming water service.
- .7 Provide sprinkler coverage below obstructions according to Code requirements, including ductwork and overhead doors.
- .8 The sprinkler bulb protector must remain in place until the sprinkler is completely installed and before the system is placed in service. Remove bulb protectors carefully by hand after installation. Do not use any tools to remove bulb protectors.
- .9 Provide chrome plated escutcheon at wall penetration of exposed piping.

#### 7.4 Drain Connections

- .1 All piping shall be installed so that the complete system can be drained. Drain piping to alarm assemblies where possible. Where not possible, provide auxiliary drains as required (locations of 'drum drips' for dry systems shall be in heated building areas and approved by the Consultant).
- .2 Do not discharge drain piping over exterior poured concrete surfaces (provide hose for directing discharge to approved surfaces where directed).

#### 7.5 Testing

- .1 The Contractor shall furnish all pumps, gauges and other equipment necessary for tests.
- .2 Where directed, all tests shall be made in the presence of the Consultant or authorized inspector.
- .3 Any defects that develop during the tests shall be promptly remedied and the test re-made all to the complete satisfaction of the Inspector.
- .4 All fire protection piping shall be tested to NFPA and Code requirements
- .5 A report of the test and inspection shall be made to the local Authority and a request made for an approval of the entire installation.

**END OF SECTION**