

City of Winnipeg

**Grant's Old Mill  
Maintenance Bldg Renovation**

2777 Portage Avenue  
Winnipeg, Manitoba

Bid Opportunity No. 512-2026



|                                     |                                                                                                                                                                           |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Project:</b>                     | <b>Grant's Old Mill Maintenance Bldg Renovation</b><br>2777 Portage Avenue<br>Winnipeg, Manitoba                                                                          |
| <b>Client:</b>                      | <b>City of Winnipeg</b><br>4 <sup>th</sup> Floor, 185 King Street<br>Winnipeg, Manitoba R3B 1J1<br>E-mail: JPincock@winnipeg.ca                                           |
| <b>Architectural:</b>               | <b>Northern Sky Architecture Inc.</b><br>100 – 128 James Avenue<br>Winnipeg, Manitoba R3B 0N8<br>Telephone: (204) 943-6767<br>Fax: (204) 956-7979<br>E-mail: kent@nsai.ca |
| <b>Structural:</b>                  | <b>KNH Sawatzky &amp; Associates (1995) Ltd.</b><br>100 – 128 James Avenue<br>Winnipeg, Manitoba R3B 0N8<br>Telephone: (204) 947-2550<br>E-mail: andrew@knhltd.ca         |
| <b>Mechanical &amp; Electrical:</b> | <b>Alliance Engineering Services Inc.</b><br>1035 Logan Avenue<br>Winnipeg, Manitoba R3E 1P6<br>Telephone: (204) 774-7859<br>E-mail: david@allianceengservices.com        |

|    |                     |                     |   |
|----|---------------------|---------------------|---|
| .0 | General Information |                     |   |
|    | 00 11 00            | Staking Certificate | 4 |

## **PART 1 - GENERAL**

### **1.01 GENERAL CONDITIONS**

- .1 Included herein is the staking certificate titled " Surveyor's Staking Certificate Showing Certain Features" prepared for Northern Sky Architecture, Winnipeg, Manitoba, dated April 30, 2026, prepared by Barnes & Duncan Surveying, Engineering & Planning.

## **PART 2 - PRODUCTS**

### **2.1 NOT USED**

- .1 Not Used.

## **PART 3 - EXECUTION**

### **3.1 NOT USED**

- .1 Not Used

6 Donald Street 180-A, 5th Street  
Winnipeg, MB Morden, MB  
R3L 0K6 R6M 1C9

Phone: 204-284-5999

800-665-6609

Fax: 204-452-7877

www.BarnesDuncan.com

## Surveyor's Staking Certificate Showing Certain Features

April 30, 2026

Northern Sky Architecture Inc.  
100 - 128 James Avenue  
Winnipeg, Manitoba  
R3B 0N8

Dear Sir/Madam:

**Re:** 2777 Portage Avenue in the City of Winnipeg, Manitoba

Certificate of Title: 1413654/1 (SEARCH DATE: APRIL 15, 2026)

Registered Owner: THE CITY OF WINNIPEG

Legal Description: LOT 1 BLOCK 1 PLAN 8055 WLTO  
EXC FIRSTLY: PORTAGE AVENUE PLAN 32891 WLTO  
AND SECONDLY: STURGEON ROAD PLAN 8941 WLTO  
IN RL 12 PARISH OF ST JAMES AND RL 122 PARISH OF  
ST CHARLES

Encumbrances: Instrument numbers 3885828/1 and 4921474/1 are registered  
against the title. Encumbrances noted herein are provided for  
information purposes only and have not been investigated as to  
their intent or extent.

As requested, this is to certify that we have staked or referenced the boundaries of the above  
described land.

There are no encroachments above ground level onto the above described land by buildings  
from adjoining properties or by the buildings on the above described land onto adjoining  
properties.

This survey was made on the 20th day of April, 2026, and is monumented on the ground as  
shown on this sketch.

This document is not an official survey unless it  
bears the signature (in blue ink) and/or seal of  
the Manitoba Land Surveyor whose authority it  
was prepared under. It is at the discretion of  
Barnes & Duncan to issue additional copies of  
documents on a case by case basis.

Our File: 26-0487  
Acad dwg: 26-0487-1 STK  
Field Book: 1674/71

Drafter: CJC

**Refer to Sketch - Pages 2 & 3**

Page 1 of 3

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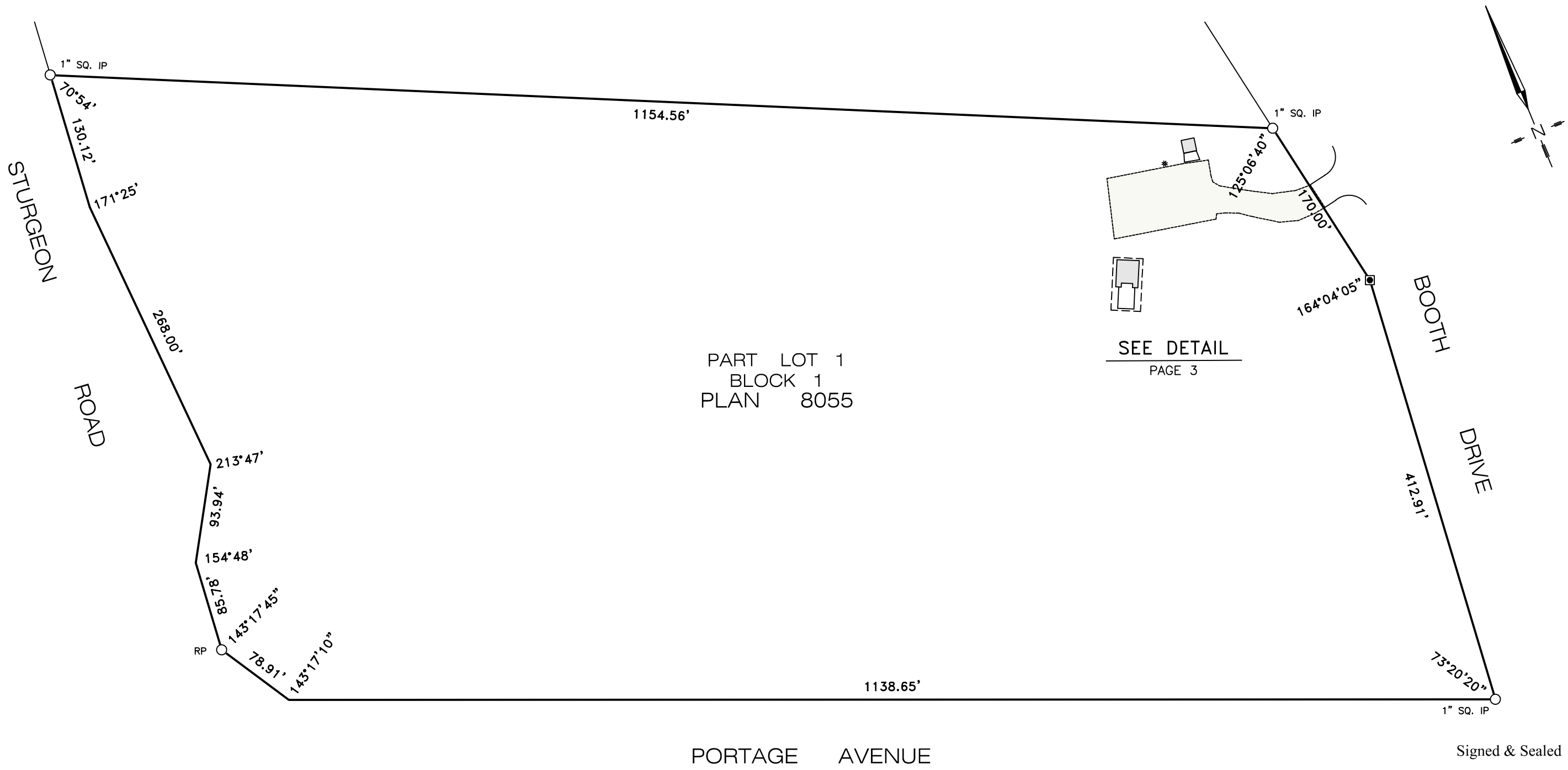
Signed & Sealed

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THE MANITOBA LAND SURVEYOR

Michael E. Sippola, M.L.S.

Sketch of Surveyor's Staking Certificate Showing Certain Features  
2777 Portage Avenue, Winnipeg, Manitoba

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SKETCH - all distances are in feet and decimals of a foot.



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R6M 1C9

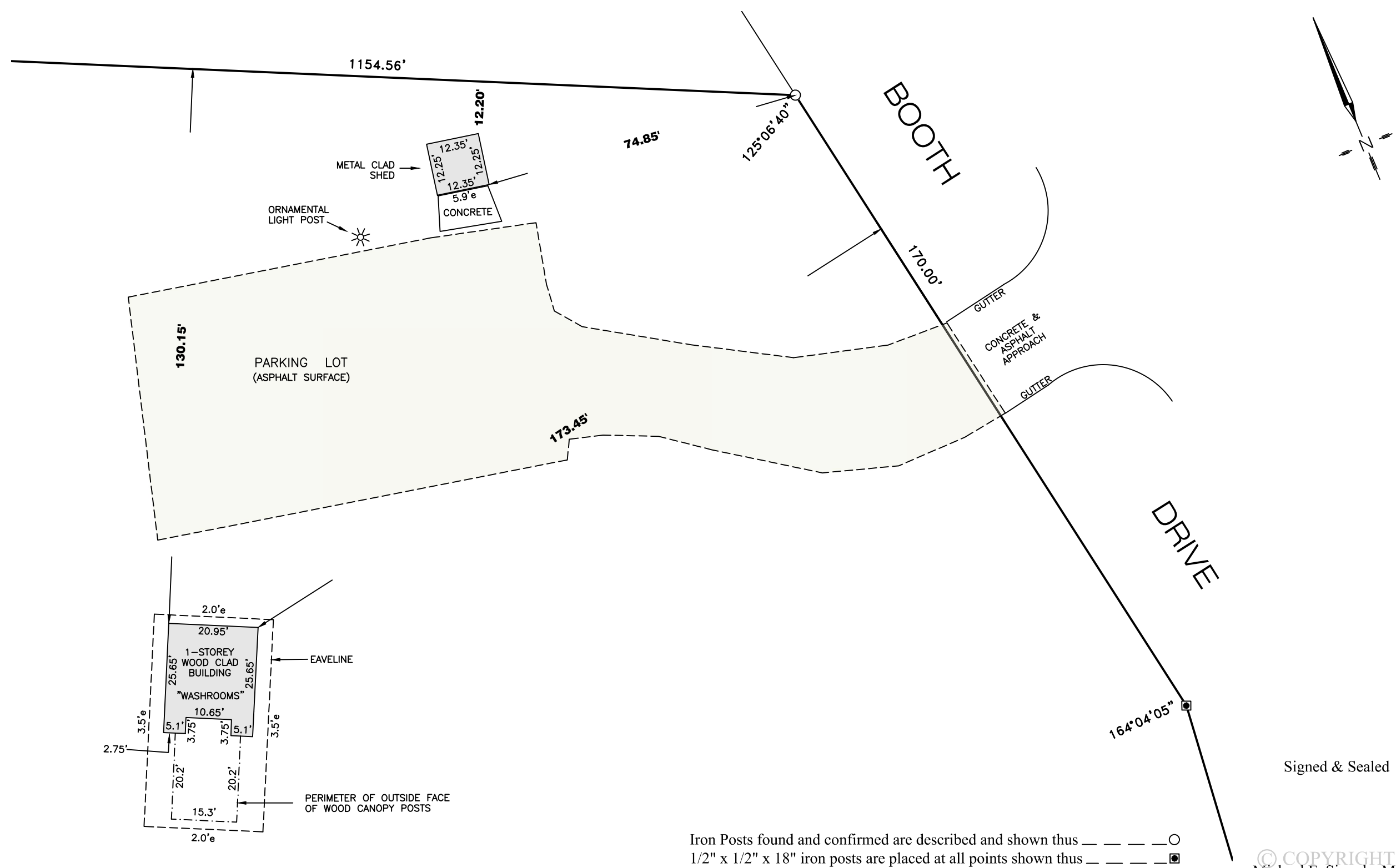
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Field Book: 1674/71  
Drafter: CJC

Iron Posts found and confirmed are described and shown thus — — — —○  
1/2" x 1/2" x 18" iron posts are placed at all points shown thus — — — —■

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Michael E Siprola, M.L.S.  
Dated this 30th day  
of April, 2026  
THIS DOCUMENT IS A PRELIMINARY SKETCH  
ORIGINALLY SIGNED AND SEALED BY  
THE MANITOBA LAND SURVEYOR

Sketch of Surveyor's Staking Certificate Showing Certain Features  
2777 Portage Avenue, Winnipeg, Manitoba

This document is not an official survey unless it bears the signature (in blue ink) and/or seal of the Manitoba Land Surveyor whose authority it was prepared under. It is at the discretion of Barnes & Duncan to issue additional copies of documents on a case by case basis.



SKETCH - all distances are in feet and decimals of a foot.

**BARNES & DUNCAN** 1906  
SURVEYING, ENGINEERING & PLANNING

6 Donald Street  
Winnipeg, MB  
R3L 0K6

180-A, 5th Street  
Morden, MB  
R6M 1C9

Our File: 26-0487  
Acad dwg: 26-0487-1 STK  
Field Book: 1674/71  
Drafter: CJC

DETAIL  
NOT TO SCALE

Iron Posts found and confirmed are described and shown thus — — — — ○  
1/2" x 1/2" x 18" iron posts are placed at all points shown thus — — — — ■

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THIS DOCUMENT IS UNLESS  
ORIGINALLY SIGNED AND SEALED BY  
THE MANITOBA LAND SURVEYOR

Michael E. Sippola, M.L.S.  
Dated this 30th day  
of April, 2026

Signed & Sealed

**.0 General Information**

|          |                      |   |
|----------|----------------------|---|
| 00 50 00 | Specifications Index | 2 |
| 00 53 00 | List of Drawings     | 1 |

**.1 General Requirements**

|          |                                                  |   |
|----------|--------------------------------------------------|---|
| 01 11 00 | Summary of Work                                  | 2 |
| 01 14 00 | Work Restrictions                                | 1 |
| 01 21 00 | Allowances                                       | 1 |
| 01 31 19 | Project Meetings                                 | 2 |
| 01 32 16 | Construction Progress Schedule Bar (GANTT) Chart | 2 |
| 01 33 00 | Submittal Procedures                             | 3 |
| 01 41 00 | Regulatory Requirements                          | 1 |
| 01 45 00 | Quality Control                                  | 2 |
| 01 51 00 | Temporary Utilities                              | 2 |
| 01 52 00 | Construction Facilities                          | 2 |
| 01 56 00 | Temporary Barriers and Enclosures                | 1 |
| 01 61 00 | Common Product Requirements                      | 3 |
| 01 71 00 | Examination & Preparation                        | 1 |
| 01 73 00 | Execution                                        | 2 |
| 01 74 11 | Cleaning                                         | 2 |
| 01 74 19 | Waste Management and Disposal                    | 2 |
| 01 77 00 | Closeout Procedures                              | 2 |
| 01 78 00 | Closeout Submittals                              | 4 |
| 01 79 00 | Demonstration and Training                       | 1 |

**.2 Site Work**

|          |                      |   |
|----------|----------------------|---|
| 02 41 19 | Selective Demolition | 2 |
| 02 81 00 | Hazardous Materials  | 3 |

**.3 Concrete**

|          |                                  |   |
|----------|----------------------------------|---|
| 03 10 00 | Concrete Forming and Accessories | 2 |
| 03 20 00 | Concrete Reinforcing             | 3 |
| 03 30 00 | Cast-in-Place Concrete           | 4 |
| 03 35 00 | Concrete Finishing               | 2 |

**.5 Metals**

|          |                    |   |
|----------|--------------------|---|
| 05 50 00 | Metal Fabrications | 3 |
|----------|--------------------|---|

**.6 Wood and Plastics**

|          |                               |   |
|----------|-------------------------------|---|
| 06 05 73 | Wood Treatment                | 2 |
| 06 10 53 | Miscellaneous Rough Carpentry | 3 |

**.7 Thermal & Moisture Protection**

|          |                               |   |
|----------|-------------------------------|---|
| 07 21 16 | Blanket Insulation            | 2 |
| 07 26 00 | Vapour Retarders              | 2 |
| 07 27 00 | Air Barriers                  | 2 |
| 07 46 19 | Steel Siding                  | 2 |
| 07 62 00 | Sheet Metal Flashing and Trim | 2 |
| 07 84 00 | Fire Stopping                 | 3 |
| 07 92 00 | Joint Sealants                | 4 |

**.8 Doors and Windows**

|          |                         |   |
|----------|-------------------------|---|
| 08 11 00 | Metal Doors and Frames  | 4 |
| 08 31 00 | Access Doors and Panels | 2 |
| 08 36 13 | Sectional Metal Doors   | 4 |
| 08 71 00 | Door Hardware           | 4 |
| 08 90 00 | Louvres and Vents       | 3 |

**.9 Finishes**

|          |                         |   |
|----------|-------------------------|---|
| 09 21 16 | Gypsum Board Assemblies | 4 |
| 09 91 13 | Exterior Painting       | 6 |
| 09 91 23 | Interior Painting       | 6 |

**.10 Specialties**

|          |                                        |   |
|----------|----------------------------------------|---|
| 10 26 00 | Wall and Corner Guards                 | 2 |
| 10 28 10 | Toilet & Bath Accessories              | 3 |
| 10 44 16 | Fire Extinguishers and Safety Blankets | 1 |

**.31 Earth Work**

|          |                                     |   |
|----------|-------------------------------------|---|
| 31 00 00 | Earthwork                           | 3 |
| 31 05 16 | Aggregate Materials                 | 2 |
| 31 23 33 | Excavating, Trenching & Backfilling | 4 |

The following list of drawings form part of this tender:

**Architectural**

|      |                                             |
|------|---------------------------------------------|
| A1.1 | LOCATION PLAN, BUILDING CODE REVIEW SUMMARY |
| A2.1 | MAIN FLOOR PLAN                             |
| A2.2 | REFLECTED CEILING PLAN                      |
| A3.1 | EXTERIOR ELEVATIONS                         |
| A4.1 | SECTIONS                                    |
| A5.1 | INTERIOR ELEVATIONS, SCHEDULES              |

**Structural**

|      |                                                                  |
|------|------------------------------------------------------------------|
| S1.1 | GENERAL NOTES / SCHEDULES / DETAILS                              |
| S2.1 | EXISTING FOUNDATION / MAIN FLOOR & ROOF DEMOLITION FRAMING PLANS |
| S2.2 | FOUNDATION / MAIN FLOOR & ROOF FRAMING PLANS                     |
| S3.1 | FULL HEIGHT SECTIONS                                             |
| S3.2 | FULL HEIGHT SECTIONS                                             |

**Mechanical**

|      |                                      |
|------|--------------------------------------|
| M1.1 | HVAC & PLUMBING - DEMOLITION (NORTH) |
| M1.2 | HVAC - DEMOLITION (SOUTH)            |
| M2.1 | HVAC - NEW CONDITONS (NORTH)         |
| M2.2 | HVAC - NEW CONDITONS (SOUTH)         |
| M2.3 | PLUMBING - NEW CONDITONS (NORTH)     |
| M3.1 | SECTIONS AND SCHEDULES               |
| M4.1 | DETAILS                              |
| M4.2 | MECHANICAL SPECIFICATIONS            |
| M4.3 | MECHANICAL SPECIFICATIONS            |
| M4.4 | MECHANICAL SPECIFICATIONS            |

**Electrical**

|      |                          |
|------|--------------------------|
| E1.0 | POWER PLAN - EXISTING    |
| E1.1 | LIGHTING PLAN - EXISTING |
| E2.0 | POWER PLAN - NEW         |
| E2.1 | LIGHTING PLAN - NEW      |
| E3.0 | SCHEDULES                |
| E4.0 | ELECTRICAL SPECIFICATION |

## **PART 1 - GENERAL**

### **1.01 WORK COVERED BY CONTRACT DOCUMENTS**

- .1 Work of this Contract comprises the renovation of public washrooms and maintenance building, located at 2777 Portage Avenue, Winnipeg, Manitoba and further identified as Grant's Old Mill Maintenance Bldg Renovation. Work includes renovations to the existing building including new washrooms, and upgrades to the maintenance storage space.

### **1.02 CONTRACT METHOD**

- .1 Construct Work under single stipulated price contract.

### **1.03 CONTRACTOR USE OF PREMISES**

- .1 Unrestricted use of site until Substantial Performance.
- .2 Co-ordinate use of premises under direction of Project Manager.
- .3 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

### **1.04 CITY FURNISHED ITEMS**

- .1 Not applicable.

### **1.05 EXISTING SERVICES**

- .1 Notify, Project Manager and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Contract Administrator 48 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian and vehicular traffic.
- .3 Establish location and extent of service lines in area of work before starting Work. Notify Contract Administrator of findings.
- .4 Submit schedule to and obtain approval from Contract Administrator for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .5 Provide temporary services when directed by Contract Administrator to maintain critical building and tenant systems.
- .6 Where unknown services are encountered, immediately advise Contract Administrator and confirm findings in writing.
- .7 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .8 Record locations of maintained, re-routed and abandoned service lines.
- .9 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

### **1.06 DOCUMENTS REQUIRED**

- .1 Maintain at job site, one copy each document as follows:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Reviewed Shop Drawings.
  - .5 List of Outstanding Shop Drawings.
  - .6 Change Orders.
  - .7 Other Modifications to Contract.
  - .8 Field Test Reports.
  - .9 Copy of Approved Work Schedule.
  - .10 Other documents as specified.

---

**PART 2 – PRODUCTS**

**2.01 NOT USED**

.1 Not used.

**PART 3 – EXECUTION**

**3.01 NOT USED**

.1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 ACCESS AND EGRESS**

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, including runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

### **1.02 USE OF SITE AND FACILITIES**

- .1 Execute work with least possible interference or disturbance to normal use of premises.
- .2 Maintain existing services to building and provide for personnel and vehicle access.
- .3 Closures: protect work temporarily until permanent enclosures are completed.

### **1.03 EXISTING SERVICES**

- .1 Notify, Contract Administrator and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Contract Administrator 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum.
- .3 Provide for personnel, pedestrian and vehicular traffic.
- .4 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

### **1.04 SPECIAL REQUIREMENTS**

- .1 Carry out noise generating work Monday to Friday and weekends and statutory holidays within provisions of applicable municipal by laws.
- .2 Submit schedule in accordance with Section 01 32 16 - Construction Progress Schedule - Bar (GANTT) Chart.
- .3 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .4 Keep within limits of work and avenues of ingress and egress.
- .5 Ingress and egress of contractor vehicles at site is limited to existing cur cuts.

### **1.05 BUILDING SMOKING ENVIRONMENT**

- .1 Comply with smoking restrictions. Smoking is not permitted.

## **PART 2 – PRODUCTS**

### **2.01 NOT USED**

- .1 Not used.

## **PART 3 – EXECUTION**

### **3.01 NOT USED**

- .1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 City of Winnipeg Construction Contract
- .2 Project Supplementary Conditions

### **1.02 CASH ALLOWANCES**

- .1 Include in Contract Price specified cash allowances.
- .2 Cash allowances, unless otherwise specified, cover net cost to Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage and other authorized expenses incurred in performing Work.
- .3 Contract Price, and not cash allowance, includes Contractor's overhead and profit in connection with such cash allowance.
- .4 Contract Price will be adjusted by written order to provide for excess or deficit to each cash allowance.
- .5 Where costs under a cash allowance exceed amount of allowance, Contractor will be compensated for excess incurred and substantiated plus allowance for overhead and profit as set out in Contract Documents.
- .6 Include progress payments on accounts of work authorized under cash allowances in Contract Administrator's monthly certificate for payment.
- .7 Prepare schedule jointly with Contract Administrator and Contractor to show when items called for under cash allowances must be authorized by Contract Administrator for ordering purposes so that progress of Work will not be delayed.
- .8 Amount of each allowance, for Work specified in respective specification Sections is as follows:
  - .1 Section 03 30 00 – Cast-in-Place Concrete, include an allowance of **\$2,500.00** for compressive strength cylinder testing.

## **PART 2 – PRODUCTS**

### **2.01 NOT USED**

- .1 Not used.

## **PART 3 – EXECUTION**

### **3.01 NOT USED**

- .1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 ADMINISTRATIVE**

- .1 Schedule and administer project meetings throughout the progress of the work at the call of Contractor.
- .2 Contractor to prepare agenda and distribute for meetings.
- .3 Contractor to provide physical space and make arrangements for meetings.
- .4 Contractor to Preside at meetings.
- .5 Contractor to Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .6 Contractor to distribute copies of minutes and transmit to meeting participants and, affected parties not in attendance.
- .7 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

### **1.02 PRECONSTRUCTION MEETING**

- .1 Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Contractor, Contract Administrator, major Subcontractors, and supervisors will be in attendance.
- .3 Contractor will establish the time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 Agenda to include:
  - .1 Appointment of official representative of participants in the Work.
  - .2 Schedule of Work: in accordance with Section 01 32 16 - Construction Progress Schedules - Bar (GANTT) Chart.
  - .3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
  - .5 Delivery schedule of specified equipment as per schedule.
  - .6 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
  - .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
  - .8 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .9 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
  - .10 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
  - .11 Monthly progress claims, administrative procedures, photographs, hold backs.
  - .12 Appointment of inspection and testing agencies or firms.
  - .13 Insurances, transcript of policies.

### **1.03 PROGRESS MEETINGS**

- .1 During course of Work, schedule progress meetings monthly, or as designated by the contractor.
- .2 Contractor, major Subcontractors involved in Work, Contract Administrator and Project Manager are to be in attendance.
- .3 Contractor to record minutes of meetings and circulate to attending parties and affected parties not in attendance.
- .4 Agenda to include the following:
  - .1 Review, approval of minutes of previous meeting.
  - .2 Review of Work progress since previous meeting.
  - .3 Field observations, problems, conflicts.
  - .4 Problems which impede construction schedule.
  - .5 Review of off-site fabrication delivery schedules.
  - .6 Corrective measures and procedures to regain projected schedule.
  - .7 Revision to construction schedule.
  - .8 Progress schedule, during succeeding work period.
  - .9 Review submittal schedules: expedite as required.
  - .10 Maintenance of quality standards.
  - .11 Review proposed changes for effect on construction schedule and on completion date.

.12 Other business.

## **PART 2 – PRODUCTS**

### **2.01 NOT USED**

.1 Not used.

## **PART 3 – EXECUTION**

### **3.01 NOT USED**

.1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 DEFINITIONS**

- .1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.
- .3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
- .4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
- .5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.
- .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
- .7 Milestone: significant event in project, usually completion of major deliverable.
- .8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

### **1.02 REQUIREMENTS**

- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.
- .4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

### **1.03 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Contract Administrator within 10 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.
- .3 Submit Project Schedule to Contract Administrator within 5 working days of receipt of acceptance of Master Plan.

### **1.04 MASTER PLAN**

- .1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- .2 Contract Administrator will review and return revised schedules within 5 working days.
- .3 Revise impractical schedule and resubmit within 5 working days.
- .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

### **1.05 PROJECT SCHEDULE**

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
  - .1 Shop Drawings, Samples.
  - .2 Mobilization.
  - .3 Site Services
  - .4 Concrete Slab.
  - .5 Wall Framing.
  - .6 Roof Framing.
  - .7 Roofing.
  - .8 Exterior Finishes.
  - .9 Site Development.
  - .10 Interior Architecture (Walls, Floors and Ceiling).

- .11 Plumbing.
- .12 Lighting.
- .13 Electrical.
- .14 Controls.
- .15 Heating, Ventilating, and Air Conditioning.
- .16 Testing and Commissioning.
- .17 Demonstration.
- .18 Occupancy.

#### **1.06 PROJECT SCHEDULE REPORTING**

- .1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.
- .2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

#### **1.07 PROJECT MEETINGS**

- .1 Discuss Project Schedule at site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
- .2 Weather related delays with their remedial measures will be discussed and negotiated.

### **PART 2 – PRODUCTS**

#### **2.01 NOT USED**

- .1 Not used.

### **PART 3 – EXECUTION**

#### **3.01 NOT USED**

- .1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 ADMINISTRATIVE**

- .1 Submit to Contract Administrator submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Where items or information is not produced in SI Metric units converted values are acceptable.
- .4 Review submittals prior to submission to Contract Administrator. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .5 Notify Contract Administrator, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .6 Verify field measurements and affected adjacent Work are co-ordinated.
- .7 Contractor's responsibility for errors and omissions in submission is not relieved by Contract Administrator's review of submittals.
- .8 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Contract Administrator review.
- .9 Keep one reviewed copy of each submission on site.

### **1.02 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 Contractor to illustrate details of a portion of Work.
- .2 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 10 days for Contract Administrator's review of each submission.
- .5 Adjustments made on shop drawings by Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Contract Administrator prior to proceeding with Work.
- .6 Make changes in shop drawings as Contract Administrator may require, consistent with Contract Documents. When resubmitting, notify Contract Administrator in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter, containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, product data and sample.
  - .5 Other pertinent data.
- .8 Submissions include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
  - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
  - .5 Details of appropriate portions of Work as applicable:
    - .1 Fabrication.
    - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
    - .3 Setting or erection details.

- .4 Capacities.
- .5 Performance characteristics.
- .6 Standards.
- .7 Operating weight.
- .8 Wiring diagrams.
- .9 Single line and schematic diagrams.
- .10 Relationship to adjacent work.
- .9 After Contract Administrator's review, distribute copies.
- .10 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Contract Administrator may reasonably request.
- .11 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Contract Administrator where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Contract Administrator.
  - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
  - .2 Testing must have been within 3 years of date of contract award for project.
- .13 Submit electronic copies of manufacturers instructions for requirements requested in specification Sections and as requested by Contract Administrator.
  - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .14 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Contract Administrator.
- .15 Delete information not applicable to project.
- .16 Supplement standard information to provide details applicable to project.
- .17 If upon review by Contract Administrator, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

### **1.03 SAMPLES**

- .1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Contract Administrator's business address.
- .3 Notify Contract Administrator in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Contract Administrator prior to proceeding with Work.
- .6 Make changes in samples which Contract Administrator may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

### **1.04 CERTIFICATES AND TRANSCRIPTS**

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- .2 Submit transcript of insurance immediately after award of Contract.

### **1.05 PHOTOGRAPHIC DOCUMENTATION**

- .1 Submit electronic copy of colour digital photography in jpg format, fine resolution, monthly.
- .2 Project identification: name and number of project and date of exposure indicated.
- .3 Number of viewpoints: 4 locations.
  - .1 Viewpoints and their location as determined by Contract Administrator.
- .4 Frequency of photographic documentation: monthly and
  - .1 Upon completion of: concrete work, framing, cladding systems, services before concealment,

finishing work.

## **PART 2 – PRODUCTS**

### **2.01 NOT USED**

.1 Not used.

## **PART 3 – EXECUTION**

### **3.01 NOT USED**

.1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCES TO REGULATORY REQUIREMENTS**

- .1 Perform Work in accordance with 2020 National Building Code of Canada (NBC) and 2020 National Energy Code for Buildings (NECB), including amendments up to construction start date. If additional codes of provincial or local application conflict or have a discrepancy, the more stringent requirements apply.
- .2 Specific design and performance requirements listed in specifications or indicated on Drawings may exceed minimum requirements established by referenced Building Code; these requirements will govern over the minimum requirements listed in Building Code
  - .1 Meet or exceed requirements of:
    - .1 Contract documents.
    - .2 Specified standards, codes and referenced documents.

### **1.02 BUILDING SMOKING ENVIRONMENT**

- .1 Comply with smoking restrictions and municipal by-laws.

### **1.03 QUALITY ASSURANCE**

- .1 Regulatory Requirements: Except as otherwise specified, Constructor will apply for, obtain, and pay fees associated with, permits, licenses, certificates, and approvals required by regulatory requirements and Contract Documents, based on General Conditions of Contract and the following:
  - .1 Regulatory requirements and fees in force on date of Bid submission, and
  - .2 A change in regulatory requirements or fees scheduled to become effective after date of tender submission and of which public notice has been given before date of tender submission.
- .2 The Contractor will apply and pay for the building permit.

## **PART 2 – PRODUCTS**

### **2.01 NOT USED**

- .1 Not used.

## **PART 3 – EXECUTION**

### **3.01 NOT USED**

- .1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 INSPECTION**

- .1 Allow Contract Administrator access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Contract Administrator instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

### **1.02 INDEPENDENT INSPECTION AGENCIES**

- .1 Independent Inspection/Testing Agencies are to be engaged for the purpose of inspecting and/or testing portions of Work.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Contract Administrator at no cost to the City. Pay costs for retesting and re-inspection.

### **1.03 ACCESS TO WORK**

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

### **1.04 PROCEDURES**

- .1 Notify appropriate agency and Contract Administrator in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

### **1.05 REJECTED WORK**

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Contract Administrator as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in opinion of Contract Administrator it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, the City will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Contract Administrator.

### **1.06 REPORTS**

- .1 Submit electronic copies of inspection and test reports to Contract Administrator.
- .2 Provide copies to subcontractor of work being inspected or tested.

### **1.07 TESTS AND MIX DESIGNS**

- .1 Furnish test results and mix designs as requested.
- .2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Contract Administrator and may be authorized as recoverable.

### **1.08 MILL TESTS**

- .1 Submit mill test certificates as required of specification Sections.

### **1.09 EQUIPMENT AND SYSTEMS**

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

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**PART 2 – PRODUCTS**

**2.01 NOT USED**

.1 Not used.

**PART 3 – EXECUTION**

**3.01 NOT USED**

.1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

### **1.02 INSTALLATION AND REMOVAL**

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

### **1.03 WATER SUPPLY**

- .1 Provide a continuous supply of potable water for construction use as required.
- .2 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.

### **1.04 TEMPORARY HEATING AND VENTILATION**

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- .2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
  - .1 Facilitate progress of Work.
  - .2 Protect Work and products against dampness and cold.
  - .3 Prevent moisture condensation on surfaces.
  - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
  - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress.
- .5 Ventilating:
  - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
  - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
  - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
  - .4 Ventilate storage spaces containing hazardous or volatile materials.
  - .5 Ventilate temporary sanitary facilities.
  - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .6 Permanent heating system of building, may be used when available. Be responsible for damage to heating system if use is permitted.
- .7 On completion of Work for which permanent heating system is used, replace filters and clean.
- .8 Ensure Date of Substantial Performance and Warranties for heating system do not commence until entire system is in as near original condition as possible and is certified by Contract Administrator.
- .9 Pay costs for maintaining temporary heat, when using permanent heating system.
- .10 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
  - .1 Conform with applicable codes and standards.
  - .2 Enforce safe practices.
  - .3 Prevent abuse of services.
  - .4 Prevent damage to finishes.
  - .5 Vent direct-fired combustion units to outside.
- .11 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

### **1.05 TEMPORARY POWER AND LIGHT**

- .1 Arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.
- .2 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors is not less than 162 lx.

**1.06 TEMPORARY COMMUNICATION FACILITIES**

- .1 Provide and pay for temporary equipment necessary for own use.

**1.07 FIRE PROTECTION**

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.
- .2 Burning rubbish and construction waste materials is not permitted on site.

**PART 2 – PRODUCTS**

**2.01 NOT USED**

- .1 Not used.

**PART 3 – EXECUTION**

**3.01 NOT USED**

- .1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-S269.2, Access Scaffolding for Construction Purposes.
  - .2 CAN/CSA-Z321, Signs and Symbols for the Occupational Environment.

### **1.02 INSTALLATION AND REMOVAL**

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Identify areas which have to be graveled to prevent tracking of mud.
- .3 Indicate use of supplemental or other staging area.
- .4 Provide construction facilities in order to execute work expeditiously.
- .5 Remove from site all such work after use.

### **1.03 SCAFFOLDING**

- .1 Scaffolding in accordance with CAN/CSA-S269.2.
- .2 Provide and maintain scaffolding, ramps, ladders, and platforms.

### **1.04 HOISTING**

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

### **1.05 SITE STORAGE/LOADING**

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

### **1.06 CONSTRUCTION PARKING**

- .1 Parking will be permitted on site provided it does not disrupt performance of Work.
- .2 Provide and maintain adequate access to project site.

### **1.07 SITE OFFICE**

- .1 A dedicated construction office is not required for this project.
- .2 Provide clearly marked and fully stocked first aid case in a readily available location.

### **1.08 SECURITY**

- .1 Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays as required.

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

- .1 Provide and maintain, in 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 manner to cause least interference with work activities.

### **1.10 SANITARY FACILITIES**

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

**1.11 PROTECTION AND MAINTENANCE OF TRAFFIC**

- .1 Maintain and protect traffic on affected roads during construction period.
- .2 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs
- .3 Protect travelling public from damage to person and property.
- .4 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .5 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .6 Provide snow removal during period of Work.

**1.12 CLEAN-UP**

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Store materials resulting from demolition activities that are salvageable.
- .4 Stack stored new or salvaged material not in construction facilities.

**PART 2 – PRODUCTS**

**2.01 NOT USED**

- .1 Not used.

**PART 3 – EXECUTION**

**3.01 NOT USED**

- .1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 INSTALLATION AND REMOVAL**

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

### **1.02 HOARDING AND FENCING**

- .1 Erect temporary site enclosure using new 1.8 m high security enclosure fence. Provide one lockable truck gate. Maintain fence in good repair.
- .2 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

### **1.03 GUARD RAILS AND BARRICADES**

- .1 Provide as required by governing authorities.

### **1.04 WEATHER ENCLOSURES**

- .1 Provide weather tight closures to unfinished door and window openings 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.
- .3 Design enclosures to withstand wind pressure and snow loading.

### **1.05 ACCESS TO SITE**

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

### **1.06 PUBLIC TRAFFIC FLOW**

- .1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

### **1.07 FIRE ROUTES**

- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.

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

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

### **1.09 PROTECTION OF BUILDING FINISHES**

- .1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.
- .2 Provide necessary screens, covers, and hoardings.
- .3 Confirm with Contract Administrator locations and installation schedule 3 days prior to installation.
- .4 Be responsible for damage incurred due to lack of or improper protection.

## **PART 2 – PRODUCTS**

### **2.01 NOT USED**

- .1 Not used.

## **PART 3 – EXECUTION**

### **3.01 NOT USED**

- .1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 Within text of each specifications section, reference may be made to reference standards.
- .2 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .3 If there is question as to whether products or systems are in conformance with applicable standards, Contract Administrator reserves right to have such products or systems tested to prove or disprove conformance.

### **1.02 QUALITY**

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
- .3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .4 Should disputes arise as to quality or fitness of products, decision rests strictly with Contract Administrator based upon requirements of Contract Documents.
- .5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

### **1.03 AVAILABILITY**

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Contract Administrator of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2 In event of failure to notify Contract Administrator at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Contract Administrator reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

### **1.04 STORAGE, HANDLING AND PROTECTION**

- .1 Handle and store products in 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 seal and labels intact. Do not remove from packaging or bundling until required in 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.
- .6 Store sheet materials, lumber and panels on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in 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 satisfaction of Contract Administrator.
- .9 Touch-up damaged factory finished surfaces to Contract Administrator's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

### **1.05 TRANSPORTATION**

- .1 Pay costs of transportation of products required in performance of Work.

### **1.06 MANUFACTURER'S INSTRUCTIONS**

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Contract Administrator in writing, of conflicts between specifications and manufacturer's instructions, so that Contract Administrator will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Contract Administrator to require removal and re-installation at no increase in Contract Price or Contract Time.

### **1.07 QUALITY OF WORK**

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Contract Administrator if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Contract Administrator reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Contract Administrator, whose decision is final.

### **1.08 CO-ORDINATION**

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

### **1.09 CONCEALMENT**

- .1 Be responsible for coordination and placement of openings, sleeves and accessories.
- .2 Before installation inform Contract Administrator if there is interference. Install as directed by Contract Administrator.

### **1.10 REMEDIAL WORK**

- .1 Refer Section 01 73 00 - Execution Requirements.
- .2 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
- .3 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

### **1.11 LOCATION OF FIXTURES**

- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
- .2 Inform Contract Administrator of conflicting installation. Install as directed.

### **1.12 FASTENINGS**

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .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 affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive 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.
- .7 Exterior fastenings for insulation or exterior cladding are to be thermally broken.

### **1.13 FASTENINGS - EQUIPMENT**

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

- .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

#### **1.14 PROTECTION OF WORK IN PROGRESS**

- .1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of Contract Administrator.

#### **1.15 EXISTING UTILITIES**

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

### **PART 2 – PRODUCTS**

#### **2.01 NOT USED**

- .1 Not used.

### **PART 3 – EXECUTION**

#### **3.01 NOT USED**

- .1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue.  
This specification refers to the following standards, specifications or publications:

- .1 The City's identification of existing survey control points and property limits.

### **1.02 EXISTING SERVICES**

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Contract Administrator of findings.
- .2 Remove abandoned service lines within 2m of structures. Cap or otherwise seal lines at cut-off points as directed by Contract Administrator.

### **1.03 LOCATION OF EQUIPMENT AND FIXTURES**

- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Contract Administrator of impending installation and obtain approval for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment when required by Contract Administrator.

### **1.04 RECORDS**

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.
- .3 Record locations of maintained, re-routed and abandoned service lines.

### **1.05 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit name and address of Surveyor to Contract Administrator.
- .2 On request of Contract Administrator, submit documentation to verify accuracy of field engineering work.
- .3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

### **1.06 SUBSURFACE CONDITIONS**

- .1 Promptly notify Contract Administrator in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or geotechnical report.
- .2 After prompt investigation, should Contract Administrator determine that conditions do differ materially, instructions will be issued for changes in Work.

## **PART 2 – PRODUCTS**

### **2.01 NOT USED**

- .1 Not used.

## **PART 3 – EXECUTION**

### **3.01 NOT USED**

- .1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit written request in advance of cutting or alteration which affects:
  - .1 Structural integrity of elements of project.
  - .2 Integrity of weather-exposed or moisture-resistant elements.
  - .3 Efficiency, maintenance, or safety of operational elements.
  - .4 Visual qualities of sight-exposed elements.
- .3 Include in request:
  - .1 Identification of project.
  - .2 Location and description of affected Work.
  - .3 Statement on necessity for cutting or alteration.
  - .4 Description of proposed Work, and products to be used.
  - .5 Alternatives to cutting and patching.
  - .6 Effect on Work of City or separate contractor.
  - .7 Written permission of affected separate contractor.
  - .8 Date and time work will be executed.

### **1.02 MATERIALS**

- .1 Required for original installation.
- .2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

### **1.03 PREPARATION**

- .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering, inspect conditions affecting performance of Work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.
- .4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .5 Provide protection from elements for areas, which are to be exposed by uncovering work; maintain excavations free of water.

### **1.04 EXECUTION**

- .1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.
- .2 Fit several parts together, to integrate with other Work.
- .3 Remove and replace defective and non-conforming Work.
- .4 Remove samples of installed Work for testing.
- .5 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- .6 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .7 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
- .8 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
- .9 Restore work with new products in accordance with requirements of Contract Documents.
- .10 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .11 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material in accordance with Section 07 84 00 - Firestopping, full thickness of the construction element.
- .12 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.
- .13 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

---

**PART 2 – PRODUCTS**

**2.01 NOT USED**

.1 Not used.

**PART 3 – EXECUTION**

**3.01 NOT USED**

.1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue.

### **1.02 PROJECT CLEANLINESS**

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by the City or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Contract Administrator. Do not burn waste materials on site.
- .3 Clear snow and ice from access to building, remove from site.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Dispose of waste materials and debris off site.
- .7 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .9 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .10 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .11 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

### **1.03 FINAL CLEANING**

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris other than that caused by the City or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Contract Administrator. Do not burn waste materials on site, unless approved by Contract Administrator.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.
- .9 Clean lighting reflectors, lenses, and other lighting surfaces.
- .10 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .11 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.
- .12 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .13 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .14 Remove dirt and other disfiguration from exterior surfaces.
- .15 Clean and sweep roofs, gutters, areaways, and sunken wells.
- .16 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.
- .17 Clean roofs, downspouts, and drainage systems.
- .18 Remove snow and ice from access to building.

---

**PART 2 – PRODUCTS**

**2.01 NOT USED**

.1 Not used.

**PART 3 – EXECUTION**

**3.01 NOT USED**

.1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 American Society for Testing and Materials (ASTM):
  - .1 ASTM E 1609, Standard Guide for Development and Implementation of a Pollution Prevention Program

### **1.02 DEFINITIONS**

- .1 Clean Waste: Untreated and unpainted; not contaminated with oils, solvents, sealants or similar materials.
- .2 Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, repair and demolition operations.
- .3 Hazardous: Exhibiting the characteristics of hazardous substances including properties such as ignitability, corrosiveness, toxicity or reactivity.
- .4 Non hazardous: Exhibiting none of the characteristics of hazardous substances, including properties such as ignitability, corrosiveness, toxicity, or reactivity.
- .5 Non toxic: Not poisonous to humans either immediately or after a long period of exposure.
- .6 Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- .7 Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- .8 Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form; recycling does not include burning, incinerating, or thermally destroying waste.
- .9 Return: To give back reusable items or unused products to vendors for credit.
- .10 Reuse: To reuse a construction waste material in some manner on the project site.
- .11 Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- .12 Sediment: Soil and other debris that has been eroded and transported by storm or well production run off water.
- .13 Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- .14 Toxic: Poisonous to humans either immediately or after a long period of exposure.
- .15 Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- .16 Volatile Organic Compounds (VOC's): Chemical compounds common in and emitted by many building products over time through outgassing:
  - .1 Solvents in paints and other coatings;
  - .2 Wood preservatives; strippers and household cleaners;
  - .3 Adhesives in particleboard, fiberboard, and some plywood; and foam insulation.
  - .4 When released, VOC's can contribute to the formation of smog and can cause respiratory tract problems, headaches, eye irritations, nausea, damage to the liver, kidneys, and central nervous system, and possibly cancer.
- .17 Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

### **1.03 DELIVERY, STORAGE AND HANDLING**

- .1 Storage Requirements: Implement a recycling/reuse program that includes separate collection of waste materials as appropriate to the project waste and the available recycling and reuse programs in the project area.
- .2 Handling Requirements: Clean materials that are contaminated before placing in collection containers and ensure that waste destined for landfill does not get mixed in with recycled materials:
  - .1 Deliver materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to recycling process.
  - .2 Arrange for collection by or delivery to the appropriate recycling or reuse facility.
- .3 Hazardous Waste and Hazardous Materials: Handle in accordance with applicable regulations.

## **PART 2 – PRODUCTS**

### **2.01 NOT USED**

- .1 Not used.

## **PART 3 – EXECUTION**

### **3.01 IMPLEMENTATION**

- .1 Manager: Contractor is responsible for designating an on site party or parties responsible for instructing workers and overseeing the CWM Plan for the project.
- .2 Distribution: Distribute copies of the CWM Plan to the job site foreman, each Subcontractor, the City, the Contract Administrator and other site personnel as required to maintain CWM Plan.
- .3 Instruction: Provide on site instruction of appropriate separation, handling, and recycling, salvage, reuse, composting and return methods being used for the project to Subcontractor's at appropriate stages of the project.

### **3.02 SUBCONTRACTOR'S RESPONSIBILITY**

- .1 Subcontractor's shall cooperate fully with the Contractor to implement the CWM Plan.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

- .1 All reference standards shall be current issue or latest revision at the date of building permit issue.

### **1.02 ADMINISTRATIVE REQUIREMENTS**

- .1 Acceptance of Work Procedures:
  - .1 Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
    - .1 Notify Contract Administrator in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
    - .2 Request Contract Administrator's inspection.
  - .2 Contract Administrator's Inspection:
    - .1 Contract Administrators and Contractor to inspect Work and identify defects and deficiencies.
    - .2 Contractor to correct Work as directed.
  - .3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:
    - .1 Work: completed and inspected for compliance with Contract Documents.
    - .2 Defects: corrected and deficiencies completed.
    - .3 Equipment and systems: tested, adjusted and balanced and fully operational.
    - .4 Certificates required by Fire Commissioner, Utility companies: submitted.
    - .5 Operation of systems: demonstrated to the City's personnel.
    - .6 Storage tank inspection documentation, registration, forms, decommissioning and removal in accordance with CEPA SOR/2008-197.
    - .7 Work: complete and ready for final inspection.
  - .4 Final Inspection:
    - .1 When completion tasks are done, request final inspection of Work by Contract Administrator, and Contractor.
    - .2 When Work incomplete according to the City and Contract Administrator, complete outstanding items and request re-inspection.
  - .5 Declaration of Substantial Performance: when Contract Administrator considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
  - .6 Commencement of Warranty Period: date of the City's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period.
  - .7 Final Payment:
    - .1 When Contract Administrator considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
    - .2 Refer to CCDC: when Work deemed incomplete by Contract Administrator, complete outstanding items and request re-inspection.
  - .8 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

### **1.03 FINAL CLEANING**

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.

## **PART 2 – PRODUCTS**

### **2.01 NOT USED**

- .1 Not used.

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**PART 3 – EXECUTION**

**3.01 NOT USED**

.1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Two weeks prior to Substantial Performance of the Work, submit one final electronic copy of operating and maintenance manuals in English.
- .3 Provide maintenance materials and special tools of same quality and manufacture as products provided in Work.

### **1.02 FORMAT**

- .1 Organize data as instructional manual.
- .2 Arrange content by systems, under Section numbers and sequence of Table of Contents.
- .3 Provide 1:1 scaled CAD files in dwg format on CD.

### **1.03 CONTENTS - PROJECT RECORD DOCUMENTS**

- .1 Table of Contents for Each Volume: provide title of project:
  - .1 Date of submission; names.
  - .2 Addresses, and telephone numbers of Contractor with name of responsible parties.
  - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
  - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data.
  - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.
- .6 Training: refer to Section 01 79 00 - Demonstration and Training.

### **1.04 AS-BUILT DOCUMENTS AND SAMPLES**

- .1 Maintain, at site one record copy of:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders and other modifications to Contract.
  - .5 Reviewed shop drawings, product data, and samples.
  - .6 Field test records.
  - .7 Inspection certificates.
  - .8 Manufacturer's certificates.
- .2 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
  - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .3 Maintain record documents in clean, dry and legible condition.
  - .1 Do not use record documents for construction purposes.

### **1.05 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS**

- .1 Record information on set of black line opaque drawings.
- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress.
  - .1 Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
  - .1 Measured depths of elements of foundation in relation to finish first floor datum.
  - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

- .4 Field changes of dimension and detail.
- .5 Changes made by change orders.
- .6 Details not on original Contract Drawings.
- .7 Referenced Standards to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction, including:
  - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
  - .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications and field test records, required by individual specifications sections.
- .7 Provide digital photos, if requested, for site records.

#### **1.06 EQUIPMENT AND SYSTEMS**

- .1 For each item of equipment and each system include description of unit or system, and component parts.
  - .1 Give function, normal operation characteristics and limiting conditions.
  - .2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
- .3 Include installed colour coded wiring diagrams.
- .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.
  - .1 Include regulation, control, stopping, shut-down, and emergency instructions.
  - .2 Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .6 Provide servicing and lubrication schedule, and list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.
- .8 Include sequence of operation by controls manufacturer.
- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .10 Provide installed control diagrams by controls manufacturer.
- .11 Provide Contractor's co-ordination drawings, with installed colour coded piping diagrams.
- .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .14 Include test and balancing reports as specified in Section 01 45 00 - Quality Control.
- .15 Additional requirements: as specified in individual specification sections.

#### **1.07 MATERIALS AND FINISHES**

- .1 Building products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
  - .1 Provide information for re-ordering custom manufactured products.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Additional requirements: as specified in individual specifications sections.

#### **1.08 MAINTENANCE MATERIALS**

- .1 Extra Stock Materials:
  - .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
  - .2 Provide items of same manufacture and quality as items in Work.
  - .3 Deliver to location as directed; place and store.
  - .4 Receive and catalogue items.

- .1 Submit inventory listing to Contract Administrator.
  - .2 Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.
- .2 Special Tools:
  - .1 Provide special tools, in quantities specified in individual specification section.
  - .2 Provide items with tags identifying their associated function and equipment.
  - .3 Deliver to location as directed; place and store.
  - .4 Receive and catalogue items.
    - .1 Submit inventory listing to Contract Administrator.
    - .2 Include approved listings in Maintenance Manual.

#### **1.09 DELIVERY, STORAGE AND HANDLING**

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.
- .5 Remove and replace damaged products at own expense and for review by Contract Administrator.

#### **1.10 WARRANTIES**

- .1 Assemble warranty information in binder, submit upon acceptance of work and organize binder as follows:
  - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
  - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
  - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
  - .4 Verify that documents are in proper form, contain full information, and are notarized.
  - .5 Co-execute submittals when required.
  - .6 Retain warranties and bonds until time specified for submittal.
- .2 Except for items put into use with City's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .3 Include information contained in warranty management plan as follows:
  - .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.
  - .2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and commissioned systems such as fire protection, alarm systems and lightning protection systems.
  - .3 Provide list for each warranted equipment, item, feature of construction or system indicating:
    - .1 Name of item.
    - .2 Model and serial numbers.
    - .3 Location where installed.
    - .4 Name and phone numbers of manufacturers or suppliers.
    - .5 Names, addresses and telephone numbers of sources of spare parts.
    - .6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
    - .7 Cross-reference to warranty certificates as applicable.
    - .8 Starting point and duration of warranty period.
    - .9 Summary of maintenance procedures required to continue warranty in force.
    - .10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
    - .11 Organization, names and phone numbers of persons to call for warranty service.
    - .12 Typical response time and repair time expected for various warranted equipment.
  - .4 Procedure and status of tagging of equipment covered by extended warranties.
  - .5 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.
- .4 Respond in timely manner to oral or written notification of required construction warranty repair work.

**1.11 WARRANTY TAGS**

- .1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag.
- .2 Attach tags with copper wire and spray with waterproof silicone coating.
- .3 Leave date of acceptance until project is accepted for occupancy.
- .4 Indicate following information on tag:
  - .1 Type of product/material.
  - .2 Model number.
  - .3 Serial number.
  - .4 Contract number.
  - .5 Warranty period.
  - .6 Inspector's signature.
  - .7 Construction Contractor.

**PART 2 – PRODUCTS**

**2.01 NOT USED**

- .1 Not used.

**PART 3 – EXECUTION**

**3.01 NOT USED**

- .1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 ADMINISTRATIVE REQUIREMENTS**

- .1 The City will provide a list of personnel to receive instructions, and will coordinate their attendance at agreed-upon times.
- .2 Demonstrate operation and maintenance of equipment and systems to designated personnel prior to date of substantial performance.
- .3 Preparation:
  - .1 Ensure equipment has been inspected and put into operation.
  - .2 Ensure testing, adjusting, and balancing has been performed and equipment and systems are fully operational.
- .4 Demonstration and Instructions:
  - .1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment at agreed upon times, at the designated location.
  - .2 Instruct personnel in phases of operation and maintenance using operation and maintenance manuals as basis of instruction.
  - .3 Review contents of manual in detail to explain aspects of operation and maintenance.

### **1.02 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit schedule of time and date for demonstration of each item of equipment and each system two weeks prior to designated dates, for Contract Administrator's approval.
- .3 Give time and date of each demonstration, with list of persons present.
- .4 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

### **1.03 QUALITY ASSURANCE**

- .1 When specified in individual Sections requiring manufacturer to provide authorized representative to demonstrate operation of equipment and systems:
  - .1 Instruct designated personnel.
  - .2 Provide written report that demonstration and instructions have been completed.

## **PART 2 – PRODUCTS**

### **2.01 NOT USED**

- .1 Not used.

## **PART 3 – EXECUTION**

### **3.01 NOT USED**

- .1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 78 00 - Closeout Submittals: Project record documents.

### **1.2 ALTERATION PROJECT PROCEDURES**

- .1 Materials: As specified in Product sections; match existing Products and work for patching and extending work.
- .2 Employ skilled and experienced installer to perform alteration work.
- .3 Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.
- .4 Remove, cut, and patch Work in a manner to minimize damage and to provide means of restoring Products and finishes to original condition.
- .5 Refinish existing visible surfaces to remain in renovated rooms and spaces, to renewed condition for each material, with a neat transition to adjacent finishes.
- .6 Where new Work abuts or aligns with existing, provide a smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.
- .7 When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and submit recommendation to Contract Administrator for review.
- .8 Where a change of plane of 6mm or more occurs, submit recommendation for providing a smooth transition; to Contract Administrator for review.
- .9 Patch or replace portions of existing surfaces which are damaged, lifted, discoloured, or showing other imperfections.
- .10 Finish surfaces as specified in individual Product sections.

### **1.3 SUBMITTALS FOR CLOSEOUT**

- .1 Project Record Documents: Accurately record actual locations of capped utilities, subsurface obstructions.

### **1.4 REGULATORY REQUIREMENTS**

- .1 Conform to applicable code for demolition work, dust control and products requiring electrical disconnection.
- .2 Do not close or obstruct egress width to any building or site exit.

### **1.5 PROJECT CONDITIONS**

- .1 Conduct demolition to minimize interference with adjacent building areas.
- .2 Cease operations immediately if structure appears to be in danger and notify Contract Administrator. Do not resume operations until directed.

## **PART 2 - PRODUCTS**

### **2.1 NOT USED**

- .1 Not Used.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- .1 Erect and maintain weatherproof closures for exterior openings.
- .2 Protect existing materials which are not to be demolished.
- .3 Prevent movement of structure; provide bracing and shoring.
- .4 Notify affected utility companies before starting work and comply with their requirements.
- .5 Mark location and termination of utilities.

### **3.2 DEMOLITION**

- .1 Disconnect, remove and identify designated utilities within demolition areas.
- .2 Demolish in an orderly and careful manner.
- .3 Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.

- .4 Remove materials as Work progresses. Upon completion of Work, leave areas in clean condition.
- .5 Remove temporary Work.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 Department of Justice Canada (Jus)
  - .1 Transportation of Dangerous Goods Act, (TDG Act), (c. 34).
  - .2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).
- .2 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .3 National Research Council Canada (NRC)
  - .1 National Fire Code of Canada (NFC).
- .4 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1 SCAQMD Rule 1113, Architectural Coatings.
  - .2 SCAQMD Rule 1168, Adhesive and Sealant Applications.

### **1.02 DEFINITIONS**

- .1 Dangerous Goods: product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.
- .2 Hazardous Material: product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into environment.
- .3 Hazardous Waste: hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.

### **1.03 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for hazardous materials and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit two copies of WHMIS MSDS to Contract Administrator for each hazardous material required prior to bringing hazardous material on site.
  - .3 Submit hazardous materials management plan to Contract Administrator that identifies hazardous materials, usage, location, personal protective equipment requirements, and disposal arrangements.
  - .4 Hazardous waste classification: identify waste codes applicable to each hazardous waste material based on applicable federal and provincial acts, regulations, and guidelines. Waste profiles, analyses, and classification submitted to contract offices for review and approval.

### **1.04 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address.
- .3 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.
  - .1 When exporting hazardous waste to another country, ensure compliance with Export and Import of Hazardous Waste and Hazardous Recyclable Materials Regulations.
- .4 Storage and Handling Requirements:
  - .1 Co-ordinate storage of hazardous materials with Contract Administrator and abide by internal requirements for labeling and storage of materials and wastes.
  - .2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.
  - .3 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada (NFC) requirements.
  - .4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.

- .1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.
- .2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Contract Administrator.
- .5 Transfer of flammable and combustible liquids is prohibited within buildings.
- .6 Transfer flammable and combustible liquids away from open flames or heat-producing devices.
- .7 Solvents or cleaning agents: non-flammable or have flash point above 38 degrees C.
- .8 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.
- .9 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.
- .10 Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:
  - .1 Store hazardous materials and wastes in closed and sealed containers.
  - .2 Label containers of hazardous materials and wastes in accordance with WHMIS.
  - .3 Store hazardous materials and wastes in containers compatible with that material or waste.
  - .4 Segregate incompatible materials and wastes.
  - .5 Ensure that different hazardous materials or hazardous wastes are stored in separate containers.
  - .6 Store hazardous materials and wastes in secure storage area with controlled access.
  - .7 Maintain clear egress from storage area.
  - .8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.
  - .9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.
  - .10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.
- .11 When hazardous waste is generated on site:
  - .1 Co-ordinate transportation and disposal with Contract Administrator.
  - .2 Comply with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.
  - .3 Use licensed carrier authorized by provincial authorities to accept subject material.
  - .4 Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility it will accept material and it is licensed to accept this material.
  - .5 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.
  - .6 Only trained personnel handle, offer for transport, or transport dangerous goods.
  - .7 Provide photocopy of shipping documents and waste manifests to Contract Administrator.
  - .8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide photocopy of completed manifest to Contract Administrator.
  - .9 Report discharge, emission, or escape of hazardous materials immediately to Contract Administrator and appropriate provincial authority. Take reasonable measures to control release.
- .12 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.
- .13 Report spills or accidents immediately to Contract Administrator. Submit a written spill report to Contract Administrator within 24 hours of incident.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- .1 Description:
  - .1 Bring on site only quantities hazardous material required to perform Work.
  - .2 Maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.
  - .3 Spill Response Materials: provide spill response materials which can be used for absorbing/shoveling and containing hazardous materials.
  - .4 Provide personal protective equipment.

## **PART 3 – EXECUTION**

### **3.01 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 Canadian Standards Association (CSA International)
  - .1 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CAN/CSA-O86, Engineering Design in Wood.
  - .3 CSA O121, Douglas Fir Plywood.
  - .4 CSA O151, Canadian Softwood Plywood.
  - .5 CAN/CSA-O325.0, Construction Sheathing.
  - .6 CSA O437 Series, Standards for OSB and Waferboard.
  - .7 CSA S269.1, Falsework for Construction Purposes.
  - .8 CAN/CSA-S269.3, Concrete Formwork, National Standard of Canada
- .2 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

### **1.02 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit shop drawings for formwork and falsework.
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Manitoba, Canada.
- .3 Submit WHMIS MSDS - Material Safety Data Sheets.
- .4 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts.
- .5 Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.
- .6 Indicate sequence of erection and removal of formwork/falsework.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- .1 Formwork materials:
  - .1 For concrete without special architectural features, use wood and wood product formwork materials to CAN/CSA-O86.
  - .2 For concrete with special architectural features, use formwork materials to CSA-A23.1/A23.2.
  - .3 Wood cement composites.
  - .4 Rigid insulation board: to CAN/ULC-S701.
- .2 Form ties:
  - .1 For concrete not designated 'Architectural', use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.
  - .2 For Architectural concrete, use snap ties complete with plastic cones and light grey concrete plugs.
- .3 Form release agent: non-toxic.
- .4 Form stripping agent: colourless mineral oil, non-toxic, free of kerosene, with viscosity between 70 and 110s Saybolt Universal at 40 degrees C, flashpoint minimum 150 degrees C, open cup.
- .5 Falsework materials: to CSA-S269.1.
- .6 Sealant: to Section 07 92 00 - Joint Sealants.

## **PART 3 – EXECUTION**

### **3.01 FABRICATION AND ERECTION**

- .1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.
- .2 Obtain Contract Administrator's approval for use of earth forms framing openings not indicated on drawings.
- .3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.
- .4 Fabricate and erect falsework in accordance with CSA S269.1.
- .5 Refer to architectural drawings for concrete members requiring architectural exposed finishes.
- .6 Do not place shores and mud sills on frozen ground.
- .7 Provide site drainage to prevent washout of soil supporting mud sills and shores.
- .8 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.
- .9 Align form joints and make watertight.
  - .1 Keep form joints to minimum.
- .10 Locate horizontal form joints for exposed columns 2400 mm above finished floor elevation.
- .11 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.
- .12 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .13 Construct forms for architectural concrete, and place ties as indicated and as directed.
  - .1 Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.
- .14 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.
  - .1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
- .15 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

### **3.02 REMOVAL AND RESHORING**

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
  - .1 4 days and A23.1 Clause 7.4, Tables 14 and 21, Figure D.2 for beam soffits, slabs, decks and other structural members, or 4 days and A23.1 Clause 7.4, Tables 14 and 21, Figure D.2 when replaced immediately with adequate shoring to standard specified for falsework.
  - .2 4 days and A23.1 Clause 7.4, Tables 14 and 21, Figure D.2 for footings and abutments.
- .2 Remove formwork when concrete has reached 75% of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.
- .3 Provide necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.
- .4 Space reshoring in each principal direction at not more than 3000 mm apart.
- .5 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 American Concrete Institute (ACI)
  - .1 SP-66, ACI Detailing Manual.
- .2 American Society for Testing and Materials (ASTM)
  - .1 ASTM A 143/A 143M, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
  - .2 ASTM A 641/A 641M, Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
  - .3 ASTM A 1064/A 1064M, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- .3 CSA Group
  - .1 CSA-A23.1-14/A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
  - .2 CSA-G30.18, Carbon Steel Bars for Concrete Reinforcement.
  - .3 CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .4 Reinforcing Steel Institute of Canada (RSIC)
  - .1 RSIC, Reinforcing Steel Manual of Standard Practice.

### **1.02 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba of Canada.
    - .1 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice.
    - .2 Indicate placing of reinforcement and:
      - .1 Bar bending details.
      - .2 Lists.
      - .3 Quantities of reinforcement.
      - .4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Contract Administrator, with identifying code marks to permit correct placement without reference to structural drawings.
      - .5 Indicate sizes, spacings and locations of chairs, spacers and hangers.
  - .3 Detail lap lengths and bar development lengths to CAN/CSA-A23.3.
    - .1 Provide type A tension lap splices unless otherwise indicated.
  - .4 Indicate position and size of openings in slabs and walls. Coordinate with trades requiring openings.

### **1.03 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Storage and Handling Requirements:
  - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- .1 Substitute different size bars only if permitted in writing by Contract Administrator.
- .2 Reinforcing steel: billet steel, grade 300 for 10M and 400 for 15M and larger, deformed bars to CSA-G30.18, unless indicated otherwise.
- .3 Reinforcing steel: weldable low alloy steel deformed bars to CSA-G30.18.
- .4 Cold-drawn annealed steel wire ties: to ASTM A 1064M.
- .5 Deformed steel wire for concrete reinforcement: to ASTM A 1064M.

- .6 Welded steel wire fabric:
  - .1 Plain in accordance ASTM A 1064/A 1064M, fabricated from as drawn steel wire into flat sheets; sizes as indicated on Drawings.
  - .2 Finish:
    - .1 Galvanized: Hot dip galvanized after welding having Class A coating in accordance with ASTM A 641.
    - .2 Epoxy Coated: Epoxy coated after welding in accordance with ASTM A 884/A 884M, Class A coated; 175 µm, Type 1 intended for use in concrete or masonry, colour contrasting with rust.
  - .3 Provide in flat sheets only.
- .7 Epoxy Coating of non-prestressed reinforcement: to ASTM A 775/A 775M.
- .8 Galvanizing of non-prestressed reinforcement: to CAN/CSA-G164, minimum zinc coating 610 g/m<sup>2</sup>.
  - .1 Protect galvanized reinforcing steel with chromate treatment to prevent reaction with Portland cement paste.
  - .2 If chromate treatment carried out immediately after galvanizing, soak steel in aqueous solution containing minimum 0.2% by weight sodium dichromate or 0.2% chromic acid.
    - .1 Temperature of solution minimum 32 degrees and galvanized steels immersed for minimum 20 seconds.
  - .3 If galvanized steels at ambient temperature, add sulphuric acid as bonding agent at concentration of 0.5% to 1%.
    - .1 No restriction applies to temperature of solution.
  - .4 Chromate solution sold for this purpose may replace solution described above, provided if of equivalent effectiveness.
    - .1 Provide product description as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
- .9 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.
- .10 Tie wire: 1.5 mm diameter annealed wire, epoxy coated.
- .11 Mechanical splices: subject to approval of Contract Administrator.
- .12 Plain round bars: to CSA-G40.20/G40.21.

## **2.02 FABRICATION**

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
  - .1 SP-66 unless indicated otherwise.
- .2 Obtain Contract Administrator's written approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Upon approval of Contract Administrator, weld reinforcement in accordance with CSA W186.
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.
  - .1 Ship epoxy coated bars in accordance with ASTM A 775M.

## **PART 3 – EXECUTION**

### **3.01 PREPARATION**

- .1 Galvanizing to include chromate treatment.
  - .1 Duration of treatment 1 hour per 25 mm of bar diameter.
- .2 Conduct bending tests to verify galvanized bar fragility in accordance with ASTM A 143/A 143M.

### **3.02 FIELD BENDING**

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by Contract Administrator.
- .2 When field bending authorized, bend without heat, applying slow and steady pressure.
- .3 Replace bars, which develop cracks or splits.

### **3.03 PLACING REINFORCEMENT**

- .1 Cutting or puncturing vapour retarder is not permitted; repair damage and reseal vapour retarder before placing concrete.
- .2 Place reinforcing steel as indicated on placing drawings and in accordance with CSA-A23.1/A23.2.

- .3 Use plain round bars as slip dowels in concrete.
  - .1 Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint.
  - .2 Apply thick even film of mineral lubricating grease when paint is dry.
- .4 Prior to placing concrete, obtain Contract Administrator's approval of reinforcing material and placement.
- .5 Maintain cover to reinforcement during concrete pour.
- .6 Protect epoxy coated portions of bars with covering during transportation and handling.

#### **3.04 FIELD TOUCH-UP**

- .1 Touch up damaged and cut ends of epoxy coated or galvanized reinforcing steel with compatible finish to provide continuous coating.

#### **3.05 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 ASTM International
  - .1 ASTM C 260/C 260M, Standard Specification for Air-Entraining Admixtures for Concrete.
  - .2 ASTM C 309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
  - .3 ASTM C 494/C 494M, Standard Specification for Chemical Admixtures for Concrete.
  - .4 ASTM C 1017/C 1017M, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
  - .5 ASTM D 412, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
  - .6 ASTM D 1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-37.2, Emulsified Asphalt, Mineral Colloid-Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.
  - .2 CAN/CGSB-51.34, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .3 CSA International
  - .1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CSA A283, Qualification Code for Concrete Testing Laboratories.
  - .3 CSA A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

### **1.02 ABBREVIATIONS AND ACRONYMS**

- .1 Limestone Cement: hydraulic cement, blended hydraulic cement (XXb - b denotes blended) and Portland-limestone cement.
  - .1 Type GU, GUb and GUL - General use cement.
  - .2 Type MS and MSb - Moderate sulphate-resistant cement.
  - .3 Type HS and HSb - High sulphate-resistant cement.

### **1.03 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken.
- .3 Concrete hauling time: provide for review by Contract Administrator deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

### **1.04 DELIVERY, STORAGE AND HANDLING**

- .1 Delivery and Acceptance Requirements:
  - .1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.
    - .1 Do not modify maximum time limit without receipt of prior written agreement from Contract Administrator and concrete producer as described in CSA A23.1/A23.2.
    - .2 Deviations to be submitted for review by Contract Administrator.
  - .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- .1 Portland Cement: to CSA A3001, Type GU and HS as per drawings.
- .2 Blended hydraulic cement: Type GUB and HSb to CSA A3001.
- .3 Portland-limestone cement: Type GUL to CSA A3001.
- .4 Water: to CSA A23.1.
- .5 Aggregates: to CSA A23.1/A23.2.
- .6 Admixtures:
  - .1 Air entraining admixture: to ASTM C 260.
  - .2 Chemical admixture: to ASTM C 494, ASTM C 1017. Contract Administrator to approve accelerating or set retarding admixtures during cold and hot weather placing.
  - .3 Corrosion-inhibiting admixture: to C 494 Type S.
  - .4 Lithium-based admixture: to C 494 Type.
  - .5 Shrinkage-reducing admixture (SRA): to C 494 Type S.
  - .6 Viscosity-modifying agent (VMA): to C 494 Type S.
- .7 Shrinkage compensating grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents to CSA A23.1/A23.2.
  - .1 Compressive strength: 35 MPa at 28 days.
  - .2 Net shrinkage at 28 days: maximum 0%.
- .8 Non premixed dry pack grout: composition of non metallic aggregate Portland cement with sufficient water for mixture to retain its shape when made into ball by hand and capable of developing compressive strength of 35 MPa at 28 days.
- .9 Curing compound: to CSA A23.1/A23.2 white.
- .10 Premoulded joint fillers:
  - .1 Bituminous impregnated fibre board: to ASTM D 1751.
  - .2 Sponge rubber: to ASTM D 1752, Type I, flexible grade.
- .11 Dampproof membrane:
  - .1 Bitumen impregnated protection board: 11mm.
- .12 Dampproofing:
  - .1 Emulsified asphalt, mineral colloid type, unfilled: to CAN/CGSB-37.2, and to Section 07 11 13 - Bituminous Dampproofing.
- .13 Polyethylene film: 0.254 mm thickness to CAN/CGSB-51.34.

## **PART 3 – EXECUTION**

### **3.01 PREPARATION**

- .1 Obtain Contract Administrator's written approval before placing concrete.
  - .1 Provide 48 hours minimum notice prior to placing of concrete.
- .2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.
- .3 During concreting operations:
  - .1 Development of cold joints not allowed.
  - .2 Ensure concrete delivery and handling facilitate placing with minimum of re-handling, and without damage to existing structure or Work.
- .4 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .5 Prior to placing of concrete obtain Contract Administrator's approval of proposed method for protection of concrete during placing and curing.
- .6 Protect previous Work from staining.
- .7 Clean and remove stains prior to application for concrete finishes.
- .8 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, workability, air content, temperature and test samples taken.
- .9 In locations where new concrete is dowelled to existing work, drill holes in existing concrete.
  - .1 Place steel dowels of deformed steel reinforcing bars and pack solidly with epoxy grout to anchor and hold dowels in positions as indicated.

### **3.02 INSTALLATION/ APPLICATION**

- .1 Do cast-in-place concrete work to CSA A23.1/A23.2.
- .2 Sleeves and inserts:

- .1 Do not permit penetrations, sleeves, ducts, pipes or other openings to pass through joists, beams, except where indicated or approved by Contract Administrator.
- .2 Where approved by Contract Administrator, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere.
- .3 Sleeves and openings greater than 100 x 100 mm not indicated, must be reviewed by Contract Administrator.
- .4 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain written approval of modifications from Contract Administrator before placing of concrete.
- .5 Confirm locations and sizes of sleeves and openings shown on drawings.
- .6 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.
- .3 Anchor bolts:
  - .1 Install anchor bolts as per details on structural drawings.
- .4 Grout under base plates using procedures in accordance with manufacturer's recommendations which result in 100% contact over grouted area.
- .5 Finishing and curing:
  - .1 Finish concrete to CSA A23.1/A23.2.
  - .2 Use procedures as reviewed by Contract Administrator to remove excess bleed water. Ensure surface is not damaged.
  - .3 Use curing compounds compatible with applied finish on concrete surfaces.
  - .4 Finish concrete floor to CSA A23.1/A23.2. Class C3.
  - .5 Concrete floor to have finish hardness equal to to CSA A23.1/A23.2.
  - .6 Provide swirl-trowelled finish where bonded topping is to be applied. Provide depressions to accommodate bonded topping.
  - .7 Provide swirl-trowelled finish unless otherwise indicated.
  - .8 Rub exposed sharp edges of concrete with carborundum to produce 3 mm minimum radius edges unless otherwise indicated.
- .6 Joint fillers:
  - .1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Contract Administrator.
  - .2 When more than one piece is required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.
  - .3 Locate and form isolation, construction and expansion joints as indicated.
  - .4 Install joint filler.
  - .5 Use 12 mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 6 mm of finished slab surface unless indicated otherwise.
- .7 Dampproof membrane:
  - .1 Install dampproof membrane under concrete slabs-on-grade inside building.
  - .2 Lap dampproof membrane minimum 150mm at joints and seal.
  - .3 Seal punctures in dampproof membrane before placing concrete.
  - .4 Use patching material at least 150mm larger than puncture and seal.

### **3.03 SURFACE TOLERANCE**

- .1 Concrete tolerance to CSA A23.1 Straightedge Method.

### **3.04 FIELD QUALITY CONTROL**

- .1 Site tests: conduct tests as follows in accordance with Section 01 45 00 - Quality Control and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
  - .1 Concrete pours.
  - .2 Slump.
  - .3 Air content.
  - .4 Compressive strength at 7 and 28 days.
  - .5 Air and concrete temperature.
- .2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Contract Administrator for review to CSA A23.1/A23.2.
- .3 Contractor may take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
- .4 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.

- .5 Inspection or testing by Contract Administrator will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

**3.05 CLEANING**

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 American Society for Testing and Materials (ASTM)
  - .1 ASTM C 309-03, Liquid Membrane-Forming Compounds for Curing Concrete.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-25.20, Surface Sealer for Floors.
- .3 CSA International
  - .1 CAN/CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction//Methods of Test for Concrete.

### **1.02 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Provide manufacturer's printed product literature and data sheets for concrete finishes and include product characteristics, performance criteria, physical size, finish and limitations.

### **1.03 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: Deliver materials to site in original factory packaging, labeled with manufacturer's name, address.

### **1.04 SITE CONDITIONS**

- .1 Temporary lighting: Minimum 1200 W light source, placed 2.5 m above floor surface, for each 40 sq m of floor being treated.
- .2 Electrical power: Provide sufficient electrical power to operate equipment normally used during construction
- .3 Work area: Make work area water tight protected against rain and detrimental weather conditions.
- .4 Temperature: Maintain minimum 10 degrees C ambient temperature for 7 days before installation and minimum 48 hours after completion of work and maintain relative humidity maximum 40% during same period.
- .5 Moisture: Ensure concrete substrate within moisture limits prescribed by flooring manufacturer.
- .6 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.
- .7 Ventilation:
  - .1 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.
  - .2 Provide continuous ventilation during and after coating application.

## **PART 2 - PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- .1 Product quality and quality of work in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Submit written declaration components used compatible and not adversely affect finished flooring products and their installation adhesives.

### **2.02 SEALING COMPOUNDS**

- .1 Surface sealer: as per flooring manufacturer requirements.

### **2.03 CURING COMPOUNDS**

- .1 Waterborne membrane forming curing membrane to ASTM C 309, Type 1 Clear Class B.
  - .1 Verify compatibility with subsequent finishes.

#### **2.04 PAINTED CONCRETE**

- .1 INT 3.2D, polyurethane pigmented coating over epoxy as per MPI installation recommendations and instructions. Colour: grey.

#### **2.05 MIXES**

- .1 Mixing ratios in accordance with manufacturer's written instructions.

### **PART 3 – EXECUTION**

#### **3.01 EXAMINATION**

- .1 Verify slab surfaces ready to receive work and elevations as recommended by manufacturer's written instructions.

#### **3.02 PREPARATION OF SLAB**

- .1 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radiused edges unless otherwise indicated.
- .2 Saw cut control joints to CAN/CSA-A23.1, 24 hours maximum after placing of concrete.

#### **3.03 APPLICATION**

- .1 Prepare and mix materials and apply each component of coating system in accordance with manufacturer's directions to produce a uniform monolithic surface. Minimum of 2 coats required. Total dry film thickness to be 32 mils.
  - .1 Prime Coat: Apply sealer as recommended by polyurethane coating manufacturer.
  - .2 Finish Coat: Apply INT 3.2D, polyurethane pigmented coating as per manufacturer's instructions. Allow coating to cure.
  - .3 Finished colour and texture to meet approval of Contract Administrator.

#### **3.04 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

#### **3.05 PROTECTION**

- .1 Protect finished installation in accordance with manufacturer's instructions.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 RELATED SECTIONS**

- .1 Section 09 91 23 - Interior Painting
- .2 Section 10 91 00 - Miscellaneous Specialties.

### **1.02 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 ASTM International
  - .1 ASTM A 53/A 53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  - .2 ASTM A 269M, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
  - .3 ASTM A 307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .2 CSA Group
  - .1 CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2 CAN/CSA G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3 CSA S16, Design of Steel Structures.
  - .4 CSA W48, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
  - .5 CSA W59, Welded Steel Construction (Metal Arc Welding).
- .3 The Master Painters Institute (MPI)
  - .1 Architectural Painting Specification.

### **1.03 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for sections, plates, pipe, tubing and bolts and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Ontario, Canada.
  - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

### **1.04 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- .1 Steel sections and plates: to CSA G40.20/G40.21, Grade 350W.
- .2 Steel pipe: to ASTM A 53/A 53M extra strong, black and galvanized finish as noted.
- .3 Welding materials: to CSA W59.
- .4 Welding electrodes: to CSA W48 Series.
- .5 Bolts and anchor bolts: to ASTM A 307.
- .6 Stainless steel tubing: to ASTM A 269, Type 302 commercial grade.
- .7 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

## **2.02 FABRICATION**

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.
- .3 Where possible, fit and shop assemble work, ready for erection.
- .4 Exposed welds continuous for length of each joint. File or grind exposed welds smooth and flush.

## **2.03 FINISHES**

- .1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m<sup>2</sup> to CAN/CSA-G164.
- .2 Chromium plating: chrome on steel with plating sequence of 0.009 mm thickness of copper 0.010 mm thickness of nickel and 0.0025 mm thickness of chromium.
- .3 Shop coat primer: MPI- INT 5.1A, MPI- EXT 5.1A.
- .4 Zinc primer: zinc rich, ready mix to MPI-INT 5.2C. MPI- EXT 5.2C.

## **2.04 ISOLATION COATING**

- .1 Isolate aluminum from following components, by means of bituminous paint:
  - .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
  - .2 Concrete, mortar and masonry.
  - .3 Wood.

## **2.05 SHOP PAINTING**

- .1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.
- .2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Paint when temperature minimum 7 degrees C.
- .3 Clean surfaces to be field welded; do not paint.

# **PART 3 – EXECUTION**

## **3.01 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts acceptable for metal fabrications installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .2 Proceed with installation only after unacceptable conditions remedied.

## **3.02 ERECTION - GENERAL**

- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
- .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Provide suitable means of anchorage acceptable to Contract Administrator such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .4 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .5 Supply components for work by other trades in accordance with shop drawings and schedule.
- .6 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.
- .7 Touch-up rivets, field welds, bolts and burnt or scratched surfaces with primer after completion of:
- .8 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

## **3.04 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

**3.05 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metal fabrications installation.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 ASTM International
  - .1 ASTM A 123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .2 ASTM A 153/A 153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - .3 ASTM A 480/A 480M Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet and Strip.
  - .4 ASTM A 653/A 653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .5 ASTM F 2329/F 2329M Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners
- .2 American Wood-Preservers' Association (AWPA)
  - .1 AWPA M2, Standard for Inspection of Treated Wood Products.
  - .2 AWPA M4, Standard for the Care of Preservative-Treated Wood Products.
- .3 CSA Group
  - .1 CSA O80 Series, Wood Preservation.
  - .2 CSA O322, Procedure for Certification of Pressure-Treated Wood Materials for Use in Preserved Wood Foundations.
- .4 Underwriters Laboratory of Canada (ULC)
  - .1 CAN/ULC-S102 Surface Burning Characteristics of Building Materials and Assemblies.

### **1.02 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit Submittal submissions: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Quality assurance submittals:
  - .1 Submit certificates in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 For products treated with preservative by pressure impregnation submit following information certified by authorized signing officer of treatment plant:
    - .1 Information listed in AWPA M2 and revisions specified in CSA O80 Series, Supplementary Requirement to AWPA M2 applicable to specified treatment.
    - .2 Moisture content after drying following treatment with water-borne preservative.
    - .3 Acceptable types of paint, stain, and clear finishes that may be used over treated materials to be finished after treatment.
  - .3 Recommended metal connector and fastener materials and corrosion protection.
  - .4 Product recommendation for field treatment.

### **1.03 QUALITY ASSURANCE**

- .1 Each piece of lumber and plywood for preserved wood foundations to be identified by CSA O322 certified stamp.
- .2 Regulatory Requirements:
  - .1 Each board or bundle of fire-retardant treated material or panel to bear ULC label indicating Flame Spread Classification (FSC), and smoke developed.

### **1.04 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with product category, manufacturer's name and address.

## **PART 2 – PRODUCTS**

### **2.01 PRESERVATIVE TREATED WOOD MATERIALS AND APPLICATION**

- .1 Provide preservative treated lumber and plywood in accordance with CSA O80 Series standards as specified below.
- .2 Lumber Battens in rainscreen cavities:
  - .1 Use Category: 3.2
  - .2 Clause: 9.7
- .3 Plywood Battens in rainscreen cavities:
  - .1 Use Category: 3.2
  - .2 Clause: 9.7 and 9.2.2.5.
- .4 Decking, above ground, exterior:
  - .1 Use Category: 3.2
  - .2 Clause: 9.2
- .5 Deck joists and support posts in ground contact:
  - .1 Use Category: 4.1
  - .2 Clause: 9.2
- .6 Furring strips, above ground, exterior, between cladding and weather barrier:
  - .1 Use Category: 3.2
  - .2 Clause: 9.2

### **2.02 CORROSION PROTECTION FOR CONNECTORS AND FASTENERS FOR USE WITH TREATED WOOD**

- .1 Connectors: Fabricated from steel sheet galvanized in accordance with ASTM A 653 to minimum G185 coating or galvanized post fabrication to ASTM A 123.
- .2 Fasteners: Hot dip galvanized to ASTM A 153/A 153M Class C and D.

### **2.03 PRESERVATIVE FOR FIELD TREATMENT**

- .1 Type recommended by manufacturer to suit specified pressure treated products.

## **PART 3 – EXECUTION**

### **3.01 CONSTRUCTION**

- .1 Incorporate treated wood products into construction in accordance with Section 06 08 99.
- .2 Use connectors and fasteners with specified corrosion protection in all construction with treated wood products.
- .3 Provide barrier membrane where indicated.

### **3.02 FIELD TREATMENT**

- .1 Comply with AWP A M4 and revisions specified in CSA O80 Series, Supplementary Requirements to AWP A M2.
- .2 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of recommended preservative before installation.
- .3 Remove chemical deposits from surfaces of treated wood to receive applied finish.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 ASTM International
  - .1 ASTM A 123/A 123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .2 ASTM A 653/A 653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .3 ASTM F 1667 Standard Specification for Driven Fasteners: Nails, Spikes and Staples.
- .2 CSA International
  - .1 CSA B111, Wire Nails, Spikes and Staples.
  - .2 CSA O121, Douglas Fir Plywood.
  - .3 CSA O141, Softwood Lumber.
- .3 National Lumber Grades Authority (NLGA)
  - .1 Standard Grading Rules for Canadian Lumber.
- .4 National Research Council Canada (NRC)
  - .1 National Building Code of Canada (NBC).

### **1.02 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store materials off ground with moisture barrier at both ground level and as a cover forming a well-ventilated enclosure, with drainage to prevent standing water.
  - .3 Store and protect architecturally exposed lumber from nicks, scratches, and blemishes.
  - .4 Replace defective or damaged materials with new.
  - .5 Store separated reusable wood waste convenient to cutting station and work areas.

## **PART 2 – PRODUCTS**

### **2.01 STRUCTURAL FRAMING**

- .1 Lumber: softwood, S4S, moisture content 19% (S-dry) or less in accordance with following standards:
  - .1 CSA O141.
  - .2 NLGA Standard Grading Rules for Canadian Lumber.
- .2 Plant fabricated structural wood:
  - .1 Proprietary prefabricated I-joists of solid, laminated veneer lumber glue laminated lumber flanges or oriented strandboard panel web, with factory pre-punched knock-out holes for electrical services, and ventilation holes for roof joists.
  - .2 Proprietary prefabricated open web parallel chord joists of solid, laminated veneer lumber glue laminated lumber flanges or oriented strandboard panel web.
  - .3 Adhesive: Exterior rated phenol-formaldehyde or phenol-resorcinol: to CSA O112.9.
  - .4 Plant fabrication with quality control in accordance with ASTM D 5055.
- .3 Structural Composite Lumber (SCL) in accordance with ASTM D 5456, for following uses:
  - .1 Laminated veneer lumber (LVL): headers, beams as indicated.
  - .2 Parallel strand lumber (PSL): beams and headers as indicated.
  - .3 Laminated strand lumber (LSL): studs as indicated.
  - .4 Oriented strand lumber (OSL): studs as indicated.

### **2.02 FURRING AND BLOCKING**

- .1 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:
  - .1 Board sizes: "Standard" or better grade.

- .2 Dimension sizes: "Standard" light framing or better grade.
- .3 Post and timbers sizes: "Standard" or better grade.
- .2 Where indicated, provide pressure treated materials for furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers in accordance with Section 06 05 73.

## **2.03 PANEL MATERIALS AND APPLICATION**

- .1 Roof sheathing:
  - .1 Plywood, DFP or CSP sheathing grade, square edge, 13 mm thick.
- .2 Exterior wall sheathing:
  - .1 Plywood, DFP or CSP grade, square edge 13 mm thick.
  - .2 OSB, 11 mm thick.
- .3 Electrical equipment mounting boards:
  - .1 Plywood, DFP or CSP G1S grade, square edge 19 mm thick.
  - .2 Fire retardant treated in accordance with Section 06 05 73 - Wood Treatment.
- .4 Where indicated, provide pressure treated panel materials in accordance with Section 06 05 73.

## **2.04 ACCESSORIES**

- .1 General purpose adhesive: to CSA O112.9.
- .2 Nails, spikes and staples: to ASTM F 1667.
- .3 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.
- .4 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.
- .5 Joist hangers, connectors and fasteners: in accordance with accepted shop drawings, minimum 1 mm thick sheet steel, galvanized to minimum ZF001 coating designation
- .6 Nailing discs: flat caps, minimum 25 mm diameter, minimum 0.4 mm thick, sheet metal, fibre, formed to prevent dishing. Bell or cup shapes not acceptable.
- .7 Roof sheathing H-Clips: formed "H" shape, thickness to suit panel material, extruded 6063-T6 aluminum alloy type approved by Contract Administrator.
- .8 Fastener Finishes:
  - .1 Galvanizing: to ASTM A 123/A 123M, use galvanized fasteners for exterior work and interior highly humid areas.
  - .2 Plated finish: use cadmium plated fasteners for interior work.
- .9 Wood Preservative: as specified in Section 06 05 73 - Wood Treatment.
- .10 Sill Plate Gasket: Closed cell polyethylene foam gasket in width to match sill plate width, 6 mm thick.

# **PART 3 – EXECUTION**

## **3.01 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .2 Inform Contract Administrator of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied.

## **3.02 SYSTEMS INTEGRATION**

- .1 Install air barrier and vapour retarder sheeting around framing members to ensure continuity of protection and to lap and seal to main sheets.
- .2 Install insulation in exterior wall framing cavities that will not be accessible after completion of framing.
- .3 Install sill plate gasket in continuous lengths between concrete surfaces and wood framing.

## **3.03 FRAMING INSTALLATION**

- .1 Install engineered framing and plant fabricated structural wood components, including all hangers, connectors and fasteners, in accordance with accepted shop drawings and manufacturers' instructions.
- .2 Install members true to line, levels and elevations, square and plumb.

- .3 Construct continuous members from pieces of longest practical length.
- .4 Install spanning members with "crown-edge" up.
- .5 Select exposed framing for appearance. Install lumber and panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.
- .6 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .7 Countersink bolts where necessary to provide clearance for other work.
- .8 Install specified panel product for each application.
- .9 Install subflooring with panel end-joints located on solid bearing, staggered at least 800 mm.
  - .1 In addition to mechanical fasteners, floor panels secure floor subflooring to floor joists using glue. Place continuous adhesive bead in accordance with manufacturer's instructions, single-bead on each joist and double-bead on joists where panel ends butt.
- .10 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

#### **3.04 FURRING AND BLOCKING**

- .1 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding, electrical equipment mounting boards, and other work as required.
- .2 Install furring to support siding applied vertically where there is no blocking and where sheathing is not suitable for direct nailing.
  - .1 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .3 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .4 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized fasteners.
- .5 Install sleepers as indicated.

#### **3.05 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

#### **3.06 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by rough carpentry installation.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 ASTM International
  - .1 ASTM C 553, Standard Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.
  - .2 ASTM C 665, Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
  - .3 ASTM C 1320, Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.
- .2 CSA Group
  - .1 CSA B111, Wire Nails, Spikes and Staples.
  - .2 CSA B149 PACKAGE, Consists of B149.1, Natural Gas and Propane Installation Code and B149.2, Propane Storage and Handling Code.
- .3 Underwriters Laboratories of Canada (ULC)
  - .1 CAN/ULC-S604, Standard for Factory-Built Type A Chimneys.
  - .2 CAN/ULC-S702, Standard for Mineral Fibre Insulation for Buildings.

### **1.02 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

## **PART 2 - PRODUCTS**

### **2.01 INSULATION**

- .1 Batt and blanket glass fibre: to ASTM C 665, CAN/ULC-S702.
  - .1 Type: 1.
  - .2 Location: as indicated on drawings.
  - .3 Thickness: as indicated on drawings.
  - .4 Acceptable material: EcoTouch Pink Fibreglas by Owens Corning, Johns Manville, or approved equal.
- .2 Batt and blanket mineral fibre: to CAN/ULC-S702.
  - .1 Type: 1.
  - .2 Thickness: to insulating value as indicated.
  - .3 Acceptable material: ComfortBatt by Rockwool, or approved equal.

### **2.02 ACCESSORIES**

- .1 Insulation clips:
  - .1 Impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, adhesive back, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self locking type.
- .2 Nails: galvanized steel, length to suit insulation plus 25 mm, to CSA B111.
- .3 Staples: 12 mm minimum leg.
- .4 Tape: as recommended by manufacturer.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for blanket insulation application in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .2 Proceed with installation only after unacceptable conditions have been remedied.

### **3.02 INSULATION INSTALLATION**

- .1 Install insulation to maintain continuity of thermal protection to building elements and spaces.
- .2 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
- .3 Do not compress insulation to fit into spaces.
- .4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN/ULC-S604 Type A chimneys and CSA B149.1 and CSA B149.2 vents.

### **3.03 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 RELATED REQUIREMENTS**

- .1 Section 07 92 00 – Joint Sealants.

### **1.02 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-51.33, Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.
  - .2 CAN/CGSB-51.34, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.

### **1.03 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

## **PART 2 – PRODUCTS**

### **2.01 SHEET VAPOUR BARRIER**

- .1 Polyethylene film: to CAN/CGSB-51.34, 0.15 mm thick. **(6mil in walls)**
- .2 Polyethylene film: to CAN/CGSB-51.34, 0.25 mm thick. **(10mil under slab)**
- .3 Self-adhesive air/vapour barrier membrane composed of SBS modified bitumen.

### **2.02 ACCESSORIES**

- .1 Joint sealing tape: air resistant pressure sensitive adhesive tape, 50 mm wide for lap joints and perimeter seals, 25 mm wide elsewhere.
- .2 Sealant: compatible with vapour retarder materials, recommended by vapour retarder manufacturer.
- .3 Staples: minimum 6 mm leg.
- .4 Moulded box vapour barrier: factory-moulded polyethylene box for use with recessed electric switch and outlet device boxes.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for vapour retarder installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .2 Proceed with installation only after unacceptable conditions have been remedied.

### **3.02 INSTALLATION**

- .1 Ensure services are installed and inspected prior to installation of retarder.
- .2 Use sheets of largest practical size to minimize joints.
- .3 Inspect for continuity. Repair punctures and tears with sealing tape before work is concealed.

### **3.03 EXTERIOR SURFACE OPENINGS**

- .1 Cut sheet vapour retarder to form openings and ensure material is lapped and sealed to frame.

### **3.04 PERIMETER SEALS**

- .1 Seal perimeter of sheet vapour barrier as follows:
  - .1 Apply continuous bead of sealant to substrate at perimeter of sheets.
  - .2 Lap sheet over sealant and press into sealant bead.
  - .3 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

### **3.05 LAP JOINT SEALS**

- .1 Seal lap joints of sheet vapour barrier as follows:
  - .1 Attach first sheet to substrate.
  - .2 Lap adjoining sheet minimum 150 mm and press into sealant bead.
  - .3 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

### **3.06 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
  - .1 Remove insulation material spilled during installation and leave work area ready for application of wall board.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 RELATED REQUIREMENTS**

- .1 Section 07 92 00 - Joint Sealants.

### **1.02 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-19.13M, Sealing Compound, One Component, Elastomeric Chemical Curing.
  - .2 CAN/CGSB-19.24M, Multi-Component, Chemical Curing Sealing Compound.
  - .3 CGSB 19-GP-14M, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.
- .2 Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification.

### **1.03 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .3 Avoid spillage: immediately notify Contract Administrator if spillage occurs and start clean up procedures.
- .4 Clean spills and leave area as it was prior to spill.

### **1.04 WASTE MANAGEMENT AND DISPOSAL**

- .1 Place materials defined as hazardous or toxic waste in designated containers.

### **1.05 AMBIENT CONDITIONS**

- .1 Install solvent curing sealants and vapour release adhesive materials in open spaces with ventilation.
- .2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.
- .3 Maintain temperature and humidity recommended by materials manufactures before, during and after installation.

### **1.06 SEQUENCING**

- .1 Sequence work in accordance with Section 01 32 16 - Construction Progress Schedules - Bar (GANTT) Charts.
- .2 Sequence work to permit installation of materials in conjunction with related materials and seals.

## **PART 2 - PRODUCTS**

### **2.01 SHEET MATERIALS**

- .1 Sheet Seal: self-adhesive bitumen laminated to high-density polyethylene film, nominal total thickness of 1.0 mm.
- .2 Sheet Seal: non-woven spunbonded polyolefin sheet.

### **2.02 SEALANTS**

- .1 Sealants in accordance with Section 07 92 00 - Joint Sealants.
- .2 Joint sealing tape: air resistant pressure sensitive adhesive tape, as recommended by air barrier manufacturer, 50mm wide for lap joints and perimeter seals.

### **2.03 ADHESIVES**

- .1 Mastic Adhesive: compatible with sheet seal and substrate, thick mastic of uniform consistency.
- .2 Adhesive: compatible with sheet seal and substrate, permanently non-curing.

## **PART 3 – EXECUTION**

### **3.01 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

### **3.02 GENERAL**

- .1 Perform Work in accordance with Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification requirements for materials and installation.
- .2 Perform Work in accordance with National Air Barrier Association - Professional Contractor Quality Assurance Program and requirements for materials and installation.

### **3.03 EXAMINATION**

- .1 Verify that surfaces and conditions are ready to accept work of this section.
- .2 Ensure surfaces are clean, dry, sound, smooth, continuous and comply with air barrier manufacturer's requirements.
- .3 Do not start work until deficiencies have been corrected.
  - .1 Beginning of Work implies acceptance of conditions.

### **3.04 PREPARATION**

- .1 Remove loose or foreign matter, which might impair adhesion of materials.
- .2 Ensure substrates are clean of oil or excess dust; masonry joints struck flush, and open joints filled; and concrete surfaces free of large voids, spalled areas or sharp protrusions.
- .3 Ensure substrates are free of surface moisture prior to application of self-adhesive membrane and primer.
- .4 Ensure metal closures are free of sharp edges and burrs.
- .5 Prime substrate surfaces to receive adhesive and sealants in accordance with manufacturer's instructions.

### **3.05 INSTALLATION**

- .1 Install materials in accordance with manufacturer's instructions.
- .2 Install sheet seal between window frames, door frames and adjacent wall seal materials as shown on drawings.
  - .1 Position lap seal over firm bearing.
- .3 Apply sealant within recommended application temperature ranges.
  - .1 Consult manufacturer when sealant cannot be applied within these temperature ranges.

### **3.06 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

### **3.07 PROTECTION OF WORK**

- .1 Protect finished work in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Do not permit adjacent work to damage work of this section.
- .3 Ensure finished work is protected from climatic conditions.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 RELATED REQUIREMENTS**

- .1 Section 07 62 00 Sheet Metal Flashing and Trim.

### **1.02 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 American Society of Mechanical Engineers (ASME)
  - .1 ASME B18.6.3, Machine Screws, Tapping Screws, and Metallic Drive Screws (Inch Series).
- .2 ASTM International
  - .1 ASTM A 653/A 653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .2 ASTM D 2369-10, Test Method for Volatile Content of Coatings.
  - .3 ASTM D 2832, Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
  - .4 ASTM D 5116, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
- CSA Group
- .5 CSA B111, Wire Nails, Spikes and Staples.
- .3 Underwriters Laboratories (UL)
  - .1 UL 2761 Sealants and Caulking Compounds.

### **1.03 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for metal siding and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Indicate VOC's for caulking materials during application and curing.

### **1.04 CLOSEOUT SUBMITTALS**

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for installed products for incorporation into manual.
- .3 Warranty Documentation: submit warranty documents specified.

### **1.05 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect metal building panels, hardware and accessories from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

### **1.06 WARRANTY**

- .1 Manufacturer's warranty: Submit, for Contract Administrator acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty in addition to and not limit other rights the City may have under Contract Documents.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- .1 Wall Cladding: to CAN/CGSB-93.2
  - .1 Thickness: 0.61mm
  - .2 Pattern: plain surface
  - .3 Profile: 12-14mm corrugated.
  - .4 Finish coating: factory precoated.
  - .5 Colour: Galvalume Plus AZ180 finish.
- .2 Fasteners: as per manufacturer's recommendations, complete with neoprene washer.
- .3 Sealants: in accordance with Section 07 92 00 - Joint Sealants.

### **2.02 ACCESSORIES**

- .1 Exposed trim: inside corners, outside corners, cap strip, drip cap, undersill trim, starter strip and trim of same material, colour and gloss as cladding, with fastener holes pre-punched.
- .2 Exposed trims to have 50mm exposed trim face.
- .3 Non-exposed accessories: as per manufacturer's recommendations.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts acceptable in accordance with manufacturer's written instructions.
  - .1 Proceed with installation only after unacceptable conditions have been remedied.

### **3.02 PREPARATION**

- .1 Clean surfaces thoroughly prior to installation.
- .2 Repair substrate flaws or defects before applying siding or soffits.
- .3 Fur surfaces to even plane and free from obstructions.
- .4 Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under project conditions.

### **3.03 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, and data sheets.

### **3.04 INSTALLATION**

- .1 Install steel siding in accordance with manufacturer's written instructions.
- .2 Install one layer of exterior wall sheathing paper horizontally by stapling lapping edges 150 mm.
- .3 Install continuous starter strips, inside and outside corners, edgings, soffit, drip, cap, sill and window/door opening flashings.
- .4 Install outside corners, fillers and closure strips with carefully formed and profiled work.
- .5 Install soffit and fascia cladding as indicated.
- .6 Maintain joints in exterior cladding, true to line, tight fitting, hairline joints.
- .7 Attach components in manner not restricting thermal movement.
- .8 Caulk junctions with adjoining work with sealant. Do work in accordance with Section 07 92 00 - Joint Sealants.

### **3.05 CLEANING**

- .1 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

### **3.06 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by preformed metal siding installation.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 ASTM International
  - .1 ASTM A 606/A 606M, Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.
  - .2 ASTM A 653/A 653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .3 ASTM A 755/A 755M Standard Specification for Steel Sheet, Metallic coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
  - .4 ASTM A 792/A 792M, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
- .2 Canadian Roofing Contractors Association (CRCA)
  - .1 Roofing Specifications Manual.
- .3 Canadian Sheet Steel Building Institute (CSSBI)
  - .1 CSSBI S8-2008 Quality and Performance Specification for Prefinished Sheet Steel Used for Building Products.
  - .2 CSSBI B17-2002 Barrier Series Prefinished Steel Sheet: Product Performance & Applications.
  - .3 CSSBI Sheet Steel Facts #12 Fastener Guide for Sheet Steel Building Products.
- .4 Sheet Metal and Air Conditioning Contractors Association of North America (SMACNA)
  - .1 Architectural Sheet Metal Manual

### **1.02 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Handle and store flashing materials to prevent creasing, buckling, scratching, or other damage.

## **PART 2 – PRODUCTS**

### **2.01 BASE SHEET METAL MATERIALS**

- .1 Provide sheet metal in base metal thickness specified. Where no thickness specified, provide base sheet metal in thickness recommended in SMACNA Architectural Sheet Metal Manual for type of item being fabricated, but not less than the thickness required by the authority having jurisdiction.
- .2 Minimum flashing thickness to be 26 gauge.

### **2.02 PREFINISHED STEEL SHEET**

- .1 Prefinished steel sheet with coating system consisting of base metal pre-treatment, primer, silicone modified polyester or polyester topcoat meeting requirements of CSSBI S8.
  - .1 Finished one side with wash coat and primer on back.
  - .2 Colour selected by Contract Administration from manufacturer's standard range.
  - .3 Exposed coating thickness: dry film coating system thickness not less than 22 micrometres.

### **2.03 ACCESSORIES**

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Pourable sealer: proprietary two-part polyurethane pourable sealer designed for sealing penetration pockets.
- .3 Loose laid underlay for metal flashing: dry sheathing to CAN/CGSB-51.32.
- .4 Self-adhesive membrane underlay and tie-in membrane for metal flashings: To CSA A123.22 or ASTM D 1970, minimum 3mm thickness.
- .5 Sealants: in accordance with Section 07 92 00, in colour to match flashing finish colour.
- .6 Cleats and hook strips: of same material, and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.
- .7 Screws: of same material as sheet metal, Suitable for substrate and material being fastened, galvanized head, neoprene washer.
- .8 Touch-up paint: as recommended by prefinished material manufacturer.

#### **2.04 FABRICATION**

- .1 Fabricate sheet steel flashings and other sheet steel work in accordance with applicable CRCA 'FL' series details and as indicated.
- .2 Form pieces in 2400 mm maximum lengths.
  - .1 Make allowance for expansion at joints.
- .3 Hem exposed edges on underside 12 mm.
  - .1 Mitre and seal corners with sealant.
- .4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .5 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

#### **2.05 METAL FLASHINGS AND TRIMS**

- .1 Form flashings, copings and fascias to profiles indicated of prefinished steel.
- .2 All exterior flashings and trims are to match adjacent metal panel finish.

#### **2.06 PANS**

- .1 Form pans to receive roofing plastic from galvanized steel of same thickness as roof cladding with minimum 75 mm upstand above finished roof and 100 mm continuous flanges with no open corners.
  - .1 Solder joints.
  - .2 Make pans minimum 50 mm wider than member passing through roof membrane.

### **PART 3 – EXECUTION**

#### **3.01 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

#### **3.02 INSTALLATION**

- .1 Use concealed fastenings except where approved before installation.
- .2 Provide underlay under sheet metal.
  - .1 Secure in place and lap joints 100 mm.
  - .2 Provide self-adhesive membrane to tie into adjacent assemblies.
- .3 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs.
  - .1 Flash joints using S-lock forming tight fit over hook strips.
- .4 Lock end joints and caulk with sealant.
- .5 Install pans, where shown and around items projecting through roof membrane.
- .6 Where flashing installed with mechanical fasteners, install fasteners in slots or oversize holes to allow expansion and contraction of flashings.

#### **3.03 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Leave work areas clean, free from grease, finger marks and stains.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .2 National Research Council Canada (NRC)
  - .1 National Building Code of Canada (NBC).
- .3 Underwriter's Laboratories of Canada (ULC)
  - .1 ULC-S115, Fire Tests of Fire stop Systems.

### **1.02 DEFINITIONS**

- .1 Fire Stop Material: device intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cable trays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.
- .2 Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.
- .3 Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on site fire stop system.
- .4 Tightly Fitted; (ref: NBC Part 3.1.9.1(1) and 9.10.9.6(1)): penetrating items that are cast in place in buildings of noncombustible construction or have "0" annular space in buildings of combustible construction.
  - .1 Words "tightly fitted" should ensure that integrity of fire separation is such that it prevents passage of smoke and hot gases to unexposed side of fire separation.

### **1.03 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit shop drawings (commonly referred to as ULC Design Sheets) to show location, proposed material, reinforcement, anchorage, fastenings and method of installation.
  - .2 Construction details should accurately reflect actual job conditions.

### **1.04 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Installer: company specializing in fire stopping installations with 5 years experience.

### **1.05 DELIVERY, STORAGE AND HANDLING**

- .1 Packing, shipping, handling and unloading:
  - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
  - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
  - .3 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate ULC markings.
- .2 Storage and Protection:
  - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- .1 Fire stopping and smoke seal systems: in accordance with CAN-ULC-S115.
  - .1 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of CAN-ULC-S115 and not to exceed opening sizes for which they are intended.
  - .2 Fire stop system rating: to match wall for floor assembly requirements.
- .2 Service penetration assemblies: systems tested to CAN-ULC-S115.
- .3 Service penetration fire stop components: certified by test laboratory to CAN-ULC-S115.
- .4 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.
- .5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.
- .6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.
- .7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- .9 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.
- .10 Sealants for vertical joints: non-sagging.

## **PART 3 – EXECUTION**

### **3.01 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

### **3.02 PREPARATION**

- .1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials.
  - .1 Ensure that substrates and surfaces are clean, dry and frost free.
- .2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.
- .3 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.
- .4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

### **3.03 INSTALLATION**

- .1 Install fire stopping and smoke seal material and components in accordance with manufacturer's certified tested system listing.
- .2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.
- .3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
- .4 Tool or trowel exposed surfaces to neat finish.
- .5 Remove excess compound promptly as work progresses and upon completion.

### **3.04 SEQUENCES OF OPERATION**

- .1 Proceed with installation only when submittals have been reviewed by Contract Administrator.
- .2 Install floor fire stopping before interior partition erections.
- .3 Metal deck bonding: fire stopping to precede spray applied fireproofing to ensure required bonding.
- .4 Mechanical pipe insulation: certified fire stop system component.
  - .1 Ensure pipe insulation installation precedes fire stopping.

### **3.05 FIELD QUALITY CONTROL**

- .1 Inspections: notify Contract Administrator when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.

### **3.06 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Remove temporary dams after initial set of fire stopping and smoke seal materials.

### **3.07 SCHEDULE**

- .1 Fire stop and smoke seal at:
  - .1 Penetrations through fire-resistance rated gypsum board partitions and walls.
  - .2 Top of fire-resistance rated gypsum board partitions.
  - .3 Intersection of fire-resistance rated gypsum board partitions.
  - .4 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
  - .5 Around mechanical and electrical assemblies penetrating fire separations.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 Canadian General Standards Board (CGSB)
  - .1 CGSB 19-GP-5M, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
  - .2 CAN/CGSB-19.13, Sealing Compound, One-component, Elastomeric, Chemical Curing.
  - .3 CGSB 19-GP-14M, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
  - .4 CAN/CGSB-19.17, One-Component Acrylic Emulsion Base Sealing Compound.
  - .5 CAN/CGSB-19.24, Multi-component, Chemical Curing Sealing Compound.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).

### **1.02 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Manufacturer's product to describe:
    - .1 Caulking compound.
    - .2 Primers.
    - .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
- .3 Manufacturer's Instructions:
  - .1 Submit instructions to include installation instructions for each product used.

### **1.03 CLOSEOUT SUBMITTALS**

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.

### **1.04 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

### **1.05 SITE CONDITIONS**

- .1 Ambient Conditions:
  - .1 Proceed with installation of joint sealants only when:
    - .1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.
    - .2 Joint substrates are dry.
    - .3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
- .2 Joint-Width Conditions:
  - .1 Proceed with installation of joint sealants only where joint widths are more than those allowed by joint sealant manufacturer for applications indicated.
- .3 Joint-Substrate Conditions:
  - .1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.

## **PART 2 – PRODUCTS**

### **2.01 SEALANT MATERIALS**

- .1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.
- .2 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.
- .3 Where sealants are qualified with primers use only these primers.

### **2.02 SEALANT MATERIAL DESIGNATIONS**

- .1 Urethanes two part:
  - .1 Self-levelling: to CAN/CGSB-19.24, Type 1, Class B, colour as selected.
  - .2 Acceptable material: Tremco THC 900, Vulkem 245 or approved equal.
- .2 Urethanes two part:
  - .1 Non-sag: to CAN/CGSB-19.24, Type 2, Class B, colour as selected.
  - .2 Acceptable material: Tremco Dymeric 240, Vulkem 227 or approved equal.
- .3 Urethanes one part:
  - .1 Self-levelling: to CAN/CGSB-19.13, Type 1, colour as selected.
  - .2 Acceptable material: Vulkem 45.
- .4 Urethanes one part:
  - .1 Non-sag: to CAN/CGSB-19.13, Type 2, colour as selected.
  - .2 Acceptable material: Tremco Dymonic, Vulkem 116, Vulkem 431.
- .5 Silicones one part: to CAN/CGSB-19.13
  - .1 To CAN/CGSB-19.13.
    - .1 Acceptable material: Tremco Spectrum 2 or 3, GE Silpruf 2000 or approved equal.
    - .2 To CAN/CGSB-19.22(Mildew Resistant).
      - .1 Acceptable material: Tremco Tremsil 200, GE SCS 1700 Sanitary or approved equal.
- .6 Acrylics one part: to CGSB 19-GP-5M.
  - .1 Acceptable material: Tremco 555 or approved equal.
- .7 Acrylic latex one part: to CAN/CGSB-19.17.
  - .1 Acceptable material: Tremflex 834 or approved equal.
- .8 Acoustical sealant: to ASTM C 919.
  - .1 Acceptable material: Tremco Acoustic Sealant, QuietSeal Pro or approved equal.
- .9 Butyl: to CGSB 19-GP-14M.
  - .1 Acceptable material: Tremco Butyl or approved equal.
- .10 Preformed compressible and non-compressible back-up materials:
  - .1 Polyethylene, urethane, neoprene or vinyl foam:
    - .1 Extruded closed cell foam backer rod.
    - .2 Size: oversize 30 to 50%.
  - .2 Neoprene or butyl rubber:
    - .1 Round solid rod, Shore A hardness 70.
  - .3 High density foam:
    - .1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m<sup>3</sup> density, or neoprene foam backer, size as recommended by manufacturer.
  - .4 Bond breaker tape:
    - .1 Polyethylene bond breaker tape which will not bond to sealant.

### **2.03 SEALANT SELECTION**

- .1 Perimeters of exterior openings where frames meet exterior facade of building (i.e. brick, block, precast masonry): sealant type: 2.02.4.
- .2 Exterior joints in horizontal wearing surfaces (as itemized): sealant type: 2.02.4.
- .3 Seal interior perimeters of exterior openings: sealant type: 2.02.7.
- .4 Perimeters of interior frames, as detailed and itemized: sealant type: 2.02.4.
- .5 Perimeter of washroom fixtures (e.g. sinks, urinals, water closets, basins, vanities): sealant type: 2.02.5.2.
- .6 Exposed interior control joints in drywall: sealant type: 2.02.4.

## **2.04 JOINT CLEANER**

- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's written recommendations.
- .2 Primer: in accordance with sealant manufacturer's written recommendations.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for joint sealants installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .2 Proceed with installation only after unacceptable conditions have been remedied.

### **3.02 SURFACE PREPARATION**

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter, which may impair Work.
- .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .4 Ensure joint surfaces are dry and frost free.
- .5 Prepare surfaces in accordance with manufacturer's directions.

### **3.03 PRIMING**

- .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

### **3.04 BACKUP MATERIAL**

- .1 Apply bond breaker tape where required to manufacturer's instructions.
- .2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

### **3.05 MIXING**

- .1 Mix materials in strict accordance with sealant manufacturer's instructions.

### **3.06 APPLICATION**

- .1 Sealant:
  - .1 Apply sealant in accordance with manufacturer's written instructions.
  - .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
  - .3 Apply sealant in continuous beads.
  - .4 Apply sealant using gun with proper size nozzle.
  - .5 Use sufficient pressure to fill voids and joints solid.
  - .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
  - .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
  - .8 Remove excess compound promptly as work progresses and upon completion.
- .2 Curing:
  - .1 Cure sealants in accordance with sealant manufacturer's instructions.
  - .2 Do not cover up sealants until proper curing has taken place.

### **3.07 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
  - .2 Clean adjacent surfaces immediately.
  - .3 Remove excess and droppings, using recommended cleaners as work progresses.

- .4 Remove masking tape after initial set of sealant.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

**3.08 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by joint sealants installation.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 RELATED REQUIREMENTS**

- .1 Section 07 92 10 - Joint Sealing.
- .2 Section 08 71 10 - Door Hardware.
- .3 Section 09 91 23 - Interior Painting.
- .4 Section 09 91 13 - Exterior Painting.

### **1.02 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM A 653/A 653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.181, Ready-Mixed Organic Zinc-Rich Coating.
  - .2 CGSB 41-GP-19Ma, Rigid Vinyl Extrusions for Windows and Doors.
- .3 Canadian Standards Association (CSA International)
  - .1 CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2 CSA W59, Welded Steel Construction (Metal Arc Welding).
- .4 Canadian Steel Door Manufacturers' Association (CSDMA)
  - .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames.
  - .2 CSDMA, Selection and Usage Guide for Commercial Steel Doors.
- .5 National Fire Protection Association (NFPA)
  - .1 NFPA 80, Standard for Fire Doors and Fire Windows.
  - .2 NFPA 252, Standard Methods of Fire Tests of Door Assemblies.
- .6 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
  - .2 CAN/ULC-S702, Standard for Thermal Insulation, Mineral Fibre, for Buildings.
  - .3 CAN/ULC-S704, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
  - .4 CAN4-S104, Standard Method for Fire Tests of Door Assemblies.
  - .5 CAN4-S105, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

### **1.03 SYSTEM DESCRIPTION**

- .1 Design Requirements:
  - .1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35 degrees C to 35 degrees C.
  - .2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.
  - .3 Steel fire rated doors and frames: labeled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 for ratings specified or indicated.
  - .4 Provide fire labeled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104 and listed by nationally recognized agency having factory inspection services.

### **1.04 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide shop drawings: in accordance with Section 01 33 00 - Submittal Procedures.
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
  - .2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazing, arrangement of hardware, fire rating and finishes.
  - .3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings, fire rating and finishes.

- .4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
- .5 Submit test and engineering data, and installation instructions.

### **1.05 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- .1 Hot dipped galvanized steel sheet: to ASTM A 653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.
- .2 Reinforcement: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A 653M, ZF75.
- .3 Composites: balance of core materials used in conjunction with lead: in accordance with manufacturers' proprietary design.

### **2.02 DOOR CORE MATERIALS**

- .1 Honeycomb construction:
  - .1 Structural small cell, 24.5 mm maximum kraft paper 'honeycomb', weight: 36.3 kg per ream minimum, density: 16.5 kg/m<sup>3</sup> minimum sanded to required thickness.
- .2 Stiffened: face sheets honeycomb or insulated core as indicated.
  - .1 Expanded polystyrene: CAN/ULC-S701, density 16 to 32 kg/m<sup>3</sup>.
- .3 Temperature rise rated (TRR): core composition to limit temperature rise on unexposed side of door to 250 degrees C at 60 minutes. Core to be tested as part of a complete door assembly, in accordance with CAN4-S104, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency having factory inspection service.

### **2.03 ADHESIVES**

- .1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.
- .2 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.
- .3 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

### **2.04 PRIMER**

- .1 Touch-up prime CAN/CGSB-1.181.
  - .1 Maximum VOC limit 50 g/L to GC-03.

### **2.05 PAINT**

- .1 Field paint steel doors and frames in accordance with Sections 09 91 23 - Interior Painting, and 09 91 13 - Exterior Painting. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.
- .2 Confirm colour of interior and exterior faces, as they may be different colours.

### **2.06 ACCESSORIES**

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Exterior and interior top and bottom caps: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.
- .3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .4 Door bottom seal: as per Section 08 71 10 - Door Hardware - General.
- .5 Metallic paste filler: to manufacturer's standard.

- .6 Fire labels: metal riveted or stamped.
- .7 Sealant: as per Section 07 92 10 - Joint Sealing.
- .8 Glazing: as per Section 08 80 50 - Glazing.
- .9 Make provisions for glazing as indicated and provide necessary glazing stops.
  - .1 Provide removable stainless steel glazing beads for use with glazing tapes and compounds and secured with countersunk stainless steel screws.
  - .2 Design exterior glazing stops to be tamperproof.

## **2.07 FRAMES FABRICATION GENERAL**

- .1 Fabricate frames in accordance with CSDMA specifications.
- .2 Fabricate frames to profiles and maximum face sizes as indicated.
- .3 Exterior frames: 1.6 mm welded and thermally broken type construction.
- .4 Interior frames: 1.6 mm welded type construction.
- .5 Blank, reinforce, drill and tap frames for mortised, templated hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
- .6 Protect mortised cutouts with steel guard boxes.
- .7 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
- .8 Manufacturer's nameplates on frames and screens are not permitted.
- .9 Conceal fastenings except where exposed fastenings are indicated.
- .10 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .11 Insulate exterior frame components with polyurethane insulation.

## **2.08 FRAME ANCHORAGE**

- .1 Provide appropriate anchorage to floor and wall construction.
- .2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
- .3 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.
- .4 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm on centre maximum.

## **2.09 FRAMES: WELDED TYPE**

- .1 Welding in accordance with CSA W59.
- .2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.
- .3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.
- .4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.
- .5 Securely attach floor anchors to inside of each jamb profile.
- .6 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.
- .7 Securely attach lead to inside of frame profile from return to jamb soffit (inclusive) on door side of frame only.

## **2.10 DOOR FABRICATION GENERAL**

- .1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.
- .2 Exterior doors: insulated construction. Interior doors: hollow steel construction.
- .3 Fabricate doors with longitudinal edges locked seam. Seams: visible.
- .4 Blank, reinforce, drill doors and tap for mortised, templated hardware and electronic hardware.
- .5 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .6 Reinforce doors where required, for surface mounted hardware. Provide flush PVC top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.
- .7 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .8 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in conformance with CAN4-S104 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

- .9 Manufacturer's nameplates on doors are not permitted.

## **2.12 HOLLOW STEEL CONSTRUCTION**

- .1 Form face sheets for exterior doors from 1.6 mm sheet steel.
- .2 Reinforce doors with vertical stiffeners, securely fastened to face sheets at 150 mm on centre maximum.
- .3 Fill voids between stiffeners of exterior doors with polystyrene core.

## **PART 3 – EXECUTION**

### **3.01 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

### **3.02 INSTALLATION GENERAL**

- .1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.
- .2 Install doors and frames to CSDMA Installation Guide.

### **3.03 FRAME INSTALLATION**

- .1 Set frames plumb, square, level and at correct elevation.
- .2 Secure anchorages and connections to adjacent construction.
- .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 Caulk perimeter of frames between frame and adjacent material.
- .6 Maintain continuity of air barrier and vapour retarder.

### **3.04 DOOR INSTALLATION**

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 - Door Hardware.
- .2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
  - .1 Hinge side: 1.0 mm.
  - .2 Latchside and head: 1.5 mm.
  - .3 Finished floor, and thresholds: 13 mm.
- .3 Adjust operable parts for correct function.
- .4 Install louvres.

### **3.05 FINISH REPAIRS**

- .1 Touch up with primer finishes damaged during installation.
- .2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

### **3.06 GLAZING**

- .1 Install glazing for doors and frames in accordance with Section 08 80 50 - Glazing.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for access door components and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
  - .2 Submit catalogue details for each type of door illustrating profiles, dimensions and methods of assembly.

### **1.02 CLOSEOUT SUBMITTALS**

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for cleaning and maintenance of finishes for incorporation into manual.

### **1.03 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Apply temporary protective coating to finished surfaces. Remove coating after installation.
    - .1 Use coatings in accordance with manufacturer's written instructions that are easily removable.
    - .2 Leave protective coating in place until final cleaning of building.

## **PART 2 – PRODUCTS**

### **2.01 ACCESS DOORS**

- .1 Sizes: as follows unless indicated:
  - .1 For body entry: 600 x 600 mm minimum.
  - .2 For hand entry: 300 x 300 mm minimum.
  - .3 For attic access: ceiling mounted 550 x 900 mm minimum.
    - .1 Construction: 20 gauge door, 16 gauge mounting frame complete with 25mm mounting flange; concealed hinge; self latching; inside latch release; 50mm thick insulation; steel finish.
  - .4 For attic access: wall mounted 550 x 900 mm minimum – 90 minute fire resistance rating.
    - .1 Construction: 20 gauge door, 16 gauge mounting frame complete with 25mm mounting flange; concealed hinge; self latching; inside latch release; steel finish.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for access door installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .2 Proceed with installation only after unacceptable conditions have been remedied.

### **3.02 INSTALLATION**

- .1 Installation: locate access doors within view of equipment and ensure equipment is accessible for

operating, inspecting, adjusting, servicing without using special tools.

- .1 Install gypsum board surfaces: in accordance with Section 09 21 16 - Gypsum Board Assemblies.

### **3.03 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

### **3.04 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by access door installation.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 Aluminum Association (AA)
  - .1 AA DAF 45, Designation System for Aluminum Finishes.
- .2 ASTM International
  - .1 ASTM A 1008/A 1008M, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
  - .2 ASTM D 523, Standard Test Method for Specular Gloss.
  - .3 ASTM D 822, Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.105, Quick-Drying Primer.
  - .2 CAN/CGSB-1.213, Etch Primer (Pretreatment Coating or Tie Coat) for Steel and Aluminum.
  - .3 CAN/CGSB-1.181, Ready-Mixed, Organic Zinc-Rich Coatings.
- .4 CSA International
  - .1 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.

### **1.02 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for [folding doors and hardware] and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
  - .2 Indicate panel construction, hinging arrangement, track and trolley assembly hardware and required clearances.
- .4 Certificates:
  - .1 Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .5 Test Reports:
  - .1 Certified test reports showing compliance with specified performance characteristics and physical properties.

### **1.03 CLOSEOUT SUBMITTALS**

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for sectional metal doors for incorporation into manual.

### **1.04 MAINTENANCE MATERIAL SUBMITTALS**

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Spare parts:
  - .1 Supply spare parts for sectional metal doors as follows:
    - .1 Door rollers: 4.
    - .2 Weatherstripping: 1 set
  - .2 Store where directed. Identify each part and reference to appropriate door.

### **1.05 QUALITY ASSURANCE**

- .1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

### **1.06 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

## **PART 2 – PRODUCTS**

### **2.01 DESIGN CRITERIA**

- .1 Design exterior door assembly to withstand wind load of 1 kPa with a maximum horizontal deflection of 1/240 of opening width.
- .2 Design door panel assemblies with thermal insulation factor 4.47 RSI.
- .3 Design door assembly to withstand minimum 100 000 cycles per annum, and 10 years total life cycle.
- .4 Standard of Acceptance: Richards-Wilcox Thermatite T200C or approved equal.

### **2.02 DOOR SECTIONS**

- .1 Door Height: 2 440 (8'-0") clear. Oversize door where required to accommodate drawing details.
- .2 Door Width: 2 440 (8'-0") clear. Oversize door where required to accommodate drawing details.
- .3 Steel skins with polyurethane core sandwich type construction, interior and exterior skins separated by continuous thermal break and shall feature WeatherLoc™ tongue-and-groove joint for weather-tight seal between sections. Sections shall have a minimum thermal insulating value of RSI 3.22 (R 18.28).
- .4 Exterior Skin: Structural quality hot-dipped galvanized steel, 0.36 mm (0.014") minimum, factory applied baked on polyester paint finish, shall have stucco texture and Multi-Ribbed profile.
- .5 Interior Skin: Structural quality hot-dipped galvanized steel, 0.33 mm (0.013") minimum, baked-on acrylic paint finish, non-repeating random stucco texture and rib pattern.
- .6 Ends of each door section shall be capped with 1.6 mm (0.0625") hot dipped galvanized steel full height end caps.
- .7 Insulation: Cavity shall be filled on continuous process, formed-in-place, CFC and HCFC free rigid polyurethane core, interior and exterior skins shall feature thermal break.
- .8 Reinforcements: Provide 0.9 mm (0.039") minimum, continuous reinforcing strip, within core of door sections, for all hardware, accessories and mounting locations. Reinforcing strip must be of adequate width to enable the attachment of all fasteners and screws to penetrate both door interior skin and reinforcing strip. Fasteners or screws etc., secured only to the door skin will not be acceptable.
- .9 Weather-stripping: Doors shall be equipped with a heavy duty, factory installed continuous top seal to seal against header, continuous replaceable seals between sections and vinyl bulb shaped astragal on the bottom edge of the bottom section. Dual Durometer vinyl jamb weather seal bolted to the continuous adjustable mounting angle (ADCA) for easy replacement.
- .10 Door Finish: Interior finish shall be standard white.
- .11 Door Finish: Exterior finish shall be from manufacturers standard Almond, Black, Bronze, Brown, Café, Desert Tan, Slate Grey, Sandstone.
- .12 Trusses: If required, provide adequate number of galvanized steel linear type reinforcing trusses to meet the wind loading.

### **2.03 HARDWARE**

- .1 Standard of Acceptance: Low Headroom Track System. Doors shall be equipped with double end roller brackets and long stem rollers.
- .2 Finish: Door tracks and track mounting hardware and torsion assembly mounting brackets shall

- be hot-dip galvanized.
- .3 Track: 2.7 mm (12ga), thick commercial galvanized track, formed track 80 mm (3 1/8") overall outside dimension. Vertical track sloped for weather tight closing.
- .4 Track Angle: Continuous adjustable track angle (ADCA), bolted type, field adjustable to ensure weather tight seal and serviceability, fabricated from 2.4 mm (13ga) commercially galvanized steel, designed to provide continuous support to the vertical track. Combination angle and clip mounting not acceptable.
- .5 Hinges: Linear type, fabricated from 2.75 mm (12ga) thick galvanized steel with embossments designed to resist higher load and to provide greater stability and improved performance. Doors width 18'-0" clear and over shall have double end hinges featuring full width bushing for both the hinge pivot and roller carries to allow for ease installation and eliminating any possibility of misalignment of the hinges.
- .6 Track Hangers: Minimum 32 x 32 mm (1 1/4" x 1 1/4") steel angles roll formed from 2.0 mm (0.078") commercially galvanized steel.
- .7 Weather-stripping: Doors shall be equipped with a heavy duty, factory installed continuous top seal to seal against header, continuous low temperature astragal retained in an aluminum retainer on the bottom edge of the door. Dual Durometer vinyl jamb weather seal bolted to the continuous adjustable mounting angle (ADCA) for easy replacement, as supplied by Richards-Wilcox Canada.
- .8 Rollers: Steel rollers 73 mm (2 7/8") diameter, with ten (10), 8 mm (5/16") diameter ball bearings, 11 mm (7/16") diameter roller axles and both inner and outer ball races of hardened steel. Length of roller stem as required.
- .9 Roller Brackets: Fabricated from 2.7 mm (12 ga) galvanized steel.
- .10 Shaft and Counter Balance Springs: Helically wound torsion springs manufactured from oil tempered spring wire stress relieved, minimum 10,000 cycles. Aluminum die cast grooved drums and flexible galvanized aircraft cables, 7 x 19 construction, mounted on minimum 25 mm (1") CRS solid steel shaft, keyed full length, rolling on flange bearings.
- .11 Bumper springs to be installed at the end of each horizontal track to prevent door over travel.
- .12 Track Guards: Continuous 4.7 mm, thick x 1524 mm, high (3/16" x 5'-0") chamfered at top at 45 degrees, painted safety yellow finish.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for sectional metal doors installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .2 Proceed with installation only after unacceptable conditions have been remedied.

### **3.02 INSTALLATION**

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Install doors and hardware in accordance with manufacturer's instructions.
- .3 Rigidly support rail and operator and secure to supporting structure.
- .4 Touch-up steel doors with primer where galvanized finish damaged during fabrication.
- .5 Install operator including electrical motors, controller units, pushbutton stations, relays and other electrical equipment required for door operation.
- .6 Lubricate and adjust door operating components to ensure smooth opening and closing of doors.
- .7 Adjust weatherstripping to form a weather tight seal.
- .8 Adjust doors for smooth operation.

### **3.03 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

- .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
  - .1 Remove traces of primer; clean doors and frames.
  - .2 Clean glass and glazing materials with approved non-abrasive cleaner.

**3.04 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by sectional metal door installation.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 RELATED REQUIREMENTS**

- .1 Section 08 11 00 – Metal Doors and Frames.
- .2 Section 26 27 26 – Wiring Device.

### **1.02 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)
  - .1 ANSI/BHMA A156.1, American National Standard for Butts and Hinges.
  - .2 ANSI/BHMA A156.2, Bored and Preassembled Locks and Latches.
  - .3 ANSI/BHMA A156.3, Exit Devices.
  - .4 ANSI/BHMA A156.4, Door Controls - Closers.
  - .5 ANSI/BHMA A156.5, Auxiliary Locks and Associated Products.
  - .6 ANSI/BHMA A156.6, Architectural Door Trim.
  - .7 ANSI/BHMA A156.8, Door Controls - Overhead Stops and Holders.
  - .8 ANSI/BHMA A156.10, Power Operated Pedestrian Doors.
  - .9 ANSI/BHMA A156.12, Interconnected Locks and Latches.
  - .10 ANSI/BHMA A156.16, Auxiliary Hardware.
  - .11 ANSI/BHMA A156.18, Materials and Finishes.
- .2 Canadian Steel Door and Frame Manufacturers' Association (CSDMA)
  - .1 CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames.

### **1.03 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for door hardware and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Hardware List:
  - .1 Submit contract hardware list.
  - .2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.
- .4 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .5 Manufacturer's Instructions: submit manufacturer's installation instructions.

### **1.04 CLOSEOUT SUBMITTALS**

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for door hardware for incorporation into manual.

### **1.05 MAINTENANCE MATERIAL SUBMITTALS**

- .1 Extra Stock Materials:
  - .1 Supply maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Tools:
  - .1 Supply 2 sets of wrenches for door closers, locksets and fire exit hardware.

### **1.06 QUALITY ASSURANCE**

- .1 Regulatory Requirements:
  - .1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

### **1.07 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product

- Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address.
- .3 Package items of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .4 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Protect prefinished surfaces.
  - .3 Replace defective or damaged materials with new.

## **PART 2 – PRODUCTS**

### **2.01 HARDWARE ITEMS**

- .1 Use one manufacturer's products only for similar items.

### **2.02 DOOR HARDWARE**

- .1 Locks and latches:
  - .1 Bored and preassembled locks and latches: to ANSI/BHMA A156.2, series 4000 bored lock, grade 1 and 2, designed for function and keyed as stated in Hardware Schedule.
  - .2 Mortise locks and latches: to ANSI/BHMA A156.13, series 1000 mortise lock, grade 1, designed for function and keyed as stated in Hardware Schedule.
  - .3 Lever handles: as scheduled.
  - .4 Normal strikes: box type, lip projection not beyond jamb.
  - .5 Cylinders: key into keying system.
  - .6 Finished to 626.
- .2 Butts and hinges:
  - .1 Butts and hinges: to ANSI/BHMA A156.1, designated by letter A and numeral identifiers, followed by size and finish, listed in Hardware Schedule.
- .3 Exit devices: to ANSI/BHMA A156.3, type and function as scheduled, grade 1, modern design, finished to US32D.
- .4 Door Closers and Accessories:
  - .1 Door controls (closers): to ANSI/BHMA A156.4, designated by letter C and numeral identifiers listed in Hardware Schedule, multi-sized, finished to EN/689.
  - .2 Door controls - overhead holders: to ANSI/BHMA A156.8, designated by letter C and numeral identifiers listed in Hardware Schedule, finished to 630.
  - .3 Closer/holder release devices: to ANSI/BHMA A156.15, designated by letter C and numeral identifiers listed in hardware schedule, finished to EN/689.
  - .4 Door co-ordinator: surface for pairs of doors with overlapping astragal.
- .5 Door Operators:
  - .1 Power assist and low energy power operated doors: to ANSI/BHMA A156.19.
- .6 Auxiliary locks and associated products: as scheduled.
- .7 Architectural door trim: to ANSI/BHMA A156.6, listed in Hardware Schedule, finished to US32D.
  - .1 Door protection plates: kick plate type stainless steel, size as scheduled, finished to US32D.
  - .2 Push plates: stainless steel, finished to US32D.
  - .3 Push/Pull units: aluminum, finished to US32D.
- .8 Door bottom seal: heavy duty, as scheduled.
- .9 Thresholds: size as scheduled, extruded aluminum mill finish, serrated surface, with thermal break of rigid PVC.
- .10 Weatherstripping:
  - .1 Head and jamb seal:
    - .1 Extruded aluminum frame and solid closed cell neoprene or silicone insert, clear anodized finish.
  - .2 Door bottom seal:
    - .1 Extruded aluminum frame and closed cell neoprene, clear anodized finish.
- .11 Astragal: as scheduled.
- .12 Key control cabinet: lockable with keyless combination lock.
- .13 Barrier Free Door Operator:

- .1 Heavy duty assisted door closer, capable of multi-door operation, complete with actuators as scheduled.

### **2.03 DOOR SIGNAGE**

- .1 Washroom signs: Rockwood BF689, 200 x 200, metal sign, US10BL/626 finish (Satin Chrome Plated Brass), Grade 2 Braille translation, mechanically fastened to wall with tamper proof fasteners or approved equal.

### **2.04 FASTENINGS**

- .1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.
- .2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .3 Exposed fastening devices to match finish of hardware.
- .4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.
- .5 Use fasteners compatible with material through which they pass.

### **2.05 KEYING**

- .1 Provide construction cores.
- .2 City shall provide all permanent cores to be installed by Contractor.

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Supply metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
- .3 Supply manufacturers' instructions for proper installation of each hardware component.
- .4 Install hardware to standard hardware location dimensions in accordance with CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction).
- .5 Where door stop contacts door pulls, mount stop to strike bottom of pull.
- .6 Use only manufacturer's supplied fasteners.
  - .1 Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

### **3.02 ADJUSTING**

- .1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.
- .2 Lubricate hardware, operating equipment and other moving parts.
- .3 Adjust door hardware to ensure tight fit at contact points with frames.

### **3.03 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
  - .2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.
  - .3 Remove protective material from hardware items where present.
  - .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

### **3.04 DEMONSTRATION**

- .1 Keying System Setup and Cabinet:
  - .1 Set up key control system with file key tags, duplicate key tags, numerical index, alphabetical index and key change index, label shields, control book and key receipt cards.
  - .2 Place file keys and duplicate keys in key cabinet on their respective hooks.

- .2 Maintenance Staff Briefing:
  - .1 Brief maintenance staff regarding:
    - .1 Proper care, cleaning, and general maintenance of projects complete hardware.
    - .2 Description, use, handling, and storage of keys.
    - .3 Use, application and storage of wrenches for door closers, locksets, and fire exit hardware.
  - .3 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

### 3.05 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by door hardware installation.

### 3.06 SCHEDULE

#### Hardware Set#: 1

Single: D101, D102

|   |                      |                                 |       |    |
|---|----------------------|---------------------------------|-------|----|
| 4 | Hinge (heavy weight) | T4A3386 NRP 4-1/2" x 4-1/2"     | US32D | MK |
| 1 | Classroom Deadbolt   | 70 8203                         | US32D | SA |
| 1 | Deadlock             | LB V21 70 8221                  | US32D | SA |
| 2 | Core                 | Supplied by City                |       | BE |
| 2 | Back to Back Pull    | RM4200-18" Mtg-Type 5HD         | US32D | RO |
| 1 | Conc Overhead Stop   | 6-X36                           | 630   | RF |
| 1 | Automatic Opener     | 6021                            | 689   | NO |
| 1 | Kick Plate           | K1050 12"                       | US32D | RO |
| 1 | Threshold            | 272A                            |       | PE |
| 1 | Gasketing            | 290AS                           |       | PE |
| 2 | Sweep                | 18100CNB                        |       | PE |
| 1 | Monitor              | LML-1                           |       | SU |
| 2 | Full Height Actuator | 639                             |       | NO |
| 1 | Guide Rail           | Curran CE-805-MB x Size to Suit | AL    | OT |

Notes: Provide 2 deadbolts - one at standard deadbolt height (standard deadbolt) and other lower on door (classroom deadbolt). Wire actuators through the LML monitor switch used on the standard deadbolt strike. When that deadbolt is thrown the actuators will be disabled. Provide standard deadbolt at standard height and classroom deadbolt lower on door.  
 Provide door sign.

#### Hardware Set#: 2

Single: D103A

|   |                 |                        |       |    |
|---|-----------------|------------------------|-------|----|
| 4 | Hinge           | TA2714 NRP 4-1/2" x 4" | US26D | MK |
| 1 | Storeroom Lock  | 28 70 10G04 LL         | US26D | SA |
| 1 | BEST Core       | Supplied by City       |       | BE |
| 1 | Door Closer     | 1431 PS                | EN    | SA |
| 1 | Armor Plate     | K1050 12"              | US32D | RO |
| 1 | Latch Protector | 320CXL                 | US32D | RO |

#### Hardware Set#: 3

Single: D103B, D103C

Refer to Section 08 36 13 Sectional Metal Doors

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 RELATED REQUIREMENTS**

- .1 Division 23 – Heating, Ventilation and Air-Conditioning (HVAC)

### **1.02 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 The Aluminum Association Inc. (AAI)
  - .1 AAI DAF-45, Designation System for Aluminum Finishes - 9th Edition.
- .2 Air Movement and Control Association International (AMCA)
  - .1 AMCA 500-D, Laboratory Methods of Testing Dampers for Rating.
  - .2 AMCA 500-L, Laboratory Methods of Testing Louvers for Rating.
  - .3 AMCA 501, Application Manual for Air Louvers.
  - .4 AMCA 511, Certified Ratings Program for Air Control Devices.
- .3 American National Standards Institute (ANSI)
  - .1 ANSI H35.1/H35.1M, Alloy and Temper Designation Systems for Aluminum.
- .4 American Society for Testing and Materials International (ASTM)
  - .1 ASTM A 167, Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
  - .2 ASTM A 653/A 653 M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .3 ASTM B 209, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
  - .4 ASTM B 221, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

### **1.03 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Closeout Submittals:
  - .1 Provide operation and maintenance data for manual or motorized operated louvres for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

### **1.04 DELIVERY, STORAGE AND HANDLING**

- .1 Packing, shipping, handling and unloading:
  - .1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.
  - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
  - .3 Deliver materials to the site in undamaged condition.
- .2 Storage and Protection:
  - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Protect louvres from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- .1 Weather resistant louvres, with bird screens made to withstand a wind load of not less than 1.44 kilopascals.
- .2 Wall louvers: complete with AMCA certified ratings program seal for air performance and water penetration in accordance with AMCA 500-D, AMCA 500-L and AMCA 511.
- .3 Ratings to indicate water penetration of 0.06 kilograms or less per square metre of free area at free velocity of 244 meters per minute.
- .4 Galvanized steel sheet: commercial quality to ASTM A 653/A 653M with Z275 zinc coating.
- .5 Steel sheet: commercial quality to ASTM A 1008/A 1008M with Class I matte finish.

- .6 Aluminum sheet: to ASTM B 209, ANSI H35.1/H35.1M, alloy 5005 with temper as required for forming and mill finish plain utility sheet.
- .7 Aluminum extrusions: to ASTM B 221 alloy 6063- T5.
- .8 Solder: to ASTM B 32.
- .9 Flux: suitable for materials to be soldered.
- .10 Nails and fasteners: same material as fabricated items.
- .11 Gaskets: as per manufacturer.
- .12 Prefinished steel sheet:
  - .1 Prefinished steel with factory applied polyvinylidene fluoride.
    - .1 Class F1S.
    - .2 Colour selected by Contract Administrator from manufacturer's standard range].
    - .3 Specular gloss: 30 units +/- in accordance with ASTM D 523.
    - .4 Coating thickness: not less than 22 micrometres.
    - .5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20 % to ASTM D 822 as follows:
      - .1 Outdoor exposure period 2500 hours.
      - .2 Humidity resistance exposure period 5000 hours.
  - .2 Prefinished steel with factory applied polyvinyl chloride.
    - .1 Class F1S.
    - .2 Colour selected by Contract Administrator from manufacturer's standard range.
    - .3 Specular gloss: 30 units +/-5 in accordance with ASTM D 523.
    - .4 Coating thickness: not less than 200 micrometres.
    - .5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20 % to ASTM D 822 as follows.
      - .1 Outdoor exposure period 5000 hours.
      - .2 Humidity resistance exposure period 5000 hours.
- .13 Prefinished aluminum sheet:
  - .1 Finish aluminum sheet metal with factory applied coating to CAN2-93.1 amended as follows:
    - .1 Type 1.
    - .2 Class F1S.
    - .3 Colour selected by Contract Administrator from manufacturer's standard range.
    - .4 Specular gloss: 30 units.
    - .5 Coating thickness: not less than 200 micrometres.
    - .6 Outdoor exposure period 5000 hours.
    - .7 Exposure period for humidity resistance 5000 hours.
    - .8 Exposure period for salt spray resistance 5000 hours.
- .14 Screens:
  - .1 Insect screens: 0.3 mm diameter fibreglass 18 x 14 mesh with 60% free area, secured to aluminum frame.
  - .2 Birdscreens: crimped aluminum wire cloth secured to 2 mm thick extruded aluminum frame mitered at corners and secured with corner locks, with 60% free area.

## 2.02 FINISHES

- .1 Finish exposed surfaces of aluminum components in accordance with ANSI H35.1/H35.1M for Aluminum Finishes.
  - .1 As fabricated or mill finish: designation AA-6063-T5.
  - .2 Integral colour anodic finish: designation AA6063-T6, colour as chosen by Contract Administrator.
  - .3 Impregnated colour anodic finish: designation AA6063-T6, colour as chosen by Contract Administrator.
  - .4 Electrolytically deposited colour anodic finish: designation AA6063-T6, colour as chosen by Contract Administrator.
- .2 Appearance and properties of anodized finishes designated by the Aluminum Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative.
- .3 Colour to match adjacent finish.

## **PART 3 – EXECUTION**

### **3.01 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

### **3.02 INSTALLATION**

- .1 Install louvres and vents where indicated.
- .2 Set adjustable louvre blades for uniform alignment in open and closed positions.
- .3 Adjust louvres so moving parts operate smoothly.
- .4 Attach insect screen to inside face of louvre or vent.
- .5 Repair damage to louvres and vents to match original finish.
- .6 Install wall louvers using stops, mouldings, flanges, strap anchors and jamb fasteners as appropriate for wall construction and in accordance with manufacturer's recommendations.
- .7 Install louvers in wood doors as per manufacturer's instructions.
  - .1 Fasten mouldings to door with screws.

### **3.03 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

### **3.04 PROTECTION**

- .1 Paint copper or copper-bearing alloys in contact with dissimilar metal with heavy-bodied bituminous paint or separate with inert membrane.
- .2 Where aluminum contacts metal other than zinc, paint dissimilar metal with primer and two coats of aluminum paint.
- .3 Paint metal in contact with mortar, concrete, or other masonry materials with alkali-resistant coatings such as heavy-bodied bituminous paint.
- .4 Paint wood or other absorptive materials that may become repeatedly wet and in contact with metal with two coats of aluminum paint or coat of heavy-bodied bituminous paint.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 Aluminum Association (AA)
  - .1 AA DAF 45, Designation System for Aluminum Finishes.
- .2 American Society for Testing and Materials (ASTM)
  - .1 ASTM C 475, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
  - .2 ASTM C 514, Standard Specification for Nails for the Application of Gypsum Board.
  - .3 ASTM C 840, Standard Specification for Application and Finishing of Gypsum Board.
  - .4 ASTM C 954, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
  - .5 ASTM C 1047, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
  - .6 ASTM C 1177/C 1177M, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
  - .7 ASTM C 1280, Standard Specification for Application of Gypsum Sheathing.
  - .8 ASTM C1396/C1396M, Standard Specification for Gypsum board.
- .3 Association of the Wall and Ceilings Industries International (AWCI)
  - .1 AWCI Levels of Gypsum Board Finish.
- .4 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-51.34, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
  - .2 CAN/CGSB-71.25, Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.
- .5 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S102, Standard Method of Test of Surface Burning Characteristics of Building Materials and Assemblies.

### **1.02 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for gypsum board assemblies and include product characteristics, performance criteria, physical size, finish and limitations.

### **1.03 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address and applicable standard designation.
- .3 Exercise care in unloading gypsum board materials shipment to prevent damage.
- .4 Storage and Handling Requirements in accordance with ASTM C 840-16:
  - .1 Store gypsum board assemblies materials level flat off ground, indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Protect gypsum board from direct exposure to rain, snow, sunlight, or other excessive weather conditions.
  - .3 Protect ready mix joint compounds from freezing, exposure to extreme heat and direct sunlight.
  - .4 Protect from weather, elements and damage from construction operations.
  - .5 Handle gypsum boards to prevent damage to edges, ends or surfaces.
  - .6 Protect prefinished aluminum surfaces. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
  - .7 Replace defective or damaged materials with new.

### **1.04 AMBIENT CONDITIONS**

- .1 Maintain temperature 10 °C minimum, 21 °C maximum for 48 hours prior to and during application of gypsum boards and joint treatment, and for 48 hours minimum after completion of

- joint treatment.
- .2 Apply board and joint treatment to dry, clean, frost free surfaces.
- .3 Ventilation: ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- .1 Standard board: to ASTM C1396/C1396M-14 regular, 13 mm thick, Type C, 13 mm thick and Type X, 16 mm thick, 1200 mm wide x maximum practical length, ends square cut, edges bevelled.
- .2 Gypsum sheathing board: to ASTM C1396/C1396M-14, regular, 13 mm thick and Type X, 16 mm thick, 1200 mm wide x maximum practical length.
- .3 Exterior gypsum soffit board: to ASTM C1396/C1396M-14 13 mm thick, 1200 mm wide x maximum practical length.
- .4 Glass mat water-resistant gypsum backing board: to ASTM C 1178/C 1178M-13, 13 mm thick, 1200 mm wide x maximum practical length.
- .5 Glass mat gypsum substrate sheathing: to ASTM C 1177/C 1177M-13, 13 mm thick, 1200 mm wide x maximum practical length.
- .6 Metal furring runners, hangers, tie wires, inserts, and anchors.
- .7 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
- .8 Resilient drywall furring: 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.
- .9 Nails: to ASTM C 514-14.
- .10 Steel drill screws: to ASTM C 1002-14.
- .11 Stud adhesive: to CAN/CGSB-71.25.
- .12 Laminating compound: as recommended by manufacturer, asbestos-free.
- .13 Casing beads, corner beads, control joints and edge trim: to ASTM C 1047, metal, 0.5 mm base thickness, perforated flanges, one piece length per location.
- .14 Sealants: in accordance with Section 07 92 00 - Joint Sealants.
- .15 Polyethylene: to CAN/CGSB-51.34, Type 2.
- .16 Insulating strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 12 mm wide, with self-sticking permanent adhesive on one face, lengths as required.
- .17 Joint compound: to ASTM C 475, asbestos-free.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for gypsum board assemblies installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .2 Proceed with installation only after unacceptable conditions have been remedied.

### **3.02 ERECTION**

- .1 Do application and finishing of gypsum board to ASTM C 840-16 except where specified otherwise.
- .2 Do application of gypsum sheathing to ASTM C 1280-13a.
- .3 Erect hangers and runner channels for suspended gypsum board ceilings to ASTM C 840-16 except where specified otherwise.
- .4 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .5 Install work level to tolerance of 1:1200.
- .6 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers and grilles.
- .7 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition

- header track.
- .8 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .9 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- .10 Install wall furring for gypsum board wall finishes to ASTM C 840-16, except where specified otherwise.
- .11 Furr openings and around built-in equipment, cabinets, access panels, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .12 Erect drywall resilient furring transversely across studs or joists, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screw.
- .13 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed.

### **3.03 APPLICATION**

- .1 Apply gypsum board after bucks, anchors, blocking, sound attenuation, electrical and mechanical work have been approved.
- .2 Apply gypsum board to metal furring or framing using screw fasteners. Maximum spacing of screws 300 mm on centre.
  - .1 Single-Layer Application:
    - .1 Apply gypsum board on ceilings prior to application of walls to ASTM C 840-16.
    - .2 Apply gypsum board on walls vertically or horizontally, providing sheet lengths that will minimize number of board edges or end joints.
  - .2 Double-Layer Application:
    - .1 Install gypsum board for base layer and exposed gypsum board for face layer.
    - .2 Apply base layer to ceilings prior to base layer application on walls; apply face layers in same sequence. Offset joints between layers at least 250 mm.
    - .3 Apply base layers at right angles to supports unless otherwise indicated.
    - .4 Apply base layer on walls and face layers vertically with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.
- .3 Apply water-resistant gypsum board where wall tiles to be applied and adjacent to slop sinks and janitors closets. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads.
- .4 Apply 12 mm 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 and ducts, in partitions where perimeter sealed with acoustic sealant.
- .5 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.
- .6 Install gypsum board on walls vertically to avoid end-butt joints. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs, except where local codes or fire-rated assemblies require vertical application.
- .7 Install gypsum board with face side out.
- .8 Install gypsum board on all openings that do not have a door frame or trim.
- .9 Do not install damaged or damp boards.
- .10 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

### **3.04 INSTALLATION**

- .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. Secure at 150 mm on centre.
- .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.
- .4 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.
- .5 Install shadow mould at gypsum board/ceiling juncture as indicated. Minimize joints; use corner pieces and splicers.
- .6 Construct control joints of two back-to-back casing beads set in gypsum board facing and

- supported independently on both sides of joint.
- .7 Provide continuous polyethylene dust barrier behind and across control joints.
- .8 Locate control joints at changes in substrate construction, at approximate 10 m spacing on long corridor runs, at approximate 15 m spacing on ceilings, or as indicated on drawings.
- .9 Install control joints straight and true.
- .10 Ensure that screws or nails are properly applied in process of attaching gypsum board to framing without damaging of gypsum board edges and ends.
- .11 Construct expansion joints, at building expansion and construction joints. Provide continuous dust barrier.
- .12 Install expansion joint straight and true.
- .13 Splice corners and intersections together and secure to each member with 3 screws.
- .14 Install access doors to electrical and mechanical fixtures specified in respective sections.
  - .1 Rigidly secure frames to furring or framing systems.
- .15 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.
- .16 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with AWCI Levels of Gypsum Board Finish:
  - .1 Levels of finish:
    - .1 Level 4: embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.
- .17 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.
- .18 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board, invisible after surface finish is completed.
- .19 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .20 Completed installation smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .21 Remove ridges by light sanding or wiping with damp cloth.

### **3.05 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
  - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

### **3.06 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by gypsum board assemblies installation.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 RELATED REQUIREMENTS**

- .1 Section 09 91 23 - Interior Painting.

### **1.02 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 Master Painters Institute (MPI)
  - .1 Architectural Painting Specification Manual.

### **1.03 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Provide manufacturer's instructions, printed product literature and data sheets for paint and paint products and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Confirm products to be used are in MPI's approved product list.
  - .3 Upon completion, provide records of products used. List products in relation to finish system and include the following:
    - .1 Product name, type and use.
    - .2 Colour numbers.
    - .3 Manufacturer's Material Safety Data Sheets (MSDS).

### **1.04 CLOSEOUT SUBMITTALS**

- .1 Provide in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: Provide operation and maintenance data for painting materials for incorporation into manual.
- .3 Include:
  - .1 Product name, type and use.
  - .2 Manufacturer's product number.
  - .3 Colour numbers.
  - .4 MPI Environmentally Friendly classification system rating.

### **1.05 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Conform to latest MPI requirements for exterior painting work including preparation and priming.
  - .2 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
  - .3 Standard of Acceptance:
    - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
    - .2 Soffits: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
    - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

### **1.06 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address.
  - .1 Labels: to indicate:
    - .1 Type of paint or coating.
    - .2 Compliance with applicable standard.
    - .3 Colour number in accordance with established colour schedule.

## **1.07 SITE CONDITIONS**

- .1 Ambient Conditions:
  - .1 Heating, Ventilation and Lighting:
    - .1 Do not perform painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
    - .2 Where required, provide continuous ventilation for seven days after completion of application of paint.
    - .3 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
    - .4 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities to be provided by contractor.
  - .2 Temperature, Humidity and Substrate Moisture Content Levels:
    - .1 Perform no painting work when:
      - .1 Ambient air and substrate temperatures are below 10 degrees C.
      - .2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperatures.
      - .3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.
      - .4 Relative humidity is above 85 % or when dew point is less than 3 degrees C variance between air/surface temperature.
      - .5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
    - .2 Perform no painting work when maximum moisture content of substrate exceeds:
      - .1 12% for plaster and gypsum board.
      - .2 Conduct moisture test using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".
      - .3 Test concrete, masonry and plaster surfaces for alkalinity as required.
    - .3 Application Requirements:
      - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
      - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits noted herein.
      - .3 Apply paint when previous coat of paint is dry or adequately cured.
      - .4 Apply paint finishes when conditions forecast for entire period of application fall within manufacturer's recommendations.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- .1 Only paint materials listed in latest edition of MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Paint materials for paint systems: to be products of single manufacturer.
- .3 Use only MPI listed rated materials.
- .4 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .5 Water-borne surface coatings and recycled water-borne surface coatings must have flash point of 61.0 degrees C or greater.

## **2.02 COLOURS**

- .1 Contract Administrator will provide Colour Schedule after Contract award.
- .2 Colour schedule will be based upon selection of 5 base colours and 3 accent colours. No more than 8 colours will be selected for entire project and no more than 3 colours will be selected in each area.
- .3 Selection of colours will be from manufacturers' full range of colours.
- .4 Where specific products are available in restricted range of colours, selection will be based on limited range.
- .5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats if requested by Contract Administrator.
- .6 For deep and ultra deep colours 4 coats may be required.

## **2.03 MIXING AND TINTING**

- .1 Perform colour tinting operations prior to delivery of paint to site.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Add thinner to paint manufacturer's recommendations. Do not use kerosene or organic solvents to thin water-based paints.
- .4 Thin paint for spraying according in accordance with paint manufacturer's instructions.
- .5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.
- .6 Deep and ultra deep colors; 4 coats may be required.

## **2.04 GLOSS/SHEEN RATINGS**

- .1 Paint gloss: defined as sheen rating of applied paint, in accordance with following values:

| Gloss Level<br>Category/ | Units @ 60<br>Degrees/ | Units @ 85<br>Degrees/ |
|--------------------------|------------------------|------------------------|
| G1 - matte finish        | 0 to 5                 | max. 10                |
| G2 - velvet finish       | 0 to 10                | 10 to 35               |
| G3 - eggshell finish     | 10 to 25               | 10 to 35               |
| G4 - satin finish        | 20 to 35               | min. 35                |
| G5 - semi-gloss finish   | 35 to 70               |                        |
| G6 - gloss finish        | 70 to 85               |                        |
| G7 - high gloss finish   | > 85                   |                        |

- .2 Gloss level ratings of painted surfaces as noted on Finish Schedule.

## **2.05 EXTERIOR PAINTING SYSTEMS**

- .1 Concrete Horizontal Surfaces: decks
  - .1 EXT 3.2G - Sealer, Clear, solvent based (S.B.)
- .2 Structural Steel and Metal Fabrications:
  - .1 EXT 5.1G - Polyurethane, Pigmented finish over epoxy zinc rich primer and high-build epoxy. Premium grade.
- .3 Galvanized Metal: not chromate passivated.
  - .1 EXT 5.3A - Latex G5 over cementitious primer finish. Premium grade.
- .4 Dimension Lumber: columns, beams, exposed joists, siding, fencing
  - .1 EXT 6.2L - S.B. stain semi-transparent finish.

## **PART 3 – EXECUTION**

### **3.01 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

### **3.02 GENERAL**

- .1 Perform preparation and operations for exterior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.

### **3.03 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable to be painted in accordance with manufacturer's written instructions:
  - .1 Visually inspect substrate.
  - .2 Proceed with installation only after unacceptable conditions have been remedied.
- .2 Exterior surfaces once completed to be: inspected by contractor who will notify Contract Administrator in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.
- .3 Where assessed degree of surface degradation of DSD-1 to DSD-3 before preparation of surfaces for repainting is revealed to be DSD-4 after preparation, repair or replacement of such unforeseen defects discovered are to be corrected, as mutually agreed, before repainting is started.
- .4 Where "special" repainting or recoating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer to provide as part of work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to the City.

### **3.04 PREPARATION**

- .1 Perform preparation and operations for exterior painting in accordance with MPI Maintenance Repainting Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.
- .3 Clean and prepare exterior surfaces to be repainted in accordance with MPI Maintenance Repainting Manual requirements. Refer to the MPI Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and surface debris by wiping with dry, clean cloths.
  - .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
  - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
  - .4 Allow surfaces to drain completely and allow to dry thoroughly. Allow sufficient drying time and test surfaces using electronic moisture meter before commencing work.
  - .5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water based paints.
  - .6 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.
- .4 Clean metal surfaces to be repainted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements. Remove such contaminants from surfaces, pockets and corners to be repainted by brushing with clean brushes, blowing with clean dry compressed air, or brushing/vacuum cleaning as required.
- .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .6 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

### **3.05 EXISTING CONDITIONS**

- .1 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .2 Maximum moisture content as follows:
  - .1 Concrete: 12%.
  - .2 Hard Wood: 15%.

### **3.06 PROTECTION**

- .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces.
- .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .3 Protect factory finished products and equipment.

- .4 Protect general public in and about building.
- .5 Remove light fixtures, surface hardware on doors, and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Store items and re-install after painting is completed.
- .6 Move and cover exterior furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
- .7 As painting operations progress, place "WET PAINT" signs in pedestrian and vehicle traffic areas.

### **3.07 APPLICATION**

- .1 Method of application to be as per manufacturer's application instructions.
- .2 Brush and Roller Application:
  - .1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.
  - .2 Work paint into cracks, crevices and corners.
  - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
  - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces to be free of roller tracking and heavy stipple.
  - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Spray Application:
  - .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
  - .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
  - .3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.
  - .4 Brush out immediately runs and sags.
  - .5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.
  - .6 Wood, stucco, concrete, cement masonry units CMU's and brick; if sprayed, must be back rolled.
- .4 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized by Contract Administrator.
- .5 Apply coats of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .7 Sand and dust between coats to remove visible defects.
- .8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as projecting ledges.
- .9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

### **3.08 MECHANICAL/ ELECTRICAL EQUIPMENT**

- .1 Unless otherwise specified, paint exterior exposed conduits, piping, hangers, duct work and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.
- .2 Do not paint over nameplates.
- .3 Paint fire protection piping red.
- .4 Paint natural gas piping yellow.
- .5 Paint steel electrical light standards. Do not paint outdoor transformers and substation equipment.

### **3.09 FIELD QUALITY CONTROL**

- .1 Standard of Acceptance:
  - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
  - .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
  - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

### **3.10 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning:
  - .1 Leave Work area clean at end of each day.

- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

### **3.11 RESTORATION**

- .1 Clean and re-install hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 RELATED REQUIREMENTS**

- .1 Section 09 91 13 - Exterior Painting.

### **1.02 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 Master Painters Institute (MPI)
  - .1 Architectural Painting Specification Manual.

### **1.03 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Provide manufacturer's instructions, printed product literature and data sheets for paint and paint products and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Confirm products to be used are in MPI's approved product list.
- .3 Upon completion, provide records of products used. List products in relation to finish system and include the following:
  - .1 Product name, type and use.
  - .2 Manufacturer's product number.
  - .3 Colour numbers.
  - .4 Manufacturer's Material Safety Data Sheets (MSDS).

### **1.04 CLOSEOUT SUBMITTALS**

- .1 Provide in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: Provide operation and maintenance data for painting materials for incorporation into manual.
- .3 Include:
  - .1 Product name, type and use.
  - .2 Manufacturer's product number.
  - .3 Colour numbers.

### **1.05 MAINTENANCE MATERIAL SUBMITTALS**

- .1 Extra Stock Materials:
  - .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
  - .2 Submit 1 four litre can of each type and colour of finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

### **1.06 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Contractor: to have a minimum of 5 years proven satisfactory experience. When requested, provide list of last 3 comparable jobs including, job name and location, specifying authority, and project manager.
  - .2 Conform to latest MPI requirements for exterior painting work including preparation and priming.
  - .3 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
  - .4 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Contract Administration.
  - .5 Standard of Acceptance:
    - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
    - .2 Soffits: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
    - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

### **1.07 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product

- Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address.
  - .1 Labels: to indicate:
    - .1 Type of paint or coating.
    - .2 Compliance with applicable standard.
    - .3 Colour number in accordance with established colour schedule.

#### **1.08 SITE CONDITIONS**

- .1 Ambient Conditions:
  - .1 Heating, Ventilation and Lighting:
    - .1 Provide heating facilities to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
    - .2 Provide continuous ventilation for 7 days after completion of application of paint.
    - .3 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
    - .4 Provide minimum lighting level of 323 Lux on surfaces to be painted.
    - .5 Temperature, Humidity and Substrate Moisture Content Levels:
      - .1 Perform no painting when:
        - .1 Ambient air and substrate temperatures are below 10 degrees C.
        - .2 Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.
        - .3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
        - .4 The relative humidity is under 85% or when the dew point is more than 3 degrees C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 degrees C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
        - .5 Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand 'normal' adverse environmental factors.
      - .2 Perform painting work when maximum moisture content of the substrate is below:
        - .1 12% for concrete and masonry (clay and concrete brick/block). Allow new concrete and masonry to cure minimum of 28 days.
        - .2 15% for hard wood.
        - .3 17% for soft wood.
        - .4 12% for plaster and gypsum board.
      - .3 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
      - .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
  - .6 Surface and Environmental Conditions:
    - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
    - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
    - .3 Apply paint when previous coat of paint is dry or adequately cured.
  - .7 Additional interior application requirements:
    - .1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- .1 Only Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Provide paint materials for paint systems from single manufacturer.
- .3 Conform to latest MPI requirements for interior painting work including preparation and priming.

### **2.02 COLOURS**

- .1 Contract Administration will provide Colour Schedule after Contract award.
- .2 Colour schedule will be based upon selection of 2 base colours and 4 accent colours. No more than 7 colours will be selected for entire project and no more than 3 colours will be selected in each area.
- .3 Selection of colours will be from manufacturers full range of colours.
- .4 Where specific products are available in restricted range of colours, selection based on limited range.
- .5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats, if requested by Contract Administration.
- .6 For deep and ultra deep colours; 4 coats may be required.

### **2.03 MIXING AND TINTING**

- .1 Perform colour tinting operations prior to delivery of paint to site. Obtain written approval from Contract Administration for tinting of painting materials.
- .2 Thin paint for spraying in accordance with paint manufacturer's instructions.
- .3 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity. Strain as necessary.

### **2.04 GLOSS/SHEEN RATINGS**

- .1 Paint gloss: defined as sheen rating of applied paint, in accordance with following values:

|                                     | <u>Gloss @ 60 degrees</u> | <u>Sheen @ 85 degrees</u> |
|-------------------------------------|---------------------------|---------------------------|
| Gloss Level 1 – Matte Finish (flat) | Max. 5                    | Max. 10                   |
| Gloss Level 2 – Velvet-Like Finish  | Max.10                    | 10 to 35                  |
| Gloss Level 3 – Eggshell Finish     | 10 to 25                  | 10 to 35                  |
| Gloss Level 4 – Satin Like Finish   | 20 to 35                  | min. 35                   |
| Gloss Level 5 – Semi Gloss Finish   | 35 to 70                  |                           |
| Gloss Level 6 – Gloss Finish        | 70 to 85                  |                           |
| Gloss Level 7 – High Gloss Finish   | More than 85              |                           |

- .2 Gloss level ratings of painted surfaces as noted on Finish Schedule.

### **2.05 INTERIOR PAINTING SYSTEMS**

- .1 Concrete Floor: Smooth
  - .1 INT 3.2D - Polyurethane pigmented finish over epoxy. Premium Grade.
- .2 Structural Steel: Structural steel and metal fabrications - columns, beams, joists:
  - .1 INT 5.1C - W.B. Dry Fall Gloss Level 1 (over Q.D. alkyd primer) finish.
  - .2 INT 5.1Q - Latex gloss level 5 finish (over Q.D. alkyd primer). Premium Grade.
- .3 Galvanized metal: doors, frames, railings.
  - .1 INT 5.3M - High performance architectural latex Gloss Level 3 (over W.B. galvanized primer) finish.
- .4 Dimension lumber: columns, beams, exposed joists, underside of decking:
  - .1 INT 6.2A - Latex G3 finish (over alkyd primer).

## **PART 3 – EXECUTION**

### **3.01 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

### **3.02 GENERAL**

- .1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.

### **3.03 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable to be painted in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .2 Proceed with installation only after unacceptable conditions have been remedied.
- .2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .3 Maximum moisture content as follows:
  - .1 Stucco, plaster and gypsum board: 12%.
  - .2 Concrete: 12%.
  - .3 Hard Wood: 15%.
  - .4 Soft Wood: 17%.

### **3.04 PREPARATION**

- .1 Protection:
  - .1 Protect adjacent building surfaces and structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Contract Administration.
  - .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
  - .3 Protect factory finished products and equipment.
- .2 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and other surface debris by wiping with dry, clean cloths.
  - .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
  - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
  - .4 Allow surfaces to drain completely and allow to dry thoroughly.
  - .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
  - .6 Use trigger operated spray nozzles for water hoses.
  - .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.
- .3 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .4 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
  - .1 Apply sealer to MPI #36 over knots, pitch, sap and resinous areas.
  - .2 Apply wood filler to nail holes and cracks.
  - .3 Tint filler to match stains for stained woodwork.
- .5 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.
- .6 Carried out during shop priming: clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes.
- .7 Touch up of shop primers with primer as specified.

### **3.05 EXISTING CONDITIONS**

- .1 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report

findings to Contract Administration. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

- .2 Maximum moisture content as follows:
  - .1 Hard Wood: 15%.
  - .2 Soft Wood: 17%

### **3.06 APPLICATION**

- .1 Apply paint by brush, roller, air sprayer, airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
  - .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
  - .2 Work paint into cracks, crevices and corners.
  - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
  - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
  - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Spray application:
  - .1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
  - .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
  - .3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.
  - .4 Brush out immediately all runs and sags.
  - .5 Use brushes and rollers to work paint into cracks, crevices and places, which are not adequately painted by spray.
- .4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.
- .5 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .7 Sand and dust between coats to remove visible defects.
- .8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.
- .9 Finish inside of cupboards and cabinets as specified for outside surfaces.
- .10 Finish closets and alcoves as specified for adjoining rooms.
- .11 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.
- .12 Wood, drywall, plaster, stucco, concrete, concrete masonry units and brick; if sprayed, must be back rolled.

### **3.07 MECHANICAL/ ELECTRICAL EQUIPMENT**

- .1 Paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as indicated.
- .2 Boiler room, mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.
- .3 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.
- .4 Do not paint over nameplates.
- .5 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
- .6 Paint disconnect switches for fire alarm system and exit light systems in red enamel.
- .7 Paint natural gas piping yellow.
- .8 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.
- .9 Do not paint interior transformers and substation equipment.

### **3.08 SITE TOLERANCES**

- .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
- .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
- .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

### **3.09 FIELD QUALITY CONTROL**

- .1 Standard of Acceptance:
  - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
  - .2 Ceilings: no defects visible from floor at 45 degrees degrees to surface when viewed using final lighting source.
  - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

### **3.10 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning:
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

### **3.11 RESTORATION**

- .1 Clean and re-install hardware items removed before undertaking painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for wall and corner guards and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Installation Drawings:
  - .1 Indicate on drawings large scale details, materials, finishes, dimensions, anchorage and assembly.

### **1.02 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

## **PART 2 – PRODUCTS**

### **2.01 FIBER REINFORCED LAMINATES**

- .1 Panels shall comply with the following:
  - .1 Thickness: 0.075 inches for walls. 0.062 inches in a sanded back for door applications only.
  - .2 Color and Finish: As selected by Contract Administrator from manufacturer's full range of colors and designs.
  - .3 Surface Burning Characteristics: US Standard UL-723/ASTM E 84 Class A; Canadian Standard ULC-S102 Class A for Surface Burning Characteristics of Building Materials.
  - .4 Chemical resistant compliant with SEFA 8 requirements.
  - .5 Wear Resistance (Cycles) NEMA 3.13: 3500 typical.
  - .6 Flexural Strength ASTM D790: 20,148 psi typical.
- .2 Molding Profiles: Outside corners flat, outside corners round, division bars, inside corners, standard end caps.
- .3 Adhesive: Construction Adhesive as approved by panel manufacturer.
- .4 Joint Caulking: 100 percent silicone based colored caulking as approved by panel manufacturer.
- .5 Contractor to site confirm end cap measurements prior to ordering to adjust for construction tolerances.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for wall guards installation in accordance with manufacturer's written instructions.

### **3.02 INSTALLATION**

- .1 Install products in strict accordance with manufacturer's instructions and approved submittals.
  - .1 Clean substrate of dirt, dust, waxes, and other bond breaking substances prior to beginning installation.
  - .2 Drywall finish: Level 3 and fully primed.
  - .3 Install panels with bottom edge located to clear top of any rigid wall base. Rubber wall bases may be bonded over the FRL ® panels using a polymer or urethane based adhesive.
  - .4 Apply adhesive uniformly using adhesive manufacturers recommended notched trowel to the entire back of panels completely to the edge.

- .5 Lay FRL ® panels in place leaving approximately 3mm vertical installations 5mm for horizontal installations between panel joints.
- .6 Follow adhesive manufacturer's recommendations for set and application times.
- .7 If you are attaching FRL ® panels to a door or wood substrate, use contact glue as recommended by the manufacturer.
- .8 Please follow contact glue manufacturer's directions.
- .9 Apply pressure to entire panel face with laminate type roller, removing trapped air and ensure proper adhesion between surfaces.
- .10 Install trim at interior corners, and perimeters of all panels.
- .11 If no trim is used, seal panel joints and top, side, and bottom edges with colored 100% silicone caulking to match panel color. Wipe smooth and remove excess caulk from FRL ® panel face.

### **3.03 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .3 Clean surfaces after installation using manufacturer's written recommended cleaning procedures.
- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.
- .5 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

### **3.05 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by wall and corner guards installation.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 ASTM International
  - .1 ASTM A 167-99, Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
  - .2 ASTM B 456, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
  - .3 ASTM A 653/A 653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .4 ASTM A 924/A 924M, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.81, Air Drying and Baking Alkyd Primer for Vehicles and Equipment.
  - .2 CAN/CGSB-1.88, Gloss Alkyd Enamel, Air Drying and Baking.
- .3 CSA International
  - .1 CAN/CSA-B651, Accessible Design for the Built Environment.

### **1.02 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Provide manufacturer's printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
  - .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.

### **1.03 CLOSEOUT SUBMITTALS**

- .1 Provide maintenance data for toilet and bath accessories for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

### **1.04 MAINTENANCE MATERIAL SUBMITTALS**

- .1 Tools:
  - .1 Provide special tools required for assembly, disassembly or removal for toilet and bath accessories in accordance with requirements specified in Section 01 78 00 - Closeout Submittals.
- .2 Deliver special tools to Contract Administrator.

### **1.05 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

## **PART 2 - PRODUCTS**

### **2.01 COMPONENTS**

- .1 Toilet tissue dispenser: surface mounted, dual coreless jumbo roll, 22 gauge stainless steel.
  - .1 Acceptable material: Bradley 5426-11 or approved equal in accordance with B7.
- .2 Soap Dispenser: surface mounted vertical type, 20 gauge stainless steel construction.
  - .1 Acceptable material: Bradley 6562, Bobrick B-2111, ASI 0347 or approved equal in accordance with B7.
- .3 Feminine napkin disposal bin: stainless steel, surface unit, continuous hinged door, self closing, embossed with "napkin disposal", removable plastic receptacles fitted with spring clip for deodorizer block.

- .1 Acceptable material: Bradley 4781-15, Bobrick B-270, ASI 20852 or approved equal in accordance with B7.
- .4 Grab bars: 32mm x 915mm, 32mm x 610mm and 32mm x 760 mm x 760 mm, concealed mounted grab bar: wall tubing stainless steel, 76 mm diameter wall flanges, concealed screw attachment, flanges welded to tubular bar, provided with steel back plates and all accessories. Grab bar material and anchorage to withstand downward pull of 2.2 kN. Check drawings for length, degree of slope, bends and locations.
  - .1 Acceptable material: ASI 3700 series, Bobrick B-5800 series, Frost 1003 Series or approved equal in accordance with B7.
- .5 Security towel hook: 14 gauge stainless steel backplate with satin finish and tamper resistant mounting screws. Stainless steel safety hook with pivoting ball joint that releases when more than 20 lbs of force is applied
  - .1 Acceptable materials: Bradley SA36, Bobrick B-983, ASI B-123 or approved equal in accordance with B7.
- .6 Hand Dryer: 22 gauge satin finish stainless steel cover, automatic operation.
  - .1 Acceptable materials: Bradley 2902-287400, Bobrick B-7128, ASI 0185 or approved equal in accordance with B7.
- .7 Waste Receptacle: 22 gauge stainless steel, 356mm wide x 457mm high x 152mm deep, 6.5 gallon capacity. Fasten to wall with tamper resistant mounting screws. Provide vinyl liner.
  - .1 Acceptable material: Bradley 357, Bobrick B-279, ASI 0828 or approved equal in accordance with B7.
- .8 Mirrors: 20 gauge bright annealed stainless steel c/w tamper resistant mounting screws.
  - .1 Acceptable material: Bradley, 7481 series 610mm x 915mm, ASI8026 or approved equal in accordance with B7.
- .9 Mop and Broom Holder: Type 304 stainless steel, 915mm wide, satin finish with three spring loaded, rubber cam, anti slip mop holders.
  - .1 Acceptable material: Bradley 9953, Bobrick B-223 x 36, ASI 8215 or approved equal in accordance with B7.

## **2.02 FABRICATION**

- .1 Weld and grind joints of fabricated components flush and smooth. Use mechanical fasteners only where approved.
- .2 Wherever possible form exposed surfaces from one sheet of stock, free of joints.
- .3 Brake form sheet metal work with 1.5 mm radius bends.
- .4 Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.
- .5 Back paint components where contact is made with building finishes to prevent electrolysis.
- .6 Hot dip galvanize concealed ferrous metal anchors and fastening devices to CAN/CSA-G164.
- .7 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instructions for building in anchors and inserts.
- .8 Provide steel anchor plates and components for installation on studding and building framing.

## **2.03 FINISHES**

- .1 Chrome and nickel plating: to ASTM B 456, satin finish.
- .2 Baked enamel: condition metal by applying one coat of metal conditioner to CGSB 31-GP-107Ma, apply one coat Type 2 primer to CAN/CGSB-1.81 and bake, apply two coats Type 2 enamel to CAN/CGSB-1.88 and bake to hard, durable finish. Sand between final coats. Colour selected from standard range by Contract Administrator.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrates and surfaces to receive toilet and bathroom accessories previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's instructions prior to toilet and bathroom accessories installation.

### **3.02 INSTALLATION**

- .1 Install and secure accessories 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 Install grab bars on built-in anchors provided by bar manufacturer.
- .3 Use tamper proof screws/bolts for fasteners.
- .4 Fill units with necessary supplies shortly before final acceptance of building.

### **3.03 ADJUSTING**

- .1 Adjust toilet and bathroom accessories components and systems for correct function and operation in accordance with manufacturer's written instructions.
- .2 Lubricate moving parts to operate smoothly and fit accurately.

### **3.04 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

### **3.05 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by toilet and bathroom accessories installation.

### **3.06 SCHEDULE**

- .1 Locate accessories where indicated on drawings and as follows. Exact locations determined by Contract Administrator if any discrepancies are discovered.
  - .1 Toilet tissue dispenser: one per toilet fixture.
  - .2 Soap dispenser: one per sink.
  - .3 Feminine napkin disposal bin: one per toilet fixture.
  - .4 Hand Dryer: one per sink.
  - .5 Towel hook: one per washroom.
  - .6 Mirror: one per sink.
  - .7 Grab bars: one horizontal and one 'L' shape at each accessible toilet.
  - .8 Mop and Broom Holder: one at each mop sink.
  - .9 Waste receptacle: one per washroom.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .2 National Fire Protection Association (NFPA)
  - .1 NFPA 10, Standard for Portable Fire Extinguishers.

### **1.02 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Closeout Submittals:
  - .1 Provide operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

### **1.03 DELIVERY, STORAGE AND HANDLING**

- .1 Packing, shipping, handling and unloading:
  - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

## **PART 2 – PRODUCTS**

### **2.01 MULTI-PURPOSE DRY CHEMICAL EXTINGUISHERS**

- .1 Stored pressure rechargeable type with hose and shut-off nozzle, ULC labelled for A, B and C class protection.
  - .1 Size: 4.5 kg.

### **2.02 EXTINGUISHER BRACKETS**

- .1 Type recommended by extinguisher manufacturer.

### **2.03 IDENTIFICATION**

- .1 Identify extinguishers in accordance with recommendations of ANSI/NFPA 10.
- .2 Attach bilingual tag, bar code or label to extinguishers, indicating month and year of installation. Provide space for service dates.

## **PART 3 – EXECUTION**

### **3.01 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

### **3.02 INSTALLATION**

- .1 Install or mount extinguishers in cabinets or on brackets as indicated on drawings in accordance with NFPA 10.
- .2 Mount handle at maximum 1200mm above finished floor.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue.  
This specification refers to the following standards, specifications or publications:

- .1 ASTM International
  - .1 ASTM D 698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft<sup>2</sup>) (600kN-m/m<sup>2</sup>).
- .2 CSA International
  - .1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
  - .2 CSA A3000, Cementitious Materials Compendium.

### **1.02 ADMINISTRATIVE REQUIREMENTS**

- .1 Co-ordination: arrange with authority having jurisdiction for relocation of buried services that interfere with execution of work.
  - .1 Pay costs of relocating services. ASTM International
  - .2 ASTM D 698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft<sup>2</sup>) (600kN-m/m<sup>2</sup>).
- .2 Free/aggregate sieve testing.
- .3 Soil Engineer to confirm testing is carried out.
- .4 Compaction testing.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- .1 Granular A, B Type I, B Type II, M, Select Subgrade to OPSS 1010. Sand to OPSS 1004.
- .2 Crushed Granular 20-0, 20-0b, 56-0, Natural Gravel 80-0, Gravel and Sand, Stone Dust, Sand to CCDG 14.02.
- .3 Unshrinkable fill: proportioned and mixed to provide:
  - .1 Maximum compressive strength of 0.4 MPa at 28 days.
  - .2 Maximum Portland cement content of 25 kg/m<sup>3</sup>.
  - .3 Minimum strength of 0.07 MPa at 24 hours.
  - .4 Concrete aggregates: to CSA A23.1/A23.2.
  - .5 Cement: to CSA A3000, Type GU.
  - .6 Slump: 160 to 200 mm.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- .1 Evaluation and Assessment:
  - .1 Before commencing work establish locations of buried services on and adjacent to site.

### **3.02 PREPARATION**

- .1 Temporary erosion and sedimentation control:
  - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
  - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
  - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- .2 Protection of in-place conditions:
  - .1 Protect excavations from freezing.
  - .2 Keep excavations clean, free of standing water, and loose soil.
  - .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Contract Administrator's approval.

- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .5 Protect buried services that are required to remain undisturbed.
- .3 Removal:
  - .1 Remove trees, stumps, logs, brush, shrubs, bushes, vines, undergrowth, rotten wood, dead plant material, exposed boulders and debris within areas designated on drawings.
  - .2 Remove stumps and tree roots below footings, slabs, and paving, and to 600 mm below finished grade elsewhere.
  - .3 Remove obsolete buried services within 2 m of foundations: cap cut-offs.

### **3.03 EXCAVATION**

- .1 Shore and brace excavations, protect slopes and banks and perform work in accordance with Provincial and Municipal regulations whichever is more stringent.
- .2 Excavate as required to carry out work.
  - .1 Do not disturb soil or rock below bearing surfaces.
  - .2 Notify Contract Administrator when excavations are complete.
  - .3 If bearings are unsatisfactory, additional excavation will be authorized in writing and paid for as additional work.
- .3 Excavate trenches to provide uniform continuous bearing and support for 150 mm thickness of pipe bedding material on solid and undisturbed ground.
  - .1 Trench widths below point 150 mm above pipe not to exceed diameter of pipe plus 600 mm.
- .4 Excavate for slabs and paving to subgrade levels.
  - .1 In addition, remove all topsoil, organic matter, debris and other loose and harmful matter encountered at subgrade level.

### **3.04 FIELD QUALITY CONTROL**

- .1 Testing of materials and compaction of backfill and fill will be carried out by testing laboratory designated by Contract Administrator.
- .2 Not later than 1 week minimum before backfilling or filling, submit to designated testing agency, samples of backfill as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
- .3 Do not begin backfilling or filling operations until material has been approved for use by Contract Administrator.
- .4 Not later than 48 hours before backfilling or filling with approved material, notify Contract Administrator to allow compaction tests to be carried out by designated testing agency.

### **3.05 BACKFILLING**

- .1 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.
- .2 Lateral support: maintain even levels of backfill around structures as work progresses, to equalize earth pressures.
- .3 Compaction of subgrade: compact existing subgrade under walks, paving, and slabs on grade, to same compaction as fill.
  - .1 Fill excavated areas with gravel and sand compacted as specified for fill.
- .4 Placing:
  - .1 Place backfill, fill and base course material in 150 mm lifts: add water as required to achieve specified density.
- .5 Compaction: compact each layer of material to following densities for material to ASTM D 698:
  - .1 To underside of base courses: 95%.
  - .2 Base courses: 100%.
  - .3 Elsewhere: 90%.
- .6 In trenches:
  - .1 Up to 300 mm above pipe or conduit: sand placed by hand.
  - .2 Over 300 mm above pipe or conduit: native material approved by Contract Administrator.
- .7 Against foundations (except as applicable to trenches and under slabs and paving): excavated material or imported material with no stones larger than 200 mm diameter within 600 mm of structures.

### **3.06 GRADING**

- .1 Grade so that water will drain away from buildings, walls and paved areas, to catch basins and other disposal areas approved by Contract Administrator.

**3.07 ADJUSTING**

- .1 Adjust door opening and closing times to suit handicapped users in accordance with Contract Administrator instructions.
- .2 Adjust control system to cause elevators to answer hall calls during working day within performance criteria specified.
- .3 Adjust for smooth acceleration and deceleration of car so as not to cause passenger discomfort.
- .4 Adjust automatic floor leveling feature at each floor.

**3.08 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
  - .2 Dispose of cleared and grubbed material off site daily.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 ASTM International
  - .1 ASTM D 4791, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

### **1.02 ADMINISTRATIVE REQUIREMENTS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for aggregate materials and include product characteristics, performance criteria, physical size, finish and limitations.

### **1.03 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Transportation and Handling: handle and transport aggregates to avoid segregation, contamination and degradation.
- .3 Storage: store washed materials or materials excavated from underwater 24 hours minimum to allow free water to drain and for materials to attain uniform water content.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- .1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, free from adherent coatings and injurious amounts of disintegrated pieces or other deleterious substances.
- .2 Flat and elongated particles of coarse aggregate: to ASTM D 4791.
  - .1 Greatest dimension to exceed 5 times least dimension.
- .3 Fine aggregates satisfying requirements of applicable section to be one, or blend of following:
  - .1 Screenings produced in crushing of quarried rock, boulders, gravel or slag.
  - .2 Reclaimed asphalt pavement.
  - .3 Reclaimed concrete material.
- .4 Coarse aggregates satisfying requirements of applicable section to be one of or blend of following:
  - .1 Crushed rock.
  - .2 Gravel and crushed gravel composed of naturally formed particles of stone.
  - .3 Light weight aggregate, including slag and expanded shale.
  - .4 Reclaimed concrete material.

### **2.02 SOURCE QUALITY CONTROL**

- .1 Inform Contract Administrator of proposed source of aggregates and provide access for sampling 4 weeks minimum before starting production.
- .2 If materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate alternative source.
- .3 Advise Contract Administrator 4 weeks minimum in advance of proposed change of material source.
- .4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- .1 Verification of Conditions: verify that conditions are acceptable for topsoil stripping.
  - .1 Visually inspect substrate.
  - .2 Proceed with topsoil stripping only after unacceptable conditions have been remedied.

### **3.02 PREPARATION**

- .1 Aggregate source preparation:
  - .1 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials.
  - .2 Where clearing is required, leave screen of trees between cleared area and roadways.
  - .3 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
  - .4 When excavation is completed dress sides of excavation to nominal 1.5:1 slope, and provide drains or ditches as required to prevent surface standing water.
  - .5 Trim off and dress slopes of waste material piles and leave site in neat condition.
  - .6 Provide silt fence or other means to prevent contamination of existing watercourse or natural wetland features.
- .2 Processing:
  - .1 Process aggregate uniformly, using methods that prevent contamination, segregation and degradation.
  - .2 Blend aggregates, as required, including reclaimed materials that meet the physical requirements of specification is permitted in order to satisfy gradation requirements for material and, percentage of crushed particles, or particle shapes specified.
- .3 Stockpiling:
  - .1 Stockpile aggregates on site in locations as indicated unless directed otherwise by the City. Do not stockpile on completed pavement surfaces.
  - .2 Stockpile aggregates in sufficient quantities to meet project schedules.
  - .3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
  - .4 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
  - .5 Do not use intermixed or contaminated materials.
  - .6 Stockpile materials in uniform layers of thickness as follows:
    - .1 Maximum 1.5 m for coarse aggregate and base course materials.
    - .2 Maximum 1.5 m for fine aggregate and sub-base materials.
    - .3 Maximum 1.5 m for other materials.
  - .7 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
  - .8 Do not cone piles or spill material over edges of piles.
  - .9 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

### **3.03 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .4 Leave any unused aggregates in neat compact stockpiles as directed by the City.
- .5 For temporary or permanent abandonment of aggregate source, restore source to condition meeting requirements of authority having jurisdiction.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.01 RELATED REQUIREMENTS**

- .1 Section 31 05 16 - Aggregate Materials.

### **1.02 REFERENCE STANDARDS**

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM C 117, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
  - .2 ASTM C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .3 ASTM D 422, Standard Test Method for Particle-Size Analysis of Soils.
  - .4 ASTM D 698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>) (600 kN-m/m<sup>3</sup>).
  - .5 ASTM D 1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup>) (2,700 kN-m/m<sup>3</sup>).
  - .6 ASTM D 4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.
  - .2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
    - .1 CSA-A3001, Cementitious Materials for Use in Concrete.
  - .2 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

### **1.03 DEFINITIONS**

- .1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.
  - .1 Rock: solid material in excess of 1.00m<sup>3</sup> and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m<sup>3</sup> bucket. Frozen material not classified as rock.
  - .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.
- .3 Topsoil:
  - .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
  - .2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.
- .4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .6 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.
- .7 Unsuitable materials:
  - .1 Weak, chemically unstable, and compressible materials.
  - .2 Frost susceptible materials:
    - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D 4318, and gradation within limits specified when tested to ASTM D 422 and ASTM C 136: Sieve sizes to CAN/CGSB-8.1.
  - .2 Table:

| <u>Sieve Designation    % Passing</u> |          |
|---------------------------------------|----------|
| 2.00 mm                               | 100      |
| 0.10 mm                               | 45 - 100 |

- 0.02 mm 10 - 80
- 0.005 mm 0 - 45
- .3 Coarse grained soils containing more than 20% by mass passing 0.075 mm sieve.
- .8 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

#### 1.04 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Preconstruction Submittals:
  - .1 Submit records of underground utility locates, indicating: location plan of existing utilities as found in field, clearance record from utility authority, location plan of relocated and abandoned services, as required.
  - .2 Submit stamped shop drawings by and Engineer for all Shoring required prior to excavation. Contract Administrator to review and comment on stamped shop drawings before excavation begins.

#### 1.05 EXISTING CONDITIONS

- .1 Buried services:
  - .1 Before commencing work establish location of buried services on and adjacent to site.
  - .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.
  - .3 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
  - .4 Prior to beginning excavation Work, notify applicable Contract Administrator establish location and state of use of buried utilities and structures. Contractor to clearly mark such locations to prevent disturbance during Work.
  - .5 Confirm locations of buried utilities.
  - .6 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
  - .7 Where utility lines or structures exist in area of excavation, obtain direction of Contract Administrator before removing or re-routing.
  - .8 Record location of maintained, re-routed and abandoned underground lines.
  - .9 Confirm locations of recent excavations adjacent to area of excavation.
- .2 Existing buildings and surface features:
  - .1 Conduct, Contract Administrator, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.
  - .2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Contract Administrator.

### **PART 2 – PRODUCTS**

#### 2.01 MATERIALS

- .1 Type 1 and Type 2 fill: properties to Section 31 05 16 - Aggregate Materials and the following requirements:
  - .1 Crushed, pit run or screened stone, gravel or sand.
  - .2 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.1.
  - .3 Table:

| Sieve Designation | % Passing |        |
|-------------------|-----------|--------|
|                   | Type 1    | Type 2 |
| 75 mm             | -         | 100    |
| 50 mm             | -         | -      |
| 37.5 mm           | -         | -      |
| 25 mm             | 100       | -      |
| 19 mm             | 75-100    | -      |
| 12.5 mm           | -         | -      |
| 9.5 mm            | 50-100    | -      |

- |          |       |       |
|----------|-------|-------|
| 4.75 mm  | 30-70 | 22-85 |
| 2.00 mm  | 20-45 | -     |
| 0.425 mm | 10-25 | 5-30  |
| 0.180 mm | -     | -     |
| 0.075 mm | 3-8   | 0-10  |
- .2 Type 3 fill: selected material from excavation or other sources, approved Contract Administrator for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.
  - .3 Unshrinkable fill: proportioned and mixed to provide:
    - .1 Maximum compressive strength of 0.4 MPa at 28 days.
    - .2 Maximum cement content of 25 kg/m<sup>3</sup> with 40% by volume fly ash replacement]: to CSA-A3001, Type GU.
    - .3 Minimum strength of 0.07 MPa at 24 h.
    - .4 Concrete aggregates: to CSA-A23.1/A23.2.
    - .5 Cement: Type GU.
    - .6 Slump: 160 to 200 mm.
  - .4 Shearwall: honeycomb type bio-degradable cardboard 100 mm thick, treated to provide sufficient structural support for poured concrete until concrete cured.

## **PART 3 – EXECUTION**

### **3.01 PREPARATION/ PROTECTION**

- .1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.
- .2 Keep excavations clean, free of standing water, and loose soil.
- .3 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .4 Protect buried services that are required to remain undisturbed.

### **3.02 SHORING AND BRACING**

- .1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with the Province of Manitoba.
  - .1 Where conditions are unstable, Shoring Engineer to verify and advise methods.
  - .2 Contractor to provide engineered Shoring Shop Drawings as per section 01 33 00 – Submittal Procedures.
- .2 Construct temporary Works to depths, heights and locations as indicated.
- .3 During backfill operation:
  - .1 Unless otherwise indicated or directed by Contract Administrator, remove sheeting and shoring from excavations.
  - .2 Do not remove bracing until backfilling has reached respective levels of such bracing.
  - .3 Pull sheeting in increments that will ensure compacted backfill is maintained at elevation at least 500 mm above toe of sheeting.
- .4 When sheeting is required to remain in place, cut off tops at elevations as indicated.
- .5 Upon completion of substructure construction:
  - .1 Remove cofferdams, shoring and bracing as directed by Engineer.

### **3.03 EXCAVATION**

- .1 Advise Contract Administrator at least 7 days in advance of excavation operations for initial cross sections to be taken.
- .2 Excavate to lines, grades, elevations and dimensions as indicated.
- .3 Remove concrete, rubble and other obstructions encountered during excavation in accordance with Section 02 41 19 - Selective Demolition.
- .4 Excavation must not interfere with bearing capacity of adjacent foundations.
- .5 For trench excavation, unless otherwise authorized by Contract Administrator in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.
- .6 Restrict vehicle operations directly adjacent to open trenches.

- .7 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .8 Notify Contract Administrator when bottom of excavation is reached.
- .9 Obtain Contract Administrator approval of completed excavation.
- .10 Hand trim, make firm and remove loose material and debris from excavations.
  - .1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

### **3.04 FILL TYPES AND COMPACTION**

- .1 Use types of fill as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D 698.
  - .1 Within building area: use Type 2 to underside of base course for floor slabs. Compact to 100 % of corrected maximum dry density.
  - .2 Under concrete slabs: provide 150 mm compacted thickness base course of Type 1 fill topped with shearmat filler as indicated to underside of slab. Compact base course to 100 %.
  - .3 Place unshrinkable fill in areas as indicated.

### **3.05 BEDDING AND SURROUND OF UNDERGROUND SERVICES**

- .1 Place and compact granular material for bedding and surround of underground services as indicated.
- .2 Place bedding and surround material in unfrozen condition.

### **3.06 BACKFILLING**

- .1 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .2 Do not use backfill material which is frozen or contains ice, snow or debris.
- .3 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .4 Backfilling around installations:
  - .1 Place bedding and surround material as specified elsewhere.
  - .2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
  - .3 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 1 m.
  - .4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
    - .1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Contract Administrator.

### **3.07 RESTORATION**

- .5 Clean and reinstate areas affected by Work as directed by Contract Administrator.

**END OF SECTION**