## Part 1 GENERAL

### 1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises general construction of a new vestibule, and renovations to adjacent interior finishes at the Millennium Library, located at 251 Donald St.; and further identified as Southwest Entrance Development.

### 1.2 CONTRACT METHOD

.1 Construct Work under stipulated price contract.

### 1.3 WORK BY OTHERS

.1 Co-operate with other Subcontractors in carrying out their respective Works and carry out instructions from Contract Administrator.

.2 Co-ordinate Work with that of other Subcontractors. If any part of Work under this Contract depends for its proper execution or result upon Work of another Sub-contractor, report promptly to Contract Administrator, in writing, any defects which may interfere with proper execution of Work.

### 1.4 WORK SEQUENCE

.1 Construct Work to accommodate The City's continued use of premises during construction.

.2 Co-ordinate Progress Schedule and co-ordinate with The City’s Occupancy during construction.

.3 Maintain fire access/control.

### 1.5 CONTRACTOR USE OF PREMISES

.1 Limit use of premises for Work, for storage, and for access, to allow:

.1 The City’s occupancy.
.2 Work by other Contractors.
.3 Public usage.

.2 Co-ordinate use of premises under direction of The City.

.3 Obtain and pay for use of additional storage or Work areas needed for operations under this Contract.

.4 Remove or alter existing Work to prevent injury or damage to portions of existing Work which remain.

.5 Repair or replace portions of existing Work which have been altered during construction operations to match existing or adjoining Work, as directed by Contract Administrator.

.6 At completion of operations condition of existing Work: equal to or better than that which existed before new Work started.

## 1.6 OCCUPANCY BY THE CITY

.1 The City will occupy premises during entire construction period for execution of normal operations.

.2 Co-operate with The City in scheduling operations to minimize conflict and to facilitate The City's usage.

## 1.7 ITEMS FURNISHED BY THE CITY

.1 The City's Responsibilities:

.1 Arrange for delivery of Shop Drawings, product data, samples, manufacturer's instructions, and certificates to Contractor.

.2 Deliver supplier's bill of Materials to Contractor.

.3 Arrange and pay for delivery to Site in accordance with Progress Schedule.

.4 Inspect deliveries jointly with Contractor.

.5 Submit claims for transportation damage.

.6 Arrange for replacement of damaged, defective or missing items.

.7 Arrange for manufacturer's field services; arrange for and deliver manufacturer's warranties and bonds to Contractor.

.2 Contractor Responsibilities:

.1 Designate submittals and delivery date for each product in progress schedule.

.2 Review Shop Drawings, product data, samples, and other submittals. Submit to Contract Administrator notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.

.3 Receive and unload products at Site.

.4 Inspect deliveries jointly with The City; record shortages, and damaged or defective items.

.5 Handle products at Site, including uncrating and storage.

.6 Protect products from damage, and from exposure to elements.

.7 Assemble, install, connect, adjust, and finish products.

.8 Provide installation inspections required by public authorities.

.9 Repair or replace items damaged by Contractor or Subcontractor on Site (under his control).

.3 Schedule of items furnished by The City:

.1 Existing Book Drop Box.

.2 Existing Sign.

## 1.8 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

.1 Execute Work with least possible interference or disturbance to building operations, occupants, public and normal use of premises. Arrange with The City to facilitate execution of Work.

## 1.9 EXISTING SERVICES

.1 Notify The City and utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, give The City 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, vehicular traffic and tenant operations.

.3 Provide alternative routes for pedestrian and vehicular traffic.

.4 Establish location and extent of service lines in area of Work before starting Work. Notify Contract Administrator of findings.

.5 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.

.6 Provide temporary services when directed by Contract Administrator to maintain critical building and tenant systems.

.7 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.

.8 Where unknown services are encountered, immediately advise Contract Administrator and confirm findings in writing.

.9 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by Authorities Having Jurisdiction.

.10 Record locations of maintained, re-routed and abandoned service lines.

.11 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

## 1.10 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 Health and Safety Plan and Other Safety Related Documents.

.11 Other documents as specified.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 ACCESS AND EGRESS

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

### 1.2 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with The City to facilitate work as stated.

.2 Maintain existing services to building and provide for personnel and vehicle access.

.3 Where security is reduced by work provide temporary means to maintain security.

.4 The City will assign sanitary facilities for use by Contractor's personnel. Keep facilities clean.

.5 Closures: protect work temporarily until permanent enclosures are completed.

### 1.3 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

.1 Execute work with least possible interference or disturbance to [building operations, occupants, public and normal use of premises. Arrange with The City to facilitate execution of work.

### 1.4 EXISTING SERVICES

.1 Notify, Contract Administrator, The City and utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, give The City 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.

.3 Provide for personnel, pedestrian and vehicular traffic as they apply to work of this contract.

.4 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

### 1.5 SPECIAL REQUIREMENTS

.1 Carry out noise generating Work prior to 10:00 am. If noise generating activities are necessary after this time, coordinate with the The City for permission.

.2 Submit schedule in accordance with Section 01 32 18 - Construction Progress Schedules - Bar (GANTT) Chart.

.3 Ensure that Contractor 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. Minimize traffic by Contractor employees through the existing building.

.5 An escort by library staff will be required to access electrical panels. Coordinate requirements with The City.

## 1.6 SECURITY CLEARANCES

.1 Personnel employed on this project will be subject to security check in accordance with Appendix A. Obtain clearance, as instructed, for each individual who will be required to enter premises.

## 1.7 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions. Smoking is not allowed on the project grounds.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 REFERENCES

.1 Project Supplementary Conditions

### 1.2 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 installation 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 is as follows:

.1 Include allowance of $ 1,000.00 for compaction testing for slab base.

.2 Include allowance of $ 3,000.00 for concrete testing.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 APPLICATIONS FOR PROGRESS PAYMENT

.1 Make applications for payment on account monthly as Work progresses.

.2 Date applications for payment last day of agreed monthly payment period and ensure amount claimed is for value, proportionate to amount of Contract, of Work performed and Products delivered to Place of Work at that date.

.3 Submit to Contract Administrator, at least 14 days before first application for payment. Schedule of values for parts of Work, aggregating total amount of Contract Price, to facilitate evaluation of applications for payment.

### 1.2 SCHEDULE OF VALUES

.1 Provide schedule of values supported by evidence as The City may reasonably direct and when accepted by The City, be used as basis for applications for payment.

.2 Include statement based on schedule of values with each application for payment.

.3 Support claims for products delivered to Place of Work but not yet incorporated into Work by such evidence as Contract Administrator may reasonably require to establish value and delivery of products.

### 1.3 PROGRESS PAYMENT

.1 Contract Administrator will issue to The City, no later than 10 days after receipt of an application for payment, certificate for payment in amount applied for or in such other amount as Contract Administrator determines to be due. If Contract Administrator amends application, Contract Administrator will give notification in writing giving reasons for amendment.

### 1.4 CHANGE ORDER PRICING

.1 Change Order pricing shall be limited to the following:

- .1 Job Costs
  - .1 Equipment: at cost.
  - .2 Cartage and Freight: at cost.
  - .3 Clean-up: 3% of value of change in the Work.
  - .4 Disposal: at cost.
  - .5 Small tools and expendables: at cost.
  - .6 Estimating and Price Review: 10% of value of change in the Work (to a maximum cost of $1,000.00).
  - .7 Trade Supervision: 5% of value of change in the Work (to a maximum cost of $1,000.00)
  - .8 Site office and communication (only in the event of a schedule extension): at cost.

.9 Project manager, coordinator (only in the event of a schedule extension): at cost.

.2 Overhead and Markups as follows:

.1 Contractor's markup on his own Work: 10%

.2 Contractor's overhead on his own Work: 10%

.3 Contractor's markup on Sub-Contractor's Work: 10%

.4 Contractor's overhead on Sub-Contractor's Work: 5%

## 1.5 SUBSTANTIAL PERFORMANCE OF WORK

.1 Prepare and submit to Contract Administrator comprehensive list of items to be completed or corrected and apply for a review by Contract Administrator to establish Substantial Performance of Work or substantial performance of designated portion of Work when Work is substantially performed if permitted by lien legislation applicable to Place of Work. Failure to include items on list does not alter responsibility to complete Contract.

.2 No later than 10 days after receipt of list and application, Contract Administrator will review Work to verify validity of application, and no later than 7 days after completing review, will notify Contractor if Work or designated portion of Work is substantially performed.

.3 Contract Administrator: state date of Substantial Performance of Work or designated portion of Work in certificate.

.4 Immediately following issuance of certificate of Substantial Performance of Work, in consultation with Contract Administrator, establish reasonable date for finishing Work.

## 1.6 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF WORK

.1 After issuance of certificate of Substantial Performance of Work:

.1 Submit application for payment of holdback amount.

.2 Submit sworn statement that accounts for labour, subContracts, products, construction machinery and equipment, and other indebtedness which may have been incurred in Substantial Performance of Work and for which The City might in be held responsible have been paid in full, except for amounts properly retained as holdback or as identified amount in dispute.

.2 After receipt of application for payment and sworn statement, Contract Administrator will issue certificate for payment of holdback amount.

.3 Where holdback amount has not been placed in a separate holdback account, The City shall, 10 days prior to expiry of holdback period stipulated in lien legislation applicable to Place of Work, place holdback amount in bank account in joint names of The City and Contractor.

.4 Amount authorized by certificate for payment of holdback amount is due and payable on day following expiration of holdback period stipulated in lien legislation applicable to Place of Work. Where lien legislation does not exist or apply, holdback amount is due and payable in accordance with other legislation, industry practice, or provisions which may be agreed to between

parties. The City may retain out of holdback amount sums required by law to satisfy liens against Work or, if permitted by lien legislation applicable to Place of Work, other third party monetary claims against Contractor which are enforceable against The City.

## 1.7 PROGRESSIVE RELEASE OF HOLDBACK

.1 Where legislation permits, if Contract Administrator has certified that Work of subContractor or supplier has been performed prior to Substantial Performance of Work, The City shall pay holdback amount retained for such subContract Work, or products supplied by such supplier, on day following expiration of holdback period for such Work stipulated in lien legislation applicable to Place of Work.

.2 In addition to provisions of preceding paragraph, and certificate wording, ensure that such subContract Work or products is protected pending issuance of final certificate for payment and be responsible for correction of defects or Work not performed regardless of whether or not such was apparent when such certificates were issued.

## 1.8 FINAL PAYMENT

.1 Submit application for final payment when Work is completed.

.2 Contract Administrator will, no later than 10 days after receipt of application for final payment, review Work to verify validity of application. Contract Administrator will give notification that application is valid or give reasons why it is not valid, no later than 7 days after reviewing Work.

.3 Contract Administrator will issue final certificate for payment when application for final payment is found valid.

## 1.9 CLAIMS FOR DELAYS

.1 In the case where the Contractor elects to request a delay claim at any point in executing the Work, the identical per day costs shall be levied against the Contractor for failing to meet the final total performance of Work as identified in the Contract. This includes delays caused by Work not accepted by Authorities Having Jurisdiction during final inspections or any other deficiencies that prolong the final occupancy date. This includes any delay caused directly or indirectly by the Contractor by failing to meet the intent of the Contract documents or failing to satisfy the wishes of the Authorities Having Jurisdiction over the issuance of permits. This clause shall only be enacted by the The City at the discretion of the Contract Administrator and only after the Contractor has previously initiated an earlier delay claim on the project.

**END OF SECTION**

# Part 1 GENERAL

## 1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

.1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Contract Administrator are specified under various sections.

## 1.2 APPOINTMENT AND PAYMENT

.1 Contract Administrator will appoint services of testing laboratory except follows:

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.

.4 Mill tests and certificates of compliance.

.5 Tests specified to be carried out by Contractor under the supervision of Contract Administrator.

.2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Contract Administrator to verify acceptability of corrected Work.

.3 Payment for tests shall be from designated cash allowance as stipulated in Section 01 21 00 – Allowances.

## 1.3 CONTRACTOR'S RESPONSIBILITIES

.1 Provide labour, equipment and facilities to:

.1 Provide access to Work for inspection and testing.

.2 Facilitate inspections and tests.

.3 Make good Work disturbed by inspection and test.

.4 Provide storage on Site for laboratory's exclusive use to store equipment and cure test samples.

.2 Notify Contract Administrator sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.3 Where Materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Contract Administrator.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 ADMINISTRATIVE

.1 Schedule and administer project meetings throughout the progress of the Work at regular intervals and at the call of Contract Administrator

.2 Prepare agenda for meetings.

.3 Distribute written notice of each meeting four days in advance of meeting date to Contract Administrator.

.4 Provide physical space and make arrangements for meetings.

.5 Preside at meetings.

.6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.

.7 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants and, affected parties not in attendance.

.8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

### 1.2 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 Senior representatives of Contract Administrator, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.

.3 Establish 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 18 – Construction Progress Schedule: 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 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.6 Proposed changes, Change Orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

.7 Products provided by The City.

.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.

## 1.3 PROGRESS MEETINGS

.1 During course of Work and 2 weeks prior to project completion, schedule progress meetings bi-weekly.

.2 Contractor, major Subcontractors involved in Work, Contract Administrator and The City are to be in attendance.

.3 Notify parties minimum 7 days prior to meetings.

.4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 3 days after meeting.

.5 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 affect on construction schedule and on completion date.

.12 Other business.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 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.

.9 Project Planning, Monitoring and Control System: overall system operated by Contract Administrator to enable monitoring of Project Work in relation to established milestones.

### 1.2 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.

## 1.3 SUBMITTALS

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

.2 Submit to Contract Administrator within 15 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.

## 1.4 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.

## 1.5 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 Award.
.2 Shop Drawings, Samples.
.3 Permits.
.4 Mobilization.
.5 Excavation.
.6 Backfill.
.7 Building foundations.
.8 Slab on grade.
.9 Structural Steel.
.10 Siding and Roofing.
.11 Interior Architecture (Walls, Floors and Ceiling).
.12 Plumbing.
.13 Lighting.
.14 Electrical.
.15 Piping.

.16 Controls.

.17 Heating, Ventilating, and Air Conditioning.

.18 Fire Systems.

.19 Testing and Commissioning.

## 1.6 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on monthly basis reflecting activity changes and completions, as well as activities in progress. Include in monthly application for payment.

.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.

## 1.7 PROJECT MEETINGS

.1 Discuss Project Schedule at regular 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.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 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 Present Shop Drawings, product data, samples and mock-ups in Imperial units.

.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.

.10 Any questions or communication from Site or Contractor shall come in the form of a Request For Information (RFI). RFI shall be numbered, dated, titled and come complete with drawing references, photos and suggestions for solutions. It is important that all questions are clear and well documented for the Contract Administrator to fully understand the issue and be able to reply in a thorough and timely manner.

### 1.2 BASECAMP REQUIREMENT

.1 Contractor will be responsible for use of Contract Administrator’s web-based software, Basecamp, to manage submittals, and other correspondence for the Contract Administration phase of the project.

.2 Upon Contract award, Contractor’s personnel will be assigned log-in information to allow them to upload and access files.

.3 There is no cost to the Contractor for use of this software.

## 1.3 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.

.3 Shop Drawings which require approval of any legally constituted Authority Having Jurisdiction shall be provided to such Authority by the Contractor for approval.

.4 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.

.5 At the time of providing Shop Drawings, the Contractor shall expressly advise the Contract Administrator in writing of any deviations in a Shop Drawing from the requirements of the Contract Documents. The Contract Administrator shall indicate the acceptance or rejection of such deviation expressly in writing.

.6 Supply Shop Drawings to the Contract Administrator to review in orderly sequence and sufficiently in advance so as to cause no delay in the work, or in the work of other Contractors.

.7 Allow 10 days for Contract Administrator's review of each Submission.

.8 Contract Administrator’s review is for conformity to the design concept and for general arrangement only. The Contract Administrator’s review shall not relieve the Contractor of responsibility for errors or omissions in the Shop Drawings or for meeting all requirements of the Contract Documents.

.9 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.

.10 Provide revised Shop Drawings to correct those which the Contract Administrator rejects as inconsistent with the Contract Documents, unless otherwise directed by the Contract Administrator. The Contractor shall notify the Contract Administrator in writing of any revisions to the Shop Drawings other than those requested by the Contract Administrator.

.11 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.

.12 Accompany Submissions with transmittal letter, in duplicate, 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.

.13 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. The Contractor represents by this review that

.1 The Contractor has determined and verified all applicable field measurements, field construction conditions, Product requirements, catalogue numbers and similar data,

.2 The Contractor has checked and co-ordinated each Shop Drawing with the requirements of the Work and of the 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.

.14 After Contract Administrator's review, distribute copies.

.15 Submit electronic PDF copy of Shop Drawings for each requirement requested in Specification Sections and as Contract Administrator may reasonably request.

.16 Submit 1 electronic PDF copy 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.

.17 Submit 1 electronic PDF copy 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.

.18 Submit 1 electronic PDF copy of certificates for requirements requested in Specification Sections and as requested by Contract Administrator.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets Specification requirements.

.2 Certificates must be dated after award of project Contract complete with project name.

.19 Submit 1 electronic PDF copy 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.

.20 Submit 1 electronic PDF copy of Manufacturer's Field Reports for requirements requested in Specification Sections and as requested by Contract Administrator.

.21 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.22 Submit 6 copies of Operation and Maintenance Data for requirements requested in Specification Sections and as requested by Contract Administrator.

.23 Delete information not applicable to project.

.24 Supplement standard information to provide details applicable to project.

.25 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.

## 1.4 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.

## 1.5 MOCK-UPS

.1 Erect mock-ups in accordance with 01 45 00 - Quality Control.

## 1.6 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic copy of colour digital photography in jpg format, fine resolution monthly at time of progress statement and as directed by Contract Administrator. Upload to Basecamp.

.2 Project identification: name and number of project and date of exposure indicated.

.3 Number of viewpoints:

.1 Viewpoints shall be selected to demonstrate progress of all work taking place on Site, including Materials delivered but not yet installed. Submit not less than 15 photographs.

.1 Additional viewpoints shall be provided to show work that is to be concealed, including but not limited to foundations, weeping tile, reinforcing bar, waterproofing, fire-stopping, sub slab conditions including compacted granular, etc.

.2 Where a particular spacing or dimension is critical for proper performance of the Work (ie. Rebar spacing, weeping tile slope), include detail photographs demonstrating proper spacing. Include measuring tape in photograph.

.4 Frequency of photographic documentation: weekly, prior to concealing work, and as directed by Contract Administrator.

## 1.7 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

.2 Submit transcription of insurance immediately after award of Contract.

**END OF SECTION**

# Part 1 GENERAL

## 1.1 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.3 Province of Manitoba

.1 The Workers Compensation Act RSM 1987 – Current Edition.

## 1.2 SUBMITTALS

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

.2 Submit Site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of Site specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for Site tasks and operation found in Work plan.

.3 Submit 1 PDF copy of Contractor's authorized representative's Work Site health and safety inspection reports to Contract Administrator and authority having jurisdiction, at intervals as required by governing regulations.

.4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.5 Submit copies of incident and accident reports.

.6 The City will review Contractor's Site-specific Health and Safety Plan and provide comments, if necessary, to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to Contract Administrator within 5 days after receipt of comments from Contract Administrator.

.7 The City’s review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.8 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for Site Personnel prior to commencement of Work, and submit additional certifications for any new Site Personnel to Contract Administrator.

.9 On-Site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

## 1.3 FILING OF NOTICE

.1 File Notice of Project with Provincial authorities prior to beginning of Work.

## 1.4 SAFETY ASSESSMENT

.1 Perform Site specific safety hazard assessment related to project.

## 1.5 MEETINGS

.1 Schedule and administer Health and Safety meeting prior to commencement of Work.

## 1.6 REGULATORY REQUIREMENTS

.1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

## 1.7 GENERAL REQUIREMENTS

.1 Develop written Site-specific Health and Safety Plan based on hazard assessment prior to beginning Site Work and continue to implement, maintain, and enforce plan until final demobilization from Site. Health and Safety Plan must address project Specifications.

.2 Contract Administrator may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

## 1.8 RESPONSIBILITY

.1 Be responsible for health and safety of Persons on Site, safety of property on Site and for protection of Persons adjacent to Site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with Site-specific Health and Safety Plan.

## 1.9 COMPLIANCE REQUIREMENTS

.1 Comply with The Workers Compensation Act, Workplace Safety Regulation, Manitoba Regulations.

## 1.10 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factors, hazards, or conditions occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Contract Administrator verbally and in writing.

## 1.11 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

.1 Have Site-related Working experience specific to activities associated with hazardous Materials commonly encountered on the construction Site.

.2 Have Working knowledge of occupational safety and health regulations.

.3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that Personnel not successfully completing required training are not permitted to enter Site to perform Work.

.4 Be responsible for implementing, enforcing daily and monitoring Site-specific Contractor's Health and Safety Plan.

.5 Be on Site during execution of Work and report directly to and be under direction of Site supervisor.

## 1.12 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on Site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Contract Administrator.

## 1.13 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Contract Administrator.

.2 Provide Contract Administrator with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Contract Administrator may stop Work if non-compliance of health and safety regulations is not corrected.

## 1.14 POWDER ACTUATED DEVICES

.1 Use powder actuated devices only after receipt of written permission from Contract Administrator.

## 1.15 WORK STOPPAGE

.1 Give precedence to safety and health of public and Site Personnel and protection of environment over cost and schedule considerations for Work.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 REFERENCES AND CODES

.1 Perform Work in accordance with National Building Code of Canada (NBC) including amendments up to Bid closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:

.1 Contract Documents.

.2 Specified standards, codes and referenced documents.

### 1.2 HAZARDOUS MATERIAL DISCOVERY

.1 Asbestos: demolition of spray or trowel-applied asbestos is hazardous to health. Stop Work immediately when Material resembling spray or trowel-applied asbestos is encountered during demolition Work. Notify Contract Administrator.

.2 PCB: Polychlorinated Biphenyl: stop Work immediately when Material resembling Polychlorinated Biphenyl is encountered during demolition Work. Notify Contract Administrator.

.3 Mould: stop Work immediately when Material resembling mould is encountered during demolition Work. Notify Contract Administrator.

### 1.3 BUILDING SMOKING ENVIRONMENT

.1 No smoking is permitted on the project grounds. Comply with smoking restrictions and municipal by-laws.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 INSPECTION

.1 Allow Contract Administrator and authorized agencies 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 The Contractor shall give the Contract Administrator reasonable notification of when the Work will be ready for review and inspection. The Contractor shall arrange for and shall give the Contract Administrator reasonable notification of the date and time of inspections by other authorities.

.4 The Contractor shall furnish promptly to the Contract Administrator two copies of certificates and inspection reports relating to the Work.

.5 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, make good such Work and pay cost of examination and correction.

.6 Contract Administrator will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such Work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, The City shall pay cost of examination and replacement.

.7 The Contractor shall pay the cost of making any test or inspection, including the cost of samples required for such test or inspection, if such test or inspection is designated in the Contract Documents to be performed by the Contractor or is designated by the laws or ordinances applicable to the Place of the Work.

.1 Refer to Section 01 29 83 – Payment Procedures for Testing Laboratory Services.

### 1.2 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Contract Administrator for purpose of inspecting and/or testing portions of Work.

.2 Allocated costs: to Section 01 29 83 – Payment Procedures for Testing Laboratory Services.

.3 Provide equipment required for executing inspection and testing by appointed agencies.

.4 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.5 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 reinspection.

## 1.3 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.

## 1.4 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.

## 1.5 REJECTED WORK

.1 Promptly 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.

## 1.6 REPORTS

.1 Submit 1 copy of inspection and test reports to Contract Administrator.

.2 Provide copies to SubContractor of Work being inspected or tested or manufacturer or fabricator of Material being inspected or tested.

## 1.7 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.

## 1.8 MOCK-UPS

.1 Prepare mock-ups for Work specifically requested in Specifications. Include for Work of Sections required to provide mock-ups.

.2 Construct in locations acceptable to Contract Administrator.

.3 Prepare mock-ups for Contract Administrator's review with reasonable promptness and in orderly sequence, to not cause delays in Work.

.4 Failure to prepare mock-ups 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.

.5 If requested, Contract Administrator will assist in preparing schedule fixing dates for preparation.

.6 Mock-ups may remain as part of Work.

## 1.9 MILL TESTS

.1 Submit mill test certificates as required of Specification Sections.

## 1.10 EQUIPMENT AND SYSTEMS

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

**END OF SECTION**

# Part 1 GENERAL

## 1.1 SUBMITTALS

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

## 1.2 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute Work expeditiously.

.2 Remove from Site all such Work after use.

## 1.3 DEWATERING

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

## 1.4 WATER SUPPLY

.1 The City will provide continuous supply of potable water for construction use.

## 1.5 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 will be operational during the performance of Work of this Contract. Prevent pollution of existing heating system by construction activities. Be responsible for damage to heating system.

.7 On completion of Work, replace filters, in permanent heating system and clean as required.

.8 Pay costs for maintaining temporary heat.

.9 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.

.10 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

## 1.6 TEMPORARY POWER AND LIGHT

.1 The City will pay for temporary power during construction for temporary lighting and operating of power tools, to a maximum supply of 230 volts.

.2 Arrange for method of connection with The City. Pay costs for installation, maintenance and removal of temporary electrical panels if required.

.3 Temporary power for equipment requiring in excess of above is responsibility of Contractor.

.4 Provide and maintain temporary lighting throughout Work area. Ensure level of illumination is not less than 162 lx.

.5 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Contract Administrator provided that guarantees are not affected. Make good damage to electrical system caused by use under this Contract. Replace lamps which have been used for more than 3 months.

## 1.7 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for temporary telephone and data hook up, lines and equipment necessary for own use.

### 1.8 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction, and governing codes, regulations and bylaws.

.2 Burning rubbish and construction waste Materials is not permitted on Site.

## Part 2 PRODUCTS

### 2.1 NOT USED

.1 Not Used.

## Part 3 EXECUTION

### 3.1 NOT USED

.1 Not Used.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.

.2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.2 Canadian Standards Association (CSA International)

.1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA-0121-M1978(R2003), Douglas Fir Plywood.

.3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.

.4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.

.3 U.S. Environmental Protection Agency (EPA) / Office of Water

.1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

### 1.2 SUBMITTALS

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

### 1.3 INSTALLATION AND REMOVAL

.1 Prepare Site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, avenues of ingress/egress to fenced area and details of fence installation.

.2 Indicate use of supplemental or other staging area.

.3 Provide construction facilities in order to execute Work expeditiously.

.4 Remove from Site all such Work after use.

### 1.4 TEMPORARY WORK

.1 The Contractor shall have the sole responsibility for the design, erection, operation, maintenance, and removal of Temporary Work.

.2 The Contractor shall engage and pay for registered professional engineering Personnel skilled in the appropriate disciplines to perform those functions referred to above, where required by law or by the Contract Documents and in all cases where such Temporary Work is of such a nature that professional engineering skill is required to produce safe and satisfactory results.

## 1.5 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA-S269.2.

.2 Provide and maintain scaffolding, ramps, ladders, platforms and all other temporary construction required to complete the Work.

.3 Scaffolding to be designed by a professional engineer licensed in the Province of Manitoba.

## 1.6 HOISTING

.1 Provide, operate and maintain hoists required for moving of Workers, Materials and equipment. Make financial arrangements with SubContractors for their use of hoists.

.2 Hoists to be operated by qualified operator.

## 1.7 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.

## 1.8 CONSTRUCTION PARKING

.1 No parking will be provided for Contractor's employees. 2 hour metered parking is available on West side of Donald St. at the Contractor's expense. Alternative arrangements for parking, such as street parking passes may be available from the Winnipeg Parking Authority. Coordinate with WPA as required.

.2 Arrange permission with City of Winnipeg for extended use of loading zone if required.

## 1.9 OFFICES

.1 Space within the existing building and project grounds is limited. If temporary office is required on Site, make arrangements with The City after Contract award.

## 1.10 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.

## 1.11 CONSTRUCTION SIGNAGE

.1 Provide and erect project sign, within three weeks of signing Contract, in a location designated by Contract Administrator.

.2 Construction sign design to be provided by Contract Administrator.

.3 No other signs or advertisements, other than warning signs, are permitted on Site.

.4 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.

.5 Maintain approved signs and notices in good condition for duration of project, and dispose of off Site on completion of project or earlier if directed by Contract Administrator.

## 1.12 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Contract Administrator.

.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.

## 1.13 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

## 2.1 NOT USED

.1 Not Used.

## Part 3 EXECUTION

.1 Not Used.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.

.2 Canadian Standards Association (CSA International)

.1 CSA-O121-M1978(R2003), Douglas Fir Plywood.

### 1.2 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from Site all such Work after use.

### 1.3 HOARDING

.1 Erect temporary Site enclosure using new 1.8 m high wire fence tied to steel fence posts spaced at 2.4 m on centre. Provide one lockable truck gate. Maintain fence in good repair.

### 1.4 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs, and other areas where a risk of falling exists.

.2 Provide as required by governing authorities.

### 1.5 WEATHER ENCLOSURES

.1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.

.2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior Work for temporary heat.

.3 Design enclosures to withstand wind pressure and snow loading.

### 1.6 DUST TIGHT SCREENS

.1 Provide dust tight screens or insulated partitions to localize dust generating activities, and for protection of Workers, finished areas of Work and Public.

.2 Interior hoarding wall to be constructed as noted on Drawings, and be sound and aesthetically pleasing. Access to site through partition/wall shall be by hinged door, weatherstripped/sealed when closed.

.3 Maintain and relocate protection until such Work is complete.

## 1.7 ACCESS TO SITE

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

## 1.8 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.

## 1.9 FIRE ROUTES

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

## 1.10 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.

## 1.11 PROTECTION OF BUILDING FINISHES

.1 Provide protection for finished and partially finished building materials 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.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 REFERENCES

.1 Within text of each Specification section, mention 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.

.4 Cost for such testing will be borne by The City in event of conformance with Contract Documents or by Contractor in event of non-conformance.

### 1.2 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 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.

.3 Should disputes arise as to quality or fitness of products, decision rests strictly with Contract Administrator based upon requirements of Contract Documents.

.4 Unless otherwise indicated in Specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.5 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.

### 1.3 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.

## 1.4 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 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.

## 1.5 TRANSPORTATION

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

.2 Transportation cost of products supplied by The City will be paid for by The City unless stated otherwise in the specific Sections. Unload, handle and store such products.

## 1.6 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.

## 1.7 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.

## 1.8 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.

## 1.9 CONCEALMENT

.1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation inform Contract Administrator if there is interference. Install as directed by Contract Administrator.

## 1.10 REMEDIAL WORK

.1 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, unless noted otherwise.

.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.

## 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, and pedestrian and vehicular traffic. Coordinate with The City per Section 01 14 00 – Work Restrictions.

.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.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 QUALIFICATIONS OF SURVEYOR

.1 Qualified registered land surveyor, licensed to practice in Place of Work, acceptable to Contract Administrator.

### 1.2 SURVEY REQUIREMENTS

.1 Establish temporary bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.

.2 Establish lines and levels, locate and lay out, by instrumentation.

.3 Stake batter boards for foundations.

.4 Establish foundation column locations and floor elevations.

### 1.3 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.

### 1.4 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.

### 1.5 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.

## 1.6 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.

## 1.7 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 a reasonable assumption of probable conditions based thereon.

.2 After prompt investigation, should Contract Administrator determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 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.
- .5 Work of The City or separate Contractor.

.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 The City or separate Contractor.
- .7 Written permission of affected separate Contractor.
- .8 Date and time work will be executed.

### 1.2 MATERIALS

.1 Required for original installation.

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

### 1.3 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.

## 1.4 CONTROL OF THE WORK

.1 The Contractor shall have total control of the Work and shall effectively direct and supervise the Work so as to ensure conformity with the Contract Documents.

.2 The Contractor shall be solely responsible for construction means, methods, techniques, sequences, and procedures and for co-ordinating the various parts of the Work under the Contract.

.3 The Contract Administrator will not be responsible for and will not have control, charge or supervision of construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs required in connection with the Work in accordance with applicable construction safety legislation, other regulations or general construction practice. The Contract Administrator will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Contract Administrator will not have control over, charge of or be responsible for the acts or omissions of the Contractor, Subcontractors, suppliers, or their agents, employees, or any other persons performing portions of the Work.

## 1.5 EXECUTION

.1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.

.2 Cutting and remedial work shall be performed by specialists familiar with the Products affected and shall be performed in a manner to neither damage nor endanger the Work.

.3 Fit several parts together, to integrate with other Work.

.4 Uncover Work to install ill-timed Work.

.5 Remove and replace defective and non-conforming Work.

.6 Remove samples of installed Work for testing when directed by Contract Administrator or required by specific Specification sections.

.7 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

.8 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.9 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

.10 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.

.11 Restore Work with new products in accordance with requirements of Contract Documents.

.12 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.13 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.

.14 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

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

**END OF SECTION**

## Part 1 GENERAL

### 1.1 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by The City or other Contractors.

.2 Remove waste materials from Site at daily regularly scheduled times. 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 Provide and use marked separate bins for recycling.

.7 Dispose of waste materials and debris at designated dumping areas off Site.

.8 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.

.9 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.10 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

.11 Use only cleaning Materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

.12 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

### 1.2 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 including that caused by The City or other Contractors.

.5 Remove waste materials from Site at regularly scheduled times. Do not burn waste materials on Site.

.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 as it applies to the work of this contract.

.8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors and ceilings.

.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 Sweep and wash clean paved areas.

.17 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.

.18 Clean roofs, downspouts, and drainage systems.

.19 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

.20 Remove snow and ice from access to building.

.21 Cleaning activities shall extend beyond the area of the renovation if Contract Administrator determines that work of this Contract has resulted in undue deposition of dirt and debris elsewhere within the building or the Site.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 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 Administrator 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 authorities having jurisdiction: submitted.

.5 Operation of systems: demonstrated to The City's personnel.

.6 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 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 Lien and Warranty Periods: date of The City's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.7 Final Payment:

.1 When Contract Administrator considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

.2 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.

## 1.2 FINAL CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.1 Remove surplus Materials, excess Materials, rubbish, tools and equipment.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 ADMINISTRATIVE REQUIREMENTS

.1 Pre-warranty Meeting:

.1 Convene meeting one week prior to Contract completion with Contractor's representative and Contract Administrator, in accordance with Section 01 31 19 - Project Meetings to:

.1 Verify Project requirements.

.2 Review manufacturer's warranty requirements.

.2 Contract Administrator to establish communication procedures for:

.1 Notifying construction warranty defects.

.2 Determine priorities for type of defects.

.3 Determine reasonable response time.

.3 Contact information for bonded and licensed company for warranty Work action: provide name, telephone number and address of company authorized for construction warranty Work action.

.4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty Work action.

### 1.2 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 to the Contract Administrator, four final copies of operating and maintenance manuals in English.

.3 Provide spare parts, maintenance Materials and special tools of same quality and manufacture as products provided in Work.

.4 Provide evidence, if requested, for type, source and quality of products supplied.

### 1.3 FORMAT

.1 Organize data as instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

.3 When multiple binders are used correlate data into related consistent groupings.

.1 Identify contents of each binder on spine.

.4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content by systems, under Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab.

.1 Bind in with text; fold larger Drawings to size of text pages.

## 1.4 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 Contract Administrator and 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.

## 1.5 AS -BUILT DOCUMENTS AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions, 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 Store record documents and samples in field office apart from documents used for construction.

.1 Provide files, racks, and secure storage.

.3 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.

.4 Maintain record documents in clean, dry and legible condition.

.1 Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection by Contract Administrator.

## 1.6 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Record information on set of black line opaque Drawings, and in copy of Project Manual, provided by Contract Administrator.

.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 References 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, field test records, required by individual specifications sections.

.7 Provide digital photos, for Site records.

## 1.7 FINAL SURVEY

.1 Submit final Site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

## 1.8 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 Additional requirements: as specified in individual Specification sections.

## 1.9 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.

## 1.10 MAINTENANCE MATERIALS

.1 Spare Parts:

.1 Provide spare parts, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to Site; 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 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 Site; 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.

.3 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 Site; place and store.

.4 Receive and catalogue items.

.1 Submit inventory listing to Contract Administrator.

.2 Include approved listings in Maintenance Manual.

## 1.11 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.

## 1.12 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Contract Administrator approval.

.3 Warranty management plan to include required actions and documents to assure that Contract Administrator receives warranties to which it is entitled.

.4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.5 Submit, warranty information made available during construction phase, to Contract Administrator for approval prior to each monthly pay estimate.

.6 Assemble approved 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.

.7 Except for items put into use with The City's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

.8 Conduct joint 4 month and 9 month warranty inspection, measured from time of acceptance, by Contract Administrator.

.9 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, sprinkler systems, 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 Contractor's plans for attendance at 4 and 9 month post-construction warranty inspections.

.5 Procedure and status of tagging of equipment covered by extended warranties.

.6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

.10 Respond in timely manner to oral or written notification of required construction warranty repair Work.

.11 Written verification to follow oral instructions.

.1 Failure to respond will be cause for the Contract Administrator to proceed with action against Contractor.

## 1.13 WARRANTY TAGS

.1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag approved by Contract Administrator.

.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.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 ADMINISTRATIVE REQUIREMENTS

.1 Demonstrate scheduled operation and maintenance of equipment and systems to The City's personnel two weeks prior to date of substantial performance.

.2 The City: provide list of personnel to receive instructions, and co-ordinate their attendance at agreed-upon times.

.3 Preparation:

.1 Verify conditions for demonstration and instructions comply with requirements.

.2 Verify designated personnel are present.

.3 Ensure equipment has been inspected and put into operation in accordance with respective sections.

.4 Ensure testing, adjusting, and balancing has been performed [in accordance with the requirements of Mechanical and Electrical sections of this specification, 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 equipment 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.

.4 Prepare and insert additional data in operations and maintenance manuals when needed during instructions.

.5 Time Allocated for Instructions: ensure amount of time required for instruction of each item of equipment or system as follows:

.1 Heating System: 1 hour of instruction.

.2 Automatic Door Operators: 1 hour of instruction.

.3 Equipment or system not listed above: duration of time appropriate to ensure full understanding of system by The City’s personnel.

### 1.2 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 Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.

.4 Give time and date of each demonstration, with list of persons present.

.5 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

## 1.3 QUALITY ASSURANCE

.1 When specified in individual Sections requiring manufacturer to provide authorized representative to demonstrate operation of equipment and systems:

.1 Instruct The City's personnel.

.2 Provide written report that demonstration and instructions have been completed.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 ACCESS AND EGRESS

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

### 1.2 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with The City to facilitate work as stated.

.2 Maintain existing services to building and provide for personnel and vehicle access.

.3 Where security is reduced by work provide temporary means to maintain security.

.4 The City will assign sanitary facilities for use by Contractor's personnel. Keep facilities clean.

.5 Closures: protect work temporarily until permanent enclosures are completed.

### 1.3 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

.1 Execute work with least possible interference or disturbance to [building operations, occupants, public and normal use of premises. Arrange with The City to facilitate execution of work.

### 1.4 EXISTING SERVICES

.1 Notify, Contract Administrator, The City and utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, give The City 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.

.3 Provide for personnel, pedestrian and vehicular traffic as they apply to work of this contract.

.4 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

### 1.5 SPECIAL REQUIREMENTS

.1 Carry out noise generating Work prior to 10:00 am. If noise generating activities are necessary after this time, coordinate with the The City for permission.

.2 Submit schedule in accordance with Section 01 32 18 - Construction Progress Schedules - Bar (GANTT) Chart.

.3 Ensure that Contractor 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. Minimize traffic by Contractor employees through the existing building.

.5 An escort by library staff will be required to access electrical panels. Coordinate requirements with The City.

## 1.6 SECURITY CLEARANCES

.1 Personnel employed on this project will be subject to security check in accordance with Appendix A. Obtain clearance, as instructed, for each individual who will be required to enter premises.

## 1.7 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions. Smoking is not allowed on the project grounds.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 REFERENCES

.1 Project Supplementary Conditions

### 1.2 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 installation 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 is as follows:

.1 Include allowance of $ 1,000.00 for compaction testing for slab base.

.2 Include allowance of $ 3,000.00 for concrete testing.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 APPLICATIONS FOR PROGRESS PAYMENT

.1 Make applications for payment on account monthly as Work progresses.

.2 Date applications for payment last day of agreed monthly payment period and ensure amount claimed is for value, proportionate to amount of Contract, of Work performed and Products delivered to Place of Work at that date.

.3 Submit to Contract Administrator, at least 14 days before first application for payment. Schedule of values for parts of Work, aggregating total amount of Contract Price, to facilitate evaluation of applications for payment.

### 1.2 SCHEDULE OF VALUES

.1 Provide schedule of values supported by evidence as The City may reasonably direct and when accepted by The City, be used as basis for applications for payment.

.2 Include statement based on schedule of values with each application for payment.

.3 Support claims for products delivered to Place of Work but not yet incorporated into Work by such evidence as Contract Administrator may reasonably require to establish value and delivery of products.

### 1.3 PROGRESS PAYMENT

.1 Contract Administrator will issue to The City, no later than 10 days after receipt of an application for payment, certificate for payment in amount applied for or in such other amount as Contract Administrator determines to be due. If Contract Administrator amends application, Contract Administrator will give notification in writing giving reasons for amendment.

### 1.4 CHANGE ORDER PRICING

.1 Change Order pricing shall be limited to the following:

- .1 Job Costs
  - .1 Equipment: at cost.
  - .2 Cartage and Freight: at cost.
  - .3 Clean-up: 3% of value of change in the Work.
  - .4 Disposal: at cost.
  - .5 Small tools and expendables: at cost.
  - .6 Estimating and Price Review: 10% of value of change in the Work (to a maximum cost of $1,000.00).
  - .7 Trade Supervision: 5% of value of change in the Work (to a maximum cost of $1,000.00)
  - .8 Site office and communication (only in the event of a schedule extension): at cost.

.9 Project manager, coordinator (only in the event of a schedule extension): at cost.

.2 Overhead and Markups as follows:

.1 Contractor's markup on his own Work: 10%

.2 Contractor's overhead on his own Work: 10%

.3 Contractor's markup on Sub-Contractor's Work: 10%

.4 Contractor's overhead on Sub-Contractor's Work: 5%

## 1.5 SUBSTANTIAL PERFORMANCE OF WORK

.1 Prepare and submit to Contract Administrator comprehensive list of items to be completed or corrected and apply for a review by Contract Administrator to establish Substantial Performance of Work or substantial performance of designated portion of Work when Work is substantially performed if permitted by lien legislation applicable to Place of Work. Failure to include items on list does not alter responsibility to complete Contract.

.2 No later than 10 days after receipt of list and application, Contract Administrator will review Work to verify validity of application, and no later than 7 days after completing review, will notify Contractor if Work or designated portion of Work is substantially performed.

.3 Contract Administrator: state date of Substantial Performance of Work or designated portion of Work in certificate.

.4 Immediately following issuance of certificate of Substantial Performance of Work, in consultation with Contract Administrator, establish reasonable date for finishing Work.

## 1.6 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF WORK

.1 After issuance of certificate of Substantial Performance of Work:

.1 Submit application for payment of holdback amount.

.2 Submit sworn statement that accounts for labour, subContracts, products, construction machinery and equipment, and other indebtedness which may have been incurred in Substantial Performance of Work and for which The City might in be held responsible have been paid in full, except for amounts properly retained as holdback or as identified amount in dispute.

.2 After receipt of application for payment and sworn statement, Contract Administrator will issue certificate for payment of holdback amount.

.3 Where holdback amount has not been placed in a separate holdback account, The City shall, 10 days prior to expiry of holdback period stipulated in lien legislation applicable to Place of Work, place holdback amount in bank account in joint names of The City and Contractor.

.4 Amount authorized by certificate for payment of holdback amount is due and payable on day following expiration of holdback period stipulated in lien legislation applicable to Place of Work. Where lien legislation does not exist or apply, holdback amount is due and payable in accordance with other legislation, industry practice, or provisions which may be agreed to between

parties. The City may retain out of holdback amount sums required by law to satisfy liens against Work or, if permitted by lien legislation applicable to Place of Work, other third party monetary claims against Contractor which are enforceable against The City.

## 1.7 PROGRESSIVE RELEASE OF HOLDBACK

.1 Where legislation permits, if Contract Administrator has certified that Work of subContractor or supplier has been performed prior to Substantial Performance of Work, The City shall pay holdback amount retained for such subContract Work, or products supplied by such supplier, on day following expiration of holdback period for such Work stipulated in lien legislation applicable to Place of Work.

.2 In addition to provisions of preceding paragraph, and certificate wording, ensure that such subContract Work or products is protected pending issuance of final certificate for payment and be responsible for correction of defects or Work not performed regardless of whether or not such was apparent when such certificates were issued.

## 1.8 FINAL PAYMENT

.1 Submit application for final payment when Work is completed.

.2 Contract Administrator will, no later than 10 days after receipt of application for final payment, review Work to verify validity of application. Contract Administrator will give notification that application is valid or give reasons why it is not valid, no later than 7 days after reviewing Work.

.3 Contract Administrator will issue final certificate for payment when application for final payment is found valid.

## 1.9 CLAIMS FOR DELAYS

.1 In the case where the Contractor elects to request a delay claim at any point in executing the Work, the identical per day costs shall be levied against the Contractor for failing to meet the final total performance of Work as identified in the Contract. This includes delays caused by Work not accepted by Authorities Having Jurisdiction during final inspections or any other deficiencies that prolong the final occupancy date. This includes any delay caused directly or indirectly by the Contractor by failing to meet the intent of the Contract documents or failing to satisfy the wishes of the Authorities Having Jurisdiction over the issuance of permits. This clause shall only be enacted by the The City at the discretion of the Contract Administrator and only after the Contractor has previously initiated an earlier delay claim on the project.

**END OF SECTION**

# Part 1 GENERAL

## 1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

.1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Contract Administrator are specified under various sections.

## 1.2 APPOINTMENT AND PAYMENT

.1 Contract Administrator will appoint services of testing laboratory except follows:

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.

.4 Mill tests and certificates of compliance.

.5 Tests specified to be carried out by Contractor under the supervision of Contract Administrator.

.2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Contract Administrator to verify acceptability of corrected Work.

.3 Payment for tests shall be from designated cash allowance as stipulated in Section 01 21 00 – Allowances.

## 1.3 CONTRACTOR'S RESPONSIBILITIES

.1 Provide labour, equipment and facilities to:

.1 Provide access to Work for inspection and testing.

.2 Facilitate inspections and tests.

.3 Make good Work disturbed by inspection and test.

.4 Provide storage on Site for laboratory's exclusive use to store equipment and cure test samples.

.2 Notify Contract Administrator sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.3 Where Materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Contract Administrator.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 ADMINISTRATIVE

.1 Schedule and administer project meetings throughout the progress of the Work at regular intervals and at the call of Contract Administrator

.2 Prepare agenda for meetings.

.3 Distribute written notice of each meeting four days in advance of meeting date to Contract Administrator.

.4 Provide physical space and make arrangements for meetings.

.5 Preside at meetings.

.6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.

.7 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants and, affected parties not in attendance.

.8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

### 1.2 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 Senior representatives of Contract Administrator, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.

.3 Establish 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 18 – Construction Progress Schedule: 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 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.6 Proposed changes, Change Orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

.7 Products provided by The City.

.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.

## 1.3 PROGRESS MEETINGS

.1 During course of Work and 2 weeks prior to project completion, schedule progress meetings bi-weekly.

.2 Contractor, major Subcontractors involved in Work, Contract Administrator and The City are to be in attendance.

.3 Notify parties minimum 7 days prior to meetings.

.4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 3 days after meeting.

.5 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 affect on construction schedule and on completion date.

.12 Other business.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 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.

.9 Project Planning, Monitoring and Control System: overall system operated by Contract Administrator to enable monitoring of Project Work in relation to established milestones.

### 1.2 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.

## 1.3 SUBMITTALS

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

.2 Submit to Contract Administrator within 15 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.

## 1.4 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.

## 1.5 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 Award.
.2 Shop Drawings, Samples.
.3 Permits.
.4 Mobilization.
.5 Excavation.
.6 Backfill.
.7 Building foundations.
.8 Slab on grade.
.9 Structural Steel.
.10 Siding and Roofing.
.11 Interior Architecture (Walls, Floors and Ceiling).
.12 Plumbing.
.13 Lighting.
.14 Electrical.
.15 Piping.

.16 Controls.

.17 Heating, Ventilating, and Air Conditioning.

.18 Fire Systems.

.19 Testing and Commissioning.

## 1.6 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on monthly basis reflecting activity changes and completions, as well as activities in progress. Include in monthly application for payment.

.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.

## 1.7 PROJECT MEETINGS

.1 Discuss Project Schedule at regular 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.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 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 Present Shop Drawings, product data, samples and mock-ups in Imperial units.

.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.

.10 Any questions or communication from Site or Contractor shall come in the form of a Request For Information (RFI). RFI shall be numbered, dated, titled and come complete with drawing references, photos and suggestions for solutions. It is important that all questions are clear and well documented for the Contract Administrator to fully understand the issue and be able to reply in a thorough and timely manner.

### 1.2 BASECAMP REQUIREMENT

.1 Contractor will be responsible for use of Contract Administrator’s web-based software, Basecamp, to manage submittals, and other correspondence for the Contract Administration phase of the project.

.2 Upon Contract award, Contractor’s personnel will be assigned log-in information to allow them to upload and access files.

.3 There is no cost to the Contractor for use of this software.

## 1.3 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.

.3 Shop Drawings which require approval of any legally constituted Authority Having Jurisdiction shall be provided to such Authority by the Contractor for approval.

.4 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.

.5 At the time of providing Shop Drawings, the Contractor shall expressly advise the Contract Administrator in writing of any deviations in a Shop Drawing from the requirements of the Contract Documents. The Contract Administrator shall indicate the acceptance or rejection of such deviation expressly in writing.

.6 Supply Shop Drawings to the Contract Administrator to review in orderly sequence and sufficiently in advance so as to cause no delay in the work, or in the work of other Contractors.

.7 Allow 10 days for Contract Administrator's review of each Submission.

.8 Contract Administrator’s review is for conformity to the design concept and for general arrangement only. The Contract Administrator’s review shall not relieve the Contractor of responsibility for errors or omissions in the Shop Drawings or for meeting all requirements of the Contract Documents.

.9 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.

.10 Provide revised Shop Drawings to correct those which the Contract Administrator rejects as inconsistent with the Contract Documents, unless otherwise directed by the Contract Administrator. The Contractor shall notify the Contract Administrator in writing of any revisions to the Shop Drawings other than those requested by the Contract Administrator.

.11 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.

.12 Accompany Submissions with transmittal letter, in duplicate, 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.

.13 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. The Contractor represents by this review that

.1 The Contractor has determined and verified all applicable field measurements, field construction conditions, Product requirements, catalogue numbers and similar data,

.2 The Contractor has checked and co-ordinated each Shop Drawing with the requirements of the Work and of the 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.

.14 After Contract Administrator's review, distribute copies.

.15 Submit electronic PDF copy of Shop Drawings for each requirement requested in Specification Sections and as Contract Administrator may reasonably request.

.16 Submit 1 electronic PDF copy 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.

.17 Submit 1 electronic PDF copy 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.

.18 Submit 1 electronic PDF copy of certificates for requirements requested in Specification Sections and as requested by Contract Administrator.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets Specification requirements.

.2 Certificates must be dated after award of project Contract complete with project name.

.19 Submit 1 electronic PDF copy 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.

.20 Submit 1 electronic PDF copy of Manufacturer's Field Reports for requirements requested in Specification Sections and as requested by Contract Administrator.

.21 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.22 Submit 6 copies of Operation and Maintenance Data for requirements requested in Specification Sections and as requested by Contract Administrator.

.23 Delete information not applicable to project.

.24 Supplement standard information to provide details applicable to project.

.25 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.

## 1.4 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.

## 1.5 MOCK-UPS

.1 Erect mock-ups in accordance with 01 45 00 - Quality Control.

## 1.6 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic copy of colour digital photography in jpg format, fine resolution monthly at time of progress statement and as directed by Contract Administrator. Upload to Basecamp.

.2 Project identification: name and number of project and date of exposure indicated.

.3 Number of viewpoints:

.1 Viewpoints shall be selected to demonstrate progress of all work taking place on Site, including Materials delivered but not yet installed. Submit not less than 15 photographs.

.1 Additional viewpoints shall be provided to show work that is to be concealed, including but not limited to foundations, weeping tile, reinforcing bar, waterproofing, fire-stopping, sub slab conditions including compacted granular, etc.

.2 Where a particular spacing or dimension is critical for proper performance of the Work (ie. Rebar spacing, weeping tile slope), include detail photographs demonstrating proper spacing. Include measuring tape in photograph.

.4 Frequency of photographic documentation: weekly, prior to concealing work, and as directed by Contract Administrator.

## 1.7 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

.2 Submit transcription of insurance immediately after award of Contract.

**END OF SECTION**

# Part 1 GENERAL

## 1.1 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.3 Province of Manitoba

.1 The Workers Compensation Act RSM 1987 – Current Edition.

## 1.2 SUBMITTALS

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

.2 Submit Site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of Site specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for Site tasks and operation found in Work plan.

.3 Submit 1 PDF copy of Contractor's authorized representative's Work Site health and safety inspection reports to Contract Administrator and authority having jurisdiction, at intervals as required by governing regulations.

.4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.5 Submit copies of incident and accident reports.

.6 The City will review Contractor's Site-specific Health and Safety Plan and provide comments, if necessary, to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to Contract Administrator within 5 days after receipt of comments from Contract Administrator.

.7 The City’s review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.8 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for Site Personnel prior to commencement of Work, and submit additional certifications for any new Site Personnel to Contract Administrator.

.9 On-Site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

## 1.3 FILING OF NOTICE

.1 File Notice of Project with Provincial authorities prior to beginning of Work.

## 1.4 SAFETY ASSESSMENT

.1 Perform Site specific safety hazard assessment related to project.

## 1.5 MEETINGS

.1 Schedule and administer Health and Safety meeting prior to commencement of Work.

## 1.6 REGULATORY REQUIREMENTS

.1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

## 1.7 GENERAL REQUIREMENTS

.1 Develop written Site-specific Health and Safety Plan based on hazard assessment prior to beginning Site Work and continue to implement, maintain, and enforce plan until final demobilization from Site. Health and Safety Plan must address project Specifications.

.2 Contract Administrator may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

## 1.8 RESPONSIBILITY

.1 Be responsible for health and safety of Persons on Site, safety of property on Site and for protection of Persons adjacent to Site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with Site-specific Health and Safety Plan.

## 1.9 COMPLIANCE REQUIREMENTS

.1 Comply with The Workers Compensation Act, Workplace Safety Regulation, Manitoba Regulations.

## 1.10 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factors, hazards, or conditions occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Contract Administrator verbally and in writing.

## 1.11 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

.1 Have Site-related Working experience specific to activities associated with hazardous Materials commonly encountered on the construction Site.

.2 Have Working knowledge of occupational safety and health regulations.

.3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that Personnel not successfully completing required training are not permitted to enter Site to perform Work.

.4 Be responsible for implementing, enforcing daily and monitoring Site-specific Contractor's Health and Safety Plan.

.5 Be on Site during execution of Work and report directly to and be under direction of Site supervisor.

## 1.12 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on Site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Contract Administrator.

## 1.13 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Contract Administrator.

.2 Provide Contract Administrator with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Contract Administrator may stop Work if non-compliance of health and safety regulations is not corrected.

## 1.14 POWDER ACTUATED DEVICES

.1 Use powder actuated devices only after receipt of written permission from Contract Administrator.

## 1.15 WORK STOPPAGE

.1 Give precedence to safety and health of public and Site Personnel and protection of environment over cost and schedule considerations for Work.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 REFERENCES AND CODES

.1 Perform Work in accordance with National Building Code of Canada (NBC) including amendments up to Bid closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:

.1 Contract Documents.

.2 Specified standards, codes and referenced documents.

### 1.2 HAZARDOUS MATERIAL DISCOVERY

.1 Asbestos: demolition of spray or trowel-applied asbestos is hazardous to health. Stop Work immediately when Material resembling spray or trowel-applied asbestos is encountered during demolition Work. Notify Contract Administrator.

.2 PCB: Polychlorinated Biphenyl: stop Work immediately when Material resembling Polychlorinated Biphenyl is encountered during demolition Work. Notify Contract Administrator.

.3 Mould: stop Work immediately when Material resembling mould is encountered during demolition Work. Notify Contract Administrator.

### 1.3 BUILDING SMOKING ENVIRONMENT

.1 No smoking is permitted on the project grounds. Comply with smoking restrictions and municipal by-laws.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 INSPECTION

.1 Allow Contract Administrator and authorized agencies 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 The Contractor shall give the Contract Administrator reasonable notification of when the Work will be ready for review and inspection. The Contractor shall arrange for and shall give the Contract Administrator reasonable notification of the date and time of inspections by other authorities.

.4 The Contractor shall furnish promptly to the Contract Administrator two copies of certificates and inspection reports relating to the Work.

.5 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, make good such Work and pay cost of examination and correction.

.6 Contract Administrator will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such Work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, The City shall pay cost of examination and replacement.

.7 The Contractor shall pay the cost of making any test or inspection, including the cost of samples required for such test or inspection, if such test or inspection is designated in the Contract Documents to be performed by the Contractor or is designated by the laws or ordinances applicable to the Place of the Work.

.1 Refer to Section 01 29 83 – Payment Procedures for Testing Laboratory Services.

### 1.2 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Contract Administrator for purpose of inspecting and/or testing portions of Work.

.2 Allocated costs: to Section 01 29 83 – Payment Procedures for Testing Laboratory Services.

.3 Provide equipment required for executing inspection and testing by appointed agencies.

.4 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.5 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 reinspection.

## 1.3 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.

## 1.4 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.

## 1.5 REJECTED WORK

.1 Promptly 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.

## 1.6 REPORTS

.1 Submit 1 copy of inspection and test reports to Contract Administrator.

.2 Provide copies to SubContractor of Work being inspected or tested or manufacturer or fabricator of Material being inspected or tested.

## 1.7 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.

## 1.8 MOCK-UPS

.1 Prepare mock-ups for Work specifically requested in Specifications. Include for Work of Sections required to provide mock-ups.

.2 Construct in locations acceptable to Contract Administrator.

.3 Prepare mock-ups for Contract Administrator's review with reasonable promptness and in orderly sequence, to not cause delays in Work.

.4 Failure to prepare mock-ups 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.

.5 If requested, Contract Administrator will assist in preparing schedule fixing dates for preparation.

.6 Mock-ups may remain as part of Work.

## 1.9 MILL TESTS

.1 Submit mill test certificates as required of Specification Sections.

## 1.10 EQUIPMENT AND SYSTEMS

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

**END OF SECTION**

# Part 1 GENERAL

## 1.1 SUBMITTALS

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

## 1.2 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute Work expeditiously.

.2 Remove from Site all such Work after use.

## 1.3 DEWATERING

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

## 1.4 WATER SUPPLY

.1 The City will provide continuous supply of potable water for construction use.

## 1.5 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 will be operational during the performance of Work of this Contract. Prevent pollution of existing heating system by construction activities. Be responsible for damage to heating system.

.7 On completion of Work, replace filters, in permanent heating system and clean as required.

.8 Pay costs for maintaining temporary heat.

.9 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.

.10 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

## 1.6 TEMPORARY POWER AND LIGHT

.1 The City will pay for temporary power during construction for temporary lighting and operating of power tools, to a maximum supply of 230 volts.

.2 Arrange for method of connection with The City. Pay costs for installation, maintenance and removal of temporary electrical panels if required.

.3 Temporary power for equipment requiring in excess of above is responsibility of Contractor.

.4 Provide and maintain temporary lighting throughout Work area. Ensure level of illumination is not less than 162 lx.

.5 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Contract Administrator provided that guarantees are not affected. Make good damage to electrical system caused by use under this Contract. Replace lamps which have been used for more than 3 months.

## 1.7 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for temporary telephone and data hook up, lines and equipment necessary for own use.

### 1.8 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction, and governing codes, regulations and bylaws.

.2 Burning rubbish and construction waste Materials is not permitted on Site.

## Part 2 PRODUCTS

### 2.1 NOT USED

.1 Not Used.

## Part 3 EXECUTION

### 3.1 NOT USED

.1 Not Used.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.

.2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.2 Canadian Standards Association (CSA International)

.1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA-0121-M1978(R2003), Douglas Fir Plywood.

.3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.

.4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.

.3 U.S. Environmental Protection Agency (EPA) / Office of Water

.1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

### 1.2 SUBMITTALS

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

### 1.3 INSTALLATION AND REMOVAL

.1 Prepare Site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, avenues of ingress/egress to fenced area and details of fence installation.

.2 Indicate use of supplemental or other staging area.

.3 Provide construction facilities in order to execute Work expeditiously.

.4 Remove from Site all such Work after use.

### 1.4 TEMPORARY WORK

.1 The Contractor shall have the sole responsibility for the design, erection, operation, maintenance, and removal of Temporary Work.

.2 The Contractor shall engage and pay for registered professional engineering Personnel skilled in the appropriate disciplines to perform those functions referred to above, where required by law or by the Contract Documents and in all cases where such Temporary Work is of such a nature that professional engineering skill is required to produce safe and satisfactory results.

## 1.5 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA-S269.2.

.2 Provide and maintain scaffolding, ramps, ladders, platforms and all other temporary construction required to complete the Work.

.3 Scaffolding to be designed by a professional engineer licensed in the Province of Manitoba.

## 1.6 HOISTING

.1 Provide, operate and maintain hoists required for moving of Workers, Materials and equipment. Make financial arrangements with SubContractors for their use of hoists.

.2 Hoists to be operated by qualified operator.

## 1.7 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.

## 1.8 CONSTRUCTION PARKING

.1 No parking will be provided for Contractor's employees. 2 hour metered parking is available on West side of Donald St. at the Contractor's expense. Alternative arrangements for parking, such as street parking passes may be available from the Winnipeg Parking Authority. Coordinate with WPA as required.

.2 Arrange permission with City of Winnipeg for extended use of loading zone if required.

## 1.9 OFFICES

.1 Space within the existing building and project grounds is limited. If temporary office is required on Site, make arrangements with The City after Contract award.

## 1.10 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.

## 1.11 CONSTRUCTION SIGNAGE

.1 Provide and erect project sign, within three weeks of signing Contract, in a location designated by Contract Administrator.

.2 Construction sign design to be provided by Contract Administrator.

.3 No other signs or advertisements, other than warning signs, are permitted on Site.

.4 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.

.5 Maintain approved signs and notices in good condition for duration of project, and dispose of off Site on completion of project or earlier if directed by Contract Administrator.

## 1.12 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Contract Administrator.

.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.

## 1.13 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

## 2.1 NOT USED

.1 Not Used.

## Part 3 EXECUTION

.1 Not Used.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.

.2 Canadian Standards Association (CSA International)

.1 CSA-O121-M1978(R2003), Douglas Fir Plywood.

### 1.2 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from Site all such Work after use.

### 1.3 HOARDING

.1 Erect temporary Site enclosure using new 1.8 m high wire fence tied to steel fence posts spaced at 2.4 m on centre. Provide one lockable truck gate. Maintain fence in good repair.

### 1.4 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs, and other areas where a risk of falling exists.

.2 Provide as required by governing authorities.

### 1.5 WEATHER ENCLOSURES

.1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.

.2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior Work for temporary heat.

.3 Design enclosures to withstand wind pressure and snow loading.

### 1.6 DUST TIGHT SCREENS

.1 Provide dust tight screens or insulated partitions to localize dust generating activities, and for protection of Workers, finished areas of Work and Public.

.2 Interior hoarding wall to be constructed as noted on Drawings, and be sound and aesthetically pleasing. Access to site through partition/wall shall be by hinged door, weatherstripped/sealed when closed.

.3 Maintain and relocate protection until such Work is complete.

## 1.7 ACCESS TO SITE

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

## 1.8 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.

## 1.9 FIRE ROUTES

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

## 1.10 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.

## 1.11 PROTECTION OF BUILDING FINISHES

.1 Provide protection for finished and partially finished building materials 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.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 REFERENCES

.1 Within text of each Specification section, mention 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.

.4 Cost for such testing will be borne by The City in event of conformance with Contract Documents or by Contractor in event of non-conformance.

### 1.2 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 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.

.3 Should disputes arise as to quality or fitness of products, decision rests strictly with Contract Administrator based upon requirements of Contract Documents.

.4 Unless otherwise indicated in Specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.5 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.

### 1.3 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.

## 1.4 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 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.

## 1.5 TRANSPORTATION

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

.2 Transportation cost of products supplied by The City will be paid for by The City unless stated otherwise in the specific Sections. Unload, handle and store such products.

## 1.6 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.

## 1.7 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.

## 1.8 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.

## 1.9 CONCEALMENT

.1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation inform Contract Administrator if there is interference. Install as directed by Contract Administrator.

## 1.10 REMEDIAL WORK

.1 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, unless noted otherwise.

.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.

## 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, and pedestrian and vehicular traffic. Coordinate with The City per Section 01 14 00 – Work Restrictions.

.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.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 QUALIFICATIONS OF SURVEYOR

.1 Qualified registered land surveyor, licensed to practice in Place of Work, acceptable to Contract Administrator.

### 1.2 SURVEY REQUIREMENTS

.1 Establish temporary bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.

.2 Establish lines and levels, locate and lay out, by instrumentation.

.3 Stake batter boards for foundations.

.4 Establish foundation column locations and floor elevations.

### 1.3 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.

### 1.4 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.

### 1.5 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.

## 1.6 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.

## 1.7 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 a reasonable assumption of probable conditions based thereon.

.2 After prompt investigation, should Contract Administrator determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 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.
- .5 Work of The City or separate Contractor.

.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 The City or separate Contractor.
- .7 Written permission of affected separate Contractor.
- .8 Date and time work will be executed.

### 1.2 MATERIALS

.1 Required for original installation.

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

### 1.3 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.

## 1.4 CONTROL OF THE WORK

.1 The Contractor shall have total control of the Work and shall effectively direct and supervise the Work so as to ensure conformity with the Contract Documents.

.2 The Contractor shall be solely responsible for construction means, methods, techniques, sequences, and procedures and for co-ordinating the various parts of the Work under the Contract.

.3 The Contract Administrator will not be responsible for and will not have control, charge or supervision of construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs required in connection with the Work in accordance with applicable construction safety legislation, other regulations or general construction practice. The Contract Administrator will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Contract Administrator will not have control over, charge of or be responsible for the acts or omissions of the Contractor, Subcontractors, suppliers, or their agents, employees, or any other persons performing portions of the Work.

## 1.5 EXECUTION

.1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.

.2 Cutting and remedial work shall be performed by specialists familiar with the Products affected and shall be performed in a manner to neither damage nor endanger the Work.

.3 Fit several parts together, to integrate with other Work.

.4 Uncover Work to install ill-timed Work.

.5 Remove and replace defective and non-conforming Work.

.6 Remove samples of installed Work for testing when directed by Contract Administrator or required by specific Specification sections.

.7 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

.8 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.9 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

.10 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.

.11 Restore Work with new products in accordance with requirements of Contract Documents.

.12 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.13 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.

.14 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

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

**END OF SECTION**

## Part 1 GENERAL

### 1.1 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by The City or other Contractors.

.2 Remove waste materials from Site at daily regularly scheduled times. 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 Provide and use marked separate bins for recycling.

.7 Dispose of waste materials and debris at designated dumping areas off Site.

.8 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.

.9 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.10 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

.11 Use only cleaning Materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

.12 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

### 1.2 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 including that caused by The City or other Contractors.

.5 Remove waste materials from Site at regularly scheduled times. Do not burn waste materials on Site.

.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 as it applies to the work of this contract.

.8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors and ceilings.

.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 Sweep and wash clean paved areas.

.17 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.

.18 Clean roofs, downspouts, and drainage systems.

.19 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

.20 Remove snow and ice from access to building.

.21 Cleaning activities shall extend beyond the area of the renovation if Contract Administrator determines that work of this Contract has resulted in undue deposition of dirt and debris elsewhere within the building or the Site.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 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 Administrator 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 authorities having jurisdiction: submitted.

.5 Operation of systems: demonstrated to The City's personnel.

.6 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 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 Lien and Warranty Periods: date of The City's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.7 Final Payment:

.1 When Contract Administrator considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

.2 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.

## 1.2 FINAL CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.1 Remove surplus Materials, excess Materials, rubbish, tools and equipment.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 ADMINISTRATIVE REQUIREMENTS

.1 Pre-warranty Meeting:

.1 Convene meeting one week prior to Contract completion with Contractor's representative and Contract Administrator, in accordance with Section 01 31 19 - Project Meetings to:

.1 Verify Project requirements.

.2 Review manufacturer's warranty requirements.

.2 Contract Administrator to establish communication procedures for:

.1 Notifying construction warranty defects.

.2 Determine priorities for type of defects.

.3 Determine reasonable response time.

.3 Contact information for bonded and licensed company for warranty Work action: provide name, telephone number and address of company authorized for construction warranty Work action.

.4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty Work action.

### 1.2 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 to the Contract Administrator, four final copies of operating and maintenance manuals in English.

.3 Provide spare parts, maintenance Materials and special tools of same quality and manufacture as products provided in Work.

.4 Provide evidence, if requested, for type, source and quality of products supplied.

### 1.3 FORMAT

.1 Organize data as instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

.3 When multiple binders are used correlate data into related consistent groupings.

.1 Identify contents of each binder on spine.

.4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content by systems, under Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab.

.1 Bind in with text; fold larger Drawings to size of text pages.

## 1.4 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 Contract Administrator and 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.

## 1.5 AS -BUILT DOCUMENTS AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions, 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 Store record documents and samples in field office apart from documents used for construction.

.1 Provide files, racks, and secure storage.

.3 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.

.4 Maintain record documents in clean, dry and legible condition.

.1 Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection by Contract Administrator.

## 1.6 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Record information on set of black line opaque Drawings, and in copy of Project Manual, provided by Contract Administrator.

.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 References 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, field test records, required by individual specifications sections.

.7 Provide digital photos, for Site records.

## 1.7 FINAL SURVEY

.1 Submit final Site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

## 1.8 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 Additional requirements: as specified in individual Specification sections.

## 1.9 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.

## 1.10 MAINTENANCE MATERIALS

.1 Spare Parts:

.1 Provide spare parts, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to Site; 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 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 Site; 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.

.3 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 Site; place and store.

.4 Receive and catalogue items.

.1 Submit inventory listing to Contract Administrator.

.2 Include approved listings in Maintenance Manual.

## 1.11 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.

## 1.12 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Contract Administrator approval.

.3 Warranty management plan to include required actions and documents to assure that Contract Administrator receives warranties to which it is entitled.

.4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.5 Submit, warranty information made available during construction phase, to Contract Administrator for approval prior to each monthly pay estimate.

.6 Assemble approved 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.

.7 Except for items put into use with The City's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

.8 Conduct joint 4 month and 9 month warranty inspection, measured from time of acceptance, by Contract Administrator.

.9 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, sprinkler systems, 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 Contractor's plans for attendance at 4 and 9 month post-construction warranty inspections.

.5 Procedure and status of tagging of equipment covered by extended warranties.

.6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

.10 Respond in timely manner to oral or written notification of required construction warranty repair Work.

.11 Written verification to follow oral instructions.

.1 Failure to respond will be cause for the Contract Administrator to proceed with action against Contractor.

## 1.13 WARRANTY TAGS

.1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag approved by Contract Administrator.

.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.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 ADMINISTRATIVE REQUIREMENTS

.1 Demonstrate scheduled operation and maintenance of equipment and systems to The City's personnel two weeks prior to date of substantial performance.

.2 The City: provide list of personnel to receive instructions, and co-ordinate their attendance at agreed-upon times.

.3 Preparation:

.1 Verify conditions for demonstration and instructions comply with requirements.

.2 Verify designated personnel are present.

.3 Ensure equipment has been inspected and put into operation in accordance with respective sections.

.4 Ensure testing, adjusting, and balancing has been performed [in accordance with the requirements of Mechanical and Electrical sections of this specification, 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 equipment 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.

.4 Prepare and insert additional data in operations and maintenance manuals when needed during instructions.

.5 Time Allocated for Instructions: ensure amount of time required for instruction of each item of equipment or system as follows:

.1 Heating System: 1 hour of instruction.

.2 Automatic Door Operators: 1 hour of instruction.

.3 Equipment or system not listed above: duration of time appropriate to ensure full understanding of system by The City’s personnel.

### 1.2 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 Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.

.4 Give time and date of each demonstration, with list of persons present.

.5 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

## 1.3 QUALITY ASSURANCE

.1 When specified in individual Sections requiring manufacturer to provide authorized representative to demonstrate operation of equipment and systems:

.1 Instruct The City's personnel.

.2 Provide written report that demonstration and instructions have been completed.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA S350-M1980(R1998), Code of Practice for Safety in Demolition of Structures.

### 1.2 SUBMITTALS

.1 Submit shop drawings in accordance with Sections 01 33 00 - Submittal Procedures.

.2 Before proceeding with demolition of load bearing walls and where required by authority having jurisdiction submit for review by Contract Administrator shoring and underpinning Drawings prepared by qualified professional engineer registered or licensed in the Province of Manitoba, showing proposed method.

### 1.3 SITE CONDITIONS

.1 Should Material resembling spray or trowel-applied asbestos or other designated substance listed as hazardous be encountered, stop Work, take preventative measures, and notify Contract Administrator immediately.

.1 Do not proceed until written instructions have been received from Contract Administrator .

.2 Notify Contract Administrator before disrupting building access or services.

## Part 2 PRODUCTS

### 2.1 NOT USED

.1 Not used.

## Part 3 EXECUTION

### 3.1 PREPARATION

.1 Inspect building Site with Contract Administrator and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.

.2 Locate and protect utilities. Preserve active utilities traversing Site in operating condition.

.3 Notify and obtain approval of utility companies before starting demolition.

.4 Disconnect, cap, plug or divert, as required, existing public utilities within the property where they interfere with the execution of the Work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these

and previously capped or plugged services on the Site and indicate location (horizontal and vertical) on the record Drawings. Support, shore up and maintain pipes and conduits encountered.

.1 Immediately notify Contract Administrator and utility company concerned in case of damage to any utility or service, designated to remain in place.

.2 Immediately notify the Contract Administrator should uncharted utility or service be encountered, and await instruction in writing regarding remedial action.

## 3.2 PROTECTION

.1 Prevent movement, settlement, or damage to adjacent structures, utilities, and landscaping features and parts of building to remain in place. Provide bracing and shoring required.

.2 Keep noise, dust, and inconvenience to occupants to minimum.

.3 Protect building systems, services and equipment.

.4 Provide temporary dust screens, covers, railings, supports and other protection as required.

.5 Do Work in accordance with Section 01 35 30 - Health and Safety Requirements.

## 3.3 SALVAGE

.1 Refer to demolition Drawings and Specifications for items to be salvaged for reuse.

.2 Remove items to be reused, store as directed by Contract Administrator, and re-install under appropriate section of Specification.

## 3.4 SITE REMOVALS

.1 Remove items as indicated.

.2 Removal of Pavements, Curbs and Gutters:

.1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by Contract Administrator.

.2 Protect adjacent joints and load transfer devices.

.3 Protect underlying and adjacent granular Materials.

.3 Removal of Interior Partitions:

.1 Remove interior partitions to extent shown.

.2 Clean surfaces into which demolished partition intersected.

.3 Cap cut ends of partially demolished partitions that are scheduled to remain with construction identical to the rest of the partition.

.4 Removal of Door and Window Frames

.1 Remove door and window frames to extent shown.

.2 Remove bucks or blocking as required.

.3 Clean sealant off of rough opening, and fill fastener holes where holes will remain exposed.

## 3.5 DEMOLITION

.1 Remove parts of existing building to permit new construction as indicated. Sort Materials into appropriate piles for reuse and recycling.

.2 Trim edges of partially demolished building elements to tolerances as defined by Contract Administrator to suit future use.

## 3.6 SUB-FLOOR PREPARATION

.1 Scrape old flooring from floor scheduled for demolition and grind rough spots as necessary. Patch uneven or rough areas as required to achieve even surface.

## 3.7 DISPOSAL

.1 Dispose of removed Materials, to appropriate recycling facilities or reuse facilities except where specified otherwise, in accordance with authority having jurisdiction.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 RELATED SECTIONS

.1 Section 03 30 00 - Cast in Place Concrete

### 1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA-O86S1-09, Engineering Design in Wood.

.3 CSA O121-08, Douglas Fir Plywood.

.4 CSA O151-09, Canadian Softwood Plywood.

.5 CSA O153-M1980(R2003), Poplar Plywood.

.6 CAN/CSA-O325.0-07, Construction Sheathing.

.7 CSA O437 Series-93(R2011), Standards for OSB and Waferboard.

.8 CSA S269.1-1975(R2003), Falsework for Construction Purposes.

.9 CAN/CSA-S269.3-M92(R2008), Concrete Formwork, National Standard of Canada

.2 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

## Part 2 PRODUCTS

### 2.1 MATERIALS

.1 Formwork materials:

.1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O121 CAN/CSA-O86 CSA O437 Series CSA-O153.

.2 For concrete with special architectural features, use formwork materials to CSA-A23.1/A23.2.

.3 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 liner:

.1 Plywood: high density overlay for exposed finishes. Douglas Fir to CSA O121 or Canadian Softwood Plywood to CSA O151 for concealed finishes.

.4 Form release agent: non-toxic, biodegradable, low VOC.

.5 Form stripping agent: colourless mineral oil, non-toxic, biodegradable, low VOC, free of kerosene, with viscosity between 70 and 110s Saybolt Universal at 40 degrees C, flashpoint minimum 150 degrees C, open cup.

.6 Falsework materials: to CSA-S269.1.

.7 Sealant: to Section 07 92 00 - Joint Sealing.

## Part 3 EXECUTION

### 3.1 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 For the purposes of this Contract, all concrete that is exposed to view shall be considered ‘Architectural’ Concrete.

.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 Have Contract Administrator review and approve formwork and reinforcing prior to pour.

.10 Ensure temperatures and weather guidelines from manufacturer are followed to produce proper finished product. Provide testing for each concrete delivery.

.11 Align form joints and make watertight.

.1 Keep form joints to minimum.

.12 Use 1 in. chamfer strips on external corners and/or 1 in. fillets at interior corners, joints, unless specified otherwise.

.13 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.14 Construct forms for architectural concrete, and place ties as indicated.

.1 Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.

.15 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.

.16 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

## 3.2 REMOVAL AND RESHORING

.1 Leave formwork in place for following minimum periods of time after placing concrete.

.1 3 days for walls and sides of beams.

.2 7 days for beam soffits, slabs, decks and other structural members, or at 75% design strength when replaced immediately with adequate shoring to standard specified for falsework.

.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 10 feet apart.

.5 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 RELATED SECTIONS

.1 Section 03 10 00 – Concrete Forming and Accessories.

.2 Section 03 30 00 – Cast-in-Place Concrete.

### 1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CAN/CSA-G30.18-09, Billet-Steel Bars for Concrete Reinforcement, A National Standard of Canada.

.3 CSA-G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.4 CAN/CSA-G164-M92(R2003)(withdrawn), Hot Dip Galvanizing of Irregularly Shaped Articles, A National Standard of Canada.

.5 CSA W186-M1990(R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.

.2 American Society for Testing and Materials International (ASTM)

.1 ASTM A82-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

.2 ASTM A185/A185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.

.3 ASTM A775/A775M-07b, Standard Specification for Epoxy-Coated Reinforcing Steel Bars.

.3 Reinforcing Steel Institute of Canada (RSIC)

.1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

### 1.3 MEASUREMENT PROCEDURES

.1 Reinforcing steel will be measured in kilograms of steel incorporated into Work, computed from theoretical unit mass specified in CAN/CSA G30.18 for lengths and sizes of bars as indicated.

.2 No measurement will be made under this Section.

.1 Include reinforcement costs in items of concrete Work in Section 03 30 00 - Cast-In-Place Concrete.

### 1.4 SUBMITTALS

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

.2 Prepare reinforcement Drawings in accordance with RSIC Manual of Standard Practice.

.3 Submit Shop Drawings including placing of reinforcement and indicate:

.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.

.4 Detail lap lengths and bar development lengths to CSA-A23.3, unless otherwise indicated.

.1 Provide class B tension lap splices unless otherwise indicated.

## Part 2 PRODUCTS

### 2.1 MATERIALS

.1 Substitute different size bars only if permitted in writing by Contract Administrator.

.2 Reinforcing steel: All reinforcing steel to be CAN/CSA-G30.18M grade 400R deformed bars except column ties and beam stirrups which shall be grade 400W.

.3 Cold drawn annealed steel wire ties: to ASTM A82.

.4 Welded steel wire fabric: to ASTM A185/A185M. Provide in flat sheets only.

.5 Galvanizing of non-prestressed reinforcement: to CAN/CSA-G164, minimum zinc coating 610 g/$m^2$.

.6 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.

.7 Plain round bars: to CSA-G40.20/G40.21.

### 2.2 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.

.2 All reinforcing is to be detailed in accordance with the latest edition of the Reinforcing Steel Institute of Canada - Manual of Standard Practice, except otherwise noted

.3 Obtain Contract Administrator's approval for locations of reinforcement splices other than those shown on placing Drawings.

.4 Upon approval of Contract Administrator, weld reinforcement in accordance with CSA W186.

.5 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

.1 Ship epoxy coated bars in accordance with ASTM A775A/A775M.

## 2.3 SOURCE QUALITY CONTROL

.1 Upon request, provide Contract Administrator with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis.

.2 Upon request inform Contract Administrator of proposed source of Material to be supplied.

# Part 3 EXECUTION

## 3.1 FIELD BENDING

.1 Do not field bend or field weld reinforcement except where indicated or authorized by Contract Administrator.

.2 When field bending is authorized, bend without heat, applying slow and steady pressure.

.3 Replace bars, which develop cracks or splits.

## 3.2 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on placing Drawings and in accordance with CSA-A23.1/A23.2.

.2 Use plain round bars as slip dowels in concrete where noted on the Drawings.

.1 Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint.

.2 When paint is dry, apply thick even film of mineral lubricating grease.

.3 Prior to placing concrete, obtain Contract Administrator's approval of reinforcing Material and placement.

.4 Ensure cover to reinforcement is maintained during concrete pour.

## 3.3 DOWELING PROCEDURES

.1 For bars that are indicated as being dowelled in, drill in and epoxy grout bars as follows:

.1 10M bars, 200 mm

.2 15M bars, 250 mm

.3 20M bars, 350 mm

.4 25M bars, 400 mm

.2 Use only approved adhesive to manufacturer’s instructions. Acceptable product:

.1 Hilti HIT HY-150 MAX/HIT-ICE by Hilti Canada.

.3 Clean hole thoroughly prior to application of epoxy. Use injection or caulking gun to ensure that the epoxy fills the bottom of the hole prior to embedment of bar.

## 3.4 FIELD TOUCH-UP

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

**END OF SECTION**

# Part 1 GENERAL

## 1.1 RELATED SECTIONS

.1 Section 03 10 00 – Concrete Forming and Accessories

.2 Section 03 20 00 – Concrete Reinforcing

.3 Section 07 21 13 - Board Insulation

.4 Section 09 30 13 - Ceramic Tiling

.5 Section 09 68 00 - Carpeting

## 1.2 REFERENCES

.1 Canadian Standards Association (CSA)

.1 CSA-A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CAN/CSA-A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005)

.3 CSA A283-06, Qualification Code for Concrete Testing Laboratories.

.2 American Concrete Institute (ACI)

.1 ACI 309R-96, Guide for the Consolidation of Concrete.

.3 American Society for Testing and Materials International (ASTM)

.1 ASTM C260-01, Specification for Air-Entraining Admixtures for Concrete.

.2 ASTM C309-03, Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.3 ASTM C494/C494M-05, Standard Specification for Chemical Admixtures for Concrete.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

## 1.3 CERTIFICATES

.1 Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CSA-A23.1. Certification letter to be sealed by an engineer registered in the Province of Manitoba.

.2 Provide certification that plant, equipment, and Materials to be used in concrete comply with requirements of CSA-A23.1. Certification letter to be sealed by an engineer registered in the Province of Manitoba.

## 1.4 DELIVERY, STORAGE AND HANDLING

.1 Concrete hauling time: maximum allowable time for concrete to be delivered to Site of Work and discharged not to exceed 120 minutes after batching.

.1 Modifications to maximum time limit must be agreed to 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

## 2.1 MATERIALS

.1 The concrete constituents shall comply with the following standards:

.1 Cement: to CAN/CSA-A3001.

.2 Blended Hydraulic cement: to CAN/CSA-A3001.

.3 Supplementary cementing Materials: to CAN/CSA-A3001.

.4 Water: To CSA-A23.1.

.5 Aggregates: to CSA-A23.1. Coarse aggregates to be normal density.

.6 Air entraining admixture: ASTM C260.

.7 Chemical admixtures: ASTM C494/C494M. Contract Administrator to approve accelerating or set retarding admixtures during cold and hot weather.

## 2.2 MIX REQUIREMENTS

.1 Proportion normal density concrete in accordance with CSA-A23.1, Alternative 1 to give the properties as indicated on the structural Drawings.

## 2.3 ACCESSORIES

.1 Evaporation retardant: Acceptable Product:

.1 Confilm by BASF Building Systems at a minimum application rate of 4.9 m²/L.

.1 Low VOC requirement: 100 g/L

.2 Cure and sealing compound:

.1 In accordance with the finish flooring manufacturer's requirements. Refer to Division 9.

.3 Sealants:

.1 Construction and control joints: One-component silicone sealant for to ASTM C920, Type S, Grade NS, Class 100/50, Use T, A, M, and O.

.1 Acceptable product: NS Parking Structure Sealant by Dow Corning Inc.

.4 Grout: Portland Cement based non-shrink, non-metallic composition and shall meet the following requirements:

.1 The grout shall not exhibit bleeding or segregation at pumpable consistency.

.2 Compressive Strength: 25 MPa @ 1 day.

.3 Bond Strength (ASTM C882) 13 MPa @ 28 days.

.4 Positive expansion confirmed by ASTM C827.

.5 The grout shall not produce a vapour barrier.

.6 Acceptable products are one of the following only

.1 Sika Grout 212 by Sika Canada Inc.

.2 Sternson M-Bed Standard by Sternson Construction Products.

.7 Alternatives to the above will be considered provided the product meets or exceeds the aforementioned performance requirements and at least three references are available detailing similar installations.

.5 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 25 MPa at 28 days.

.6 Premoulded joint fillers:

.1 Bituminous impregnated fiber board: to ASTM D1751.

## Part 3 EXECUTION

### 3.1 PREPARATION

.1 Obtain Contract Administrator's approval before placing concrete. Provide 24 hours notice prior to placing of concrete.

.2 Ensure reinforcement and inserts are not disturbed during concrete placement.

.3 Prior to placing of concrete obtain Contract Administrator's approval of proposed method for protection of concrete during placing and curing in adverse weather. Protection and curing must comply with the hot weather and cold weather requirements of CSA-A23.1.

.4 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.5 In locations where new concrete is dowelled to existing Work, drill holes in existing concrete. Place steel dowels of deformed steel reinforcing bars and epoxy grout to anchor and hold dowels in positions as indicated. Refer to Section 03 20 00.

.6 Do not place load upon new concrete until authorized by Contract Administrator.

.7 Provide formwork and falsework to Section 03 10 00 - Concrete Forming and Accessories.

.8 Place reinforcing steel and install dowels to Section 03 20 00 - Concrete Reinforcement. Provide dowels at locations shown on the Drawings.

.9 Provide temporary bridging as required to permit access to all areas during placement, finishing and curing.

## 3.2 PREPARATION OF EXISTING FLOOR SLABS TO SUIT FLOORING

.1 Remove existing floor coverings, coatings, adhesives, curing compounds, efflorescence, dust, grease, laitance, etc. down to bare concrete.

.2 Patch and make surface of floor level, clean and suitable to receive new flooring. Prepare floor slab to meet requirements of scheduled finish flooring Material to approval of subtrade performing installation.

## 3.3 MIX PRODUCTION

.1 Concrete to be mixed, delivered and placed in accordance with CSA A23.1.

.2 Concrete to be batched and mixed at a ready mix plant and delivered to Site in ready to place form.

.3 Control of slump on the job Site to be in accordance with CSA-A23.1 except as otherwise specified below:

.4 Slump and air must be measured both before and after addition of WRA.

.5 The addition of water to the concrete to increase slump and aid in pumping is strictly forbidden

## 3.4 PLACEMENT

.1 Place concrete Work in accordance with CSA-A23.1.

.2 Concrete shall be transported to placement location by pump or trolley.

.3 When concrete is placed by pump, the initial slurry used to prime the pump shall not be incorporated into the topping. The slurry shall be trapped and disposed off-Site.

.4 Ensure high points and slopes to drains as shown on Drawings are maintained.

.5 When placing concrete against concrete that has achieved initial set, wait until final set occurs; then prepare the surface and treat like any other cured concrete surface being prepared for concrete.

.6 Place concrete in its final position as soon as possible after mixing. A maximum time limit of 120 minutes from the time of initial mixing to complete discharge shall be observed. Do not use any concrete more than 120 minutes from initial mixing or having a partial set before placing. Exemptions to the maximum time limit, if required, shall be submitted to the Contract Administrator in writing a minimum of 2 weeks prior to placement of concrete. Proposed methods and Materials used to extend the maximum time limit shall be agreed upon by the Contract Administrator and the concrete supplier prior to placement of the concrete.

.7 Pour concrete continuously between predetermined construction and control joints. Do not break or interrupt successive pours such that cold joints occur. Install a construction dam or bulkhead in case of a delay longer than 60 minutes. During delays between 5 and 60 minutes, protect the end of the placement with damp burlap.

.8 Protect freshly placed concrete from exposure to dust, debris and precipitation.

.9 Special provisions for cold weather concrete placement shall be in accordance with CSA A23.1-09 unless specifically noted otherwise.

## 3.5 CONSTRUCTION

.1 Sleeves and inserts.

.1 No sleeves, ducts, pipes or other openings shall pass through concrete members except where indicated or approved by Contract Administrator.

.2 Electrical conduits, junction and fixture boxes shall not be embedded within concrete members.

.3 Sleeves and openings greater than 4 x 4 in. not indicated, must be approved by Contract Administrator.

.4 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of modifications from Contract Administrator before placing of concrete.

.5 Check 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.

.2 Anchor bolts:

.1 Set anchor bolts to templates under supervision of appropriate trade prior to placing concrete.

.2 Protect anchor bolt holes from water accumulations, snow and ice build ups.

.3 Drainage holes and weep holes:

.1 Form weep holes and drainage holes in accordance with Section 03 10 00 - Concrete Forming and Accessories. If wood forms are used, remove them after concrete has set.

.2 Install weep hole tubes and drains as indicated.

.4 Grout under base plates using procedures in accordance with manufacturer's recommendations which result in 100% contact over grouted area.

.5 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 construction joints as indicated.

.4 Install joint filler.

.5 Use 12mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 12mm of finished slab surface unless indicated otherwise.

## 3.6 FINISHING

.1 Finish concrete in accordance with CSA-A23.1/A23.2.

.2 Consolidate concrete in accordance with CSA A23.1 and ACI 309.

.3 Under adverse conditions only, excess bleed water may be removed from the surface using procedures acceptable to Contract Administrator and those noted in CSA-A23.1. Ensure surface is not damaged.

.4 Immediately after final finishing apply approved evaporation retardant at indicated coverage rate. Evaporation retardant is not to be applied during finishing operations nor should it be Worked into the surface.

.5 Unless otherwise indicated round edges of formed joints in pavements with a 3/8 in. radius edging tool.

.6 Flatwork:

.1 Continuously consolidate and finish to specified elevations, ensuring thickness and required elevations are maintained.

.2 Immediately after concrete has been placed and consolidated, bull-float slab surface to a smooth uniform surface.

.3 Use of hand trowels will be required to hand finish areas the finishing machine cannot reach.

.4 Surface free of all trowel marks and ridges.

.5 Finishes:

.1 The specified finish shall be Class A as defined by CSA-A23.1 and meet the following requirements.

.1 FF = 20

.2 FL = 15

.3 Surface texture: Steel trowel finish as per CSA-A23.1.

.4 Surface free of all trowel marks and ridges.

.2 All exterior pavement Work must match existing finishes, patterns, joint spacing, colors, profiles and elevations.

.7 Vertical Formed Surface

.1 Where applicable finishing of formed surfaces shall commence immediately after stripping the forms.

.2 All form ties and other metal items shall be removed or cut back to a depth of at least 20 mm from the surface of the concrete.

.3 Patch surface defects as directed by Contract Administrator.

.4 All exterior surfaces to match existing adjacent finishes.

.5 Unless otherwise indicated, all formed surfaces shall receive a smooth-form finish in accordance with CSA-A23.1.

.6 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radius edges unless otherwise indicated.

## 3.7 JOINTS

.1 Provide control and construction joints at locations shown on Drawings or to match existing.

.2 Where paving abuts curbs, walls and other vertical surfaces use 1/2 in. asphalt impregnated fibre board.

.3 Unless otherwise indicated, all control and construction joints to be filled with a flexible joint sealant. Install sealants to manufacturer's instructions and ASTM C1193-11a Standard Guide for Use of Joint Sealants.

## 3.8 CURING

.1 Cure and protect concrete in accordance with requirements CSA A23.1.

.2 Concrete surfaces to be cured at a minimum temperature of 10°C for the entire curing period.

.3 Curing methods shall be in accordance with CSA A23.1 unless otherwise indicated.

.4 Unless noted otherwise the curing regime shall be consistent with the Class of Exposure. See General Notes on structural Drawing for Class of Exposure.

## 3.9 FIELD QUALITY CONTROL

.1 Inspection and testing of concrete and concrete Materials will be carried out by a Testing Laboratory designated by Contract Administrator in accordance with CSA-A23.1 and Section 01 45 00 - Quality Control and as described herein.

.1 Testing laboratory to be certified in accordance with CSA A283.

.2 The Contractor will pay for costs of tests via the testing cash allowance as per Section 01 21 00 - Allowances.

.3 Frequency and Number of Tests:

.1 Not less than one strength test per 50 m³ of concrete placed and not less than one test for each class of concrete placed on any one day.

.2 Slump and air measurements will be completed on each of the initial 3 loads of concrete per day of casting to ensure satisfactory control of the air content is established. If adequate control of air content is not established within the first 3 loads of concrete or if a test falls outside the specified limits, the testing frequency shall revert to one test per load until satisfactory control is re-established. Costs for additional testing will be the responsibility of the concrete supplier.

.4 Contract Administrator may take additional test cylinders during cold weather concreting or when concrete quality is suspect. Cure cylinders on job Site under same conditions as concrete which they represent.

.5 Non-destructive Methods for Testing Concrete shall be in accordance with CSA-A23.2.

.6 Inspection or testing by Contract Administrator will not augment or replace Contractor quality control nor relieve Contractual responsibility.

## 3.10 DEFECTIVE CONCRETE

.1 Defective concrete: cracking, spalling, scaling and concrete not conforming to required lines, details, dimensions, tolerances, or specified requirements.

.2 Repair or replacement of defective concrete will be determined by the Contract Administrator, based on the specifications and the above guidelines.

.3 Do not patch, fill, touch-up, repair or replace exposed concrete except upon express direction of Contract Administrator for each individual use.

.4 Modify or replace concrete not conforming to lines, detail and elevations indicated on Drawings.

.5 Repair or replace concrete not properly placed, resulting in excessive honeycombing and other defects in critical areas of stress.

.6 Notify Contract Administrator of proposed methods of repairing or replacing defective concrete. Methods of repairing or replacing defective concrete shall be acceptable to the Contract Administrator.

**END OF SECTION**

# Part 1 GENERAL

## 1.1 RELATED SECTIONS

.1 Section 03 10 00 - Concrete Forming Accessories

.2 Section 03 30 00 - Cast-In-Place Concrete

.3 Section 07 52 00 - Modified Bituminous Membrane Roofing

.4 Section 08 43 13 – Glazed Aluminum Storefronts

.5 Section 08 44 13 – Glazed Aluminum Curtain Walls

.6 Section 09 21 16 - Gypsum Board Assemblies

.7 Section 09 22 16 - Non-Structural Metal Framing

## 1.2 REFERENCES

.1 American National Standards Institute (ANSI)

.1 ANSI/NPA A208.1-1999, Particleboard, Mat Formed Wood.

.2 American Society for Testing and Materials International (ASTM)

.1 ASTM A653/A653M-05a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealled) by the Hot-Dip Process.

.2 ASTM C36/C36M-03, Standard Specification for Gypsum Wallboard.

.3 ASTM C578-05a, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.

.4 ASTM C1289-05a, Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.

.5 ASTM D1761-88(2000), Standard Test Methods for Mechanical Fasteners in Wood.

.6 ASTM D5055-05, Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists.

.7 ASTM D5456-05a, Standard Specification for Evaluation of Structural CompoSite Lumber Products.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-11.3-M87, Hardboard.

.2 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.

.3 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.4 CAN/CGSB-71.26-M88, Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems.

.4 Canadian Standards Association (CSA International)

.1 CSA A123.2-03, Asphalt Coated Roofing Sheets.

.2 CAN/CSA-A247-M86, Insulating Fiberboard.

.3 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.4 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.5 CSA O112 Series-M1977(R2006), CSA Standards for Wood Adhesives.

.6 CSA O121-M1978(R2003), Douglas Fir Plywood.

.7 CSA O122-06, Structural Glued-Laminated Timber.

.8 CSA O141-05, Softwood Lumber.

.9 CSA O151-04, Canadian Softwood Plywood.

.10 CSA O153-M1980(R2003), Poplar Plywood.

.11 CAN/CSA-O325.0-92(R2003), Construction Sheathing.

.12 CSA O437 Series-93(R2006), Standards on OSB and Waferboard.

.5 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber 2005.

.6 Truss Design and Procedures for Light Metal Connected Wood Trusses, Truss Plate Institute of Canada.

.7 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S706-97, Mineral Fibre Thermal Insulation for Buildings.

### 1.3 SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.

### 1.4 QUALITY ASSURANCE

.1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood, particleboard, OSB and wood based compoSite panels in accordance with CSA and ANSI standards.

## Part 2 PRODUCTS

### 2.1 FRAMING AND STRUCTURAL MATERIALS

.1 Lumber: unless specified otherwise, 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 Framing and board lumber: in accordance with NBC.

.3 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.

.4 Pressure treated lumber: To CAN/CSA-O80, UC 3.

## 2.2 PANEL MATERIALS

.1 Plywood, OSB and wood based compoSite panels: to CAN/CSA-O325.0.

.2 Pressure treated plywood: To CAN/CSA-O80, UC 3.

.3 Douglas fir plywood (DFP): to CSA O121, standard construction.

.4 Canadian softwood plywood (CSP): to CSA O151, standard construction.

.5 Poplar plywood (PP): to CSA O153, standard construction.

.6 Interior mat-formed wood particleboard: to ANSI 208.1.

## 2.3 ACCESSORIES

.1 Sealants: in accordance with Section 07 92 00 - Joint Sealing

.2 General purpose adhesive: to CSA O112 Series.

.3 Nails, spikes and staples: to CSA B111.

.4 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.

.5 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, fastening devices, recommended for purpose by manufacturer.

.6 Nailing discs: flat caps, minimum 25 mm diameter, minimum 0.4 mm thick, sheet metal, formed to prevent dishing. Bell or cup shapes not acceptable.

## 2.4 FASTENER FINISHES

.1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for exterior Work, interior highly humid areas.

.2 Use finish recommended by manufacturer for specially treated lumber.

# Part 3 EXECUTION

## 3.1 PREPARATION

.1 Store wood products in accordance with manufacturer’s written instructions.

## 3.2 INSTALLATION

.1 Install members true to line, levels and elevations, square and plumb.

.2 Construct continuous members from pieces of longest practical length.

.3 Install spanning members with "crown-edge" up.

.4 Install blocking as required to space-out and support wall and ceiling finishes, facings, fascia, soffit, and other Work as required.

.5 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other Work.

.6 Install backing, nailers, other wood supports as required and secure using galvanized steel fasteners.

.7 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.

## 3.3 ERECTION

.1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

.2 Countersink bolts where necessary to provide clearance for other Work.

.3 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

**END OF SECTION**

# Part 1 GENERAL

## 1.1 SUMMARY

.1 Section Includes:

.1 Application of exterior below grade, cold-applied elastomeric waterproofing membrane system designed for use on concrete and masonry substrates.

## 1.2 RELATED SECTIONS

.1 Section 02 41 99 – Demolition for Minor Works

.2 Section 03 30 00 – Cast-in-Place Concrete

.3 Section 07 21 13 – Board Insulation

.4 Section 09 21 16 – Gypsum Board Assemblies

## 1.3 SUBMITTALS

.1 Comply with Section 01 33 00 Submittal Procedures

.2 Product Data: Submit manufacturer's technical bulletins and MSDS on each product.

.1 Submit list of project references as documented in this Specification under Quality Assurance Article. Include contact name and phone number of person charged with oversight of each project.

## 1.4 QUALITY ASSURANCE

.1 Comply with Section 01 45 00 – Quality Control.

.2 Qualifications:

.1 Applicator: Minimum of 5 years experience in application of similar systems and products on projects of similar size and scope.

.2 Successful completion of a minimum of 5 projects of similar size and complexity to specified Work.

.3 Manufacturer Qualifications: Company shall be ISO 9001:2000 Certified.

.4 Manufacturer: Minimum 15 years of experience in manufacturing of high build coatings.

.5 Field Sample:

.1 Install at Project site or pre-selected area of building an area for field sample, minimum 6 inches by 4 feet (1.2 m by 1.2 m), using specified coating system.

.2 Apply material in strict accordance with manufacturer’s written application instructions.

.3 Manufacturer's representative or designated representative will review technical aspects; surface preparation, repair, and workmanship.

.4 Field sample will be standard for judging workmanship on remainder of Project.

.5 Maintain field sample during construction for workmanship comparison.

.6 Do not alter, move, or destroy field sample until Work is completed and approved by Architect.

.7 Obtain Architect's written approval of field sample before start of material application, including approval of aesthetics, color, texture, and appearance.

## 1.5 DELIVERY, STORAGE, AND HANDLING

.1 Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

.2 Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

.3 Store tightly sealed coating system materials off ground and away from moisture, direct sunlight, extreme heat, and freezing temperatures.

.4 Store in unopened containers in clean, dry conditions at 40 degrees F (4 degrees C) to 80 degrees F (27 degrees C).

## 1.6 PROJECT CONDITIONS

.1 Environmental Requirements:

.1 Ensure that substrate surfaces are dry, and ambient air temperatures are 40 degrees F (4 degrees C) to 90 degrees F (32 degrees C) at application time and remain above 40 degrees F (4 degrees C) for at least 24 hours after application. Ensure that frost or frozen surfaces are thawed and dry.

.2 Do not apply coatings if snow, rain, fog, and mist is anticipated within 12 hours after application. Allow surfaces to attain temperature and conditions specified before proceeding with coating application.

.3 Do not apply over sealant joints, control joints, or other materials that will be affected by solvent.

.4 Avoid application when inclement weather is present or imminent.

.5 Do not apply membrane to reinforcing bars or to wet or contaminated surfaces.

## 1.7 PRODUCTS

.1 Acceptable Manufacturer:

.1 Subject to compliance with requirements, provide products from the following manufacturer:
BASF Building Systems
889 Valley Park Drive
Shakopee, MN 55379

Customer Service: 800- 433-9517
Technical Service: 800-243-6739
Direct Phone: 952-496-6000
Internet: www.BASFbuildingsystems.com

.2 Acceptable Product: HLM 5000® by BASF Building Systems.

.1 One-component, moisture-curing, bitumen-modified polyurethane, elastomeric waterproofing membrane for exterior below-grade, between slab applications.

.2 Grade: High build.

.3 Reinforcing Fabric: Manufacturer's recommended type.

.4 Color: Black.

.3 Substitutions: No substitutions are permitted for Work of this Section.

## Part 2 EXECUTION

### 2.1 EXAMINATION

.1 Confirm that substrates for Work of this Section and adjacent Work is ready to receive Work of this Section.

### 2.2 SURFACE PREPARATION

.1 Expose existing membrane to the extent indicated to allow for tie-in of new membrane to existing Work.

.2 Lightly steel trowel new concrete to flat, uniform surface. Light broom finish is acceptable. Properly cure new concrete minimum of 14 days. Mechanically remove membrane-curing compounds.

.3 Patch voids and deep depressions in substrates with appropriate patching material before applying waterproofing membrane.

.4 Before applying waterproofing membrane, dam drains and drain openings.

.5 Carefully work material over irregular concrete to avoid pinholes.

.6 Remove dust, dirt, and other contaminants just before or during application. Ensure surfaces are dry at the time of application.

.7 Open air-void pockmarks or honeycombs up to allow waterproofing membrane to fill cavities completely. Air entrapment within voids may cause blisters. Extreme cases may require a parge coat.

### 2.3 PRESTRIPING

.1 Before applying final membrane, seal joints, cracks, and openings around protrusions by caulking or prestriping (a preliminary coating of waterproofing membrane applied with trowel or stiff bristled brush). Allow drying overnight before applying final membrane.

.2 When final membrane is applied, verify overall thickness over joints and cracks, at coves, and around penetrations of approximately 100 wet mils (2.5 mm) on standard system, or approximately 200 wet mils on high build system.

.3 Static Joints and Cracks: Fill joints and cracks less than 1/16 inch (1.6 mm) by prestriping. Apply material so it both fills and overlaps joint or crack to 4 inch (102 mm) width on each side.

.4 Working or Expansion Joints:

.1 Seal joints over 1/8 inch (3 mm) with joint sealant. Rout moving joints less than 1/8 inch (3 mm) to 1/8 inch (3 mm) minimum and fill with joint sealant. Prevent waterproofing membrane from adhering to joint sealant, which could cause sealant or membrane failure, by applying coat of wax or teflon tape over cured sealant and then prestriping.

.5 Metal:

.1 Clean metal to bright metal by wire brush or sandblast. Prime with quality rust-inhibiting metal primer before application of waterproofing membrane.

.6 Vent, Drain Pipe, and Post Penetrations:

.1 Clean metal surfaces to bright metal and prime with quality rust-inhibiting metal primer. Remove dust, debris, and other contaminants from voids. Seal with appropriate joint sealant.

.2 Seal openings exceeding 1/8 inch (3 mm) with joint sealant. Next, prestripe to 4 inch (102 mm) minimum width on base slab and continue up penetration to height of top-course wearing surface.

## 2.4 APPLICATION

.1 High-Build System:

.1 Concrete Substrate: Apply 60 wet mils (1.5 mm) of waterproofing membrane, followed by setting reinforcing fabric into wet material. Overlap seams 3 inches (76 mm) minimum. Additional material may be required to properly embed reinforcing fabric where it overlaps. Allow first coat to cure overnight and follow with second 60 wet-mil (1.5 mm) application of waterproofing membrane.

.2 For tie-in to existing membrane: Tack-up edge of existing membrane using solvent recommended by Manufacturer. Apply new coat of membrane over top of existing in accordance with manufacturer's instructions.

## 2.5 CURING

.1 Appreciable properties develop within 24 to 48 hours at 75 degrees F (24 degrees C) and 50 percent relative humidity. Protect waterproofing membrane from traffic during curing.

.2 Drainage and Protection:

.1 For protection during backfill and where hydrostatic pressure is anticipated, use appropriate drain board system.

.2 For protection during backfill only, install protection board as soon as possible following cure of waterproofing membrane.

## 2.6 FIELD QUALITY CONTROL

.1 Site Tests:

.1 Test integrity of cured membrane on horizontal surface by damming entire area and flooding with water to minimum depth of 2 inches (51 mm). Allow water to stand for 24 to 48 hours. Visually inspect bottom surface to check for water penetration. If repairs are necessary, drain area and allow drying before reapplying waterproofing membrane. After reapplication, test area again for membrane integrity. Repeat procedure until no leaks appear in membrane.

## 2.7 CLEANING AND PROTECTION

.1 Remove temporary coverings and protection from adjacent Work areas. Clean up areas not to be coated of over-spray and droppings. Remove construction debris from project Site.

.2 Clean tools and equipment immediately after application with manufacturer's recommended cleaning solution.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 RELATED SECTIONS

.1 Section 03 30 00 - Cast-In-Place Concrete

.2 Section 07 21 16 - Blanket Insulation

.3 Section 07 21 32 - Sprayed Polyurethane Foam Insulation

.4 Section 07 24 00 - Exterior Insulation and Finish Systems

.5 Section 07 26 00 - Vapour Retarders

.6 Section 07 52 00 - Modified Bituminous Membrane Roofing

.7 Section 07 92 00 - Joint Sealing

.8 Section 09 21 16 - Gypsum Board Assemblies

.9 Section 09 22 16 - Non-Structural Metal Framing

### 1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

- .1 ASTM C208-95(2001), Specification for Cellulosic Fiber Insulating Board.
- .2 ASTM C591-01, Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
- .3 ASTM C612-04, Standard Specification for Mineral Fibre Block and Board Thermal Insulation.
- .4 ASTM C726-05, Standard Specification for Mineral Fiber Roof Insulation Board.
- .5 ASTM C728-05, Standard Specification for Perlite Thermal Insulation Board.
- .6 ASTM C1126-04, Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation.
- .7 ASTM C1289-05a, Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
- .8 ASTM E96/E96M-05, Standard Test Methods for Water Vapour Transmission of Materials .

.2 Canadian Gas Association (CGA)

- .1 CAN/CGA-B149.1-05, Natural Gas and Propane Installation Code Handbook.
- .2 CAN/CGA-B149.2-05, Propane Storage and Handling Code.

.3 Canadian General Standards Board (CGSB)

.1 CGSB 71-GP-24M-77(R1983), Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.

.4 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S604-M91, Standard for Type A Chimneys.

.2 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.

.3 CAN/ULC-S702-97, Standard for Thermal Insulation, Mineral Fibre, for Buildings.

.4 CAN/ULC-S704-03, Standard for Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.

.5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

## 1.3 SUBMITTALS

.1 Shop Drawings:

.1 Submit Shop Drawings of tapered roof insulation to Section 01 33 00 – Submittal Procedures.

.2 Describe extent and slope of tapered insulation, roof drains, mechanical equipment, roof anchors, and penetrations.

# Part 2 PRODUCTS

## 2.1 INSULATION

### .1 Board Insulation 1 (BI-1)

.1 Expanded polystyrene (EPS): to CAN/ULC-S701.

.1 Acceptable Material: Plastifab or approved equal in accordance with B6.

.2 Type: 2

.3 Compressive strength: 110 kPa

.4 Thickness: as indicated.

.5 Size: As per manufacturer's recommendations.

.6 Edges: square.

.7 CFC/HCFC Content: 0

### .2 Board Insulation 2 (BI-2)

.1 Polyisocyanurate Insulation: Closed cell rigid foamed plastic boards conforming to CAN/ULC-S704,

.1 Acceptable Material: IKOTherm by IKO Industries or approved equal in accordance with B6.

.2 Type: 2

.3 Class: 3

.4 Facing: glass reinforced organic felt paper, perforated

.5 Size: As per manufacturer's recommendations.

.6 Thickness: as indicated.

**.3 Board Insulation 3 (BI-3)**

.1 Extruded polystyrene (XPS): to CAN/ULC-S701.

.1 Acceptable Material: Dow Styrofoam SM or equal.

.2 Type: 4

.3 Compressive strength: 210 kPa.

.4 Thickness: as indicated

.5 Size: Largest practical size.

.6 Edges: Square or shiplap as required.

.7 CFC/HCFC Content: 0

**.4 Board Insulation for EIFS**

.1 Refer to Section 07 24 00 – Exterior Insulation and Finish Systems.

## 2.2 ADHESIVE

.1 Adhesive (for polystyrene): to CGSB 71-GP-24.

.1 Type: As recommended by manufacturer.

## 2.3 ACCESSORIES

.1 To manufacturer's written instructions for the required purpose.

# Part 3 EXECUTION

## 3.1 MANUFACTURER'S INSTRUCTIONS

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

## 3.2 WORKMANSHIP

.1 Install insulation after building substrate Materials are dry.

.2 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, and other protrusions.

.4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN4-S604 type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 type B and L vents.

.5 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.

.6 Offset both vertical and horizontal joints in multiple layer applications.

.7 Do not enclose insulation until it has been inspected and approved by Contract Administrator.

## 3.3 EXAMINATION

.1 Examine substrates and immediately inform Contract Administrator in writing of defects.

.2 Prior to commencement of Work ensure:

.1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

## 3.4 ROOF INSTALLATION

.1 Install appropriate thermal barrier to deck following roofing manufacturer's written instructions. Apply insulation according to roofing manufacturer's written instructions.

## 3.5 BELOW GRADE INSTALLATION

.1 Install insulation to indicated elevations. Backfill in lifts designed to minimize damage to insulation.

## 3.6 WALL INSTALLATION

.1 Refer to Section 07 24 00 – Exterior Insulation and Finishing Systems.

## 3.7 CLEANING

.1 Upon completion of installation, remove surplus Materials , rubbish, tools and equipment barriers.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 RELATED SECTIONS

.1 Section 07 21 13 - Board Insulation

.2 Section 07 21 32 - Sprayed Polyurethane Foam Insulation

.3 Section 07 24 00 - Exterior Insulation and Finish Systems

.4 Section 07 26 00 - Vapour Retarders

.5 Section 09 21 16 - Gypsum Board Assemblies

.6 Section 09 22 16 - Non-Structural Metal Framing

### 1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM C553-02, Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.

.2 ASTM C665-01e1, Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

.3 ASTM C1320-05, Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.

.2 Canadian Gas Association (CGA)

.1 CAN/CGA-B149.1-05, Natural Gas and Propane Installation Code Handbook.

.2 CAN/CGA-B149.2-05, Propane Storage and Handling Code.

.3 Canadian Standards Association (CSA International)

.1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.4 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S604-M1991, Type A Chimneys.

.2 CAN/ULC-S702-1997, Standard for Mineral Fibre Insulation.

### 1.3 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

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

## Part 2 PRODUCTS

### 2.1 INSULATION

.1 Batt and blanket mineral fibre: to CAN/ULC S702 and CAN/ULC-S102-M88.

.1 Acceptable Material: Johns Manville Metal Frame Acoustical and Thermal Batt Insulation or or approved equal in accordance with B6.

.2 Type: 1.

.3 Thickness: as indicated.

### 2.2 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

### 3.1 MANUFACTURER'S INSTRUCTIONS

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

### 3.2 INSULATION INSTALLATION

.1 Install insulation to maintain continuity of thermal and acoustical 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 CAN/CGA-B149.1 and CAN/CGA-B149.2 Type B and L vents.

.5 Do not enclose insulation until it has been inspected by Contract Administrator.

## 3.3 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 RELATED SECTIONS

.1 Section 07 21 13 - Board Insulation

.2 Section 07 21 16 - Blanket Insulation

.3 Section 07 24 00 - Exterior Insulation and Finish Systems

.4 Section 07 26 00 - Vapour Retarders

.1 Section 08 43 13 – Glazed Aluminum Storefronts

.2 Section 08 44 13 – Glazed Aluminum Curtain Walls

.3 Section 09 21 16 - Gypsum Board Assemblies

.4 Section 09 22 16 - Non-Structural Metal Framing

### 1.2 REFERENCES

.1 Canadian Urethane Foam Contractors' Association Inc. (CUFCA)

.1 Installer site reference guides

.1 “Sprayed Polyurethane Foam – Certified Installer – Level I Manual”

.2 “Sprayed Polyurethane Foam – Certified Installer – Level II Manual”

.3 “Sprayed Polyurethane Foam – Certified Installer – Level III Manual”

.4 “Sprayed Polyurethane Foam – Certified Installer – Level IV Manual”

.5 “Sprayed Polyurethane Foam – Certified Installer – Level V Manual”

.2 Green Seal Environmental Standards

.1 Standard GC-03-93, Anti-Corrosive Paints.

.2 Standard GS-11-97, Architectural Paints.

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.4 South Coast Air Quality Management District (SCAQMD), California StateSCAQMD Rule 1113-06, Architectural Coatings.

.5 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S101-04, Fire Endurance Tests of Building Construction and Materials.

.2 CAN/ULC-S102-03, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

.3 CAN/ULC-S705.1-01, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification.

.4 CAN/ULC-S705.2-05, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Application.

## 1.3 SYSTEM DESCRIPTION

.1 Materials of this section shall provide continuity of thermal insulation, and act as the vapour barrier at building enclosure in conjunction with thermal insulation and vapour retarder materials as specified in related Sections.

## 1.4 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 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.

.1 Test reports: submit certified test reports for insulation from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.

.2 Submit test reports in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics.

.3 Manufacturer's Field Reports: submit to manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

## 1.5 QUALITY ASSURANCE

.1 Applicators to conform to CUFCA Quality Assurance Program:

.1 Contractor performing work under this section must be licensed under the SPF Quality Assurance Program (QAP) used by CUFCA (Canadian Urethane Foam Contractors Association). The contractor shall, under the QAP Licensing Agreement and as required by the CAN/ULC S705.2-05, only purchase and install, for this project, only material that conforms to the requirements of CAN/ULC S705.1-01 Material standard.

.2 Installers (Applicators) performing work under this section must be Licensed under the SPF Quality Assurance Program. The installer shall be trained by CUFCA/NECA (National Energy Conservation Association) and certified by PSDI (Professional Skills Development Institute Inc.) in accordance with the training requirements outlined in the CAN/ULC S705.2-05 Installation Standard. Applicators shall have

their photo-identification certification cards in their possession and available on the project site, for inspection upon request.

.3 The Licensed Installer shall conduct the on-site daily testing as required by the CAN/ULC S705.2-05 Installation Standard. The Licensed Installer shall complete the Daily Work Report as required by the CAN/ULC S705.2-05 Installation Standard. The Licensed Contractor shall forward to the The City copies of the Daily Work Record upon request. The Licensed Contractor shall submit copies of the Daily Work Records or a monthly summary sheet to the CUFCA office, on a monthly basis, as required by the SPF Quality Assurance Program used by CUFCA.

.2 Additional Qualifications:

.1 Installer: person specializing in sprayed insulation installations with 5 years documented experience and approved by manufacturer.

.2 Manufacturer: company with minimum 5 years experience in producing of material used for work required for this project, with sufficient production capacity to produce and deliver required units without causing delay in work.

.3 Mock-up:

.1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.

.2 Construct mock-up of an appropriate size to demonstrate installation, of sprayed insulation, including one inside corner and one outside corner, around one door, and one window opening.

.3 Mock-up may be part of finished work.

.4 Allow 48 hours for inspection of mock-up by Contract Administrator before proceeding with sprayed insulation work. Do not enclose work prior to review by Contract Administrator and written instruction to proceed.

.4 Health and Safety Requirements: worker protection:

.1 Protect workers as recommended by CAN/ULC-S705.2 and manufacturer's recommendations:

.2 Workers must not eat, drink or smoke while applying foam insulation.

## 1.6 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.

## 1.7 SITE CONDITIONS

.1 Ventilate area in accordance with Section 01 51 00 - Temporary Utilities.

.2 Ventilate area to receive insulation by introducing fresh air and exhausting air continuously during and 24 hour after application to maintain non-toxic, unpolluted, safe working conditions.

.3 Provide temporary enclosures to prevent spray and noxious vapours from contaminating air beyond application area.

.4 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of insulation materials.

.5 Apply insulation only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

## 1.8 WARRANTY

.1 The work under this section shall be warranted by the contractor against defects in workmanship or material for a period of two years from date of substantial completion.

.2 Promptly rectify, at the contractors expense, defects or deficiencies that become apparent during the warranty period.

.3 All work shall be covered by the third party warranty program as set forth by the SPF Quality Assurance Program used by CUFCA.

# Part 2 PRODUCTS

## 2.1 MATERIALS

.1 Insulation: Closed cell spray polyurethane to CAN/ULC-S705.1.

.1 Acceptable Materials:

.1 General use: Polarfoam PF-7300 Soya or or approved equal in accordance with B6.

.2 For use around windows: Dow Great Stuff Pro Window and Door.

.2 Primers: in accordance with manufacturer's recommendations for surface conditions.

## 2.2 EQUIPMENT

.1 The equipment used to spray the polyurethane foam material shall be in accordance with ULC S705.2-05 and the equipment manufacturer’s recommendations for specific type of application.

.2 Equipment settings are to be recorded on the Daily Work Record as required by the CAN/ULC S705.2-05 Installation standard.

.3 Each proportioner unit to supply only one spray gun.

## 2.3 ACCESSORIES

.1 Prime substrate when required by spray polyurethane manufacturer. The type of primer and the installation of the primer shall follow the requirements of the manufacturer for the surface conditions.

.2 Air/Vapour barrier membranes, mastics, sealants, liquids complete with required primers to complete the transitions for the air barrier system.

# Part 3 EXECUTION

## 3.1 MANUFACTURER'S INSTRUCTIONS

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

## 3.2 EXAMINATION

.1 Verify that surfaces and conditions are suitable to accept work as outlined in this section.

.2 Prior to commencement of work report in writing to the Contract Administrator any defects in surfaces or conditions that may adversely affect the performance of products installed under this section.

.3 Commencement of work outlined in this section shall be deemed as acceptance of existing work and conditions.

## 3.3 PREPARATION

.1 Protection

.1 Mask and cover adjacent areas to protect from over spray.

.2 Ensure any required foam stop or back up material are in place to prevent over spray and achieve complete seal.

.3 Seal off existing ventilation equipment. Install temporary ducting and fans to ensure exhaust fumes. Provide for make-up air.

.4 Erect barriers, isolate area and post warning signs to advise non-protected personnel to avoid the spay area.

.2 Surface Preparation

.1 Surfaces to receive foam insulation shall be clean, dry and properly fastened to ensure adhesion of the polyurethane foam to the substrate.

.2 Ensure that all work by other trades that may penetrate through the thermal insulation is in place and complete.

.3 Ensure that surface preparation and any primers required conform to the manufacturer’s instructions.

## 3.4 APPLICATION

.1 Spray-application of polyurethane foam shall be performed in accordance with CAN/ULC S705.2-05 and the manufacturer's instructions.

.2 Apply only when surfaces and environmental conditions are within limits prescribed by the material manufacturer and the CAN/ULC S705.2-05 Installation standard.

.3 Apply in consecutive passes as recommended by manufacturer to thickness as indicated on drawings. Passes shall be not less than 15mm and not greater than 50mm.

.4 Do not install spray polyurethane foam within 75mm of heat emitting devices such as light fixtures and chimneys.

.5 Finished surface of foam insulation to be free of voids and embedded foreign objects.

.6 Remove masking materials and over spray from adjacent areas immediately after foam surface has hardened. Ensure cleaning methods do not damage work performed by other sections.

.7 Trim, as required, any excess thickness that would interfere with the application of cladding/covering system by other trades.

## 3.5 TOLERANCES

.1 Maximum variation from indicated thickness: minus (-) 3mm; plus (+) 10mm.

## 3.6 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.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 RELATED SECTIONS

.1 Section 07 21 13 - Board Insulation

.2 Section 07 21 16 - Blanket Insulation

.3 Section 07 21 32 - Sprayed Polyurethane Foam Insulation

.4 Section 07 26 00 - Vapour Retarders

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

.6 Section 07 92 00 - Joint Sealing

.1 Section 08 43 13 – Glazed Aluminum Storefronts

.2 Section 08 44 13 – Glazed Aluminum Curtain Walls

.3 Section 09 21 16 - Gypsum Board Assemblies

.4 Section 09 22 16 - Non-Structural Metal Framing

### 1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

- .1 ASTM B117-03, Standard Practice for Operating Salt Spray (Fog) Apparatus.
- .2 ASTM C144-04, Standard Specification for Aggregate for Masonry Mortar.
- .3 ASTM C297/C297M-04, Standard Test Method for Flatwise Tensile Strength of Sandwich Construction.
- .4 ASTM C1002-04, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- .5 ASTM D968-05, Standard Test Methods for Abrasion Resistance of Organic Coatings by the Falling Abrasive.
- .6 ASTM D2247-02, Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
- .7 ASTM E72-05, Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
- .8 ASTM E96/E96M-04, Standard Test Methods for Water Vapor Transmission of Materials.
- .9 ASTM E2098-00, Standard Test Method for Determining Tensile Breaking Strength of Glass Fiber Reinforcing Mesh for Use in Class PB Exterior Insulation and Finish Systems (EIFS), after Exposure to a Sodium Hydroxide Solution.

.10 ASTM E2134-01, Standard Test Method for Evaluating the Tensile-Adhesion Performance of an Exterior Insulation and Finish System (EIFS).

.11 ASTM E2321-03, Standard Practice for Use of Test Methods E 96 for Determining the Water Vapor Transmission (WVT) of Exterior Insulation and Finish Systems (EIFS).

.12 ASTM E2430-05, Standard Specification For Expanded Polystyrene (EPS) Thermal Insulation Boards For Use In Exterior Insulation and Finish Systems (EIFS).

.13 ASTM G154-04, Standard Practice for Operating Fluorescent Light Apparatus UV Exposure of Nonmetallic Materials.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.162-2004, Emulsion Coating for Stucco and Masonry.

.2 CAN/CGSB-19.24-M90, Multicomponent, Chemical-Curing Sealing Compound.

.3 Canadian Standards Association (CSA International)

.1 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.1 CSA-A3001-F03, Cementitious Materials for Use in Concrete.

.4 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S134-92(1998), Standard Method of Fire Test of Exterior Wall Assemblies.

.2 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.3 CAN/ULC-S702-97, Standard for Mineral Fibre Thermal Insulation for Buildings.

.5 EIFS Industry Members Association (EIMA)

.1 EIMA 101.86-95, Standard Test for Impact Resistance

## 1.3 DEFINITIONS

.1 Aesthetic joint: joint for appearance of installation ease. Also known as aesthetic reveals, grooves and reglets used to provide starting and stopping points during application of finish coat.

.2 Adhesive: a polymer based, polymer modified or cementitious Material, typically mixed with Portland cement used to attach insulation board to substrate.

.3 Back wrapping: at edges (termination) of EIFS where the reinforcing mesh and base coat extend from the back side of the insulation around the termination edge and onto the front of the insulation.

.4 Base coat adhesive: adhesive used in base coat.

.5 Base coat: layer consists of polymer modified, typically mixed with Portland cement and applied to face of insulation board and reinforced with one or more layers of mesh to function as a weather barrier.

.6 Base coat thickness: greater than 3 mm.

.7 Expansion joint: joint through EIFS to allow for movement.

.8 Finish coat: acrylic-based, decorative and protective coating applied to outside surface of base coat.

.9 Lamina: base coat, reinforcing mesh and finish.

.10 Mechanical fastener: mechanical device for attaching insulation to substrate.

.11 Reinforcing mesh: balanced, open weave, glass fibre reinforcement to base coat providing impact resistance.

.12 Substrate: surface to which EIFS is attached.

## 1.4 SYSTEM DESCRIPTION

.1 Exterior insulation and finish system to be Site applied cladding system consisting of adhesive, insulation board, base coat with reinforcing mesh and finish.

.1 Adhesive applied.

## 1.5 DESIGN REQUIREMENTS

.1 Design panels in accordance with Manitoba Building Code with design hourly wind pressure suitable for location of Work.

.2 Finish appearance colour, texture, reveals etc. shall match acrylic stucco on adjacent surfaces of the existing building. Provide colour sample to manufacturer’s lab for custom tinting process.

## 1.6 PERFORMANCE REQUIREMENTS

.1 Installed modified polymer coat wall system to have following performance properties:

.1 Comply with CAN/ULC-S134.

.2 Finish-abrasion resistance: falling sand method to ASTM D968, no deleterious effects after 500 litres (132 gal).

.3 Finish-salt spray resistance: to ASTM B117, after 300 hours' exposure to 5% salt spray solution - no effects.

.4 Finish-moisture resistance: to ASTM D2247 (U.S. Federal Test Standard 141A Method 6201), after 15 days exposure - no deleterious effects.

.5 Accelerated weathering: to ASTM G23, 2000 hours - no effect.

.6 Impact resistance: to ASTM D5420, >3 Joule Impact, no damage.

.7 Bond strength: to ASTM C 297.

.8 Permeability: to ASTM E96.

## 1.7 SUBMITTALS

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

.2 Product Data:

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit product data sheets for system Materials. Include product characteristics, performance criteria, limitations and colours.

.3 Shop Drawings:

.1 Submit Shop Drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate wall layout, details, connections, expansion joints, finish system, installation sequence, including interface with doors, windows, air barriers, vapour retarders and other components.

.4 Samples:

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit one 300 x 300 mm sample of each colour of finished wall system prior to fabrication of mock-up.

.5 Manufacturer's Instructions: provide to indicate special handling criteria, installation sequence, cleaning procedures.

## 1.8 QUALITY ASSURANCE

.1 Pre-Bid Site Review: Contractor for Work of this Section shall visit the Site prior to submitting a Bid in order to familiarize himself with the colour, texture, reveals and other pertinent qualities of the existing acrylic stucco on adjacent construction. It is intended that the acrylic stucco described in this Section be installed to match the existing product on adjacent construction.

.2 Qualifications:

.1 Installation of exterior insulation and finish wall system by applicators certified by manufacturers of system used.

.2 Submit certification to Contract Administrator prior to commencement of Work in accordance with 01 33 00 - Submittal Procedures.

.3 Mock-ups

.1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.

.2 Construct mock up of complete EIFS system on typical exterior wall 3’ long x 3’ wide x 1’ high incorporating:

.1 Window and frame to demonstrate back wrap and reinforcement at corners.

.2 Door and frame to demonstrate back wrap and reinforcement at corners.

.3 Wrappings and terminations: back wrapping and edge wrapping.

.4 Joints to demonstrate aesthetic, control and expansion joint construction.

.5 Construction at changes in substrate.

.6 Construction at corner stop.

.7 Construction at sill of wall, windows and doors.

.8 Construction at grade and below grade.

.9 Construction at parapets and soffits.

.10 Construction at both large and small penetrations.

.11 Construction at surface mounted objects and foam shapes.

.12 Adhesive and mechanical fastening systems.

.13 Colour, texture and finish.

.3 Construct mock-up where directed.

.4 Allow 24 hours for inspection of mock-up by Contract Administrator before proceeding with Work.

.5 Mock-up will be used

.1 To judge Workmanship, substrate preparation, operation of equipment and Material application.

.6 When accepted, mock-up will demonstrate minimum standard of quality required for this Work. Approved mock-up may remain as part of finished Work.

## 1.9 DELIVERY, STORAGE, AND HANDLING

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

.2 Deliver and store Materials in accordance with manufacturer's instructions.

.3 Protect adhesives and base finish Materials from freezing.

.4 Store and protect insulation from physical damage and direct exposure to weather.

## 1.10 PROJECT/SITE ENVIRONMENTAL REQUIREMENTS

.1 Temperature, relative humidity, moisture content.

.1 Apply insulation only when surfaces and ambient temperatures are within manufacturer’s prescribed limits.

.2 Apply EIFS components at temperatures, relative humidity, and substrate moisture content and substrate temperature in accordance with manufacturer's written instructions.

.2 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of insulation, adhesive and caulking Materials.

.3 Ventilation:

.1 Ventilate area of Work as directed by Contract Administrator by use of approved portable supply and exhaust fans.

.2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.

.3 Provide continuous ventilation during and after insulation application. Run ventilation system 24 hours per day during installation; provide

continuous ventilation for 7 days after completion of insulation installation.

## 1.11 WARRANTY

.1 Manufacturer's standard 5 year limited warranty.

# Part 2 PRODUCTS

## 2.1 ACCEPTABLE MATERIAL

.1 akrilonPRO-NC system by Akrilon Industries Inc. or approved equal in accordance with B6.

## 2.2 PRODUCTS

.1 Weather Resistant Barrier (WRB)

.1 Vapour Retarding Weather Resistant Barrier:

.1 Shall be 100% acrylic Hydroflex Akril-Guard (vapour retarder): mixed with Type GU Portland cement;

.2 Shall be tested to ASTM E96 for water permeability;

.3 Shall meet ASTM E-283 for air permeability;

.4 Shall be manufactured by Akrilon Industries Inc.

## 2.3 ADHESIVE/DRAINAGE PLANE

.1 Shall be a 100%-acrylic polymer based Material applied as vertical ribbons to the back of the insulation board:

.1 Acceptable Material:

.1 Akrilon Styro- wall N.C. mixed with an approximately equal volume of Type GU Portland cement (Weight ratio = 30kg (66 lbs.) Styro-wall N.C. to 15kg (33 Lbs.) Portland cement).

.2 Ready-mixed Akril-Adhesive.

.3 Adhesive shall be applied in vertical ribbon orientation to the entire back surface of the insulation board using a 3/8"x1/2"x1-1/2" U-notched trowel (typical).

## 2.4 INSULATION BOARD

.1 Acceptable Material: Akrilon EPS flat insulation.

.1 to CAN-ULC S701-01, Type 1 and be made from virgin Material with a nominal density of 16 Kg/m3 (1 Lb/ft3).

.2 Insulation thickness: as indicated.

## 2.5 BASECOAT

.1 100% acrylic-based, non-combustible product

.1 Acceptable Material:

.1 Akrilon Styro-Wall N.C. basecoat mixed with an approximately equal volume of Type GU Portland cement (Weight ratio = 30kg (66 lbs.) basecoat to 15kg (33 lbs.) Portland cement).

.1 Conforms to CAN/ULC S101 "Fifteen Minute Stay in Place Test".

.2 Conforms to CAN/ULC S114 (Non-Combustible Material) and CAN/ULC S101 -89 (Fifteen Minute Stay in Place Test). See Paragraph 1.2.2 of this Section.

## 2.6 REINFORCING FIBREGLASS MESH

.1 As selected from Manufacturer's full range of mesh.

.1 Shall be alkali-resistant according to ANSI 99-A-2001.

.2 Shall meet ASTM E-2098 and ASTM D-5035 standards.

.3 Shall have different weights according to specific needs:

1. Starter/Detail Mesh: 150g/$m^2$ (4.5 oz/$Lbs^2$)
2. Soft Mesh: 150g/$m^2$ (4.5 oz/$Lbs^2$)
3. Standard Mesh: 150g/$m^2$ (4.5 oz/$Lbs^2$)
4. Intermediate Mesh: 375g/$m^2$ (11 oz/$Lbs^2$)
5. High Impact Mesh: 500g/$m^2$ (15 oz/$Lbs^2$)
6. Corner Mesh: 305g/$m^2$ (9 oz/$Lbs^2$)

## 2.7 PRIMER

.1 Manufacturer's recommended primer.

## 2.8 FINISH COAT

.1 Factory-mixed, 100% acrylic-based Finish Coat, containing integral colour and texture.

.1 Acceptable Material: Akrilon Finish Coat.

.2 The colour and texture shall match existing acrylic stucco adjacent to Work of this Contract.

## 2.9 OTHER MATERIALS

.1 Portland Cement

.1 Lump-free, Type GU (Type GU) Portland cement conforming to CSA A5-98 standards.

.2 Water

.1 Shall be clean, potable and free of sediment.

.3 Transition Membrane

.1 Shall be a flexible, self-adhesive compoSite Material tested for adhesion to itself and approved by the Manufacturer.

.1 Acceptable Material: Akrilon A-FLEX TAPE (4"-12" rolls).

.4 Backer Rod & Sealant

.1 Backer rod: closed pore type.

.2 Low-modulus caulking with long service lives.

.1 Acceptable products:

.1 Dow 790 and 795,

.2 Sonneborn Sonolastic 150 VLM

.3 SIKA Sikaflex 15LM.

.4 Two part polyurethane caulks are not acceptable.

## Part 3 EXECUTION

### 3.1 INSPECTION

.1 Prior to installation, the applicator must examine the condition of the substrate including sheathing, blocking, flashing and report to the General Contractor any deficiency that might impair proper installation of the akrilonPRO-NC system in its performance and appearance.

.2 Applicator to inspect cladding penetrations and through-wall design features, including windows and doors.

.3 Consider "appearance" of equal importance to "performance". All surfaces to be clad with EIFS must be clean, dry, structurally sound and uniform. "Performance" must be assessed with respect to the integrity of primary and secondary weather barriers, exclusion of moisture from the interior wall assembly and inclusion of proper flashing details to deflect moisture away from the cladding surface.

### 3.2 PREPARATION

.1 Ensure conduit pipes, cables and outlets are adequately covered before commencing with installation.

.2 Adjacent finish Work must be protected from damage during the installation of Work of this Section.

### 3.3 MIXING

.1 Air-barrier membrane:

.1 Mix manufacturer’s membrane Material until thoroughly blended. This will remove any settling of the contents due to storage.

.2 In a clean container, combine membrane Material with fresh, lump-free Type GU Portland cement at a ratio of 1:1 by weight. Thoroughly mix to a homogenous state using a paddle mixer and electric drill. Add Portland cement in small increments to prevent lumps from occurring.

.3 Small amounts of water may be added to adjust the consistency.

.4 All other additives (antifreeze, accelerators, or otherwise) are strictly forBidden.

.2 Basecoat/adhesive:

.1 Mix the manufacturer’s basecoat Material until thoroughly blended. This will remove any settling of the contents due to storage.

.2 In a clean container, combine basecoat Material with fresh, lump-free Type GU Portland cement at a ratio of 1:1 by volume (approximately 2:1 by weight). Thoroughly mix to a homogenous state using a paddle mixer and electric drill. Add Portland cement in small increments to prevent lumps from occurring.

.3 Allow mixture to set up for 5 minutes, then mix again to break the initial set.

.4 Small amounts of water may be added to adjust the consistency.

.5 All other additives (antifreeze, accelerators, or otherwise) are strictly forBidden.

## 3.4 INSTALLATION

**.1** Flashing

.1 Refer to Section 07 62 00 – Sheet Metal Flashing and Trim.

.2 Install flashing as indicated.

.3 Join flashing to the Weather Resistant Barrier (WRB) by applying the membrane overtop the upper leg of the flashing with a minimum 100mm (4") piece of starter/detail mesh installed 50mm (2") embedded on either side of the transition point.

.4 Alternatively, apply flex tape over the flashing leg and apply the trowel-on membrane directly to the flex tape surface.

**.2** Sheathing Joint Treatment

.1 Complete sheathing joint treatments as per the Weather Resistant Barrier data sheets.

.2 Roll joint treatment along sheathing joint connections and fully embed minimum 100mm (4") starter/detail mesh into the membrane.

**.3** Weather Resistant Barrier (WRB)

.1 Ensure transition membranes are installed, sealing all junctions between the substrate and other Materials (wall penetrations, openings, and dissimilar Materials).

.2 The Weather Resistant Barrier shall be joined to other components of the system so that the air barrier is continuous in three dimensions.

.3 Read the Weather Resistant Barrier data sheets for complete installation instructions.

.4 For the installation of HYDROFLEX AKRIL-GUARD:

.1 Standard mesh is embedded into the membrane to help dictate proper thickness as well as treat the sheathing joints.

.2 Trowel membrane over the substrate to an approximate thickness of 2mm (3/16").

.3 Immediately embed standard mesh into the wet membrane. Trowel from the centre of the mesh outwards to prevent wrinkles from forming in the mesh. Smooth out the membrane to eliminate trowel lines.

.4 The final thickness of the membrane shall be such that the mesh is fully embedded and <u>not</u> visible. If mesh is visible, apply an additional skim coat of membrane.

.5 Allow the Weather Resistant Barrier to fully cure before adhering insulation boards over the membrane.

## 3.5 STAY-IN-PLACE MECHANISM

.1 At the top of wall sections, starter/detail mesh shall be adhered to the Weather Resistant Barrier (min. 100mm (4")) with Akrilon STYRO-WALL N.C. The mesh will be wrapped to the front face of the EPS insulation board during the wall mesh application. This will create a "stay-in-place" mechanism (required for fire protection).

## 3.6 BACKWRAPS

.1 Edges of the EPS insulation board that meet dissimilar substrates, terminations, wall openings, etc. shall be backwrapped.

.2 Spread Akrilon Styro-Wall N.C. (mixed with Portland cement) over the end and onto the face of the board wide enough to adhere minimum 100mm (3") of mesh. Wrap the mesh around the board edge so it extends minimum 100mm (3") onto the oppoSite surface.

.3 Allow the basecoat/mesh backwrap to dry prior to installation.

## 3.7 INSULATION BOARDS

.1 Apply manufacturer’s recommended adhesive as vertical ribbons to the complete backside of the insulation boards using a 3/8" x 1/2" x 1-1/2" U-notched trowel.

.2 Insulation boards shall be placed horizontally on the walls starting with edge wrapped boards at the base of the wall. Apply firm pressure over the entire surface of the board to ensure complete contact of the adhesive to the substrate. Ensure the adhesive does not dry prior to installation of the insulation boards.

.3 EPS Boards shall be butted tightly together to eliminate any thermal breaks. Care must be taken to prevent adhesive from getting between the joints of the EPS insulation boards.

.4 Gaps between insulation boards shall be packed with slivers of EPS foam or filled with an expanding spray-foam compatible with the insulation board.

.5 Stagger vertical joints and interlock insulation boards at all inside and outside corners.

.6 Stagger insulation board and sheathing board joints at least 150mm (6") apart from each other.

.7 Where the akrilonPRO-NC system meets dissimilar substrates and/or terminates (vertically) the insulation shall be backwrapped (as per paragraph 3.4.5 of this Section).

.8 Insulation boards shall be rasped to achieve a smooth even surface, create better adhesion, and remove possible ultra-violet damage and/or other surface pollutants.

.9 The entire surface of the insulation boards shall be clean prior to the application of the basecoat and reinforcing mesh.

## 3.8 AESTHETIC DETAILS

.1 V-grooves/Reveals shall be installed as per the construction documents and to match the existing adjacent acrylic stucco.

.2 V-grooves/Reveals shall be completed using a hot-wire knife to ensure tight, crisp lines are maintained. The inset areas shall be finished with mesh and basecoat.

.3 A minimum thickness of 19mm (3/4") of EPS insulation, between the substrate and base of any reveal, shall be maintained.

.4 V-grooves/Reveals shall not be in alignment with insulation board joints or with the corners of openings.

## 3.9 BATTEN & FOAM DETAILS

.1 All battens made of expanded polystyrene (EPS) shall be installed by bonding them with basecoat/adhesive, or with spray polyurethane such as Wind-lock's Foam-2-Foam, or by mechanically fastening them to the structure.

.2 Foam battens shall be locked to the insulation by embedding the mesh "wings" of the batten into basecoat.

.3 All batten details extending more than 50mm (2") beyond the basecoat must have an outward-facing slope (minimum of 22º degrees) to prevent moisture from accumulating on them.

## 3.10 BASECOAT & REINFORCING MESH

.1 Apply basecoat over the surface of the insulation to a uniform thickness of approximately 3mm (1/8"). Work horizontally or vertically in strips of 1016mm (40"), and immediately embed standard mesh into the wet basecoat.

.2 Standard mesh shall be double lapped not less than 200mm (8") at all corners and overlapped not less than 50mm (2") at mesh joints. Avoid wrinkles from forming in the mesh.

.3 Install an additional 300mm (12") long piece of starter/detail mesh (at a 45º-degree angle) at the corners of all wall openings.

.4 The reinforcing mesh must be fully embedded and not visible. Apply additional skim coats as required.

.5 Install high impact mesh where noted in the construction Drawings.

.6 Apply basecoat to the surface of the insulation boards to a thickness of 2.4mm (3/32”) and embed high impact mesh (vertical application is preferred). Smooth the surface until the mesh is fully embedded.

.7 High impact mesh shall be abutted and not lapped.

.8 Where applicable, the high impact mesh shall be installed to heights indicated in the plans.

.9 All layers of high impact mesh shall be covered with a layer of standard mesh.

.10 Install high impact corner mesh on exposed interior/exterior corners.

.11 Allow the basecoat to dry before applying the primer and finish coat (24-hours).

## 3.11 PRIMER

.1 Apply an even coat of primer (tinted to the same colour as the finish coat) with a good-quality paintbrush, 10mm (3/8") nap roller, or sprayer.

.2 Allow primer to dry before commencing with the Finish Coat.

## 3.12 FINISH COAT

.1 Trowel-apply a tight coat of Finish Coat, colour and texture to match existing adjacent acrylic stucco, to a thickness not greater than the largest aggregate. Apply the finish coat with a stainless steel trowel in a continuous fashion, maintaining a wet edge. Levelling and texturing shall take place in one operation to give the Finish Coat a uniform appearance.

.2 Avoid applications in direct sunlight.

.3 Avoid applying finish coat at locations where caulking will be installed.

.4 Weather conditions will be a factor in the application and drying time of the Finish Coat.

## 3.13 CAULKING

.1 Refer to Section 07 92 00 - Joint Sealing.

.2 Caulking shall be installed in a timely manner. Protect open joints from water intrusion during the construction period with backer rod until permanently sealed.

## 3.14 PROTECTION

.1 Ensure that the general Contractor protects all Work against moisture infiltration and other damages by installing the necessary flashing and caulking in a timely manner.

.2 Provide protection against dirt, moisture, high humidity, and freezing temperatures until Materials are fully dry.

## 3.15 CLEAN UP

.1 After completion, remove waste and left over Materials (used in this Section) from the job Site.

.2 Clean all adjacent Materials and surfaces, and repair any defects to this application or any defects to any other Work caused by this application, all to the approval of the Contract Administrator.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 RELATED SECTIONS

.1 Section 07 21 13 - Board Insulation

.2 Section 07 21 16 - Blanket Insulation

.3 Section 07 21 32 - Sprayed Polyurethane Foam Insulation

.4 Section 07 24 00 - Exterior Insulation and Finish Systems

.5 Section 07 52 00 - Modified Bituminous Membrane Roofing

.6 Section 07 92 00 - Joint Sealing

.1 Section 08 43 13 – Glazed Aluminum Storefronts

.2 Section 08 44 13 – Glazed Aluminum Curtain Walls

.3 Section 09 21 16 - Gypsum Board Assemblies

.4 Section 09 22 16 - Non-Structural Metal Framing

### 1.2 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.33-M89, Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.

.2 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.

### 1.3 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:

.1 Product characteristics.

.2 Performance criteria.

.3 Limitations.

.3 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS).

### 1.4 QUALITY ASSURANCE

.1 Mock-Ups:

.1 Submit mock-ups in accordance with Section 01 45 00 - Quality Control.

.2 Construct mock-up of sheet vapour barrier installation including one lap joint, one inside corner and at one electrical box. Mock-up may be part of finished Work.

.3 Mock-up will be used to judge Workmanship, substrate preparation, and Material application.

.4 Locate where directed.

.5 Allow 48 hours for inspection of mock-up by Contract Administrator before proceeding with vapour barrier Work.

.2 When accepted, mock-up will demonstrate minimum standard of quality required for this Work. Approved mock-up may remain as part of finished Work.

## Part 2 PRODUCTS

### 2.1 SHEET VAPOUR BARRIER

.1 Polyethylene film: to CAN/CGSB-51.34, 6 mil. or 10 mil. as indicated.

.2 Self-adhesive membrane: SBS rubberized asphalt compound laminated to a cross-laminated polyethylene film.

.1 Acceptable Material: Bakor Blueskin SA or equal.

### 2.2 ACCESSORIES

.1 Joint sealing tape: air resistant pressure sensitive adhesive tape, type recommended by vapour barrier manufacturer, 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. To Section 07 92 00 - Joint Sealing.

.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.

.5 Self-adhesive membrane primer: Type recommended by membrane manufacturer for application. Compatible with substrate.

## Part 3 EXECUTION

### 3.1 INSTALLATION

.1 Ensure services are installed and inspected prior to installation of retarder.

.2 Install sheet vapour retarder on warm side of exterior wall, ceiling, and floor assemblies as indicated prior to installation of gypsum board to form continuous retarder.

.3 Use sheets of largest practical size to minimize joints.

.4 Inspect for continuity. Repair punctures and tears with sealing tape before Work is concealed.

## 3.2 EXTERIOR SURFACE OPENINGS

.1 Wrap openings in self-adhesive membrane. Apply primer to substrates as required. Lap membrane over wall air and vapour barriers 50mm to maintain continuity of seals. Coordinate with requirements of Section 07 24 00 – Exterior Insulation and Finish Systems.

## 3.3 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 Install staples through lapped sheets at sealant bead into metal substrate.

.4 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

## 3.4 LAP JOINT SEALS

.1 Seal lap joints of sheet vapour barrier as follows:

.1 Attach first sheet to substrate.

.2 Apply continuous bead of sealant over solid backing at joint.

.3 Lap adjoining sheet minimum 150 mm and press into sealant bead.

.4 Install staples through lapped sheets at sealant bead into metal substrate.

.5 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

## 3.5 ELECTRICAL BOXES

.1 Seal electrical switch and outlet device boxes that penetrate vapour barrier as follows:

.1 Install moulded box vapour barrier.

.2 Apply sealant to seal edges of flange to main vapour barrier and seal wiring penetrations through box cover.

## 3.6 CLEANING

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

.2 Upon completion and verification of performance of installation, remove surplus Materials, excess Materials, rubbish, tools and equipment.

**END OF SECTION**

# Part 1 GENERAL

## 1.1 SUMMARY

.1 Section Includes: Provide SBS modified bituminous membrane roofing system including but not limited to following:

.1 surface preparation
.2 vapour retarder.
.3 roof insulation.
.4 SBS modified bituminous base sheet.
.5 SBS modified bituminous cap sheet.
.6 roof accessories.

## 1.2 RELATED SECTIONS

.1 Section 07 21 13 - Board Insulation

.2 Section 07 26 00 - Vapour Retarders

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

.4 Section 07 84 00 - Firestopping

.5 Section 07 92 00 - Joint Sealing

.6 Section 09 21 16 - Gypsum Board Assemblies

.7 Section 09 22 16 - Non-Structural Metal Framing

## 1.3 REFERENCES

.1 Abbreviations and Acronyms:

.1 AWPA: American Wood Protection Association; www.awpa.com.
.2 CCA: Chromated copper arsenate (preservative).
.3 CRCA: Canadian Roofing Contractors' Association; www.roofingcanada.com.
.4 EVT: Equiviscous Temperature.
.5 FBT: Finish Blowing Temperature.
.6 FM: Factory Mutual Global; www.fmglobal.com.
.7 FP: Flash Point.
.8 LTTR: Long Term Thermal Resistance.
.9 MSDS: Material Safety Data Sheets.
.10 OIRCA: Ontario Industrial Roofing Contractors Association; www.ontarioroofing.com.
.11 SBS: Styrene-Butadiene-Styrene.
.12 SMACNA: Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.

.13 ULC: Underwriters Laboratories of Canada.

.14 VOC: Volatile Organic Compound.

.2 Definitions:

.1 Roofing Terminology: Refer to ASTM D1079 and glossary as dictated by CRCA Manual.

.2 Phased Construction: Layered installation in which each component of cross section of roof system are not completed in a specific roof area during a 1 day Work period. This type of construction is NOT acceptable to roof system manufacturer.

## 1.4 REFERENCES

.1 ASTM C208-08a/CAN/ULC-S-706: Standard Specification for Cellulose Fibre Insulating Board

.2 ASTM C1177/C1177M-08: Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing

.3 ASTM D92-05a: Standard Test Method for Flash and Fire Points by Cleveland Open Cup

.4 ASTM D1079-08a: Standard Terminology Relating to Roofing and Waterproofing

.5 ASTM D3273-00(05): Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber

.6 AWPA P5-07: Standard for Waterborne Preservatives

.7 CGSB 37-GP-9Ma: Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing

.8 CGSB 37-GP-56M: Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing

.9 CAN/CGSB-51.33-M89: Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction

.10 CSA A123.4-04(08): Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems

.11 CSA O80.1-M08: Specification of Treated Wood

.12 FM 4470-86: Approval Standard for Class 1 Roof Covers

.13 CAN/ULC-S102-07: Surface Burning Characteristics of Building Materials and Assemblies

.14 CAN/ULC-S107-03: Methods of Fire Tests of Roof Coverings

.15 CAN/ULC-S126-06: Standard Method of Test for Fire Spread Under Roof-Deck Assemblies

.16 CAN/ULC-S704-03: Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced

.17 CAN/ULC-S770-00: Determination of Long-Term Thermal Resistance of Closed-Cell Thermal Insulating Foams

.18 UL 1256: Standard for Fire Test of Roof Deck Construction

## 1.5 ADMINISTRATIVE REQUIREMENTS

.1 Coordination:

.1 Prior to start-up and during Work, review conditions of space below to ensure conflicts and/or altercations are kept to a minimum.

.2 Work deemed disruptive to overall Project shall be cleared by Contractor and The City in advance.

.2 Preinstallation Meetings:

.1 Arrange preinstallation meeting 1 week prior to commencing Work with parties associated with trade as designated in Contract Documents or as requested by Contract Administrator. Presided over by Contractor, include Contract Administrator who may attend, SubContractor performing Work of this trade, The City's representative, manufacturer's representative, testing company's representative and Contract Administrators of applicable discipline. Contact Contract Administrator and involved parties minimum 2 weeks prior to preinstallation meeting to confirm details of meeting.

.2 Record discussions of conference, decisions, agreements or conflicts reached and furnish a copy to involved parties. Review preparations and installation procedures and coordinate scheduling required for Work of this Section.

.3 Review methods and procedures related to roofing including following:

.1 Tour, inspect and discuss conditions and coordination of substrate, roof drains, locations of roof drains, curbs penetrations and other Work performed by trades impacting this Section.

.2 Examine deck substrate conditions and finishes for compliance. Review structural loading limits of deck and inspect deck for loss of flatness and for required mechanical fastening.

.3 Review methods and procedures related to roofing installation, including manufacturer's written instructions.

.4 Review roofing system requirements (Drawings, Specifications and other documents).

.5 Review required submittals.

.6 Review and finalize construction schedules related to roofing Work and verify availability of Materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.

.7 Review required inspections, testing, certifying and Material usage accounting procedures.

.8 Review weather and forecasted weather conditions, and procedures for coping with unfavorable conditions, including possibility of temporary roofing.

.9 Review structural loading limitations of roof deck for stocking roofing Materials.

.10 Review flashing details, roof drainage and other conditions that will affect roofing systems.

.11 Review fire hazard assessment of Work prior to commencement of heat welding.

.12 Review temporary protection requirements for roofing system during and after installation.

.13 Review roof observation and repair procedures after roofing installation.

.3 Scheduling:

.1 Co-operate with adjoining subtrades and promptly proceed with Work as soon as Site conditions permit.

.2 Ensure items to be incorporated into Work of this Section and items required for incorporation by other subtrades are supplied in a timely manner. Proceed with Work of this Section after built-in items are installed and roof substrates are completed.

## 1.6 SUBMITTALS

.1 Provide 2 copies of each submittal unless otherwise noted in Specifications.

.2 Product Data: Submit Product data on components of roof system including but not limited to:

.1 Each product to be used, composition of Material, and method of installation.

.2 MSDS.

.3 certification of compliance with applicable standards and authorities having jurisdiction.

.4 warranty.

.3 Shop Drawings: Submit Shop Drawings as required showing method of installation and layout of each layer, roof edge condition details, roof penetration flashing details, standard roof sections, connection to air barrier in wall, details of insulation, tapered insulation layouts, vapour retarder and sheathing securement details and other details required for proper roof system installation not specified in, or are different from Specifications and Drawings.

.4 Samples: Provide following samples of manufacturer's roofing system components prior to commencement of Work in this Section:

.1 insulation 300 mm x 300 mm (12" x 12") square.

.2 roof membrane 300 mm x 300 mm (12" x 12") square.

.3 metal flashing Material 300 mm (12") long.

.5 Test and Evaluation Reports:

.1 If requested, provide Product test reports based on evaluation of comprehensive test performed by manufacturer and witnessed by a qualified independent testing agency for components for roofing system.

.2 Indicate components of roofing system comply with requirements of manufacturer and these Specifications including quantity, statistical and descriptive data for each Product and other data pertaining to date, time and temperature for each load of bulk asphalt.

.6 Manufacturers' Instructions: Submit manufacturers' installation instructions prior to installation of roofing system for use during installation.

.7 Qualification Statements:

.1 Provide a certificate or letter of authorization issued by roofing system manufacturer stating Contractor is registered, approved, authorized or licensed by roof system manufacturer to apply their Products and furnish manufacturer's warranties if required.

.2 Ensure Contractor is a member in good standing of CRCA.

## 1.7 CLOSEOUT SUBMITTALS

.1 Operation and Maintenance Data: Supply necessary maintenance data and repair instructions for binding into maintenance manuals. Data includes: Project name, location, dated and executed copy of manufacturer's warranty, described herein and name address and phone number of nearest manufacturer's representative. Include recommendations for periodic inspections, care and maintenance. Identify common causes of damage with instructions for temporary patching until permanent repair can be made.

## 1.8 QUALITY ASSURANCE

.1 Qualifications:

.1 Manufacturers: Company to be recognized by membrane manufacturer as being qualified to install their roofing systems.

.2 Installers:

.1 Provide Work of this Section executed by competent installers with minimum 10 years experience in application of Products, systems and assemblies specified and with approval and training of Product manufacturers.

.3 Project Foreman:

.1 Provide a competent project foreman with minimum 5 years experience in supervision of roofing system installation, knowledgeable in roofing type specified herein. Ensure foreman is present at job Site during majority of Work hours and is accessible to ensure good project coordination.

.2 Do not alter foreman or crew without prior approval of Contract Administrator.

.3 Foreman to monitor weather conditions and take steps to ensure appropriate measures are implemented due to inclement conditions and to protect Materials equipment and Work to date.

.2 Conform to CRCA's "Roofing Specifications - 1997" manual as amended to date of this Specification, as applicable, except where indicated or specified otherwise. Do roofing Work employing roofing Products, plates and fasteners conforming to FM data for proposed roofing system. More stringent requirements by Contract Administrator govern.

.3 Mock-Ups: Construct for review, minimum 10 sq ft mock-up sample at Project location designated by Contract Administrator. Once accepted, mock-up remains part of finished Work and used as a quality reference standard for balance of Project.

## 1.9 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Deliver Materials in manufacturer's original, unopened containers with manufacturer's labels intact and legible.

.2 Carefully unload in a manner to prevent damage.

.2 Storage and Handling Requirements:

.1 Refer to Product MSDS for precautionary measures during storage and handling.

.2 Keep pail goods and membrane Materials dry, stored in rolls standing on end, selvage edge up, elevated from contact with moisture, at temperatures not less than 4 deg C (40 deg F) or more than 49 deg C (120 deg F) and pre-conditioned before installation. Handle rolls with care to avoid crushing, puncturing or other damage. Ensure selvage edge is not damaged during handling and banding strips are removed before application of membrane. Do not use wet or damp membrane or flattened rolls.

.3 Protect Materials from damage by elements, weather and other activities on raised platforms and covered with breathable tarpaulins.

.4 Ensure pail-goods have tight fitting lids when not in use. Store on end in up-right position.

.5 Ensure Materials stored on roof stay within designated live load limits of roof construction. Provide ample bases under equipment and Materials to distribute weight to conform to these live load limits. Do not store Materials on, or transport Materials across, completed roof areas.

.6 Do not expose insulation [and roof sheathing] to wet weather. Store and handle insulation to prevent broken edges and corners, punctures, indentations or other damage. Remove damaged insulation from Site.

.7 Ensure bitumen delivered in form of cartons has manufacturer's Material identification labels intact on each carton; if in form of bulk tanker delivery, each shipment to be accompanied by written certificate from manufacturer confirming Material identification including following:

.1 Softening Point as per CSA A123.4.

.2 Minimum FP per ASTM D92.

.3 EVT.

.4 FBT.

.8 Do not intermix different types or grades of bitumen in bulk shipments.

.9 Protect sheet metal Materials from bending and scratching.

.10 Store adhesive, emulsion based waterproofing mastics, sealants and primers between 15 deg C and 26 deg C (59 deg F and 79 deg F), or restore to temperature ranges before use.

.11 Store Materials at Site within temporary sheds or trailers; such facilities must be well sealed and kept at least 3 deg C (5 deg F) warmer than exterior ambient temperature to ensure Materials remain dry in terms of roofing. Do not use wet, damp, frozen or damaged Materials. Stack rolls of felt on end.

.12 Do not store more than 1 day's supply of Materials on roof at any time. On roof, stack Materials on pallets and completely cover with incombustible waterproof tarpaulin whenever Work is interrupted, or when there is precipitation of any kind. Securely tie covering to pallets in such way as to be weather tight. Plastic covers and shrinkwrap covers by manufacturers are not acceptable for Site storage and be removed upon delivery to roof.

.13 Store combustible Materials away from heat and open flames. Protect and store Materials in dry, ventilated area away from welding flame, spark and from elements or harmful substance.

.14 Do not lift rigid insulation in slings which will damage edges. Remove damaged insulation and replace with new Material at no cost to The City.

## 1.10 SITE CONDITIONS

.1 Ambient Conditions: Do not apply roof system during inclement weather or when ambient temperatures are expected to be below 5 deg C (40 deg F). For temperatures below this practice cold weather application techniques as recommended by membrane manufacturer.

## 1.11 WARRANTY

.1 IKO Limited Labour and Membrane Warranty:

.1 Warrant Work of this Section for a period of 5 years against roof leaks as a result of Material defects in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Contract Administrator and at no expense to The City. Defects include but are not limited to; leaking, buckling, opening of seams, bond failure and extensive colour fading.

.2 In addition to above, provide to The City a written warranty covering defects of Workmanship for a period of 2 years commencing from date of Substantial Performance of the Work and agree to Make Good promptly any defects which occur or become apparent within warranty period in conjunction with membrane manufacturer’s warranty. Ensure warranty is on either CRCA’s or OIRCA’s “Standard Form of Warranty.

## Part 2 PRODUCTS

### 2.1 MANUFACTURERS

.1 Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications.

.1 IKO Industries Ltd.; www.iko.com

.2 Lexsuco Canada; www.lexcor.net

.3 Tru-Fast; www.trufast.com

### 2.2 REGULATORY REQUIREMENTS

.1 External Fire Resistance: Design roofing system to meet minimum Class C in accordance with CAN/ULC-S107 test method.

.2 Internal Fire Resistance: Design roofing system to comply with CAN/ULC-S126, standard test method for fire spread under metal roof deck assemblies.

.3 Compliance with Local, Provincial and Federal Building Codes: Ensure roofing system complies with authorities having jurisdiction over construction covered within scope of this Specification.

### 2.3 MATERIAL COMPATIBILITY

.1 Components of roof system to be compatible with adjoining Materials under application and service as demonstrated by roofing manufacturer and based on testing and field experience.

### 2.4 SYSTEMS:

**.1 Roof Type 1 (Roof system over metal deck):**

.1 Description:

.1 A 2 ply SBS modified bitumen roof membrane using a mechanically fastened base sheet and heat welded granulated cap sheet, polyisocyanurate insulation, sloped expanded polystyrene insulation and vapour retarder.

.2 Design roofing membrane system and base flashings to be watertight, does not permit passage of water through finished roof system and resists exposure to weather without failure.

.2 Metal Deck Roof System: Provide 2 ply SBS modified bituminous mechanically fastened/heat welded on membrane roofing system over metal deck, including but not limited to following:

.1 metal deck (by others).

.2 vapour retarder

.3 tapered rigid insulation board.

.4 Polyisocyanurate rigid insulation board.

.5 base sheet membrane (mechanically fastened).

.6 cap sheet membrane (heat welded).

.7 base sheet flashing.

.8 heat welded cap sheet flashing.

.3 Materials:

.1 Lumber, Nailers and Blocking:

.1 #2 grade or better plank. Pressure treated lumber to CSA O80.1-M with CCA to AWPA P-5. Asphalt treated creosote impregnated lumber will not be accepted. Piping of lumber not permitted.

.2 Seal cut ends of lumber with Coppers Napthenate preservative to CSA O80.1-M.

.2 Gypsum Sheathing: to Section 09 21 16 – Gypsum Board Assemblies.

.3 Vapour Retarder: Self-adhering sheet vapour retarder, in compliance with CAN/CGSB-51.33-M, Type 2. Provide “MVP Vapour Retarder” by IKO Industries Ltd.

.1 Adhesive: SAM Adhesive.

.4 Tapered Insulation: BI-1 Expanded polystyrene (EPS) insulation to CAN/ULC S-701.

.1 Refer to Section 07 21 13 – Board Insulation.

.5 Polyisocyanurate Insulation: BI-2 Closed cell rigid foamed plastic boards conforming to CAN/ULC-S704.

.1 Refer to Section 07 21 13 – Board Insulation.

.6 SBS Modified Bitumen Base Sheet: SBS modified asphalt base sheet meeting CGSB 37-GP-56M, Type 2, Grade 2, Class P, 180 g/m² (0.6 oz/sq ft) polyester reinforced, thermofusible film on bottom and top surface with double selvage self adhering side laps.

.1 Acceptable Material: “Fast-N-Stick 180 Base” by IKO Industries Ltd or approved equal in accordance with B6.

.7 Fasteners:

.1 Ensure fasteners compatibility with roof membranes and flashings. Ensure fasteners are of type and size shown on manufacturer’s written instructions.

.2 Use self drilling, self tapping, organic fluoropolymer coated screws for securing of wood nailers and blocking. Screws to pass FM V Class 1 criteria, minimum of 30 cycles in a Kesternich Cabinet. Ensure thread diameter is minimum 6 mm (0.245”) such as “#14 HD” by Tru-Fast.

.3 Ensure nails used to secure metal to wood are galvanized and long enough to penetrate wood by a minimum of 25 mm (1”).

.4 Use self drilling, self tapping, organic fluoropolymer coated screws to secure rigid insulation to decking. Screws to pass FM Class 1 criteria, minimum of 30 cycles in a Kesternich Cabinet. Ensure thread diameter is minimum 5.58 mm (0.220”) such as “#12 DP” by Tru-Fast and penetrate decking by a minimum of 25 mm (1”).

.8 Stressplates for Attachment:

.1 Insulation stressplates: 75 mm (3") diameter, galvanized steel or Galvalume;

.1 Acceptable Material: "MP-3" by Tru-Fast; www.trufast.com or approved equal in accordance with B6.

.2 Base sheet stressplates: 60 mm (2-3/8") diameter, barbed plate;

.1 Acceptable Material: "SFS Intec Galvalume Steel Round 2-3/8" by SFS Intec; www.sfsintecusa.com or approved equal in accordance with B6.

.3 Minimum Screw Size: #12 fasteners. #14 fasteners minimum for FM approved assemblies.

.4 Ensure fasteners are acceptable to membrane manufacturer and be in compliance with fastener standard FM 4470, 1-28 and 1-29.

.9 SBS Modified Bitumen Cap Sheet: SBS modified asphalt cap sheet meeting CGSB 37-GP-56M, Type 2, Grade 2, Class G, 180 g/m² (0.83 oz/sq ft) polyester reinforced, granulated top surface, thermofusible film bottom surface. Granular colour to be selected by Contract Administrator from manufacturer's samples at a later date.

.1 Acceptable Material: "TP-250 CAP" Granular roof cap by IKO Industries Ltd. or approved equal in accordance with B6.

.10 SBS Modified Bitumen Base Flashing: SBS modified asphalt base sheet meeting CGSB 37-GP-56M, Type 2, Grade 2, Class P, 140 g/m² (0.46 oz/sq ft) polyester reinforced, thermofusible film on top and self adhering bottom surface.

.1 Acceptable Material: "Armourbond" Flash by IKO Industries Ltd.

.11 SBS Modified Bitumen Cap Flashing: SBS modified asphalt cap sheet meeting CGSB 37-GP-56M, Type 2, Grade 2, Class 2, 250 g/m² (0.6 oz/sq ft) polyester reinforced, granulated top surface, thermofusible film bottom surface.

.1 Acceptable Material: Torchflex TP-180 CAP by IKO Industries Ltd or approved equal in accordance with B6.

.12 Mastics: Asphalt mastic conforming to CGSB 37-GP-9Ma requirements.

.13 Walkways: SBS modified asphalt cap sheet membrane of a different colour from field membrane cap sheet.

.1 Acceptable Material: Torchflex or Modiflex Cap Sheets by IKO Industries Ltd or approved equal in accordance with B6.

## 2.5 ACCESSORIES

.1 Stack-Jack Flashings: 1.6 mm (0.063") thick x 300 mm (12") high x diameter to suit, seamless, spun aluminum sleeve flashings with premoulded urethane insulation on inner side of sleeve and 100 mm (4") wide bituminous paint primed flange with removable 1.2 mm (0.047") thick aluminum cap with

neoprene grommet cap seal and 1.6 mm (0.063") thick aluminum type bitumen protection cup.

.1 Acceptable Material: Flash-Tite Flashings Model VSC-G" by Lexsuco Canada or approved equal in accordance with B6.

.2 Flashings for Flexible Conduit: 1.3 mm (0.051") thick x 300 mm (12") high x diameter to suit, seamless, spun copper sleeve flashings with premoulded urethane insulation on inner side of sleeve, 150 mm (6") wide bituminous paint primed sleeve flange with 0.69 mm (0.027") thick flexible copper liner with premoulded urethane insulation on inner side of liner.

.1 Acceptable Material: Flash-Tite Flashings, Model WPF-12" by Lexsuco Canada or approved equal in accordance with B6.

.3 Flashings for "B" Vents: 2.1 mm (0.083") thick x 300 mm (12") high x diameter to suit, seamless spun aluminum sleeve flashing with sloping sides having 50 mm (2") wide perforated aluminum vent holes at top of sleeve, 100 mm (4") wide bituminous paint primed sleeve flange with 2.1 mm (0.083") thick split aluminum collar, aluminum rivets, and 4.8 mm (3/16") diameter stainless steel nuts and bolts and 1.6 mm (0.063") thick aluminum type bitumen protection cup.

.1 Acceptable Material: Flash-Tite B-Vent Flashings by Lexsuco Canada or approved equal in accordance with B6.

.4 Flashings for Gas Lines: 1.6 mm (0.063") thick x 300 mm (12") high x diameter to suit, seamless spun aluminum sleeve flashing with 50 mm (2") wide perforated aluminum vent holes at top of sleeve, 100 mm (4") wide bituminous paint primed sleeve flange with removable 1.3 mm (0.051") thick formed aluminum collar and 2.1 mm (0.083") thick aluminum type bitumen protection cup.

.1 Acceptable Material: Flash-Tite Flashings by Lexsuco Canada or approved equal in accordance with B6.

## Part 3 EXECUTION

### 3.1 EXAMINATION

.1 Verification of Conditions:

.1 Verify actual Site dimensions and location of adjacent Materials prior to commencing Work. Notify Contract Administrator in writing of any conditions which would be detrimental to installation.

.2 Verify roof penetrations and drains are present in quantity required. Verify that roof drains are securely clamped in place.

.3 Verify wood blocking is securely anchored to deck and nailers match thickness of anticipated roof insulation.

.4 Examine substrate for compliance of conditions that affect installation and performance of roof system.

.2 Evaluation and Assessment: Proceed with installation of roof after unsatisfactory conditions have been corrected. Commencement of Work implies acceptance of previously completed Work.

## 3.2 PREPARATION

.1 Surface Preparation:

.1 Ensure new and existing metal decking is clean, dry and properly anchored prior to roof installation.

.2 Ensure concrete substrate is clean and dry prior to roof installation.

## 3.3 APPLICATION

.1 Safety Precautions: Refer to Product MSDS sheets for any safety requirements when applying components.

.2 Vapour Retarder to Steel Deck:

.1 Apply vapour retarder adhesive to presecured gypsum sheathing at a rate of 0.43 L/$m^2$ (257 sq ft/gal).

.2 Unroll vapour retarder into freshly applied adhesive ensuring sidelaps fall over a male flute for joining later.

.3 Coat side laps with adhesive overlapped a minimum of 50 mm (2”).

.4 Overlap and seal endlaps a minimum of 150 mm (6”) with adhesive.

.5 Encapsulate insulation using vapour retarder Material to affect a proper tie-in to building’s continuous air/vapour barrier system and encapsulation of insulation.

.3 Rigid Insulation to Steel Deck:

.1 Mechanically Attached: Install tapered sheets of expanded polystyrene insulation with joints tightly fit and staggered from adjacent boards. Overlay polyisocyanurate insulation. Ensure multiple layered insulation joints are staggered minimum 300 mm from joints below. Use fastening density of screws and plates as determined by Factory Mutual FM 1-90 or follow the insulation manufacturer’s recommendations.

.4 Roof Membrane Base Sheet

.1 Mechanically Fastened Base Sheet:

.1 Starting at lowest point of roof or at centerline of roof drain, unroll and dry fit base sheet and allow it to relax.

.2 Remove protective film over sidelap and commence installation of fasteners starting at center of base sheet and Working out towards the ends. Locate fasteners towards inner edge of selvage strip at 610 mm (24”) oc.

.3 Apply next sheet of base sheet by first dry fitting into position then removing protective film on underside of side lap and adhering this to recently installed base sheet, covering exposed fasteners fully in the process.

.4 Continue across field of roof until entire roof is covered with base sheet. Make sure end laps are staggered from each other by a minimum of 610 mm (24”) in the process.

.5 Secure end laps by overlapping bottom sheet with adjoining sheet and securing through both with 4 fasteners, 2 in middle and 2 over selvage edges. Cut a strip of base sheet across

width that is 300 mm (12”) in depth and position over endlap and heat weld into place.

.6 Ensure there are not exposed fasteners in sight when the field is completed.

.7 Perimeter and Corner Wind Up-Lift Enhancements:

.1 Due to higher wind pressures in corners and perimeters mechanically fastened base sheet requires additional fasteners. For buildings FM Insured, follow FM prescriptions dictated by FM Loss Prevention Data Sheets 1-28 and 1-29.

.2 For perimeter and corner prescriptive enhancement apply following: increase fastener density in perimeter zones by locating fasteners in 1 row 610 mm (24”) oc in selvage edge and 1 row 610 mm (24”) oc in the middle of the base sheet, stagger rows. In corner locate 1 row at 610 mm (24”) oc in the selvage edge and 2 rows located 610 mm (24”) in the middle of the sheet. Space fasteners 4” from centre line on either side. Stagger rows of fasteners in sidelap and middle of base sheet. Use same fasteners as those used in field.

.5 Roof Membrane Cap Sheet:

.1 Use a single burner torch system only for heat welding of cap sheet and base sheet end lap details.

.2 Install cap sheet via heat welding over base sheet in accordance with manufacturer’s instructions. Stagger side laps from base sheet sidelaps minimum 150 mm (6”), stagger end laps minimum 150 mm (6”) from base sheet end laps and 610 mm (24”) from other cap sheet end laps.

.3 Fully adhere cap and base sheet membranes free of wrinkles, buckles, fishmouths, voids or seams bucking natural flow of water.

.4 Apply temporary water cut-offs extending a minimum of 6” onto completed roof membrane at end of each day and remove fully on start of next Working Day.

.6 Base Flashings and Cap Flashings:

.1 Install new wood blocking and metal where required and as specified in other Sections of this Specification.

.2 Install base flashings in accordance with Drawings and roofing membrane manufacturer’s requirements.

.3 Extend tops and vertical laps of base sheet flashings over parapets and nail on exterior face using roofing nails spaced 200 mm (8”) oc. Terminate base flashing at 450 mm (18”) for parapets above 450 mm (18”) in height and fix in place using a termination bar. On lower parapets install flashing minimum 200 mm (8”) above finished roof surface.

.4 Ensure base sheet flashing width of 1 m (39”) width staggering seams a minimum of 300 mm (12”) from laps in base sheet. Prime parapets fully prior to application of base sheet flashing and ensure that it runs onto field a minimum of 200 mm (8”). Place into position and roll smooth to ensure a solid bond.

.5 Thoroughly prime exposed metal prior to installing base flashing. Follow primer manufacturer's instructions as to dry time.

.6 Provide reinforcement gusset at inside corners in accordance with membrane manufacturer.

.7 Cut cap flashings into 1 m (39") wide strips ensuring coverage of cap sheet on field minimum of 150 mm (6") and terminate ends on vertical base sheets minimum 200 mm (8") above finished roof surface or equal to termination of base flashing. Ensure cap flashings are not carried over parapet and terminated on exterior face. Apply sidelaps minimum 150 mm (6") from base sidelaps and minimum 150 mm (6") from cap sheet sidelaps on field. Follow flashing details as recommended by membrane manufacturer.

.7 Metal Flashings: Install in accordance with SMACNA Specifications and/or CRCA FL series details.

.8 Special Techniques:

.1 Cold Weather Precautions:

.1 Follow cold weather application guidelines from manufacturer when temperatures are expected to be below 5 deg C (40 deg F). If such guidelines are unavailable or not known, contact membrane manufacturer for clarification.

.2 During cold weather store roll goods and pail goods in a heated environment and bring to roof Site just prior to use. Unroll and allow SBS rolls to relax fully prior to installation. Time may vary for this depending on sunlight and air temperature. If in doubt, call membrane manufacturer for instruction.

## 3.4 SITE QUALITY CONTROL

.1 Site Tests and Inspections:

.1 Inspection - Roof Levels:

.1 Before roofing is commenced, inspect and check roof surfaces for levels.

.2 Undertake a series of spot level checks to determine unevenness in roof decks which may result in pools of water remaining on completed roofing in excess of 13 mm (1/2") depth.

.3 Ensure deck has been inspected and approved by Contract Administrator prior to start of roofing Work.

.2 Non-Conforming Work: Replace damaged Work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Contract Administrator at no cost to The City.

.2 Manufacturer Services: Arrange for membrane manufacturer representative to visit Site on day roofing is commenced and periodically thereafter, to ensure Work is properly performed. Upon completion of Work of this Section, ensure manufacturer's representative inspects roof and verifies quality of Work to yield weathertight waterproofing roofing system and issue manufacturer's warranty. Ensure manufacturer's representative informs Contract Administrator, Contractor and SubContractor executing Work of this Section promptly in writing when inspection is complete and provide detailed report.

## 3.5 CLEANING

.1 Waste Management: Discard and legally dispose components that cannot be applied within its stated shelf life to requirements of authorities having jurisdiction.

## 3.6 PROTECTION

.1 Take necessary precautions to protect The City's property and adjacent properties, including trees, shrubs, buildings, sanitation, water piping, gas piping, electrical service and miscellaneous cabling from damage which may result from Work of this Section.

.2 Provide protection covering out of plywood underlaid with 25 mm (1") thick polystyrene insulation board adhered to it, over roofed areas when Working from, or over, such roof surfaces. Provide such protection below hoist rigs, ladders, pallets of Material and in other circumstances where roofing membrane is exposed to potential damage. Secure protection boards mechanically against wind storm loss.

.3 Protect finished wall and roof surfaces against damage of any kind. Protect finished sheet metal Work and membrane flashing against punctures and damage of any kind. Be responsible for damage sustained by Work of this trade. Do not use equipment over roofing Materials which would cause damage to Materials in any way.

.4 Protect surrounding Work, and adjacent building and other property from damage during roofing operations, taking particular care to prevent bitumen droppings and discolouration of surrounding buildings by smoke from kettles. Locate kettles to prevent smoke entering adjacent and Project buildings.

.5 Use protection covering specified in Work areas and along Work routes as required to prevent damage to steel deck, or roofing. Ensure Workers stay off newly heat welded membrane until cooled.

.6 Verify no vent pipes venting flammable fumes (i.e. fuel storage tanks) are located in area of Work.

.7 Temporarily block drain pipes during application of roofing membrane. Remove blocking each night or when Work is not in progress and after Work of this Section is completed.

.8 Protect completed portions of roof from damage.

.9 At conclusion of each day's Work, seal exposed edges of roof insulation. Remove when resuming Work.

.10 Do not heat weld over or near flammable substrates such as fibreboard.

.11 Fire Protection:

.1 Respect safety measures described in manufacturer's literature as well as local jurisdictional authorities.

.2 Have a 9 kg (20 lb) dry chemical fire extinguisher acceptable to authorities having jurisdiction, fully charged and in operable condition at every location where open flames are used.

.3 During roofing maintain a clean Site and keep 2 foam or dry type fire extinguishers on roof within easy access of heat welding application and in any open flame location while roofing is in progress.

.4 Verify no vent pipes venting flammable fumes (i.e. fuel storage tanks) are located in area of Work.

.5 Do not have gasoline or other flammable solvents on roof while heat welding.

.6 Be vigilant against self starting fires at end of roofing operations cease for day. Use a heat detector gun to spot any smouldering or concealed fire. Examine roof for hot spots 1 hour after completion of roofing operations, especially at flashings and around roof penetrations.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 RELATED SECTIONS

.1 Section 07 24 00 - Exterior Insulation and Finish Systems

.2 Section 07 52 00 - Modified Bituminous Membrane Roofing

.3 Section 07 92 00 - Joint Sealing

.1 Section 08 43 13 – Glazed Aluminum Storefronts

.2 Section 08 44 13 – Glazed Aluminum Curtain Walls

### 1.2 REFERENCES

.1 The Aluminum Association Inc. (AAI)

.1 AAI-Aluminum Sheet Metal Work in Building Construction-2002.

.2 AAI DAF45-03, Designation System for Aluminum Finishes.

.2 American Society for Testing and Materials International (ASTM)

.1 ASTM A167-99(2004), Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 ASTM A240/A240M-07e1, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

.3 ASTM A606-04, Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.

.4 ASTM A653/A653M-07, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.5 ASTM A792/A792M-06a, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.6 ASTM B32-04, Standard Specification for Solder Metal.

.7 ASTM B370-03, Standard Specification for Copper Sheet and Strip for Building Construction.

.8 ASTM D523-89(1999), Standard Test Method for Specular Gloss.

.9 ASTM D822-01(2006), Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.

.3 Canadian Roofing Contractors Association (CRCA)

.1 Roofing Specifications Manual 1997.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.

.2 CAN/CGSB-93.1-M85, Sheet Aluminum Alloy, Prefinished, Residential.

.5 Canadian Standards Association (CSA International)

.1 CSA A123.3-05, Asphalt Saturated Organic Roofing Felt.

.2 AAMA/WDMA/CSA 101/I.S.2/A440-2008, Standard/Specification for Windows, Doors, and Unit Skylights.

.3 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.6 Green Seal Environmental Standards

.1 Standard GS-03-93, Anti-Corrosive Paints.

.2 Standard GS-11-97, Architectural Paints.

.3 Standard GS-36-00, Commercial Adhesives.

.7 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.8 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule #1113-04, Architectural Coatings.

.2 SCAQMD Rule #1168-05, Adhesives and Sealants.

## 1.3 SUBMITTALS

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

.2 Samples:

.1 Submit duplicate 50 x 50 mm samples of each type of sheet metal Material, finishes and colours.

## 1.4 DELIVERY, STORAGE AND HANDLING

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

# Part 2 PRODUCTS

## 2.1 PREFINISHED STEEL SHEET

.1 Prefinished steel with factory applied silicone modified polyester.

.1 Class: F1S.

.2 Gauge: 26

.3 Colour: As selected by Contract Administrator from manufacturer's standard range.

.4 Specular gloss: 30 units +/- 5 in accordance with ASTM D523.

.5 Coating thickness: not less than 25 micrometres.

.6 Resistance to accelerated weathering for chalk rating of 8, colour fade 6 units or less and erosion rate less than 20 % to ASTM D822 as follows:

.1 Outdoor exposure period 1000 hours.

.2 Humidity resistance exposure period 1000 hours.

## 2.2 ACCESSORIES

.1 Isolation coating: alkali resistant bituminous paint.

.2 Plastic cement: to CAN/CGSB 37.5.

.3 Underlay for metal flashing: No. 15 perforated asphalt felt to CSA A123.3.

.4 Sealants: To Section 07 92 00 Joint Sealing.

.5 Cleats: of same Material, and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.

.6 Fasteners: of same Material as sheet metal, to CSA B111, screws of length and thickness suitable for metal flashing application.

.7 Washers: of same Material as sheet metal, 1 mm thick with rubber packings.

.8 Touch-up paint: as recommended by prefinished Material manufacturer.

## 2.3 FABRICATION

.1 Fabricate metal flashings and other sheet metal Work in accordance with applicable CRCA 'FL' series details or as indicated where flashing is shown on the Drawings.

.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.

## 2.4 METAL FLASHINGS

.1 Form flashings, copings and fascias to profiles indicated of prefinished metal

## 2.5 REGLETS

.1 Form reglets of sheet metal to be built into existing construction as detailed on the Drawings, or if not indicated in accordance with CRCA FL series details.

## 2.6 EAVES TROUGHS AND DOWNPIPES

.1 Form eaves troughs and downpipes from 26 ga. prefinished steel sheet metal.

.2 Sizes and profiles as indicated.

.3 Provide goosenecks, outlets, strainer baskets and necessary fastenings.

## 2.7 SCUPPERS

.1 Form scuppers from 26 ga. prefinished steel.

.2 Sizes and profiles as indicated.

.3 Provide necessary fastenings.

# Part 3 EXECUTION

## 3.1 MANUFACTURER'S INSTRUCTIONS

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

## 3.2 INSTALLATION

.1 Install sheet metal Work in accordance with CRCA FL series details where not indicated, and as detailed.

.2 Use concealed fastenings except where approved before installation.

.3 Provide underlay under sheet metal.

.1 Secure in place and lap joints 100 mm.

.4 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs.

.1 Flash joints using S-lock forming tight fit over hook strips, as detailed.

.5 Lock end joints and caulk with sealant.

.6 Install surface mounted reglets true and level, and caulk top of reglet with sealant.

.7 Insert metal flashing into reglets to form weather tight junction.

.8 Turn top edge of flashing into recessed reglet to depth indicated. Lead wedge flashing securely into joint.

.9 Caulk flashing at reglet with sealant.

.10 Install pans, where shown around items projecting through roof membrane.

## 3.3 SCUPPERS

.1 Install scuppers as indicated. Coordinate with Section 07 52 00 – Modified Bituminous Membrane Roofing.

## 3.4 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

## 1.1 DEFINITIONS

1. Firestopping: Material or combination of Materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, water and hot gases through penetrations in, or construction joints between, fire rated wall and floor assemblies.

## 1.2 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION

.1 Only tested firestop systems shall be used in specific locations as follows:

- .1 Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical busways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.
- .2 Safing slot gaps between edge of floor slabs and curtain walls.
- .3 Openings between structurally separate sections of wall or floors.
- .4 Gaps between the top of walls and ceilings or roof assemblies.
- .5 Expansion joints in walls and floors.
- .6 Openings and penetrations in fire-rated partitions or walls containing fire doors.
- .7 Openings around structural members which penetrate floors or walls.

.2 Prior to submitting a bid, Contractor shall familiarize himself with the existing building. The Contractor shall include in his pricing the cost to firestop around existing pipes, ducts, electrical Work and similar in situ services, at penetration of existing fire-resistance rated assemblies, as well as fire-resistance rated assemblies to be constructed under this Contract.

## 1.3 RELATED SECTIONS

.1 Coordinate Work of this Section with Work of other Sections as required to properly execute the Work and as necessary to maintain satisfactory progress of the Work of other Sections, including:

- .1 Section 03 30 00 - Cast-In-Place Concrete
- .2 Section 07 52 00 - Modified Bituminous Membrane Roofing
- .3 Section 07 84 00 - Firestopping
- .4 Section 07 92 00 - Joint Sealing
- .5 Section 09 21 16 - Gypsum Board Assemblies
- .6 Section 09 91 23 - Interior Painting

## 1.4 REFERENCES

.1 Test Requirements: ULC-S115-M or CAN4-S115-M, "Standard Method of Fire Tests of Through Penetration Fire Stops".

.2 Underwriters Laboratories of Canada (ULC) of Scarborough runs CAN4-S115-M under their designation of ULC-S115-M and publishes the results in their "FIRE RESISTANCE RATINGS DIRECTORY" that is updated annually.

.1 Underwriters Laboratories (UL) of Northbrook, IL runs ASTM E-814 under their designation of UL 1479 and publishes the results in their "FIRE RESISTANCE DIRECTORY" that is updated annually. UL tests that meet the requirements of ULC-S115-M are given a cUL listing and are published by UL in their “Products Certified for Canada (cUL) Directory.

.2 Omega Point Laboratories runs ASTM E-814 and publishes the results annually in their “Omega Point Laboratories Directory”

.3 Test Requirements: UL 2079, “Tests for Resistance of Building Joint Systems” or ASTM E 1966, “Standard test method for Fire Resistive Joint Systems”. These test requirements provide more guidelines for testing moving joints than that given in CAN4-S115-M. UL tests that meet the requirements of ULC-S115-M are given a cUL listing and are published by UL in their “Products Certified for Canada (cUL) Directory

.4 Inspection Requirements: ASTM E 2174, “Standard Practice for On-Site Inspection of Installed Fire Stops.”

.5 Test Requirements: ASTM E 2307, “Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus”

.6 Test Requirements: ASTM E413, "Classification for Rating Sound Insulation," using results from measurements in accordance with ASTM E90, "Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions,"

.7 International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments

.8 CAN/ULC-S102-M, Standard Test Method for Surface Burning Characteristics of Building Materials.

.9 National Building Code of Canada 2010.

.10 NFPA 101 - Life Safety Code

.11 Canadian Electrical Code

## 1.5 QUALITY ASSURANCE

.1 A manufacturer's direct representative (not distributor or agent) to be on-Site during initial installation of firestop systems to train appropriate Contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.

.2 Firestop System installation must meet requirements of CAN4-S115-M, ULC S-115-M or UL 2079 tested assemblies that provide a fire rating as shown in Section 2.03 Clauses Q, R & S below.

.3 Proposed firestop Materials and methods shall conform to applicable governing codes having local jurisdiction.

.4 Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

.5 For those firestop applications that exist for which no ULC or cUL tested system is available through a manufacturer, a manufacturer's engineering judgment derived from similar ULC or cUL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgment drawings must follow requirements set forth by the International Firestop Council

.6 Notify Contract Administrator when firestop Materials have been installed and prior to proceeding with Work that would conceal firestop systems. Do not conceal firestop Work prior to written approval by Contract Administrator.

## 1.6 SUBMITTALS

.1 Submit Product Data: Manufacturer's specifications and technical data for each Material including the composition and limitations, documentation of ULC or cUL firestop systems to be used and manufacturer's installation instructions to comply with Section 01 33 00.

.2 Manufacturer's engineering judgment identification number and drawing details when no ULC or cUL system is available for an application. Engineered judgment must include both project name and Contractor’s name who will install firestop system as described in drawing.

.3 Submit Material safety data sheets provided with product delivered to job-Site.

.4 Submit documentation showing products are formaldehyde free and low in VOC content in accordance with sustainable requirements.

.5 Submit a complete firestopping and smokeseal schedule within fourteen (14) days of award of Contract to the Contract Administrator for review. Schedule

is to include complete details, cut sheets, system descriptions and location of each proposed firestopping & smokeseal application. Alter schedule as recommended by the Contract Administrator and resubmit as required.

## 1.7 INSTALLER QUALIFICATIONS

.1 Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having the necessary experience, staff, and training to install manufacture's products per specified requirements. A supplier's willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on the buyer.

.2 All firestopping to be completed by a single Contactor.

## 1.8 DELIVERY, STORAGE, AND HANDLING

.1 Deliver Materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and ULC or cUL label where applicable.

.2 Coordinate delivery of Materials with scheduled installation date to allow minimum storage time at job-Site.

.3 Store Materials under cover and protect from weather and damage in compliance with manufacturer's requirements.

.4 Comply with recommended procedures, precautions or remedies described in Material safety data sheets as applicable.

.5 Do not use damaged or expired Materials.

## 1.9 PROJECT CONDITIONS

.1 Do not use Materials that contain flammable solvents.

.2 Scheduling

.1 Schedule installation of other firestopping Materials after completion of penetrating item installation but prior to covering or concealing of openings.

.3 Verify existing conditions and substrates before starting Work. Correct unsatisfactory conditions before proceeding.

.4 Weather conditions: Do not proceed with installation of firestop Materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.

.5 During installation, provide masking and drop cloths to prevent firestopping Materials from contaminating any adjacent surfaces.

## Part 2 PRODUCTS

### 2.1 FIRESTOPPING, GENERAL

.1 Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.

.2 Provide components for each firestopping system that are needed to install fill Material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.

.3 Firestopping Materials are either “cast-in-place” (integral with concrete placement) or “post installed.” Provide cast-in-place firestop devices prior to concrete placement.

.4 See drawings for fire-resistance ratings of walls and doors. Contractor must provide sufficient firestop Material for all penetrations to requirements of shown separations.

### 2.2 ACCEPTABLE MANUFACTURERS

.1 Subject to compliance with through penetration firestop systems and joint systems listed in the U.L.C Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory, provide products of the following manufacturers as identified below:

.1 Hilti (Canada) Corporation, Mississauga, Ontario

1-800-363-4458/www.ca.hilti.com

.2 Other manufacturers listed in the U.L.C Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory

### 2.3 MATERIALS

.1 Use only firestop products that have been ULC or cUL tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.

.2 Sound Transmission - Fire Stopping products shall be tested for Sound transmission class ratings in accordance with ASTM E413, "Classification for Rating Sound Insulation," using results from measurements in accordance with ASTM E90, "Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions,"

.3 Low VOC requirement: The volatile organic compound (VOC) content of each sealant or adhesive used on this project shall be less than 250 g/L.

.4 Cast-in place firestop devices for use with non-combustible and combustible plastic pipe (closed and open piping systems) penetrating concrete floors, the following products are acceptable:

.1 Hilti CP 680 Cast-In Place Firestop Device for combustible and non-combustible pipe

.1 Add Aerator adaptor when used in conjunction with aerator ("sovent") system.

.2 Hilti CP 681 Tub Box Kit for use with tub installations

.3 Hilti CP 682 Cast-In Place Firestop Device for non- combustible pipe

.4 Equivalent products listed in the U.L.C Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory

.5 Sealants or caulking Materials for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:

.1 Hilti FS-ONE Intumescent Firestop Sealant

.2 Hilti CP 604 Self Leveling Firestop Sealant

.3 Hilti CP 620 Fire Foam

.4 Hilti CP 606 Flexible Firestop Sealant

.5 Hilti CP 601s Elastomeric Firestop Sealant

.6 Equivalent products listed in the U.L.C Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory

.6 Sealants or caulking Materials for use with sheet metal ducts, the following products are acceptable:

.1 Hilti CP 601s Elastomeric Firestop Sealant

.2 Hilti CP 606 Flexible Firestop Sealant

.3 Hilti FS-ONE Intumescent Firestop Sealant

.4 Hilti CP 604 Self Leveling Firestop Sealant

.5 Equivalent products listed in the U.L.C Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory

.7 Sealants, caulking or spray Materials for use with fire-rated construction joints and other gaps, the following products are acceptable:

.1 Hilti CP 672 Speed Spray

.2 Hilti CP 601s Elastomeric Firestop Sealant

.3 Hilti CP 606 Flexible Firestop Sealant

.4 Hilti CP 604 Self Leveling Firestop Sealant

.5 Equivalent products listed in the U.L.C Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory

.8 Pre-formed mineral wool designed to fit flutes of metal profile deck; as a backer for spray Material.

.1 Hilti CP 777 Speed Plugs

.2 Hilti CP 767 Speed Strips

.9 Intumescent sealants or caulking Materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:

.1 Hilti FS-ONE Intumescent Firestop Sealant

.2 Equivalent products listed in the U.L.C Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory

.10 Foams, intumescent sealants, caulking or putty Materials for use with flexible cable or cable bundles, the following products are acceptable:

.1 Hilti FS-ONE Intumescent Firestop Sealant

.2 Hilti CP 618 Firestop Putty Stick

.3 Hilti CP 620 Fire Foam

.4 Hilti CP 601s Elastomeric Firestop Sealant

.5 Hilti CP 606 Flexible Firestop Sealant

.6 Equivalent products listed in the U.L.C Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory

.11 Non curing, re-penetrable intumescent sealants, caulking or putty Materials for use with flexible cable or cable bundles, the following products are acceptable:

.1 Hilti CP 618 Firestop Putty Stick

.2 Hilti CP 658T Firestop Plug

.3 Equivalent products listed in the U.L.C Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory

.12 Wall opening protective Materials for use with cUL. / ULC listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:

.1 Hilti CP 617 Firestop Putty Pad

.2 Equivalent products listed in the UL Products Certified for Canada (cUL) Directory

.13 Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems) tested to 50 Pa. differential, the following products are acceptable:

.1 Hilti CP 643N Firestop Collar

.2 Hilti CP 644 Firestop Collar

.3 Hilti CP 645/648 Wrap Strips

.4 Equivalent products listed in the U.L.C Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory

.14 Materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

.1 FS 637 Firestop Mortar
.2 Hilti FS 657 Fire Block
.3 Hilti CP 620 Fire Foam
.4 Hilti CP 675-T Firestop Board
.5 Equivalent products listed in the U.L.C Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory

.15 Non curing, re-penetrable Materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

.1 Hilti FS 657 Fire Block
.2 Hilti CP 675-T Firestop Board
.3 Equivalent products listed in the U.L.C Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory

.16 Sealants or caulking Materials used for openings between structurally separate sections of wall and floors, the following products are acceptable:

.1 Hilti CP 672 Speed Spray
.2 Hilti CP 601s Elastomeric Firestop Sealant
.3 Hilti CP 606 Flexible Firestop Sealant
.4 Hilti CP 604 Self Leveling Firestop Sealant
.5 Equivalent products listed in the U.L.C Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory

.17 For blank openings made in fire-rated wall or floor assemblies, where future penetration of pipes, conduits, or cables is expected, the following products are acceptable:

.1 Hilti FS 657 Fire Block (for walls and floors)
.2 Hilti CP 658T Firestop Plug (for walls and floors)
.3 Hilti CP 680 Cast-In Place Firestop Device (for floors only)
.4 Equivalent products listed in the U.L.C Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory

.18 For penetrations through a Fire Separation wall provide a firestop system with a "F" Rating as determined by ULC or cUL as indicated below:

| Fire Resistance Rating of Separation | Required ULC or cUL "F" Rating of Firestopping Assembly |
|---|---|
| 30 minutes | 20 minutes |
| 45 minutes | 45 minutes |
| 1 hour | 45 minutes |
| 1.5 hours | 1 hour |
| 2 hours | 1.5 hours |
| 3 hours | 2 hours |
| 4 hours | 3 hours |

.19 For combustible pipe penetrations through a Fire Separation provide a firestop system with a "F" Rating as determined by ULC or cUL which is equal to the fire resistance rating of the construction being penetrated.

.20 For penetrations through a Fire Wall or horizontal Fire Separation provide a firestop system with a "FT" Rating as determined by ULC or cUL which is equal to the fire resistance rating of the construction being penetrated.

.21 For joints provide a firestop system with an Assembly Rating as determined by CAN4-S115-M, ULC-S115-M or UL 2079 which is equal to the fire resistance rating of the construction being penetrated.

## Part 3 EXECUTION

### 3.1 PREPARATION

.1 Verification of Conditions: Examine areas and conditions under which Work is to be performed and identify conditions detrimental to proper or timely completion.

.1 Verify penetrations are properly sized and in suitable condition for application of Materials.

.2 Surfaces to which firestop Materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.

.3 Ensure all service lines are in place, tested and acceptable to the authority having jurisdiction, prior to application of fire stopping and smoke seal.

.4 Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping Materials.

.5 Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.

.6 Do not proceed until unsatisfactory conditions have been corrected.

## 3.2 COORDINATION

.1 Coordinate location and proper selection of cast-in-place Firestop Devices with trade responsible for the Work. Ensure device is installed before placement of concrete.

.2 Responsible trade is to provide adequate spacing of field run pipes to allow for installation of cast-in-place firestop devices without interference.

## 3.3 PREPARATION OF SURFACES

.1 Where adjacent finished surfaces are exposed, provide and maintain masking, drop cloths, and polyethylene coverings for such surfaces to protect them during Work of this Section. Remove stains on adjacent surfaces as required.

.2 Provide complete enclosures and human protective devices when installing or mixing hazardous Materials.

.3 Make provisions for natural ventilation during and subsequent to application of firestopping and smoke seal. In enclosed areas or areas lacing openings for natural ventilation, circulate interior air by use of temporary circulators or exhaust fans.

.4 Examine sizes and conditions of voids to be filled to establish correct thickness and installation of Materials.

.5 Clean bonding surfaces of deleterious substances including dust, paint, rust, oil, grease and other foreign matter which may otherwise impair effective bonding.

.6 Do not apply firestops and smokeseals to surfaces previously painted or treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of Materials. Remove coatings as required.

.7 Prepare surfaces in accordance with manufacturer's directions.

.8 Priming and sealing: Prime surfaces in accordance with manufacturer's directions.

.9 Mask where necessary to avoid spillage onto adjoining surfaces.

## 3.4 MIXING

.1 Mix Materials in strict accordance with manufacturer's directions.

.2 Ensure components are mixed thoroughly and that these components are prepared by a qualified Worker.

## 3.5 INSTALLATION

.1 Regulatory Requirements: Install firestop Materials in accordance with ULC Fire Resistance Directory or UL Products Certified for Canada (cUL) Directory or Omega Point Laboratories Directory.

.2 Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration and construction joint Materials.

.1 Seal all holes or voids made by penetrations to ensure an air and water resistant seal.

.2 Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of ULC or cUL firestop systems that might hamper the performance of fire dampers as it pertains to duct Work.

.3 Protect Materials from damage on surfaces subjected to traffic.

.4 Tool or trowel exposed surfaces to a neat uniform texture where required.

.5 Remove excess compound promptly as Work progresses and upon completion.

.6 Do not cover up fire stop and smoke seal installations until they have been reviewed and accepted by the Contract Administrator and the authority having jurisdiction.

## 3.6 FIELD QUALITY CONTROL

.1 Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.

.2 Keep areas of Work accessible until inspection by applicable code authorities.

.3 Inspection of through-penetration firestopping shall be performed in accordance with ASTM E 2174, “Standard Practice for On-Site Inspection of Installed Fire Stops” or other recognized standard.

.4 Perform under this Section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.

.5 Install a warning card that is clearly visible adjacent to all large and medium openings that may be re-penetrated. This card should contain the following information:

.1 Warning that the opening has being fire stop protected

.2 Indicate the fire stop system used (ULC or cUL)

.3 F rating or FT rating

.4 Fire stop product(s) used

.5 Person to contact and phone number in case of modification or new penetration of fire stop system

## 3.7 ADJUSTING AND CLEANING

.1 Remove equipment, Materials and debris, leaving area in undamaged, clean condition.

.2 Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop Materials and soiling as Work progresses.

**END OF SECTION**

# Part 1 GENERAL

## 1.1 SECTION INCLUDES

.1 Materials, preparation and application for caulking and sealants.

## 1.2 RELATED SECTIONS

.1 Section 07 21 13 - Board Insulation

.2 Section 07 24 00 - Exterior Insulation and Finish Systems

.3 Section 07 26 00 - Vapour Retarders

.4 Section 07 52 00 - Modified Bituminous Membrane Roofing

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

.6 Section 07 84 00 - Firestopping

.1 Section 08 43 13 – Glazed Aluminum Storefronts

.2 Section 08 44 13 – Glazed Aluminum Curtain Walls

.3 Section 08 80 50 - Glazing

.4 Section 09 21 16 - Gypsum Board Assemblies

.5 Section 09 91 23 - Interior Painting

## 1.3 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM C919-02, Standard Practice for Use of Sealants in Acoustical Applications.

.2 Canadian General Standards Board (CGSB)

.1 CGSB 19-GP-5M-1984, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).

.2 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.

.3 CGSB 19-GP-14M-1984, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).

.4 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.

.5 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

## 1.4 QUALITY ASSURANCE/MOCK-UP

.1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.

.2 Construct mock-up to show location, size, shape and depth of joints complete with back-up Material, primer, caulking and sealant.

.3 Mock-up will be used:

.1 To judge Workmanship, substrate preparation, operation of equipment and Material application.

.4 Locate where indicated.

.5 Allow 24 hours for inspection of mock-up by Contract Administrator before proceeding with sealant Work.

.6 When accepted, mock-up will demonstrate minimum standard of quality required for this Work. Approved mock-up may remain as part of finished Work.

## 1.5 DELIVERY, STORAGE, AND HANDLING

.1 Deliver and store Materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

## 1.6 PROJECT CONDITIONS

.1 Environmental Limitations:

.1 Do not proceed with installation of joint sealants under following conditions:

.1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.

.2 When joint substrates are wet.

.2 Joint-Width Conditions:

.1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

.1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

## 1.7 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous Materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada.

.2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

### 1.8 WARRANTY

.1 Submit a guarantee of the Work of this section except for covering a period of three years from date of Substantial Performance of the Contract.

.2 Defective Work shall include, but not be restricted to joint leakage, cracking, crumbling, melting, running, loss of adhesion, loss of cohesion, or staining of adjoining or adjacent Work or surfaces.

## Part 2 PRODUCTS

### 2.1 SEALANT MATERIAL DESIGNATIONS

.1 Sealant colour**:** to be selected by the Contract Administrator.

.2 Primers**:** to be type recommended by sealant manufacturer.

.3 Joint backing Material**:** shall be extruded polyolefin foam.

.1 Standard of Acceptance**:** Tremco Sof Rod.

.4 Bond breaker**:** where joint configuration does not allow for proper depth/width ratio - a pressure sensitive plastic tape, such as 3M #226 or #481 shall be placed on the back of the joint which will not bond to the sealant.

.5 Joint cleaner**:** type recommended by sealant manufacturer and compatible with joint forming Materials.

.6 Sealant:

.1 Type 1: Sealant for all locations except where another type is specified in this section. Multi-component, polyepoxide urethane sealant. To meet specified requirements of CGSB Specification CAN2.19-24-M80.
Standard of Acceptance**:**
.1 Tremco Dymeric 240
.2 VOC: 35g/L

.2 Type 2: Sealant for construction joints in lieu of Type 1 where pre-approved by Contract Administrator. One part elastomeric sealants: to meet specified requirements of NSC/CGSB Specification CAN2.19-13-M82. Classification MC-2-25-B-N moisture curing hybrid polyurethane.
Standard of Acceptance**:**
.1 Tremco Dymonic
.2 VOC: 50 g/L

.3 Type 3: Sealant for glass to glass, sloped glazing systems, glass to metal, and metal to metal joints. One part low modulus silicone elastomeric sealant to meet specified requirements of NSC/CGSB Specification CAN2-19.13-M82.
Standard of Acceptance**:**
.1 Tremco Spectrem 2

.2 VOC: 8g/L

.4 Type 4: Polyurethane sealant for exterior and interior horizontal traffic joints.
Standard of Acceptance**:**
.1 Tremco THC-900
.2 VOC: 105g/L

.5 Type 5: Sealant for miscellaneous fixtures, bathtubs and vanity tops. One part mildew resistant silicone sealant to meet specified requirements of CGSB Specification 19GP22M.
Standard of Acceptance:
.1 Tremco Proglaze
.2 VOC: 36g/L

.6 Type 6: Use at all perimeter joints and openings in sound rated drywall systems and sealing polyethylene air/vapour barriers. One part acoustical sealant to meet specified requirements of CGSB Specification 19-GP-21M.
Standard of Acceptance:
.1 Tremco acoustical sealant
.2 VOC: 155g/L

.7 Type 7: Sealant for finishing interior construction joints subject to minimal movement and not otherwise specified in this section. One part paintable latex.
Standard of Acceptance:
.1 Tremco Tremflex 834
.2 VOC: 11g/L

.8 Type 8: Sealant for sealing gutters and rainware. One part high quality synthetic rubber blended with a synthetic resin for metal to metal and metal to plastic joints.
Standard of Acceptance:
.1 Tremco Gutter Seal
.2 VOC: 240g/L

## 2.2 JOINT CLEANER

.1 Non-corrosive and non-staining type, compatible with joint forming Materials and sealant recommended by sealant manufacturer.

.2 Primer: as recommended by manufacturer.

# Part 3 EXECUTION

## 3.1 PROTECTION

.1 Protect installed Work of other trades from staining or contamination.

## 3.2 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.

## 3.3 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.

## 3.4 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.

## 3.5 MIXING

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

## 3.6 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.

.9 All door frames (millWork, hollow metal, knock down) to be caulked neatly at wall interface unless otherwise directed by Contract Administrator

.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 Cleanup.

.1 Clean adjacent surfaces immediately and leave Work neat and clean.

.2 Remove excess and droppings, using recommended cleaners as Work progresses.

.3 Remove masking tape after initial set of sealant.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 SUMMARY OF WORK

.1 This Section specifies aluminum swing doors, thermally broken aluminum swing doors and accessories.

.1 Section does not include framing of door opening.

### 1.2 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry

.2 Section 07 21 32 - Sprayed Polyurethane Foam Insulation

.3 Section 07 24 00 - Exterior Insulation and Finish Systems

.4 Section 07 26 00 - Vapour Retarders

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

.6 Section 07 92 00 - Joint Sealing

.7 Section 08 43 13 – Glazed Aluminum Storefronts

.8 Section 08 44 13 – Glazed Aluminum Curtainwalls

.9 Section 08 71 00 - Door Hardware

.10 Section 08 80 50 - Glazing

.11 Section 09 21 16 - Gypsum Board Assemblies

.12 Section 09 22 16 - Non-Structural Metal Framing

### 1.3 REFERENCE STANDARDS

.1 Aluminum Association (AA)

.1 DAF 45 2003, Designation System For Aluminum Finishes.

.2 American Architectural Manufacturers Association (AAMA).

.1 AAMA-2603-2002, Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.

.2 AAMA-2604-2005, Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.

.3 AAMA-2605-2005, Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

.4 AAMA CW-10-2004, Care and Handling of Architectural Aluminum From Shop to Site.

.3 ASTM International (ASTM).

.1 ASTM B209-07, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.2 ASTM B221-08, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.3 ASTM C612 – 09, Standard Specification for Mineral Fiber Block and Board Thermal Insulation.

.4 ASTM E283-04, Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

.5 ASTM E331 - 00, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.

.6 ASTM E1105 – 00(2008), Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.

.7 ASTM D2240 – 05, Standard Test Method for Rubber Property—Durometer Hardness.

.4 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-12.8-97, Insulating Glass Units.

.2 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.

.3 CAN/CGSB-19.13-M87, Sealing Compound, One-Component, Elastomeric, Chemical Curing.

.5 CSA International (CSA)

.1 CAN/CSA-S157-2005, Strength Design in Aluminum.

.2 CAN/CSA W59.2-M1991(R2003), Welded Aluminum Construction.

## 1.4 ADMINISTRATIVE REQUIREMENTS

.1 Co-ordination: Co-ordinate Work of this Section with Work of other trades for proper time and sequence to avoid construction delays.

.2 Pre-installation Meeting: Convene pre-installation meeting after Award of Contract and one week prior to commencing Work of this Section to verify project requirements, substrate conditions and coordination with other building sub-trades, and to review manufacturer's written installation instructions.

.1 Comply with Section 01 31 19 - Project Meetings and co-ordinate with other similar pre-installation meetings.

.2 Notify attendees 2 weeks prior to meeting and ensure meeting attendees include as minimum:

.1 The City;

.2 Contract Administrator;

.3 Glazing subContractor;

.4 Manufacturer's Technical Representative.

.3 Ensure meeting agenda includes review of methods and procedures related to aluminum door installation including co-ordination with related Work.

.4 Record meeting proceedings including corrective measures and other actions required to ensure successful completion of Work and distribute to each attendee within 1 week of meeting.

## 1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Make submittals in accordance with Contract Conditions and Section 01 33 00 - Submittal Procedures.

.2 Product Data: Submit product data including manufacturer's literature for aluminum, panels, styles, rails, components and accessories, indicating compliance with specified requirements and Material characteristics.

.1 Submit list on aluminum door manufacturer's letterhead of Materials, components and accessories to be incorporated into Work.

.2 Include product names, types and series numbers.

.3 Include contact information for manufacturer and their representative for this Project.

.3 Shop Drawings: Submit Drawings stamped and signed by Professional Engineer registered or licensed in Province of Manitoba, Canada. Include on shop Drawings:

.1 Indicate Materials and profiles and provide full-size, scaled details of components for each type of door. Indicate:

.1 Core thicknesses of components.

.2 Type and location of exposed finishes.

.3 Size of door opening and tolerances.

.4 Arrangement of hardware and required clearances.

.4 Include catalogue details for each type of door illustrating profiles, dimensions and methods of assembly.

.5 Samples:

.1 Submit duplicate 300 x 300 mm (12 x 12 inches) sample sections showing prefinished aluminum surface, finish, colour and texture, and including section of infill panel.

.2 Include corner sample of each type of door.

.3 Submit duplicate 300 x 300 mm (12 x 12 inches) sample sections of insulating glass unit showing glazing Materials and edge and corner details.

.6 Test Reports:

.1 Submit test reports showing compliance with specified performance characteristics and physical properties including air infiltration, water infiltration and structural performance.

.7 Field Reports: Submit manufacturer's field reports within 3 days of manufacturer representative's Site visit and inspection.

.8 Installer Qualifications:

.1 Submit letter verifying installer's experience with Work similar to Work of this Section.

## 1.6 CLOSEOUT SUBMITTALS

.1 Operation and Maintenance Data: Supply maintenance data for curtain wall for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

.2 Record Documentation: In accordance with Section 01 78 00 - Closeout Submittals.

.1 List Materials used in door Work.

.2 Warranty: Submit warranty documents specified.

## 1.7 QUALITY ASSURANCE

.1 Mock-up: Co-ordinate mock-up of aluminum door with Section 08 44 13 – Glazed Aluminum Curtain Wall and Section 08 43 13 – Glazed Aluminum Storefronts.

## 1.8 DELIVERY STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Deliver Material in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver aluminum door Materials and components in manufacturer's original packaging with identification labels intact and in sizes to suit project.

.1 Material Handling: To AAMA CW-10.

.3 Storage and Handling Requirements: Store Materials off ground and protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.

.1 Material storage: To AAMA CW-10.

## 1.9 WARRANTY

.1 Project Warranty: Refer to Contract Conditions for project warranty provisions.

.2 Manufacturer's warranty: Submit, for The City's acceptance, manufacturer's standard warranty document executed by authorized company official.

Manufacturer's warranty is in addition to and not intended to limit other rights The City may have under Contract Conditions.

.1 Warranty period: 5 years commencing on Date of Substantial Performance of Work.

## Part 2 PRODUCTS

### 2.1 MANUFACTURER

.1 Manufacturer: Alumicor Limited, 290 Humberline Drive, Toronto, Ontario, Canada M9W 5S2, Phone: (416) 745-4222 or (877) ALUMICOR, e-mail: **info@Alumicor.com**, URL: **www.Alumicor.com**.

### 2.2 DESCRIPTION

.1 Aluminum-framed swing door with glass insert suitable for inclusion in curtain wall or storefront system.

### 2.3 DESIGN CRITERIA

.1 Design aluminum components to CAN/CSA S157.

.2 Air infiltration: 0.3 L/s/$m^2$ (0.63 cfm) maximum of wall area to AAMA 501 and ASTM E283 at differential pressure across assembly of 300 Pa (0.044 psi).

### 2.4 MATERIALS

.1 Aluminum Door Components:

.1 Extruded aluminum: To ASTM B221, 6063 alloy with temper as recommended by the manufacturer.

.2 Sheet aluminum: To ASTM B209, utility grade for unexposed surfaces, anodizing quality for exposed surfaces.

.3 Fasteners, screws and bolts: Cadmium plated stainless steel 300 or 400 series to meet curtain wall requirements and as recommended by manufacturer.

.4 Vision glass for interior single glazed door: to Section 08 80 50 – Glazing.

.5 Insulating glass units for exterior glazed door: to Section 08 80 50 – Glazing.

### 2.5 DOOR FABRICATION

.1 Do aluminum welding to CAN/CSA W59.2.

.2 Fabricate aluminum assemblies of extruded sections to sizes and profiles indicated.

.1 Ensure stiles and rails are tubular extrusions designed for mechanical shear block fastening in combination with SIGMA deep penetration plug welds and fillet welds at all stile/rail connections.

.3 Door Thickness: 51 mm (2 inches).

.4 Construct doors square, plumb and free from distortion, waves, twists, buckles or other defects detrimental to performance or appearance.

.5 Accurately fit and secure joints and corners.

.1 Ensure joints are flush and hairline

.6 Use only concealed or semi-concealed fasteners

.1 Where fasteners cannot be concealed, countersunk screws finished to match adjacent Material may be used.

.7 Install door hardware.

.8 Acceptable Material:

.1 Exterior Doors: Alumicor 600A Insuldoor.

.1 Stile width: 146.1mm (5.750 inches).

.2 Top rail: 142.9 mm (5.625 inches).

.3 Bottom rail: 177.8mm (7 inches).

.2 Interior Doors: Alumicor 600A.

.1 Stile width: 146.1mm (5.750 inches).

.2 Top rail: 142.9 mm (5.625 inches).

.3 Bottom rail: 177.8mm (7 inches).

## 2.6 FINISHES

.1 Exposed aluminum surfaces: To AA DAF-45-M12C22A44, Architectural Class I, anodized 18 µm (0.0007 inches) minimum thickness coloured Bronze.

.1 Acceptable Material: Alumicor Ltd., Class I Anodic Finish.

## 2.7 HARDWARE

.1 Hardware: In accordance with Section 08 71 00 – Door Hardware.

## 2.8 ACCESSORIES

.1 Gasketing: To CCD-45 EPDM gaskets.

.2 Setting Blocks: To CCD-45 and ASTM D2240, manufacturer's standard Material, Shore A Durometer hardness.

.3 Spacers: To CCD-45 and ASTM D2240, manufacturer's standard Material, Shore A Durometer hardness.

.4 Sealant: To CAN/CGSB-19.13, Class 40, one-component, cold-applied, non-sagging silicone.

.1 Acceptable Material: Dow Corning 795.

.5 Sealant Bond Breaker: Open cell foam backer rod sized to suit project requirements.

## Part 3 EXECUTION

### 3.1 INSTALLERS

.1 Use only manufacturer authorized installers with 2 years minimum experience in Work similar to Work of this Section.

### 3.2 EXAMINATION

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

.1 Visually inspect substrate in presence of Contract Administrator.

.2 Inform Contract Administrator of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Contract Administrator.

### 3.3 INSTALLATION

.1 Install aluminum swing doors in accordance with manufacturer's written instructions.

### 3.4 ADJUSTING

.1 Adjust operable parts for correct function.

.2 Ensure doors do not bind while opening and closing.

### 3.5 FIELD QUALITY CONTROL

.1 Manufacturer's Services:

.1 Schedule manufacturer's review of Work procedures at stages listed:

.1 Installation: 2 Site reviews at commencement of Work and upon completion of Work.

.2 Submit manufacturer's written reports to Contract Administrator describing:

.1 The scope of Work requested.

.2 Date, time and location.

.3 Procedures performed.

.4 Observed or detected non-compliances or inconsistencies with manufacturers' recommended instructions.

.5 Limitations or disclaimers regarding the procedures performed.

.6 Obtain reports within seven days of review and submit immediately to Contract Administrator.

## 3.6 CLEANING

.1 Progress Cleaning: Perform cleanup as Work progresses in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean end of each day.

.2 Final Cleaning: Upon completion, remove surplus Materials, rubbish, tools, and equipment in accordance with Section 01 74 11 – Cleaning.

## 3.7 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent Materials caused by aluminum door installation.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 SUMMARY OF WORK

.1 This Section specifies glazed, non-thermally broken aluminum-framed storefronts and accessories.

### 1.2 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry

.2 Section 07 21 32 - Sprayed Polyurethane Foam Insulation

.3 Section 07 24 00 - Exterior Insulation and Finish Systems

.4 Section 07 26 00 - Vapour Retarders

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

.6 Section 07 92 00 - Joint Sealing

.7 Section 08 11 17 – Aluminum Doors

.8 Section 08 44 13 – Glazed Aluminum Curtainwalls

.9 Section 08 71 00 - Door Hardware

.10 Section 08 80 50 - Glazing

.11 Section 09 21 16 - Gypsum Board Assemblies

.12 Section 09 22 16 - Non-Structural Metal Framing

### 1.3 REFERENCE STANDARDS

.1 Aluminum Association (AA)

.1 DAF 45 2003, Designation System For Aluminum Finishes.

.2 American Architectural Manufacturers Association (AAMA).

.1 AAMA-501-2005, Methods of Test for Exterior Walls.

.2 AAMA-2603-2002, Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.

.3 AAMA-2604-2005, Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.

.4 AAMA-2605-2005, Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

.5 AAMA CW-10-2004, Care and Handling of Architectural Aluminum From Shop to Site.

.6 AAMA CW-11-1985, Design Windloads for Buildings and Boundary Layer Wind Tunnel Testing.

.7 AAMA-TIR A1-2004, Sound Control for Fenestration Products.

.3 ASTM International (ASTM).

.1 ASTM A653 / A653M – [09a], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM B209-07, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.3 ASTM B221-08, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.4 ASTM C612 – 09, Standard Specification for Mineral Fiber Block and Board Thermal Insulation.

.5 ASTM E283-04, Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

.6 ASTM E331-00, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.

.7 ASTM E413 – 04, Classification for Rating Sound Insulation.

.8 ASTM E1105 – 00(2008), Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.

.9 ASTM D2240 – 05, Standard Test Method for Rubber Property—Durometer Hardness.

.4 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-12.8-97, Insulating Glass Units.

.2 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.

.3 CAN/CGSB-19.13-M87, Sealing Compound, One-Component, Elastomeric, Chemical Curing.

.5 CSA International (CSA)

.1 CAN/CSA-S157-2005, Strength Design in Aluminum.

.2 CAN/CSA-S136–2007, North American Specification for the Design of Cold-Formed Steel Structural Members.

.3 CAN/CSA W59.2-M1991(R2003), Welded Aluminum Construction.

.6 Underwriter's Laboratories of Canada (ULC)

.1 CAN/ULC-S710.1 2005, Standard for Thermal Insulation – Bead-Applied One Component Polyurethane Air Sealant Foam, Part 1:

Materials Standard for Thermal Insulation - Bead - Applied One Component Polyurethane Air Sealant Foam, Part 1: Materials.

## 1.4 ADMINISTRATIVE REQUIREMENTS

.1 Co-ordination: Co-ordinate Work of this Section with Work of other trades for proper time and sequence to avoid construction delays.

.2 Pre-installation Meeting: Convene pre-installation meeting after Award of Contract and one week prior to commencing Work of this Section to verify project requirements, substrate conditions and coordination with other building sub-trades, and to review manufacturer's written installation instructions.

.1 Comply with Section 01 31 19 - Project Meetings and co-ordinate with other similar pre-installation meetings.

.2 Notify attendees 2 weeks prior to meeting and ensure meeting attendees include as minimum:

.1 The City;

.2 Contract Administrator;

.3 Glazing subcontractor;

.4 Manufacturer's Technical Representative.

.3 Ensure meeting agenda includes review of methods and procedures related to glazed aluminum-framed storefront installation including co-ordination with related Work.

.4 Record meeting proceedings including corrective measures and other actions required to ensure successful completion of Work and distribute to each attendee within 1 week of meeting.

## 1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Make submittals in accordance with Contract Conditions and Section 01 33 00 - Submittal Procedures.

.2 Product Data: Submit product data including manufacturer's literature for glazed aluminum-framed storefront extruded members, panels, components and accessories, indicating compliance with specified requirements and Material characteristics.

.1 Submit list on aluminum-framed storefront manufacturer's letterhead of Materials, components and accessories to be incorporated into Work.

.2 Include product names, types and series numbers.

.3 Include contact information for manufacturer and their representative for this Project.

.3 Shop Drawings: Submit drawings stamped and signed by Professional Engineer registered or licensed in Province of Manitoba, Canada. Include on Shop Drawings:

.1 Aluminum-framed storefront panel and component dimensions, framed opening requirements and tolerances, adjacent construction, anchor details anticipated deflection under load, affected related Work, weep drainage netWork, expansion and contraction joint location and details, and field welding required.

.2 Include details of fasteners between interior and exterior extrusions.

.4 Samples:

.1 Submit duplicate 300 x 300 mm (12 x 12 inches) sample sections showing prefinished aluminum surface, finish, colour and texture.

.2 Submit duplicate 300 x 300 mm (12 x 12 inches) sample sections of insulating glass unit showing glazing Materials and edge and corner details.

.5 Thermal Performance: Submit verification that Insulating Glass Units used in aluminum-framed storefront system meet RSI (R) values specified.

.6 Test Reports:

.1 Submit test reports showing compliance with specified performance characteristics and physical properties including air infiltration, water infiltration and structural performance.

.7 Field Reports: Submit manufacturer's field reports within 3 days of manufacturer representative's Site visit and inspection.

.8 Installer Qualifications:

.1 Submit letter verifying installer's experience with Work similar to Work of this Section.

## 1.6 CLOSEOUT SUBMITTALS

.1 Operation and Maintenance Data: Supply maintenance data for aluminum-framed storefront for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

.2 Record Documentation: In accordance with Section 01 78 00 - Closeout Submittals.

.1 List Materials used in aluminum-framed storefront Work.

.2 Warranty: Submit warranty documents specified.

## 1.7 QUALITY ASSURANCE

.1 Mock-up: Co-ordinate mock-up of aluminum-framed storefront with Section 08 44 13 – Glazed Aluminum Curtain Wall and Section 08 11 17 – Aluminum Doors.

## 1.8 DELIVERY STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Deliver Material in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver glazed aluminum-framed storefront Materials and components in manufacturer's original packaging with identification labels intact and in sizes to suit project.

.2 Material Handling: To AAMA CW-10.

.3 Storage and Handling Requirements: Store Materials off ground and protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.

.1 Material storage: To AAMA CW-10.

## 1.9 WARRANTY

.1 Project Warranty: Refer to Contract Conditions for project warranty provisions.

.2 Manufacturer's warranty: Submit, for The City's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and not intended to limit other rights The City may have under Contract Conditions.

.3 Warranty period: 5 years commencing on Date of Substantial Performance of Work.

# Part 2 PRODUCTS

## 2.1 MANUFACTURER

.1 Manufacturer: Alumicor Limited, 290 Humberline Drive, Toronto, Ontario, Canada M9W 5S2, Phone: (416) 745-4222 or (877) ALUMICOR, e-mail: **info@Alumicor.com**, URL: **www.Alumicor.com**.

## 2.2 DESCRIPTION

.1 Aluminum-framed glazed storefront constructed from prefinished aluminum extrusions and including swing type doors.

.2 Storefront Framing: Flush glazed framing 114.9 mm (4.53 inches) deep.

.1 Aluminum-framed storefront: 44.5 mm (1.75 inches) wide profile.

## 2.3 DESIGN CRITERIA

.1 Design aluminum-framed storefront to AAMA CW-DG-1.

.2 Design aluminum components to CAN/CSA S157.

.3 Design and size aluminum-framed storefront to withstand dead and live loads caused by pressure and suction of wind, acting normal to plane of wall using design pressure of 0.95 kPa (20 psf) to AAMA CW 11 and ASTM E330.

.1 Design aluminum-framed storefront system for expansion and contraction caused by cycling temperature range typical for a vestibule over 12 hour period without causing detrimental effect to system components.

.2 Thermal expansion: Ensure aluminum-framed storefront system can withstand temperature differential typical for a vestibule and is able to accommodate interior and exterior system expansion and contraction without damage to components or deterioration of seals.

.3 Design vertical expansion joints with baffled overlaps and compressed resilient air seal laid between mullion ends.

.4 Ensure system is designed to accommodate:

.1 Movement within aluminum-framed storefront assembly.

.2 Movement between system and perimeter framing components.

.3 Dynamic loading and release of loads.

.4 Deflection of structural support framing.

.5 Glass dimensions: Size glass units to CAN/CGSB-12.20.

.6 Flatness criteria: 6 mm (0.25 inches) maximum in 6 m (20 feet) for each panel.

## 2.4 MATERIALS

.1 Aluminum-Framed Storefront System and Components:

.1 Extruded aluminum: To ASTM B221, 6063 alloy with temper as recommended by manufacturer.

.2 Sheet aluminum: To ASTM B209, utility grade for unexposed surfaces, anodizing grade for exposed surfaces.

.3 Fasteners, screws and bolts: Cadmium plated stainless steel 300 or 400 series to meet aluminum-framed storefront requirements and as recommended by manufacturer.

.4 Anchors: Ensure anchors have three-way adjustment.

.5 Vision glass: to Section 08 80 50 – Glazing.

.6 Doors: In accordance with Section 08 11 17 - Aluminum Doors.

.2 Acceptable Material: Alumicor Ltd., FlushGlaze 1800 Series Storefront.

## 2.5 ALUMINUM-FRAMED STOREFRONT SYSTEM FABRICATION

.1 Do aluminum welding to CAN/CSA W59.2.

.2 Fabricate aluminum assemblies of extruded sections to sizes and profiles indicated.

.1 Ensure verticals and horizontals are extrusions designed for either shear block or screw spline corner construction.

.3 Construct units square, plumb and free from distortion, waves, twists, buckles or other defects detrimental to performance or appearance.

.4 Fabricate aluminum framed doors in accordance with Section 08 11 17 – Aluminum Doors.

.5 Accurately fit and secure joints and corners.

.1 Ensure joints are flush, hairline.

.6 Prepare aluminum-framed storefront to receive anchor devices.

.7 Use only stainless steel or zinc plated concealed fasteners

.1 Where fasteners cannot be concealed, countersunk screws finished to match adjacent Material may be used upon receipt of written approval from Contract Administrator.

.8 Prepare components to receive doors and openings as indicated.

## 2.6 FINISHES

.1 Exposed aluminum surfaces: To AA DAF-45-M12C22A44, Architectural Class I, anodized 18 µm (0.0007 inches) minimum thickness coloured Bronze.

.1 Acceptable Material: Alumicor Ltd., Class I Anodic Finish.

## 2.7 ACCESSORIES

.1 Gasketing: To CCD-45 Silicone compatible rubber or extruded silicone gaskets.

.2 Setting Blocks: To CCD-45 and ASTM D2240, manufacturer's standard Shore A Durometer hardness.

.3 Spacers: To CCD-45 and ASTM D2240, manufacturer's standard Shore A Durometer hardness.

.4 Sealant: To CAN/CGSB-19.13, Class 40, one-component, cold-applied, non-sagging silicone.

.1 Acceptable Material: Dow Corning 795.

.5 Sealant Bond Breaker: Open cell foam backer rod sized to suit project requirements.

.6 Flashings: 3 mm (0.125 inches) thick aluminum flashing to profiles indicated and in accordance with Section 07 62 00 - Sheet Metal Flashing and Trim.

.7 Liquid Foam Insulation: To Section 07 21 32 – Sprayed Polyurethane Foam Insulation

# Part 3 EXECUTION

## 3.1 INSTALLERS

.1 Use only manufacturer authorized installers 2 years minimum experience in Work similar to Work of this Section.

## 3.2 EXAMINATION

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

.1 Visually inspect substrate in presence of Contract Administrator.

.2 Inform Contract Administrator of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Contract Administrator.

## 3.3 INSTALLATION

.1 Install aluminum-framed storefront in accordance with manufacturer's written recommendations.

.2 Do aluminum welding to CAN/CSA W59.2.

.3 Attach aluminum-framed storefront assemblies to structure plumb and level, free from warp, and allow for sufficient adjustment to accommodate construction tolerances and other irregularities.

.1 Maintain dimensional tolerances and align with adjacent Work.

.2 Use alignment attachments and shims to permanently fasten elements to building structure.

.3 Clean welded surfaces and apply protective primer to field welds and adjacent surfaces.

.4 Provide manufacturer's recommended isolation coating where aluminum will come in contact with concrete, or dissimilar metals.

## 3.4 FIELD QUALITY CONTROL

.1 Site Installation Tolerances:

.1 Variation from plumb: 12 mm per 30 m (0.5 inches per 100 feet) maximum.

.2 Misalignment of two adjacent panels or members: 0.8 mm (0.03 inches) maximum.

.3 Sealant space between aluminum-framed storefront and adjacent construction: 13 mm (0.5 inches) maximum.

.2 Manufacturer's Services:

.1 Schedule manufacturer's review of Work procedures at stages listed:

.1 Installation: 2 Site reviews at commencement of Work and upon completion of Work.

.2 Submit manufacturer's written reports to Contract Administrator describing:

.1 The scope of Work requested.

.2 Date, time and location.

.3 Procedures performed.

.4 Observed or detected non-compliances or inconsistencies with manufacturers' recommended instructions.

.5 Limitations or disclaimers regarding the procedures performed.

.6 Obtain reports within seven days of review and submit immediately to Contract Administrator.

## 3.5 CLEANING

.1 Progress Cleaning: Perform cleanup as Work progresses in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean end of each day.

.2 Final leaning: Upon completion, remove surplus Materials, rubbish, tools, and equipment in accordance with Section 01 74 11 – Cleaning.

## 3.6 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent Materials caused by aluminum-framed storefront installation.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 SUMMARY OF WORK

.1 This Section specifies thermally broken, stick-built, glazed aluminum curtain wall and accessories.

### 1.2 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry

.2 Section 07 21 32 - Sprayed Polyurethane Foam Insulation

.3 Section 07 24 00 - Exterior Insulation and Finish Systems

.4 Section 07 26 00 - Vapour Retarders

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

.6 Section 07 92 00 - Joint Sealing

.7 Section 08 11 17 – Aluminum Doors

.8 Section 08 43 13 – Glazed Aluminum Storefronts

.9 Section 08 71 00 - Door Hardware

.10 Section 08 80 50 - Glazing

.11 Section 09 21 16 - Gypsum Board Assemblies

.12 Section 09 22 16 - Non-Structural Metal Framing

### 1.3 REFERENCE STANDARDS

.1 Aluminum Association (AA)

.1 DAF 45 2003, Designation System For Aluminum Finishes.

.2 American Architectural Manufacturers Association (AAMA).

.1 AAMA-501-2005, Methods of Test for Exterior Walls.

.2 AAMA-2603-2002, Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.

.3 AAMA-2604-2005, Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.

.4 AAMA-2605-2005, Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

.5 AAMA CW DG-1-96, Aluminum Curtain Wall Design Guide Manual.

.6 AAMA CW-10-2004, Care and Handling of Architectural Aluminum From Shop to Site.

.7 AAMA CW-11-1985, Design Windloads for Buildings and Boundary Layer Wind Tunnel Testing.

.8 AAMA-TIR A1-2004, Sound Control for Fenestration Products.

.3 ASTM International (ASTM).

.1 ASTM A653 / A653M – 09a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM B209-07, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.3 ASTM B221-08, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.4 ASTM C612 – 09, Standard Specification for Mineral Fiber Block and Board Thermal Insulation.

.5 ASTM E283-04, Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

.6 ASTM E331-00, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.

.7 ASTM E413 – 04, Classification for Rating Sound Insulation.

.8 ASTM E1105 – 00(2008), Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.

.9 ASTM D2240 – 05, Standard Test Method for Rubber Property—Durometer Hardness.

.4 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-12.8-97, Insulating Glass Units.

.2 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.

.3 CAN/CGSB-19.13-M87, Sealing Compound, One-Component, Elastomeric, Chemical Curing.

.5 CSA International (CSA)

.1 CAN/CSA-S157-2005, Strength Design in Aluminum.

.2 CAN/CSA-S136–2007, North American Specification for the Design of Cold-Formed Steel Structural Members.

.3 CAN/CSA W59.2-M1991(R2003), Welded Aluminum Construction.

.6 Underwriter's Laboratories of Canada (ULC)

.1 CAN/ULC-S710.1 2005, Standard for Thermal Insulation – Bead-Applied One Component Polyurethane Air Sealant Foam, Part 1: Materials Standard for Thermal Insulation - Bead - Applied One Component Polyurethane Air Sealant Foam, Part 1: Materials.

## 1.4 ADMINISTRATIVE REQUIREMENTS

.1 Co-ordination: Co-ordinate Work of this Section with Work of other trades for proper time and sequence to avoid construction delays.

.2 Pre-installation Meeting: Convene pre-installation meeting after Award of Contract and one week prior to commencing Work of this Section to verify project requirements, substrate conditions and coordination with other building Sub-trades, and to review manufacturer's written installation instructions.

.1 Comply with Section 01 31 19 - Project Meetings and co-ordinate with other similar pre-installation meetings.

.2 Notify attendees 2 weeks prior to meeting and ensure meeting attendees include as minimum:

.1 The City;

.2 Contract Administrator;

.3 Glazing Subcontractor;

.4 Manufacturer's Technical Representative.

.3 Ensure meeting agenda includes review of methods and procedures related to glazed aluminum curtain wall installation including co-ordination with related Work.

.4 Record meeting proceedings including corrective measures and other actions required to ensure successful completion of Work and distribute to each attendee within 1 week of meeting.

## 1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Make submittals in accordance with Contract Conditions and Section 01 33 00 - Submittal Procedures.

.2 Product Data: Submit product data including manufacturer's literature for glazed aluminum curtain wall extruded members, panels, components and accessories, indicating compliance with specified requirements and Material characteristics.

.1 Submit list on curtain wall manufacturer's letterhead of Materials, components and accessories to be incorporated into Work.

.2 Include product names, types and series numbers.

.3 Include contact information for manufacturer and their representative for this Project.

.3 Shop Drawings: Submit Drawings stamped and signed by Professional Engineer registered or licensed in Province of Manitoba, Canada. Include on Shop Drawings:

.1 Curtain wall panel and component dimensions, framed opening requirements and tolerances, adjacent construction, anchor details anticipated deflection under load, affected related Work, weep drainage netWork, expansion and Contraction joint location and details, and field welding required.

.4 Samples:

.1 Submit duplicate 300 x 300 mm (12 x 12 inches) sample sections showing prefinished aluminum surface, finish, colour and texture, and including section of infill panel.

.2 Submit duplicate 300 x 300 mm (12 x 12 inches) sample sections of insulating glass unit showing glazing Materials and edge and corner details.

.5 Thermal Performance: Submit verification that Insulating Glass Units used in curtain wall system meet RSI (R) values specified.

.6 Test Reports:

.1 Submit test reports showing compliance with specified performance characteristics and physical properties including air infiltration, water infiltration and structural performance.

.7 Field Reports: Submit manufacturer's field reports within 3 days of manufacturer representative's Site visit and inspection.

.8 Installer Qualifications:

.1 Submit letter verifying installer's experience with Work similar to Work of this Section.

## 1.6 CLOSEOUT SUBMITTALS

.1 Operation and Maintenance Data: Supply maintenance data for curtain wall for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

.2 Record Documentation: In accordance with Section 01 78 00 - Closeout Submittals.

.1 List Materials used in curtain wall Work.

.2 Warranty: Submit warranty documents specified.

## 1.7 QUALITY ASSURANCE

.1 Mock-up: Construct full size 6' x full height mock-up of vertical glazed aluminum curtain wall using proposed procedures, Materials and quality of Work where directed by Contract Administrator.

.1 Include intermediate mullion, corner mullion, sill, column cover, vision glass light, and insulated infill panel.

.2 Assemble to illustrate component assembly including glazing Materials, weep drainage system, attachments, anchors, and perimeter sealant.

.3 Purpose: To judge quality of Work and Material installation.

.4 Allow Contract Administrator 24 hours minimum prior to inspection of mock-up.

.5 Do not proceed with Work prior to receipt of written acceptance of mock-up by Contract Administrator.

.6 When accepted, mock-up will demonstrate minimum standard of quality required for Work of this Section.

.7 Approved mock-up will remain part of finished Work.

## 1.8 DELIVERY STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Deliver Material in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver glazed aluminum curtain wall Materials and components in manufacturer's original packaging with identification labels intact and in sizes to suit project.

.2 Material Handling: To AAMA CW-10.

.3 Storage and Handling Requirements: Store Materials off ground and protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.

.1 Material storage: To AAMA CW-10.

## 1.9 WARRANTY

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

.2 Warranty period: 5 years commencing on Date of Substantial Performance of Work.

# Part 2 PRODUCTS

## 2.1 MANUFACTURER

.1 Manufacturer: Alumicor Limited, 290 Humberline Drive, Toronto, Ontario, Canada M9W 5S2, Phone: (416) 745-4222 or (877) ALUMICOR, e-mail: **info@Alumicor.com**, URL: **www.Alumicor.com**.

## 2.2 DESCRIPTION

.1 Thermally broken, vertical stick-built glazed aluminum curtain wall system of tubular aluminum sections, shop fabricated, factory prefinished, vision glass, insulated metal panel spandrel infill, column covers; related flashings, anchorage and attachment devices.

.2 Ensure assembled system design permits re-glazing of individual glass and infill panels from exterior without requiring removal of structural mullions.

## 2.3 DESIGN CRITERIA

.1 Design curtain wall to AAMA CW-DG-1.

.1 Design glazed aluminum curtain wall following rainscreen principles.

.2 Ensure horizontal members are sealed to vertical members to form individual compartments in accordance with rainscreen principles.

.3 Ventilate and pressure equalize air space outside exterior surface of insulation to exterior.

.2 Design aluminum components to CAN/CSA S157.

.1 Design and size curtain wall components to withstand dead and live loads caused by pressure and suction of wind, acting normal to plane of wall using design pressure of 0.95 kPa (26 psf) to AAMA CW 11 and ASTM E330.

.1 Design curtain wall system for expansion and Contraction caused by cycling temperature range of 95 degrees C over 12 hour period without causing detrimental effect to system components.

.2 Thermal expansion: Ensure curtain wall system can withstand temperature differential of 95 degrees C and is able to accommodate interior and exterior system expansion and Contraction without damage to components or deterioration of seals.

.3 Design vertical expansion joints with baffled overlaps and compressed resilient air seal laid between mullion ends.

.1 Ensure system is designed to accommodate:

.1 Movement within curtain wall assembly.

.2 Movement between system and perimeter framing components.

.3 Dynamic loading and release of loads.

.4 Deflection of structural support framing.

.3 Thermal resistance:

.1 Spandrel areas: RSI 3.0 (R 16.8).

.4 Limit mullion deflection to flexure limit of glass maximum with full recovery of glazing Materials.

.5 Deadload prevention: Design curtain wall system with separate, integrated support for insulating glass units.

.6 Sound attenuation through wall system (exterior to interior): STC 50 to AAMA T1R - A1 and ASTM E413.

.7 Glass dimensions: Size glass units to CAN/CGSB-12.20.

.8 Flatness criteria: 6 mm (0.25 inches) maximum in 6 m (20 feet) for each panel.

.9 Air infiltration: 0.3 L/s/$m^2$ (0.63 cfm) maximum of wall area to AAMA 501 and ASTM E283 at differential pressure across assembly of 300 Pa (0.044 psi).

.10 Water infiltration: None to AAMA 501, ASTM E331 and ASTM E1105 at differential pressure across assembly of 720 Pa (0.104 psi).

.11 Ensure interior surfaces have no condensation before exposed edges of sealed units reach dew point temperatures during testing to AAMA 501.

.12 Maintain continuous air barrier and vapour retarder throughout building envelope and curtain wall assembly.

.13 Ensure no vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system occur.

## 2.4 MATERIALS

.1 Curtain Wall System and Components:

.1 Extruded aluminum: To ASTM B221, 6063 alloy with temper as recommended by manufacturer.

.2 Finish coatings: To AA DAF 45 Architectural Class I, clear anodized 18 µm (0.0007 inches) thick minimum.

.3 Sheet aluminum: To ASTM B209, utility grade for unexposed surfaces anodizing grade for exposed surfaces. Anodized to match curtain wall framing.

.4 Fasteners, screws and bolts: Tamperproof, cadmium plated stainless steel 300 or 400 series to meet curtain wall requirements and as recommended by manufacturer.

.5 Anchors: Ensure anchors have three-way adjustment.

.6 Insulating glass units: In accordance with Section 08 80 50 – Glazing.

.7 Thermal Break: Glass fibre reinforced polyamide porthole extrusion.

.8 Spandrels:

.1 Fabricate spandrels to as closely as possible resemble spandrels for existing aluminum windows on Site.

.2 Typical Spandrel:

.1 Exterior Surface: Sheet aluminum to match curtain wall framing.

.2 Curtain wall back pan liner: Reinforce panels to maintain flat surface.

.1 Concealed locations: 0.952 mm (20 gauge) steel sheet to CSA-S136M with 458 g/$m^2$ (1.25 oz/sq.ft) galvanized coating and corners sealed at concealed locations.

.2 Interior exposed locations: 1.588 mm (16 gauge) bronze anodized aluminum sheet.

.3 Where backpan is to interface with drywall ceiling, ensure surface of pan is flush with mullions.

.3 Curtain wall back pan insulation: 100 mm (4 inches) thick.

.1 Density: 64 kg/$m^3$ (4 lbs/cu ft) minimum.

.2 Thermal resistance: RSI 3.0 (R 16.8).

.9 Spandrel at relocated book drop box:

.1 Exterior and Interior Surface: Sheet aluminum to match curtain wall framing.

.2 Core: Laminate exterior and interior surfaces to core of 19mm (3/4 inch) marine grade plywood; rigid polystyrene insulation to Section 07 21 13 – Board Insulation, Type BI-3, thickness to suit; 19mm (3/4 inch) marine grade plywood.

.2 Acceptable Material: Alumicor Ltd., ThermaWall 2600 Series.

## 2.5 CURTAIN WALL SYSTEM FABRICATION

.1 Do aluminum welding to CAN/CSA W59.2.

.2 Fabricate aluminum assemblies of extruded sections to sizes and profiles indicated.

.1 Ensure vertical and horizontal members are tubular extrusions designed for shear block corner construction.

.2 Mullion depth sizes as indicated.

.3 Cap depth sizes: 19 mm (0.75 inches).

.4 Ensure caps for mullion assemblies are constructed without gap.

.3 Construct units square, plumb and free from distortion, waves, twists, buckles or other defects detrimental to performance or appearance.

.1 Ensure curtain wall is fabricated with separate, integrated support for insulating glass unit.

.2 Do glazing in accordance with Section 08 80 50 – Glazing.

.3 Site glazing is permitted.

.4 Fabricate curtain wall with minimum clearances and shim spacing around panel perimeter and ensure installation and dynamic movement of perimeter seal is enabled.

.5 Fabricate infill panels with metal covered edge seals around perimeter of panel assembly, enabling installation and minor movement of perimeter seal.

.1 Reinforce interior surface of exterior infill panel sheet from deflection caused by wind and suction loads.

.2 Place insulation within infill panel adhered to exterior face of interior panel sheet over entire area of sheet using impale fasteners with integral discs.

.6 Accurately fit and secure joints and corners.

.1 Ensure joints are flush, hairline, and weatherproof.

.7 Prepare curtain wall to receive anchor devices.

.8 Use only concealed fasteners

.1 Ensure fasteners do not penetrate thermal break.

.2 Where fasteners cannot be concealed, countersunk screws finished to match adjacent Material may be used upon receipt of written approval from Contract Administrator.

.9 Prepare components to receive doors and openings as indicated.

.10 Visible manufacturer's labels are not permitted.

## 2.6 FINISHES

.1 Exterior exposed aluminum surfaces: To AA DAF-45-M12C22A44, Architectural Class I, Bronze anodized 18 µm (0.0007 inches) minimum thickness.

.1 Acceptable Material: Alumicor Ltd., Class I Anodic Finish.

.2 Interior exposed aluminum surfaces: To AA DAF-45-M12C22A44, Architectural Class I, Bronze anodized 18 µm (0.0007 inches) minimum thickness.

.1 Acceptable Material: Alumicor Ltd., Class I Anodic Finish.

## 2.7 ACCESSORIES

.1 Fibre board: to ASTM C612.

.1 Type: 1VB.

.2 Density: 64 kg/$m^3$ (4 lbs per cu.ft.) minimum.

.3 Thickness: 100 mm (4 inches) minimum.

.4 Acceptable Material: Roxul Inc., CurtainRock.

.2 Gasketing: To CCD-45 Silicone compatible rubber or extruded silicone gaskets.

.3 Setting Blocks: To CCD-45 and ASTM D2240, manufacturer's standard Material, Shore A Durometer hardness.

.4 Spacers: To CCD-45 and ASTM D2240, manufacturer's standard Material, Shore A Durometer hardness.

.5 Sealant: To CAN/CGSB-19.13, Class 40, one-component, cold-applied, non-sagging silicone.

.1 Acceptable Material: Dow Corning 795.

.2 Sealant Bond Breaker: Open cell foam backer rod sized to suit project requirements.

.6 Flashings: 3 mm (0.125 inches) thick aluminum flashing to profiles indicated and in accordance with Section 07 62 00 - Sheet Metal Flashing and Trim.

.7 Liquid Foam Insulation: To Section 07 21 32 – Sprayed Polyurethane Foam Insulation.

.8 Miscellaneous Components: Covers, copings, special flashings, filler pieces, termination pieces, cap closures, expansion joint covers, and metal bellows to match curtain wall system as indicated.

## Part 3 EXECUTION

### 3.1 INSTALLERS

.1 Use only Manufacturer authorized installers with 2 years minimum experience in Work similar to Work of this Section.

### 3.2 EXAMINATION

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

.1 Visually inspect substrate in presence of Contract Administrator.

.2 Inform Contract Administrator of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Contract Administrator.

### 3.3 INSTALLATION

.1 Install curtain wall in accordance with manufacturer's written instructions.

.2 Do aluminum welding to CAN/CSA W59.2.

.3 Attach curtain wall assemblies to structure plumb and level, free from warp, and allow for sufficient adjustment to accommodate construction tolerances and other irregularities.

.1 Maintain dimensional tolerances and align with adjacent Work.

.2 Use alignment attachments and shims to permanently fasten elements to building structure.

.3 Clean welded surfaces and apply protective primer to field welds and adjacent surfaces.

.4 Install thermal isolation where components penetrate or disrupt building insulation.

.5 Install sill flashings.

.6 Co-ordinate attachment and seal of perimeter air barrier in accordance with Section 07 24 00 – Exterior Insulation and Finish Systems.

.7 Co-ordinate attachment and seal of perimeter vapour retarder in accordance with Section 07 26 00 – Vapour Retarders.

.8 Install liquid foam insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

.9 Install insulating glass units and infill panels in accordance with Section 08 80 50 - Glazing and to manufacturer's written instructions.

.10 Install perimeter sealant to method required to achieve performance criteria, backing Materials, and installation criteria in accordance with Section 07 92 00 - Joint Sealing.

.11 Provide manufacturer's recommended isolation coating where aluminum will come in contact with concrete, or dissimilar metals.

## 3.4 FIELD QUALITY CONTROL

.1 Field Inspection: Coordinate field inspection in accordance with Section 01 45 00 - Quality Control.

.2 Site Installation Tolerances:

.1 Variation from plumb: 12 mm per 30 m (0.5 inches per 100 feet) maximum.

.2 Misalignment of two adjacent panels or members: 0.8 mm (0.03 inches) maximum.

.3 Sealant space between curtain wall and adjacent construction: 13 mm (0.5 inches) maximum.

.3 Manufacturer's Services:

.1 Schedule manufacturer's review of Work procedures at stages listed:

.1 Installation: 2 Site reviews at commencement of Work and upon completion of Work.

.2 Submit manufacturer's written reports to Contract Administrator describing:

.1 The scope of Work requested.

.2 Date, time and location.

.3 Procedures performed.

.4 Observed or detected non-compliances or inconsistencies with manufacturers' recommended instructions.

.5 Limitations or disclaimers regarding the procedures performed.

.6 Obtain reports within seven days of review and submit immediately to Contract Administrator.

## 3.5 CLEANING

.1 Progress Cleaning: Perform cleanup as Work progresses in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean end of each day.

.2 Final cleaning: Upon completion, remove surplus Materials, rubbish, tools, and equipment in accordance with Section 01 74 11 – Cleaning.

## 3.6 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent Materials caused by glazed aluminum curtain wall installation.

**END OF SECTION**

# Part 1 GENERAL

## 1.1 RELATED SECTIONS

.1 Section 08 11 17 – Aluminum Doors

## 1.2 SUMMARY

.1 Section Includes

.1 Furnish, Deliver and Install all Finish Hardware as required by this Specification section. Include all screws, fasteners and Material necessary for the proper installation of the hardware.

## 1.3 SUBMITTALS

.1 General Requirements:

.1 Provide all submittals in accordance with Section 01 33 00 and as detailed in this section.

.2 Schedules

.1 Provide Six (6) copies of a detailed hardware schedule in the vertical format.

.3 Product Data

.1 Include with the hardware schedule all product data sheets and catalogue cuts required for any related trades sections. Provide two copies of each.

.4 Samples

.1 Samples of products in the hardware sets shall be provided upon request.

.5 Templates

.1 Provide all templates required by related trade sections for the proper preparation of their product.

## 1.4 QUALITY ASSURANCE

.1 Substitutes:

.1 The manufacturers products listed in the hardware sets establish a minimum guideline for the standard of quality. Similar items, if listed as an “acceptable substitute” may be supplied provided they are approved by the Contract Administrator, and provided required data and physical samples are submitted in accordance with Division One.

## 1.5 DELIVERY, STORAGE AND HANDLING

.1 Marking and Packaging

.1 Deliver to the project all hardware in the manufacturers packages with markings corresponding to the hardware schedule clearly shown.

.2 Delivery

.1 Deliver directly to the fabricator any items, which are requested for their use in fabrication.

.3 Storage

.1 Store all finish hardware in its original packages in a secure, clean, dry and warm area, equipped with sufficient shelving.

## 1.6 WARRANTY

.1 Warranty all hardware for the period of one year. Door Closers to be warranted for five years.

# Part 2 PRODUCTS

## 2.1 MATERIALS

.1 Screws and Fasteners

.1 All hardware is to be installed with the standard fasteners supplied by the manufacturer unless called for otherwise in the hardware sets.

.2 Hinges

.1 All hinges shall be Ives and of the size, type, and finish as indicated in the hardware sets.

.3 Exit Devices

.1 Shall be of the flush bar type. All devices whether rim or vertical rod to be surface mounted. All exit devices to Von Duprin. No substitute.

.4 Pulls

.1 To be of brass, bronze, or stainless steel construction. All pulls to be thru bolt mounted. Provide Ives as specified.

.5 Door Stops and Holders

.1 All floor stops to be solid brass or bronze. With rubber bumpers. Stops fastened to brick or concrete shall have wood screws and lead shields. Stops fastened to walls or floors of wood construction shall have wood screws. Provide Ives stops as specified.

.6 Thresholds and Weather-strip

.1 All weatherstrip, sweeps, automatic door bottoms, shall be anodized aluminum construction with polyurethane or neoprene gasketting as specified. All to be screw in mounting. K.N. Crowder as specified.

.7 High Security Cylinders

.1 All lock cylinders are to be Abloy and supplied by the The City.

## 2.2 KEYING

.1 All Abloy high security cylinders shall be provided Masterkeyed from the factory for a new system according to the The City's requirements. All locks and cylinders will be provided with two keys per lock and three masterkeys. All keys and cylinders shall have a visual key control on the keys and cylinders. Allow for three symbols per key or cylinder.

.2 The City will order the cylinders through Abloy complete with keying instructions. Contact Greg Joss of Abloy at 668-5102.

# Part 3 EXECUTION

## 3.1 EXAMINATION

.1 Examine all doors and frames prior to installation of hardware to determine if the hardware can be installed correctly. Do not proceed with installation until defects are corrected.

## 3.2 INSTALLATION

.1 Install all hardware in accordance with the manufacturer's installation instructions.

.2 All door hardware heights to be in accordance with Manitoba Building Code.

## 3.3 HARDWARE SETS

.1 Provide Finish Hardware as follows:

# Finish Hardware Specification

for

**Southeast Entrance Development**
Millenium Library
Winnipeg, MB



| | |
|---|---|
| Architect: | MMP Architects Inc,<br>500-321 McDermot Ave.<br>Winnipeg, MB R3A 0A3 |
| Supplier: | Penner Doors & Hardware<br><br>405a De Baets Street<br>Winnipeg, MB R2J 3V6<br>(204)594-0133 Fax# (204)694-7130 |
| Prepared by: | Michael Plett, AHC |
| Job Number: | S-246 |
| Date: | July 13, 2012 |

# Finish Hardware Specification

## Southeast Entrance Development

Job Number: S-246

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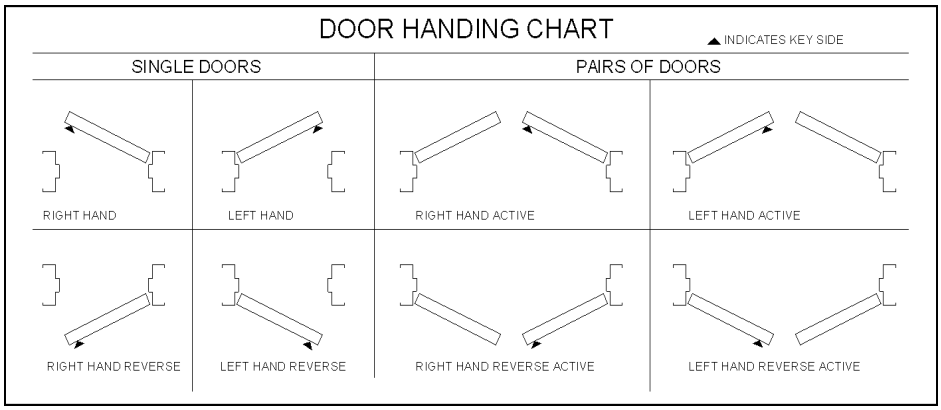

# Finish Hardware Specification

## Southeast Entrance Development



**Based on:**

| | |
|---|---|
| Hinge | IVES (IVES) |
| Cylinder | Abloy (ABL) |
| Exit Device | Von Duprin, Inc. (VDI) |
| Door Pull | IVES (IVES) |
| Push/Pull | IVES (IVES) |
| Automatic Operator | Gyro Tech (GT) |
| Door Guard | Gyro Tech (GT) |
| Overhead Holder/Stop | Glynn - Johnson (GJ) |
| Sweep Strip | K. N. Crowder Mfg., Inc. (KNC) |
| Threshold | K. N. Crowder Mfg., Inc. (KNC) |
| Balance by Door Supplier | Furnished by others (FBO) |
| Key Switch | Gyro Tech (GT) |
| Motion Sensor | Gyro Tech (GT) |

# Finish Hardware Specification

## Southeast Entrance Development



**Hardware Finishes:**

| Finish | Finish Description |
|---|---|
| 10B | |
| 313AN | |
| 613 | |
| 630 | Satin Stainless Steel |
| Alum | |
| Black | |
| Bronze Ano. | |
| Duro | |

# Finish Hardware Specification

## Southeast Entrance Development



## Door List

| Door# | Hardware Set# |
|---|---|
| 02 | 1 |
| 03 | 2 |

# Finish Hardware Specification

## Southeast Entrance Development

Job Number: S-246



**Hardware Set#: 1**

Pair: 02

| Qty | UOM | Item Type | Item Series/Description | Finish |
|---|---|---|---|---|
| 8.0 | EA | Hinge | 3CB1HW 4.5 x 4 NRP | 613 |
| 2.0 | EA | Cylinder | Abloy Cylinder by others | 613 |
| 2.0 | EA | Exit Device | 3347NL-OP | 313AN |
| 2.0 | EA | Door Pull | 8190-18 | 613 |
| 2.0 | EA | Automatic Operator | GT8500 | Duro |
| 2.0 | EA | Door Guard | DLW-D CLR 42" Guide Rail | Alum |
| 2.0 | EA | Overhead Holder/Stop | 104S | 10B |
| 2.0 | EA | Sweep Strip | W-13S | Bronze Ano. |
| 1.0 | EA | Threshold | CT-65 | Bronze Ano. |
| 1.0 | EA | Balance by Door Supplier | Weatherstrip and Astragal Seal by Door Supplier | |
| 1.0 | EA | Key Switch | ESK-12 | |
| 2.0 | EA | Motion Sensor | BEA Eagle | Black |
| 4.0 | EA | Motion Sensor | Superscan SS1 Sensor | Black |

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**Hardware Set#: 2**

Pair: 03

| Qty | UOM | Item Type | Item Series/Description | Finish |
|---|---|---|---|---|
| 8.0 | EA | Hinge | 3CB1HW 4.5 x 4 NRP | 630 |
| 2.0 | SET | Push/Pull | 9190-18 Offest Pull/Push Bar Combination | 613 |
| 2.0 | EA | Automatic Operator | GT8500 | Duro |
| 2.0 | EA | Overhead Holder/Stop | 104S | 10B |
| 1.0 | EA | Key Switch | ESK-12 | |
| 2.0 | EA | Motion Sensor | BEA Eagle | Black |
| 4.0 | EA | Motion Sensor | Superscan SS1 Sensor | Black |

## Part 1 GENERAL

### 1.1 RELATED SECTIONS

.1 Section 07 26 00 - Vapour Retarders

.2 Section 07 92 00 - Joint Sealing

.3 Section 08 11 17 – Aluminum Doors

.4 Section 08 43 13 – Glazed Aluminum Storefronts

.5 Section 08 44 13 – Glazed Aluminum Curtain Walls

### 1.2 REFERENCES

.1 American National Standards Institute (ANSI).

.1 ANSI/ASTM E330-02, Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

.2 American Society for Testing and Materials International, (ASTM).

.1 ASTM C542-94(1999), Specification for Lock-Strip Gaskets.

.2 ASTM D790-02, Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

.3 ASTM D1003-00, Test Method for Haze and Luminous Transmittance of Plastics.

.4 ASTM D1929-96(R2001)e1, Test Method for Determining Ignition Temperature of Plastics.

.5 ASTM D2240-02b, Test Method for Rubber Property - Durometer Hardness.

.6 ASTM E84-01, Test Method for Surface Burning Characteristics of Building Materials.

.7 ASTM F1233-98, Test Method for Security Glazing Materials and Systems.

.3 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.

.2 CAN/CGSB-12.2-M91, Flat, Clear Sheet Glass.

.3 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.

.4 CAN/CGSB-12.4-M91, Heat Absorbing Glass.

.5 CAN/CGSB-12.5-M86, Mirrors, Silvered.

.6 CAN/CGSB-12.6-M91, Transparent (One-Way) Mirrors.

.7 CAN/CGSB-12.8-97, Insulating Glass Units.

.8 CAN/CGSB-12.9-M91, Spandrel Glass.

.9 CAN/CGSB-12.10-M76, Glass, Light and Heat Reflecting.

.10 CAN/CGSB-12.11-M90, Wired Safety Glass.

.11 CAN/CGSB-12.12-M90, Plastic Safety Glazing.

.12 CAN/CGSB-12.13-M91, Patterned Glass.

.4 Canadian Standards Association (CSA International).

.1 CSA A440.2-98, Energy Performance Evaluation of Windows and Sliding Glass Doors.

.2 CSA Certification Program for Windows and Doors 2000.

.5 Flat Glass Manufacturers Association (FGMA).

.1 FGMA Glazing Manual - 1997.

.6 Laminators Safety Glass Association (LSGA).

.1 LSGA Laminated Glass Design Guide 2000.

## 1.3 SYSTEM DESCRIPTION

.1 Performance Requirements:

.1 Provide continuity of building enclosure vapour and air barrier using glass and glazing Materials as follows:

.1 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.

.2 Size glass to withstand wind loads, dead loads and positive and negative live loads acting normal to plane of glass to a design pressure listed in the Manitoba Building Code.

.3 Limit glass deflection to flexural limit of glass with full recovery of glazing Materials.

## 1.4 SUBMITTALS

.1 Shop Drawings:

.1 Submit Shop Drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Samples:

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit duplicate 300 mm size samples of glass and sealant Material.

.3 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

.4 Closeout Submittals:

.1 Provide maintenance data including cleaning instructions for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

## 1.5 QUALITY ASSURANCE

.1 Upon request by Contract Administrator, provide:

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying Materials comply with specified performance characteristics and criteria and physical requirements.

.2 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

### 1.6 SITE CONDITIONS

.1 Environmental Requirements:

.1 Install glazing when ambient temperature is 10 degrees C minimum. Maintain ventilated environment for 24 hours after application.

.2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

### 1.7 WARRANTY

.1 Provide twenty (20) year manufacturer’s limited warranty for insulated glass units from seal failure, interpane dusting or misting, and replacement of same.

## Part 2 PRODUCTS

### 2.1 MATERIALS: FLAT GLASS

.1 Float glass **(CGL)**: to CAN/CGSB-12.3, Glazing quality, 6 mm thick.

.1 Tempered.

.2 Heat absorbing glass **(HAG)**: to CAN/CGSB-12.4, 6 mm thick.

.1 Class B-Heat Strengthened.

.2 Tint: To match existing adjacent windows.

### 2.2 MATERIALS: SEALED INSULATING GLASS

.1 Insulating glass units: to CAN/CGSB-12.8, double unit, 25.4 mm overall thickness.

.1 Tinted Insulated Glass **(IGU-1):**

.1 Glass: to CAN/CGSB-12.3.

.2 Glass thickness: 6 mm CGL inner light, 6 mm HAG outer light.

.3 Inter-cavity space thickness: 12 mm between inner and outer lights with low conductivity spacers.

.1 Acceptable Material: Edgetech Superspacer or approved equal in accordance with B6.

.4 Glass coating: surface number 3, low "E".

.1 Acceptable Material: PPG Solarban 60 or approved equal in accordance with B6.

.5 Inert gas fill: argon.

### 2.3 ACCESSORIES

.1 Setting blocks: Manufacturer's standard.

.2 Spacer shims: Manufacturer's standard.

.3 Glazing tape:

.1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D2240; coiled on release paper; size as required; black colour.

.4 Glazing clips: manufacturer's standard type.

## Part 3 EXECUTION

### 3.1 MANUFACTURER'S INSTRUCTIONS

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

### 3.2 EXAMINATION

.1 Verify that openings for glazing are correctly sized and within tolerance.

.2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

### 3.3 PREPARATION

.1 Clean contact surfaces with solvent and wipe dry.

.2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.

.3 Prime surfaces scheduled to receive sealant.

### 3.4 INSTALLATION: EXTERIOR

.1 Follow frame manufacturer's written instructions for installation of exterior glazing.

### 3.5 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Remove traces of primer, caulking.

.3 Remove glazing Materials from finish surfaces.

.4 Remove labels after work is complete.

.5 Clean glass using approved non-abrasive cleaner in accordance with manufacturer's instructions.

.6 Upon completion of installation, remove surplus Materials, rubbish, tools and equipment barriers.

## 3.6 PROTECTION OF FINISHED WORK

.1 After installation, mark light with an "X" by using removable plastic tape or paste. Do not mark heat absorbing or reflective glass units.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry

.2 Section 07 21 13 - Board Insulation

.3 Section 07 21 16 - Blanket Insulation

.4 Section 07 21 32 - Sprayed Polyurethane Foam Insulation

.5 Section 07 24 00 - Exterior Insulation and Finish Systems

.6 Section 07 26 00 - Vapour Retarders

.7 Section 07 52 00 - Modified Bituminous Membrane Roofing

.8 Section 07 84 00 - Firestopping

.9 Section 07 92 00 - Joint Sealing

.1 Section 08 43 13 – Glazed Aluminum Storefronts

.2 Section 08 44 13 – Glazed Aluminum Curtain Walls

.3 Section 09 22 16 - Non-Structural Metal Framing

.4 Section 09 91 23 - Interior Painting

### 1.2 REFERENCES

.1 Aluminum Association

.1 Designation for Aluminum Finishes-1997.

.2 American Society for Testing and Materials International, (ASTM)

.1 ASTM C36/C36M-01, Specification for Gypsum Wallboard.

.2 ASTM C79/C79M-01, Standard Specification for Treated Core and Non-treated Core Gypsum Sheathing Board.

.3 ASTM C442/C442M-01, Specification for Gypsum Backing Board, Gypsum Coreboard, and Gypsum Shaftliner Board.

.4 ASTM C475-01, Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

.5 ASTM C514-01, Specification for Nails for the Application of Gypsum Board.

.6 ASTM C557-99, Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.

.7 ASTM C630/C630M-01, Specification for Water-Resistant Gypsum Backing Board.

.8 ASTM C840-01, Specification for Application and Finishing of Gypsum Board.

.9 ASTM C931/C931M-01, Specification for Exterior Gypsum Soffit Board.

.10 ASTM C954-00, 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.

.11 ASTM C960/C960M-01, Specification for Pre-decorated Gypsum Board.

.12 ASTM C1002-01, Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

.13 ASTM C1047-99, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

.14 ASTM C1178/C1178M-01, Specification for Glass Mat Water-Resistant Gypsum Backing Board.

.3 Association of the Wall and Ceilings Industries International (AWEI)

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-71.25-M88, Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.

.5 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S102-1988(R2000), Surface Burning Characteristics of Building Materials and Assemblies.

## 1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver Materials in original packages, containers or bundles bearing manufacturers brand name and identification.

.2 Store Materials inside, level, under cover. Keep dry. Protect from weather, other elements and damage from construction operations and other causes.

.3 Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal accessories and trim from being bent or damaged.

## 1.4 SITE ENVIRONMENTAL REQUIREMENTS

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

.2 Apply board and joint treatment to dry, 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

### 2.1 MATERIALS

.1 Standard board: to ASTM C36/C36M regular, 12.7 mm thick and Type X, 15.9 mm thick, 1200 mm wide x maximum practical length, ends square cut, edges tapered.

.1 Acceptable Products:

.1 Regular: ProRoc Regular or Evenwall, manufactured by CertainTeed Gypsum, Inc.

.2 Fire Rated: ProRoc Type X or Evenwall Type X, manufactured by CertainTeed Gypsum, Inc.

.2 Glass mat gypsum roof board: to ASTM C1178/C1178M, 12.7 mm thick, 1200 mm wide x maximum practical length.

.1 Acceptable Materials:

.1 DensDeck, manufactured by Georgia-Pacific Gypsum or approved equal in accordance with B6.

.3 Glass mat gypsum substrate sheathing: to ASTM C1177/C1177M, 13 mm thick, and Fire Rated 15.9 mm thick. 1200 mm wide x maximum practical length.

.1 Acceptable Materials:

.1 Regular: DensGlass Gold, manufactured by Georgia-Pacific Gypsum or approved equal in accordance with B6.

.2 Fire Rated: DensGlass Gold Fireguard, manufactured by Georgia-Pacific Gypsum or approved equal in accordance with B6.

.4 Metal furring runners, hangers, tie wires, inserts, anchors.

.5 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.

.6 Resilient clips: 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.

.7 Reveal Channels: To match existing reveals in adjacent ceiling construction. Ensure size, depth and finish are equivalent to existing.

.8 Nails: to ASTM C514.

.9 Steel drill screws: to ASTM C1002.

.10 Stud adhesive: to CAN/CGSB-71.25.

.11 Laminating compound: as recommended by manufacturer, asbestos-free.

.12 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, metal, zinc-coated by hot-dip process, 0.5 mm base thickness, perforated flanges, one piece length per location.

.13 Sealants: in accordance with Section 07 92 00 - Joint Sealing.

.14 Acoustic sealant: in accordance with Section 07 92 00 - Joint Sealing.

.15 Polyethylene: to Section 07 26 00 – Vapour Retarders.

.16 Joint compound: to ASTM C475, asbestos-free.

## Part 3 EXECUTION

### 3.1 ERECTION

.1 Do application and finishing of gypsum board in accordance with ASTM C840 except where specified otherwise.

.2 Do application of gypsum sheathing in accordance with ASTM C1280.

.3 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C840 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, 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 Install wall furring for gypsum board wall finishes in accordance with ASTM C840, except where specified otherwise.

.10 Furr openings and around built-in equipment, cabinets, access panels on four sides. Extend furring into reveals. Check clearances with equipment suppliers.

.11 Furr duct shafts, beams, columns, pipes and exposed services where indicated.

### 3.2 APPLICATION

.1 Do not apply gypsum board until bucks, anchors, blocking, sound attenuation, electrical, and mechanical Work are approved.

.2 Apply double layer gypsum board to metal furring or framing using screw fasteners for first layer, screw fasteners for second layer. Maximum spacing of screws 300 mm on centre.

.1 Single-Layer Application:

.1 Apply gypsum board on ceilings prior to application of walls in accordance with ASTM C840.

.2 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize 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 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 cutouts around electrical boxes, ducts in partitions where perimeter sealed with acoustic sealant.

.4 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.

.5 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.

.6 Install gypsum board with face side out.

.7 Do not install damaged or damp boards.

.8 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

## 3.3 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. Seal joints with sealant.

.4 Coordinate with requirements of Curtain Wall manufacturer where gypsum ceilings abut Curtain Wall. DO NOT PENETRATE CURTAIN WALL BACK PANS WITH FASTENERS WITHOUT PRIOR WRITTEN APPROVAL FROM THE CURTAIN WALL MANUFACTURER.

.5 Construct control joints of preformed units set in gypsum board facing and supported independently on both sides of joint. Control joints are present in adjacent ceiling. Provide control joints in new ceiling to ensure visual consistency between existing and new ceilings. Use reveal channels to match existing control joints.

.6 Provide continuous polyethylene dust barrier behind and across control joints.

.7 Locate control joints where indicated and at changes in substrate construction.

.8 Install control joints straight and true.

.9 Construct expansion joints, at building expansion and construction joints. Provide continuous dust barrier.

.10 Install expansion joint straight and true.

.11 Install cornice cap where gypsum board partitions do not extend to ceiling.

.12 Splice corners and intersections together and secure to each member with 3 screws.

.13 Install access doors to electrical and mechanical fixtures specified in respective sections.

.1 Rigidly secure frames to furring or framing systems.

.14 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.

.15 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with Association of the Wall and Ceiling Industries (AWCI) International Recommended Specification on Levels of Gypsum Board Finish:

.1 Level of finish:

.1 Level 5: 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; apply a thin skim coat of joint compound to entire surface; surfaces smooth and free of tool marks and ridges.

.16 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.

.17 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.

.18 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

.19 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

.20 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.

.21 Mix joint compound slightly thinner than for joint taping.

.22 Apply thin coat to entire surface using trowel or drywall broadknife to fill surface texture differences, variations or tool marks.

.23 Allow skim coat to dry completely.

.24 Remove ridges by light sanding or wiping with damp cloth.

.25 Provide protection that ensures gypsum drywall Work will remain without damage or deterioration at time of substantial completion.

**END OF SECTION**

# Part 1 GENERAL

## 1.1 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry

.2 Section 07 21 13 - Board Insulation

.3 Section 07 21 16 - Blanket Insulation

.4 Section 07 21 32 - Sprayed Polyurethane Foam Insulation

.5 Section 07 24 00 - Exterior Insulation and Finish Systems

.6 Section 07 52 00 - Modified Bituminous Membrane Roofing

.1 Section 08 43 13 – Glazed Aluminum Storefronts

.2 Section 08 44 13 – Glazed Aluminum Curtain Walls

.3 Section 09 21 16 - Gypsum Board Assemblies

## 1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).

.1 ASTM C645-00, Specification for Nonstructural Steel Framing Members.

.2 ASTM C754-00, Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

.2 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-1.40-97, Primer, Structural Steel, Oil Alkyd Type.

.3 Environmental Choice Program (ECP).

.1 CCD-047a -98, Paints - Surface Coatings.

.2 CCD-048-98, Surface Coatings - Recycled Water-borne.

## 1.3 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying Materials comply with specified performance characteristics and criteria and physical requirements.

## Part 2 PRODUCTS

### 2.1 MATERIALS

.1 Non-load bearing channel stud framing: to ASTM C645, stud size as indicated, roll formed from hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 460 mm centres.

.1 Gauges as follows except where height of partitions or anticipated wind load requires heavier gauge studs:

.1 Interior partitions: 25 gauge.

.2 Penetrations in interior partitions: 22 gauge.

.2 Metal channel stiffener: 37 mm x 19 mm size, 1.6 mm thick cold rolled steel, coated with rust inhibitive coating.

.3 Acoustical sealant: to Section 07 92 00 – Joint Sealing.

.4 Insulating strip: rubberized, moisture resistant 3 mm thick foam strip, 12 mm wide, with self sticking adhesive on one face, lengths as required.

## Part 3 EXECUTION

### 3.1 ERECTION

.1 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum. Install sill insulation gasket below floor track for sound insulated partitions.

.2 Install damp proof course under stud shoe tracks of partitions on slabs on grade.

.3 Place studs vertically at spacing indicated and not more than 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.

.4 Erect metal studding to tolerance of 1:1000.

.5 Attach studs to bottom and ceiling track using screws.

.6 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use 50 mm leg ceiling tracks.

.7 Coordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.

.8 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for Work specified in other Sections.

.9 Provide minimum two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed

alongside frame anchor clips. Provide additional studs at sides of openings as required by Manufacturer's written instructions.

.10 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Provide double headers at all openings. Install intermediate studs above and below openings in same manner and spacing as wall studs.

.11 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.

.12 Provide 75mm G1S plywood backing secured between studs for attachment of fixtures attached to steel stud partitions. Backing to be minimum 300 mm in height between studs as necessary to attach all fixtures and accessories as specified.

.13 Coordinate with Section 06 10 00 –Rough Carpentry for installation of blocking to support wall mounted equipment.

.14 Install steel studs or furring channel between studs for attaching electrical and other boxes.

.15 Extend partitions to underside of deck except where noted otherwise on Drawings.

.16 Install two continuous beads of acoustical sealant under studs and tracks around perimeter of sound control partitions and to each side of abutting stud where it meets concrete or concrete block.

.17 Install closed cell polyethylene sill gasket as detailed.

## 3.2 CLEANING

.1 Upon completion of installation, remove surplus Materials, rubbish, tools and equipment barriers.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 RELATED SECTIONS

.1 Section 03 30 00 - Cast-In-Place Concrete

.2 Section 09 68 00 - Carpeting

### 1.2 REFERENCES

.1 American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI)

.1 ANSI A108.1-99, Specification for the Installation of Ceramic Tile (Includes ANSI A108.1A-C, 108.4-.13, A118.1-.10, ANSI A136.1).

.2 CTI A118.3-92, Specification for Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive (included in ANSI A108.1).

.3 CTI A118.4-92, Specification for Latex Cement Mortar (included in ANSI A108.1).

.4 CTI A118.5-92, Specification for Chemical Resistant Furan Resin Mortars and Grouts for Tile Installation (included in ANSI A108.1).

.5 CTI A118.6-92, Specification for Ceramic Tile Grouts (included in ANSI A108.1).

.2 American Society for Testing and Materials International (ASTM)

.1 ASTM C144-04, Specification for Aggregate for Masonry Mortar.

.2 ASTM C207-06, Specification for Hydrated Lime for Masonry Purposes.

.3 ASTM C847-06, Specification for Metal Lath.

.4 ASTM C979-05, Specification for Pigments for Integrally Coloured Concrete.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.2 CGSB 71-GP-22M-78(AMEND.), Adhesive, Organic, for Installation of Ceramic Wall Tile.

.3 CAN/CGSB-75.1-M88, Tile, Ceramic.

.4 CAN/CGSB-25.20-95, Surface Sealer for Floors.

.4 Canadian Standards Association (CSA International)

.1 CSA A123.3-05, Asphalt Saturated Organic Roofing Felt.

.2 CAN/CSA-A3000-03(R2006), Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.5 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

.6 Terrazzo Tile and Marble Association of Canada (TTMAC)

.1 Tile Specification Guide 09 30 00 2006/2007, Tile Installation Manual.

.2 Tile Maintenance Guide 2000.

## 1.3 SUBMITTALS

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

.2 Provide product data in accordance with Section 01 33 00 - Submittal Procedures.

.1 Include manufacturer's information on:

.1 Ceramic tile, marked to show each type, size, and shape required.

.2 Cementitious backer unit.

.3 Dry-set cement mortar and grout.

.4 Divider strip.

.5 Elastomeric membrane and bond coat.

.6 Reinforcing tape.

.7 Levelling compound.

.8 Latex cement mortar and grout.

.9 Commercial cement grout.

.10 Organic adhesive.

.11 Slip resistant tile.

.12 Waterproofing isolation membrane.

.13 Fasteners.

.3 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.

.1 Floor tile: submit duplicate, 300 x 300 mm sample panels of each colour, texture, size, and pattern of tile.

.2 Adhere tile samples to 11 mm thick plywood and grout joints to represent project installation.

## 1.4 QUALITY ASSURANCE

.1 Quality Assurance Submittals:

.1 Manufacturer's Instructions: manufacturer's installation instructions.

.2 Manufacturer's Field Reports: manufacturer's field reports specified.

.2 Prior to commencing installation, each flooring installer involved in work of this Section shall deliver to Contract Administrator signed letter on company letterhead indicating that a review of the subfloor has been performed, and confirming their acceptance of the flatness and moisture content of the substrate.

## 1.5 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.

### 1.6 AMBIENT CONDITIONS

.1 Maintain air temperature and structural base temperature at ceramic tile installation area above 12 degrees C for 48 hours before, during, and 48 hours after, installation.

.2 Do not install tiles at temperatures less than 12 degrees C or above 38 degrees C.

.3 Do not apply epoxy mortar and grouts at temperatures below 15 degrees C or above 25 degrees C.

### 1.7 MAINTENANCE

.1 Extra Materials:

.1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide minimum 2% of each type and colour of tile required for project for maintenance use. Store where directed.

.3 Maintenance material same production run as installed material.

## Part 2 PRODUCTS

### 2.1 FLOOR TILE

.1 Tile (CT-1):

.1 Olympia Tile; Regal Series; 18” x 18”; Colour: Black Matte.

### 2.2 TRIM SHAPES

.1 Schluter: Reno-TK, anodized aluminum with nickel finish.

### 2.3 BOND COAT

.1 Thinset Adhesive

.1 Acceptable Manufacturer:

.1 Flextile 52 Polymer Modified Thinset

.2 Adhesives: maximum VOC limit 65 g/L to SCAQMD Rule 1168.

### 2.4 GROUT

.1 Epoxy Grout: Flextile Flex-Epoxy 100 Epoxy Grout

.1 CT-1: Colour to be selected by Contract Administrator to match existing.

.2 Grouts: maximum VOC limit 100 g/L.

### 2.5 ACCESSORIES

.1 Reinforcing mesh: 50 x 50 x 1.6 x 1.6 mm galvanized steel wire mesh, welded fabric design, in flat sheets.

.2 Prefabricated Movement Joints: purpose made, having a Shore A Hardness not less than 60 and elasticity of plus or minus 40 percent when used in accordance to TTMAC Detail 301EJ.

.3 Sealant: in accordance with Section 07 92 00 - Joint Sealants.

.4 Floor sealer and protective coating: to CAN/CGSB-25.20, to tile and grout manufacturer's recommendations.

### 2.6 PATCHING AND LEVELLING COMPOUND

.1 Cement base, acrylic polymer compound, manufactured specifically for resurfacing and levelling concrete floors. Products containing gypsum are not acceptable.

.2 Have not less than the following physical properties:

.1 Compressive strength - 25 MPa.
.2 Tensile strength - 7 MPa.
.3 Flexural strength - 7 MPa.
.4 Density - 1.9.

.3 Capable of being applied in layers up to 50 mm thick, being brought to feather edge, and being trowelled to smooth finish.

.4 Ready for use in 48 hours after application.

### 2.7 CLEANING COMPOUNDS

.1 Specifically designed for cleaning concrete and which will not prevent bond of subsequent tile setting materials including patching and levelling compounds and elastomeric waterproofing membrane and coat.

.2 Materials containing acid or caustic material are not acceptable.

## Part 3 EXECUTION

### 3.1 MANUFACTURER'S INSTRUCTIONS

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

### 3.2 WORKMANSHIP

.1 Do tile work in accordance with TTMAC Tile Installation Manual 2006/2007, "Ceramic Tile", except where specified otherwise.

.2 Apply tile or backing coats to clean and sound surfaces.

.3 Fit tile around corners, fitments, fixtures, drains and other built-in objects. Maintain uniform joint appearance. Cut edges smooth and even. Do not split tiles.

.4 Maximum surface tolerance 1:800.

.5 Make joints between tile uniform and sized to match existing tile of the same type within the building, plumb, straight, true, even and flush with adjacent tile. Align patterns.

.6 Lay out tiles so perimeter tiles are minimum 1/2 size.

.7 Sound tiles after setting and replace hollow-sounding units to obtain full bond.

.8 Make internal angles square, external angles bullnosed.

.9 Install divider strips at junction of tile flooring and dissimilar materials.

.10 Allow minimum 24 hours after installation of tiles, before grouting.

.11 Clean installed tile surfaces after installation and grouting cured.

.12 Make control joints where indicated. Make joint width same as tile joints. Fill control joints with sealant in accordance with Section 07 92 00 - Joint Sealants. Keep building expansion joints free of mortar and grout.

## 3.3 FLOOR SEALER AND PROTECTIVE COATING

.1 Apply in accordance with manufacturer's instructions.

## 3.4 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

.1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

## 3.5 CLEANING

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 RELATED SECTIONS

.1 Section 03 30 00 - Cast-In-Place Concrete

.2 Section 09 30 13 - Ceramic Tiling

### 1.2 REFERENCES

.1 American Association of Textile Chemists and Colorists (AATCC)

- .1 AATCC 16-1998, Color Fastness to Light.
- .2 AATCC 23-1999, Color Fastness to Burn Gas Fumes.
- .3 AATCC 118-1997, Oil Repellency: Hydrocarbon Resistance Test.
- .4 AATCC 129-2001, Colour Fastness to Ozone in the Atmosphere Under High Humidities.
- .5 AATCC 134-2001, Electrostatic Propensity of Carpet.
- .6 AATCC 171-2000, Carpets: Cleaning of; Hot Water Extraction Method.
- .7 AATCC 174-1998, Antimicrobial Activity Assessment of Carpets.
- .8 AATCC 175-1998, Stain Resistance: Pile Floor Coverings.
- .9 AATCC 189-2001, Fluorine Content of Carpet Fibers.

.2 American Society for Testing and Materials (ASTM International)

- .1 ASTM D1055-97, Specification for Flexible Cellular Materials - Latex Foam.
- .2 ASTM D1335-98, Tuft Bind of Pile Floor Coverings.
- .3 ASTM D1667-97, Standard Specification for Flexible Cellular Materials-Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).
- .4 ASTM D3936-00 Standard Test Method for Resistance to Delamination of the Secondary Backing of Pile Yarn Floor Covering.
- .5 ASTM D5252-98a, Standard Practice for the Operation of the Hexapod Drum Tester.
- .6 ASTM D5417-99, Standard Practice for Operation of the Vettermann Drum Tester.
- .7 ASTM E84-01, Test Method for Surface Burning Characteristics of Bulding Materials.
- .8 ASTM E648-00, Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
- .9 ASTM E662-01, Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.

.3 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-4.2 No.27.6-M91, Textile Test Methods - Flame Resistance - Methemine Tablet Test for Textile Floor Coverings.
- .2 CAN/CGSB-4.2 No.77.1-94/ISO 4919:1978, Textile Test Methods - Carpets - Determination of Tuft Withdrawal Force.

.3 CGSB 4-GP-36M-78, Carpet Underlay, Fiber Type.

.4 CAN/CGSB-4.129-93(R1997), Carpets for Commercial Use.

.5 CGSB 20-GP-23M-78, Cushion, Carpet, Flexible Polymeric Material.

.6 CAN/CGSB-25.20-95, Surface Sealer Floors.

.4 Carpet and Rug Institute (CRI)

.1 CRI-104-96, Standard Installation of Commercial Carpet.

.2 Green Label IAQ Carpet Testing Program.

.5 National Floor Covering Association (NFCA)

.1 Floor Covering Specification Manual 1998.

.6 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S102-88(R2000), Surface Burning Characteristics of Building Materials and Assemblies.

.2 CAN/ULC-S102.2-88(R2000), Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.

## 1.3 SUBMITTALS

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

.2 Submit verification to demonstrate compliance with CAN/ULCS102 and CAN/ULCS102.2.

.3 Submit report verifying that tuft bind meets requirements of CAN/CGSB-4.129 when tested to CAN/CGSB-4.2 No.77.1.

.4 Submit carpet schedule using same room designations indicated on Drawings.

.5 Submit carpet manufacturer's installation instructions: Indicate special procedures and perimeter conditions requiring special attention.

## 1.4 PRODUCT DATA

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit product data sheet for each carpet, adhesive, carpet protection and subfloor patching compound.

.3 Submit WHMIS MSDS - Material Safety Data Sheets acceptable to Labour Canada and Health Canada for carpet adhesive and seam adhesive. Indicate VOC content.

.4 Submit data on specified products, describing physical and performance characteristics, sizes, patterns, colours, and methods of installation.

## 1.5 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit duplicate 675 x 900 mm pieces of each type carpet specified, duplicate 225 x 225 mm pieces for each colour selected, base, and divider strips.

## 1.6 MOCK UP

.1 Construct mock-ups in accordance with Section 01 45 00 – Quality Control.

.2 Construct mock-up of each type of carpet, including underlayment and base, carpet patterning and floor transitions.

.3 Construct mock-up where directed.

.4 Allow 72 hours for inspection of mock-up by Contract Administrator before proceeding with Work.

.5 When accepted, mock-up will demonstrate minimum standard for this Work. Mock-up may remain as part of the finished Work.

## 1.7 CLOSEOUT SUBMITTALS

.1 Submit operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

.2 Submit maintenance data: Include maintenance procedures, recommendations for maintenance Materials and equipment, and suggested schedule for cleaning.

## 1.8 QUALIFICATIONS

.1 Installer Qualifications:

.1 Flooring Contractor requirements.

.1 Specialty Contractor normally engaged in this type of Work, with prior experience in installation of these types of Materials.

.2 Certified by carpet manufacturer prior to bid submission.

.3 Must not sub-contract labour without written approval of Contract Administrator.

.2 Be responsible for proper product installation, including floor testing and preparation as specified and in accordance with carpet manufacturer’s written instructions.

## 1.9 QUALITY ASSURANCE

.1 Prior to commencing installation, each flooring installer involved in Work of this Section shall deliver to Contract Administrator signed letter on company letterhead indicating that a review of the subfloor has been performed, and confirming their acceptance of the flatness and moisture content of the substrate.

## 1.10 DELIVERY, STORAGE AND HANDLING

.1 Label packaged Materials. For carpet tile products indicate nominal dimensions of tile and indicate installation direction.

.2 Store packaged Materials in original containers or wrapping with manufacturer's seals and labels intact.

.3 Store carpeting and accessories in location as directed by Contract Administrator. Store carpet and adhesive at minimum temperature of 18°C and relative humidity of maximum 65% for minimum of 48 hours before installation.

.4 Prevent damage to Materials during handling and storage. Keep Materials under cover and free from dampness.

.5 Store Materials in area of installation for minimum period of 48 hours prior to installation.

.6 Modular carpet: store on pallet form as supplied by Manufacturer. Do not stack pallets.

## 1.11 ENVIRONMENTAL REQUIREMENTS

.1 Moisture: Ensure substrate is within moisture limits and alkalinity limits prescribed by manufacturer. Prepare moisture testing and provide report to Contract Administrator.

.2 Temperature: Maintain ambient temperature of not less than 18 °C from 48 hours before installation to at least 48 hours after completion of Work.

.3 Relative humidity: Maintain relative humidity between 10 and 65% RH for 48 hours before, during and 48 hours after installation.

.4 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous Materials.

.5 Ventilation:

.1 Ventilate area of Work as directed by Contract Administrator by use of approved portable supply and exhaust fans.

.2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities. Provide fans with HEPA filters.

.3 Provide continuous ventilation during and after carpet application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of carpet installation.

.6 Do not install carpet until space is enclosed and weatherproof, wet-Work in space is completed and nominally dry, Work above ceilings is complete.

## 1.12 EXTRA MATERIALS

.1 Provide extra Materials of carpet, carpet base where applicable, and adhesives in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide extra Materials in the amount of 3% of the total carpeted area, in each colour, pattern and type of carpeting.

.3 Extra Materials to be from same production run as installed Materials.

.4 Identify each package of carpet and each container of adhesive.

.5 Deliver to Contract Administrator and store as directed.

## Part 2 PRODUCTS

### 2.1 MODULAR CARPET

.1 CPT-1 Acceptable Material:

.1 Shaw Contract Group Repartee EW 24

.1 Style Number: 59387

.2 Construction: Texture Loop

.3 Gauge: 1/10

.4 Primary Backing: Synthetic

.5 Secondary Backing: ecoworx

.6 Colour: To be selected by Contract Administrator from manufacturer's full range.

.7 Install: To be determined by Contract Administrator prior to installation.

.2 CPT-2 Acceptable Material:

.1 Forbo Coral Duo Entrance System

.1 Gauge: 0.394"

.2 Backing: Everfort vinyl.

.3 Slip Resistance to ASTM D 2047: 0.6

.4 Durability to EN 1307: 33

.5 Colour: 9801 Grey

.6 Install: Monolithic layout, stripes perpendicular to pedestrian traffic through the doors.

### 2.2 ACCESSORIES

.1 Base: Acceptable Product

.1 Rubber base (RB-1): Johnsonite Rubber Wall Base

.1 Thickness: .125".

.2 Height: 4" high.

.3 Profile: Coved (Toe) profile.

.4 Colour: to be selected from manufacturer's full range by Contract Administrator to match existing.

.2 Adhesive:

.1 Multi-purpose adhesive type: recommended by carpet manufacturer for direct glue down installation.

.2 Pressure sensitive type: recommended by carpet manufacturer for direct glue down installation of modular carpet or speciality backed carpets.

.3 Carpet protection: non-staining heavy duty kraft paper.

.4 Subfloor patching compound: Portland cement base filler, mix with water to form a cementitious paste.

## Part 3 EXECUTION

### 3.1 SUB-FLOOR TREATMENT

.1 Concrete shall be inspected to determine special care required to make it a suitable foundation for carpet. Cracks 3 mm wide or protrusions over 0.8 mm will be filled and levelled with appropriate and compatible patching compound.

.2 Do not exceed manufacturer's recommendations for patch thickness.

.3 Large patch areas are to be primed with a compatible primer.

.4 Concrete substrates shall be cured, clean and dry.

.5 Concrete substrates shall be free of paint, dirt, grease, oil, curing or parting agents, and other contaminants, including sealers, that may interfere with the bonding of the adhesive.

.6 Wherever a powdery or porous concrete surface is encountered, a primer compatible with the adhesive shall be used to provide a suitable surface for glue-down installation.

### 3.2 PREPARATION

.1 Prepare floor surfaces in accordance with CRI 104 Standard for Installation of Commercial Carpet.

.2 Pre-condition carpeting following manufacturer's printed instructions.

### 3.3 INSTALLATION

.1 Install carpeting using minimum number of tiles.

.2 Install in accordance with manufacturer's printed instructions and in accordance with Carpet and Rug Institute Standard for Installation of Commercial Carpet, CRI 104.

.3 Finish installation to present smooth wearing surface free from conspicuous seams, burring and other faults.

.4 Use Material from same dye lot. Ensure colour, pattern and texture match within any one visual area. Maintain patterning as directed by Contract Administrator.

.5 Fit neatly around architectural, mechanical, electrical and telephone outlets, and furniture fitments, around perimeter of rooms into recesses, and around projections.

.6 Install carpeting in pan type floor access covers.

.7 Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

.8 Install carpet smooth and free of bubbles, puckers, and other defects.

## 3.4 MODULAR CARPET

.1 Apply acrylic release type adhesive and install modular carpet in accordance with manufacturer's written instructions.

.2 Lay modular carpet with butt seams.

.3 Roll modular carpet with appropriate roller for complete contact of carpet with mill-applied adhesive to sub-floor.

## 3.5 BASE INSTALLATION

.1 Lay out base to keep number of joints at minimum.

.2 Clean substrate and prime with one coat of adhesive.

.3 Apply adhesive to back of base.

.4 Set base against wall and floor surfaces tightly by using 3 kg hand roller.

.5 Install straight and level to variation of 1:1000.

.6 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.

.7 Cope internal corners. Use premoulded corner units for right angle external corners. Use formed straight base Material for external corners of other angles.

## 3.6 PROTECTION OF FINISHED WORK

.1 Vacuum carpets clean immediately after completion of installation. Protect traffic areas.

.2 Prohibit traffic on carpet for a period of 24 hours until adhesive is cured.

.3 Install carpet protection to satisfaction of Contract Administrator.

**END OF SECTION**

# Part 1 GENERAL

## 1.1 SUMMARY

.1 Section Includes:

.1 Material and installation of Site applied paint finishes to new interior surfaces, including Site painting of shop primed surfaces.

## 1.2 RELATED SECTIONS

.1 Section 09 21 16 - Gypsum Board Assemblies

## 1.3 REFERENCES

.1 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act (CEPA), 1999, c. 33

.2 Environmental Protection Agency (EPA)

.1 EPA Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 - 1995, (for Surface Coatings).

.3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.4 Master Painters Institute (MPI)

.1 MPI Architectural Painting Specifications Manual, 2004.

.5 National Fire Code of Canada - 1995

.6 Society for Protective Coatings (SSPC)

.1 SSPC Painting Manual, Volume Two, 8th Edition, Systems and Specifications Manual.

.7 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

## 1.4 QUALITY ASSURANCE

.1 Qualifications:

.1 Contractor: minimum of five years proven satisfactory experience. Provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.

.2 Journeymen: qualified journeymen who have "Tradesman Qualification Certificate of Proficiency" engaged in painting Work.

.3 Apprentices: Working under direct supervision of qualified trades person in accordance with trade regulations.

.2 Mock-Ups:

.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.

.1 Provide 600 mm x 600 mm mock-up. Prepare and paint designated surface, area, room or item (in each colour scheme) to specified requirements, with specified paint or coating showing selected colours, gloss/sheen, textures.

.2 Mock-up will be used:

.1 To judge Workmanship, substrate preparation, operation of equipment and Material application and Workmanship to MPI Architectural Painting Specification Manual standards.

.3 Locate where directed.

.4 Allow 24 hours for inspection of mock-up before proceeding with Work.

.5 When accepted, mock-up will demonstrate minimum standard of quality required for this Work. Approved mock-up may remain as part of finished Work.

.3 Pre-Installation Meeting:

.1 Convene pre-installation meeting one week prior to beginning Work of this Section and on-Site installations in accordance with Section 01 32 18 - Construction Progress Schedules - Bar (GANTT) Chart.

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Coordination with other building subtrades.

.4 Review manufacturer's installation instructions and warranty requirements.

.4 Health and Safety:

.1 Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.

## 1.5 SCHEDULING

.1 Submit Work schedule for various stages of painting to Contract Administrator for review. Submit schedule minimum of 48 hours in advance of proposed operations.

.2 Obtain written authorization from Contract Administrator for changes in Work schedule.

.3 Schedule painting operations to prevent disruption of occupants.

## 1.6 SUBMITTALS

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

.2 Product Data:

.1 Submit product data and instructions for each paint and coating product to be used.

.2 Submit product data for the use and application of paint thinner.

.3 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOCs during application and curing.

.3 Samples:

.1 Submit full range colour sample chips to indicate where colour availability is restricted.

.2 Submit duplicate 200 x 300 mm sample panels of each paint, clear coating, special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate Materials:

.1 3 mm plate steel for finishes over metal surfaces.

.2 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.

.3 10 mm MDF for finishes over MDF surfaces.

.3 Retain reviewed samples on-Site to demonstrate acceptable standard of quality for appropriate on-Site surface.

.4 Closeout Submittals: submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals include following:

.1 Product name, type and use.

.2 Manufacturer's product number.

.3 Colour numbers.

## 1.7 MAINTENANCE

.1 Extra Materials:

.1 Deliver to extra Materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Section 01 78 00 - Closeout Submittals.

.2 Quantity: provide one - four litre can of each type and colour of primer, finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

.3 Delivery, storage and protection: comply with Contract Administrator requirements for delivery and storage of extra Materials.

## 1.8 DELIVERY, STORAGE AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

.1 Pack, ship, handle and unload Materials in accordance with Section 01 61 00 - Common Product Requirements and manufacturer's written instructions.

.2 Acceptance at Site:

.1 Identify products and Materials with labels indicating:

.1 Manufacturer's name and address.

.2 Type of paint or coating.

.3 Compliance with applicable standard.

.4 Colour number in accordance with established colour schedule.

.3 Remove damaged, opened and rejected Materials from Site.

.4 Storage and Protection:

.1 Provide and maintain dry, temperature controlled, secure storage.

.2 Store Materials and supplies away from heat generating devices.

.3 Store Materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.

.5 Store temperature sensitive products above minimum temperature as recommended by manufacturer.

.6 Keep areas used for storage, cleaning and preparation clean and orderly. After completion of operations, return areas to clean condition.

.7 Remove paint Materials from storage only in quantities required for same day use.

.8 Fire Safety Requirements:

.1 Provide one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.

.2 Store oily rags, waste products, empty containers and Materials subject to spontaneous combustion in ULC approved, sealed containers and remove from Site on a daily basis.

.3 Handle, store, use and dispose of flammable and combustible Materials in accordance with National Fire Code of Canada requirements.

## 1.9 SITE 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 seven days after completion of application of paint.

.3 Provide minimum lighting level of 323 Lux on surfaces to be painted.

.2 Temperature, Humidity and Substrate Moisture Content Levels:

.1 Unless pre-approved written approval by Specifying body and product manufacturer, 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 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at Site.

.6 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 Allow new concrete and masonry to cure minimum of 28 days.

.2 15% for wood.

.3 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.

.3 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.

.4 Additional interior application requirements:

.1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

.2 Apply paint in occupied facilities during silent hours only. Schedule operations to approval of Contract Administrator such that painted surfaces will have dried and cured sufficiently before occupants are affected.

## Part 2 PRODUCTS

### 2.1 MATERIALS

.1 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.

.4 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.

.5 Linseed oil, shellac, and turpentine: highest quality product from approved manufacturer listed in MPI Architectural Painting Specification Manual, compatible with other coating Materials as required.

.6 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids:

.1 Water-based, Water soluble, Water clean-up.

.2 Non-flammable, biodegradable.

.3 Manufactured without compounds which contribute to ozone depletion in the upper atmosphere.

.4 Manufactured without compounds which contribute to smog in the lower atmosphere.

.5 Do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.

.7 Formulate and manufacture water-borne surface coatings with no aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.

.8 Flash point: 61.0 degrees C or greater for water-borne surface coatings and recycled water-borne surface coatings.

## 2.2 COLOURS

.1 Selection of colours from manufacturer’s full range of colours.

.2 Where specific products are available in restricted range of colours, selection based on limited range.

.3 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

## 2.3 MIXING AND TINTING

.1 Perform colour tinting operations prior to delivery of paint to Site. Obtain written approval from Contract Administrator for tinting of painting Materials.

.2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.

.3 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.

.4 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.

## 2.4 GLOSS/SHEEN RATINGS

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

| | Gloss @ 60 degrees | Sheen @ 85 degrees |
|---|---|---|
| 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 - Traditional Semi-Gloss Finish | 35 to 70 | |
| Gloss Level 6 - Traditional Gloss | 70 to 85 | |
| Gloss Level 7 - High Gloss Finish | More than 85 | |

.2 Gloss level ratings of painted surfaces as noted in Section 2.5.

## 2.5 INTERIOR PAINTING SYSTEMS

.1 Galvanized metal: doors, frames, railings, misc. steel, pipes, overhead decking, and ducts.

.1 INT 5.3A – High performance architectural latex, semi-gloss finish.

.2 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type Material", and textured finishes:

.1 INT 9.2A –High performance architectural latex satin finish.

.3 Low VOC Requirement for all paints:

.1 Non-flat architectural paints/coatings/primers applied to interior surfaces and ceilings: 150 g/L

.2 Flat architectural paints/coatings/primers applied to interior surfaces and ceilings: 50g/L

# Part 3 EXECUTION

## 3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or Specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

## 3.2 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.

## 3.3 EXAMINATION

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Contract Administrator damages, defects, unsatisfactory or unfavourable conditions before proceeding with Work.

.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%.

## 3.4 PREPARATION

.1 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 surfaces as directed by Contract Administrator.

.2 Protect items that are permanently attached such as Fire Labels on doors and frames.

.3 Protect factory finished products and equipment.

.4 Protect passing pedestrians, building occupants and general public in and about the building.

.2 Surface Preparation:

.1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.

.2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.

.3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of Contract Administrator.

.3 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 vacuuming, wiping with dry, clean cloths or compressed air.

.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 To prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.

.6 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.

.4 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.

.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 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, blowing with clean dry compressed air or vacuum cleaning.

.7 Touch up of shop primers with primer as specified.

.8 Do not apply paint until prepared surfaces have been accepted by Contract Administrator.

## 3.5 APPLICATION

.1 Method of application to be as approved by Contract Administrator. Apply paint by brush and roller. 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 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.

.4 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.6 Sand and dust between coats to remove visible defects.

.7 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as projecting ledges.

.8 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

.9 Keep sprinkler heads free of paint.

.10 Paint inside of ductWork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.

## 3.6 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.

## 3.7 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 to approval of Contract Administrator. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Contract Administrator.

## 3.8 SCHEDULE

.1 PNT-1: To be determined by Contract Administrator to match existing.

**END OF SECTION**