

**PROJECT:** WINNIPEG FIRE & PARAMEDIC SERVICE (WFPS)  
**FIRE STATION No. 1 – INTERIOR RENOVATIONS**  
65 ELLEN ST., WINNIPEG, MB

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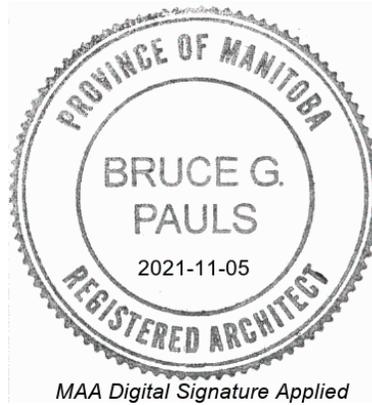
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The following specifications (Divisions 0 through 12) were prepared by - or under the supervision of – the following registered professionals.

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Refer to Drawings for Mechanical and Electrical Specifications

**END OF SECTION**

**1. GENERAL**

**1.1. RELATED SECTIONS**

- .1 Section 01 78 00 – Closeout Submittals

**1.2. CONTRACTOR USE OF PREMISES**

- .1 Contractor has use of Site with the following restrictions.
- .2 Use Site for Work, for storage, and for access, limited to the areas indicated on the drawings or as directed by Contract Administrator. Co-ordinate use of premises under direction of Contract Administrator. Assume full responsibility for protection and safekeeping of products under this Contract.
- .3 Obtain and pay for use of additional storage or Work areas needed for operations under this Contract.

**1.3. COMPLEMENTARY DOCUMENTS**

- .1 Drawings, specifications, and schedules are complementary to the other and what is called for by one to be binding as if called for by all. Should any discrepancy appear between documents which leave doubt as to the intent or meaning, abide by Precedence of Documents article in Section 01 19 00 - Specifications and Documents or obtain direction from the Contract Administrator in writing **before submitting a Bid in accordance with B4.** If this is not done it will be assumed that the most expensive alternative has been included in the Bid price. For any ruling to become binding, the Contract Administrator must issue the new direction in a published addendum.
- .2 Drawings indicate general location and route of conduit and wire/conductors. Install conduit or wiring/conductors and plumbing piping not shown or indicated diagrammatically in schematic or riser diagrams to provide an operational assembly or system.
- .3 Install components to physically conserve headroom, to minimize furring spaces, or obstructions.
- .4 Locate devices with primary regard for convenience of operation and usage.
- .5 Examine all discipline drawings, specifications, and schedules and related Work to ensure that Work can be satisfactorily executed without changes to the building or Contract value. Conflicts or additional Work beyond Work described to be immediately brought to attention of the Contract Administrator.
- .6 In case of conflict, codes and regulations take precedence over the Contract Documents. In no instance reduce the standard or scope of Work or intent established by the drawings and specifications by applying any of the codes referred to herein. Any discrepancies must be brought to the Contract Administrator's attention in writing.

**1.1. WORK COVERED BY CONTRACT DOCUMENTS**

Refer to City of Winnipeg Tender No. 535-2021; Section D2 SCOPE OF WORK.

**1.2. DOCUMENTS PROVIDED**

- .1 Contractor Administrator will supply the Contractor with five (5) sets of Contract Documents for construction purposes.
- .2 The Contractor may obtain additional sets of Contract Documents at the cost of printing, handling and shipping.

**1.3. DOCUMENTS REQUIRED**

- .1 Maintain at job Site, one of 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 City of Winnipeg Forestry Guidelines.
- .12 Other documents as specified.

**END OF SECTION**

## **1 GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 01 32 16 – Construction Progress Schedules.
- .2 Section 01 56 00 - Temporary Barriers and Enclosures

### **1.2 ACCESS AND EGRESS**

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

### **1.3 USE OF SITE AND FACILITIES**

- .1 Where security is reduced by Work provide temporary means to maintain security.
- .2 Closures: protect Work temporarily until permanent enclosures are completed.

### **1.4 EXISTING SERVICES**

- .1 Notify, Contract Administrator and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Contract Administrator 72 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 pedestrian and vehicular traffic.
- .4 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

### **1.5 SPECIAL REQUIREMENTS**

- .1 Ensure Contractor's personnel employed on Site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .2 Keep within limits of Work and avenues of ingress and egress.

### **1.6 BUILDING SMOKING ENVIRONMENT**

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

**2 PRODUCTS**

**2.1 NOT USED**

.1 Not Used.

**3 EXECUTION**

**3.1 NOT USED**

.1 Not Used.

**END OF SECTION**

## **1. GENERAL**

### **1.1. RELATED SECTIONS**

- .1 Refer to City of Winnipeg Tender No. 535-2021; General Conditions.
- .2 Section 01 11 00 – Summary of Work.

### **1.2. COMPLEMENTARY DOCUMENTS**

- .1 Generally, drawings indicate graphically, the dimensions and location of components and equipment. Specifications indicate specific components assemblies, and identify quality.
- .2 Drawings, specifications, diagrams and schedules are complementary, each to the other and what is required by one, to be binding as if required by all.
- .3 Should any conflict or discrepancy appear between documents which leaves doubt as to the intent or meaning, apply the Precedent of Documents article below or obtain guidance or direction from the Contract Administrator.
- .4 Examine all discipline drawings, specifications, schedules, diagrams and related Work to ensure that Work can be satisfactorily executed without changes to the building or Contract value.
- .5 Where a particular product, system or technique is specified, a bid submitted by the Contractor for installation of such a system shall be considered complete. And inclusive of all materials and labour required to carry out the installation, in its entirety. No extras shall be granted where the Contractor did not include in his price all components required for installation.
- .6 All specification sections of the Project Manual and Drawings are affected by requirements of Division 01 sections.

**END OF SECTION**

## **1. GENERAL**

### **1.1. RELATED DOCUMENTS**

- .1 Refer to City of Winnipeg Tender No. 535-2021; General Conditions.
- .2 Section 01 33 00 – Submittal Procedures.

### **1.2. SUMMARY**

- .1 This section includes administrative and procedural requirements for handling requests for equals and substitutions made after award of the Contract.
- .2 Related Sections: The following Sections contain requirements that relate to this Section:
  - .1 Division 01 Section 01 33 00 - Submittal Procedures specifies requirements for submitting the Contractor's Construction Schedule and the Submittal Schedule.

### **1.3. SUBMITTALS**

- .1 Refer to Section 01 33 00 – Submittal Procedures.

## **2. PRODUCTS**

### **2.1. SUBSTITUTES**

- .1 Refer to City of Winnipeg Tender No. 535-2021; Section B7 –Substitutes.

## **3. EXECUTION**

### **3.1. NOT USED**

- .1 Not Used.

**END OF SECTION**

## **1 GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .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 and pay for 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 Full time review of pile foundation installation by a qualified Geotechnical Engineer, or their duly appointed representative, registered in the Province of Manitoba.
  - .4 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
  - .5 Inspection and testing performed for the purposes of quality control and as specified under various sections herein.
  - .6 Inspection and testing performed for the purposes of preparation of concrete substrates prior to installation of resilient flooring products.
  - .7 Mill tests and certificates of compliance.
  - .8 Tests specified to be carried out by Contractor under supervision of Contract Administrator.
  - .9 Additional tests specified in the following paragraph.
- .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.

### **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 a minimum of 48 hours 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.

**2 PRODUCTS**

**2.1 NOT USED**

.1 Not Used.

**3 EXECUTION**

**3.1 NOT USED**

.1 Not Used.

**END OF SECTION**

## 1. GENERAL

### 1.1. ADMINISTRATIVE

- .1 Contractor will schedule, and administer project meetings throughout the progress of the Work at the call of Contract Administrator.
- .2 Contractor will prepare agenda for project meetings.
- .3 Contractor will distribute written notice of each meeting five days in advance of meeting date to Contract Administrator.
- .4 Contractor will provide physical space and make arrangements for meetings.
- .5 Contractor will preside at meetings.
- .6 Contractor will record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7 Contractor will 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, major Subcontractor, other Subcontractors involved in Work and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

### 1.2. CONSTRUCTION ORGANIZATION AND STARTUP

- .1 Within 15 Working days after award of Contract, a meeting of parties in Contract will be held to discuss and resolve administrative procedures and responsibilities.
- .2 Senior representatives of City, Contractor, major Subcontractors, field inspectors and supervisors, and Contract Administrator will be in attendance. Ensure project schedule efficiencies through monitoring.
- .3 Contractor shall establish time and location of meeting and notify parties concerned minimum 10 Working days before meeting.
- .4 Agenda to include following:
  - .1 Appointment of official representative of participants in Work.
  - .2 Schedule of submission of shop drawings, samples, and colour chips in accordance with Section 01 33 00 - Submittal Procedures.
  - .3 Requirements for temporary facilities, Site sign, offices, storage sheds, utilities, fences in accordance with Section 01 51 00 - Temporary Utilities.
  - .4 Site security in accordance with Section 01 52 00 - Construction Facilities.
  - .5 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements.
  - .6 Record drawings in accordance with Section 01 78 00 - Closeout Submittals.
  - .7 Maintenance in accordance with Section 01 78 00 - Closeout Submittals.
  - .8 Take-over procedures, acceptance, and warranties in accordance with Section 01 77 00 - Closeout Procedures and 01 78 00 - Closeout Submittals.
  - .9 Monthly progress claims, administrative procedures, photographs, and holdbacks.
  - .10 Appointment of inspection and testing agencies or firms in accordance with Section 01 45 00 - Quality Control.
  - .11 Insurances and transcript of policies.
- .5 Comply with Contractor's allocation of mobilization areas of Site; for field offices and sheds, for, access, traffic, and parking facilities.
- .6 During construction co-ordinate use of Site and facilities through Contractor's procedures for intra-project communications: Submittals, reports and records, schedules, coordination

- of drawings, recommendations, and resolution of ambiguities and conflicts.
- .7 Comply with instructions of Contractor for use of temporary utilities and construction facilities.
- .8 Coordinate field engineering and layout Work with Contractor.

### **1.3. CONSTRUCTION PROGRESS MEETINGS**

- .1 During course of Work and two weeks prior to project completion, Contractor will schedule and attend progress meetings monthly or as determined by Contract Administrator.
- .2 Contractor, major Subcontractors involved in Work, Contract Administrator and City are to be in attendance. Include costs for execution, preparation and reproduction of schedule submittals in bid documents.
- .3 Contractor will notify parties minimum five days prior to meetings.
- .4 Contractor will record minutes of meetings and circulate to attending parties and affected parties not in attendance within three 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, and conflicts.
  - .4 Problems that 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.
- .6 Review of progress and status of Critical Path activities.

### **1.4. PCN PRICING**

- .1 The Contractor shall provide PCN pricing from three separate sub-trades for each PCN issued.

### **1.5. ON-SITE DOCUMENTS**

- .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.

### **1.6. SCHEDULES**

- .1 Submit preliminary construction progress schedule in accordance with Section 01 32 16 – Construction Progress Schedule to Contract Administrator coordinated with Contract Administrator's projects schedule.
- .2 After review, revise and resubmit schedule to comply with revised project schedule.
- .3 During progress of Work revise and resubmit monthly, or as directed by Contract Administrator.

**1.7. SUBMITTALS**

- .1 Prepare and issue submittals to Contract Administrator for review.
- .2 Submit preliminary shop drawings, product data and samples to Section 01 33 00 – Submittal Procedures for review compliance with Contract Documents. After review, revise and resubmit for transmittal to Contract Administrator.
- .3 Submit requests for payment for review, and for transmittal to Contract Administrator.
- .4 Submit requests for interpretation of Contract Documents and obtain instructions through Contract Administrator.
- .5 Process substitutions through Contract Administrator.
- .6 Process change order through Contract Administrator.
- .7 Deliver closeout submittals for review and preliminary inspections, for transmittal to Contract Administrator.

**1.8. CLOSEOUT PROCEDURES**

- .1 Notify Contract Administrator when Work is considered ready for Substantial Performance.
- .2 Accompany Contract Administrator on preliminary inspection to determine items listed for completion or correction.
- .3 Comply with Contract Administrator's instructions for correction of items of Work listed in executed certificate of Substantial Performance and for access to occupied areas.
- .4 Notify Contract Administrator of instructions for completion of items of Work determined in Contract Administrator's final inspection.
- .5 Provide Construction Schedule indicating completion of items of Work and corrections of items of Work following Substantial Performance. Total Completion (Excluding Seasonal Deficiencies) shall be within 40 days of Substantial Performance.

**END OF SECTION**

## **1 GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 01 32 16 – Construction Progress Schedules.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 45 00 – Quality Control.
- .4 Section 01 52 00 - Construction Facilities.
- .5 Section 01 56 00 - Temporary Barriers and Enclosures.
- .6 Section 01 78 00 - Closeout Submittals.
- .7

### **1.2 ADMINISTRATIVE**

- .1 Contractor will schedule and administer project meetings throughout the progress of the Work as required.
- .2 Prepare agenda for meetings.
- .3 Distribute written notice of each meeting five (5) Working days in advance of meeting date to all parties required to attend.
- .4 Provide physical space and make arrangements for meetings.
- .5 Preside at meetings.
- .6 Record accurate and complete 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.

### **1.3 PRECONSTRUCTION MEETING**

- .1 Within 15 days after award of Contract, request a meeting of parties in Contract to discuss and resolve administrative procedures and responsibilities.
- .2 Contractor, major Subcontractors, Contract Administrator will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum 5 days

before meeting.

- 4 Agenda to include:
  - .1 Appointment of official representative of participants in the Work.
  - .2 Schedule of Work: in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.
  - .3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .4 Requirements for temporary facilities, Site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
  - .5 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 City provided products.
  - .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, and hold backs.
  - .12 Appointment of inspection and testing agencies or firms in accordance with Section 01 45 00 – Quality Control.
  - .13 Insurances, and transcript of policies.
- 5 Comply with Contractor's allocation of mobilization areas of Site; for field offices and sheds, for access, traffic, and parking facilities.
- 6 During construction co-ordinate use of Site and facilities through Contractor's procedures for intra-project communications: Submittals, reports and records, schedules, coordination of drawings, recommendations, and resolution of ambiguities and conflicts.
- 7 Comply with instructions of Contractor for use of temporary utilities and construction facilities.
- 8 Coordinate field engineering and layout Work with Contractor.

#### **1.4 PROGRESS MEETINGS**

- .1 During course of Work and two weeks prior to project completion, schedule progress meetings monthly as required.
- .2 Contractor, major Subcontractors involved in Work, Contractor, Contract Administrator, and City are to be in attendance. Include costs for execution, preparation and reproduction of schedule submittals in bid documents
- .3 Notify parties minimum five (5) Working days prior to meetings.
- .4 Contractor will record accurate and complete minutes of meetings and circulate to attending parties and affected parties not in attendance within three Working 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.
  
- .6 Review of progress and status of Critical Path activities.

## **2 PRODUCTS**

### **2.1 NOT USED**

- .1 Not Used.

## **3 EXECUTION**

### **3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

## **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 ten (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, Substantial Certificate and Final Certificate as defined times of completion are of essence of this Contract.

### **1.3. ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Refer to City of Winnipeg Tender No. 535-2021.
- .2 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Submit to Contract Administrator within ten (10) 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 five (5) Working days.
- .3 Revise impractical schedule and resubmit within five (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 Building foundation.
  - .6 Structural Steel.
  - .7 Hollow core.
  - .8 Cladding and Roofing.
  - .9 Interior Architecture (Walls, Floors and Ceiling).
  - .10 Plumbing.
  - .11 Lighting.
  - .12 Electrical.
  - .13 Heating, Ventilating, and Air Conditioning.
  - .14 Fire Stopping Systems.
  - .15 Millwork.
  - .16 Testing and Commissioning.
  - .17 Supplied equipment long delivery items.
  - .18 Engineer supplied equipment required dates.

**1.6. PROJECT SCHEDULE REPORTING**

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

**1.7. 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**

## **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 SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Review submittals prior to submission to Contract Administrator. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and 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.
- .6 Notify Contract Administrator, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are co-ordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Contract Administrator's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Contract Administrator's review.
- .10 Keep one reviewed copy of each submission on Site.
- .11 Contractor to issue Request for Information [RFI] for required approvals. Response to be within five (5) business days.

### **1.2 SHOP DRAWINGS AND PRODUCT DATA**

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Submit drawings stamped and signed by professional engineer registered or licensed in province of Manitoba, Canada.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design

- drawings and specifications.
- .4 Allow five days for Contract Administrator's review of each submission.
  - .5 Adjustments made on shop drawings by Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Contract Administrator prior to proceeding with Work.
  - .6 Make changes in shop drawings as Contract Administrator may require, consistent with Contract Documents. When resubmitting, notify Contract Administrator in writing of revisions other than those requested.
  - .7 Accompany submissions with transmittal letter, 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.
  - .8 Submissions include:
    - .1 Date and revision dates.
    - .2 Project title and number.
    - .3 Name and address of:
      - .1 Subcontractor.
      - .2 Supplier.
      - .3 Manufacturer.
    - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
    - .5 Details of appropriate portions of Work as applicable:
      - .1 Fabrication.
      - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
      - .3 Setting or erection details.
      - .4 Capacities.
      - .5 Performance characteristics.
      - .6 Standards.
      - .7 Operating weight.
      - .8 Wiring diagrams.
      - .9 Single line and schematic diagrams.
      - .10 Relationship to adjacent Work.
  - .9 After Contract Administrator's review, distribute copies.
  - .10 Submit four (4) prints of shop drawings for each requirement requested in specification Sections and as Contract Administrator may reasonably request.
  - .11 Submit four (4) copies of product data sheets or brochures for requirements requested in

- specification Sections and as requested by Contract Administrator where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit four (4) copies of test reports for requirements requested in specification Sections and as requested by Contract Administrator.
    - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
    - .2 Testing must have been within 3 years of date of Contract award for project.
  - .13 Submit four (4) copies 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.
  - .14 Submit four (4) copies of manufacturer's 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.
  - .15 Submit four (4) copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Contract Administrator.
  - .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
  - .17 Submit four (4) copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Contract Administrator.
  - .18 Delete information not applicable to project.
  - .19 Supplement standard information to provide details applicable to project.
  - .20 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.
  - .21 The review of shop drawings by the Contract Administrator is for sole purpose of ascertaining conformance with general concept.
    - .1 This review shall not mean that Contract Administrator approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
    - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job Site, for information that

pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

### **1.3 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.

### **1.4 MOCK-UPS**

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

### **1.5 PHOTOGRAPHIC DOCUMENTATION**

- .1 Submit electronic copy colour digital photography in jpg format, fine resolution monthly with progress statement and as directed by Contract Administrator.
- .2 Project identification: name and number of project and date.
- .3 Number of viewpoints: 2 locations.
  - .1 Viewpoints and their location as determined by Contract Administrator.
- .4 Frequency of photographic documentation: daily.
  - .1 documenting the progress of the Work and at all concealed areas prior to being covered.

### **1.6 CERTIFICATES AND TRANSCRIPTS**

- .1 Refer to City of Winnipeg Tender No. 535-2021; Sections D8 - Authority to Carry on Business, D9 - Safe Work Plan, D10 - Insurance, and D12 - Performance Security.

## **2 PRODUCTS**

### **2.1 SUBSTITUTES**

- .1 Refer to City of Winnipeg Tender No. 535-2021; Section B7 Substitutes.

**3 EXECUTION**

**3.1 NOT USED**

.1 Not Used.

**END OF SECTION**

## **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 - Updated 2015.
- .4 City of Winnipeg
  - .1 Contractor Safety – A Shared Responsibility; available on the Information Connection page at the City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/safety/>
  - .2 City of Winnipeg Safe Work Plan; available on the Information Connection page at the City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/safety/>

### **1.1. ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit Site-specific Health and Safety Plan: Within seven (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 two (2) copies of Contractor's authorized representative's Work Site health and safety inspection reports to Contract Administrator and authority having jurisdiction, weekly.
- .4 Submit copies of reports or directions issued by Federal, and Provincial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 00 - Hazardous Materials.
- .7 Contract Administrator will review Contractor's Site-specific Health and Safety Plan and provide comments to Contractor within 5 days after receipt of plan.

Revise plan as appropriate and resubmit plan to Contractor Administrator within five (5) days after receipt of comments from Contract Administrator.

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

## **1.2. FILING OF NOTICE**

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

## **1.3. SAFETY ASSESSMENT**

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

## **1.4. MEETINGS**

- .1 Schedule and administer Health and Safety meeting with Contract Administrator prior to commencement of Work.

## **1.5. REGULATORY REQUIREMENTS**

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

## **1.6. 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.

## **1.7. 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.

## **1.8. COMPLIANCE REQUIREMENTS**

- .1 Comply with The Workers Compensation Act, Workplace Safety Regulation, Manitoba Reg. R.S.M. 1987.

#### **1.9. UNFORSEEN HAZARDS**

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition 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.

#### **1.10. 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 minimum two (2) years' Site-related Working experience specific to activities associated with health and safety
  - .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.

#### **1.11. 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.

#### **1.12. 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.

#### **1.13. POWDER ACTUATED DEVICES**

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

#### **1.14. 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.

**2. PRODUCTS**

**2.1. NOT USED**

.1 Not used.

**3. EXECUTION**

**3.1. NOT USED**

.1 Not used.

**END OF SECTION**

## **1. GENERAL**

### **1.1. REFERENCES**

#### **.1 Definitions:**

- .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

#### **.2 Reference Standards:**

- .1 The City of Winnipeg General Conditions for Construction (Revision 2006 12 15), available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at [http://www.winnipeg.ca/matmgt/gen\\_cond.stm](http://www.winnipeg.ca/matmgt/gen_cond.stm)
- .2 U.S. Environmental Protection Agency (EPA)/Office of Water
- .3 EPA 832/R-92-005-92, Storm Water Management for Construction Activities, Chapter 3.

### **1.2. ACTION AND INFORMATIONAL SUBMITTALS**

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

### **1.3. FIRES**

- .1 Fires and burning of rubbish on Site not permitted.

### **1.4. DISPOSAL OF WASTES**

- .1 Do not bury rubbish and waste materials on Site.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

### **1.1. DRAINAGE**

- .1 Provide temporary drainage and pumping required to keep excavations and Site free from water.
- .2 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.

- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

## **1.2. SITE CLEARING AND PLANT PROTECTION**

- .1 Protect trees and plants on Site and adjacent properties as indicated.
- .2 Wrap in burlap, trees and shrubs adjacent to construction Work, storage areas and trucking lanes, and encase with protective wood frame work from grade level to height of 2 m minimum.
- .3 Protect roots of designated trees to dripline during excavation and Site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .4 Minimize stripping of topsoil and vegetation.
- .5 Restrict tree removal to areas indicated or designated by Contract Administrator.

## **1.3. WORK ADJACENT TO WATERWAYS**

- .1 Do not operate construction equipment in waterways.
- .2 Do not use waterway beds for borrow material.
- .3 Do not dump excavated fill, waste material or debris in waterways.
- .4 Design and construct temporary crossings to minimize erosion to waterways.
- .5 Do not skid logs or Construction materials across waterways.
- .6 Avoid indicated spawning beds when constructing temporary crossings of waterways.
- .7 Do not blast under water or within 100 m of indicated spawning beds.

## **1.4. POLLUTION CONTROL**

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .2 Control emissions from equipment and plant to local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
- .4 Provide temporary enclosures as required.
- .5 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

## **1.5. NOTIFICATION**

- .1 Contract Administrator will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or

regulations, permits, and other elements of Contractor's Environmental Protection plan.

- .2 Contractor: after receipt of such notice, inform Contract Administrator of proposed corrective action and take such action as approved by Contract Administrator.
- .3 Contract Administrator will issue stop order of Work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

## **2. PRODUCTS**

### **2.1. NOT USED**

- .1 Not Used.

## **3. EXECUTION**

### **3.1. CLEANING**

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management: separate waste materials for recycling in accordance with Section 01 74 19 - Construction Waste Management and Disposal.
- .3 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.

**END OF SECTION**

## 1. GENERAL

### 1.1. REFERENCES AND CODES

- .1 Perform Work in accordance with 2015 National Building Code of Canada (NBC 2015) 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: Stop Work immediately when materials believed to contain asbestos be encountered during execution of the Work and notify Contract Administrator. Do not proceed until written instructions have been received from the Contract Administrator. Perform asbestos abatement and repair in accordance with the Province of Manitoba asbestos regulations, Latest Edition.
- .2 PCB: Polychlorinated Biphenyl: stop Work immediately when materials believed to contain Polychlorinated Biphenyl is encountered during execution of the Work and notify Contract Administrator. Do not proceed until written instructions have been received from the Contract Administrator. Perform asbestos abatement and repair in accordance with the Province of Manitoba asbestos regulations, Latest Edition.
- .3 Mould: stop Work immediately should material resembling mould be encountered during the execution of Work and notify Contract Administrator. Do not proceed until written instructions have been received from Contract Administrator.

### 1.3. NON SMOKING ENVIRONMENT

- .1 Comply with the Non Smoking Health Protection Act.

### 1.4. RELICS AND ANTIQUITIES

- .1 Protect relics, antiquities, items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tablets, and similar objects found during course of Work. **The front lobby is known to contain a wall containing handwritten signatures commemorating the passing of a firefighter in the line of duty. Signatures were written on painted drywall, and have since been covered by artificial brick paneling. The drywall is to be preserved as carefully as possible and salvaged for future use elsewhere as directed by the Contract Administrator.**
- .2 Give immediate notice to Contract Administrator and await Contract Administrator's written instructions before proceeding with Work in this area.
- .3 Relics, antiquities and items of historical or scientific interest remain Her Majesty's property.

## 2. PRODUCTS

### 2.1. NOT USED

- .1 Not Used.

**3. EXECUTION**

**3.1. NOT USED**

.1 Not Used.

**END OF SECTION**

## **1. GENERAL**

### **1.1. RELATED DOCUMENTS**

- .1 Drawings and general provisions of this Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

### **1.2. INDUSTRY STANDARDS**

- .1 Unless the Contract Documents include more stringent requirements, applicable Construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made part of the Contract Documents by reference.
- .2 All Construction industry standards referenced in this specification to meet the edition of the standard referenced by the 2015 National Building Code of Canada (NBC). If the Construction industry standard is not referenced in the NBC, the latest edition of the standard shall apply.
- .3 Each entity engaged in Construction on this Project must be familiar with construction industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Construction Documents.
  - .1 Where copies of Construction industry standards are needed to perform a required construction activity, obtain copies directly from publication source and make them available upon request.

### **1.1. ABBREVIATIONS AND ACRONYMS FOR INDUSTRY ORGANIZATIONS**

- .1 Where abbreviations and acronyms are used, they shall mean the recognized name of the entities in the following list. Names are believed to be accurate and up-to-date as of the date of the Contract Documents.
- .2 Industry Organizations:
  - .1 Air Conditioning and Mechanical Contractors Association (AMCA).
  - .2 Air Conditioning and Refrigeration Institute (ARI).
  - .3 Americans with Disability Act (ADA).
  - .4 Air Movement and Control Association (AMCA).
  - .5 The Aluminum Association, Inc. (AA).
  - .6 American Contract Administrator Rural Manufacturers Association (AAMA).
  - .7 American Association of State Highway and Transportation Officials (AASHTO).
  - .8 American Association of Textile Chemists and Colourists (AATCC).
  - .9 American Bearing Manufacturers Association (ABMA).
  - .10 American Boiler Manufacturer's Association (ABMA).
  - .11 American Concrete Institute (ACI).
  - .12 American Industrial Hygiene Association (AIHA).
  - .13 American Institute of Steel Construction (AISC).
  - .14 American Iron & Steel Institute (AISI).
  - .15 American National Standards Institute (ANSI).
  - .16 American Petroleum Institute (API).

- .17 American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).
- .18 American Society of Mechanical Engineers (ASME).
- .19 American Society of Sanitary Engineer's (ASSE).
- .20 American Society for Testing and Materials (ASTM).
- .21 American Water Works Association (AWWA).
- .22 American Welding Society (AWS).
- .23 American Wood-Preservers' Association (AWPA).
- .24 Contract Administrator Rural WoodWork Institute (AWI).
- .25 Contract Administrator Rural WoodWork Manufacturers Association of Canada (AWMAC).
- .26 Asphalt Institute (AI).
- .27 Associated Air Balance Council (AABC).
- .28 Association of the Wall and Ceilings Industries International (AWEI).
- .29 Atomic Energy Control Board Regulations.
- .30 Brick Industry Association (BIA).
- .31 Building Industry Consulting Services International (BICSI).
- .32 Canada Green Building Council (CaGCB).
- .33 Canada Labour Code.
- .34 Canadian Council of Ministers of the Environment (CCME).
- .35 Canadian Code for Preferred Packaging.
- .36 Canadian Construction Materials Centre (CCMC).
- .37 Canadian Environmental Protection Act (CEPA).
- .38 Canadian Gas Association (CGA).
- .39 Canadian General Standards Board (CGSB).
- .40 Canadian Institute of Steel Construction (CISC).
- .41 Canadian Nursery Landscape Association (CNLA).
- .42 Canadian Paint Manufacturer's Association (CPMA).
- .43 Canadian Roofing Contractors' Association (CRCA).
- .44 Canadian Sheet Steel Building Institute (CSSBI).
- .45 Canadian Standards Association (CSA).
- .46 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA).
- .47 Canadian Urethane Foam Contractors' Association Inc. (CUFCA).
- .48 Carpet and Rug Institute (CRI).
- .49 Ceramic Tile Institute (CTI).
- .50 Consumer Electronics Association (CEA).

- .51 Cooling Technology Institute (CTI).
- .52 Department of Justice Canada (Jus).
- .53 Electrical and Electronic Manufacturers' Association of Canada (EEMAC).
- .54 Electronic Industries Alliance (EIA).
- .55 Environment Canada (EC).
- .56 The Environmental Choice Program.
- .57 Environmental Protection Agency (EPA).
- .58 Environmental Protection Services (EPS).
- .59 ETL Listing Laboratories (ETL).
- .60 Factory Mutual (FM).
- .61 Federal Communications Commission (FCC).
- .62 Flat Glass Manufacturers Association (FGMA).
- .63 Green Seal Environmental Standards.
- .64 Health Canada - Workplace Hazardous Materials Information System (WHMIS).
- .65 Hydraulics Institute (HI).
- .66 Hydronic Institute of Boiler and Radiator Manufacturers (IBR).
- .67 Industry Canada - Terminal Attachment Program.
- .68 Institute of Electrical and Electronics Engineers (IEEE).
- .69 Institute for Research in Construction (IRC).
- .70 Insulated Cable Engineers Association (ICEA).
- .71 International Electro Technical Commission (IEC).
- .72 International Masonry Industry All-Weather Council (IMIAC).
- .73 International Standards Organization (ISO).
- .74 Laminators Safety Glass Association (LSGA).
- .75 Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS).
- .76 Master Painters Institute (MPI).
- .77 Model National Energy Code of Canada for Buildings (MNECB).
- .78 National Association of Contract Administrator Rural Metal Manufactures (NAAMM).
- .79 National Association of Corrosion Engineers (NACE).
- .80 National Building Code of Canada (NBC).
- .81 National Bureau of Standards/Products Standard (NBS/PS).
- .82 National Electrical Manufacturers Association (NEMA).
- .83 National Environmental Balancing Bureau (NEBB).
- .84 National Fire Code of Canada (NFC).

- .85 National Fire Protection Association (NFPA).
- .86 National Floor Covering Association (NFCA).
- .87 National Hardwood Lumber Association (NHLA).
- .88 National Lumber Grades Authority (NLGA).
- .89 National Plumbing Code of Canada (NPC).
- .90 National Research Council Canada (NRC).
- .91 National Roofing Contractors Association (NRCA).
- .92 National Sanitation Foundation (NSF).
- .94 Plumbing and Drainage Institute (PDI).
- .96 Provincial Boiler, Pressure Vessel and Compressed Gas Regulations.
- .97 Scientific Equipment and Furniture Association (SEFA).
- .98 Sealant and Waterproofer's Institute.
- .99 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA).
- .100 Society of Automotive Engineers (SAE).
- .101 The Society for Protective Coatings (SSPC).
- .102 South Coast Air Quality Management District (SCAQMD).
- .103 Telecommunications Distribution Methods Manual (TDMM).
- .104 Telecommunications Industries Association (TIA).
- .105 Terrazzo Tile and Marble Association of Canada (TTMAC).
- .106 Thermal Insulation Association of Canada (TIAC).
- .107 Transport Canada (TC).
- .108 Transport Canada - Marine Safety (TCMS).
- .109 Treasury Board of Canada (TB).
- .110 Treasury Board Information Technology Standard (TBITS).
- .111 Truss Plate Institute of Canada (TPIC).
- .112 Underwriters' Laboratories Inc. (UL).
- .113 Underwriter's Laboratories of Canada (ULC).
- .114 United States Federal Trade Commission (US Federal Trade Commission).
- .115 U.S. Coast Guard Equipment List (USCG).
- .116 U.S. Department of Transportation (DOT).

## **2. PRODUCTS**

### **2.1. NOT USED**

- .1 Not Used.

## **3. EXECUTION**

### **3.1. NOT USED**

.1 Not Used.

**END OF SECTION**

## **1. GENERAL**

### **1.1. RELATED REQUIREMENTS**

- .1 All Sections within Divisions 02 31 through 33.

### **1.2. INSPECTION**

- .1 Allow Contract Administrator access to Work.
- .2 Allow Authorities having jurisdiction 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.
- .3 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Contract Administrator's instructions, or law of Place of Work. Provide photo documentation where applicable in accordance with Sections 01 11 00 – Summary of Work and 01 33 00 – Submittal Procedures.
- .4 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .5 Contract Administrator may order any 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, Contract Administrator shall pay cost of examination and replacement.

### **1.3. INDEPENDENT INSPECTION AGENCIES**

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

### **1.1. 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.

### **1.2. 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.

### **1.3. REJECTED WORK**

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

### **1.4. REPORTS**

- .1 Submit four (4) copies of inspection and test reports to Contract Administrator.
- .2 Provide copies to subcontractor of Work being inspected or tested, manufacturer or fabricator of material being inspected or tested.

### **1.1. 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.

### **1.2. 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 Remove mock-up at conclusion of Work or when acceptable to Contract Administrator.
- .7 Mock-ups may remain as part of Work when acceptable to Contract Administrator.
- .8 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

**1.3 EQUIPMENT AND SYSTEMS**

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

**END OF SECTION**

## **1. GENERAL**

### **1.1. REFERENCES**

- .1 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. ACTION AND INFORMATIONAL SUBMITTALS**

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

### **1.3. INSTALLATION AND REMOVAL**

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

### **1.4. DEWATERING**

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

### **1.5. WATER SUPPLY**

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

### **1.6. 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.
  - .6 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress.
- .4 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.
- .5 Permanent heating system of building may NOT be used when available.
- .6 Ensure Date of Substantial Performance and Warranties for heating system do not commence until entire system is in as near original condition as possible and is certified by Contract Administrator.
- .7 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
  - .1 Conform to 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.
- .8 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

**1.7. TEMPORARY POWER AND LIGHT**

- .1 Contractor will provide and pay for temporary power during construction for temporary lighting, operating of power tools, electric cranes and all other equipment requiring electric power.
- .2 Arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.
- .3 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.
- .4 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 that have been used for more than 1 month.

**1.8. TEMPORARY COMMUNICATION FACILITIES**

- .1 Provide and pay for temporary telephone, fax and data hook up, lines

necessary for own use.

**1.9. 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.

**END OF SECTION**

## **1. GENERAL**

### **1.1. RELATED REQUIREMENTS**

- .1 All Sections within Divisions 02 through 13, 21 through 28, and 31 through 33.

### **1.2. 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 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as of: May 14, 2004.
- .4 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.

### **1.3. ACTION AND INFORMATIONAL SUBMITTALS**

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

### **1.4. INSTALLATION AND REMOVAL**

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

### **1.5. SCAFFOLDING**

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

### **1.6. HOISTING**

- .1 Provide, operate and maintain hoists and/or cranes required for moving of Workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.

- .3 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .4 Dust control: adequate to ensure safe operation at all times.
- .5 Provide snow removal during period of Work.

**1.15. CLEAN-UP**

- .1 Remove construction debris, waste materials, and packaging material from Work as necessary.
- .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 as to not impede the Work.

**END OF SECTION**

## **1. GENERAL**

### **1.1. REFERENCES**

- .1 Canadian General Standards Board (CGSB)
  - .1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel 01 61
  - .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. SITE ENCLOSURE**

- .1 Use existing chain link fence as temporary Site enclosure, repair as needed. Provide one lockable truck gate. Maintain fence in good repair.
- .2 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

### **1.4. GUARD RAILS AND BARRICADES**

- .1 Provide secure, rigid guardrails and barricades around deep excavations, open shafts, open stairwells, open edges of floors and roofs.
- .2 Provide as required by governing authorities.

### **1.5. HOARDING**

- .1 Erect temporary Site enclosures using 38 x 89 mm construction grade lumber framing at 600 mm centres, installed on 89 x 89 mm wood posts at 2400 mm centres or 50 mm dia. steel posts at 2400 mm centres. Posts to be placed in post holes filled with concrete to minimum 900 mm depth. Finish temporary Site enclosures with and 1200 x 2400 x 13 mm exterior grade fir plywood to CSA O121 or chain link fence fabric to Section 32 31 13 – Chain Link Fences and Gates.
  - .1 Apply plywood panels or chain link fence fabric vertically flush and butt jointed.
  - .2 Provide one lockable truck entrance gate and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.
  - .3 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.
  - .4 Paint public side of Site enclosure in selected colours with one coat primer to CAN/CGSB 1.189 and one coat exterior paint to CGSB 1.59. Maintain public side of enclosure in clean condition.
  - .5 Provide barriers around trees and plants designated to remain as per City of Winnipeg Tree Protection Specifications. Protect from damage by equipment and construction procedures.

### **1.2. 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.
- .4 Erect enclosures to allow access for installation of materials and Working inside enclosure.

**1.1. 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 Maintain and relocate protection until such Work is complete.

**1.2. ACCESS TO SITE**

- .1 Provide and maintain access roads, sidewalk crossings, ramps and Construction runways as may be required for access to Work.
- .2 Build and maintain temporary roads where indicated or directed and provide snow removal during period on Work.
- .3 If authorized to use existing roads for access to project Site, maintain such roads for duration of Contract and make good damage resulting from Contractor's use of roads.

**1.3. PUBLIC TRAFFIC FLOW**

- .1 Contractor shall allow for continued public access to the Site throughout the Construction period and shall ensure that the Work is maintained to the approval of the Local Authorities having Jurisdiction, local by-laws, and Work Place Safety and Health Policies. This will also be applicable to street accesses.
- .2 Contractor shall observe and enforce all Construction safety measures required by the Manitoba Building Code, Worker's Compensation Board, Municipal Statute or By-Laws. In the event of a conflict between any provisions of the above authorities, the most restrictive provision shall apply.
- .3 Contractor shall maintain traffic flow around the Work Area. Contractor's operations shall in no way interfere with the safe movement of pedestrian traffic.

**1.4. FIRE ROUTES**

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

**1.5. 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.

**1.6. PROTECTION OF BUILDING FINISHES**

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

## 1.7. PROTECTION OF EXISTING TREES

- .1 The Contractor shall take the following precautionary steps to prevent damage from Construction activities to existing boulevard trees within the limits of the Construction area. If you require further information on these specifications, please contact the City of Winnipeg Forestry Branch at 204-986-2004:
  - .1 For trees greater than 100 mm in diameter, attach wood strapping material having a minimum thickness of 25 millimetres and minimum length of 2440 millimetres around tree trunks in a manner that will not harm the trees. Do not use nails or other fasteners that penetrate into trees. The width of strapping should suit the size of the tree being protected. Length of strapping may be reduced to suit tree being protected as approved by the Contract Administrator.
  - .2 For trees less than 100 mm in diameter, install snow fencing around the tree to a 2.0 meter radius complete with installation hardware. The 2.0 meter radius of the snow fencing may be reduced to suit the tree being protected as approved by the Contract Administrator.
  - .3 Operation of equipment within the dripline of the trees shall be kept to the minimum required to perform Work. Equipment shall not be parked, repaired, refueled; Construction materials shall not be stored, and earth materials shall not be stockpiled within the driplines of the trees. The dripline of a tree shall be considered to be the ground surface directly beneath the tips of its outermost branches. The Contractor shall ensure that the operations do not cause flooding or sediment deposition on areas where trees are located.
  - .4 Repair, replace and maintain tree protection material during Construction of the Work.
  - .5 Remove snow fencing and strapping material without harming trees as soon as the Construction and restoration Work is complete.
- .2 Obtain approval from the Contract Administrator to excavate within 2.0 meters of a tree.
- .3 Excavate in a manner to minimize damage to root systems. Keep exposed roots in excavations and trenches moist or shaded.
- .4 Prune exposed roots with equipment such as trenchers, chain saws, root cutters or other methods acceptable to the Contract Administrator in a manner that will leave a neat, clean root end.
- .5 Take precautions to ensure tree limbs overhanging the Site are not damaged by Construction equipment. Contact the Forestry Branch for consultation on pruning of overhanging or damaged limbs and branches and other unanticipated problems with trees during Construction of the Works.
- .6 Elm trees are not to be pruned between April 1st and August 1st of any year under provisions of The Dutch Elm Disease Act.
- .7 All damage to existing trees caused by the Contractor's activities shall be repaired to the requirements and satisfaction of the Contract Administrator and the Forestry Branch. Damages must be repaired by an individual with a Manitoba Arborist license or by the Forestry Branch.
- .8 The Forestry Branch will remove and replace any trees deemed to have died or that are dying due to damage from carelessness during Construction. Removal and replacement costs will be determined by size, market price of the largest transplantable tree of same or different species and may include appraised value of existing tree as determined by current International Society of Arboriculture evaluation procedure presently used by Forestry Branch in conjunction with City Claims Branch. Estimated replacement cost of a

25 and 60 cm diameter American elm on a boulevard based on an appraised value is approximately \$5,000.00 and \$30,000.00 respectively.

- .9 Protection of existing trees, repair of trees and pruning of damaged limbs will not be measured for payment and will be included with Underground or Surface Works. Removal and replacement of existing trees by the Forestry Branch deemed to have died or that are dying due to damage from carelessness during Construction will be at own costs and will be invoiced for or deducted from any payments owing.

**END OF SECTION**

## **1. GENERAL**

### **1.1. REFERENCES**

- .1 Within text of each specifications section, reference may be made to reference standards. Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .2 If there is question as to whether any product or system is in conformance with applicable standards, Contractor reserves right to have such products or systems tested to prove or disprove conformance.
- .3 Cost for such testing will be borne by Contractor in event of conformance with Contract Documents or by Contractor in event of non-conformance.
- .4 Conform to latest date of issue of referenced standards in effect on date of submission of Bid, except where specific date or issue is specifically noted.

### **1.1. QUALITY**

- .1 Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) 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.

### **1.2. 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.

### **1.3. PRODUCT CHANGES**

- .1 Products substitution or alternative shall be submitted in accordance with Section 01 25 00 – Substitution Procedures.

### **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 nameplates.

#### **1.5. TRANSPORTATION**

- .1 Pay costs of transportation of products required in performance of Work.
- .2 Transportation costs of products supplied by City will be paid for by Contract Administrator. Unload, handle and store such products.
- .3 Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.

#### **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 his or her 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 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.
- .2 Perform remedial Work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

**1.11. LOCATION OF FIXTURES**

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

**1.12. FASTENINGS**

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

**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/or building occupants and pedestrian and vehicular traffic.

- .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**

## **1. GENERAL**

### **1.1. RELATED SECTIONS**

- .1 Individual product Sections: cutting and patching incidental to Work of section. Advance notification to other sections required.

### **1.2. ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit written request in advance of cutting or alteration which affects:
  - .1 Structural integrity of elements of project.
  - .2 Integrity of weather-exposed or moisture-resistant elements.
  - .3 Efficiency, maintenance, or safety of operational elements.
  - .4 Visual qualities of sight-exposed elements.
  - .5 Work of 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 City or separate Contractor.
  - .7 Written permission of affected separate Contractor.
  - .8 Date and time Work will be executed.

### **1.3. MATERIALS**

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

### **1.4. 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.

### **1.5. EXECUTION**

- .1 Execute cutting, fitting, and patching to complete Work.
- .2 Fit several parts together, to integrate with other Work.
- .3 Uncover Work to install ill-timed Work.

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

**END OF SECTION**

## **1. GENERAL**

- .1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
- .2 Store volatile waste in covered metal containers and remove from premises at end of each Working day.
- .3 Provide adequate ventilation during use of volatile or noxious substances. Use for building ventilation systems is not permitted for this purpose.

### **1.1. RELATED REQUIREMENTS**

- .1 All Sections within Divisions 02 31 through 33.

### **1.2. PROJECT CLEANLINESS**

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

### **1.3. CLEANING PRIOR TO ACCEPTANCE**

- .1 Prior to applying for Substantially Performance of the Work 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 City or other Contractors.

- .5 Remove waste materials from Site at regularly scheduled times or dispose of as directed by Contract Administrator. Do not burn waste materials on Site, unless approved by Contract Administrator.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .8 Remove stains, spots, marks and dirt from decorative Work, electrical and mechanical fixtures, furniture fitments, walls, 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.

#### **1.4. FINAL CLEANING**

- .1 Refer to General Conditions.
- .2 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .3 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .4 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .5 Remove waste products and debris including that caused by other Contractors.
- .6 Remove waste materials from Site at regularly scheduled times or dispose of as directed by Contract Administrator. Do not burn waste materials on Site.
- .7 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .8 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.

- .9 Remove stains, spots, marks and dirt from decorative Work, electrical and mechanical fixtures, window treatments, furniture fitments, walls, floors and ceilings.
- .10 Clean lighting reflectors, lenses, and other lighting surfaces.
- .11 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .12 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.
- .13 Inspect finishes, fitments and equipment and ensure specified Workmanship and operation.
- .14 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .15 Remove dirt and other disfiguration from exterior surfaces.
- .16 Clean and sweep roofs, gutters, areaways, and sunken wells.
- .17 Sweep and wash clean paved areas.
- .18 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.

**1.5. WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials in accordance with Section 01 74 19 - Construction Waste Management and Disposal.

**END OF SECTION**

## **1. GENERAL**

### **1.1. RELATED SECTIONS**

- .1 Construction Waste Management - Relates to ALL Sections.

### **1.2. REFERENCES**

- .1 [www.cagbc.org](http://www.cagbc.org)
- .2 The Contractor is to divert a minimum of 75% of the demolition and construction waste from the landfill by recycling and salvaging.

### **1.3. REQUIREMENTS**

- .1 All sub-trades are to conform to the construction waste management requirements.
- .2 The Contractor in conjunction with the Contract Administrator is to develop and implement a Construction Waste Management Plan. The Contractor shall be responsible for sourcing appropriate recycling and reuse facilities. A draft preliminary plan has been attached to spec 01 74 19 – Construction Waste Management and Disposal.
- .3 Weekly construction waste progress reports, Contract Administrator during both demolition and construction.
- .4 A consistent method of measurement is to be used; all information is to be provided in metric tonnes.

### **1.4. INFORMATIONAL SUBMITTALS**

- .1 Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Include the following information on the tracking template:
  - .1 Date,
  - .2 Type of waste.
  - .3 Diversion location or recycler and end use
  - .4 Total quantity of waste in tonnes.
  - .5 Quantity of waste salvaged or recycled, in tonnes.
  - .6 Total quantity of waste recovered as a percentage of total waste.
- .2 Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests,

weight tickets, receipts, and invoices.

- .3 Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

#### **1.4. STORAGE, HANDLING AND PROTECTION**

- .1 Provide on-Site facilities for collection, handling, and storage of anticipated quantities of reusable and/or recyclable materials.
- .2 Provide containers to deposit reusable and/or recyclable materials.
- .3 Place containers in strategic locations to facilitate deposit of materials without hindering daily operations. Recycle containers are to be located closer to the Work area and be more readily accessible than waste containers to encourage recycling.
- .4 Separate salvaged materials into separate piles or containers on Site and protect them from damage. Transport offSite to approved and authorized recycling facility.
- .5 Mark containers and/or stockpile areas.
- .6 Stockpile areas to be consistent with applicable fire regulations.
- .7 Unless otherwise specified, materials for removal become Contractor's property.
- .8 On Site sale of salvaged, reusable, or recyclable materials is not permitted.

#### **1.5. DISPOSAL OF WASTES**

- .1 Do not bury or incinerate rubbish or waste materials.
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil, and paint thinner into waterways, storm, or sanitary sewers.

#### **1.6. SCHEDULING**

- .1 Co-ordinate Work with other activities at Site to ensure timely and orderly progress of Work.

#### **1.7. CLEANING**

- .1 Remove tools and waste materials on completion of Work, and leave Work area in clean and orderly condition.
- .2 Maintain a clean and safe Work area as Work progresses.
- .3 Source separate materials to be reused/recycled into specified sort areas.

### **2. PRODUCTS**

#### **2.03. NOT USED**

- .1 Not Used.

### **3. EXECUTION**

#### **3.3. APPLICATION**

- .1 Do Work in compliance with CWM plan.

- .2 Burning and incineration of rubbish and waste cannot be used as an alternative method for diverting waste from the landfill.
- .3 Burying of waste and rubbish is prohibited, unless approved by the sustainability Contract Administrator.
- .4 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

#### **3.4. DIVERSION OF MATERIALS**

- .1 Provide instruction regarding disposal practices to all sub-trades.
- .2 It is required that every effort be taken to divert 100% of the following materials acquired during construction, from the landfill as long as recycling facilities exist:
  - .1 Cardboard
  - .2 Plastic Packaging
  - .3 Rubble
  - .4 Steel
  - .5 Wood (clean)
  - .6 Wood (used)
  - .7 Concrete
  - .8 Other metals
  - .9 Masonry
  - .10 Other materials if recycling facilities exist.

#### **3.5. DISPOSAL OF WASTES**

- .1 Hazardous materials are to be disposed of in accordance with Section 01 35 43 - Environmental Procedures.
- .2 Disposal of waste, volatile materials, mineral spirits, oil, and/or paint thinner into waterways, water table, storm, and/or sanitary sewers is prohibited.

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## **1. GENERAL**

### **1.1. RELATED REQUIREMENTS**

- .1 Section 01 78 00 – Closeout Submittals
- .2 Section 01 74 19 - Construction Waste Management and Disposal.

### **1.2. REFERENCES**

- .1 Canadian Environmental Protection Act (CEPA)
  - .1 SOR/2008-197, Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations.

### **1.3. ADMINISTRATIVE REQUIREMENTS**

- .1 Acceptance of Work Procedures:
  - .1 Contractor's Inspection: Contractor and all subcontractors shall conduct an 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's and Contractor to inspect Work and identify defects and deficiencies.
    - .2 Contractor to correct Work as directed.
  - .3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:
    - .1 Work: completed and inspected for compliance with Contract Documents.
    - .2 Defects: corrected and deficiencies completed.
    - .3 Equipment and systems: tested, adjusted and balanced and fully operational.
    - .4 Certificates required by Fire Commissioner: 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's, 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 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.
  - .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.

**1.04. FINAL CLEANING**

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Waste Management: separate waste materials for recycling in accordance with Section 01 74 19 - Construction Waste Management and Disposal.

**2. PRODUCTS**

**2.01. NOT USED**

- .1 Not Used.

**3. EXECUTION**

**3.01. NOT USED**

- .1 Not Used.

**END OF SECTION**

## **1. GENERAL**

### **1.1. ADMINISTRATIVE REQUIREMENTS**

- .1 Pre-warranty Meeting:
  - .1 Convene meeting two (2) weeks prior to Contract completion with Contractor's representative and Contract Administrator, in accordance with Section 01 31 00 - Project Management and Coordination to:
    - 1.1 Verify Project requirements.
    - 1.2 Review manufacturer's installation instructions and warranty requirements.
  - .2 Contract Administrator to establish communication procedures for:
    - 2.1 Notifying construction warranty defects.
    - 2.2 Determine priorities for type of defects.
    - 2.3 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 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .3 Prepare instructions and data using personnel experienced in maintenance and operation of described products
- .4 Two (2) weeks prior to Substantial Performance of the Work, submit to the Contract Administrator, four final copies of operating and maintenance manuals in English.
- .5 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
- .6 Provide evidence, if requested, for type, source and quality of products supplied.
- .7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
- .8 Pay for costs of transportation.

### **1.1. FORMAT**

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose-leaf 219 x 279 mm (8 ½" x 11") 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 flyleaf 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.

## **1.2. 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.

## **1.3. AS -BUILT DOCUMENTS AND SAMPLES**

- .1 Maintain, in addition to requirements in General Conditions, at Site for Contract Administrator 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 the Contract Administrator.

#### **1.4. 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: legibly 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: legibly 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, if requested, for Site records.

#### **1.5. 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 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
- .3 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.
  - .1 Include regulation, control, stopping, shutdown, and emergency instructions.
  - .2 Include summer, winter, and any special operating instructions.
- .4 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing,

and checking instructions.

- .5 Provide servicing and lubrication schedule, and list of lubricants required.
- .6 Include manufacturer's printed operation and maintenance instructions.
- .7 Include sequence of operation by controls manufacturer.
- .8 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .9 Provide installed control diagrams by controls manufacturer.
- .10 Provide Contractor's co-ordination drawings, with installed colour coded piping diagrams.
- .11 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- .12 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .13 Include test and balancing reports as specified in Section 01 45 00 - Quality Control.

#### **1.6. 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.

#### **1.7. WARRANTIES AND BONDS**

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, thirty (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 twelve (12) 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 alarm systems, lightning protection systems.
  - .3 Provide list for each warranted equipment, item, feature of construction or system indicating:
    - 3.1 Name of item.
    - 3.2 Model and serial numbers.
    - 3.3 Location where installed.
    - 3.4 Name and phone numbers of manufacturers or suppliers.
    - 3.5 Names, addresses and telephone numbers of sources of spare parts.
    - 3.6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
    - 3.7 Cross-reference to warranty certificates as applicable.
    - 3.8 Starting point and duration of warranty period.
    - 3.9 Summary of maintenance procedures required to continue warranty in force.
    - 3.10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
    - 3.11 Organization, names and phone numbers of persons to call for warranty service.
    - 3.12 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.

**1.8. 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                SECTION INCLUDES**

- .1        This section contains general requirements for commissioning the facility's systems and components.

**1.2                DESCRIPTION**

- .1        The purpose of the Commissioning process is to provide the City of the facility with the assurance that the building systems have been installed according to the Contract Documents and will operate within the performance guidelines set out in the Design Intent and the Specifications. The commissioning process includes specific tasks to be conducted during each phase in order to verify that design, construction, and training meets the City's project requirements. Commissioning shall:
  - .1        Verify that applicable equipment and systems are installed according to the Contract documents, manufacturer's recommendations, and industry accepted minimum standards and that they receive adequate operational checkout by installing Contractors.
  - .2        Verify and document proper performance of equipment and systems.
  - .3        Verify that O&M documentation left on Site is complete.
  - .4        Verify that the the City's operating personnel are adequately trained.
- .2        All Contractors and related subcontractors shall be responsible for cooperating and coordinating their Work with the commissioning team. The Contractors shall be responsible for carrying out all the activities required for the initial installation of components and systems, and for operating the systems as required during the commissioning process.
- .3        The Commissioning process does not reduce the responsibility of the installing Contractors to provide a fully functional finished product in accordance with the Contract Documents.

**1.3                REFERENCES**

- .1        Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 specification sections, apply to this section.
- .2        ASHRAE Guideline 0-2013
- .3        Associated Air Balance Council (AABC): National Standards for Field Measurements and Instrumentation, Total Systems Balance, Air Distribution-Hydraulics Systems
- .4        Manitoba Hydro New Buildings Program 2.0: Performance Path Program Guide

## 1.4 QUALITY ASSURANCE

- .1 Cooperate with testing organization services under provisions specified in Section 01 45 00 — Quality Control.
- .2 Complete the Testing, Adjusting and Balancing requirements specified in the Project manual.
- .3 Complete, document, and submit quality assurance, quality control, and testing of electrical Work as recommended by manufacturers, as required by the authority having jurisdiction, and as specified in the Project manual.
- .4 Comply with applicable procedures and standards of the certification sponsoring association.
- .5 Perform services under direction of supervisor qualified under certification requirements of sponsoring association.
- .6 Equipment shall not be started up for temporary use until pre-start-up checklists and procedures from the manufacturer have been completed, and moisture, dust, and other environmental/building integrity issues have been addressed.

## 1.5 DEFINITIONS

- .1 Checklists - Verification checklists that are developed and used during all phases of the commissioning process to verify that the the City's project requirements are being achieved. This includes checklists for general verification, plus testing, training, and other specific requirements.
- .2 Commissioning Authority (Contract Administrator) - The entity identified by the The City who leads, plans, schedules, and coordinates the commissioning team to implement the commissioning process.
- .3 Commissioning Officer (CxO) - The entity identified by the Contractor who coordinates with commissioning activities between the Contractor and sub-Contractors, and the Commissioning Authority.
- .4 Commissioning Plan - An overall plan developed by the commissioning agent that provides the structure, schedule and coordination planning for the commissioning process.
- .5 Deferred Performance Tests (DPTs) - Performance tests that are performed, at the discretion of the Contract Administrator, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design, or other Site conditions that disallow the test from being performed.
- .6 Issues Log - A formal and ongoing record of problems or concerns – and their resolution – that have been raised by members of the commissioning team during the course of the commissioning process.
- .7 Quality Based Sampling - A process for evaluating a sub-set (sample) of the total population. The sample is based upon a known or estimated probability distribution of expected values; an assumed statistical distribution based upon

data from a similar product, assembly, or system; or a random sampling that has scientific statistical basis.

- .8 Seasonal Performance Tests - Performance tests that are deferred until the system(s) will experience conditions closer to their design conditions based on weather conditions.
- .9 Startup - The initial starting or activating of dynamic equipment, including completing construction checklists.
- .10 Training Plan - A written document that details the expectations, schedule, budget, and deliverables of commissioning process activities related to training of project operating and maintenance personnel, users, and occupants.
- .11 Verification - The process by which specific documents, components, equipment, assemblies, systems, and interfaces among systems are confirmed to comply with the criteria described in the City's Project Requirements.

## 1.6 ACRONYMS

- .1 Acronyms used within this section are as follows:
  - .1 AHJ – Authority Having Jurisdiction
  - .2 BAS – Building Automation System
  - .3 Contract Administrator – Commissioning Authority
  - .4 CxO – Commissioning Officer
  - .5 DDC – Direct Digital Control
  - .6 EC – Electrical Contractor
  - .7 GC – Contractor
  - .8 MC – Mechanical Contractor
  - .9 PM – Project Manager
  - .10 TAB – Testing, Adjusting, and Balancing Contractor

## 1.7 Coordination

- .1 Project Commissioning Team - The members of the project commissioning team will consist of the commissioning authority and any support personnel, the Commissioning Officer (CxO), the City's facility staff (FS) or designee, the Contractor, subcontractors and/or vendors as required, and the Contract Administrator/ engineer (CONTRACT ADMINISTRATOR).
- .2 Management - The Contract Administrator coordinates the commissioning activities through the CxO. All members shall Work together to fulfill their contracted responsibilities and meet the objectives of the Contract documents.
- .3 Scheduling - The Contract Administrator, through the City or CxO, will provide sufficient notice to the Contractor for scheduling commissioning activities with respect to the City's participation. The Contractor will integrate all commissioning activities into the overall project schedule. All parties will address scheduling problems and make necessary notifications in a timely manner in order to expedite the commissioning process.

## **1.8 Commissioning Plan**

- .1 The Contract Administrator will develop the commissioning plan which shall be included in the project schedule when approved by the City or CxO. The following narrative provides a brief overview of the typical commissioning tasks during construction and the general order in which they occur.
  - .1 Commissioning during construction begins with an initial commissioning meeting conducted by the Contract Administrator where the commissioning process is reviewed with the project commissioning team members.
  - .2 Additional meetings will be required throughout construction, scheduled by the Contract Administrator, through the City or CxO, with necessary parties attending to plan, scope, coordinate, schedule future activities and resolve problems.
  - .3 Equipment documentation is submitted to the Contract Administrator, through the City or CxO, during normal submittals, including detailed startup procedures.
  - .4 The construction checklists are to be completed by the Contractor (or its subcontractors), before and during the startup process.
  - .5 Construction checklists, TAB and startup must be completed before performance testing.
  - .6 Items of non-compliance in material, installation, or setup shall be corrected at no expense to the City.
  - .7 The Contractor ensures that the subcontractors' construction checklists are executed and documented and that startup and initial checkout are performed. The Contract Administrator verifies that the TAB, construction checklists and startup were completed according to the approved plans. This includes the Contract Administrator approving TAB, checklists and startup plans. This also includes witnessing startup of selected equipment. Any testing failure is to be corrected at no additional cost to the City, and a re-test is to be performed, observed, and documented.
  - .8 The Contract Administrator develops and implements equipment and system performance test procedures. The forms and procedures are approved by the City, CxO and CONTRACT ADMINISTRATOR.
  - .9 The performance tests are executed by the Contractor under the direction of the Contract Administrator with the assistance of the facility staff. All documentation is by the Contract Administrator.
  - .10 The Contract Administrator reviews the O&M documentation for completeness and provides the commissioning record for the O&M manuals.
  - .11 Commissioning should be completed before substantial completion.
  - .12 The Contract Administrator develops procedures, reviews, pre-approves, coordinates, and implements the training provided by the Contractor.
  - .13 Deferred testing is conducted as specified or required.

## **1.9 Commissioning Team**

- .1 The commissioning team will include a third party Commissioning Agent appointed by the City of Winnipeg, the Mechanical and Electrical Design Consultants, the Contract Administrator, the City's facility management

staff/building operator, Contractor, and Subcontractor(s). A brief description of the roles of these various team members is outlined below.

- .2 The commissioning team shall be responsible for ensuring that the technical subsystems Work with one another to produce an integrated facility that functions as specified in the design intent manual. These subsystems shall include, but not be restricted to, HVAC systems, building automation systems, plumbing systems, fire protection systems, electrical systems, and communication systems and equipment.
- .3 Members appointed by Contractors:
  - .1 CxO - The Contractor will appoint a Commissioning Officer who will participate in and coordinate all Cx activities and procedures.
  - .2 Individuals, each having authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated actions. The commissioning team shall consist of, but not be limited to, representatives of each Contractor, including project superintendent and subcontractors, installers, suppliers, and specialists deemed appropriate by the Contract Administrator.
- .4 Members appointed by the City:
  - .1 Contract Administrator - An entity identified by the City who leads, plans, schedules, and coordinates the commissioning team to implement the commissioning process. The City will engage the Contract Administrator under a separate Contract.
  - .2 Representatives of the facility user and operation and maintenance personnel.
  - .3 Contract Administrator and engineering design professionals.

#### **1.10 Commissioned Equipment**

- .1 Mechanical and electrical equipment, systems and subsystems (including associated duct Work, piping, wiring, and conduit) will be commissioned in this project. A complete list of commissioned equipment will be included in the Cx Plan following the submittal of shop drawings.

#### **Part 2 Products**

##### **2.1 TEST EQUIPMENT**

- .1 All standard testing equipment required to perform startup and initial checkout and required performance testing shall be provided by the Contractor for the equipment being tested.

#### **Part 3 Execution**

##### **3.1 COMMISSIONING TEAM MEETINGS**

- .1 Meetings will be scheduled by the PM, in coordination with the Contract Administrator and Contractor. These meetings will generally be held regularly following mobilization of the MC and EC.

- .2 Coordination meetings will include members of the commissioning team as required, and will be used to plan, discuss, and review commissioning activities. Meetings shall take place until Work has been completed, or as appropriate.
- .3 The construction schedule, commissioning schedule, and the commissioning plan shall be reviewed and updated as required. Upcoming tests and equipment start-ups will be reviewed and completed test results will be evaluated.

### **3.2 Submittals**

- .1 The Contract Administrator will provide appropriate Contractors with a specific request for the type of submittal documentation the Contract Administrator requires facilitating the commissioning Work. These requests will be integrated into the normal submittal process and protocol of the construction team.
- .2 A copy of all approved shop drawings associated with equipment to be commissioned shall be forwarded to the Contract Administrator after review by the CxO or PM.
  - .1 The Contract Administrator shall review the Shop Drawings, and make comments to the PM as necessary.
- .3 Electrical distribution testing carried out as specified by Division 26 and as required by the AHJ shall be documented and copies submitted to the Contract Administrator.

### **3.3 COMMISSIONING FORM COMPLETION and Documentation**

- .1 Equipment Verification Sheets - Equipment verification forms will be used to track the commissioned equipment from the design phase through submittals and installation.
- .2 Installation checklists - Installation checklists will be used to document and verify that commissioned equipment is installed as designed and as per manufacturers' recommendations. They should be completed prior to startup. Installation checklists may be combined with equipment verification sheets or separate manufacturers' sheets may be used at the discretion of the Contract Administrator.
- .3 Start-up checklists - The related installation subcontractor shall complete all start-up checklists as provided by the manufacturer or supplier. Where start-up checklists are not available from the manufacturer, the Contract Administrator may provide alternate forms.
- .4 Functional performance test forms - The Contract Administrator shall provide supplementary forms as required for commissioning equipment. The forms will be based on the approved shop drawings for the integrated automation system. The Contract Administrator shall witness all testing and repeated testing and sign the completed forms.
- .5 The related installation subcontractor shall complete equipment verification sheets as provided by the Contract Administrator. Completed checklists and forms shall be promptly forwarded to the Contract Administrator.

### 3.4 Equipment and System Startup

- .1 Startup and Checkout Plan - The Contract Administrator will assist the project commissioning team members responsible for startup of any equipment. The primary goal of the Contract Administrator in this process is to ensure that there is written documentation for installation, start-up and commissioning has been completed.
  - .1 The Contractor shall determine which trade is responsible for executing and documenting each of the line item tasks and transmit the checklists to the responsible subcontractors. Each form may have more than one trade responsible for its execution.
  - .2 The Contractor will communicate the full startup plan the Cx Team for their review and use.
- .2 Contract Administrator Involvement - The Contract Administrator may witness system start-up procedures for equipment within a system in order to verify that start-up was conducted according to manufacturer's recommendations and the Contract Documents. Contractors will do their best to coordinate start-ups in order to minimize the number of necessary Site visits.

### 3.5 Checklists and Startup Approval

- .1 The Contractor shall ensure that the subcontractors clearly list any outstanding items of the initial startup and construction checklist procedures that were not completed successfully, on an attached sheet. The form and any outstanding deficiencies shall be provided, through CxO, to the Contract Administrator within two days of test completion.
- .2 The Contract Administrator will review the report and issue either a non-compliance report or an approval form, through the CxO, to the Contractor. The installing subcontractors or vendors shall correct all areas that are deficient or incomplete in the checklists and tests in a timely manner, shall notify the CxO as soon as outstanding items have been corrected, and resubmit an updated startup report with a Statement of Correction on the original non-compliance report. When satisfactorily completed, the Contract Administrator will recommend approval of the execution of the checklists and startup of each system.

### 3.6 SYSTEM PREPARATION and INSPECTION REQUIREMENTS

- .1 The Contractor will be tasked with effectively preparing all systems for commissioning. Once equipment is running, the Contractor shall check that the equipment is operating according to specifications and manufacturers guidelines.
- .2 The Contractor will adjust, repair, or correct all items that are found not to be operating according to Specification.
- .3 All mechanical systems will be observed under actual operating conditions for sufficient time to ensure proper operation under varying conditions.
- .4 The Contractor shall periodically check the following items and make corrections, adjustments, or repairs, as required:
  - .1 Strainers and filters are in place and are changed as specified

- .2 Control system is functioning as per the Sequence of Operations
  - .3 Safety valves and seals are tight and fully operational; there are no system leaks
  - .4 All mechanical equipment is operating with pressures and temperatures within Manufacturer's recommendations.
  - .5 All gauges are adjusted and reading properly
  - .6 Excessive oil and grease is cleaned on a regular basis
  - .7 Dampers and valves close tightly and stroke fully
- .5 Equipment and systems are to be demonstration ready for the Contract Administrator prior to Functional Performance Testing. Additional Site visits that are required due to systems that are not demonstration ready will be at Contractors Expense.

### **3.7 FUNCTIONAL PERFORMANCE TESTING**

- .1 Functional Performance Tests are to be done to verify the performance of individual systems, as well as the interactions between systems as they operate together. Test procedures will be identified on the Functional performance Test forms provided by the Contract Administrator.
- .2 The Contractor shall provide test equipment, and demonstrate system operation to the Contract Administrator as deemed necessary.
- .3 Functional Performance Testing shall begin only after all mechanical testing; start-up checklists; and testing, adjusting, and balancing required by the Contractor have been completed, and when the Contract Administrator has acknowledged that the physical installation of components and systems being tested is substantially installed in accordance with the Contract Documents.
- .4 The testing schedule will be coordinated by the PM and the Commissioning Team. Adequate notice will be provided to all parties involved in performing & witnessing tests.
- .5 The Mechanical Contractor shall Work in consultation with the Contract Administrator, PM, and related Subcontractor to complete functional performance testing for all installed equipment and systems.
- .6 Performance testing and verification may be achieved by manual testing or by monitoring the performance and analyzing the results using the control system's trend log capabilities or by stand-alone data loggers. The Contract Administrator may substitute specified methods or require an additional method to be executed other than what was specified, with the approval of the CONTRACT ADMINISTRATOR and the City. The Contract Administrator will determine which method is most appropriate for tests that do not have a specified method.
- .7 Functional performance tests may include the demonstration of any or all of the following sequences controlled by the BAS:
  - .1 Start-up/shutdown
  - .2 Occupied/unoccupied modes
  - .3 Modulation of device range or capacity

- .4 Power failure
  - .5 Alarms
  - .6 Equipment staging
  - .7 Interlocks with other equipment
  - .8 Sensor and actuator calibrations
- 
- .8 The Contract Administrator may use the BAS or any other instrumentation necessary for mechanical systems testing. The BAS shall be programmed by the Controls Subcontractor to record trend data over a time period specified by the PM or Contract Administrator.
  - .9 The Contract Administrator may use trend data to evaluate the performance of the systems in conjunction with other recorded data.
  - .10 Tests shall be conducted systematically, starting from the primary energy system through to the system components and controls.
  - .11 The Mechanical Contractor shall report all test failures to the PM and Contract Administrator.
  - .12 Unsuccessful tests will be repeated until they are successful, at no additional cost to the Contract.
  - .13 The burden of responsibility to solve, correct, and retest malfunctions/failures is with the Contractor, with CONTRACT ADMINISTRATOR approval as required.
- 3.8 Non-Conformance (Commissioning Issues Log)
- .1 Corrections of minor deficiencies identified may be made during the tests at the discretion of the Contract Administrator. In such cases the deficiency and resolution will be documented on the procedure form or on an attached sheet as corrected on Site (COS).
  - .2 As tests progress and issues are identified, the Contract Administrator shall discuss the issue with the commissioning team, and the Contractor.
    - .1 When there is no dispute on the issue and the Contractor accepts responsibility to correct it:
      - .1 The Contract Administrator will document the issue and the Contractor's response and intentions. The Contractor corrects the issue, signs the statement of correction at the bottom of the non-compliance form certifying that the equipment is ready to be retested and sends it back to the Contract Administrator.
      - .2 The Contractor shall reschedule the test; and the test repeated.
    - .2 If there is a dispute about an issue that cannot be resolved within the Cx Team, the dispute shall be documented with the Contractor's response and forwarded to the Project Team to be dealt with as a deficiency.
  - .3 Cost of retesting a performance test shall be the Contractor's. Retesting shall not be considered a justified reason for a claim of delay or for a time extension by the Contractor.

- .4 The Contractor shall submit in writing to the Cx Team at least as often as commissioning meetings are being scheduled, the status of each outstanding discrepancy identified during commissioning. Discussion shall cover explanations of any disagreement and proposals for their resolutions.

### **3.9 SYSTEM ACCEPTANCE**

- .1 All test forms shall be completed and signed promptly after testing, and submitted to the Contract Administrator for review and approval.
- .2 Prior to final project completion, the Contract Administrator shall assemble the completed testing forms into a single document.
- .3 Where equipment does not meet the design intent or The City's Requirements, the system will be adjusted and re-tested until performance is acceptable.
- .4 Where necessary, the PM shall issue corrective measures if acceptable performance is not achieved.
- .5 The Contract Administrator shall review the results of the Functional Performance Tests and shall submit a report on the findings to the PM. This report shall make recommendations for improving system performance whenever possible.

### **3.10 SEASONAL/ DEFERRED COMMISSIONING**

- .1 A schedule for the deferred commissioning will be drawn up at the time of construction completion which will identify all performance testing which could not be undertaken due to season, lack of occupancy, or for any other reason.
- .2 The Contract Administrator will arrange with the City to prepare a schedule for seasonal commissioning which allows the systems to be tested under varying operating conditions, including extreme heat and cold.
- .3 Seasonal and other deferred Commissioning must be completed within the warranty period.
- .4 Any problems which are uncovered during testing shall be reported to the Contract Administrator, including suggestions for corrective actions to be taken to resolve the problem.

### **3.11 OPERATIONS & MAINTENANCE MANUALS**

- .1 The commissioning process requires detailed O&M documentation as identified in this section and technical specifications.
- .2 The project team, Contractors, and subcontractors shall coordinate to supply the Contract Administrator with draft copies of the complete operating and maintenance manual for review by the Contract Administrator and Contract Administrator.
- .3 The Contractor will compile the information received into an O&M manual which meets the criteria as specified elsewhere or as follows (whichever is more stringent):

- .1 Information is complete and applicable
  - .2 The O&M document is bound and labeled as per the Mechanical Specification
  - .3 Instructions for installation, maintenance, replacement, and start-up instructions are included
  - .4 A list of replacement parts, special tools required, and local sources is included
  - .5 Warranty information is identified
  - .6 As-built controls package for all sequences and modes of operation are included
  - .7 A description of each sequence of operation has been written
  - .8 Single-line schematic control drawings have been included
- .4 Contractor shall submit corrected final approved manuals prior to substantial completion. Prior to final submittal, the Contract Administrator shall review the O&M manuals (in addition to the initial draft O&M manual), and documentation, with redline as-builts, for systems that were commissioned to verify compliance with the specifications. The Contract Administrator will communicate, through the CxO, deficiencies in the manuals to the Contractor or CONTRACT ADMINISTRATOR, as requested. Upon a successful review of the corrections, the Contract Administrator will recommend approval and acceptance of these sections of the O&M manuals. The Contract Administrator will also review each equipment warranty and verify that all requirements to keep the warranty valid are clearly stated. This Work does not supersede the CONTRACT ADMINISTRATOR's review of the O&M manuals according to the CONTRACT ADMINISTRATOR's Contract.

### **3.12 Demonstration, TRAINING AND ORIENTATION**

- .1 Staff training shall be provided by the appropriate Contractor under the supervision of the Contractor, as specified elsewhere in the Project manual or as follows (whichever is more stringent).
- .2 Training will continue until the City is satisfied that adequate training has been provided.
- .3 Training sessions should be documented in a durable form for future reference. Where training is for the BAS controls system or other systems using a computer Workstation, the screen of the computer shall be recorded directly using appropriate computer software during training sessions using screen capture software and a microphone for the technician providing the training.
- .4 Training sessions will fulfill all requirements for Commissioning, including but not limited to:
  - .1 Identification of the general purpose of system (design intent)
  - .2 Instruction on how to use the O&M Manuals
  - .3 Review of as-built control drawings and schematics
  - .4 Start-up, normal operation, shut-down, unoccupied operation, seasonal changeover, manual operation, control setup and programming troubleshooting and alarms

- .5 Demonstration of interactions between systems, and optimized methods for energy conservation
- .6 Identification of health and safety issues
- .7 Special maintenance and replacement sources
- .8 Occupant interaction issues
- .9 System response to different operating conditions

**END OF SECTION**

**Part 1            General**

**1.1                SECTION INCLUDES**

- .1    Alteration project procedures.
- .2    Removal of designated building equipment and fixtures.
- .3    Removal of designated construction.
- .4    Disposal and/or Salvage and Storage of removed materials for re-use.
- .5    Identification of utilities.
- .6    Refer to items as indicated.

**1.2                RELATED SECTIONS**

- .1    Section 01 10 13 - Summary of Work:
  - .1    Work will be phased according to the drawings. Personnel will temporarily vacate the portion of building under renovation. Apparatus Bays will remain operational throughout.
  - .2    WFPS personnel will partly occupy the building for the duration of construction (in areas not under renovation).
- .2    Section 01 52 00 - Construction Facilities and Temporary Controls: Temporary enclosures, security at Owner occupied areas, and cleanup during construction.
- .3    Section 01 73 03 - Execution Requirements: Project record documents.

**1.3                ALTERATION PROJECT PROCEDURES**

- .1    Materials: As specified in Product sections; match existing Products and work for patching and extending work.
- .2    Employ skilled and experienced installer to perform alteration work.
- .3    Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.
- .4    Remove, cut, and patch Work in a manner to minimize damage and to provide means of restoring Products and finishes to original condition.
- .5    Refinish existing visible surfaces to remain in renovated rooms and spaces, to renewed condition for each material, with a neat transition to adjacent finishes.
- .6    Where new Work abuts or aligns with existing, provide a smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.

- .7 When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and submit recommendation to Consultant for review.
- .8 Where a change of plane occurs, submit recommendation for providing a smooth transition to Contract Administrator for review.
- .9 Patch or replace portions of existing surfaces which are damaged, lifted, discoloured, or showing other imperfections.
- .10 Finish surfaces as specified in individual Product sections.

#### **1.4 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Procedures for submittals.

#### **1.5 SUBMITTALS FOR CLOSEOUT**

- .1 Section 01 73 03: Procedures for submittals.
- .2 Project Record Documents: Accurately record actual locations of any capped utilities.

#### **1.6 REGULATORY REQUIREMENTS**

- .1 Conform to applicable regulations for demolition work, dust control, products requiring disconnection and re-connection of utilities and building services.
- .2 Obtain required permits from authorities.
- .3 Do not close or obstruct egress width to any building or site exit.
- .4 Do not disable or disrupt building fire or life safety systems without 3 days prior written notice to Contract Administrator.
- .5 Conform to procedures applicable when hazardous or contaminated materials are discovered.

#### **1.7 SCHEDULING**

- .1 Section 01 33 00: Work schedule.
- .2 Schedule Work to immediately prior to new construction.
- .3 Describe demolition removal procedures and schedule.
- .4 Consult with Contract Administrator prior to performing noisy, malodorous, or dusty, work to minimize disruption to occupants.

#### **PROJECT CONDITIONS**

- .5 Conduct demolition to minimize interference with adjacent and occupied building areas.

- .6 Cease operations immediately if structure appears to be in danger and notify Contract Administrator. Do not resume operations until directed.

**Part 2 Products**

Not Used
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**Part 3 Execution**

**3.1 PREPARATION**

- .1 Provide, erect, and maintain temporary barriers to ensure safety of occupants.
- .2 Erect and maintain temporary partitions to prevent spread of dust, odours, and noise to permit continued occupancy.
- .3 Protect existing materials and surfaces which are not to be demolished.
- .4 Prevent movement of structure; provide bracing and shoring.
- .5 Notify affected utility companies before starting work and comply with their requirements.
- .6 Mark location and termination of utilities.
- .7 Provide appropriate temporary signage including signage for exit or building egress.

**3.2 DEMOLITION**

- .1 Disconnect, cap or remove and identify designated utilities within demolition areas.
- .2 Demolish in an orderly and careful manner. Protect existing supporting structural members and adjacent finishes to remain.
- .3 **A quantity of concrete masonry units are to be salvaged for re-use at the abandoned doorway between Stair 115 and Apparatus Rm 114. Carefully preserve the required quantity of units.**
- .4 **The front lobby is known to contain a wall that commemorates the passing of a firefighter in the line of duty. Firefighters' signatures were written on painted drywall but have since been covered by artificial brick paneling. The drywall is to be preserved as carefully as possible and salvaged for future use elsewhere as directed by the Contract Administrator.**
- .5 Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.

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

### **3.3 SCHEDULES**

- .1 Disconnect and remove the following equipment for the Owner's retention. Deliver to location (on site storage container) designated by Contract Administrator:
  - .1 Gas range.
  - .2 Commercial Dishwasher.
  - .3 Microwaves.
  - .4 Coffee Brewer / Urns.
  - .5 Coffee Grinders.
  - .6 Chest Freezer.
  - .7 Popcorn Machine.
  - .8 Kitchen Fridges
  - .9 Kitchen slicer
  - .10 Popcorn counter
- .2 Remove (relocate and store) the following material and equipment:
  - .1 Office Furniture – Desks, Chairs.
  - .2 Free-standing lockers.
  - .3 Lounge recliner chairs.
  - .4 Beds
  - .5 Common Room Dining Tables and Chairs
  - .6 Janitor Room Shelving
- .3 Adequately protect any remaining fixtures and equipment

**END OF SECTION**

## 1. GENERAL

### 1.1. REFERENCES

- .1 Definitions:
  - .1 Dangerous Goods: product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.
  - .2 Hazardous Material: product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.
  - .3 Hazardous Waste: hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.
- .2 Reference Standards:
  - .1 Canadian Environmental Protection Act, 1999 (CEPA 1999)
    - .1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).
  - .2 Department of Justice Canada (Jus)
    - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act) [1992], (c. 34).
    - .2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).
  - .3 Green Seal Environmental Standards (GS)
    - .1 GS-11-[2008, 2nd Edition], Paints and Coatings.
    - .2 GS-36-[00], Commercial Adhesives.
  - .4 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
    - .1 Material Safety Data Sheets (MSDS).
  - .5 National Research Council Canada Institute for Research in Construction (NRC-IRC)
    - .1 National Fire Code of Canada-[2005].

### 1.2. ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for hazardous materials and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29 - Health and Safety Requirements to Contract Administrator for each hazardous material required prior to bringing hazardous material on Site.
  - .3 Construction Waste Management:
    - .1 Submit project Waste Management Plan Waste Reduction Workplan highlighting recycling and salvage requirements.
    - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50% of construction wastes were recycled or salvaged
  - .4 Low-Emitting Materials: submit listing of adhesives and sealants and paints and coatings used in building, comply with VOC and chemical component limits or restrictions requirements.

### 1.3. DELIVERY, STORAGE AND HANDLING

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

- Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to Site in original factory packaging, labelled with manufacturer's name and address.
- .3 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.
- .4 Storage and Handling Requirements:
  - .1 Co-ordinate storage of hazardous materials with Contract Administrator and abide by internal requirements for labelling and storage of materials and wastes.
  - .2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.
  - .3 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada requirements.
  - .4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.
    - .1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.
    - .2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for Work purposes requires the written approval of the Contract Administrator.
  - .5 Transfer of flammable and combustible liquids is prohibited within buildings.
  - .6 Transfer flammable and combustible liquids away from open flames or heat-producing devices.
  - .7 Solvents or cleaning agents must be non-flammable or have flash point above 38 degrees C.
  - .8 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.
  - .9 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.
  - .10 Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:
    - .1 Store hazardous materials and wastes in closed and sealed containers.
    - .2 Label containers of hazardous materials and wastes in accordance with WHMIS.
    - .3 Store hazardous materials and wastes in containers compatible with that material or waste.
    - .4 Segregate incompatible materials and wastes.
    - .5 Ensure that different hazardous materials or hazardous wastes are stored in separate containers.
    - .6 Store hazardous materials and wastes in secure storage area with controlled access.
    - .7 Maintain clear egress from storage area.
    - .8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.
    - .9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.
    - .10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.

## **2. PRODUCTS**

### **2.1. MATERIALS**

- .1 Description:
  - .1 Bring on Site only quantities hazardous material required to perform Work.
  - .2 Maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

### **2.2. CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling.
  - .1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.
  - .2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.
  - .3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.
  - .4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
  - .5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.
  - .6 Dispose of hazardous wastes in timely fashion in accordance with applicable provincial regulations.
  - .7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.
  - .8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:
    - .1 Hazardous wastes recycled in manner constituting disposal.
    - .2 Hazardous waste burned for energy recovery.
    - .3 Lead-acid battery recycling.
    - .4 Hazardous wastes with economically recoverable precious metals.

**END OF SECTION.**

## **1. GENERAL**

### **1.1. RELATED REQUIREMENTS**

- .1 Section 03 20 00 – Concrete Reinforcing
- .2 Section 03 30 00 – Cast-in-Place Concrete
- .3 Section 03 35 00 – Concrete Finishing

### **1.2. REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CSA-O86S1-05, Supplement No. 1 to CAN/CSA-O86-01, Engineering Design in Wood.
  - .3 CSA O121-M1978(R2003), Douglas Fir Plywood.
  - .4 CSA O151-04, Canadian Softwood Plywood.
  - .5 CAN/CSA-O325.0-92(R2003), Construction Sheathing.
  - .6 CSA O437 Series-93(R2006), Standards for OSB and Waferboard.
  - .7 CSA S269.1-1975(R2003), False Work for Construction Purposes.
  - .8 CAN/CSA-S269.3-M92(R2003), Concrete Form Work, National Standard of Canada
- .2 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

### **1.3. ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CSA S269.1, for false Work drawings. Comply with CAN/CSA-S269.3 for form Work drawings.
- .3 Indicate form Work design data: permissible rate of concrete placement, and temperature of concrete, in forms.
- .4 Indicate sequence of erection and removal of form Work/false Work as directed by Contract Administrator.

### **1.4. DELIVERY, STORAGE AND HANDLING**

- .1 Waste Management & Disposal:
  - .1 Separate wood materials, plastic materials and waste materials for reuse and/or recycling
  - .2 Place materials defined as hazardous or toxic in designated containers.
  - .3 Divert unused form release material from landfill to an official hazardous material collections Site as approved by the Contract Administrator.

### **1.5. MATERIALS**

- .1 Form Work materials:
  - .1 For concrete without special architectural features, use wood and wood product form Work materials to CSA-O121: Douglas Fir species; good one side grade; sound undamaged sheets with clean, true edges.
  - .2 For architectural concrete feature walls, use Medium Density Overlay panel form Work materials to CSA-A23.1/A23.2.
  - .3 Rigid insulation board: to CAN/ULC-S701 .
- .4 Pan forms: steel of size and profile as indicated.

- .5 Preformed Steel Forms: minimum 16 gauge matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.
- .6 Void Forms: Moisture resistant treated paper faces, biodegradable, structurally sufficient to support weight of wet concrete mix until initial set; thickness as specified in Drawings.
- .7 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 1-inch diameter in concrete surface.
  - .2 For Architectural concrete, use snap ties complete with 1" ø plastic cones and no concrete plugs. Refer to drawings for form tie pattern and spacing.
- .8 Form release agent: non-toxic, colourless mineral oil which will not stain concrete, or absorb moisture or impair natural bonding or colour characteristics of coating intended for use on concrete.
- .9 Form stripping agent: non-toxic, colourless mineral oil, free of kerosene, with viscosity between 70 and 110s Saybolt Universal at 40 degrees C, flashpoint minimum 150 degrees C, open cup.
- .10 False Work materials: to CSA-S269.1.
- .11 Flashing Reglets: Galvanized steel, 22 gauge thick, longest possible lengths, with alignment splines for joints, foam filled, release tape sealed slots, anchors for securing to concrete form Work.
- .12 Waterstops: Rubber, minimum 1,750 psi tensile strength, minimum 50 degrees F to plus 175 degrees F Working temperature range, 8" wide, maximum possible lengths, ribbed profile, preformed corner sections heat welded jointing.

## **2. EXECUTION**

### **2.1. EXAMINATION**

- .1 Verify lines, levels and centres before proceeding with form Work.
- .2 Ensure that dimensions agree with drawings.

### **2.2. FABRICATION AND ERECTION**

- .1 Fabricate and erect false Work in accordance with CSA S269.1
- .2 Refer to architectural drawings for concrete members requiring architectural exposed finishes.
- .3 Do not place shores and mud sills on frozen ground.
- .4 Provide Site drainage to prevent washout of soil supporting mudsills and shores.
- .5 Fabricate and erect form Work 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.
- .6 Align form joints and make watertight.
  - .1 Keep form joints to minimum.
  - .2 Caulk or gasket form joints to maintain seal under vibration.
- .7 Locate horizontal form joints for exposed columns 96" above finished floor elevation.
- .8 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .9 Construct forms for architectural concrete, and place ties as indicated and as directed.
  - .1 Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.
- .10 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.

**2.3. APPLICATION – FORM RELEASE AGENT**

- .1 Apply form release agent on form Work in accordance with manufacturer's recommendations.
- .2 Apply prior to placement of reinforcing steel, anchoring devices and embedded items.
- .3 Do not apply form release agent where concrete surfaces will receive special finished, which are effected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

**2.4. INSERTS, EMBEDDED PARTS AND OPENINGS**

- .1 Provide formed openings where required for items to be embedded into passing through concrete Work.
- .2 Locate and set in place items that will be cast directly into concrete.
- .3 Coordinate with Work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts and components of other Work.
- .4 Install accessories in accordance with manufacturer's written instructions, straight, level and plumb. Ensure items are not disturbed during concrete placement.
- .5 Install waterstops in accordance with manufacturer's written instructions continuous without displacing reinforcement. Heat seal joints watertight.
- .6 Provide temporary ports or openings in form Work where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
- .7 Close temporary openings with tight fitting panels, flush with inside face of forms and neatly fitted so joints will not be apparent in exposed concrete surfaces.

**2.5. FORM CLEANING**

- .1 New forms to be washed with a cement paste prior to being used for the first time, dissolving sugars in the wood that can cause discoloration of concrete.
- .2 Clean forms as erection proceeds, to remove foreign matter within forms.
- .3 Clean formed cavities of debris prior to placing concrete.
- .4 Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
- .5 During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless form Work and concrete construction proceed within heated enclosure, Use compressed air or other means to remove foreign matter.

**2.6. FORM WORK TOLERANCES**

- .1 Construct form Work to maintain tolerances in accordance with standards listed on Structural Drawings
- .2 Camber slabs and beams as per structural requirements.

**2.7. FORM WORK QUALITY CONTROL**

- .1 Section 01 45 00: Quality Control
- .2 Inspect erected form Work, shoring, and bracing to ensure that Work is in accordance with form Work design, and that supports, fastenings, wedges, ties and items are secure.
- .3 Re-use of form Work subject to requirements of CSA-A23.1/A23.2 and standards listed on Structural Drawings. Do not patch form Work.

**2.8. FORM REMOVAL AND RESHORING**

- .1 Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- .2 Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- .3 Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.
- .4 Leave form Work in place for following minimum periods of time after placing concrete:
  - .1 Walls, columns, and beam sides: Concrete curing temperature of:
    - .1 21 degrees C – 35 degrees C = 2 days
    - .2 16 degrees C – 21 degrees C = 3 days
    - .3 10 degrees C – 16 degrees C = 4 days
  - .2 Beams, soffits, slabs, decks and other structural members: Concrete curing temperature of:
    - .1 21 degrees C – 35 degrees C = 14 days
    - .2 16 degrees C – 21 degrees C = 17 days
    - .3 10 degrees C – 16 degrees C = 21 days
- .5 Remove form Work when concrete has reached 75 % of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.
- .6 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.
- .7 Space reshoring in each principal direction at not more than 10' apart.
- .8 Re-use form Work and false Work subject to requirements of CSA-A23.1/A23.2.

**END OF SECTION.**

## **1. GENERAL**

### **1.1. RELATED REQUIREMENTS**

- .1 Section 03 10 00 – Concrete Forming & Accessories
- .2 Section 03 30 00 – Cast-in-Place Concrete
- .3 Section 03 35 00 – Concrete Finishing

### **1.2. PRICE AND PAYMENT PROCEDURES**

- .1 Measurement and Payment:
  - .1 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.

### **1.3. REFERENCES**

- .1 American Concrete Institute (ACI)
  - .1 SP-66-04, ACI Detailing Manual 2004.
- .2 ASTM International
  - .1 ASTM A 82/A 82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
  - .2 ASTM A 143/A 143M-07, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
  - .3 ASTM A 185/A 185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
  - .4 ASTM A 775/A 775M-07b, Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
- .3 CSA International
  - .1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
  - .2 CAN/CSA-A23.3-04(R2010), Design of Concrete Structures.
  - .3 CSA-G30.18-09, Carbon Steel Bars for Concrete Reinforcement.
  - .4 CSA-G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .5 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .6 CSA W186-M1990(R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .4 Reinforcing Steel Institute of Canada (RSIC)
  - .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

### **1.4. ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice and SP-66.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by Professional Engineer registered or licensed in the Province of Manitoba, Canada.

- .1 Indicate placing of reinforcement and:
  - .1 Bar bending details.
  - .2 Lists.
  - .3 Quantities of reinforcement.
  - .4 Sizes, spacing, 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.
- .2 Detail lap lengths and bar development lengths to CAN/CSA-A23.3, unless otherwise noted.

#### **1.5. QUALITY ASSURANCE**

- .1 Perform Work in accordance with CSA-A23.1/A23.2 standards listed on Structural Drawings.
- .2 Submit in accordance with Section 01 45 00 - Quality Control and as described in PART 2 - SOURCE QUALITY CONTROL.
  - .1 Mill Test Report: upon request, provide Contract Administrator with certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning reinforcing Work.
  - .2 Upon request submit in writing Contract Administrator proposed source of reinforcement material to be supplied.

#### **1.6. DELIVERY, STORAGE AND HANDLING**

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

### **2. PRODUCTS**

#### **2.1. MATERIALS**

- .1 Substitute different bar sizes only if permitted in writing by Contract Administrator.
- .2 Reinforcing steel: billet steel, grade 400, deformed bars to CSA-G30.18, unless indicated otherwise.
- .3 Reinforcing steel: weldable low alloy steel deformed bars to CSA-G30.18.
- .4 Cold-drawn annealed steel wire ties: to ASTM A 82/A 82M.
- .5 Deformed steel wire for concrete reinforcement: to ASTM A 82/A 82M.
- .6 Welded steel wire fabric: provide in flat sheets only to ASTM A185/A185M.
- .7 Welded deformed steel wire fabric: provide in flat sheets only to ASTM A82/A82M.
- .8 Epoxy Coating of non-prestressed reinforcement: to ASTM A 775/A 775M.
- .9 Galvanizing of non-prestressed reinforcement: to CAN/CSA-G164, minimum zinc coating 610 g/m<sup>2</sup>.
  - .1 Protect galvanized reinforcing steel with chromate treatment to prevent reaction with Portland cement paste.
  - .2 If chromate treatment is carried out immediately after galvanizing, soak steel in aqueous solution containing minimum 0.2% by weight sodium dichromate or 0.2% chromic

acid.

- .1 Temperature of solution equal to or greater than 32 degrees and galvanized steels immersed for minimum 20 seconds.
- .3 If galvanized steels are at ambient temperature, add sulphuric acid as bonding agent at concentration of 0.5% to 1%.
  - .1 In this case, no restriction applies to temperature of solution.
- .4 Chromate solution sold for this purpose may replace solution described above provided it is of equivalent effectiveness.
  - .1 Provide product description as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
- .10 Chairs, bolsters, bar supports, spacers: sized and shaped for strength and support of reinforcement during concrete placement conditions including load bearing pad on bottom to prevent vapour barrier puncture to CSA-A23.1/A23.2.
- .11 Mechanical splices: subject to approval of Contract Administrator.
- .12 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 Obtain Contract Administrator's written approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Upon approval of Contract Administrator, weld reinforcement in accordance with CSA W186.
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

## **2.3. SOURCE QUALITY CONTROL**

- .1 Provide Contract Administrator with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to beginning reinforcing Work.
- .2 Inform Contract Administrator of proposed source of material to be supplied.

## **3. EXECUTION**

### **3.1. PREPARATION**

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

### **3.2. 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.

### **3.3. PLACING REINFORCEMENT**

- .1 Place reinforcing steel as indicated on structural drawings and placing drawings and in accordance with CSA-A23.1/A23.2.
- .2 Use plain round bars as slip dowels in concrete.
  - .1 Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint.

- .2 When paint is dry, apply thick even film of mineral lubricating grease.
- .3 Ensure cover to reinforcement is maintained during concrete pour.
- .4 Do not displace or damage vapour barrier.
- .5 Accommodate placement of formed openings.
- .6 Prior to placing concrete, obtain Contract Administrator approval of reinforcing material and placement.

**3.4. CLEANING**

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

**END OF SECTION.**

## **1. GENERAL**

### **1.1. RELATED REQUIREMENTS**

- .1 Section 03 10 00 – Concrete Forming and Accessories
- .2 Section 03 20 00 – Concrete Reinforcing
- .3 Section 03 35 00 – Concrete Finishing

### **1.2. REFERENCES**

- .1 ASTM International
  - .1 ASTM A 185/A 185M-[07], Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
  - .2 ASTM D 1751-[04], Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non extruding and Resilient Bituminous Types).
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-19.24-[M90], Multicomponent, Chemical-Curing Sealing Compound.
- .3 CSA International
  - .1 CSA-A23.1/A23.2-[2004], Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CSA A3000-[08], Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
  - .3 CAN/CSA-G30.18-[M92(R2002)], Billet-Steel Bars for Concrete Reinforcement.

### **1.3. ADMINISTRATIVE REQUIREMENTS**

- .1 Pre-installation Meetings: in accordance with Section 01 32 16 - Construction Progress Schedules, convene pre-installation meeting one week prior to beginning concrete Works.
  - .1 Ensure key personnel, Site supervisor, Contract Administrator, specialty contractor - finishing, forming, concrete producer and testing laboratories attend.
    - .1 Verify project requirements.

### **1.4. ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
  - .1 Submit placing drawings prepared in accordance with plans to clearly show size, shape, location and necessary details of reinforcing.
- .3 At least 4 weeks prior to beginning Work, provide Contract Administrator with Product Data Sheets of materials proposed for use as follows: curing compound, each type of joint filler, each type of waterstops, each type of supplementary cementing material, each type of blended hydraulic cement, each admixture and each fine and coarse aggregate.
- .4 Provide testing, inspection results and reports for review by Contract Administrator and do

not proceed without written approval when deviations from mix design or parameters are found.

- .5 Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in Part 3 – Field Quality Control.

#### **1.5. QUALITY ASSURANCE**

- .1 Quality Assurance: in accordance with Section 01 45 00 – Quality Control.
- .2 Provide Contract Administrator, minimum 4 weeks prior to starting concrete Work, with valid and recognized certificate from plant delivering concrete.
  - .1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.
- .3 Test and Evaluation Reports:
  - .1 Provide certified test reports in accordance with Section 01 29 83 – Payment Procedures and Testing Laboratory Services.
  - .2 Test reports to certify compliance of concrete with specified performance characteristics and physical properties.
- .4 Perform Work in accordance with standards listed on Structural Drawings.
- .5 Acquire cement and aggregate from same source for all Work.
- .6 Minimum 4 weeks prior to starting concrete Work, provide proposed quality control procedures for review by Contract Administrator on following items: false Work erection, hot weather concrete, cold weather concrete, curing, finishes, form Work removal and joints.
- .7 Quality Control Plan: provide written report to Contract Administrator verifying compliance that concrete in place meets performance requirements of concrete as established in Part 2 – Products.
- .8 Sustainability Standards Certification:

#### **1.6. MOCK-UP**

- .1 Construct mock-up for Architectural concrete using same procedures, equipment, and materials that will be used for production of cast-in-place architectural concrete, including curing procedures.
  - .1 West wall to be constructed as mockup.
  - .2 For walls, include vertical, horizontal, and rustication joints. Demonstrate methods of repair, curing, aggregate exposure, finishing, sealers, and coating. Construct mockup to include a minimum of two lifts having heights planned for placement of architectural concrete.
- .2 Upon direction of Contract Administrator provide a simulated repair area to determine an acceptable repair procedure. Repair procedure shall be suitable to provide an acceptable color and texture match. Maintain and protect the mock-up until final acceptance of Architectural concrete.
- .3 Obtain Contract Administrator's approval of mockup before proceeding with remainder of Work.
- .4 Approved mockup to be incorporated into the Work.
- .5 Upon completion of architectural concrete, final acceptance is based upon matching the

architectural cast-in-place concrete with the accepted field mock-up. Defective Work, including repair areas not accepted, shall be removed and replaced.

### **1.7. DELIVERY, STORAGE AND HANDLING**

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

## **2. PRODUCTS**

### **2.1. DESIGN CRITERIA**

- .1 Performance: to CSA A23.1/A23.2, and as described in Mixes of Part 2 – Products.

### **2.2. PERFORMANCE CRITERIA**

- .1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Contract Administrator and provide verification of compliance as described in Part 1 - Quality Assurance.

### **2.3. MATERIALS**

- .1 Portland Cement: to CSA A3001, Type GU (general use) or HS (high sulphate-resistant) as specified on the drawings. White Portland Cement to be used for exposed cast-in-place walls as indicated on the drawings.
- .2 Supplementary cementing materials: to CSA A3001.
- .3 Aggregates: to CSA A23.1/A23.2
- .4 Water: to CSA A23.1.
- .5 Admixtures:
  - .1 Air Entrainment: to ASTM C260.
  - .2 Chemical Admixtures: to ASTM C494 and ASTM C1017. Contract Administrator to approve accelerating or set retarding admixtures during cold weather and hot weather placing.
- .6 Shrinkage compensating grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents to CSA A23.1/A23.2
  - .1 Compressive strength: 17 MPa at 48 hours and 58 MPa at 28 days
- .7 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 56 MPa at 28 days.
- .8 Curing compound: to CSA A23.1/A23.2
- .9 Mechanical waterstops: ribbed extruded PVC of sizes indicated with prewelded corner and intersecting pieces: tensile strength and elongation to ASTM D412 with tear resistance to ASTM D624.
- .10 Premoulded joint filler: bituminous impregnated fiber board to ASTM D1751.

- .11 Weep hole tubes: galvanized steel.
- .12 Polyethylene film: 0.15mm thickness to CAN/CGSB-51.34

#### **2.4. CONCRETE MIX**

- .1 Performance Method for specifying concrete: to meet Contract Administrator performance criteria to CSA A23.1/A23.2
  - .1 Ensure concrete supplier meets performance criteria for the concrete mixes specified on the drawings and provide verification of compliance as in Quality Control Plan.
  - .2 Provide quality management plan to ensure verification of concrete quality to specified performance.
  - .3 Concrete supplier's certification: both batch plant and materials meet CSA A23.1 requirements.

### **3. EXECUTION**

#### **3.1. PREPARATION**

- .1 Obtain Contract Administrator's written approval before placing concrete.
  - .1 Provide 24 hours minimum notice prior to placement.
- .2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.
- .3 During concreting operations:
  - .1 Development of cold joints not allowed.
  - .2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.
- .4 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .5 Prior to placing of concrete obtain Contract Administrator's approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .6 Protect previous Work from staining.
- .7 Clean and remove stains prior to application of concrete finishes.
- .8 Verify all dimensions, locations, openings, embedments and anchor, seat, plate locations required on drawings.
- .9 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .10 Do not place load upon new concrete until authorized by Contract Administrator.

#### **3.2. INSTALLATION/APPLICATION**

- .1 Do cast-in-place concrete Work in accordance with CSA A23.1/A23.2.
- .2 Sleeves and inserts:
  - .1 Where approved by Contract Administrator, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere.
  - .2 Confirm locations and sizes of sleeves and openings shown on drawings.
  - .3 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain written approval of modifications from Contract Administrator before placing concrete.
  - .4 Sleeves and openings greater than 4" x 4" not indicated, must be reviewed by Contract Administrator.
  - .5 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.
- .3 Anchor bolts:
  - .1 Set anchor bolts to templates in co-ordination with appropriate trade and reviewed shop drawings prior to placing concrete.
  - .2 Protect anchor bolt holes from water accumulations and snow and ice build-ups.

- .4 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 after concrete has set.
  - .2 Install weep hole tubes and drains as indicated
- .5 Grout under base plates using procedures in accordance with manufacturer's recommendations that result in 100% contact over grouted area.
- .6 Place concrete in its final position as soon as possible after mixing and must be placed within 2 hours after water has been added to dry materials. Do not use any concrete after more than 2 hours or having a partial set before placing.
- .7 Install vapour retarder under interior slabs on grade. Lap joints minimum 12" and seal watertight by sealant applied between overlapping edges and ends.
- .8 Separate slabs on grade from vertical surfaces with ½" thick joint filler. Extend joint filler from bottom of slab to within ½" of finished slab surface.

### **3.3. FINISHING AND CURING**

- .1 Finish concrete floor to CSA A23.1/A23.2. Class A.
- .2 Use procedures as reviewed by Contract Administrator or those noted in CSA A23.1/A23.2 to remove excess bleed water. Ensure surface is not damaged.
- .3 Use curing compounds compatible with applied finish on concrete surfaces. Provide written declaration that compounds used are compatible.
- .4 Rub exposed sharp edges of concrete with carborundum to produce 3mm minimum radius edges unless otherwise indicated.
- .5 Formed surfaces exposed to view: light sanded finish in accordance with CSA A23.1/A23.2. Mockup area to be tested on Mockup wall as directed by Contract Administrator for approval before finishing remaining surface of Work.

### **3.4. JOINT FILLERS**

- .1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Contract Administrator
- .2 When more than one piece is required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.
- .3 Locate and form isolation, construction and expansion joints as indicated.
- .4 Install joint filler.
- .5 Use 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 otherwise indicated.

### **3.5. WATERSTOPS**

- .1 Install waterstops to provide continuous water seal.
- .2 Do not distort or pierce waterstop in any manner to hamper performance.
- .3 Do not displace reinforcement when installing waterstops.
- .4 Use equipment to manufacturer's requirements to field splice waterstops.
- .5 Tie waterstops rigidly in place.
- .6 Use only straight heat sealed butt joints in field.
- .7 Use factory welded corners and intersections unless otherwise approved by Contract Administrator.

### **3.6. SURFACE TOLERANCE**

- .1 Concrete tolerance to CSA A23.1 Straightedge Method for Class A floor finish.

### **3.7. FIELD QUALITY CONTROL**

- .1 Site tests: conduct test as follows and in accordance with Section 01 45 00 –Quality

Control and submit report as described in Part 1 – Action and Informational Submittals.

- .1 Concrete pours, slump, air content, compressive strength at (7 and 28) or (7 and 56) days as specified in the mix design and air and concrete temperature.
- .2 Inspection and testing of concrete and concrete materials will be carried out by an independent testing laboratory approved by the Contract Administrator.
  - .1 Ensure testing laboratory is certified to CSA A283.
- .3 Ensure test results are distributed for discussion at pre-pouring concrete meeting between testing laboratory and Contract Administrator.
- .4 Pay for costs of test as specified in Section 01 29 83 – Payment Procedures and Laboratory Testing.
- .5 Contractor to take additional test cylinders during cold weather concreting. Cure cylinders on job Site under same conditions as concrete in which they represent.
- .6 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2
- .7 Inspection or testing by Contract Administrator will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.
- .8 Type, quantity and frequency of testing to be in accordance with CAN/CSA A23.1/A23/2
- .9 Allow Contract Administrator to inspect concrete surfaces immediately upon removal of forms. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Contract Administrator immediately upon discovery.

**3.8. CLEANING**

- .1 Clean in accordance with Section 01 74 11 – Cleaning and Section 01 74 19 – Waste Management and Disposal..

**3.9. DEFECTIVE CONCRETE**

- .1 Defective Concrete: 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 Modify or replace concrete not conforming to lines, detail and elevations indicated on drawings.
- .4 Do not patch, fill, touch-up, repair or replace exposed concrete except under express direction of Contract Administrator for each individual area.

**END OF SECTION**

## **1. GENERAL**

### **1.1. RELATED REQUIREMENTS**

- .1 Section 03 10 00 – Concrete Forming
- .2 Section 03 30 00 – Cast-in-Place Concrete

### **1.2. REFERENCES**

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-25.20-95, Surface Sealer for Floors.
- .2 CSA International
  - .1 CAN/CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction//Methods of Test for Concrete.

### **1.3. PERFORMANCE REQUIREMENTS**

- .1 Product quality and quality of Work in accordance with Section 01 61 00 – Common Product Requirements.
- .2 Submit written declaration that compounds used are compatible and will not adversely affect finished flooring products and their installation adhesives.

### **1.4. PRODUCT DATA**

- .1 Submit product data in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Include application instructions for concrete floor treatment.

### **1.5. WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.
- .2 Place materials in defined hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from public.
- .4 Use chemical hardener that are no-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.
- .6 Dispose of waste from stripping of floor in a manner that will not have unfavorable effect on the environment.

### **1.6. ENVIRONMENTAL REQUIREMENTS**

- .1 Temporary lighting:
  - .1 Minimum 1200 W light source, placed 2.5 m above floor surface, for each 40 sq m of floor being treated.
- .2 Electrical power:
  - .1 Provide sufficient electrical power to operate equipment normally used during construction.
- .3 Work area:
  - .1 Make Work area water tight protected against rain and detrimental weather conditions.
- .4 Temperature:
  - .1 Maintain ambient temperature of not less than 10 degrees C from 7 days before installation to at least 48 hours after completion of Work and maintain relative

humidity not higher than 40% during same period.

- .5 Moisture:
  - .1 Ensure concrete substrate is within moisture limits prescribed by flooring manufacturer.
- .6 Safety:
  - .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.
- .7 Ventilation:
  - .1 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.
  - .2 Provide continuous ventilation during and after coating application.

### **1.7. DELIVERY, STORAGE AND HANDLING**

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

## **2. PRODUCTS**

### **2.1. MATERIALS**

- .1 Water: potable.
- .2 Hardener: Two-step process used to harden and seal newly poured concrete floors. Hardener is a dry, granular mixture of Portland Cement and non-metallic hardening agents used for concrete floors exposed to abrasive and light to medium traffic.
  - .1 Standard of Acceptance:
    - .1 CPD Floor Hardener Pre-Mix (premium)
- .3 Sealant: Water based acrylic curing, sealing, and dustproofing compound; solution of chemically active hardening agents; clear.
  - .1 Standard of Acceptance:
    - .1 CPD Acrylic Cure and Seal WB
- .4 Joint sealants to Section 07 92 00 – Joint Sealants.

### **2.2. MIXES**

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

## **3. EXECUTION**

### **3.1. EXAMINATION**

- .1 Verify existing conditions before starting Work.
- .2 Ensure surfaces are clean, dry and free of contaminants.
- .3 Ensure new concrete has cured minimum 28 days.
- .4 Ensure ambient temperature is minimum 10 degrees Celsius and substrate temperature is minimum 4 degrees Celsius.
- .5 Apply sealer only after the disappearance of all surface moisture.
- .6 Do not apply material if rain is predicted within six hours after application to exterior surfaces.

### **3.2. PREPARATION**

- .1 Surfaces must be clean, dry, and free of all loose dirt, oil, wax, sealer, curing and parting compounds, and other foreign matter. Clean substrate surfaces to manufacturer's written instructions.
- .2 Acid wash or shot-blast steel trowelled surfaces, or surface harder installed floors.

- .3 Perform application on minimum 9 square feet test section; obtain approval of test section from Contract Administrator before proceeding with application.
- .4 Saw cut control joints to CSA A23.1, maximum 24 hours after placing concrete.

**3.3. APPLICATION**

- .1 After floor treatment is dry, seal control joints and joints at junction with vertical surfaces with sealant.
- .2 Apply floor treatment in accordance with Sealer manufacturer's written instructions.
- .3 Finish concrete floor surfaces in accordance with CAN3-A23.1M.
- .4 Clean over spray. Clean sealant from adjacent surfaces.
- .5 Uniformly spread, screed and float concrete. Do not use grate tampers or mesh rollers. Do not spread concrete by vibration.
- .6 Apply hardener on concrete floor surfaces that do not receive additional flooring material in accordance with manufacturers written instructions.
- .7 Apply sealer on floor surfaces to receive hardener. Apply in accordance to manufacturers written instructions.
- .8 Interior floor slabs to be left exposed to receive floor covering requiring smooth surface: initial finishing operations followed by final finishing comprising mechanical floating and steel trowelling as specified in CSA A23.1/A23.2 to produce hard, smooth, dense trowelled surface free from blemishes.
- .9 In areas with floor drains maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal slope.
- .10 Equipment pads: provide smooth trowelled surface.
- .11 Pavements, walks, curbs and exposed Site concrete:
  - .1 Screed to plane surfaces and use aluminum floats.
  - .2 Provide round edges and joint spacing using standard tools.
  - .3 Trowel smooth to provide lightly brushed non-slip finish perpendicular to the direction of travel.

**3.4. CLEANING**

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

**3.5. PROTECTION**

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

**END OF SECTION.**

## **1. GENERAL**

### **1.1. RELATED REQUIREMENTS**

- .1 Section 03 10 00 – Concrete Forming
- .2 Section 03 30 00 – Cast-in-Place Concrete
- .3 Section 03 35 00 – Concrete Finishing

### **1.2. REFERENCES**

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-25.20-95, Surface Sealer for Floors.
- .2 CSA International
  - .1 CAN/CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction//Methods of Test for Concrete.

### **1.3. ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
  - .1 Provide drawings that indicate the locations of all joint in concrete slabs, including construction joints, expansion joints, isolation joints, weakened plane joints and contraction joints. Coordinate with the requirements specified in Section 03 10 00 – Concrete Forming.
- .3 Product Data:
  - .1 Provide manufacturer's printed product literature and data sheets for concrete finishes and include product characteristics, performance criteria, physical size, finish and limitations.
    - .1 Provide two copies of WHMIS MSDS in accordance with Section 01 35 29 - Health and Safety Requirements. WHMIS MSDS acceptable to Labour Canada and Health and Welfare Canada for concrete floor treatment materials. Indicate VOC content in g/L.
    - .2 Include application instructions for concrete floor treatment[s].

### **1.4. ENVIRONMENTAL REQUIREMENTS**

- .1 Temporary lighting:
  - .1 Minimum 1200 W light source, placed 2.5 m above floor surface, for each 40 sq m of floor being treated.
- .2 Electrical power:
  - .1 Provide sufficient electrical power to operate equipment normally used during construction.
- .3 Work area:
  - .1 Make Work area water tight protected against rain and detrimental weather conditions.
- .4 Temperature:
  - .1 Maintain ambient temperature of not less than 10° C from 7 days before installation to at least 48 hours after completion of Work and maintain relative humidity not higher than 40% during same period.
- .5 Moisture:

- .1 Ensure concrete substrate is within moisture limits prescribed by flooring manufacturer.
- .6 Safety:
  - .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.
- .7 Ventilation:
  - .1 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.
  - .2 Provide continuous ventilation during and after coating application.

**1.5. DELIVERY, STORAGE AND HANDLING**

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

**2. PRODUCTS**

**2.1. PERFORMANCE REQUIREMENTS**

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

**2.2. CONCRETE HARDENER & DUSTPROOFER**

- .1 Chemical clear liquid hardener, which produces a dense, hard, dustproof concrete surface, manufactured specifically for the intended purpose.

**2.3. SEALING COMPOUNDS**

- .1 Surface sealer: to CAN/CGSB-25.20, Type 2 - water based, clear.
- .2 Sealants: maximum VOC limit 250 g/L
- .3 Surface sealer: acrylic carnuba wax
- .4 Surface sealers are not manufactured or formulated with aromatic solvents, formaldehyde, mercury, lead, hexavalent chromium and their compounds.

**2.4. CURING MATERIALS**

- .1 Refer to Section 03 35 00 Concrete Finishing for requirements.
- .2 Provide for damp curing only. Curing compound will not be permitted on floors to receive concrete hardener and dustproofers.

**2.5. MIXES**

- .1 Cement to be normal type 10.
- .2 Concrete strength at 28 days to be 25MPa.
- .3 Minimum fly ash content 10%, maximum 15%.
- .4 Maximum coarse aggregate size 10mm.
- .5 Maximum slump 50mm +/- 20mm.
- .6 Mixing ratios in accordance with manufacturer's written instructions.

**3. EXECUTION**

**3.1. EXAMINATION**

- .1 Verify that slab, substrate, Site conditions surfaces are ready to receive Work and elevations are as indicated on shop drawings.

**3.2. PREPARATION**

- .1 At a minimum 48 hours prior to placement, notify Contract Administrator of the intention to deliver and place concrete.
- .2 Before placing concrete, broom clean structural slab surfaces and install bond breaker membrane where indicated.

**3.3. APPLICATION**

- .1 Apply concrete finishing floor hardener in accordance with manufacturers written instructions.
- .2 After floor treatment is dry, seal control joints and joints at junction with vertical surfaces with sealant.
- .3 Apply floor treatment in accordance with sealer manufacturers written instructions.
- .4 Clean over spray. Clean sealant from adjacent surfaces.

**3.4. CLEANING**

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

**3.5. PROTECTION**

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

**END OF SECTION.**

## 1. GENERAL

### 1.1. RELATED REQUIREMENTS

- .1 Section 04 22 00 – Concrete Unit Masonry

### 1.2. REFERENCES

- .1 Canadian Standards Association (CSA International)
  - .1 CSA-A165 Series-[04], Standards on Concrete Masonry Units.
  - .2 CSA A179-[04], Mortar and Grout for Unit Masonry.
  - .3 CSA-A371-[04], Masonry Construction for Buildings.
- .2 International Masonry Industry All-Weather Council (IMIAC)
  - .1 Recommended Practices and Guide Specification for Hot and Cold Weather Masonry Construction.

### 1.3. ADMINISTRATIVE REQUIREMENTS

- .1 Pre-installation meetings: comply with Section 01 31 19 - Project Meetings. Conduct pre-installation meeting one week prior to commencing work of this Section to:
  - .1 Verify project requirements, including mock-up requirements.
  - .2 Verify substrate conditions.
  - .3 Co-ordinate products, installation methods and techniques.
  - .4 Sequence Work of related sections.
  - .5 Co-ordinate with other building sub trades.
  - .6 Review manufacturer's installation instructions.
  - .7 Review masonry cutting operations, methods and tools and determine worker safety and protection from dust during cutting operations.
  - .8 Review warranty requirements.
- .2 Sequencing: sequence with other work in accordance with Section 01 32 16 - Construction Progress Schedules. Comply with manufacturer's written recommendations for sequencing construction operations.
- .3 Scheduling: schedule with other work in accordance with Section 01 32 16 - Construction Progress Schedules.

### 1.4. ACTION SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, limitations and colours.
  - .2 Provide two copies of Workplace Hazardous Materials Information System (WHMIS) - Material Safety Data Sheets (MSDS)
- .3 Samples:
  - .1 Provide samples as follows:
    - .1 Two of each type of concrete masonry unit, clay brick specified.
    - .2 Two cured, and coloured samples of mortar and grout, illustrating mortar colour and colour range, supplemented with specific requirements in Section 04 05 12 - Masonry Mortar and Grout.
    - .3 Samples: used for testing and when accepted become standard for material used.
- .4 Shop Drawings:
  - .1 Provide drawings stamped and signed by Professional Engineer registered or licensed in the Province of Manitoba, Canada.
  - .2 Provide shop drawings detailing temporary bracing required, designed to resist wind pressure and lateral forces during installation.
- .5 Sustainable Design Submittals:

**1.5. INFORMATION SUBMITTALS**

- .1 Certificates: provide manufacturer's product certificates certifying materials comply with specified requirements.
- .2 Test and Evaluation Reports:
  - .1 Provide certified test reports in accordance with Section 01 29 83 – Payment Procedures and Testing Laboratory Services.
  - .2 Test reports to certify compliance of masonry units and mortar ingredients with specified performance characteristics and physical properties.
  - .3 Provide data for masonry units, in addition to requirements set out in referenced CSA and ASTM Standards, indicating initial rates of absorption.
- .3 Installer Instructions: provide manufacturer's installation instructions, including storage, handling, safety and cleaning.
- .4 Manufacturer's Reports: provide written reports prepared by manufacturer's on-Site personnel to include:
  - .1 Verification of compliance of work with Contract.
  - .2 Site visit reports providing detailed review of installation of work, and installed work.

**1.6. CLOSEOUT SUBMITTALS**

- .1 Provide manufacturer's instructions for care, cleaning and maintenance of prefaced masonry units for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

**1.7. EXTRA MATERIALS**

- .1 Provide manufacturer's instructions in accordance with Section 01 78 00 - Closeout Submittals covering maintenance requirements and parts catalogue, with cuts and identifying numbers.

**1.8. QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Manufacturer: capable of providing field service representation during construction and approving application method.
  - .2 Installer: experienced in performing work of this section who has specialized in installation of Work similar to that required for this project.
  - .3 Masons: company or person specializing in masonry installations with 5 years documented experience with masonry work similar to this project.
    - .1 Masons employed on this project must demonstrate ability to reproduce mock-up standards.
- .2 Mockups:
  - .1 Construct mockups in accordance with Section 01 45 00 – Quality Control.
  - .2 Construct mockup panel of exterior masonry wall construction 1200x1800mm showing masonry colours and textures, use of reinforcement, ties, through-wall flashing, weep holes, jointing, coursing, mortar and workmanship.
  - .3 Mockup used to judge workmanship, substrate preparation, operation of equipment and material application.
  - .4 Construct mockup where directed by Contract Administrator.
  - .5 Allow 24 hours for inspection of mockup by Contract Administrator before proceeding with Work.
  - .6 When accepted by Contract Administrator, mockup will demonstrate minimum standard for this work. Mockup may remain as part of finished Work.
  - .7 Start Work only upon receipt of written acceptance of mockup by Contract Administrator.

**1.9. DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver, store and handle materials in accordance with manufacturers written instructions.
- .3 Storage and Handling Protection:
  - .1 Keep materials dry until use.
  - .2 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

#### **1.10. SITE CONDITIONS**

- .1 Ambient Conditions: assemble and erect components when temperatures are above 5 degrees C.
- .2 Weather Requirements: to CSA-A371 and to IMIAC - Recommended Practices and Guide Specifications for Hot and Cold Weather Masonry Construction.
- .3 Cold weather requirements:
  - .1 To CSA-A371 with following requirements.
    - .1 Maintain temperature of mortar between 5 degrees C and 50 degrees C until batch is used or becomes stable.
    - .2 Maintain ambient temperature of masonry Work and its constituent materials between 5 degrees C and 50 degrees C and protect site from wind-chill.
    - .3 Maintain temperature of masonry above 0 degrees C for minimum of 7 days, after mortar is installed.
    - .4 Preheat unheated wall sections in enclosure for minimum 72 hours above 10 degrees C, before applying mortar.
  - .2 Hot weather requirements:
    - .1 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.
    - .2 Keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until masonry work is completed and protected by flashings or other permanent construction.
  - .3 Spray mortar surface at intervals and keep moist for maximum of three days after installation.

### **2. PRODUCTS**

#### **2.1. MANUFACTURERS**

- .1 Ensure manufacturers have minimum 5 years' experience in manufacturing components similar to or exceeding requirements of project.

#### **2.2. MATERIALS**

- .1 Masonry materials are specified elsewhere in related Sections:
  - .1 Section 04 22 00 – Concrete Unit Masonry
  - .2 Section 04 21 13 – Brick masonry

### **3. EXECUTION**

#### **3.1. INSTALLERS**

- .1 Experienced and qualified masons to carry out erection, assembly and installation of masonry Work.

#### **3.2. 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.

### 3.3. EXAMINATION

- .1 Examine conditions, substrates and Work to receive Work of this Section.
- .2 Examine openings to receive masonry units. Verify opening size, location, and that opening is square and plumb, and ready to receive Work of this Section.
  - .1 Inform Contract Administrator of unacceptable conditions immediately upon discovery.
  - .2 Proceed with installation after unacceptable conditions have been remedied and after receipt of written approval from Contract Administrator.
- .3 Verification of Conditions:
  - .1 Verify that:
    - .1 Substrate conditions that have been previously installed under other sections or contracts are acceptable for product installation in accordance with manufacturer's instructions prior to installation of concrete block.
    - .2 Field conditions are acceptable and are ready to receive Work.
    - .3 Built-in items are in proper location, and ready for roughing into masonry Work.
  - .2 Commencing installation means acceptance of existing substrates.

### 3.4. PREPARATION

- .1 Surface Preparation: prepare surface in accordance with manufacturer's written recommendations.
- .2 Establish and protect lines, levels, and coursing.
- .3 Protect adjacent materials from damage and disfiguration.

### 3.5. INSTALLATION

- .1 Do masonry Work in accordance with CSA-A371 except where specified otherwise.
- .2 Build masonry plumb, level, and true to line, with vertical joints in alignment, respecting construction tolerances permitted by CSA-A371.
- .3 Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

### 3.6. CONSTRUCTION

- .1 Exposed masonry:
  - .1 Remove chipped, cracked, and otherwise damaged units, in accordance with CSA A-165, in exposed masonry and replace with undamaged units.
- .2 Jointing:
  - .1 Allow joints to set just enough to remove excess water, and then tool with round jointer to provide smooth, joints true to line, compressed, uniformly concave joints where concave joints are indicated.
  - .2 Allow joints to set just enough to remove excess water, then rake joints uniformly to 6mm depth and compress with square tool to provide smooth, compressed, raked joints of uniform depth where raked joints are indicated.
  - .3 Strike flush joints concealed in walls and joints in walls to receive plaster, tile, insulation, or other applied material except paint or similar thick finish coating.
- .3 Cutting:
  - .1 Cut out for electrical switches, outlet boxes, and other recessed or built-in objects.
  - .2 Make cuts straight, clean, and free from uneven edges.
- .4 Building-In:
  - .1 Build in items required to be built into masonry.
  - .2 Prevent displacement of built-in items during construction. Check plumb, location and alignment frequently, as Work progresses.
  - .3 Brace door jambs to maintain plumb. Fill spaces between jambs and masonry with mortar.
- .5 Wetting of bricks:

- .1 Except in cold weather, wet bricks having initial rate of absorption exceeding 1 g/minute/1000 mm<sup>2</sup>: wet to uniform degree of saturation, 3 to 24 hours before laying, and do not lay until surface dry.
- .2 Wet tops of walls built of bricks qualifying for wetting, when recommencing Work on such walls.
- .6 Support of loads:
  - .1 Use 40 MPa concrete to Section 03 30 00 - Cast-in-Place Concrete, where concrete fill is used in lieu of solid units.
  - .2 Use grout to CSA A179 where grout is used in lieu of solid units.
  - .3 Install building paper below voids to be filled with concrete keep paper 25 mm back from faces of units.
- .7 Provision for movement:
  - .1 Leave 3 mm space below shelf angles.
  - .2 Leave 6 mm space between top of non-load bearing walls and partitions and structural elements. Do not use wedges.
  - .3 Build masonry to tie in with stabilizers, with provision for vertical movement.
- .8 Loose steel lintels:
  - .1 Install loose steel lintels. Centre over opening width.
- .9 Control joints:
  - .1 Construct continuous control joints as indicated.
- .10 Movement joints:
  - .1 Build-in continuous movement joints as indicated.
- .11 Interface with other Work:
  - .1 Cut openings in existing Work as indicated.
  - .2 Openings in walls: to be reviewed by Contract Administrator.
  - .3 Make good existing Work. Use materials to match existing.
  - .4 Coordinate the installation of embedded steel members as required to support top of masonry block wall.

**3.7. SITE TOLERANCES**

- .1 Tolerances in notes to CSA-A371 apply.

**3.8. FIELD QUALITY CONTROL**

- .1 Site Tests, Inspection:
  - .1 Perform field inspection and testing in accordance with Section 01 45 00 - Quality Control.
  - .2 Notify inspection agency minimum of 24 hours in advance of requirement for tests.
  - .3 Type, quantity and frequency of testing to be in accordance with CSA A179.

- .2 Manufacturer's Services:
  - .1 Schedule Site visits to review Work at stages listed:
    - .1 After delivery and storage of products, and when preparatory Work on which Work of this Section depends is complete, but before installation begins.
    - .2 Twice during progress of Work at 25% and 60% complete.
    - .3 Upon completion of Work, after cleaning is carried out.
  - .2 Obtain reports within three days of review and submit immediately to Contract Administrator.

### **3.9. CLEANING**

- .1 Clean in accordance with Section 01 74 11 -Cleaning.
- .2 Progress Cleaning: in accordance with related masonry sections.
- .3 Final Cleaning:
  - .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
  - .2 Upon completion of installation and verification of performance of installation, remove surplus materials, rubbish, tools and equipment barriers.

### **3.10. PROTECTION**

- .1 Temporary Bracing:
  - .1 Provide temporary bracing of masonry Work during and after erection until permanent lateral support is in place.
  - .2 Brace masonry walls as necessary to resist wind pressure and lateral forces during construction.
- .2 Moisture Protection:
  - .1 Keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until completed and protected by flashing or other permanent construction.
  - .2 Cover completed and partially completed Work not enclosed or sheltered with waterproof covering at end of each Workday. Anchor securely in position.
  - .3 Air Temperature Protection: protect completed masonry as recommended in 1.10 SITE CONDITIONS.

**END OF SECTION**

## **1. GENERAL**

### **1.1. RELATED REQUIREMENTS**

- .1 Section 04 22 00 – Concrete Unit Masonry: Installation of mortar and grout.
- .2 Section 08 11 00 – Metal Doors and Frames: Grouted steel doorframes.

### **1.2. REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-A23.1/A23.2-[04], Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CAN/CSA A179-[04], Mortar and Grout for Unit Masonry.
  - .3 CAN/CSA A371-[04], Masonry Construction for Buildings.
  - .4 CAN/CSA-A3000-[03], Cementitious Materials Compendium; CAN/CSA-A3002-[03], Masonry and Mortar Cement.

### **1.3. ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide manufacturer's printed product literature, specifications and datasheets. Include product characteristics, performance criteria, and limitations.
- .3 Samples: provide unit samples supplemented as follows:
  - .1 Provide two samples of mortar, illustrating mortar colour and colour range.
- .4 Manufacturer's Instructions: Provide manufacturer's installation instructions.

### **1.4. QUALITY ASSURANCE**

- .1 Test Reports: certified test reports including sand gradation tests in accordance with CAN/CSA A179 showing compliance with specified performance characteristics and physical properties, and in accordance with Section 04 05 00 - Common Work Results for Masonry
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

### **1.5. DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver, store and handles masonry mortar and grout materials in accordance with Section 01 61 00 - Common Product Requirements, supplemented as follows:
  - .1 Deliver prepackaged, dry-blended mortar mix to project Site in labelled plastic-lined bags each bearing name and address of manufacturer, production codes or batch numbers, and colour or formula numbers.
  - .2 Maintain mortar, grout and packaged materials clean, dry, and protected against dampness, freezing, traffic and contamination by foreign materials.

### **1.6. SITE CONDITIONS**

- .1 Ambient Conditions: maintain materials and surrounding air temperature to:
  - .1 Minimum 10 degrees C prior to, during, and 48 hours after completion of masonry Work.
  - .2 Maximum 32 degrees C prior to, during, and 48 hours after completion of masonry Work.
- .2 Weather Requirements: CAN/CSA A371 International Masonry Industry All-Weather Council (IMIAC) - Recommended Practices and Guide Specifications for Hot and Cold Weather Masonry Construction.

## **2. PRODUCTS**

### **2.1. MATERIALS**

- .1 Use same brands of materials and source of aggregate for entire project.
- .2 Cement:
  - .1 Portland Cement: to CAN/CSA-A3000, Type GU - General use hydraulic cement gray colour.
    - .1 Use low VOC products in compliance with SCAQMD Rule 1168.
  - .2 Masonry Cement: to CAN/CSA-A3002 and CAN/CSA A179, Type S.
    - .1 Mortar Cement: to CAN/CSA-A3002 and CAN/CSA A179, Type S.
      - .2 Use low VOC products in compliance with SCAQMD Rule 1168.
  - .3 Packaged Dry Combined Materials for mortar: to CAN/CSA A179, Type S, using gray colour cement.
- .3 Aggregate: supplied by one supplier.
  - .1 Fine Aggregate: to CAN/CSA A179.
  - .2 Course Aggregate: to CAN/CSA A179
- .4 Water: clean and potable.
- .5 Lime:
  - .1 Hydrated Lime: to CAN/CSA A179, Type S.
- .6 Bonding Agent: latex type.
- .7 Polymer Latex: organic polymer latex admixture of butadiene-styrene type non-emulsifiable bonding admixture.

### **2.2. COLOUR ADDITIVES**

- .1 Powder: inorganic mineral oxide pigment; custom colour to match masonry.
  - .1 Provide colour sample mockup for approval by Contract Administrator.

### **2.3. MORTAR MIXES**

- .1 Mortar for exterior masonry above grade:
  - .1 Loadbearing: type S based on property specifications.
  - .2 Non-Loadbearing: type N based on property specifications.
- .2 Mortar for interior masonry:
  - .1 Loadbearing: type S based on property specifications.
  - .2 Non-Loadbearing: type N based on property specifications.
- .3 Use pre-blended, pre-coloured mortar prepackaged under controlled factory conditions. Ingredients batching limitations to be within 1% accuracy.
- .4 Mix mortar ingredients in accordance with CAN/CSA A179 in quantities needed for immediate use.
- .5 Maintain sand uniformly damp immediately before mixing process.
- .6 Add mortar colour and admixtures in accordance with manufacturer's instructions. Provide uniformity of mix and colouration.
- .7 Do not use anti-freeze compounds including calcium chloride or chloride-based compounds.
- .8 Do not add air entraining admixture to mortar mix.
- .9 Use a batch type mixer in accordance with CAN/CSA A179.
- .10 Pointing mortar: prehydrate pointing mortar by mixing ingredients dry, then mix again adding just enough water to produce damp un Workable mix that will retain its form when pressed into ball. Allow to stand for not less than 1 hour no more than 2 hours then remix with sufficient water to produce mortar of proper consistency for pointing.
- .11 Re-temper mortar only within two hours of mixing, when water is lost by evaporation.

- .12 Use mortar within 1 1/2 hours after mixing at temperatures of 25 degrees C, or 2-1/2 hours at temperatures under 25 degrees C.

**2.4. GROUT MIXES**

- .1 Bond Beams: 20 MPa strength at 28 days; 100-200 mm slump; mixed in accordance with CAN/CSA A179.
- .2 Engineered Masonry: 20 MPa strength at 28 days; 100-200 mm slump; mixed in accordance with CAN/CSA A179.

**2.5. GROUT MIXING**

- .1 Mix grout ingredients in quantities needed for immediate use in accordance with CAN/CSA A179.
- .2 Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- .3 Do not use antifreeze liquids, calcium chloride, frost inhibitors based on calcium chloride, salts or other substances used for lowering the freezing point or accelerating time.

**3. EXECUTION**

**3.1. EXAMINATION**

- .1 Request inspection of spaces to be grouted.

**3.2. PREPARATION**

- .1 Apply bonding agent to existing concrete surfaces.
- .2 Plug clean-out holes with block masonry units. Brace masonry for wet grout pressure.

**3.3. 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.

**3.4. CONSTRUCTION**

- .1 Do masonry mortar and grout Work in accordance with CAN/CSA A179 except where specified otherwise.
- .2 Apply parging in uniform coating not less than 10 mm thick, where indicated.

**3.5. MIXING**

- .1 All pointing mortar can be mixed using a regular paddle mixer. Only electric motor mixers are permissible. Mixers run on hydrocarbons are not permitted, due to fumes. Mixing by hand must be pre-approved by the Contract Administrator.
- .2 Clean all mixing boards and mechanical mixing machine between batches.
- .3 Mortar must be weaker than the units it is binding.
- .4 Contractor to appoint one individual to mix mortar, for duration of project. In the event that this individual must be changed, mortar mixing must cease until the new individual is trained, and mortar mix is tested.

**3.6. MORTAR PLACEMENT**

- .1 Install mortar to requirements of CAN/CSA A179.
- .2 Remove excess mortar from grout spaces.
- .3 Mortar joint finish to be tooled square.

**3.7. GROUT PLACEMENT**

- .1 Install grout in accordance with CAN/CSA A179.
- .2 Work grout into masonry cores and cavities to eliminate voids.
- .3 Do not install grout in lifts greater than 400 mm, without consolidating grout by rodding.
- .4 Do not displace reinforcement while placing grout.

**3.8. FIELD QUALITY CONTROL**

- .1 Site Tests, Inspection: in accordance with Section 04 05 00 - Common Work Results for Masonry supplemented as follows:
  - .1 Test and evaluate mortar prior to construction and during construction in accordance with CAN/CSA A179.
  - .2 Test and evaluate grout prior to construction and during construction to CAN/CSA A179; test in conjunction with masonry unit sections specified.
- .2 Manufacturer's Field Services: in accordance with Section 04 05 00 - Common Work Results for Masonry.

**3.9. CLEANING**

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.
- .2 Remove droppings and splashings using clean sponge and water.
- .3 Clean masonry with low-pressure clean water and soft natural bristle brush.

**END OF SECTION**

## **1. GENERAL**

### **1.1. RELATED REQUIREMENTS**

- .1 Section 04 05 00 – Common Work Results for Masonry
- .2 Section 04 05 12 – Masonry Mortar & Grout

### **1.2. REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-A165 Series-04, CSA Standards on Concrete Masonry Units
  - .2 CAN/CSA A371-14, Masonry Construction for Buildings.
  - .3 CSA S304.1-14, Design of Masonry Structures.
  - .4 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.
- .2 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S101-14, Standard Methods of Fire Endurance Tests of Building Construction and Materials.

### **1.3. ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Construct mockup panel of unit masonry construction for approval by Contract Administrator.
- .2 Approved mockup may remain as part of the Work.

## **2. PRODUCTS**

### **2.1. MATERIALS**

- .1 Existing smooth faced Concrete block units salvaged from demolition of interior walls. Quantity as required to construct infill at existing door between Apparatus Rm 114 and Stair 115.

### **2.2. MORTAR AND GROUT MIXES**

- .1 Mortar and mortar mixes selected for best match to existing colours, to be selected from manufacturer's samples and verified by Contract Administrator.

### **2.3. CLEANING COMPOUNDS**

- .1 Compatible with substrate and acceptable to masonry manufacturer for use on products.
- .2 Cleaning compounds compatible with concrete unit masonry and in accordance with manufacturer's written recommendations and instructions.

## **2.4. TOLERANCES**

- .1 Tolerances for standard concrete unit masonry tolerances in accordance with CAN/CSA A165.1, supplemented as follows:
  - .1 Maximum variation between units within specific job lot not to exceed 2 mm.
  - .2 No parallel edge length, width or height dimension for individual unit to differ by more than 2 mm.
  - .3 Out of square tolerance not to exceed 2 mm.
- .2 Tolerances for architectural concrete masonry units in accordance with CAN/CSA A165.1, supplemented as follows:
  - .1 Maximum variation in length or height between units within specific job lot for specified dimension not to exceed 2 mm.
  - .2 No parallel edge length, width or height dimension for individual unit to differ by more than 2 mm.
  - .3 Out of square tolerance not to exceed 2 mm.
  - .4 Maximum variation in width between units within specific job lot for specified dimension not to exceed 2mm.

## **3. EXECUTION**

### **3.1. EXAMINATION**

- .1 Verify surfaces and conditions are ready to accept Work of this Section.
- .2 Commencing installation means acceptance of [existing substrates].

### **3.2. PREPARATION**

- .1 Protect adjacent finished materials from damage due to masonry Work.

### **3.3. INSTALLATION**

- .1 Concrete block units:
  - .1 Salvaged existing units.
  - .2 Coursing: Running bond to match existing

### **3.4. CONSTRUCTION**

- .1 Construct masonry walls using stack bond unless otherwise noted.
- .2 Build around frames previously set and braced. Fill behind hollow frames within masonry walls with mortar or grout and embed anchors.
- .3 Fit masonry closely against electrical and plumbing outlets so collars, plates and covers overlap and conceal cuts.
- .4 Install movement joints and keep free of mortar where indicated.
- .5 Hollow Units: spread mortar setting bed from outside edge of face shells. Gauge amount of mortar on top and end of unit to create full joints, equivalent to shell thickness. Avoid excess mortar.
- .6 Solid Units: apply mortar over entire vertical and horizontal surfaces. Avoid bridging of airspace between brick veneer and backup wall with mortar.
- .7 Ensure compacted head joints. Use full or face-shell joint as indicated.
- .8 Tamp units firmly into place.
- .9 Do not adjust masonry units after mortar has set. Where resetting of masonry is required, remove, clean and reset units in new mortar.
- .10 Tool exposed joints square; strike concealed joints flush.
- .11 After mortar has achieved initial set up, tool joints.
- .12 Do not interrupt bond below or above openings.

### **3.5. REPAIR/RESTORATION**

- .1 Upon completion of masonry, fill holes and cracks, remove loose mortar and repair defective Work.

**3.6. CLEANING**

- .1 Clean in accordance with Section 01 74 11 - Cleaning, supplemented as follows.
  - .1 Progress Cleaning:
    - .1 Concrete Unit Masonry:
      - .1 Allow mortar droppings on masonry to partially dry then remove by means of trowel, followed by rubbing lightly with small piece of block. Clean wall surface with suitable brush or burlap.

**3.7. PROTECTION**

- .1 Protect finished concrete unit masonry as required.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 SUMMARY**

A. Section Includes the following Laminates:

1. Patterns.
2. Woodgrains.
3. Formica® Compact.

B. Related Requirements:

1. Finish Carpentry.
2. Architectural Woodwork.

### **1.2 REFERENCES**

A. Reference Standards: In addition to requirements, comply with applicable provisions of following for design, materials, fabrication, and installation of component parts:

1. ANSI / NEMA LD-3: High Pressure Decorative Laminates.
2. ASTM E 84: Standard Test Method for Surface Burning Characteristics of Building Materials.
3. ASTM E 162: Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source.
4. FSC: Forest Stewardship Council.
5. NFPA 101: Life Safety Code.
6. Architectural Woodwork Quality Standards.

### **1.3 PREINSTALLATION MEETINGS**

A. Preinstallation Conference: Conduct meeting at Project site as required.

### **1.4 SUBMITTALS**

A. Product Data:

1. Product data for each specified product. Include manufacturer's technical data sheets and published instruction instructions.

B. Shop Drawings: Each installation.

1. Anchorages to other construction, including requirements for concealed supports.
2. Use same unit designations used on Drawings.

C. Samples for Selection:

1. Available standard framing finish colors.

D. Verification Samples: 12-inch length of typical framing member in specified finish.

1. Plastic-laminate-clad panels, not less than 8 by 10 inches (200 by 250 mm), for each type, color, pattern, and surface finish.
2. Thermoset decorative-overlay-surfaced panels, not less than 8 by 10 inches (200 by 250 mm), for each type, color, pattern, and surface finish.

#### **1.5 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: Provide references for fabricator and installer to be provided to Contract Administrator at Pre-Award Meeting .
- B. Product Certificates: For the following:
  1. Thermoset decorative panels.
  2. High-pressure decorative laminate.
  3. Adhesives.

#### **1.6 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: Manufacturer's written maintenance instructions to be provided to Contract Administrator.
- B. Manufacturer warranties transferrable to City of Winnipeg upon Substantial Completion.

#### **1.7 QUALITY ASSURANCE**

- A. Installer Qualifications: Company specializing in fabricating and installing decorative plastic laminate finished work with a minimum 5-7 years experience.
- B. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance with a minimum 5-7 years experience.

#### **1.8 DELIVERY, STORAGE, AND HANDLING**

- A. Package and ready materials according to manufacturer's instructions.
- B. Do not deliver components until Project is fully enclosed
- C. Store products inside building protected from light, heat and moisture and never store in contact with floor or outside wall surfaces. Do not expose to continuous direct sunlight.
- D. Store horizontally, face-to-face and back-to-back with the top sheet turned face down.
- E. Sheets must be handled by sliding when possible.
- F. Stored at a temperature not less than 60 degrees F (16 degrees C) and a relative humidity not less than 40 percent.
- G. Provide protective coverings of suitable material. Take special precautions at corners.

## 1.9 PROJECT CONDITIONS

- A. Coordinate sizes and locations of cut-outs and other related Work specified in other Sections to ensure that interior laminate construction can be supported and installed as indicated.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: Provide decorative plastic laminate with the following surface burning characteristics as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
  - 1. Flame-Spread Index: 25 or less.
  - 2. Smoke-Developed Index: 450 or less.
- B. Source Limitations: Obtain decorative plastic laminate materials through one source from a single manufacturer.

### 2.2 MANUFACTURER

- A. Manufacturer:
  - 1. Basis of Design: Formica Corporation.

### 2.3 PLASTIC LAMINATE PRODUCTS

- A. Formica® Brand
  - 1. Description:
    - a. General purpose laminate - Patterns.
  - 2. Laminate Color(s):
    - a. # 3505-58 Storm Solidz
    - b. # 8844-58 Aged Ash
  - 3. Laminate Finishes:
    - a. -58 Matte, 12.
  - 4. Laminate Application(s):
    - a. Plastic-Laminate-Architectural Woodwork as specified.
    - b. Flush Wood Doors as specified
- B. Formica® Brand
  - 1. Description:

- a. General purpose laminate - Woodgrains.
  2. Laminate Grade(s):
    - a. Grade 12, HGP - 0.035 Inches (0.9 mm).
  3. Laminate Color(s):
    - a. PLAM-3 # 8844-58 Aged Ash
  4. Laminate Finishes:
    - a. -58 Matte, 12.
  5. Laminate Application(s):
    - a. Plastic-Laminate-Wood Doors
    - b. Plastic-Laminate-Architectural Woodwork.
- D. Formica® Compact.
1. Description:
    - a. Structural Laminate.
  2. Laminate Grade(s):
    - a. Grade S7, 0.750 Inches (12.7 mm).
  3. Laminate Color(s):
    - a. PLAM-1: # 8844-58 Aged Ash
    - b. PLAM-2: # 3505-58 Storm Solidz
  4. Laminate Finishes:
    - a. -58 Matte.
  5. Laminate Application(s): Horizontal and Vertical.
    - a. Plastic-Laminate-Architectural Woodwork. Location as indicated on drawings
    - b. Adhesives:
      - 1) Bonding Laminate: Franklin Advanced Polymer adhesive recommended. See Formica technical guide for recommended adhesive by substrate type.
    - c. Sealant:
      - 1) Color Coordinated Sealant: 100% silicone caulk material by Color-Rite Incorporated as recommended by Formica Corporation.

## **2.4 LAMINATE ACCESSORY MATERIALS**

- A. Edge Banding:
  - 1. Laminate Grade:
    - a. To match Laminate specified.
- B. Backing sheets:
  - 1. Provide where recommended by manufacturer to minimize lamination warpage.
- C. Adhesives:
  - 1. Bonding Laminate: Provide type recommended by manufacturer.
  - 2. Bonding Edge Molding: Provide type recommended by manufacturer.

## **2.5 LAMINATE FABRICATION**

- A. Conform to Formica Corporation standard practices, procedures, conditions including preconditioning, panel balancing, material recommendations, machining, equipment and workmanship.
- B. Formica Brand Laminate with low sheen surfaces are subject to marring. Fabricating with peel coat on surface (if applicable) is recommended. Router base should be clean and free of burrs and debris. Table saws should be clean, flat, and free of burrs.
- C. Do not adhere laminates directly to plaster, gypsum board or concrete construction.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. General: Install decorative plastic laminate in accordance with manufacturer's installation instructions, approved submittals and requirements of:
- B. Provide templates and rough-in measurements.
- C. Accessory Materials: Install in accordance with manufacturer's written installation instructions.

### **3.2 CLEANING AND PROTECTING**

- A. Cleaning:
  - 1. Clean decorative plastic laminate surfaces and edge moldings or aluminum trims in accordance with manufacturer's instructions.
- B. Protection:
  - 1. Do not permit construction near unprotected surfaces.

**END OF SECTION 06 05 13**

## **PART 1- GENERAL**

### **1.1 REFERENCES**

- .1 American National Standards Institute / National Particleboard Association (ANSI/NPA)
  - .1 ANSI/NPA A208.1-[2009], Particleboard.
  
- .2 ASTM International
  - .1 ASTM A 123/A 123M-[09], Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .2 ASTM A 653/A 653M-[09a], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
  - .3 ASTM C 578-10, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
  - .4 ASTM C 1289-10, Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
  - .5 ASTM C 1396/C 1396M-[09a], Standard Specification for Gypsum Board.
  - .6 ASTM D 1761-06, Standard Test Methods for Mechanical Fasteners in Wood.
  - .7 ASTM D 5055-10, Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists.
  - .8 ASTM D 5456-10, 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 and amendment.
  
- .4 CSA International
  - .1 CAN/CSA-A123.2-03(R2008), Asphalt Coated Roofing Sheets.
  - .2 CAN/CSA-A247-M86(R1996), Insulating Fiberboard.
  - .3 CSA B111-[1974(R2003)], Wire Nails, Spikes and Staples.
  - .4 CSA O112 Series-M1977(R2006), CSA Standards for Wood Adhesives.
  - .5 CSA O121-08, Douglas Fir Plywood.
  - .6 CSA O141-05(R2009), Softwood Lumber.
  - .7 CSA O151-09, Canadian Softwood Plywood.
  - .8 CSA O153-M1980(R2008), Poplar Plywood.
  - .9 CSA O325-07] Construction Sheathing.
  - .10 CSA O437 Series-93(R2006), Standards on OSB and Waferboard.
  
- .5 Forest Stewardship Council (FSC)
  - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
  - .2 FSC-STD-20-002-2004, Structure and Content of Forest Stewardship Standards V2-1
  - .3 FSC Accredited Certified Bodies.
  
- .6 National Lumber Grades Authority (NLGA)
  - .1 Standard Grading Rules for Canadian Lumber 2007.

.7 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI.  
Source Specific Standards

- .1 SCAQMD Rule 1113-A2007, Architectural Coatings.
- .2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

.8 Underwriters' Laboratories of Canada (ULC)

- .1 CAN/ULC-S706-09, Standard for Wood Fiber Insulating Boards for Buildings.

## **1.2 SUBMITTALS**

.1 Provide submittals as required.

## **1.3 QUALITY ASSURANCE**

.1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood, particleboard, OSB in accordance with CSA and ANSI standards.

## **1.4 DELIVERY, STORAGE AND HANDLING**

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Storage and Handling Requirements:

- .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect materials from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

## **2 PRODUCTS**

### **2.1 MATERIALS**

.1 Lumber: softwood, S4S, moisture content 19% (S-dry) or less in accordance with following standards:

- .1 CSA O141.
- .2 NLGA Standard Grading Rules for Canadian Lumber.

.2 Framing and board lumber: in accordance with NBC.

.3 Furring, blocking, nailing strips, grounds, rough bucks, [cants,] curbs, fascia backing and sleepers:

- .1 S2S is acceptable for all Work.
- .2 Board sizes: "Standard" or better grade.
- .3 Dimension sizes: "Standard" light framing or better grade.
- .4 Post and timbers sizes: "Standard" or better grade.

.4 Plywood, OSB and wood based compo Site panels: to CSA O325.

- .5 Douglas fir plywood (DFP): to CSA O121, standard construction.
- .6 Canadian softwood plywood (CSP): to CSA O151, standard construction.
- .7 Poplar plywood (PP): to CSA O153, standard construction.
- .8 Gypsum sheathing: to ASTM C36/C36M.
- .9 All wall mounted fixtures backing boards:
  - .1 ¾" Plywood G1S, DFP or CSP grade, square edge.
- .10 Electrical equipment mounting boards:
  - .1 ¾" Plywood G1S, DFP or CSP grade, square edge.
- .11 Site carpentry:
  - .1 Pressure treated timbers: to CSA 080, pressure treated pine or fir to National Lumber Grades Authority, select grade 2 and better, all dried to a maximum moisture content of 20% prior to treating. Non-incised, CCA treatment to minimum retention of 4.0 kg/m<sup>3</sup> for above ground use and 6.4 kg/m<sup>3</sup> for ground contact. Colour: Cedar Tone Green.
  - .2 Preservative: Green, End Cut Wood Preservative type to CSAO80.

## **2.2 ACCESSORIES**

- .1 General purpose adhesive: to CSA O112 Series.
- .2 Sill Gasket Air seal: closed cell polyurethane or polyethylene.
- .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 fiber plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.

### **3 EXECUTION**

#### **3.1 INSTALLATION**

- .1 Install members true to line, levels and elevations, square and plumb.
- .2 All wood to be free of defects. Any warped, checked or bent materials shall be rejected and not be used.
- .3 Construct continuous members from pieces of longest practical length.
- .4 Select exposed framing for appearance. Install panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.
- .5 Install furring and blocking as required to space-out and support case Work, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding, electrical equipment mounting boards, and other Work as required.
- .6 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other Work.
- .7 Install sleepers as indicated/ required.
- .8 Use dust collectors and high-quality respirator masks when cutting or sanding wood panels.
- .9 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .10 Countersink bolts where necessary to provide clearance for other Work.
- .11 Site carpentry treated timber:
  - .1 Handle and use treated material in a manner which will avoid damage or field fabrication causing alteration in original treatment.
  - .2 Treat in field, cuts and damages to surface of treated material with an appropriate, topical, end-cut preservative as described in CSA 080.1974. Ensure that damaged areas such as abrasions; nail and spike holes, are thoroughly saturated with field treatment solutions as per CSA 080.1974.

#### **3.2 CLEANING**

- .1 Progress Cleaning:
  - .1 Leave Work area clean at end of each day.

#### **3.3 PROTECTION**

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

**END OF SECTION 06 10 00**

## **1 GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 06 40 00 – Architectural Woodwork
- .2 Section 09 21 16 – Gypsum Board Assemblies

### **1.2 REFERENCES**

- .1 American National Standards Institute / National Particleboard Association (ANSI/NPA)
  - .1 ANSI/NPA A208.1, Particleboard.
  
- .1 CSA International
  - .1 CSA B111-[1974(R2003)], Wire Nails, Spikes and Staples.
  - .2 CSA O112 Series-M1977(R2006), CSA Standards for Wood Adhesives.
  - .3 CSA O121-08, Douglas Fir Plywood.
  - .4 CSA O141-05(R2009), Softwood Lumber.
  - .5 CSA O151-09, Canadian Softwood Plywood.
  - .6 CSA O153-M1980(R2008), Poplar Plywood.
  - .7 CSA O325-07 Construction Sheathing.

### **1.3 SUBMITTALS**

- .1 Provide 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 compo Site panels in accordance with CSA and ANSI standards.

### **1.5 DELIVERY, STORAGE AND HANDLING**

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

## **2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Lumber: softwood, S4S, moisture content 19% (S-dry) or less in accordance with following standards:
  - .1 CSA O141.
  - .2 NLGA Standard Grading Rules for Canadian Lumber.
- .2 Framing and board lumber: in accordance with NBC.

.3 Furring, blocking, nailing strips, grounds, rough bucks, [cants,] curbs, fascia backing and sleepers:

- .1 S2S is acceptable for all Work.
- .2 Board sizes: "Standard" or better grade.
- .3 Dimension sizes: "Standard" light framing or better grade.
- .4 Post and timbers sizes: "Standard" or better grade.

.4 Plywood, OSB and wood based compo Site panels: to CSA O325.

.5 Douglas fir plywood (DFP): to CSA O121, standard construction.

.6 Canadian softwood plywood (CSP): to CSA O151, standard construction.

.7 Poplar plywood (PP): to CSA O153, standard construction.

.8 Gypsum sheathing: to ASTM C36/C36M.

.9 All wall mounted fixtures backing boards:

- .1 ¾" Plywood G1S, DFP or CSP grade, square edge.

.10 Electrical equipment mounting boards:

- .1 ¾" Plywood G1S, DFP or CSP grade, square edge.

## **2.2 ACCESSORIES**

.1 General purpose adhesive: to CSA O112 Series.

.2 Sill Gasket Air seal: closed cell polyurethane or polyethylene.

.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 fiber plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.

.6 Roof sheathing H-Clips: formed "H" shape, thickness to suit panel material, type approved by Contract Administrator.

.7 Fastener Finishes:

- .1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for exterior Work, pressure- preservative, fire-retardant, treated lumber.

## **3 EXECUTION**

### **3.1 INSTALLATION**

.1 Install members true to line, levels and elevations, square and plumb.

.2 All wood to be free of defects. Any warped, checked or bent materials shall be rejected and not be used.

.3 Construct continuous members from pieces of longest practical length.

.4 Select exposed framing for appearance. Install panel materials so that grade-marks and other

.5 Install furring and blocking as required to space-out and support case Work, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding, electrical equipment mounting boards, and other Work as required.

.6 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other Work.

.7 Install sleepers as indicated.

.8 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.

.9 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

.10 Countersink bolts where necessary to provide clearance for other Work.

### **3.2 CLEANING**

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

.1 Leave Work area clean at end of each day.

### **3.3 PROTECTION**

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by rough carpentry installation.

## **END OF SECTION**

### **1 GENERAL**

#### **1.1 REFERENCES**

.1 ASTM International

.1 ASTM E 1333-[96(2002)], Standard Test Method for Determining Formaldehyde Concentrations in Air and Emissions Rates from Wood Products Using a Large Chamber.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-11.3-[M87], Hardboard.

.3 Underwriters' Laboratories of Canada (ULC)

.1 CAN4-S104-[80(R1985)], Standard Method for Fire Tests of Door Assemblies.

.2 CAN4-S105-[85(R1992)], Standard Specification for Fire Door Frames, meeting the Performance Required by CAN4-S104.

.4 Canadian Standards Association (CSA)

.1 CSA B111-[74(R2003)], Wire Nails, Spikes and Staples.

.2 CAN/CSA-G164-[M92(R2003)], Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CSA O121-[M89(R2003)], Douglas Fir Plywood.

.4 CAN/CSA O141-[91(R1999)], Softwood Lumber.

.5 CSA O151-[04], Canadian Softwood Plywood.

.6 CSA O153-[M1980(R2003)], Poplar Plywood.

- .6 American National Standards Institute (ANSI)
  - .1 ANSI A208.2-[02], Medium Density Fiberboard (MDF).
  - .2 ANSI/HPVA HP-1-[2004], Standard for Hardwood and Decorative Plywood.
  
- .7 Architectural Wood Work Manufacturers Association of Canada (AWMAC) and Architectural Wood Work Institute (AWI)
  - .1 Architectural Wood Work Quality Standards Illustrated, 8th edition, Version 1.0[2003].
  
- .8 Canadian Plywood Association (CanPly)
  - .1 The Plywood Handbook [2005]
  
- .9 Forest Stewardship Council (FSC)
  - .1 FSC-STD-01-001-[2004], FSC Principle and Criteria for Forest Stewardship.
  
- .10 National Hardwood Lumber Association (NHLA)
  - .1 Rules for the Measurement and Inspection of Hardwood and Cypress [1998]
  
- .11 National Lumber Grades Authority (NLGA)
  - .1 Standard Grading Rules for Canadian Lumber [2005]

## **1.2 SUBMITTALS**

- .1 Shop Drawing Submittals: in accordance with Section 01 33 00 – Submittal Procedures.
  - .1 Indicate details of Construction, profiles, jointing, fastening and other related details
  - .2 Indicate materials, thickness, finishes and hardware.

## **1.3 QUALITY ASSURANCE**

- .1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
  
- .2 Wood Products: Comply with the following
  - .1 Medium Density Fiberboard: ANSI A208.2, Grade MD-Exterior Glue.

## **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
  
- .2 Storage and Handling Requirements:
  - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect materials from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
  - .4 Protect from extreme changes of temperature or humidity.

## **2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Interior Shelving:
  - .1 Shelving: 3/4" Medium Density Fiberboard (MDF). White melamine.
    - .1 Adjustable shelves where specified on architectural drawings.

## **2.2 ACCESSORIES**

- .1 Nails and staples: to CSA B111; galvanized to CAN/CSA-G164 for exterior Work, interior humid areas and for treated lumber; plain finish elsewhere.
- .2 Wood screws: electroplated, type and size to suit application.
- .3 Adhesive: recommended by manufacturer.
  - .1 Maximum VOC limit 30g/L.

## **3 EXECUTION**

### **3.1 EXAMINATION**

- .1 Verification of Conditions:
  - .1 Inspection: Verify that project conditions and substrates are acceptable, to the installer, to begin installation of Work of this section.

### **3.2 INSTALLATION**

- .1 Do finish carpentry to Quality Standards of the Architectural Wood Work Manufacturers Association of Canada (AWMAC), except where specified otherwise.
- .2 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets, or other projecting, intersecting or penetrating objects.
- .3 Form joints to conceal shrinkage.
- .4 Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with Work of other sections.

### **3.3 CONSTRUCTION**

- .1 Fastening
  - .1 Position items of finished carpentry Work accurately, level, plumb, true and fasten or anchor securely.
  - .2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
  - .3 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round smooth cut hole and plug with wood plug to match material being secured.
  - .4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.
- .2 Shelving
  - .1 Install shelving on shelf brackets, where indicated.
- .3 Hardware
  - .1 Install cabinet and miscellaneous hardware as indicated.

## **END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 123661 Solid Surface Countertops.

**1.2 REFERENCES**

- .1 American National Standards Institute (ANSI)
  - .1 ANSI A208.1-[09], Particleboard.
  - .2 ANSI A208.2-[09], Medium Density Fiberboard (MDF) for Interior Applications.
  - .3 ANSI/HPVA HP-1-[10], Standard for Hardwood and Decorative Plywood.
- .2 ASTM International
  - .1 ASTM E1333-[10], Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.
- .3 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
  - .1 Architectural Woodwork Quality Standards Illustrated, 8th edition, Version 1.0 (2009).
- .4 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-71.20-[M88], Adhesive, Contact, Brushable.
- .5 Canadian Standards Association (CSA)
  - .1 CSA B111-[74(R2003)], Wire Nails, Spikes and Staples.
  - .2 CSA O112.10-[08], Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure).
  - .3 CSA O121-[08], Douglas Fir Plywood.
  - .4 CSA O141-[05(R2009)], Softwood Lumber.
  - .5 CSA O151-[09], Canadian Softwood Plywood.
  - .6 CSA O153-[M1980(R2008)], Poplar Plywood.
  - .7 CAN/CSA-Z809-[08], Sustainable Forest Management.
- .6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .7 National Hardwood Lumber Association (NHLA)
  - .1 Rules for the Measurement and Inspection of Hardwood and Cypress [2011].
- .8 National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber [2010].

**1.3 SUBMITTALS**

- .1 Shop Drawings to be submitted showing the following:
  - .1 Indicate details of construction, profiles, jointing, fastening and other related details.
  - .2 Indicate materials, thicknesses, finishes and hardware.
  - .3 Indicate locations of service outlets in casework, [typical and special installation conditions], and connections, attachments, anchorage and location of exposed fastenings.
- .2 Samples:

- .1 Submit for review and acceptance of each unit.
  - .2 Samples will be returned for inclusion into work.
  - .3 Submit duplicate samples of Compact laminate colors as specified.
  - .4 Submit duplicate samples of Solid Surface Countertop as specified.
- .3 Certifications: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

#### **1.4 QUALITY ASSURANCE**

- .1 Provide Certificate of Quality Compliance upon completion of Fabrication, in accordance with Architectural Wood Work Manufacturer's Association of Canada (AWMAC) quality standards.
- .2 Provide Certificate of Quality Compliance upon satisfactory completion of installation.
- .3 Work shall be in accordance with the Grade or Grades specified of the Architectural Wood Work Standards.
- .4 Qualification:
  - .1 Firm (wood Work manufacturer) with no less than 5-7 years of production experience similar to a specific project, whose qualifications indicate the ability to comply with the requirements of this Section and can demonstrate familiarity with the specified products.
- .5 Mock-ups:
  - .1 Construct mock-ups as follows.
    - .1 Shop prepare one wall cabinet, complete with hardware and install where directed by Contract Administrator. Allow 48 hours for inspection of mock-up by City of Winnipeg and WFPS before proceeding with Work.
    - .2 When accepted, mock-up will demonstrate minimum standard for Work.
    - .3 Do not proceed with work prior to receipt of written acceptance of mock-up by Contract Administrator
    - .4 Mock-up may remain as part of finished work if acceptable.

#### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions].
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address. Protect millwork against dampness and damage during and after delivery.
  - .1 Store millwork in ventilated areas, protected from extreme changes of temperature or humidity.
- .3 Storage and Handling Requirements:
  - .1 Store materials indoors [in dry location] and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect architectural woodwork from nicks, scratches, and blemishes. Solid Surface countertops are to be covered after installation.
  - .3 Replace defective or damaged materials with new.

**1.6 SCHEDULING**

- .1 Coordinate fabrication, delivery, and installation with the General Contractor and other applicable trades.

**Part 2 PRODUCTS**

**2.1 MATERIALS**

- .1 Softwood lumber: unless specified otherwise, S4S, moisture content 19 % or less in accordance with following standards:

- .1 CAN/CSA O141.
- .2 NLGA Standard Grading Rules for Canadian Lumber.
- .3 AWMAC premium grade, moisture content as specified.

**2.2 MANUFACTURED UNITS**

- .1 Storage Room Cabinets (MW-6), Charging Station (MW-5), Watch Desk Casework: (MW-3 & MW-4), Control Room Casework (MW-2) and Coffee Counter (MW-1):

- .1 Fabricate caseworks to AWMAC premium quality grade.
- .2 Furring, blocking, nailing strips, grounds and rough bucks and sleepers.

- .2 Case Work Body: Fabricate body to AWMAC premium grade supplemented as follows:

- .1 PLAM-1: Formica Compact Laminate:8844-58 Aged Ash; 3/4" thick Grade S7. Refer to drawings for locations. Horizontal Grain direction.
- .2 PLAM-2: Formica Compact Laminate:3505-58 Storm Solidz; 3/4" thick Grade S7. Refer to drawings for locations.

- .3 Watch Desk Base:

- .1 3/4" fir plywood marine base, finished with Stainless Steel (SS-2). Refer to Drawings.

- .4 Control Room Case Work Body: Fabricate body to AWMAC premium grade supplemented as follows:

- .1 PLAM-2: Formica Compact Laminate:3505-58 Storm Solidz; 3/4" thick Grade S7. Refer to drawings for locations.

- .5 Solid Surface Countertop SSC-1:

- .1 Refer to Section 123661 Solid Surfacing Countertops

- .6 Storage Room Cabinets (Kitty Lockers): Fabricate units to AWMAC premium grade supplemented as follows:

- .1 Sides and Backs.
  - .1 PLAM-2: Formica Compact Laminate:3505-58 Storm Solidz; 3/4" thick Grade S7
- .2 Insides/Bottoms:
  - .1 PLAM-2: Formica Compact Laminate:3505-58 Storm Solidz; 3/4" thick Grade S7.
- .3 Fronts/Doors:
  - .1 PLAM-2: Formica Compact Laminate:3505-58 Storm Solidz; 3/4" thick Grade S7
- .4 Base:
  - .1 3/4" fir plywood marine base, finished with Porcelain Tile (QT-1)

- .7 Coffee Counter Casework (MW-1):
  - .1 Fabricate caseworks to AWMAC premium quality grade.
  - .2 Furring, blocking, nailing strips, grounds and rough bucks and sleepers.
  - .3 Fabricate Casework doors and body to AWMAC premium grade supplemented as follows:
    - .1 PLAM-1: Formica Compact Laminate:8844-58 Aged Ash;3/4" thick Grade S7; Horizontal Grain direction.
- .8 Shelving:
  - .1 As specified on drawings: PLAM-1 Formica Compact Laminate; #8844-58 Aged Ash Grade S7 or PLAM-2: Formica Compact Laminate:3505-58 Storm Solidz ; 3/4" thick Grade S7. Refer to drawings for Locations.
- .9 Coffee Counter Base (MW-1) and Storage Room Cabinets (Kitty Lockers) base:
  - .1 3/4" fir plywood marine base, finished with Porcelain Tile (QT-1) or
- .10 Stainless Steel Countertop (SS-1): Refer to Specifications on Drawings.

## **2.3 FABRICATION**

- .1 Set nails and countersink screws apply [stained] [plain] wood filler to indentations, sand smooth and leave ready to receive finish.
- .2 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.
- .3 Shelving to cabinetwork to be adjustable unless otherwise noted.
- .4 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.
- .5 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.
- .6 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.
- .7 Provide access in Watch Desk, Charging Station shelving at back and sides for wire management. Refer to drawings.

## **2.4 ACCESSORIES**

- .1 Adhesive: As recommended by manufacturer.
- .2 Grommets: Provide 2" dia. Plastic Grommets- white or grey in color. Location and quantity as indicated on drawings from General Casework and Watch Desk casework.
- .3 Tackboard TB-1: As Specified on Drawings for Watch Desk, Common Room, Lieutenant Office, Lounge and Control Desk. Refer to drawings for location, sizes and details. Frame to be PLAM-3: High Pressure Laminate; Formica Group Aged Ash #8844-58. Tackboard to be TB-1: Forbo Flooring Systems; Bulletin Board; Color: 2204 Poppy Seed; 6mm thick,

**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for architectural woodwork installation in accordance with manufacturer's instructions.
  - .1 Verify the adequacy and proper location of any required backing or support framing.
  - .2 Verify that Mechanical, Electrical, Plumbing, and other building components affecting Work in this Section are in place.

**3.2 INSTALLATION**

- .1 Do architectural woodwork to Quality Standards of AWMAC.
- .2 Install prefinished millwork at locations shown on drawings.
  - .1 Position accurately, level, plumb straight.
- .3 Fasten and anchor millwork securely.
  - .1 Supply and install heavy duty fixture attachments for wall mounted cabinets.
- .4 Scribe and cut as required to fit abutting walls and to fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.
- .5 At junction of Solid Surface counter back splash and adjacent wall finish, apply small bead of sealant in accordance with Section 123661
- .6 Fit hardware accurately and securely in accordance with manufacturer's written instructions.

**3.3 CLEANING**

- .1 Progress Cleaning:
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
  - .1 Clean millwork and cabinet work inside cupboards and drawers, and outside surfaces
  - .2 Remove excess glue from surfaces.

**3.4 PROTECTION**

- .1 Protect millwork and cabinet work from damage until final inspection.
- .2 Protect installed products and countertops from damage during construction.
- .3 Repair damage to adjacent materials caused by architectural woodwork installation.

**3.5 SCHEDULES**

- .1 Refer to Millwork Hardware Schedule on drawings.

**END OF SECTION 064000**

## **1. GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 03 30 00 – Cast-in-Place Concrete
- .2 Section 04 22 00 – Concrete Unit Masonry
- .3 Section 09 21 16 – Gypsum Board Assemblies

### **1.2 REFERENCES**

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .2 Underwriter's Laboratories of Canada (ULC)
  - .1 ULC-S115-[1995], Fire Tests of Fire stop Systems.

### **1.3 DEFINITIONS**

- .1 Fire Stop Material: device intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cable trays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.
- .2 Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.
- .3 Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on Site fire stop system.
- .4 Tightly Fitted; (ref: NBC Part 3.1.9.1.1 and 9.10.9.6.1): penetrating items that are cast in place in buildings of noncombustible construction or have "0" annular space in buildings of combustible construction.
  - .1 Words "tightly fitted" should ensure that integrity of fire separation is such that it prevents passage of smoke and hot gases to unexposed side of fire separation.

### **1.4 SYSTEM DESCRIPTION**

- .1 Firestopping Materials: ULC to achieve a fire rating as noted in Drawings.

### **1.5 REGULATORY REQUIREMENTS**

- .1 Conform to Manitoba Building Code for fire resistance ratings and surface burning characteristics.
- .2 Provide certificate of compliance from authority having jurisdiction indicating approval of materials used.

### **1.6 ENVIRONMENTAL REQUIREMENTS**

- .1 Do not apply materials when temperature of substrate material and ambient air is below 15 degrees C.
- .2 Maintain this minimum temperature before, during and for curing for 3 days after installation of materials.
- .3 Provide ventilation in areas to receive solvent cured materials.

**1.7. ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit two copies of WHMIS MSDS – Material Safety Data Sheets.
- .3 Shop Drawings:
  - .1 Submit shop drawings to show location proposed material, reinforcement, anchorage, fastenings and methods of installation.
  - .2 Construction details should accurately reflect actual job conditions.

**1.8. QUALITY ASSURANCE**

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

**2. PRODUCTS**

**2.1. MATERIALS**

- .1 Use only firestop products that have been ULC or cUL tested for specific fire-rated construction conditions confirming to construction assembly type, penetrating item type, annular space requirements and fire-rating involved for each separate instance.
- .2 Fire stopping and smoke seal systems: in accordance with CAN-ULC-S115.
  - .1 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of CAN-ULC-S115 and not to exceed opening sizes for which they are intended.
  - .2 Firestop system rating: as indicated on drawings.
- .3 Service penetration assemblies: systems tested to CAN-ULC-S115.
- .4 Service penetration fire stop components: certified by test laboratory to CAN-ULC-S115.
- .5 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.
- .6 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.
- .7 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.
- .8 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. No silicone based firestop are allowed to be applied on plastic pipes.
- .9 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .10 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- .11 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.
- .12 Sealants for vertical joints: non-sagging.

### **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. PREPARATION**

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

#### **3.3. INSTALLATION**

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

#### **3.4. SEQUENCES OF OPERATION**

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

#### **3.5. CLEANING**

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

#### **3.6. SCHEDULE**

- .1 Fire stop and smoke seal at:
  - .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
  - .2 Top of fire-resistance rated masonry and gypsum board partitions.
  - .3 Intersection of fire-resistance rated masonry and gypsum board partitions.

- .4 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.
- .5 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
- .6 Openings and sleeves installed for future use through fire separations.
- .7 Around mechanical and electrical assemblies penetrating fire separations.
- .8 Rigid ducts: fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.

**END OF SECTION**

## 1. GENERAL

### 1.1. RELATED REQUIREMENTS

- .1 Section 03 30 00 – Cast-in-Place Concrete
- .2 Section 04 22 00 – Concrete Unit Masonry
- .3 Section 07 84 00 – Firestopping
- .4 Section 08 11 00 – Metal Doors & Frames

### 1.2. REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
  - .1 ASTM C 919-[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-19.24-[M90], Multi-component, Chemical Curing Sealing Compound.
- .3 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .4 General Services Administration (GSA) - Federal Specifications (FS)
  - .1 FS-SS-S-200-[E(2)1993], Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .6 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).

### 1.3. ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 -Submittal Procedures.
- .2 Submit WHMIS MSDS – Material Safety Data Sheets in accordance with Section 01 33 00 Submittal Procedures – Shop Drawings, Product Data, and Samples, with the VOC levels highlighted.
- .3 Manufacturer's product to describe.
  - .1 Caulking compound.

- .2 Primers.
- .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
- .4 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .5 Submit duplicate samples of each type of material and colour.
- .6 Cured samples of exposed sealants for each color where required to match adjacent material.
- .7 Submit manufacturer's instructions in accordance with Section 01 33 00 - Submittal Procedures.
  - .1 Instructions to include installation instructions for each product used.

#### **1.4. SITE 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.

#### **1.5. 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.
- .3 Adhesives and sealants must conform to State of California's South Coast Air Quality Management District (SCAQMD) Rule #1168, June 2006 with VOC contents as stipulated.

#### **1.6. QUALITY CONTROL**

- .1 Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose Work has resulted in joint-sealant installations with a record of successful in-service performance.
- .2 Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- .3 Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates in accordance with sealant manufacturer's recommendations:
  - .1 Locate test joints where indicated or, if not indicated, as directed by

- Contract Administrator.
- .2 Conduct field tests for each application indicated below:
  - .1 Each type of elastomeric sealant and joint substrate indicated.
  - .2 Each type of non-elastomeric sealant and joint substrate indicated.

### **1.7. MOCKUPS**

- .1 Mock-ups: Construct mock-ups of all exposed sealants to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution in accordance with Section 01 45 00 Quality Control for mock-ups and as follows:
  - .1 Provide mock-up of typical joints at all typical substrate conditions.
  - .2 Notify Contract Administrator a minimum seven days prior to mock-ups construction.
  - .3 Review and acceptance of mock-ups does not constitute approval of deviations from the Contract Documents contained in mock-ups unless Contract Administrator specifically notes such deviations in writing.
  - .4 Once reviewed by Contract Administrator, acceptable mock-up can form a permanent part of the Work, and will form the basis for acceptance for the remainder of the project.
  - .5 Remove and replace materials found not acceptable at no cost to The City or Contract Administrator.

## **2. PRODUCTS**

### **2.1. SEALANT MATERIALS**

- .1 Do not use caulking that emits strong odors, contains toxic chemicals, or is not certified as mould resistant in air handling units.
- .2 Sealants and Caulking compounds must:
  - .1 Meet or exceed all applicable governmental and industrial safety and performance standards
  - .2 Be manufactured and transported in such a manner that all steps for the process, including the disposal of waste products arising therefrom, will meet the requirements of all applicable governmental acts, laws and regulations including for facilities located in Canada, the Fisheries Act and the Canadian Environmental Protection Act (CEPA).
- .3 Sealants and caulking compounds must not be formulated or manufactured with: aromatic solvents, fibrous talc or asbestos, formaldehyde, halogenated solvents, mercury, leads, cadmium, hexavalent chromium, barium or their compounds, except barium sulphate.
- .4 Sealant and caulking compounds must not contain a total of volatile organic compound (VOC's) in excess of 5% by weight as calculated from records of the amounts of constituents used to make the product.
- .5 Where sealants are qualified with primers use only those primers.
- .6 Sealants acceptable for use on this project must be listed on CGSB Qualified Products List issued by CGSB Qualification Board for Joint Sealants.

### **2.2. SEALANT MATERIAL DESIGNATIONS**

- .1 Acrylic Sealant: CGSB 19-GP-5M, single component, solvent curing, non-staining, non-bleeding, non-sagging, capable of continuous water immersion, colour to match adjacent materials.
- .2 Butyl Sealant: CGSB 19-GP-4M, single component, solvent release, non-skinning, non-sagging, butyl-polyisobutylene compound, colour to match adjacent materials.

- .3 Acoustical Sealant: CGSB 19-GP-21M, single component, non-skinning, high solids content, synthetic rubber, non-corrosive to metals or concrete, non-sagging.
- .4 Polyurethane Sealant: CGSB 19-GP-13M, single component, chemical curing, non-staining, non-bleeding, non-sagging, capable of continuous water immersion.
- .5 Silicone Sealant: CGSB 19-GP-18M, single component, solvent curing non-sagging, non-staining, fungus resistant non-bleeding, colour to match adjacent materials.

### **2.3. SEALANT SELECTION**

- .1 Perimeters of exterior openings where frames meet exterior facade of building (i.e. brick, block, precast masonry): Sealant type: Polyurethane.
- .2 Expansion and control joints in exterior surfaces of poured-in-place concrete walls: Sealant type: Butyl.
- .3 Control and expansion joints in exterior surfaces of unit masonry walls: Sealant type: Butyl.
- .4 Exposed joints between hollowcore slabs to ¼" maximum width: Acrylic.
- .5 Seal interior perimeters of exterior openings as detailed on drawings: Sealant type: Silicone.
- .6 Control and expansion joints on the interior of exterior poured-in place concrete walls: Sealant type: Butyl.
- .7 Control and expansion joints on the interior of exterior surfaces of unit masonry walls: Sealant type: Butyl.
- .8 Perimeter of bath fixtures (e.g. sinks, tubs, urinals, stools, waterclosets, basins, vanities): Sealant type: Silicone.
- .9 All vapour retarder seams between sheets and seals to framing: Acoustical.

### **2.4. 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.

## **3. EXECUTION**

### **3.1. GENERAL**

- .1 See drawing details for sealant locations.
- .2 Sealants only to be applied where indicated in drawings or as directed by Contract Administrator in writing.

### **3.2. PROTECTION**

- .1 Protect installed Work of other trades from staining or contamination.

### **3.3. 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.

**3.4. 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.

**3.5. 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.

**3.6. APPLICATION**

- .1 Sealant.
  - .1 Apply sealant in accordance with manufacturers 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, and embedded impurities.
  - .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
  - .8 Remove excess compound promptly as Work progresses and upon completion.
- .2 Curing.
  - .1 Cure sealants in accordance with sealant manufacturer's instructions.
  - .2 Do not cover up sealants until proper curing has taken place.

**3.7. CLEANING**

- .1 Proceed in accordance with Section 01 74 11 -Cleaning.
- .2 Clean adjacent surfaces immediately and leave Work neat and clean.
- .3 Remove excess and droppings, using recommended cleaners as Work progresses.
- .4 Remove masking tape after initial set of sealant.

**END OF SECTION**

**Part 1            General**

**1.1                SECTION INCLUDES**

- .1            Non-rated steel frames.

**1.2                RELATED SECTIONS**

- .1            Section 08 13 13 - Standard Hollow Metal Doors.
- .2            Section 08 71 00 - Door Hardware - General: Hardware, silencers.
- .3            Section 09 91 10 - Painting: Field painting of doors.

**1.3                REFERENCES**

- .1            ANSI A117.1 - Accessible and Usable Buildings and Facilities.
- .2            ASTM A653/A653M - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .3            ASTM E2074- Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies.
- .4            CSDFMA (Canadian Steel Door and Frame Manufacturers Association).
- .5            DHI - Door Hardware Institute: The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.
- .6            SDI-100 - Standard Steel Doors and Frames.

**1.4                SUBMITTALS FOR REVIEW**

- .1            Product Data: Indicate frame configuration and finishes.
- .2            Shop Drawings: Indicate frame elevations, reinforcement, anchor types and spacings, location of cut-outs for hardware, and finish.

**1.5                SUBMITTALS FOR INFORMATION**

- .1            Manufacturer's Installation Instructions: Indicate special installation instructions.
- .2            Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

**1.6                QUALITY ASSURANCE**

- .1            Conform to requirements of CSDFMA and ANSI A117.1.
- .2            Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum five years experience.

**1.7                DELIVERY, STORAGE, AND PROTECTION**

- .1            Accept frames on site in manufacturer's packaging. Inspect for damage.

□

**Part 2 Products**

**2.1 FRAME MANUFACTURERS**

- .1 Allmar Manufacturing or approved equivalent

**2.2 FRAMES**

- .1 Frame: Heavy Duty Masonry Steel Frame. Min. 18 ga. steel. 3 piece knock-down steel frame for field assembly. Mitred corner.

**2.3 ACCESSORIES**

- .1 Removable Stops: Rolled steel. Prepared for countersink style screws.
- .2 Primer: Zinc chromate type.
- .3 Silencers: Resilient rubber fitted into drilled hole.

**2.4 FABRICATION**

- .1 Fabricate frames for knock down field assembly.
- .2 Fabricate frames with hardware reinforcement plates welded in place.
- .3 Prepare frames for silencers. Provide three single silencers for single doors.

**2.5 FINISH**

- .1 Steel Sheet: Galvanized to ASTM A653/A653M
- .2 Primer: Air dried or baked.

**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Section 01 73 03: Verification of existing conditions before starting work.
- .2 Verify that opening sizes and tolerances are acceptable.

**3.2 INSTALLATION**

- .1 Install frames in accordance with CSDFMA, SDI-100 and DHI.
- .2 Coordinate installation of frames with installation of hardware. Provide schedule when door and frame schedules are not described on drawings. The schedule should identify various types or categories of doors and associated frames, fire ratings if any, hardware sets, etc.

**END OF SECTION**

**Part 1            General**

**1.1                SECTION INCLUDES**

- .1            Non-rated steel doors.

**1.2                RELATED SECTIONS**

- .1            Section 08 12 13 - Standard Hollow Metal Frames.
- .2            Section 08 71 00 - Door Hardware - General.
- .3            Section 09 91 10 - Painting: Field painting of doors.

**1.3                REFERENCES**

- .1            ANSI A117.1 - Accessible and Usable Buildings and Facilities.
- .2            ASTM A653/A653M - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .3            ASTM C1363 - Method for Thermal Performance of Building Assemblies by Means of a Hot-Box Apparatus.
- .4            ASTM E2074 - Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies.
- .5            ASTM E413 - Classification for Rating of Sound Insulation.
- .6            CSDFMA (Canadian Steel Door and Frame Manufacturers Association).
- .7            DHI (Door Hardware Institute) - The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.
- .8            SDI-100 - Standard Steel Doors and Frames.

**1.4                SUBMITTALS FOR REVIEW**

- .1            Product Data: Indicate door configurations, location of cut-outs for hardware reinforcement.
- .2            Shop Drawings: Indicate door elevations, internal reinforcement, closure method.

**1.5                SUBMITTALS FOR INFORMATION**

- .1            Manufacturer's Installation Instructions: Indicate special installation instructions.
- .2            Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

**1.6                QUALITY ASSURANCE**

- .1            Conform to requirements of CSDFMA SDI-100 and ANSI A117.1
- .2            Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum five years experience.

**1.7 DELIVERY, STORAGE, AND PROTECTION**

- .1 Accept doors on site in manufacturer's packaging. Inspect for damage.
- .2 Break seal on site to permit ventilation.

**Part 2 Products**

**2.1 DOOR MANUFACTURERS**

- .1 Allmar Manufacturing or approved equivalent

**2.2 DOORS**

- .1 Interior Doors - Fire rated and Non-rated steel doors
- .2 Min. 18 ga. steel construction

**2.3 ACCESSORIES**

- .1 Removable Stops: Rolled steel, channel shape, mitred corners; prepared for countersink style screws.
- .2 Door viewer.
- .3 Primer: Zinc chromate type.

**2.4 FABRICATION**

- .1 Fabricate doors with hardware reinforcement welded in place.

**2.5 FINISH**

- .1 Steel Sheet: Galvanized to ASTM A653/A653M.
- .2 Primer: Air dried or baked.

**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Verify that opening sizes and tolerances are acceptable.

**3.2 INSTALLATION**

- .1 Install doors in accordance with CSDFMA SDI-100 and DHI.
- .2 Adjust door for smooth and balanced door movement.

**END OF SECTION**

**Part 1        General**

**1.1            SECTION INCLUDES**

- .1        Non-fire rated solid core wood doors.
- ~~.2        Non fire-rated hollow core pre-hung doors.~~

**1.2            RELATED SECTIONS**

- .1        Section 06 20 00 – Finish Carpentry
- .2        Section 08 12 13 - Standard Hollow Metal Frames.
- .3        Section 08 71 00 - Door Hardware.

**1.3            REFERENCES**

- .1        AWMAC (Architectural Woodwork Manufacturers Association of Canada) - Quality Standards.
- .2        CAN/CSA O132.2 Series – Wood Flush Doors.

**1.4            SUBMITTALS FOR REVIEW**

- .1        Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- .2        Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, factory machining criteria, factory finishing criteria.
- .3        Samples: Submit sample of door construction, 300mm x 300mm in size, cut from bottom corner of door.

**1.5            SUBMITTALS FOR INFORMATION**

- .1        Manufacturer's Installation Instructions: Indicate special installation instructions.

**1.6            QUALITY ASSURANCE**

- .1        Perform work in accordance with AWI/AWMAC Custom Grade.
- .2        Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

**1.7 REGULATORY REQUIREMENTS**

**1.8 DELIVERY, STORAGE, AND PROTECTION**

- .1 Package, deliver and store doors in accordance with AWI/AWMAC
- .2 Protect doors with resilient packaging. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges if stored more than one week.

**1.9 PROJECT CONDITIONS**

- .1 Coordinate the work with door opening construction, door frame and door hardware installation.

**1.10 WARRANTY**

- .1 Provide manufacturer's standard warranty, including coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, telegraphing core construction.

**Part 2 Products**

**2.1 DOOR TYPES/CONSTRUCTION**

- .1 Solid Core: flush; 44 mm thick; solid core to CAN/CSA O132.2; AWI/AWMAC Section 09; solid particleboard core; stile and rail frame bonded to particleboard core with wood lock blocks; fire rated as indicated; MDO (medium density overlaid) faced; high pressure laminate finish.
- .2 Hollow Core: flush; 44 mm thick; hollow core to CAN/CSA O132.2; AWI/AWMAC Section 09; honeycomb construction; MDO faced; pre-hung complete with hinges, frames or track, and machined to receive specified lockset. Refer to Door Schedule.

**2.2 ADHESIV**

- .1 Facing Adhesive: Type I - waterproof. "Lockweld" adhesive system not acceptable.

**2.3 ACCESSORIES**

**2.4 FABRICATION**

- .1 Fabricate non-rated doors in accordance with AWMAC Quality Standards requirements.

- .2 Provide lock blocks at lock edge and] [top of door for closer] for hardware reinforcement.
- .3 Vertical Exposed Edge of Stiles: Plastic laminate same as door facing.
- .4 Fit door edge trim to edge of stiles after applying veneer facing.
- .5 Bond edge banding to cores.
- .6 At exterior doors, provide aluminum flashing at the [top and bottom rail] [and] [the sill of glazed openings for full thickness and width of door].
- .7 Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware. Provide solid blocking for through bolted hardware.
- .8 Factory fit doors for frame opening dimensions identified on shop drawings.
- .9 Provide edge clearances in accordance with AWMAC.

## **2.5 FINISH**

- .1 Factory finish doors in accordance with AWMAC Quality Standard and approved sample.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Section 01 73 03: Verification of existing conditions before starting work.
- .2 Verify that opening sizes and tolerances are acceptable.
- .3 Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

### **3.2 INSTALLATION**

- .1 Install doors in accordance with manufacturer's instructions, and AWMAC Quality Standard
- .2 Machine cut for hardware.
- .3 Coordinate installation of doors with installation of frames specified in Section 08 12 13 and hardware specified in Section 08 71 00.

**3.3           INSTALLATION TOLERANCES**

- .1       Conform to AWMAC requirements for fit and clearance tolerances.
- .2       Conform to AWMAC Section 1300 requirements for maximum diagonal distortion.

**3.4           ADJUSTING**

- .1       Adjust door for smooth and balanced door movement.
- .2       Adjust closer for full closure.

**3.5           SCHEDULE**

- .1       Refer to Drawings

**END OF SECTION**

**Part 1            General**

**1.1                SECTION INCLUDES**

- .1            Aluminum doors and frames.

**1.2                RELATED SECTIONS**

- .1            Section 08 06 00 – Door Schedule
- .2            Section 08 71 00 – Door Hardware
- .3            Section 08 80 00 – Glazing
- .4            Electrical – wiring for door hardware.

**1.3                REFERENCES**

- .1            AA (Aluminum Association) - Designation System for Aluminum Finishes.
- .2            AAMA - CW-10 - Care and Handling of Architectural Aluminum from Shop to Site.
- .3            AAMA 611 - Specification for Anodized Architectural Aluminum.
- .4            AAMA SFM-1 - Aluminum Store Front and Entrance Manual.
- .5            ANSI A117.1 - Accessible and Usable Buildings and Facilities.

**1.4                SYSTEM DESCRIPTION**

- .1            Aluminum entrances and storefront system includes tubular aluminum sections, shop fabricated, factory finished, vision glass, anchorage and attachment devices.
- .2            System Assembly: Site assembled.

**1.5                PERFORMANCE REQUIREMENTS**

- .1            System Design: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall:
  - .1            As calculated in accordance with building code.
  - .2            As measured in accordance with ASTM E330.
- .2            Deflection: Limit mullion deflection to flexure limit of glass; with full recovery of glazing materials.
- .3            System Assembly: Accommodate without damage to components or deterioration of seals, movement within system, movement between system and peripheral construction, dynamic loading and release of loads, deflection of structural support framing.

- .4 Air Infiltration: Limit air leakage through assembly to 0.0003 cu m/s/sq m of wall area, measured at a reference differential pressure across assembly of 75 Pa as measured in accordance with ASTM E283.
- .5 Air and Vapour Seal: Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.
- .6 Water Leakage: None, when measured in accordance with ASTM E331 with a test pressure difference of 136.85 N/sq m.
- .7 Expansion / Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 95 degrees C over a 12 hour period without causing detrimental effect to system components and anchorage.
- .8 System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

## **1.6 SUBMITTALS**

- .1 Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware.
- .2 Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work and expansion and contraction joint location and details.

## **1.7 QUALITY ASSURANCE**

- .1 Perform Work in accordance with AAMA SFM-1.
- .2 Conform to requirements of ANSI A117.1.
- .3 Manufacturer and Installer: Company specializing in manufacturing aluminum glazing systems with minimum 3 (three) years documented experience.

## **1.8 DELIVERY, STORAGE, AND PROTECTION**

- .1 Handle Products of this section in accordance with AAMA - Curtain Wall Manual #10.
- .2 Protect finished aluminum surfaces with [wrapping] [strippable coating]. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

## **1.9 ENVIRONMENTAL REQUIREMENTS**

- .1 Do not install sealants when ambient temperature is less than 5 degrees C during and 48 hours after installation.

**1.10 WARRANTY**

- .1 Correct defective Work within a period of five years after Substantial Completion.
- .2 Warranty: Provide manufacturer's standard warranty, including degradation of finish. Include coverage for complete system for failure to meet specified requirements.
- .3 Provide five year manufacturer warranty for glazed units.

**Part 2 Products**

**2.1 ACCEPTABLE MANUFACTURERS/PRODUCTS**

- .1 Exterior Frame: extruded aluminum, to ASTM B221; 50.8 x 114.3 mm (2 x 4 1/2 inches); thermally broken with interior tubular section insulated from exterior; flush glazing stops; drainage holes; internal weep drainage system.
  - .1 Kawneer Trifab VG 451T or approved equivalent
- .2 Interior Frame: extruded aluminum, to ASTM B221; 50.8 x 114.3 mm (2 x 4 1/2 inches); non-thermal; centre plane; stick fabrication.
  - .1 .1 Kawneer Trifab VG 450
- .3 Entry Doors: Kawneer 360 Insulclad
  - .1 Glazing Stops: Square
  - .2 Refer to Door Schedule and Elevations for sizes.
- .4 Interior Doors: Kawneer 190
  - .1 Glazing Stops: Square
  - .2 Refer to Door Schedule and Elevations for sizes.
- .5 Fasteners: Galvanized steel.

**2.2 GLASS AND GLAZING MATERIALS**

- .1 Glazing Materials:
  - .1 Exterior: dual pane, as specified in Section 08 80 00

**2.3 SEALANT MATERIALS**

- .1 Sealant and Backing Materials:
  - .1 Per manufacturers recommendations

**2.4 HARDWARE**

- .1 Refer to Section 08 71 00 – Door Hardware.

## **2.5 FABRICATION**

- .1 Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- .2 Accurately fit and secure joints and corners. Make joints flush, hairline.
- .3 Prepare components to receive anchor devices. Fabricate anchors.
- .4 Arrange fasteners and attachments to conceal from view.
- .5 Prepare components with internal reinforcement for door hardware and door operator hinge hardware.
- .6 Reinforce framing members for imposed loads.

## **2.6 FINISHES**

- .1 All exposed aluminum surfaces: clear anodized.
- .2 Extent of Finish:
  - .1 Apply factory coating to all surfaces exposed at completed assemblies.
  - .2 Apply finish to surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
  - .3 Apply touch-up materials recommended by coating manufacturer for field application to cut ends and minor damage to factory applied finish.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verify and existing conditions, dimensions, tolerances and method of attachment with other work prior to starting work.
- .2 Verify wall openings and adjoining air and vapour seal materials are ready to receive work of this Section.

### **3.2 INSTALLATION**

- .1 Install system in accordance with manufacturer's instructions.
- .2 Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- .3 Provide alignment attachments and shims to permanently fasten system to building structure.
- .4 Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

- .5 Provide thermal isolation where components penetrate or disrupt building insulation.
- .6 Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- .7 Coordinate attachment and seal of perimeter air and vapour barrier materials.
- .8 Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- .9 Install flashings.
- .10 Set thresholds in bed of mastic and secure.
- .11 Install hardware using templates provided.
- .12 Install glass to glazing method required to achieve performance criteria.
- .13 Install perimeter sealant, backing materials, and installation criteria in accordance with Section 07 92 00.

### **3.3 ERECTION TOLERANCES**

- .1 Maximum Variation from Plumb: 1.5 mm/m non-cumulative or 1.5 mm per 3m, whichever is less.
- .2 Maximum Misalignment of Two Adjoining Members Abutting in Plane: 0.8 mm.

### **3.4 ADJUSTING**

- .1 Adjust operating hardware and sash for smooth operation.

### **3.5 CLEANING**

- .1 Section 01 73 03: Cleaning installed work.
- .2 Remove protective material from pre-finished aluminum surfaces.
- .3 Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- .4 Remove excess sealant by method acceptable to sealant manufacturer.

### **3.6 PROTECTION OF FINISHED WORK**

- .1 Protect finished Work from damage.

**END OF SECTION**

**Part 1            General**

**1.1            SECTION INCLUDES**

- .1            Fiberglass windows.

**1.2            RELATED SECTIONS**

- .1            Section 07 92 00 - Joint Sealants: Sealants and caulking.
- .2            Section 08 80 00 - Glazing

**1.3            REFERENCES**

- .1            ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process
- .2            ASTM D5796-10, Standard Test Method for Measurement of Dry Film Thickness of Thin Film Coil-Coated Systems by Destructive Means Using a Boring Device
- .3            ASTM E283-04, Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- .4            ASTM E330-02 (2010), Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
- .5            ASTM E547-00(2009), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference.
- .6            ASTM F588-07, Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.
- .7            AAMA/WDMA/CSA 101/1.S.2/A440-11, NAFS North American Fenestration Standard /Specification for Windows, Doors, and Skylights .
- .8            CAN/CSA A440.2-09/A440.3-09, Fenestration Energy Performance/User Guide to CSA A440.2-09, Fenestration Energy Performance
- .9            CAN/CSA A440.4-07, Window, Door and Skylight Installation.
- .10          Manitoba Building Code (National Building Code of Canada (2010) with Manitoba Amendments).

**1.4            PERFORMANCE REQUIREMENTS**

- .1            Design and size components to withstand dead and live loads caused by pressure and suction of wind acting normal to plane of aluminum window glazing system as calculated in accordance with 2010 National Building Code of Canada, Climatic Information for Building Design for at the Place of the Work, but not less than specified thickness and dimension.

- .2 In accordance with requirements of Efficiency Manitoba as required for any applicable funding incentives.
- .3 Windows to meet or exceed AAMA IWDMA/CSA 101/I.S.2/A440 classifications for Air Tightness, Water Tightness, and Wind Load Resistance as follows:
  - .1 Air Tightness: Fixed (picture), A3 (awning).
  - .2 Water Tightness: B7.
  - .3 Wind Load Resistance: C5.
  - .4 Windows to meet Grade 20/F-2 in accordance with ASTM F588 for Forced Entry.

### **1.5 SUBMITTALS FOR REVIEW**

- .1 Product Data: Submit manufacturer's product data, including installation instructions. Include any special instructions.
- .2 Shop Drawings: Submit manufacturer's shop drawings, indicating dimensions, construction, component connections and locations, anchorage methods and locations, hardware locations, and installation details
- .3 Sample(s): Submit full-size or partial full-size sample of window illustrating glazing system, quality of construction, and color of finish.
- .4 Warranty: Submit manufacturer's standard warranty.

### **1.6 QUALITY ASSURANCE**

- .1 Conform to requirements of CSDFMA SDI-100 and ANSI A117.1
- .2 Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum five years experience.

### **1.7 DELIVERY, STORAGE, AND PROTECTION**

- .1 Accept doors on site, unopened, in manufacturer's labelled packaging. Inspect for damage at time of delivery.

## **Part 2 Products**

### **2.1 WINDOW MANUFACTURERS**

- .1 Duxton Windows and Doors
- .2 Silex Fiberglass Windows and Doors
- .3 Accurate Dorwin Inc.

### **2.2 FIBREGLASS WINDOWS**

- .1 Fibreglass Windows: factory-assembled fiberglass window system.

- .2 Frame:
  - .1 Pultruded Fibreglass
  - .2 Exterior and interior finish: Painted
  - .3 Overall frame depth: to suit opening, minimum 3 1/4 inches.
  - .4 Nominal wall thickness of fibreglass members: 0.080 in. or greater.
  - .5 Frame corners: mitred.
- .3 Sash: pultruded fibreglass
  - .1 Exterior and interior finish: painted
  - .2 Corners: mitred
- .4 Weather stripping
  - .1 Single foam filled weather stripping on sash
  - .2 Dual foam filled weather stripping on frame
  
- 2.3 GLAZING:**
  - .1 See Section 08 80 00 - Glazing
  
- 2.4 ACCESSORIES**
  - .1 Insect Screens: Standard. Set in aluminum frame fitted to inside of window. Finish to match window frame.
  
- 2.5 HARDWARE**
  - .1 Casement Operator:
    - .1 steel scissor arm operator with hardened gears
    - .2 die cast operator base, linkage, hinge slide and hinge arms.
    - .3 Crank handle: baked enamel finish.
  - .2 Locking system:
    - .1 Multi-point locking system
    - .2 Lock handles: baked enamel finish
  
- 2.6 FINISH**
  - .1 Steel Sheet: Galvanized to ASTM A653/A653M.
  - .2 Primer: Air dried or baked.
  
- 2.7 SOURCE QUALITY CONTROL**
  - .1 Factory Testing: Factory test individual standard operable windows for air infiltration in accordance with ASTM E 283, to ensure compliance with this specification.

**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Examine areas to receive windows. Advise Contract Administrator of conditions that may adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

**3.2 INSTALLATION**

- .1 Install windows in accordance with manufacturer's instructions and approved shop drawings.

**END OF SECTION**

**Part 1            General**

**1.1                SECTION INCLUDES**

- .1            Hardware for wood, hollow steel, aluminum doors.
- .2            Thresholds.
- .3            Weatherstripping, seals, and door gaskets.

**1.2                RELATED SECTIONS**

- .1            Section 08 12 13 - Hollow Metal Frames.
- .2            Section 08 13 13 - Hollow Metal Doors.
- .3            Section 08 14 16 - Wood Doors.
- .4            Section 08 41 13 - Aluminum Framed Entrances And Storefronts: Hardware for same
- .5            Section 08 71 43 - Automatic Door Operators: Hardware for same
- .6            Electrical: Power supply to electric hardware devices

**1.3                ALLOWANCES**

**1.4                REFERENCES**

- .1            ANSI/BHMA A156 Series
- .2            DHI (Door Hardware Institute) Canada
- .3            NFPA 80 - Fire Doors, Fire Windows.
- .4            NFPA 101 - Life Safety Code.
- .5            NFPA 252 - Fire Tests of Door Assemblies.
- .6            ULC (Underwriters Laboratories Canada)
- .7            Manitoba Building Code

**1.5                ADMINISTRATIVE REQUIREMENTS**

- .1            Coordination: Coordinate with other work having a direct bearing on work of this section.

- .1 Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.
- .2 Coordinate Owner's keying requirements during the course of the Work.
- .2 Sequencing: Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

## **1.6 SUBMITTALS FOR REVIEW**

- .1 Shop Drawings:
  - .1 Indicate locations and mounting heights of each type of hardware, schedules, catalogue cuts, electrical characteristics and connection requirements.
  - .2 Submit manufacturer's parts lists, templates.
- .2 Schedules:
  - .1 Indicate specified hardware, including: make, model, material, function, finish, size, and other pertinent information.
  - .2 Hardware Schedules shall be submitted as per "Sequence and Format for the Hardware Schedule" – vertical format published by DHI
  - .3 Schedules shall reference architectural openings as identified on architectural plans and in specifications.
  - .4 Submit proposed keying schedule for locks and cylinders to Contract Administrator for review.

## **1.7 SUBMITTALS FOR INFORMATION**

- .1 Manufacturer's Installation Instructions: Indicate special procedures or conditions requiring special attention.

## **1.8 SUBMITTALS AT PROJECT CLOSEOUT**

- .1 Operation and Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- .2 Record Documentation:
  - .1 Record actual locations of installed cylinders and their master key code.
  - .2 Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier. Coordinate the following paragraph with the Warranty article.
- .3 Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

**1.9 QUALITY ASSURANCE**

- .1 Perform Work in accordance with ANSI/BHMA and Manitoba Building Code.
- .2 Obtain each type of hardware (locksets, closers, etc.) for all hardware sets from single manufacturer.
- .3 Supplier/Installer:
  - .1 Supplier shall possess minimum of 5 years of experience with Architectural Hardware on projects of similar size.
  - .2 Supplier shall employ or retain the services of an Architectural Hardware Consultant (A.H.C.) in good standing with DHI for review of schedules prior to submittal, to verify effective coordination and proper function of all components listed.
  - .3 Supplier's Installer shall be certified for installation of proprietary systems and specialized hardware as required.

**1.10 REGULATORY REQUIREMENTS**

- .1 Products Requiring Electrical Connection: Listed and classified by ULC, as suitable for the purpose specified and indicated.

**1.11 DELIVERY, STORAGE, AND PROTECTION**

- .1 Protect products from damage during delivery, handling and storage..
- .2 Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

**1.12 PROJECT CONDITIONS**

- .1 Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.
- .2 Coordinate Owner's keying requirements during the course of the Work.

**1.13 WARRANTY**

- .1 Provide manufacturer's standard warranty.

**1.14 MAINTENANCE PRODUCTS**

- .1 Provide special wrenches and tools applicable to each different or special hardware component.
- .2 Provide maintenance tools and accessories supplied by hardware component manufacturer.

**Part 2 Products**

**2.1 HARDWARE ITEMS**

- .1 Refer to Schedule at end of Section for specified products.

**2.2 MANUFACTURERS**

**2.3 KEYING**

- .1 Prepare detailed keying schedule in conjunction with Owner.
- .2 Provide keys in triplicate for every lock in this Contract.
- .3 Stamp keying code numbers on keys and cylinders.

**2.4 FINISHES**

- .1 Finishes: Identified in Schedule at end of section.

**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings.
- .2 Verify that electric power is available to power operated devices and is of the correct characteristics.

**3.2 INSTALLATION**

- .1 Install hardware in accordance with manufacturer's instructions.
- .2 Use templates provided by hardware item manufacturer.
- .3 Mounting heights: within tolerances found in Manitoba Building Code and Winnipeg Accessibility Design Standard.

**3.3 FIELD QUALITY CONTROL**

- .1 Architectural Hardware Consultant will inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

**3.4 ADJUSTING**

- .1 Adjust hardware for smooth operation.

**3.5 PROTECTION OF FINISHED WORK**

- .1 Do not permit adjacent work to damage hardware or finish.

**3.6 SCHEDULES**

**Door Hardware Sets**

**Set: 1.0**

4 Hinge, Full Mortise, Hvy Wt	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1 Push Bar & Pull	BF15847	US32D	RO
1 Conc Overhead Stop	6-X36	630	RF
2 Full Height Actuator	Wikk S-136-5	AL	OT
1 Operator	4100 Series	689	HO

**Set: 2.0**

3 Hinge, Full Mortise	TA2714 4-1/2" x 4"	US26D	MK
1 Entry/Office Lock	28 72 10G05 LL	US26D	SA
1 Best Core	By Owner		BE
1 Surface Closer	1431 UO	EN	SA
1 Kick Plate	K1050 12"	US32D	RO
1 Floor Stop	441/443	US26D	RO

**Set: 3.0**

3 Hinge, Full Mortise	TA2714 4-1/2" x 4"	US26D	MK
1 Entry/Office Lock	28 72 10G05 LL	US26D	SA
1 Best Core	By Owner		BE
1 Conc Overhead Stop	2-X36	630	RF
1 Surface Closer	1431 O	EN	SA
1 Kick Plate	K1050 12"	US32D	RO
1 Kick Down Holder	461	US26D	RO

**Set: 4.0**

3 Hinge, Full Mortise	TA2714 4-1/2" x 4"	US26D	MK
1 Entry/Office Lock	28 72 10G05 LL	US26D	SA
1 Best Core	By Owner		BE
1 Surface Closer	1431 UO	EN	SA
1 Kick Plate	K1050 12"	US32D	RO
1 Floor Stop	441/443	US26D	RO
1 Kick Down Holder	461	US26D	RO

**Set: 5.0**

3 Hinge, Full Mortise	TA2714 NRP 4-1/2" x 4"	US26D	MK
1 Storeroom/Closet Lock	28 72 10G04 LL	US26D	SA
1 Best Core	By Owner		BE
1 Conc Overhead Stop	2-X36	630	RF

**Set: 6.0**

3 Hinge, Full Mortise	TA2714 4-1/2" x 4"	US26D	MK
1 Hinge, Full Mortise	TA2714 CC4 4-1/2" x 4"	US26D	MK
1 Fail Safe Lock	28 72 10G70-24V LL	US26D	SA
1 Best Core	By Owner		BE
1 Electric Strike	5000C-LBM	630	HS
2 Full Height Actuator	Wikk S-136-5	AL	OT
1 Operator	4100 Series	689	HO
1 Kick Plate	K1050 12"	US32D	RO
1 Wall Stop	406	US32D	RO
1 Emergency Call System	Camden WEC10BK2		OT
1 Washroom Relay Kit	Camden CX-WC11		OT
1 Power Supply	AQD2		SU

Notes: Outside lever normally unlocked and electric strike normally unlocked. Pressing inside "push to lock" button will lock the electric strike and the outside lever, disable the outside actuator and illuminate the "occupied when lit" indicator. Pushing the inside actuator will release the electric strike, power open the door and reset the system. Opening the door manually will also reset the system. Washroom control kit includes push to lock button, occupied when lit indicator, door position switch and relay. Single gang boxes for push to lock button and occupied when lit indicator by others. Latch bolt monitor in electric strike can be used in lieu of the door position switch included in the washroom control kit. Emergency call system shown above is a stand alone system and not connected to door lock. Emergency entry by key in

lock at all times.

**Set: 7.0**

2 Kick Plate	K1050 12"	US32D	RO
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Notes: Balance of hardware is existing.

**Set: 8.0**

3 Hinge, Full Mortise, Hvy Wt	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1 Rim Exit Device, Passage	12 8815 ETL	US32D	SA
1 Surface Closer	351 UO	EN	SA
1 Kick Plate	K1050 12"	US32D	RO
1 Floor Stop	441/443	US26D	RO
1 Gasketing	S88BL		PE
1 Door Bottom	420APKL		PE

**Set: 9.0**

3 Hinge, Full Mortise	TA2714 4-1/2" x 4"	US26D	MK
1 Passage Latch	28 10U15 LL	US26D	SA
1 Surface Closer	1431 UO	EN	SA
1 Kick Plate	K1050 12"	US32D	RO
1 Wall Stop	406	US32D	RO

**Set: 10.0**

1 Hinge, Full Mortise	TA2714 4-1/2" x 4"	US26D	MK
2 Hinge, Spring	1502 4-1/2" x 4"	US26D	MK
1 Privacy Lock	V20 8266 LNL	US26D	SA
1 Kick Plate	K1050 12"	US32D	RO
1 Wall Stop	406	US32D	RO

**Set: 11.0**

1 Bifold Track and Hardware	HF2/100A Size to Suit		PE
1 Knob	841	US26D	RO

**Set: 12.0**

2 Full Height Actuator	Wikk S-136-5	AL	OT
1 Operator	4100 Series	689	HO
1 Balance of Hardware is Existing			OT

Notes: Modify door for use with new auto operator. Revise any existing hardware to suit.

**END OF SECTION**

**Part 1        General**

**1.1            SECTION INCLUDES**

- .1        Glass and polycarbonate glazing for doors, windows and entrances.

**1.2            RELATED SECTIONS**

- .1        Section 08 41 13 - Aluminum Framed Entrances And Storefronts.
- .2        Section 08 54 13 – Fibreglass Windows.

**1.3            REFERENCES**

- .1        ASTM C864 - Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
- .2        ASTM E330 - Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- .3        ASTM E774 - Classification of the Durability of Sealed Insulating Glass Units.
- .4        ASTM D638 – Standard Test Method for Tensile Properties
- .5        ASTM D790 - Standard Test Method for Flexural Strength
- .6        ASTM D695 – Standard Test Method for Compressive Properties of Rigid Plastics.
- .7        GANA (Glass Association of North America) - Glazing Manual.

**1.4            PERFORMANCE REQUIREMENTS**

- .1        Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass as calculated in accordance with applicable code.
- .2        Limit glass deflection to 1/20 or flexure limit of glass with full recovery of glazing materials, whichever is less.

**1.5            SUBMITTALS FOR REVIEW**

- .1        Section 01 33 00: Submission procedures.
- .2        Product Data on Glass and Polycarbonate Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

- .3 Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colours.

## **1.6 QUALITY ASSURANCE**

- .1 Perform Work in accordance with GANA Glazing Manual glazing installation methods.
- .2 Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years documented experience.

## **1.7 ENVIRONMENTAL REQUIREMENTS**

- .1 Do not install glazing when ambient temperature is less than 10 degrees C.
- .2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

## **1.8 WARRANTY**

- .1 Provide manufacturer's standard warranties to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.

## **Part 2 Products**

### **2.1 FLAT GLASS MATERIALS**

- .1 Safety Glass: CAN/CGSB 12.1; clear, tempered; 6 mm thick.
- .2 Security 'Glass': Clear Polycarbonate 6 mm minimum thickness.

### **2.2 SEALED INSULATING GLASS MATERIALS**

- .1 Insulating glass (windows, exterior storefront/entrance): CAN2-12.8; double pane, clear; heat strengthened outer pane; Low E coating; argon filled cavities; performance (centre of glass) as follows:
  - .1 U-value: 0.26
  - .2 SHGC: 0.3
  - .3 Visible light transmittance: 65% minimum
  - .4 Edge Seal Construction: warm edge spacer, as recommended by glass manufacturer; colour black.

## **2.3 PLASTIC SHEET MATERIALS**

- .1 Manufacturers:
  - .1 Rockglass
- .2 Polycarbonate Sheet; clear, 7mm thickness.

## **2.4 GLAZING ACCESSORIES**

- .1 Setting Blocks: Neoprene; 80 to 90 Shore A durometer hardness; length of 25 mm for each square metre of glazing or minimum 100 mm x width of glazing rabbet space minus 1.5 mm x height to suit glazing method and pane weight and area.
- .2 Spacer Shims: Neoprene; 50 to 60 Shore A durometer hardness; minimum 75 mm long x one half the height of the glazing stop x thickness to suit application.
- .3 Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled on release paper; black colour. Acceptable product: Tremco POLYshim II
- .4 Glazing Splines, Gaskets: Manufacturer's standard.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verify existing conditions before starting work.
- .2 Verify that openings for glazing are correctly sized and within tolerance.
- .3 Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

### **3.2 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.
- .4 Perform installation in accordance with ASTM C804 for solvent release sealants or in accordance with manufacturer's instructions.

**3.3 INSTALLATION - INTERIOR DRY METHOD (TAPE AND TAPE)**

- .1 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.
- .2 Place setting blocks at 1/4 points with edge block no more than 150 mm from corners.
- .3 Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
- .4 Place glazing tape on free perimeter of glazing in same manner described above.
- .5 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- .6 Knife trim protruding tape.
- .7 Fit tight to glass perimeter with razor cut edge.

**3.4 INSTALLATION – EXTERIOR GLAZING**

- .1 To be installed to storefront and fibreglass window manufacturer's instructions.

**3.5 CLEANING**

- .1 Remove glazing materials from finish surfaces.
- .2 Remove labels after Work is complete.
- .3 Clean glass and adjacent surfaces.

**3.6 PROTECTION OF FINISHED WORK**

- .1 After installation, mark pane with an 'X' by using removable plastic tape or paste.

**3.7 SCHEDULE**

- .1 Refer to drawings for locations of new windows and replacement of glazing units within existing frames.

**END OF SECTION**

## 1. GENERAL

### 1.1. SECTION INCLUDES

- .1 Gypsum board
- .2 Gypsum backer board
- .3 Cementitious backer board
- .4 Acoustic insulation

### 1.2. REFERENCES

- .1 American National Standards Institute (ANSI)
  - .1 ANSI A118.9 – Specifications for Test Methods and Specifications for Cementitious Backer Units
- .2 ASTM International (ASTM)
  - .1 ASTM C475/C475M-15 – Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board
  - .2 ASTM C665-12 – Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
  - .3 ASTM C840-13 – Standard Specification for Application and Finishing of Gypsum Board
  - .4 ASTM C954-15 – Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness
  - .5 ASTM C1002-14 – 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
  - .6 ASTM C1047-14a – Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base
  - .7 ASTM C1177/C1177M-13 – Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
  - .8 ASTM C1325-14 – Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units
  - .9 ASTM C1396-C1396M-14a – Standard Specification for Gypsum Board
  - .10 ASTM D3273-16 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction
- .4 ECD Energy & Environment Canada
  - .1 Green Globes Canada, Design for New Construction and Major Retrofits v.2 2014
- .5 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S101-07, Fire Endurance Tests of Building Construction and Materials
  - .2 CAN/ULC-S-102-10 – Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
  - .3 CAN/ULC-S702-14 – Standard for Mineral Fibre Thermal Insulation for Buildings

### 1.3. SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data:
  - .1 Provide data on each type of gypsum board and cementitious backer board.

### 1.4. QUALITY ASSURANCE

- .1 Products of This Section: Shall have Environmental Product Declaration (EPD) certification.

## 1.5. WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Section 01 74 19 – Waste Management and Disposal

## 2. PRODUCTS

### 2.1. PERFORMANCE REQUIREMENTS

- .1 Acoustic Attenuation for Identified Interior Partitions: STC rating indicated.

### 2.2. REGULATORY REQUIREMENTS

- .1 Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to CAN/ULC-S101 by an independent testing agency. Refer to Drawings for design assemblies.

### 2.3. GYPSUM BOARD MATERIALS

- .1 Interior Standard Gypsum Board: STM C1396/C1396M, paper-faced; 1220mm wide, maximum available length in place; tapered edged, ends square cut
  - .1 Regular core, 13 mm thick.
  - .2 Regular and fire rated core, 16 mm thick.
- .2 Moisture-Resistant Interior Gypsum Board: to ASTM C1396M, moisture-resistant, treated core, mold resistance rating 10 to ASTM D 3273. Type X, 16 mm thick for walls, 12 mm thick for ceilings by 1200 mm wide b maximum practical length, ends square cut, long edges beveled. Location: for use behind ceramic tile in dry areas, janitor rooms, and where indicated.
  - .1 Manufacturer/Model:
    - .1 Georgia-Pacific; ToughRock Mold-Guard.
    - .2 CGC; Sheetrock Brand Panels Mold Though.
    - .3 CertainTeed; M2Tech
  - .3 Fibre-reinforced cementitious backer board: To ASTM: D239 4 / C947 / C1325, water durable, mould-resistant to ASTM D3273 and G21.
    - .1 Manufacturer/Model:
      - .1 CGC; Durock
      - .2 Approved alternate.

### 2.4. ACCESSORIES

- .1 Acoustic Insulation: CAN/ULC-S702 or ASTM C665 Type I; roll, blanket, friction fit type.
  - .1 Manufacturer/Model:
    - .1 Owen Corning
    - .2 Certainteed
    - .3 Johns Manville
  - .2 Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board.
  - .3 Insulating Strip: rubberized, moisture-resistant, 3mm thick closed cell neoprene strip, 12 mm wide, with self-sticking permanent adhesive on one face, lengths as require.
  - .4 Polyethylene: to CAN/CGSB-51.34, 0.15 mm thick
  - .5 Steel Drill Screws:
    - .1 For metal framing less than 0.91 mm thick: to ASTM C 1002.
    - .2 For metal framing 0.31 mm and thicker: to ASTM C 954.
  - .6 Casing Beads, Corner Beads, Control Joints and Edge Trim: to ASTM C1047, zinc-coated by hot-dip process, 0.46 mm base thickness, laminated to paper tape, one piece length per location.
  - .7 Joint Materials: ASTM C475/C475M.
    - .1 Reinforcing tape, adhesive, and water.
    - .2 Joint compound: Asbestos-free.

- .8 Cementitious Board Fasteners: Board manufacturer's purpose made screws, corrosion, resistant steel, self-drilling points, counter-sink head to prevent strip-out, for steel substrate
- .9 Framing and Furring for Suspended Gypsum Board Ceilings: 0.455 mm thick metal furring, or purpose-made grid suspension system to ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
  - .1 Manufacturer/Model:
    - .1 Armstrong; Drywall Grid Systems.
    - .2 CertainTeed; 1-1/2" Drywall System.
    - .3 Chicago metallic; Drywall Grid System.
    - .4 CGC; Drywall Suspension System.

### 3. EXECUTION

#### 3.1. EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting Work.
- .2 Verify that Site conditions are ready to receive Work.
- .3 Do not apply gypsum board until bucks, anchors, blocking, sound attenuation, electrical and mechanical Work is reviewed.

#### 3.2. ACOUSTIC ACCESSORIES INSTALLATION

- .1 Place acoustic insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.
- .2 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
- .3 Seal full perimeter of cut-outs around electrical boxes, ducts, and all penetrations in partitions where perimeter sealed with acoustic sealant.

#### 3.3. GYPSUM BOARD INSTALLATION

- .1 Install gypsum board to ASTM C840 and manufacturer's written instructions.
- .2 Erect gypsum board with ends and edges occurring over firm bearing.
- .3 Apply gypsum board to metal furring or framing using screw fasteners. For double layer application, use screw fasteners for both layers. Maximum spacing of screws 200 mm on centre.
  - .1 Single-Layer Application:
    - .1 Apply gypsum board on ceilings prior to application of walls in accordance with ASTM C 840.
    - .2 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints.
  - .2 Double-layer Application:
    - .1 Install gypsum backing 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.
- .4 Erect exterior gypsum soffit board perpendicular to supports, with staggered end joints over supports.
- .5 Treat cut edges and holes in moisture resistant gypsum board with sealant.
- .6 Install backing board over metal studs to manufacturer's written instructions.

### 3.4. INSTALLATION – ACCESSORIES

- .1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure using joint compound for full length.
- .2 Install casing beads around perimeter of suspended ceilings.
- .3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.
- .4 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frame, to provide thermal break.
- .5 Control Joints:
  - .1 Construct of preformed units in ceilings, and of preformed units or two back-to-back casing beads set in gypsum board facing and supported independently on both sides of joint elsewhere.
  - .2 Provide continuous polyethylene dust barrier behind and across control joints.
  - .3 Locate control joints at 6 metres o.c. maximum or at changes in substrate construction . Where control joints occur at door frames, align control joint with outside edge of door frame.
  - .4 Install control joints straight and true.
- .6 Expansion Joints:
  - .1 Construct expansion joints as detailed, at building expansion and construction joints. Provide continuous dust barrier.
  - .2 Install expansion joint straight and true.
  - .3 Splice corners and intersections together and secure to each member with three screws
- .7 Install cornice cap where gypsum board partitions do not extend to ceiling.
- .8 Fit cornice cap over partition, secure to partition track with two rows of sheet metal screws staggered at 300 mm on centre
- .9 Splice corners and intersections together and secure to each member with three screws.
- .10 Install access doors to electrical and mechanical fixtures specified in respective sections.
  - .1 Rigidly secure frames to furring or framing systems.
- .11 Where gypsum board is installed above finished ceilings, fit Work tight to items penetrating gypsum board Work. Seal around full perimeter of items with caulking. Use fire retardant caulking at fire rated enclosure, acoustical caulking elsewhere.

### 3.5. JOINT TREATMENT

- .1 Finish to ASTM C840. Refer to article "Schedule" for levels of finishing.
- .2 Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
- .3 Feather coats on to adjoining surfaces so that camber is maximum 0.8 mm
- .4 Taping, filling, and sanding is not required at surfaces behind ceramic tile.

### 3.6. SCHEDULES

- .1 Gypsum Finishing Levels:
  - .1 Level 2: Behind ceramic tile
  - .2 Level 4 Walls and ceilings exposed to view.

**END OF SECTION 09 21 16**

## 1. GENERAL

### 1.1. SECTION INCLUDES

- .1 Formed metal framing of studs and furring, at interior locations.
- .2 Framing accessories.

### 1.2. REFERENCES

- .1 ASTM International (ASTM)
  - .1 ASTM A123/A123M-15 – Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
  - .2 ASTM A 653/A653M-13 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  - .3 ASTM C645-14 – Standard Specification for Nonstructural Steel Framing Members
  - .4 ASTM C754-15 – Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panels Products
  - .5 ASTM C951-15 – Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness
  - .6 ASTM C1002-14 – 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

### 1.3. ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
  - .1 Coordinate with other Work having a direct bearing on Work of this section.
  - .2 Coordinate the placement of components recessed within the stud framing assemblies including but not limited to access doors and frames, recessed washroom, accessories, fire extinguisher cabinets.
  - .3 Coordinate simultaneous erection of studs with installation of services lines

### 1.4. WASTE MANAGEMENT

- .1 Separate waste materials for recycling.

## 2. PRODUCTS

### 2.1. PERFORMANCE REQUIREMENTS

- .1 Maximum Allowable Deflection: L/360 for walls with ceramic tile; L/240 elsewhere at a lateral force of 240 Pa for maximum heights indicated.
- .2 Design stud and track connections to accommodate vertical deflection movement of structure without imposing axial loads onto framing.

### 2.2. MANUFACTURERS

- .1 Clark Detrich.
- .2 Bailey.

### 2.3. STUD FRAMING MATERIALS

- .1 Framing Assembly Components: ASTM C 645.
- .2 Studs: ASTM A653/A653M, non-load bearing rolled steel, channel shaped, punched for utility access at 460 mm on centre, and as follows:
  - .1 Depth: indicated
  - .2 Thickness: 0.836 mm where required for unrestrained heights, for jamb studs and

where cementitious backer board is scheduled; 0.53 mm elsewhere, unless indicated other.

- .3 Floor Tracks and Header: Same material and thickness as studs, bent leg retainer notched to receive studs; 50 mm flange height.
- .4 Ceiling Track: Single leg track consisting of 50 mm deep leg ceiling track, 38 mm x 1.6 mm thick U-channel, and 38 x 38 mm x 1.6 mm thick U-channel support clips. U channel installed continuous through top knock-out service hole, maximum 300 mm for top track, with support clip at each stud location.
- .5 Furring and Bracing Members: Of same material as studs; thickness to suit purpose.
- .6 Fasteners:
  - .1 Framing less than 0.84 mm: ASTM C 1002, self-drilling, self-tapping screws.
  - .2 Framing 0.84 mm thick or thicker: to ASTM C 954 screws
- .7 Sheet Metal Backing: 0.91 mm thick, galvanized steel for reinforcement.
- .8 Anchorage Devices: Drilled expansion bolts.
- .9 Acoustic Sealant: As specified in Section 09 21 16.
- .10 Insulating Strip: 3 mm thick by 12 mm side rubberized, moisture-resistant self-adhesive foam strip or strip of self-adhesive air/vapour barrier.
- .11 Resilient furring channels: 13-mm-deep, steel sheet members designed to reduce sounds transmission.
  - .1 Configuration: Asymmetrical.

#### **2.4. FINISHES**

- .1 Framing Materials: Galvanize to Z180 zinc coating designation.
- .2 Accessories: Same finish as framing members.

### **3. EXECUTION**

#### **3.1. EXAMINATION**

- .1 Verify that rough-in utilities are in proper location.

#### **3.2. ERECTION**

- .1 Install framing in accordance with ASTM C754.
- .2 Align and secure bottom and bottom tracks at 600 mm on centre.
- .3 Place insulating strip under floor tracks, and to isolate studs from uninsulated surfaces.
- .4 Place two beads of acoustic sealant between tracks and substrate to achieve an acoustic seal.
- .5 Place two beads of acoustic sealant between studs and adjacent vertical surfaces to achieve an acoustic seal.
- .6 Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.
- .7 Install studs vertically at 400 mm on centre where cementitious backerboard is used; 600 mm on centre elsewhere, unless otherwise indicated.
- .8 Align stud web openings horizontally.
- .9 Secure studs to tracks using fastener method. Do not weld. Screw penetration beyond joined material: minimum three exposed threads.
- .10 Stud Splicing: not permissible.
- .11 Fabricate corners using minimum three studs.
- .12 Provide double studs extending from floor to ceiling at wall openings wider than stud centres specified, not more than 50 mm from each side of openings. Secure studs together.
- .13 Brace stud framing assembly rigid.
- .14 Frame openings and around built-in equipment, cabinets, access panels on four sides. Extend framing into reveals. Coordinate clearances with equipment suppliers.
- .15 Install steel studs or furring channels between stud for attaching electrical and other boxes
- .16 Coordinate erection of studs with requirements of door and window frames; install supports and

attachments.

- .17 Blocking: Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, hardware, and opening frames.
  - .1 Secure steel channels to studs.
- .18 Refer to Drawings for indication of partitions extending stud framing through the ceiling to the structure above or to height above ceiling indicated. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide extended leg ceiling runners.
- .19 Coordinate placement of insulation in stud spaces after stud frame erection

### **3.3. CEILINGS AND BULKHEADS**

- .1 Erect hangers and runner channels or use purpose-made grid suspension system for suspended gypsum board ceilings in accordance with ASTM C840 except where specified otherwise.
- .2 Install Work level to tolerance of 1:1200
- .3 Do not support light fixtures on suspension system
- .4 Frame perimeter of openings for access panels, light fixtures, diffusers, grilles and other openings with furring channels
- .5 Install 19 by 64 mm furring channels parallel to, and at exact locations of steel stud partitions header track
- .6 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .7 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated. Extend gypsum board to underside of structure except where indicated otherwise. Allow for deflection.

### **3.4. ERECTION TOLERANCES**

- .1 Section 01 73 00: Tolerances.
- .2 Erect metal studding to tolerance of 1:1000.

**END OF SECTION 092216**

**Part 1 GENERAL**

**1.1 SECTION INCLUDES**

- .1 Porcelain Tile
- .2 Tile Accessories
- .3 Mortar and Grout.

**1.2 REFERENCES**

- .1 American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI)
  - .1 ANSI A108/A118/A136.1-2009, Specification for the Installation of Ceramic Tile
- .2 Canadian General Standards Board (CGSB)
  - .1 CGSB 71-GP-30M-[79], Adhesive, Epoxy and Modified Mortar Systems, for Installation of Quarry Tiles.
  - .2 CAN/CGSB-75.1-[M88], Tile, Ceramic.
- .3 Canadian Standards Association (CSA)
  - .1 CAN/CSA-A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
- .4 American Society for Testing and Materials (ASTM)
  - .1 ASTM C144, Standard Specification for Aggregate for Masonry Mortar.
- .5 Terrazzo, Tile and Marble Association of Canada (TTMAC)
  - .1 Tile Specification Guide 09 30 00 Tile Installation Manual, 2012-2014
  - .2 Tile Maintenance Guide, latest edition.

**1.3 SUBMITTALS**

- .1 Product data: include manufacturer's information on:
  - .1 Porcelain tile, marked to show each type, size, and shape required.
  - .2 Mortar and grout.
  - .3 Divider strip and metal trim.
  - .4 Leveling compound.
- .2 Samples: provide samples of the following materials provided for project.
  - .1 Porcelain tile: one full size tile of each type and colour.
  - .2 Metal edge strips: one piece of each type, sized, and colour.
- .3 Manufacturer's Instructions: manufacturer's installation instructions.

#### 1.4 CLOSEOUT SUBMITTALS

- .1 Operation and Maintenance Data: Submit TTMAC Maintenance Guide and additional information as follows.
  - .1 Manufacturer's maintenance data sheets for grout, floor sealers and other non-tile maintenance materials and accessories.
  - .2 Warning of maintenance practices or materials that may damage or disfigure finished Work.
  - .3 Provide recommended maintenance materials and procedures including stain removal.

#### 1.5 MAINTENANCE MATERIAL SUBMITTALS

- .1 For maintenance use: Provide 2% of each size, color, and surface finish of tile specified.
  - .1 Porcelain tile – All floor tile: 2% (not less than 1 box) to match colour, texture and accessories.
  - .2 Metal edge strips: 2% of each type and colour installed on project.
  - .3 Provide one (1) bag of each colour and type of grout.
- .2 Extra materials to be of same production run and dye lot as installed materials.
- .3 Wrap each separately and protect with plastic or heavy-duty craft paper. Identify contents. Leave unopened packages in original condition.
- .4 Deliver to site and store where directed. Provide written receipt, signed by Contractor, verifying delivery.
- .5 Unused tiles from open cartons remain the property of the City of Winnipeg.

#### 1.6 QUALITY ASSURANCE

- .1 Installer Qualifications: Company specializing in performing the Work of this section with minimum 5-7 years documents experience and having completed tile installations similar in material, design and extent to this Project. Must be familiar and have experience with Epoxy grout installations.
- .2 Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one manufacturer and each aggregate from one source or producer.
- .3 Conform to TTMAC Manual.
- .4 Applicable Standards: Except as otherwise specified herein, materials shall be in accordance with CAN/CGSB 75.1.
- .5 Reference Standards and Workmanship: all work shall be done by a Tiling Contractor employing skilled tradesmen, the TTMAC and reference details, manufacturer's recommendations and details and customs of best trade practices; true to lines, planes and dimensions of building.
- .6 The setting material manufacturer's representative shall review the details with the Contractor prior to the start of work. Instruct the Contractor on the proper installation procedures to ensure compliance with the guarantee requirements.

- .7 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five (5) years documented experience.

### **1.7 MOCK-UP**

- .1 Construct mock-up of porcelain tile work using same materials as specified for finished work.
- .2 Construct mock-up on site over building substrate of approximately 100 ft<sup>2</sup> in size in an area designated by the Contract Administrator. Include typical tile patterns, control joint, edge strips.
- .3 Allow one (1) week for Contract Administrator's review and approval.
- .4 Mock-up, if accepted, may remain a part of the finished work, and shall establish the minimum standard of quality for remainder of project.

### **1.8 DELIVERY, STORAGE AND PROTECTION**

- .1 Packing, shipping, handling and unloading:
  - .1 Deliver, store packaged materials in original cartons with labels intact and seals unbroken.
  - .2 Deliver, store and handle products in manner to avoid damage or contamination.
  - .3 Have materials delivered to job site just prior to installation.
  - .4 Keep cartons dry and protected from vandalism and away from heavy traffic areas. Store Cementitious materials in a dry area and raised off floor.
  - .5 Store cartons in upright position.
  - .6 Handle furan resin mortar and grout with care and abide by safety labels found on each unit and product MSDS's.
- .2 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of materials.

### **1.9 SITE CONDITIONS**

- .1 Ventilation:
  - .1 Provided continuously during and after installation. Run system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of installation.
- .2 Temperature:
  - .1 Maintain air temperature and structural base temperature at porcelain tile installation area above 10°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.

## **Part 2 PRODUCTS**

### **2.1 TILES**

- .1 Quarry tile: QT-1- C&S Tile Ceramstone Collection- Icon Collection; Color: # 5224 Jet Black; Size: 12"x24" Rectified. Installation pattern as per Floor Finish drawings.

## 2.2 MORTAR AND ADHESIVE MATERIALS

- .1 Premium, Extra Smooth, Large and Heavy Tile Polymer modified Mortar: Non Sag and thin set mortar for tile and stone installations on floors and walls for bond coats up to 1/2 " thick. High content of dry polymer. Exceeds A118. 4HTE and A118.15HTE ANSI requirements.

Acceptable Materials:

- .1 Mapei Keraflex Super.

## 2.3 SELF LEVELING UNDERLAYMENT

- .1 High Strength self leveling cement-based underlayment and repair mix for smoothing and repairing interior floors. Ready for tile in 24 hours. Meets compression and flatness requirements of ASTM F710-17 and ASTM F2873-13.

Acceptable Materials:

- .1 Mapei Novoplan2 Plus, Professional Self Leveling Underlayment.

## 2.4 PRIMER

- .1 Multipurpose Bond Promoting Primer: Low VOC synthetic resin-based primer with bond promoting silica aggregates. Ready to use latex, one component single coat application.

Acceptable Materials:

- .1 Mapei Eco Prim Grip Primer.

## 2.5 GROUT

- .1 Epoxy grout: GR-1 to ANSI A118.3, 100% solids, stain resistant, water-soluble, two-component epoxy grout. Having colour and characteristics to match epoxy bond coat. Suggested Grout line width of 1/4" thick.

Acceptable materials:

- .1 Product: Mapei Kerapoxy CQ, 100% Solids Epoxy grout. Color as selected from Manufacturer's running line.

## 2.6 ACCESSORIES

- .1 **TR-1** Coved tile profile trim at Porcelain floor tile to wall tile transitions: anodized aluminum

.1 Acceptable material: Schluter Dilex-AHK

- .2 **TR-2** Transition profile from Floor tile to Epoxy Flooring/ Sheet Vinyl Flooring transitions.

.1 Acceptable material: Schluter Reno V; anodized aluminum finish

- .3 **TR-3** Metal profile trim at vertical Porcelain floor tile edges: anodized aluminum finish.

.1 Acceptable material: Schluter Schiene

.2 Provide clear silicone bead on top edge where wall meets Schluter Schiene to conceal any gaps.

- .4 **TR-4** Metal control joint for floor tile (as required): Schluter Dilex AKWS anodized aluminum finish. Contractor to assess on site and confirm if control joints required in floor tile.
- .5 **MTLB** Metal Baseboard as located on drawings: Schluter Designbase SL DBSL80AEEB; Anodized Aluminum Finish; 3 5/32" High.
- .6 Mesh tape: (As required) glass fibre mesh tape, 50 mm wide, purpose made, for taping joints and corners in tile backer board.
- .7 Floor sealer and protective coating: to tile and grout manufacturer's recommendations.
- .8 Grout sealer: silicone based, clear, low viscosity penetrating sealer of type recommended by grout manufacturer as required.
- .9 Soft control joint: hybrid adhesive and sealant caulk
  - .1 Acceptable material: FlexTile Ultra-Performance Caulk, Mapei Mapesil T, CBP Commercial 100% Silicone Caulk or equal.
- .10 All tile installation materials to be part of the same manufacturer's system.

## **2.7 MORTAR AND LEVELLING COAT MIXES**

- .1 Levelling coat: 1 part cement, 4 parts sand, minimum 1/10 part latex additive, 1 part water, including latex additive. Premixed mortar may be used per manufacturer's instructions. Refer to section 03 10 00 -Concrete Forming and Accessories.
- .2 Mortar ingredients: measured by volume.
- .3 Dry set mortar: mixed to manufacturer's instructions.

## **2.8 PERFORMANCE CRITERIA**

- .1 Do tile work in accordance with TTMAC Tile Installation Manual, except use more stringent requirements of manufacturer or these specifications.

## **Part 3 EXECUTION**

### **3.1 EXAMINATION**

- .1 Verify existing conditions are ready to receive work.
- .2 Examine surfaces and verify that surfaces are ready to receive tile installation.
  - .1 Concrete substrates have cured minimum of ninety (90) days to TTMAC requirements.
  - .2 Substrates are dry; clean; free from oil, waxy films, and curing compounds; and within starting flatness tolerances, and are ready for application of leveling materials.
  - .3 Grounds, anchors, recessed frames, electrical and mechanical units of Work in or behind tile have been installed.
  - .4 Joints and cracks in tile substrates are coordinated with tile joint locations.
- .3 Verify tile subject to colour variations has been factory blended and packaged. If not factory blended, blend tiles at site before installing.

### **3.2 WORKMANSHIP**

- .1 Do tile work in accordance with TTMAC Tile Installation Manual 2006/2007.

- .2 Apply mortar bed [or bond coat] to clean and sound surfaces.
- .3 Fit tile units around corners, fittings, fixtures, drains and other built-in objects. Maintain uniform joint appearance. Make cut edges smooth and even.
- .4 Maximum surface tolerance: 1:800.
- .5 Make joints between [tiles] [pavers] uniform and approximately [6] mm wide, plumb, straight, true, even and with adjacent units flush. Align patterns.
- .6 Lay out units 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.
- .9 Construct base as indicated on drawings with square top edge.
- .10 Install divider strips at junction of [tile] [paver] flooring and dissimilar material.
- .11 Clean installed tile surfaces after installation cured. Keep building expansion joints free of mortar or grout.

### **3.3 TILE APPLICATION**

- .1 Install tile and bases on substrate in accordance with TTMAC installation method.
- .2 Spread setting materials using properly sized trowels matched to tile sizes and setting materials, as recommended in TTMAC Tile Installation Manual. Spread setting materials in a manner to avoid air pockets, and ensure full coverage of edges and corners.
- .3 Back butter large format tiles, natural stone tiles, exterior tiles, and tiles in wet areas with setting material to ensure proper coverage.
- .4 For ungauged tile back butter with push box or box screed immediately prior to setting to achieve a uniform thickness of tile and mortar combined.
- .5 Ensure bond material coverage of at least 95% and that material is evenly disbursed over back of tile. Ensure corners and edges are fully supported by bonding material.
- .6 Twist and slide tile firmly into position to ensure proper bond.
- .7 Sound tiles after setting. Replace hollow-sounding units to obtain full bond.
- .8 Keep 2/3 of depth of grout joints free of setting material.
- .9 Allow minimum 24 h after installation of tiles, before grouting.
- .10 Force grout into joints to ensure dense finish.
- .11 Protect all tiles from grout staining. Test in advance and pre-seal if required. Preseal or pre-wax rough textured or irregular surface tile prior to grouting.
- .12 Clean installed tile surfaces after installation and grout has cured. Follow manufacturer's recommendations for grout and residue removal.
- .13 Apply grout sealer to grouted joints of bright glazed porcelain tile after grout is cured and dry.

- .14 Protect installed areas from traffic until setting materials have cured for periods specified in TTMAC Tile Installation Manual.
- .15 Barricade grouted areas to prevent foot traffic for 24 hours after grouting.
- .16 Protect wall tiles and bases from impact, vibration, heavy hammering on adjacent and opposite walls for at least 14 days after installation.
- .17 Spread setting materials using properly sized trowels matched to tile sizes and setting materials, as recommended in TTMAC Tile Installation Manual. Spread setting materials in a manner to avoid air pockets, and ensure full coverage of edges and corners.

### **3.4 MOVEMENT JOINTS**

- .1 Provide expansion joints and control joints in porcelain tile where indicated and at locations specified in TTMAC Tile Installation Manual, whether or not they are indicated on the drawings.
- .2 Make expansion and control joints in accordance with TTMAC Detail 301MJ.
- .3 Keep joints free of mortar and grout. Fill movement joints with sealant.
- .4 Locate control joints in porcelain tile in accordance with TTMAC Tile Installation Manual.
- .5 Provide control joints around perimeter of large areas, around columns, in locations where area changes direction and where tile abuts other hard material. Place movement joints directly over subfloor expansion/control joints.

### **3.5 FLOOR SEALER AND PROTECTIVE COATING**

- .1 Apply 2 coats in accordance with manufacturer's printed instructions.

**END OF SECTION 093015**

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

1. Edge-protection and transition profiles for floors.
2. Movement joint and cove-shaped profiles.

### **1.2 RELATED SECTIONS**

1. Section 03 30 00 - Cast-in-Place Concrete.
2. Section 05 55 00 - Metal Stair Treads and Nosings.
3. Section 06 10 00 - Rough Carpentry.
4. Section 07 90 00 - Joint Protection.
5. Section 09 29 00 - Gypsum Board.
6. Section 09 30 00 - Tiling.
7. Section 09307 - Tile Shower Components and Waterproofing Membrane. Shower trays, curbs, ramps, bench, niche, sealing compound, waterproofing membrane, drainage panels, drainage membrane compatible with floor drains.
8. Section 10 26 13 - Corner Guards.

### **1.3 REFERENCES**

1. CSA B79-08: Floor, Area, and Shower Drains, and Cleanouts for Residential Construction.
2. IAPMO IGC 195: Interim Guide Criteria for Floor Drain with Integrated Bonding Flange.
3. Tile Council of North America (TCNA) Handbook for Ceramic Tile Installation.
4. Terrazzo, Tile and Marble Association of Canada (TTMAC) Specification Guide 09300 Tile Installation Manual.
5. American National Standard Specifications for the installation of ceramic tile A108 / A118 / A136.1.

### **1.4 SUBMITTALS**

1. Submit under provisions of Section 01 30 00.
2. Product Data: Manufacturer's data sheets on each product to be used, including:
  - a. Preparation instructions and recommendations.
  - b. Storage and handling requirements and recommendations.
  - c. Installation methods.
3. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) long, representing actual product, color, and finish.
4. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

## 1.5 QUALITY ASSURANCE

1. Installer Qualifications: Company specializing in performing the work of this section with minimum five years experience.
2. Source Limitations for Setting Materials and Accessories: Obtain product of a uniform quality for each application condition from a single manufacturer.
3. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - a. Finish areas designated by Contract Administrator.
  - b. Do not proceed with remaining work until workmanship, color, and sheen are approved by Contract Administrator.
  - c. Refinish mock-up area as required to produce acceptable work.
4. Preinstallation Conference: Conduct conference at the Project site.
  - a. Convene one week prior to commencing work of this section.
  - b. Require attendance of installation material manufacturer, tile supplier, tile installer and installers of related work. Review installation procedures and coordination required with related work.
  - c. Meeting agenda includes but is not limited to:
    - 1.5.4.c.1 Surface preparation.
    - 1.5.4.c.2 Tile and installation material compatibility.
    - 1.5.4.c.3 Edge protection, transition and pre-fabricated movement joint profiles.
    - 1.5.4.c.4 Waterproofing techniques.
    - 1.5.4.c.5 Crack isolation techniques.

## 1.6 DELIVERY, STORAGE, AND HANDLING

1. Store products in manufacturer's unopened packaging until ready for installation.
2. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.
3. Store materials in a dry, warm, ventilated weathertight location.

## 1.7 PROJECT CONDITIONS

1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

## 1.8 COORDINATION

1. Coordinate Work with other operations and installation of floor finish materials to avoid damage to installed materials.

## 2 PART 2- PRODUCTS

### 2.1 MANUFACTURERS

1. Acceptable Manufacturer: Schluter Systems (Canada) Inc., 21100 Chemin Ste-Marie, Ste-Anne-de-Bellevue, QC H9X 3Y8. Tel: (800) 667-8746. Fax (514) 336-2410. E-mail: [specassist@schluter.com](mailto:specassist@schluter.com). Web: [www.schluter.ca](http://www.schluter.ca).

### 2.2 EDGE-PROTECTION AND TRANSITION PROFILES FOR FLOORS

1. Schluter-SCHIENE
    - a. Description: L-shaped profile with 1/8 inch (3.2 mm) wide visible surface integrated trapezoid-perforated anchoring leg, and integrated grout joint spacer.
    - b. Anchoring Leg:
      - 2.2.1.b.1 Provide with straight anchoring leg.
    - c. Material and Finish:
      - 2.2.1.c.1 A – Aluminum; Height as required to coordinate with tile selection and setting system selected.
  
  2. Schluter-RENO-V
    - a. Description: ball-and-socket hinged profile with sloped exposed surface, tapered leading edge, integrated trapezoid-perforated anchoring leg, and integrated grout joint spacer.
    - b. Material and Finish:
      - 2.2.2.b.1 AE - Satin Anodized Aluminum. Height as required to coordinate with tile selection and setting system selected.
- 2.3 FINISHING AND EDGE-PROTECTION PROFILES FOR WALLS AND COUNTERTOPS
1. Schluter-DESIGNBASE - SL
    - a. Description: Prefabricated Baseboard profile comprised of a symmetrically-rounded top, flat exposed face, and 5/16 inch (8 mm) radius lower section.
    - b. Corners:
      - 2.3.1.b.1 Provide with matching inside corners.
      - 2.3.1.b.2 Provide with matching outside corners.
      - 2.3.1.b.3 Provide with matching connectors.
      - 2.3.1.b.4 Provide with matching end caps.
      - 2.3.1.b.5 Provide with matching Sealing Lip.
    - c. Height: 3 1/8" (80mm)
    - d. Material and Finish: AE Satin Anodized aluminum,
- 2.4 MOVEMENT JOINTS AND COVE-SHAPED PROFILES
1. Schluter-DILEX-AKWS (as required)
    - a. Description: profile with integrated aluminum, trapezoid-perforated anchoring legs, connected by grip bars to a 1/4 inch (6 mm) wide soft PVC movement zone, which together form the visible surface.
    - b. Movement Zone Color: Grey
      - 2.4.1.b.1 G – Grey; Height as required to coordinate with tile selection and setting system selected.
  
  2. Schluter-DILEX-AHK
    - a. Description: anodized aluminum profile with integrated trapezoid-perforated anchoring legs, connected at a 90-degree angle by a cove-shaped section with 3/8 inch (10 mm) radius that forms the visible surface.
    - b. Corners:
      - 2.4.2.b.1 Provide with matching inside corners.
      - 2.4.2.b.2 Provide with matching outside corners.
      - 2.4.2.b.3 Provide with matching connectors.
    - c. Material and Finish:
      - 2.4.2.c.1 AE - Satin Anodized Aluminum; Height as required to coordinate with tile selection and setting system selected.

### 3 PART 3-EXECUTION

#### 3.1 EXAMINATION

1. Do not begin installation until substrates have been properly prepared.
2. If substrate preparation is the responsibility of another installer, notify Contract Administrator of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

1. Clean surfaces thoroughly prior to installation.
2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### 3.3 INSTALLATION

1. Install in accordance with manufacturer's instructions.

### 3.4 PROTECTION

1. Protect installed products until completion of project.
2. Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SECTION 09 30 50**

## **1. PART 1-GENERAL**

### **1.1. SECTION INCLUDES**

- .1 Suspended metal grid ceiling system and perimeter trim.
- .2 Acoustic panels

### **1.2. REFERENCES**

- .1 ASTM International (ASTM)
  - .1 ASTM C635/C635M-13a – Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
  - .2 ASTM E1264-14 – Standard Classification of Acoustical Ceiling Products

### **1.3. ADMINISTRATIVE REQUIREMENTS**

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Sequencing:
  - .1 Sequence Work to ensure acoustic ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead Work is completed, tested, and approved.
  - .2 Stall acoustic units after interior wet Work is dry

### **1.4. SUBMITTALS**

- .1 Section 01 33 00: Submission procedures
- .2 Product data: Provide data on metal grid system components, and acoustic tiles
- .3 Samples:
  - .1 Submit two samples, manufacturer's standard sample size, illustrating material and finish of acoustic units.

### **1.5. MAINTENANCE MATERIAL SUBMITTALS**

- .1 Section 01 78 00: Maintenance and extra material requirements.
- .2 Extra Stock Materials: Provide 5% of total acoustic unit area of extra panels to Contract Administrator.

### **1.6. QUALITY ASSURANCE**

- .1 Products of This Section: Shall have Environmental Product Declaration (EPD) certification.

### **1.7. DELIVERY, STORAGE AND HANDLING**

- .1 Deliver acoustical panels, suspension-system components, and accessories to Project Site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- .2 Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
- .3 Handle acoustical panels carefully to avoid chipping edges or damaging units

### **1.8. AMBIENT CONDITIONS**

- .1 Do not install acoustical panel ceiling until spaces are enclosed and weatherproof, wet Work in spaces is complete and dry, Work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

## 2. PART 2- PRODUCTS

### 2.1. SUSPENSION GRID MATERIALS & PERIMETER TRIMS

- .1 Non-fire-rated, two-directional, wide-face, capped, double-web, steel suspension system. Main and cross runners roll formed from cold-rolled steel sheet; pre-painted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than Z90 coating designation; with prefinished 24-mm wide metal caps on flanges.
  - .1 Structural Classification: Heavy Duty; Intermediate-duty system
  - .2 Face Design: Non-directional
  - .3 Cap Material: Steel cold-rolled sheet.
  - .4 Cap Finish: Painted white.
  - .5 Manufacturer/Model:
    - .1 Armstrong Ceiling Solutions- Prelude 15/16"
- .2 Hanger Wire:
  - .1 Galvanized soft annealed steel wire
  - .2 Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but no less than 2.6 mm diameter wire.
- .3 Hanger Inserts: purpose made. Provide hangers and fasteners for independent suspension of light boxes
- .4 Perimeter Trims: Armstrong Ceilings Standard Suspension Trim Profile 150 mmH.
- .5 Metal Edge Moldings and Trim: Roll-formed, sheet-metal of type and profile indicated or, if not indicated, manufacturer's standard mouldings for edges and penetrations; formed from sheet metal of same material, finish, and colour as that used for exposed flanges of suspension-system runners.

### 2.2. ACOUSTIC PANEL MATERIALS

- .1 **ACT-1** Acoustic Panels: to ASTM E1264, conforming to the following:
  - .1 Size: 2" x 2" x 3/4"
  - .2 Thickness: 19 mm.
  - .3 Composition: Wet-formed mineral fibre.
  - .4 Light Reflectance: minimum 84%
  - .5 NRC: minimum 0.55
  - .6 CAC: minimum 35
  - .7 Edge: Angled reveal.
  - .8 Surface Color: White
  - .9 Surface Finish: Non-directional fissured with factory applied latex paint.
  - .10 Manufacturer/Model:
    - .1 Armstrong Ceilings #584 Cirrus Angled Tegular
- .2 **ACT-2** Acoustic Panels: to ASTM E1264, conforming to the following:
  - .1 Size: 2" x 2" x 5/8"
  - .2 Thickness: 19 mm.
  - .3 Composition: Wet-formed mineral fibre.
  - .4 Light Reflectance: minimum 84%
  - .5 NRC: minimum 0.55
  - .6 CAC: minimum 35
  - .7 Edge: Square
  - .8 Surface Color: White
  - .9 Surface Finish: Factory applied latex paint
  - .10 Manufacturer/Model:
    - .1 Armstrong Ceilings #673 Kitchen Zone

### **2.3. ACCESSORIES**

- .1 Acoustical Sealant: Manufacturer's standard sealant complying with ASTM C 834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
  - .1 Exposed Joints: Non-sag, paintable, non-staining latex sealant
  - .2 Concealed Joints: Non-drying, non-hardening, non-skinning, non-staining, gunnable, synthetic-rubber sealant.
- .2 Touch-up Paint: Type and colour to match acoustic and grid units

## **3. PART 3- EXECUTION**

### **3.1. EXAMINATION**

- .1 Do not erect ceiling suspension system until Work above ceiling including anchors, blockings, sound and fire barriers, mechanical and electrical Work has been reviewed by Contract Administrator
- .2 Verify that layout of hangers will not interfere with other Work.

### **3.2. PREPARATION**

- .1 Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

### **3.3. INSTALLATION – LAY-IN GRID SUSPENSION SYSTEM**

- .1 Install suspension system to ASTM C636/C636M, and manufacturer's written instructions, and as supplemented in this section.
- .2 Install system capable of supporting imposed loads to deflection of 1/360 maximum.
- .3 Install after major above ceiling Work is complete. Coordinate the location of hangers with other Work.
- .4 Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.
- .5 Hang suspension system independent of walls, columns, ducts, pipes, and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- .6 Where width of ducts and other construction with ceiling plenum produces hanger spacings that interfere with location of hangers at spacing required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
- .7 Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads independent of suspension grid .
- .8 Do not eccentrically load system, or produce rotation runners
- .9 Do not kink, or bend hanger wires to level system
- .10 Perimeter Moulding:
  - .1 Install edge moulding at intersection of ceiling and vertical surfaces.
  - .2 At sound rated partitions, install edge moulding into bed of acoustic sealant or gasket. Ensure sealant or sealant are no exposed below perimeter moulding
  - .3 Use longest practical lengths.
  - .4 Mitre corners
  - .5 Provide moulding at junctions with other interruptions
  - .6 Do not use exposed fasteners, including pop rivets, on mouldings and trim

**3.4. INSTALLATION – ACOUSTIC UNITS**

- .1 Fit acoustics units in place, free from damaged edges or other defects detrimental to appearance and function.
- .2 Install units after above ceiling Work is complete
- .3 Install acoustic units level, in uniform plane, and free from twist, warp, and dents.
- .4 Cutting Acoustic Units:
  - .1 Cut to fit irregular grid and perimeter edge trim.
  - .2 Double cut and field paint exposed edges of reveal edge units.
- .5 Where round obstructions occur, provide preformed closures to match perimeter molding.
- .6 Install hold-down clips to retain panels right to grid system within 6 m of an exterior door.
- .7 Do not use scratched, damaged or broken panels. Replace scratched, damaged and broken panels.

**3.5. ERECTION TOLERANCES**

- .1 Section 01 73 00: Tolerances
- .2 Maximum variation from Flat and Level Surface: 3 mm in 3650 mm.
- .3 Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees

**3.6. CLEANING**

- .1 Touch up scratches, abrasions, voids and other defects in painted surfaces.
- .2 Clean down materials, leave free of grime, dirt, finger prints, other evidence of Work

**END OF SECTION 09 51 13**

## **PART 1- GENERAL**

### **1.1 RELATED DOCUMENTS**

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### **1.2 SUMMARY**

1. Section Includes:
  1. Resilient Wall Base.

### **1.3 SUBMITTALS**

1. Product Data: For each type of product indicated.
2. Samples for Initial Selection: For each type of product indicated.
3. Samples for Verification: For each type of product indicated, in manufacturer's standard-size samples of each resilient product color, texture, and pattern required.
4. Product Schedule: For resilient products. Use same designations indicated on Drawings.

### **1.4 QUALITY ASSURANCE**

1. Mockups: Provide resilient products with mockups specified in other Sections as requested.

### **1.5 DELIVERY, STORAGE, AND HANDLING**

1. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by Johnsonite, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

### **1.6 PROJECT CONDITIONS**

1. Install resilient products after other finishing operations, including painting, have been completed.
2. Maintain ambient temperatures within range recommended by Johnsonite, but not less than 65 deg F (18 deg C) or more than 85 deg F (29 deg C) in spaces to receive resilient products during the following time periods:
  1. 48 hours before installation.
  2. During installation.
  3. 48 hours after installation.
3. Maintain the ambient relative humidity between 40% and 60% during installation.
4. Until Substantial Completion, maintain ambient temperatures within range recommended by Manufacturer, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

## **PART 2 - PRODUCTS**

### **2.1 TRADITIONAL WALL BASE (RCB-1)**

1. Traditional Rubber Wall Base
  1. Manufactured from a proprietary thermoplastic rubber formulation.
  2. ASTM E 648, Standard Test Method for Critical Radiant Flux of 0.45 watts/cm<sup>2</sup> or greater, Class I.
  3. ASTM E 84, Standard Test Method for Surface Burning Characteristics of Building Materials, Class A, Smoke <450.
  4. Flexibility: Does not crack, break, or show any signs of fatigue when bent around a 1 1/4" diameter cylinder when tested according to ASTM F 137 Standard Test Method for Flexibility of Resilient Flooring Materials protocols.
  5. Color Stability: Meets or exceeds ASTM F 1861 requirements for color stability when tested to ASTM F 1515 Standard Test Method for Measuring Light Stability of Resilient Flooring protocols.
  6. Phthalate-free.
  7. Possible LEED contributions include MR:2, MR:4, MR:5, and EQ: 4.3.
  8. Johnsonite offers a RESTART reclamation program for returning jobsite scrap.
  9. Contains at least 14% pre consumer recycled content.
  10. 100% Recyclable.
  11. SCS FloorScore® Certified and meets California Specifications Section 01350
  12. Johnsonite facilities are ISO 9001 and ISO 14001 Certified.
  
2. For Traditional Rubber Wall Base 1/8" thick
  - Profile: DC Traditional Toe Type
  - Colour: 40 Black
  - Height: 4" or 6"- refer to drawings.
  - Length 120' or 100' coils for 6" heights

### **2.2 INSTALLATION MATERIALS**

1. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based formulation manufactured and warranted by a reputable manufacturer.
2. Adhesives: as recommended by Johnsonite to meet site conditions.
  1. Johnsonite 960 Cove Base Adhesive
  2. Johnsonite 946 Premium Contact Bond Adhesive

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

1. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the work.
2. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

1. Prepare substrates according to Johnsonite's written instructions to ensure adhesion of resilient wall base.
2. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
3. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
4. Vacuum clean substrates to be covered by resilient products immediately before installation.

### **3.3 RESILIENT BASE INSTALLATION**

1. Comply with Johnsonite's written instructions for installing resilient base.
2. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
3. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
4. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
5. Do not stretch resilient base during installation.
6. Preformed corners: Install preformed corners if available before installing straight pieces.
7. Job-formed corners:
  1. Outside corners: Form by bending without producing discoloration (whitening) at bends.
  2. Inside corners: Butt one piece to corner then scribe next piece to fit.

### **3.4 CLEANING AND PROTECTION**

1. Comply with Johnsonite's written instructions for cleaning and protection of resilient products.
2. Perform the following operations immediately after completing resilient product installation:
  1. Remove adhesive and other blemishes from exposed surfaces.
  2. Damp-mop surfaces to remove marks and soil.
3. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

**END OF SECTION 09.65.13**

## **PART 1 - GENERAL**

### **1.1 RELATED DOCUMENTS**

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### **1.2 SUMMARY**

- .1 Section Includes:
  1. Resilient Rubber Floor Tile

### **1.3 SUBMITTALS**

1. Product Data: For each type of product indicated.
2. Samples for Initial Selection: For each type of product indicated.
3. Samples for Verification: For each type of product indicated, in manufacturer's standard-size samples of each resilient product color, texture, and pattern required.
4. Product Schedule: For resilient products. Use same designations indicated on Drawings.

### **1.4 QUALITY ASSURANCE**

1. Installation Qualification: Contractors for floor covering installation should be experienced in managing commercial flooring projects and provide professional installers, qualified to install the various flooring materials specified. An installer is "qualified" if trained by Tarkett or a certified INSTALL (International Standards & Training Alliance) resilient floor covering installer.
2. Mockups: Provide resilient products with mockups specified in other Sections.

### **1.5 DELIVERY, STORAGE, AND HANDLING**

1. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by Tarkett, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

### **1.6 PROJECT CONDITIONS**

1. Install resilient products after other finishing operations, including painting, have been completed.
2. Maintain ambient temperatures within range recommended by Tarkett, but not less than 65 deg F (18 deg C) or more than 85 deg F (29 deg C) in spaces to receive resilient products during the following time periods:
  1. 48 hours before installation.
  2. During installation.
3. Maintain the ambient relative humidity between 40% and 60% during installation.
4. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

## **PART 2 - PRODUCTS**

- 2.1 TARKETT COLORSPLASH RUBBER TILE (RF-1)
1. Basis-of-Design Product: Subject to compliance with requirements, provide Tarkett; Colorsplash Hammered.
  2. Classification specify: ASTM F1344, **Type I-B**,
  3. For thickness specify: 0.080 inch (2 mm)
  4. For size specify: 24 in. x 24 in. (610mm x 610 mm)
  5. Colors and Texture: VG1 Forks Falls; Hammered Texture (HRT)
  6. Test data:
    1. Hardness (ASTM D2240):  $\geq 85$  Shore A
    2. Abrasion Resistance (ASTM D3389): Passes
    3. Thickness Tolerance (ASTM F386): Passes
    4. Resistance to Chemicals (ASTM F925): Passes
    5. Static Load Resistance (ASTM F970): 250 psi
    6. Resistance to Heat (ASTM F 1514):  $\Delta E \leq 8$
    7. Size/Squareness Tolerance (ASTM F2055): Passes
    8. Dimensional Stability (ASTM F2199): Passes
    9. Static Coefficient of Friction (ASTM D 2047):  $\geq 0.8$  SCOF
    10. Flammability (ASTM E648, Critical Radiant Flux): Class 1 ( $\geq 0.45$  W/cm<sup>2</sup>)
    11. Limited Commercial Warranty: 5 years
    12. Cradle to Cradle certified Bronze
  7. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation.
  8. Adhesives: As recommended by Tarkett to meet site conditions
    1. Tarkett 965 Flooring and Tread Adhesive
    2. Tarkett 975 Two-Part Urethane Adhesive
    3. Tarkett 996 Two-Part Epoxy Adhesive
    4. Tarkett 901 SpraySmart Adhesive

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

1. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the work.
2. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

1. Prepare substrates according to Tarkett written instructions to ensure proper adhesion of Resilient Flooring.
  1. Prepare concrete substrates in accordance with ASTM F 710.
    1. Concrete treads must be free of dust, solvent, paint, wax, oil, grease, residual

adhesive, adhesive removers, film-forming curing compounds, silicate penetrating curing compounds, sealing, hardening or parting compounds, alkaline salts, excessive carbonation or laitence, mold, mildew, and other foreign materials that may affect dissipation rate of moisture from the concrete, discoloration or adhesive bonding.

### **3.3 PREPARATION**

1. Prepare substrates according to Tarkett written instructions to ensure proper adhesion of Resilient Flooring.
  1. Prepare concrete substrates in accordance with ASTM F 710.
    1. Concrete treads must be free of dust, solvent, paint, wax, oil, grease, residual adhesive, adhesive removers, film-forming curing compounds, silicate penetrating curing compounds, sealing, hardening or parting compounds, alkaline salts, excessive carbonation or laitence, mold, mildew, and other foreign materials that may affect dissipation rate of moisture from the concrete, discoloration or adhesive bonding.
    2. Mechanically remove contamination on the substrate that may cause damage to the resilient flooring material. Permanent and non-permanent markers, pens, crayons, paint, etc., must not be used to write on the back of the flooring material or used to mark the substrate as they could bleed through and stain the flooring material.
  2. Wood subfloors must be rigid, free of movement.
    1. Single wood and tongue and groove subfloors should be covered with ¼" (6.4 mm) or ½" (12.7 mm) APA approved underlayment plywood.
    2. Do not install over OSB (Oriented Strand Board), particle board, chipboard, lauan or composite type under layments.
2. Fill cracks, holes, depressions and irregularities in the substrate with good quality Portland cement based underlayment leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
3. Do not install resilient products until they are same temperature as the space where they are to be installed.
  1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
4. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

### **3.4 RESILIENT TILE FLOORING INSTALLATION**

1. Comply with manufacturer's written instructions for installing resilient tile flooring.
2. Resilient Rubber Floor Tile:
  1. Install with Johnsonite adhesive specified for the site conditions and follow adhesive label for proper use.
  2. Roll the flooring in both directions using a 100 pound three-section roller.

### **3.5 CLEANING AND PROTECTION**

1. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
2. Perform the following operations immediately after completing resilient product installation:
  1. Remove adhesive and other blemishes from exposed surfaces.
  2. Sweep and vacuum surfaces thoroughly.
  3. Damp-mop surfaces to remove marks and soil

3. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
  1. No traffic for 24 hours after installation.
  2. No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.
4. Wait 72 hours after installation before performing initial cleaning.
5. A regular maintenance program must be started after the initial cleaning.

**END OF SECTION 09.65.19**

## **GENERAL**

### **1.1. RELATED REQUIREMENTS**

- .1 Section 04 22 00 – Concrete Unit Masonry
- .2 Section 05 50 00 – Metal Fabrications
- .3 Section 08 11 00 – Metal Doors and Frames
- .4 Section 09 21 16 – Gypsum Board Assemblies

### **1.2. REFERENCES**

- .1 Environmental Protection Agency (EPA)
  - .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .3 The Master Painters Institute (MPI)
  - .1 Architectural Painting Specification Manual - [February 2004].
  - .2 Standard GPS-1-[05], MPI Green Performance Standard for Painting and Coatings.
- .4 National Fire Code of Canada.
- .5 Society for Protective Coatings (SSPC)
  - .1 Systems and Specifications, SSPC Painting Manual [2005].
- .6 Canada Green Building Council (CaGBC)

### **1.3. QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Contractor: to have a minimum of five years proven satisfactory experience. When requested, provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
  - .2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting Work
  - .3 Apprentices: may be employed provided they Work under direct supervision of qualified journeyperson in accordance with trade regulations.
  - .4 Conform to latest MPI requirements for exterior painting Work including preparation and priming.
  - .5 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
  - .6 Paint materials such as linseed oil, shellac, and turpentine to be highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and to be compatible with other coating materials as required.
  - .7 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by the Contract Administrator.
- .8 Standard of Acceptance:
  - .1 Walls: No defects visible from a distance of 1000 mm at 90 degrees to surface.
  - .2 Soffits: No defects visible from floor at 45 degrees to surface when viewed using final lighting source.
  - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

**1.4. PERFORMANCE REQUIREMENTS**

- .1 Environmental Performance Requirements:
  - .1 Provide paint products meeting MPI "Environmentally Friendly" E2 ratings based on VOC (EPA Method 24) content levels.
  - .2 Green Performance in accordance with MPI Standard GPS-1.

**1.5. SCHEDULING**

- .1 Submit Work schedule for various stages of painting Contract Administrator for approval. 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 in and about building.

**1.6. 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 Upon completion, submit records of products used. List products in relation to finish system and include the following:
  - .1 Product name, type and use.
  - .2 Manufacturer's product number.
  - .3 Colour numbers.
  - .4 MPI Environmentally Friendly classification system rating.
  - .5 Manufacturer's Material Safety Data Sheets (MSDS).
- .5 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .1 Submit 200 x 300 mm sample panels of each paint, stain, clear coating, special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards submitted on the following substrate materials:
    - .1 3 mm plate steel for finishes over metal surfaces.
    - .2 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
    - .3 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
  - .2 When approved, samples shall become acceptable standard of quality for appropriate on-Site surface with one of each sample retained on-Site.
  - .3 Submit full range of available colours where colour availability is restricted.

**1.7. MAINTENANCE**

- .1 Submit one, four litre can of each type and colour of primer, stain, finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

**1.8. DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements, supplemented as follows:
  - .1 Deliver and store materials in original containers, sealed, with labels intact.
  - .2 Labels: to indicate:
    - .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 Provide and maintain dry, temperature controlled, secure storage.
- .5 Observe manufacturer's recommendations for storage and handling.
- .6 Store materials and supplies away from heat generating devices.
- .7 Store materials and equipment in well-ventilated area with temperature range 7 degrees C to 30 degrees C.
- .8 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .9 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Contract Administrator. After completion of operations, return areas to clean condition to approval of Contract Administrator.
- .10 Remove paint materials from storage only in quantities required for same day use.
- .11 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
- .12 Fire Safety Requirements:
  - .1 Provide one 9 kg Type ABC 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 the National Fire Code of Canada.
- .2 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling.
  - .2 Paint, stain and wood preservative finishes and related materials (thinners, solvents, etc.) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.
  - .3 Material, which cannot be reused, must be treated as hazardous waste and disposed of in an appropriate manner.
  - .4 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
  - .5 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into the ground the following procedures shall be strictly adhered to:
    - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
    - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
    - .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
    - .4 Dispose of contaminants in an approved legal manner in accordance with hazardous waste regulations.
    - .5 Empty paint cans are to be dry prior to disposal or recycling (where available).
  - .6 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
  - .7 Close and seal tightly partly used sealant and adhesive containers and store protected in well-ventilated fire-safe area at moderate temperature.

### 1.9. AMBIENT CONDITIONS

- .1 Heating, Ventilation and Lighting:
  - .1 Do not perform painting Work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
  - .2 Where required, provide continuous ventilation for seven days after completion of application of paint.
  - .3 Co-ordinate use of existing ventilation system with General Contractor and ensure its operation during and after application of paint as required.
  - .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
  - .5 Perform no painting Work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities to be provided by General Contractor.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
  - .1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and, applied product manufacturer, perform no painting Work when:
    - .1 Ambient air and substrate temperatures are below 10 degrees C.
    - .2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperatures.
    - .3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.
    - .4 Relative humidity is above 85 % or when dew point is less than 3 degrees C variance between air/surface temperature.
    - .5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at Site.
  - .2 Perform no painting Work when maximum moisture content of substrate exceeds:
    - .1 12% for concrete and masonry (clay and concrete brick/block).
    - .2 15% for wood.
    - .3 12% for plaster and gypsum board.
  - .3 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "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 noted herein.
  - .3 Apply paint when previous coat of paint is dry or adequately cured.
  - .4 Apply paint finishes when conditions forecast for entire period of application fall within manufacturer's recommendations.
  - .5 Do not apply paint when:
    - .1 Temperature is expected to drop below 10 degrees C before paint has thoroughly cured.
    - .2 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's limits.
    - .3 Surface to be painted is wet, damp or frosted.

- .6 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.
- .7 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.
- .8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.
- .9 Paint occupied facilities in accordance with approved schedule only. Schedule operations to approval of Contract Administrator such that painted surfaces will have dried and cured sufficiently before occupants are affected.

**1.10. WASTE MANAGEMENT AND DISPOSAL**

- .1 Remove from Site and dispose of packaging materials at appropriate recycling facilities.
- .2 Collect and separate for disposal paper, plastic, corrugated cardboard, packaging material for recycling in accordance with Waste Management Plan.

**2. PRODUCTS**

**2.1. MANUFACTURERS – PAINT**

- .1 Standard of Acceptance: Benjamin Moore Paints; PPG DULUX Paints
- .2 Substitutions: Refer to Section 01 25 00
- .3 Refer to Paint Finish Schedule on Drawings.

**2.2. 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 Low odour products: whenever possible, select products exhibiting low odour characteristics. If two products are otherwise equivalent, select the product with the lowest odour. Only qualified products with E2 or E3 "Environmentally Friendly" rating are acceptable for use on this project.
- .4 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids, shall:
  - .1 be water-based, water soluble, water clean-up.
  - .2 be non-flammable
  - .3 be manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
  - .4 be manufactured without compounds which contribute to smog in the lower atmosphere.
  - .5 do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.
- .5 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).
- .6 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .7 Water-borne surface coatings must have a flash point of 61.0°C or greater.
- .8 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:

- .1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
- .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
- .9 Water-borne paints and stains, and water borne varnishes must meet a minimum "Environmentally Friendly" E2 rating.

### 2.3. COLOURS

- .1 Colours are to be final colours to be confirmed by Contract Administrator prior to ordering. Selection of colours will be as per the Paint Finish Schedule. Refer to drawings.

### 2.4. MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to Site. On-Site tinting of painting materials is allowed only with Contract Administrator's written permission. See Drawing A3.0 For Stairway Colour
- .2 Paste, powder or catalyzed paint mixes shall be mixed in strict accordance with manufacturer's written instructions.
- .3 Where thinner is used, addition shall not exceed paint manufacturer's recommendations. Do not use kerosene or any such organic solvents to thin water-based paints.
- .4 Thin paint for spraying according in strict accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Contract Administrator.
- .5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

### 2.5. GLOSS/SHEEN RATINGS

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

<b>Part 1</b>	<b><u>Gloss Level /Category Units @ 60E/ Units @ 85°</u></b>	
G1 - matte finish	0 to 5	max. 10
G2 - velvet finish	0 to 10	10 to 35
G3 - eggshell finish	10 to 25	10 to 35
G4 - satin finish	20 to 35	min. 35
G5 - semi-gloss finish	35 to 70	
G6 – gloss finish	70 to 85	
G7 - high gloss finish	> 85	

- .2 Gloss level ratings of painted surfaces shall be as specified in Paint finish schedule.

### 2.6. INTERIOR PAINTING SYSTEMS

- .1 Concrete Masonry Units:
  - .1 Color as specified – As specified, 1 coat of primer; 2 finish coats of Semi-Gloss Finish for standard CMU walls- G5 Finish. For Spectra Glaze finished Concrete Masonry Units: 1 coat Primer: Dulux X-Pert Water-Based Alkyd Primer # 23010; Topcoat – Pitt-Glaze WB1 Pre-Catalyzed Semi-Gloss Epoxy # 16-510C; Color as specified.
- .2 Moisture Resistant Interior Gypsum Board – Laundry/Shower Rooms/ Universal Toilet Room:
  - .1 Color as specified- Acrylic Latex- G5 Finish. 1 coat of primer; 2 finish coats

- .3 Interior Gypsum Board – Offices, Control Room, Common Room, Storage, Network Room:
  - .1 Color as specified- Acrylic Latex- G4 Finish. 1 coat of primer; 2 finish coats on new Gypsum Board.
- .4 Metal Doors and Frames:
  - .1 Color as specified- Acrylic Latex- G5 Finish. Semi-gloss Finish. 1 coat of primer; 2 finish coats.

### **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. PREPARATION**

- .1 Perform preparation and operations for exterior painting in accordance with MPI Maintenance Repainting Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.
- .3 Clean and prepare exterior surfaces to be repainted in accordance with MPI Maintenance Repainting Manual requirements. Refer to the MPI Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and surface debris by 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. Allow sufficient drying time and test surfaces using electronic moisture meter before commencing Work.
  - .5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water-based paints.
  - .6 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.
- .4 Clean metal surfaces to be repainted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements. Remove such contaminants from surfaces, pockets and corners to be repainted by brushing with clean brushes, blowing with clean dry compressed air, or brushing/vacuum cleaning as required.
- .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .6 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.
- .7 Existing Spectra Glaze finish on concrete masonry wall surfaces must be thoroughly sanded to produce a very dull appearance. (Using a power orbital sander is likely the easiest method).

### 3.3. PROTECTION

- .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces 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, and general public in and about building.
- .5 Remove light fixtures, surface hardware on doors, and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Store items and re-install after painting is completed.
- .6 Move and cover exterior furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
- .7 As painting operations progress, place "WET PAINT" signs in pedestrian and vehicle traffic areas to approval of Contract Administrator.

### 3.4. APPLICATION

- .1 Method of application to be as approved by Contract Administrator. Apply paint by brush, roller, air sprayer. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
  - .1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.
  - .2 Work paint into cracks, crevices and corners.
  - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
  - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces shall be free of roller tracking and heavy stipple.
  - .5 Remove runs, sags and brush marks from finished Work and repaint.
- .3 Spray Application:
  - .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
  - .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
  - .3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.
  - .4 Brush out immediately runs and sags.
  - .5 Use brushes to Work paint into cracks, crevices and places, which are not adequately painted by spray.
- .4 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized by Contract Administrator.
- .5 Apply coats of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .7 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized by Contract Administrator.
- .8 Apply coats of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

- .9 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .10 Sand and dust between coats to remove visible defects.
- .11 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as projecting ledges.
- .12 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

**3.5. MECHANICAL/ELECTRICAL EQUIPMENT**

- .1 Unless otherwise specified, paint exterior exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.
- .2 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .3 Do not paint over nameplates.

**3.6. STRUCTURAL STEEL, JOISTS, SPACE FRAME, DECKING**

- .1 Paint all structural steel, steel joists, steel space frame and steel decking with colour and finish as noted as required.

**3.7. FIELD QUALITY CONTROL**

- .1 Inspection:
  - .1 Field inspection of exterior painting, where applicable, to be carried out by independent inspection firm as designated by Contract Administrator.
  - .2 Advise Contract Administrator when each surface and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
  - .3 Co-operate with inspection firm and provide access to areas of Work.
- .2 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.

**3.8. CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
  - .1 Remove paint where spilled, splashed, splattered or sprayed as Work progresses using means and materials that are not detrimental to affected surfaces.

**END OF SECTION 09 91 00**

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- A. High build, high solids, epoxy wall system with glaze like, orange peel finish.

### **1.2 SUMMARY**

- A. Definitions: Resinous wall system includes a penetrating, two-component, epoxy polyamide primer and a two-component, high performance, high solids, pigmented epoxy glaze coating.
- B. Application Method: Roll on.

### **1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.
- B. Samples for Verification: For each resinous wall system required, 5 inches (150 mm) square, applied to a rigid backing for color verification and texture. Separate from site Mock up sample required.
- C. Product Schedule: Use resinous wall designations indicated in Part 2 and room designations indicated on Drawings in product schedule.
- D. Installer Certificates: Signed by manufacturer certifying that installers are certified and comply with specified requirements. To be presented to Contract Administrator at Pre- Award Meeting.
- E. Maintenance Data: For resinous wall system to include in maintenance manuals.

### **1.4 QUALITY ASSURANCE**

- A. No request for substitution shall be considered that would change the generic type of wall coating system specified (i.e. primary resinous wall coating system). Equivalent materials of other manufacturers may be substituted only on approval of City of Winnipeg Contract Administrator in writing. Request will be subject to specification requirements described in this section.
- B. Installer Qualifications: General Contractor must engage an experienced installer (applicator) who is experienced in applying resinous wall systems similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance, and who is acceptable to the resinous wall coating manufacturer listed.
  - 1. Engage a resinous wall coating installer who is currently certified in writing by resinous wall coating manufacturer as qualified to apply the resinous wall coating systems indicated.
  - 2. Resinous wall coating installer must have a minimum 5-7 years of experience installing specified products, and shall have completed at least ten (10) projects of similar size and complexity.
  - 3. Hi- Build Coatings Manufacturer must offer installation training to installers on Resinous wall coating systems and be able to certify in writing that they have completed/ met training requirements.
- C. Source Limitations: Obtain primary resinous wall materials, including primers, resins, hardening agents, aggregates, finish, or sealing coats, through one source from a single manufacturer, with not less than ten years of successful experience in manufacturing and installing principal materials described in this section. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.

- D. Manufacturer Field Technical Service Representatives: Resinous wall system manufacture shall retain the services of Field Technical Service Representatives who are trained specifically on installing the system to be used on the project.
1. Field Technical Services Representatives shall be employed by the system manufacture to assist in the quality assurance and quality control process of the installation and shall be available to perform field problem solving issues with the installer Must be available to be on site within one (1) business day if needed.
- E. Mockups: Apply site mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials, installation methods and execution.
1. Apply full-thickness mockups on 48-inch- (1200-mm-) square wall area selected by Contract Administrator, or sample board.
  2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- F. Pre-installation Conference:
1. General contractor shall arrange a meeting not less than thirty days prior to starting work.
  2. Attendance:
    - a. General Contractor
    - b. City of Winnipeg Contract Administrator.
    - c. Manufacturer/Installer's Representative.
  3. ISO 9001: All materials, including primers, resins, curing agents, finish coats, aggregates and sealants are manufactured and tested under an ISO 9001 registered quality system.

### **1.5 DELIVERY, STORAGE AND HANDLING**

- A. Material shall be delivered to job site and checked by wall coating contractor for completeness and shipping damage prior to job start.
- B. All materials used shall be factory pre-weighed and pre-packaged in single, easy to manage batches to eliminate on site mixing errors. No on site weighing or volumetric measurements allowed.
- C. Material shall be stored in a dry, enclosed area protected from exposure to moisture. Temperature of storage area shall be maintained between 60 and 85°F/16 and 30°C.

### **1.6 PROJECT CONDITIONS**

- A. Concrete or masonry substrates shall be properly cured for a minimum of 30 days and shall be tested to ensure relative humidity or water vapour emission rates are in accordance with Manufacturer's recommendations. A vapor barrier or exterior applied waterproofing membrane must be present for concrete walls below grade.
- B. Cement board substrates shall be finished to a Level 5 finish (Paint Ready). All joint compound shall be setting type compound and shall be dried for the minimum period as per Manufacturer's recommendations prior to over coating.
- C. Utilities, including electric, water, heat (air temperature between 60 and 85°F/16 and 30°C) and finished lighting to be supplied by General Contractor.

- D. Job area to be free of other trades during, and for a period of 24 hours, after wall coating installation.
- E. Protection of finished wall coating from damage by subsequent trades shall be the responsibility of the General Contractor.

#### 1.7 WARRANTY

- A. Manufacturer shall furnish a single, written warranty covering both material and workmanship for a period of one (1) full year from date of installation.

### **PART 2- PRODUCTS**

#### 2.1 COLORS

- A. Color: Custom Color to match Benjamin Moore #OC-17 White Dove.

#### 2.2 RESINOUS WALL SYSTEM

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include:
  - 1. Must be a roll-on wall application using a 9mm nap tight roller for smooth surfaces. Brush application not acceptable.
- B. Acceptable Manufacturers:
  - 1. Stonhard Basis of design.
- C. Products: Subject to compliance with requirements:
  - 1. Stonhard, Inc.; Stonglaze VSR®. Stonglaze VSR as distributed by Stonhard division, RPM Canada, is a nominal 10-12 mil (250 to 300 micron) thick system comprised of a two-component, general service, polyamide epoxy primer and a two-component, high performance, high solids, epoxy glaze coating. High Gloss Finish.
- D. System Characteristics:
  - 1. Primer: 4-6 mils
  - 2. Stonproof ME7 Waterproof Membrane (Wet areas only- as required).
  - 3. VSR Colored base coat: 5-7 mils
  - 4. VSR Colored top coat: 5-7 mils

(Based on using a 9mm nap tight roller for smooth surfaces)

Note: Components listed above and below are the basis of design intent; all bids will be compared to this standard including hardness, wearing surface, bond strength, and installation procedures. General Contractor shall be required to comply with all the requirements of the Specifications and all of the components required by the Specifications, whether or not such products are specifically listed above.

- E. Physical Properties: Provide wall coating system in which physical properties of wall primer and topcoat, when tested in accordance with standards or procedures referenced below, are as follows:

Hardness .....	80-85
(ASTM D-2240/ Shore D Durometer)	
Bond Strength.....	>300 psi
(ASTM D-7234) (100% concrete failure)	
Impact Resistance .....	Exceeds 80 in. lbs.
(ASTM D-2794) (No cracking, crazing or loss of adhesion)	
Abrasion Resistance .....	0.08 gm max weight loss
(ASTM D-4060, Taber Abrader CS-17 wheel)	
Fire Resistance of Dry Film .....	Class A
(ASTM E-84 / CAN/ ULC S102)	
	Flame Spread 10
	Smoke Developed 20
Heat Resistance Limitation .....	140°F/60°C
	(for continuous exposure)
	200°F/93°C
	(for intermittent exposure)
Cure Rate allow .....	24 hours for normal operations
(at 70°F/21°C)	
VOC .....	70 g/ L
(ASTM D-2369)	

### 2.3 ACCESSORY MATERIALS

- A. Joint Sealant: Type produced by manufacturer of resinous wall coating system for type of service and joint condition indicated.
- B. Waterproof Membrane: (Where required) Apply Stonproof ME7 horizontal urethane membrane to wall area only to provide a positive barrier against water transmission at all screw holes, joint seams. Apply prior to Stonglaze VSR coatings.

## PART 3- EXECUTION

### 3.1 PREPARATION

- A. Concrete Substrate: Concrete preparation shall be by mechanical means and may include use of grinder and / or sander for removal of bond inhibiting materials such as curing compounds, dust, form release agents or laitance. Other contaminants not otherwise removed by means of mechanical surface preparation shall be removed by scrubbing with a heavy duty industrial degreaser (Stonkleen TD9) and rinsing with clean water. General contractor shall approve concrete preparation to ICRI Concrete Surface Profile 1 minimum prior to coating application.
- B. Drywall / Gypsum/ Cement Board Substrate: Drywall or Cement Board shall be level, true, plumb and finished to a Level 5 standard prior to application of wall coatings. The surface shall be inspected with critical lighting to ensure the substrate is ready for wall coating application. The surface shall be prepared by mechanical means and may include sanding, wiping and / or vacuuming for removal of bond inhibiting materials such as dust or other bond inhibiting material(s). Level 4 or Level 5 drywall finishes shall not be coated with Stonglaze VSI and shall be removed by mechanical means to a Level 5 finish. General contractor shall approve wall finish to Level 5 and suitability for high gloss finish prior to coating application.

### 3.2 APPLICATION

- A. General: Apply each component of resinous wall coating system in compliance with manufacturer's directions to produce a uniform monolithic surface of thickness indicated, uninterrupted except at expansion joints or other types of joints (if any), indicated or required.

- B. Primer: Mix and apply primer over properly prepared substrate with strict adherence to manufacturer's installation procedures and coverage rates. Coordinate timing of primer application with application of wall coating system to ensure optimum inter-coat adhesion. Product to be Stonhard Standard Primer, 4-6 mils.
- C. Topcoat: Mix material according to manufacturer's recommended procedures. Topcoat material should be applied in two coats at 5-7 mils per coat immediately after mixing using high quality medium nap rollers, or airless sprayer. Strict adherence to manufacturer's coverage rates is imperative.

### 3.3 FIELD QUALITY CONTROL

- A. Final Resinous Wall applications must match approved site mock up samples.

### 3.4 CURING, PROTECTION AND CLEANING

- A. Cure resinous wall coating materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 24 hours.
- B. Protect resinous wall coating materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. General Contractor is responsible for protection and cleaning of surfaces after final coats.
- C. Cleaning: Remove temporary covering and clean resinous wall coating just prior to final inspection. Use cleaning materials and procedures recommended by resinous wall coating manufacturer.

**END OF SECTION 09 96 59**

## **PART 1- GENERAL**

### **1.1 RELATED DOCUMENTS**

- .1 Section 04 22 00 – Concrete Unit Masonry
- .2 Section 05 50 00 – Metal Fabrications
- .3 Section 08 80 50 – Glazing
- .4 Section 10 21 13 – Toilet Compartments

### **1.2 REFERENCES**

- .1 ASTM International
  - .1 ASTM A 167-[99(2009)], Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
  - .2 ASTM B 456-[03], Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
  - .3 ASTM A 653/A 653M-[09], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .4 ASTM A 924/A 924M-[09], Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- .2 Canada Green Building Council (CaGBC)
  - .1 LEED Canada NC 2009, LEED: Green Building Rating System Reference Package for New Construction and Major Renovations (including Addendum).
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.81-[M90], Air Drying and Baking Alkyd Primer for Vehicles and Equipment.
  - .2 CAN/CGSB-1.88-[92], Gloss Alkyd Enamel, Air Drying and Baking.
  - .3 CGSB 31-GP-107MA-[90], Non-inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.
- .4 CSA International
  - .1 CAN/CSA-B651-[04], Accessible Design for the Built Environment.
  - .2 CAN/CSA-G164-[M92(R2003)], Hot Dip Galvanizing of Irregularly Shaped Articles.

### **1.3 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Provide manufacturer's printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings: Include overall product dimensions, sections, details, and attachments to other Work. Include choice of options with details.

### **1.4 CLOSEOUT SUBMITTALS**

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

### **1.5 MAINTENANCE MATERIAL SUBMITTALS**

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

- .2 Deliver special tools to Contract Administrator.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to Site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect toilet and bathroom accessories from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse and return of pallets, crates, padding, and packaging materials.

## **2. PRODUCTS**

### **2.1 MATERIALS**

- .1 Sustainability Characteristics:
  - .1 Solid surface Adhesives:
    - .1 Urea Formaldehyde Free.
- .2 Fasteners: concealed screws and bolts hot dip galvanized, exposed fasteners to match face of unit. Expansion shields fibre, lead or rubber as recommended by accessory manufacturer for component and its intended use.

### **2.2 COMPONENTS IN 112 UNIVERSAL TOILET ROOM**

- .1 Soap Dispenser: Bobrick B-2012 Automatic Wall-Mounted Mounted Soap Dispenser. Satin-finish stainless steel.
- .2 Toilet Paper Dispenser: Bobrick 2740 Surface Mounted Dual-Roll Toilet Tissue Dispenser. Satin-finish stainless steel.
- .3 Sanitary Napkin Disposal: Bobrick B-270 Sanitary Napkin Disposal. Satin-finish stainless steel.
- .4 Grab bars: Bobrick B-6106.99 (24, 30, 36) 1 ½" 18 ga. tube, exposed mounting flange. Peened grip.
- .5 Clothes Hook: Bobrick B-981 Vandal-Resistant Clothes Hook. Satin-finish stainless steel.
- .6 Mirror: Bobrick B-293 1836 Fixed- Position Tilt Mirror. 18"x36"
- .7 Waste Receptacle: City supplied
- .8 Paper Towel Dispenser: Kimberly Clark Professional H-1131

### **2.3 COMPONENTS IN W/C #122-A, 122-B, 122-C, SHOWER-#1 123-A, SHOWER #2 123-B, SHOWER #3 123-C, AND SHOWER #4 123-D**

- .1 Soap Dispenser: Bobrick B-2012 Automatic Wall-Mounted Mounted Soap Dispenser. Satin-finish stainless steel.
- .2 Toilet Paper Dispenser: 274 Surface-Mounted Dual-Roll Toilet Tissue Dispenser. Satin-finish stainless steel.
- .3 Sanitary Napkin Disposal: Bobrick B-270 Surface-Mounted Sanitary Napkin Disposal.

- Satin-finish stainless steel.
- .4 Towel Hooks: Bobrick B-6777 Towel Pin. Satin-finish stainless steel.
- .5 Mirror: surface mounted with aluminum frame and adhesive, height and width as drawn in drawings. Glazing for mirror specifications and Bobrick B-2908/1830"
- .6 Waste Receptacle: City Supplied
- .7 Stainless Steel Shelf: Bobrick B-295X16.
- .8 Shower Curtain & Hooks: Single 42" x 72"h (1065 x 1830 mm) Curtain for SH-1 and SH-2  
Curtain: Bobrick 204-2. Hooks Bobrick 204-1.; Colour: White

## **2.4 COMPONENTS IN COMMON ROOM #130**

- .1 Circular Waste Chute: Bobrick B-529 Countertop Mounted Circular Waste Chute. Bright polished stainless steel. To be installed into solid surface countertop of Coffee Counter.

## **3. EXECUTION**

### **3.1 EXAMINATION**

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

### **3.2 INSTALLATION**

- .1 Install and secure accessories rigidly in place as follows:
  - .1 Stud walls: Provide 3/4" plywood backing for all wall mounted equipment.
  - .2 Hollow masonry units, existing plaster or drywall: use toggle bolts drilled into cell or wall cavity.
  - .3 Solid masonry, marble, stone or concrete: use bolt with lead expansion sleeve set into drilled hole.
  - .4 Toilet and shower compartments: use male to female through bolts.
  - .5 Install grab bars on built-in anchors provided by manufacturer.
  - .6 Install mirrors in accordance with Section 08 80 50 – Glazing.
  - .7 Coordinate requirements for power supply.

### **3.3 ADJUSTING**

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

### **3.4 CLEANING**

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

**3.5 PROTECTION**

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

**3.6 SCHEDULE**

- .1 Locate accessories where indicated on drawings and as indicated in this section.

**END OF SECTION 10 28 00**

**Part 1 GENERAL**

**1.1 SECTION INCLUDES**

- .1 Commercial Refrigerator.
- .2 Commercial Ice Machine.
- .3 Commercial Dishwasher.
- .4 Stackable Clothes washer and dryer.

**1.2 RELATED SECTIONS**

- .1 Electrical works
- .2 Plumbing works
- .3 Kitchen Equipment Schedule.

**1.3 QUALITY ASSURANCE**

- .1 Equipment: Conform to applicable codes for CSA; ULC; CGA approval/certification.

**1.4 SUBMITTALS**

- .1 Product Data: Provide data on equipment and accessories.
- .2 Include warranty and maintenance information on regular servicing.

**1.5 WARRANTY**

- .1 Section 01 73 03: Warranties.
- .2 Provide the manufacturer's warranty offered on parts and labour. **All appliance warranties to be transferred over to the City of Winnipeg upon project substantial completion. The City of Winnipeg to be listed as the appliance warranty registered owner.**

**Part 2 PRODUCTS**

**2.1 MANUFACTURERS**

- .1 As listed on the Kitchen Equipment Schedule.

**2.2 APPLIANCES**

- .1 Refer to the Kitchen Equipment Schedule for specifications on:
  - .1 Commercial Refrigerator.
  - .2 Commercial Ice Machine.
  - .3 Commercial Dishwasher.
  - .4 Stackable Clothes washer and dryer.

**2.3 ACCESSORIES**

- .1 Appliances: Power cord to connect to utilities. Pipe and fittings to connect to utilities.

**Part 3 EXECUTION**

**3.1 PREPARATION**

- .1 Verify that prepared openings are ready to receive work and opening dimensions are as indicated on shop drawings and instructed by the manufacturer.
- .2 Verify that proper power supplies are available.

**3.2 INSTALLATION**

- .1 Install appliances to manufacturer's instructions and CSA and ULC requirements.
- .2 Set and adjust units level and plumb.
- .3 Activate units to confirm correct operation.
- .4 Turn refrigerators on to moderate temperature setting and flush water line.
- .5 Connect to utilities and make units operational.

**END OF SECTION 113100**

### **Kitchen Equipment Schedule**

**ITEM 1:** Commercial Dishwasher DW-1

Product: Moyer Diebel Nexus N900 Undercounter High Temperature Dishwasher  
Size: 23 7/8" wide x 25" deep x 33.5" high  
Description: 1 Hp pump motor, soft start features, sealed feather touch top mounted controls;  
316 stainless steel tank, frame, fill and drain type operation  
150 second total wash cycle; 180F rinse temperature  
Capacity: 24 racks per hour  
Warranty: 1-year parts and labour warranty  
Quantity: One (1)

**ITEM 2:** Commercial Refrigerator RF-1

Product: Habco SE46SXG Stainless Xterior Display Refrigerator- *Swing Doors*  
Size: 47.5" w (1207mm) x 31" d (788mm) D x 78" h (1982mm)  
Description: Self Contained Cassette Forced air removable refrigeration unit with self-closing  
swing safety glass doors  
Finishes: Stainless Steel Exterior front and sides; White Aluminum Interior with coved corner  
floor and LED Lighting  
Castors: Four (4) five inch swivel castors; two of which are locking  
Shelves: Six (6) White coated shelves on aluminum pilasters; NSF approved.  
Warranty: 45 months parts, 3 years labour warranty and 5 years Compressor warranty  
Quantity: Two (2)

**ITEM 3:** Commercial Ice Machine with Bin. ICE-1

Product: Koolaire by Manitowoc Ice Machine  
Product #:KT-0300 Series Ice Kube Machine  
Size: 34" d x 30" w x 32" H  
Power Output: 220-240 V  
Ice Bin: Koolaire #K-400 bin  
Bin Size: 24" d x 30" w x 21.5" H ( Stacks on top of ice machine)  
Quantity: One (1)

**ITEM 4:** Cutlery Tray

Product: Vollrath: Plastic Sil-A-Tainer  
Distributor: Russell Hendrix  
Six Cylinder Cutlery Storage  
Size: 15 1/8" x 10 3/4" x 11"  
Model #: Russell Hendrix # 1900/52644  
Stainless Steel Flatware Cylinders: 1900/99710 (sold separately)  
Note: Sits on island countertop  
Quantity: Holder: One (1); Cylinders: Six

**ITEM 5:** Stackable Washer and Dryer Unit. WD-1

Product: Maytag MLE22PRAZW  
Size: 27" wide x 29.5" deep x 74" high  
Description: Electric Stackable washer/ dryer unit-  
Washer Voltage:120v; 30A  
Dryer Voltage: 240V; 40 A  
Quantity: One (1) Set

## **PART 1 - GENERAL**

### **1.1 REFERENCES**

- .1 National Fire Protection Association (NFPA)
  - .1 NFPA 701: Standard Methods of Fire Tests for Flame Resistant Textiles and Films.

### **1.2 SUBMITTALS**

- .1 Samples:
  - .1 Submit for approval, A sample shade, where requested, fully representing the shades to be provided and cassette specified.
  - .2 Submit samples of fabrics and finish colours for selection and approval.
- .2 Product Data:
  - .1 Submit manufactures printed product literature, specifications and data sheet in accordance with Section 01 33 00 – Submittal Procedures.
  - .2 Fire-Performance Characteristics: Provide shade material tested in accordance with NFPA 701 - Vertical-Burn Test and rated "PASS". AND CAN USC 109.

### **1.3 DELIVERY, STORAGE AND HANDLING**

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

### **1.4 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Manufacturer: capable of providing field service representation during construction and approving application method.
  - .2 Installer: to be experienced in performing Work of this section who has specialized in installation of Work similar to that required for this project. Minimum 3-5 Years experience installing Roller Shades.

### **1.5 MAINTENANCE**

- .1 Submit maintenance and operating instructions, detailing the care, maintenance and cleaning of fabric.

### **1.6 SITE CONDITIONS**

- .1 Check dimensions on Site before fabrication commences, and report to Contract Administrator in writing all discrepancies.

### **1.7 WARRANTY**

- .1 Provide a warranty of the Work of this section, covering the period of one (1) years.
- .2 Promptly correct, at no additional cost to the Contract, any defects or deficiencies that become apparent within warranty period.

## **PART 2 - PRODUCTS**

### **2.1 BLINDS**

- .1 Manufacturer: Altex, Terrebonne, Quebec, Canada. 1-800-363-5930
  - .1 Product: Altex Sunproject
  - .2 Height: as indicated on drawing A8.1, to be confirmed on site.
  - .3 Standard Width: 118" Wide; sizes, to be confirmed on site.
  - .4 Fabric: Altex TexOpaque Eco 6100 Blackout Roller Shades; 100%Polyester with Acrylic Backing- PVC Free. Fabric to be same color both sides of shade.
  - .5 Openness Factor: Blackout
  - .6 Blind Colour: To be selected by consultant. Submit samples.
  - .7 Blind Weight: 12.14 Oz/yd
  - .8 Cassette Style: Altex Deko LL, S70 – 3"x3" Cassette with SS Chain; Aluminum Finish
  - .9 Warranty: 1 Year
  - .10 Fire Classification: NFPA 701; CAN/ ULC-S 109-03; NFPA 101 Class A Rating
  
- .2 Location: Blinds to be located on windows in the following rooms:
  - Lieutenant's Office 103
  - Captain's Office 104
  - Platoon's Chief's 105
  - Paramedic's Office 110
  - Paramedic's Dormitory 113
  - Dormitory 116A
  - Dormitory 116
  - Dormitory 129
  - Dormitory 129A
  - Common Room 130
  - Lounge 135

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

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

### **3.2 INSTALLATION**

- .1 Install materials in accordance to manufacturer's specifications, standards, and procedures as detailed on Contract drawings.
- .2 Adequate clearance shall be provided to permit unencumbered operation of shade and hardware.
- .3 Fasten up into alum. angle attached to existing window frames. Provide angle to match mullion finish as indicated in drawings.
- .4 Install square, plumb, true to line with operable parts adjusted for correct function.
- .5 Before completion of the installation, the installer shall adjust all moving and operating parts to function smoothly and correctly.

### **3.3 CLEANING**

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

### **3.4 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by installation.
- .3 Protect shades from damage until final inspection

**END OF SECTION 12 24 13**

## **PART 1 - GENERAL**

### **1.1 RELATED DOCUMENTS**

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections where available, apply to this Section.

### **1.2 SUMMARY**

1. Section Includes:
  1. Solid surface material countertops.
  2. Solid surface adhesives and sealants.
  3. Solid surface millwork
2. Related Requirements:
  1. Section 06 20 00 Rough Carpentry
  2. Section 06 40 00 Architectural Woodwork

### **1.3 SUBMITTALS**

1. Submit Product Data: For countertop including manufacturer's technical data sheets, and published written instructions.
2. Submit Material Data and Safety Sheets (MSDS) for all adhesives and sealants.
3. Shop Drawings: Submit fully dimensioned shop drawings showing countertop layouts, joinery, terminating conditions, substrate construction, cutouts and holes. Show plumbing installation provisions. Include elevations, section details, and large-scale details. Show directional pattern, if any.
4. Samples for Verification: For the following products:
  1. Countertop material as specified, 4 inches (102 mm) square.
  2. Joint Sealant Color

### **1.4 CLOSEOUT SUBMITTALS**

1. Maintenance Data: For solid surface material countertops to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

## **1.5 QUALITY ASSURANCE**

1. Fabricator Qualifications: Minimum 3 to 5 years documented experience in fabricating solid surface countertops similar in scope and complexity to this project, and currently certified by the manufacturer as an acceptable fabricator.
2. Installer Qualifications: Minimum 3 to 5 years documented installation experience for projects similar in scope and complexity to this project, and currently certified by the Manufacturer as an acceptable installer.

## **1.6 PROJECT CONDITIONS**

1. Field Measurements: Verify actual dimensions and openings in countertops by field measurements before countertop fabrication is complete. Show all recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.
2. Adhesive: Acclimatize adhesives to occupancy room temperatures with a maximum temperature not to exceed 75 deg F.

## **1.7 DELIVERY, STORAGE AND HANDLING**

1. Storage and Protection: Store Materials protected from exposure to harmful weather conditions, at temperature and humidity conditions recommended by manufacturer. Store sheet materials flat on pallets or similar rack type storage.

## **1.8 WARRANTY**

1. Manufacturer's Limited Warranty: Provide manufacturer's Standard 10 year commercial Limited Warranty against defects in solid surface materials.

## **PART 2 - PRODUCTS**

### **2.1 SOLID SURFACE COUNTERTOP MATERIALS**

1. Composition Solid-Surface Material: Acrylic resins, fire retardant mineral fillers, and proprietary coloring agents. Through the body color for full thickness of sheet material.
  1. Acceptable Product: "Wilsonart Solid Surface"
  2. Thickness: Type 050 ½ inch nominal (12.7 mm)
  3. Panel Weight: 4.4 lb/sq. ft
  4. Surface-Burning Characteristics: Class 1 and Class A; ASTM E 84
  5. Colors and Patterns: White Stone 9208CS- Matte Finish
2. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

## **2.2 COUNTERTOP FABRICATION**

1. Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."
2. Countertops: 1/2-inch (12.7-mm) thick, solid surface material with front edge built up with same material. Refer to drawing details.
  1. Joint Locations: Not within 3 inches (76 mm) of a cutout or cooktop, 1 inch (25 mm) from inside corner for conventional seams, and not where countertop sections less than 36 inches (900 mm) long would result, unless unavoidable.
3. Cutouts and Holes:
  1. Drill countertops (where possible) on site for plumbing fittings, Grommet Holes and similar items.

## **2.3 INSTALLATION MATERIALS**

1. Joint Adhesive: Product recommended by solid surface material manufacturer. Color to be match solid surface selected color and to be approved by the Designer.
2. Sealant for Countertops: Where countertops meet walls, use Siliconized Acrylic latex Sealant. Product: Wilsonart Color Matched Caulk.
3. Construction Adhesive: Countertop manufacturer's recommended silicone- based construction adhesive for backsplashes, end splashes and other applications according to manufacturer's instructions.

## **2.4 FABRICATION**

1. Fabricate components in shop to greatest extent practicable, in sizes and shapes indicated according to approved shop drawings and Wilsonart published fabrication requirements.
2. Form joint seams between solid surfacing components with specified seam adhesive. Completed joints to be inconspicuous in appearance and without voids. Provide joint reinforced if required by manufacturer for particular installations.
3. Provide holes and cutouts indicated on approved shop drawings. Rout cutouts and complete by sanding all edges smooth.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

1. Examine substrates to receive solid surface material countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.

2. Substrates must be sound, flat, smooth and free from dust or other surface contaminants.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION**

1. Install countertops plumb, level and true according to approved shop drawings and manufacturer's instructions.
2. Fasten countertops by adhering with 100-percent silicone material in dab format (not bead format) to base units into underside of countertop. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
3. Fill gaps between countertop and terminating substrates with specified silicone sealant.
4. Form joint seams with specified seam adhesive, Seams to be inconspicuous in completed work. Seams in locations shown on approved shop drawings and acceptable to manufacturer. Promptly remove excess adhesive.
5. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.
  1. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.
6. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.
7. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.

### **3.3 CLEANING AND PROTECTON**

1. Clean solid surfacing components according to manufacturer's published maintenance instructions. Completely remove excess adhesives and sealants from finished surfaces.
2. Protect complete work from damage during remainder of construction period.

**END OF SECTION 123661.16**

## **PART 1 - GENERAL**

### **1.1 SUMMARY**

1. Section includes: Entrance grid systems, including vinyl foot grids.
2. Related Sections: Sections related to this section include:
  1. Section 03300 - Cast-In-Place Concrete.
  2. Section 08110 - Steel Doors and Frames.
  3. Section 08212 - Stile and Rail Wood Doors.
  4. Section 08710 - Door Hardware.

### **1.2 REFERENCES**

1. Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. The Standards listed here are identified with a designation number, title or other designation established by the issuing authority.
2. DIN 51130 Slip Resistant R 13 Classification
3. UL 94 Flammability Rating VO
4. ASTM E648 / DIN 4102 / CP-SCFF1-70 Flooring Radiant Panel Test

### **1.3 SYSTEM DESCRIPTION**

1. Performance Requirements: Provide Vinyl entrance grid system with Supreme Knob Inserts, which has been manufactured and installed to maintain performance criteria stated by manufacturer without defects, damage or failure.

### **1.4 SUBMITTALS**

1. General: Submit listed submittals in accordance with the Conditions of the Contract and Division 1 Submittal Procedures Section.
2. Product data: Submit product data, including manufacturer's specification sheet and installation instructions for specified products. Include methods of installation and substrate preparation for each type of substrate.
3. Shop drawings: Submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors, patterns and textures.
4. Samples: Submit samples for each type and color of exposed entrance mat, frames and accessories required. Provide samples of mat materials.

5. Quality Assurance Submittals: (1) Certified test reports showing compliance with specified performance characteristics and physical properties and (2) Manufacturer's Installation Instructions.

6. Closeout Submittals: (1) Cleaning & Maintenance Data (Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance), and (2) Warranty.

### **1.5 QUALITY ASSURANCE**

1. Installer: Installer should be highly experienced in performing work of this section, having previously done work similar to that required for this project with minimum 3-5 years' experience.

### **1.6 SEQUENCING/SCHEDULING**

1. Ordering: Comply with Manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

2. Delivery: Deliver materials in Manufacturer's original, unopened, undamaged packaging.

3. Storage: Store materials at temperature and in humidity conditions recommended by manufacturer and protect from exposure to harmful weather conditions.

4. Installation: Except as otherwise indicated herein, sequencing or scheduling for performance of work of this section in relation with other work is Contractor's option. Delay installation of grids until near time of substantial completion for the project.

### **1.7 PROJECT CONDITIONS**

1. Temperature: Maintain temperature where products will be installed before, during and after installation as recommended by Manufacturer.

2. Field Measurements: Where possible, verify actual measurements by field measuring before fabrication and include measurements in shop drawings. To avoid construction delays, coordinate field measurements and fabrication schedule based upon construction progress.

## **PART 2 - PRODUCTS**

### **2.1 ACCEPTABLE MANUFACTURER**

1. Provide Debris Trap Matting by Edgewood Matting Ltd, 18120 - 109 Edmonton, Alberta T5L 2K2 1.780.466.2084 [www.edgewoodgroup.ca](http://www.edgewoodgroup.ca)

## 2.2 MATERIALS

1. Vinyl Foot Grille: Constructed from 30 percent pre-consumer recycled polyvinyl chloride (PVC. Injected Molded modular tiles in a non-hinged, grille design with an embossed non-skid surface, (non-embossed surfaces not acceptable) to sizes indicated with the following characteristics:

1. Debris Trap: Injection Molded PVC Grid, charcoal color.

2. Insert options for Debris Trap Matting:

1. Debris Trap Supreme: 100% Asota® solution-dyed UV stabilized polypropylene fibers on EM rubber backing. Permanent Of rip n replace available. Color: #20 Charcoal.

3. Framing and Nosing Accessories for Vinyl Foot Grille

1. Recessed Application: Debris Trap: use “L” or “J” frame, mill finish aluminum

4. Product Testing for Vinyl Foot Grid

1. DIN 51130 Slip Resistant R 13 Classification.

2. UL 94 Flammability Rating VO

3. ASTM E648 / DIN 4102 / CP-SCFF1-70 Flooring Radiant Panel Test

4. LEED v3

a. IEQ Credit 5: Debris Trap is designed for permanent installation.

b. MR Credit 4: 30 % pre-consumer

5. LEED v4

a. Indoor Environmental Quality Enhanced Indoor Air Quality Strategies Credit - Debris Trap is designed for permanent installation.

b. Materials & Resources Sourcing of Raw Materials Credit - 30 % pre- consumer

## PART 3 – EXECUTION

### 3.1 SUBSTRATE PREPARATION

1. Examine substrates and conditions where floor grids will be installed. Do not proceed with installation until unsatisfactory conditions are corrected. Sub floor shall be clean and dry, and within acceptable tolerances.

### **3.2 INSTALLATION**

1. Sizes: Where not indicated otherwise, provide single unit for each mat installation, but do not exceed manufacturer's maximum size recommendation for units intended for removal and cleaning. Where possible, verify sizes by field measurement before shop fabrication.
2. Accessories: Where indicated for recessed or wall-to-wall installations, provide aluminum framework as recommended by manufacturer.
3. General: Strictly comply with manufacturer's installation instructions and recommendations. Coordinate installation with adjacent work to ensure proper clearances and to prevent tripping hazards.

### **3.3 CLEANING AND PROTECTION**

1. General Cleaning: Refer to Manufacturer's Cleaning and Maintenance Instructions.
2. Owner's Personnel: Instruct Owner's personnel in proper maintenance procedures.
3. Protection: Protect installed product and finish surfaces from damage during construction and until acceptance.

**END OF SECTION 12484**