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## Part 1 GENERAL

### 1.1 GEOTECHNICAL DATA

.1 A detailed report and soil boring data from geotechnical investigations has NOT been completed and will be the responsibility of the Contractor as part of their Work in determining the recommended foundation design and load bearing capacities of the soils.

.2 Include the cost for Geotechnical Investigations Report as a separate cost in Proposal.

.3 The report, by its nature, cannot reveal all conditions that exist or can occur on the site. Should subsurface conditions be found to vary substantially from the report, changes in the design and construction of foundations shall be made, with resulting credits or expenditures to the contract price accruing to The City.

.4 Contractor shall perform, at his expense, such subsurface exploration, investigation, testing, and analysis as deemed necessary for the design and construction of the foundation system.

### 1.2 BUILDING PERMIT

.1 Contractor will submit plans to Local Authorities Having Jurisdiction for plans examination.

.2 Contractor shall apply for the building permit on behalf of The City prior to commencement of any construction Work.

.3 The Building Permit shall be taken out in the name of the Contractor.

.4 Contractor shall pick-up the Building Permit once it is available.

.5 The cost of the Permit will be carried by the successful Contractor.

.6 Contractor shall be responsible for all other applicable permits, licenses, construction deposits, or certificates necessary for the performance of the Work which were in force at the dates of Closing.

**END**

## Part 1 GENERAL

### 1.1 SUMMARY OF WORK

.1 It is the intent of the Contract Documents that Contractor undertakes full responsibility for delivery of the Project.

.2 Contractor shall provide all design services and construction activities, and associated direct and indirect costs including labour, materials, equipments, supervision, tools, transportation, supplies and incidentals necessary to successfully complete the Project in compliance with the Contract Documents.

.3 The RFP does not provide details necessary to carry out the intent of the Contract Documents. Such detailed designs and specifications are the sole responsibility of the Contractor to develop in accordance with the Contract Documents and the standards and criteria for performance established for the Project.

.4 The Contractor must meet or exceed mandatory provisions in the Model National Energy Code of Canada for Buildings (MNECB).

.5 Contractor shall perform, as minimum, the primary items of Work listed herein. This list is not all-inclusive, and Contractor shall be responsible for identifying the items of the Work and executing them as required to fulfill the needs described in the Project Program.

.6 If the Contract Documents omit or incorrectly describe the Work necessary to be performed in order to deliver the Project, Contractor shall not be excused from performing such omitted Work or incorrectly described details of the Work (no matter how extensive), and such Work shall be performed as if fully and correctly set forth and described in the Contract Documents, without entitlement to a Change Order hereunder except as specifically allowed by the Contract Documents.

.7 Contractor shall design and construct this facility to an environmentally responsible manner, utilizing sustainable design concepts, systems and materials to the maximum extent practical, in order to provide a facility that minimizes adverse effects on the exterior environments, enhances the quality of the indoor environment, and minimizes consumption of energy, water, construction materials, and other resources.

### 1.2 STATEMENT OF REQUIREMENTS

.1 Project Summary

.1 The Work to be done under Contract shall consist of the design, supply, supervision and construction of a outdoor pool building including change rooms, washrooms and administrative rooms located at 5 Rue Desmeurons in St Vital Winnipeg Manitoba.

.2 The major components of the Work of the BUILDING are:

.1 Design and construction documents;

.2 Site work to within 2 meters of the building’s perimeter.

.3 Structure and building envelope;

.4 Exterior wall cladding and roofing;

.5 Doors and windows;

.6 Interior construction;

.7 Interior finishes;

.8 Plumbing;

.9 Heating, ventilation and partial air conditioning (HVAC);

.10 Electrical power, lighting, controls and communication; and,

.11 Commercial equipment and furnishings.

## 1.3 CODES, STANDARDS & AUTHORITIES

.1 All Work shall comply with all current applicable codes, regulation, by-laws and ordinances for the Province of Manitoba, and to the requirements of Authorities Having Jurisdiction at time of Closing.

.2 In no instance shall the standard of quality of materials, products, and workmanship established by the Contract Documents be reduced by any of the codes, standards, or regulations.

## 1.4 ROLES AND RESPONSIBILITES

.1 Roles and responsibilities will be as set out in CCA-CSC-RAIC Document 14 except as specifically noted below.

.2 Communication between Contractor and The City shall be through the Contract Administrator.

.3 The Payment Certifier will be the Contract Administrator. The Contractor and their consultants may provide information, expertise and advice concerning payment amounts, but the signing authority will be the Contract Administrator.

.4 The Project is intended to provide a “Turn Key” solution. In the unlikely event of a Change Order and/or Change Directive, they will be issued by the Contract Administrator . The Contractor will provide information, expertise and advice for proposed changes, but authorization for changes will come from the Contract Administrator.

.5 Substantial Completion of the Work will be certified by the Contract Administrator.

## 1.5 ADMINISTRATIVE REQUIREMENTS

.1 Contract Administrators

.1 The Contractor will be required to provide the services of qualified design professionals (architects and engineers) registered to practice in the Province of Manitoba **as required** for the following disciplines:

.1 Architecture

.2 Geotechnical engineering

.3 Structural engineering

.4 Mechanical engineering

.5 Electrical engineering

.6 Civil engineering (Underground site services)

.2 Subcontractor List

.1 Contractor shall provide in writing to The City a complete list of Subcontractors whom he proposes to engage, at or prior to a pre-construction meeting and prior to the commencement of any Work on Site.

.3 Detailed Work Schedule

.1 In order to plan, monitor, maintain and control project activities and progress, the Contractor shall provide The City with THREE (3) copies of a detailed Work Schedule for review within 15 days after award of Contract.

.2 The schedule shall identify all major project milestones from Design through Construction phases of the Project in chronological order, in a horizontal bar chart format with time scale identifying the first work day of each week.

.3 The City will review schedule and return reviewed copy within TEN (10) days after receipt.

.4 Resubmit finalized schedule within SEVEN (7) days after return of reviewed copy.

.5 Include the complete sequence of design and construction activities and associated milestones.

.6 Activities to be indicated shall include but not necessarily be limited to the following:

.1 Design development and contract document submissions, review meetings, and review time periods.

.2 Permit applications.

.3 Site mobilization.

.4 Shop drawing submissions and reviews.

.5 Quality Control Plan activities.

.6 Earthwork and installation of site services and utilities.

.7 Foundation work.

.8 Structural framing.

.9 Installation of building envelope.

.10 Subcontractor work.

.11 Mechanical systems rough-in, equipment deliveries and installation, finishing.

.12 Electrical systems rough-in, equipment deliveries and installation, finishing.

.13 Architectural systems installations and finishing.

.14 Millwork and other major equipment/component deliveries and installation.

.15 Paving and concrete aprons.

.16 Grading.

.17 Submission of Operation and Maintenance Manuals.

.18 Training and orientation activities and turnover procedures.

.19 Substantial Completion

.20 Project Records and Documentation submissions.

.21 Final Completion.

.4 Construction Facilities

.1 Contractor is responsible for all necessary temporary construction related facilities and services, including but not necessarily limited to:

.1 Field office, sheds, storage and other temporary facilities.

.2 Temporary power, light, water, sanitary facilities, phone, and heat.

.3 Hoarding, site fencing, tools and equipment, protection, and security.

.4 Any site signage must be pre-approved by The City.

.5 Start-up Meeting

.1 After Award of Contract, but before start of Work, Contractor shall arrange for, schedule, and chair and initial start-up meeting to introduce all key personnel involved, to discuss and resolve administrative procedures and responsibilities, and to clarify any matters of the Contract.

.2 Senior representatives of the City, the Contract Administrator, Contractor and major Subcontractors shall attend.

.3 Establish time and location of meeting agreeable to The City, and notify all concerned parties within five (5) working days of meeting.

.4 Agenda shall include but not necessarily be limited to the following:

.1 Appointment of official representatives of participants in the Work.

.2 Communication plan, distribution list and contact information.

.3 Schedules of work, submission, progress scheduling, meetings, reviews and milestones.

.4 Plans for temporary facilities, offices, storage sheds, sanitary facilities, utilities, fences.

.5 Safety program.

.6 As-Built Drawings.

.7 Maintenance Manuals.

.8 Take-over procedures, acceptance, warranties.

.9 Monthly progress claims, administrative procedures, holdbacks.

.10 Job Progress Meetings.

.11 Additional items brought forward by attendees.

.6 Job Progress Meetings

.1 Hold job progress meetings at regularly scheduled intervals to ensure proper coordination of the Work.

.2 Designate times and locations of meetings and notify all parties concerned, including Subcontractors, to attend.

.3 Chair meetings and record minutes. Prepare and distribute minutes to all attending parties within seven (7) calendar days after meeting.

.7 Document Review

.1 The Contractor shall make known to The City any and all variances between the documents submitted for review, and the requirements of the RFP and these Design-Build Services and Specifications

.2 Prepare and submit design development and construction documents to The City for review at the following stages of completeness. A review meeting shall be held to present and discuss each submission.

.1 Design development (100% complete)

.2 Construction documents (95% complete)

.3 For review purposes provide three (3) paper copy sets of all documents required for submission to The City, seven (7) calendar days prior to a scheduled review meeting. Review meetings are to be attended by the Contractor, the Contract Administrator, and The City.

.4 The final, 100% complete Construction Documents must be signed and sealed by the appropriate professional discipline responsible for the Design as required by Authority Having Jurisdiction.

.5 If the Contractor intends to proceed with “phased construction” or “fast-tracking” of any phase or stage, work may not proceed until all pertinent documents have been 100% completed, reviewed and The City approved for that portion of the Work.

.8 Review by Authorities

.1 Submission of Construction Documents for review by Authorities Having Jurisdiction over all statues, regulations, codes and by-laws applicable to the design and meeting the requirements of these Authorities will be a required part of this work. Authorities for this project include, but are not limited to:

.1 TBA

.9 Survey Requirements

.1 A surveyor's certificate is not required. However, the building must be accurately located on the record drawings with respect to the site, site access, and all connections to site services.

.10 Letter of Conformance

.1 Prior to Substantial Performance, submit a letter to the Contract Administrator from each design professional confirming that, "the Work has been performed in accordance with Building Codes and Standards, the drawings and specifications prepared by the Contractor, and in accordance with the requirements of the Authorities Having Jurisdiction".

.11 Shop Drawings

.1 Shop Drawings will be produced by suppliers and fabricators and reviewed by the Contractor and the Contract Administrator, as required by the nature of the Work.

.12 Samples

.1 Samples will be provided by suppliers and manufacturers and reviewed by the Contractor and the Contract Administrator, as requested.

.2 Samples will be required to assess and approve finishes.

.13 Mock-Ups

.1 Construction assembly and product mock-ups will be required for portions of the Work for review and acceptance, PRIOR to fabrications, construction, installations.

.2 Allow for full size 1:1 scale mock-ups that may be part of the construction or of adequate size to ascertain the quality and workmanship of the construction and materials and connection details.

.14 Colour Selection

.1 A colour scheme by the Contractor will be required for review and approval by The City with coordinated colour samples for all finishes.

.15 Record Drawings

.1 One complete set of Construction Documents (drawing, specifications, and shop drawings) shall be kept on site for the sole purpose of recording deviations made during construction.

.2 This set will be identified as "PROJECT RECORD COPY" and will be available for review by The City. Changes will be made daily as they occur.

.3 The information from the Project Record Copy will be transposed onto 2 clean copies of the construction drawings, and one (1) CAD version on compact disc (CD), which will be turned over to The City as a requirement of Substantial Completion.

.16 Maintenance Manuals

.1 Manuals containing information on the operation and maintenance of the Project will be provided as part of the Work. The content of the manuals will be limited to the information normally provided with the products by the manufacturers.

.2 Substantial Completion will not be issued unless The City is in receipt of complete and accurate manuals.

.17 Inspection and Takeover Procedures

.1 Prior to substantial Completion, Contractor shall carefully inspect the Work and ensure that it is complete, that major and minor construction deficiencies are complete and/or corrected and that the building and site is clean and in condition for occupancy.

.2 Submit a letter to the Contract Administrator from each design professional confirming that, “the Work has been performed in accordance with Building Codes and Standards, the drawings and specifications prepared by the Contractor, and in accordance with the requirements of the Authorities Having Jurisdiction”, and request a review.

.3 The final review team to include the Contract Administrator, Contractor, Contractor’s Consultants (architects and engineers), and any subcontractors deemed necessary by the Contractor and/or The City.

.4 Defects and deficiencies determined by this review will be listed by the Contractor and when completed and/or corrected will be confirmed by a re-review by the Contract Administrator and Contractor.

.18 Warranty Period

.1 The Contractor shall promptly remedy any defects due to faulty materials, equipment or workmanship, as defined by the Contract, and for a minimum period of ONE (1) year after the date of Substantial Completion.

## 1.6 QUALITY CONTROL

.1 Contractor shall have in place a Quality Control Plan that details the procedures, instructions and reports to be used to assure compliance with the Contract Documents.

.2 The Quality Control function is the regulatory process by which the Contractor shall measure actual quality performance through careful and critical investigation of all Work, compare it with performance standards and codes to detect variances, and act on the difference to correct in time to prevent reworking and delay.

.3 The Plan shall be applicable to all Design and Construction phases of Work and may be developed in two parts as such. The plan should identify a process and a series of activities designed to ensure that the Contractor produces Work to the performance standards called for in the Contract Documents. The Contract Administrator shall attest that Work, as it progresses, is in conformity with quality standards specified, that the completed facility has been constructed in accordance with the Contract Drawings and Specification, and meets the design intent.

.4 The Plan should describe in detail proposed quality control practices that identify times of Work which will be subject to controls, and list particular checks and tests that are to be performed for each item of work, indicate frequency of checks or tests, milestones at which they are to be carried out, and provide for reports on results of these activities, with reports submitted to The City.

.5 The Contractor shall appoint and pay for services of Testing Agents & Laboratories.

.6 Where tests or inspections by designated Testing Laboratory reveal work not in accordance with requirements, Contractor shall pay all costs for additional tests or inspections as required by The City to verify acceptability of corrected work.

.7 The City reserves the right to appoint an independent inspection / testing agency to carry out inspection and testing of the Work for conformance with the Contract Documents. Such costs for Inspection and Testing will be paid by The City. Any additional inspection and testing required resulting from non-conformance discovered by The City’s testing will be at the Contractor’s expense.

.8 Dated photographs provided by the Contractor on a regular schedule shall form part of the Quality Control Plan.

.9 As part of the Quality Control Plan the Contract Administrator shall perform the tasks listed below. These tasks are listed for guidance only and do not constitute a full inventory of activities. It is the Contractor’s responsibility to define the accurate and project specific quality control process requirements to substantiate the Work.

.1 Civil:

.1 Inspect work at appropriate periods and submit reports to The City.

.2 Provide independent report on concrete, soils, asphalt testing.

.2 Structural:

.1 Quality assurance inspections for formwork, re-bar, and soils testing for each concrete pour.

.2 Inspection of structural components/assemblies/installations to certify conformance to specifications, drawings, and codes and standards.

.3 Architectural:

.1 Inspection and approval of insulation, vapour retarders, and air barriers before cover-up.

.2 Inspection and approval of fireproofing and fire stopping.

.3 Bi-weekly site inspections to otherwise report on overall conformance to specifications and drawings, quality control and workmanship.

.4 Mechanical:

.1 Certify pressure test of all piping.

.2 Inspect and report on piping installations once a week.

.3 Inspect and report that all plumbing clean-outs are installed such that the entire drainage system can be rodded.

.4 Inspect and report on position of service valves and ensure valves are oriented correctly.

.5 Inspect and report on isolation valves and unions being properly located for specific equipment.

.6 Bi-weekly site inspections to otherwise report on overall conformance to specifications and drawings, quality control and workmanship, and codes and standards.

.5 Electrical:

.1 Inspection of electrical components/systems/installations to certify conformance to specifications, drawings, and codes and standards.

.6 Operational testing for all other systems at project completion.

.1 Certify conformance to specifications, drawings, codes, and standards, and performance.

## 1.7 SCHEDULE OF WORK

.1 Work by Others

.1 The Contractor will arrange and co-ordinate work to be performed by Other Contractors and The City shall include utilities and other agencies on or near the site.

.2 Work by others includes but is not necessarily limited to Manitoba Hydro and MTS.

.3 Where work by others interferes with Contractor’s planned work, he shall modify his plans and do other work to keep the project on schedule.

**END**

## Part 1 GENERAL

### 1.1 NARRATIVE

.1 The Performance Technical Specifications (PTS) contain the performance technical sections that define the performance and quality of the building elements that are required by the Project Program.

.2 The performance technical sections are arranged in a sequential order of major components and/or building systems.

.3 These specifications are to be read in combination with the City of Winnipeg Community Centre (CC) Design Guidelines (see Appendix E) and the City of Winnipeg Accessibility Design Standards (available on-line) and incorporated accordingly.

.4 NOTE THAT THIS BUILDING IS TO BE USED FOR THE SUMMER SWIMMING SEASON TIME OF THE YEAR ONLY AND WILL BE WINTERIZED AND ONLY REQUIRE MINIMAL HEATING DURING THE OTHER TIMES OF THE YEAR IN ORDER TO MAINTAIN AND KEEP EQUIPMENT, MATERIALS, FITTINGS, FIXTURES AND FINISHES SAFE AND PREVENT ADVANCED DEGRADATION OR DETERIORATION. THE SELECTION OF PRODUCTS, EQUIPMENT, MATERIALS AND FINISHES THAT ARE APPROPRIATE FOR THIS USE MUST BE INCORPORATED INTO THE DESIGN AND CONSTRUCTION OF THIS FACILITY.

### 1.2 FOUNDATIONS

.1 Narrative

.1 This section includes the requirements for the foundation of the building including any footings, piles, piers, pile caps, grade beams, foundation walls, slabs, and earthwork, also perimeter insulation and foundation drainage.

.2 General Requirements

.1 Work shall comply with applicable codes and design standards as a minimum, and in accordance with approval of Authorities Having Jurisdiction.

.3 Subsurface Soils information and Geotechnical Report

.1 Subsurface soil information and associated geotechnical report for the Site is not available.

.4 Quality Assurance

.1 Materials and assemblies installed in the work shall be inspected and found to be in compliance with industry standards and these specifications prior to acceptance of the work. Items found not to be in compliance shall be removed or corrective measures taken, to assure compliance with standards.

.2 When warranted by the project scope, the Contractor's structural engineer of record shall require additional stress tests, inspections, certifications, reports, or observations in addition to those required in the Contract Documents. Quality assurance requirements shall be listed on the structural design drawings.

.3 Inspection and testing of concrete and concrete materials will be carried out by an independent Testing Laboratory in accordance with CAN/CSA-A23.1. Provide Certificate of Field Quality Inspection and Testing to The City.

.4 Inspection or testing by the City or Contract Administrator will not augment or replace Contractor quality control not relieve him of his contractual responsibility.

.5 Foundation System

.1 Provide footing or pile foundation system in accordance recommended by geotechnical engineer.

.2 Provide reinforced cast in place concrete perimeter grade beam system, as required by soil conditions, to meet the required loading requirement, and applicable codes and standards.

.3 Design and Construct in accordance with the requirements of this section and other portions of this RFP.

.4 Provide certification that concrete mix proportions selected will produce concrete of quality, yield strength as specified by Contract Administrator, and will comply with CAN/CSA-A23.1.

.5 Submit reinforcement shop drawings in accordance with Reinforcing Steel Manual of Standard Practice- by Reinforcing Steel Institute of Canada, ANSI/ACI 315 and ACI 315R, Manual of engineering and Placing Drawings for Reinforced Concrete Structure.

.6 Obtain Contract Administrator's written approval of granular base and reinforcing steel placement prior to placing concrete and provide The City copy of same.

.6 Floor Structure

.1 Provide precast concrete hollow core substructure with cast in place concrete topping, or, alternatively, formed in place steel reinforced concrete structural slab with topping finished as below.

.2 Provide Contract Administrator with 24 hour notice prior to placing of concrete.

.3 Finishing

1. Finish Concrete in accordance with CAN/CSA-A23.1
2. Provide sufficient lighting as necessary for furnishing requirements.

.4 Floor Hardener

1. Provide a non-metallic hardener to exposed concrete finished floor surfaces: premixed, aggregate type, dry shake surface hardener, cement to hardener ration 2 to 1, cement colour.

.5 Protection

1. Protect finished installation until floor treatment has completely cured.

.7 Foundation Restrictions

.1 Do not use timber footing or wood foundations.

.8 Dewatering

.1 Dewater site for foundation construction as required by soil conditions and local subsurface waters and surface water, including rainfall. Dewatering requirements and methods shall be established by the Contract Administrator based on subsurface exploration and investigation.

.9 Foundation and Below Grade Insulation

.1 The proposed structure will be insulated to prevent frost penetration below its foundation.

.2 Insulation shall be sufficient thickness and thermal resistance value around perimeter edges of foundation and horizontally out and as required to meet applicable building code and Power Smart Efficiency Requirements.

.3 Extruded polystyrene insulation: to CAN/CGSB-51.20 (latest), types as applicable; mechanically fastened to wall. Only polystyrene insulations listed on CGSB Qualified Products List (41 GP Series) are acceptable for use on this project.

1. Provide only thermal insulating materials recommended by manufacturer for perimeter insulation.
2. Acceptable Product: Dow Styrofoam SM, Perimate Brand, or CT Brand one-step Perimeter Insulation, or approved substitute.
3. Adhesive, accessories and installation as per manufacturers written instruction.

.4 Provide a protective barrier/membrane to minimize ground moisture migration into foundation. Submit product data for approval to Contract Administrator.

.10 Perimeter Foundation Draining

.1 Perimeter drainage system shall be provided to remove water away from the foundation of the facility.

.2 Provide at grade splash-pads at location of rainwater leaders.

**1.3 EXTERIOR ENCLOSURE**

.1 Narrative

.1 This section includes the requirements for the superstructure and any columns and interior load-bearing walls, the exterior enclosure for the building, including exterior wall and roof system, thermal and moisture protection, exterior doors and windows, and finishes.

.2 Refer to and incorporate products, materials and finishes in accordance with the City of Winnipeg CC Design Guidelines as applicable.

.2 General Requirements

.1 Work shall comply with applicable codes and design standards as a minimum, and in accordance with and approval of Authorities Having Jurisdiction.

.2 Any wood that comes into contact with concrete foundation shall be pressure treated complete with sill gasket.

.3 Quality Assurance

.1 Materials and assemblies installed in the work shall be inspected and found to be in compliance with industry standards and these specifications prior to acceptance of work. Items found not to be in compliance shall be removed or corrective measures taken, to assure compliance with standards.

.2 When warranted by the project scope, the Contractor’s structural engineer of record shall require additional structural tests, inspections, certifications, Quality assurance requirements shall be listed on the structural design drawings.

.3 Wall cladding/finish will be maintenance-free and carry a minimum 15-year warranty that it will not crack, peel, chalk, fade in colour or erode to expose the substrate.

.4 Roofing shall have a minimum 25-year warranty.

.5 Window manufacturer to appraise proposed types and installation of windows in areas and locations indentified and provide written recommendations and installation instructions to Contractor with copies issued to Contract Administrator for the proper connections to the new air barrier membrane and adjacent wall construction in order to maintain the integrity of the air barrier and performance expectations for the windows.

.4 Building Components and Assemblies

.1 Any structural frame, wall system, and roof framing system meeting the requirements of this section including the full requirements of all parts of this Design-Build RFP, may be used.

.2 Provide exterior wall construction consisting of exterior skin system of non-structural outside face elements with rain-screen back-up wall systems including; flashing, air barriers, & insulation systems with interior skin system materials to provide protective finish on inside face of exterior walls.

.3 Finish colours to be reviewed and accepted by The City after Closing Date and during Design Development from manufacturer's standard range.

.5 Insulation and Air Barrier Systems

.1 The building envelope shall meet or exceed the minimum insulating values and air infiltration rates as required by the Model National Energy Building Code, the National Building Code and the Manitoba Building Code.

.1 Basement/Foundation Walls: RSI 2.0.

.2 Exterior Walls: RSI 3.5.

.3 Roof: RSI 5.0.

.6 Exterior Doors and Frames

.1 The door schedule is furnished as assistance to the fabricator and should not be considered as inclusive. Examine drawings and specifications; determine extent and quality required. Should any door or frame indicated on plans be omitted or required, the Contractor shall supply as required to suit desired function and Regulatory Agencies.

.2 Exterior doors will be commercial grade, insulated galvanized steel in thermally broken pressed steel frames. Wired Glass inserts.

.3 The steel surfaces will be permanently bonded to a rigid urethane core and crimped around wood stiles.

.4 Door thickness will be 44 mm (1-3/4").

.5 Exterior doors and frames to be fabricated according to current standards of the Canadian Steel Door and Frame Manufacturer's Association and Canadian Manufacturing Specifications for Steel Doors and Frames.

.6 Shop drawings

.1 Submit shop drawings, indicate each type of door, material, thickness, openings, glazing, arrangement of hardware and fire rating finishes.

.2 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

.7 Hardware

1. In addition to the requirements of the Door Hardware, provide exit doors with necessary panic hardware, door closers and exit signage.

.7 Windows

.1 Windows are to be provided to allow natural light and views to the outside at identified locations. The spaces with these requirements are noted in the space program.

.2 Windows shall meet or exceed the minimum performance standards as required by the Manitoba Building Code and the Model National Energy Building Code.

.3 Exterior windows shall be commercial grade aluminum.

.4 Warranties:

.1 Window units to have 20-year warranty against leakage, defects, and malfunction under normal usage.

.2 Sealed units are to have 10-year warranty against seal failure.

.3 The manufacturer warrants the space between the panes to be free of condensation under conditions of -30 degrees Celsius, with a building interior relative humidity of 25%.

.5 The sill at the inside will be an extension of the frame material.

.6 Shop Drawings

.1 Submit Shop Drawings; indicate materials and details from head, jamb and sill, profiles of components, interior and exterior trim. Elevations of unit, description of related components, and caulking.

.2 Include schedule indentifying each unit, with window marls and numbers relating to numbering on drawings and door schedule.

.8 Materials

.1 Wall Cladding

.1 Acceptable materials shall be brick, masonry, limestone, heavy gauge metal, precast panels.

.2 Materials and finishes shall be designed with low maintenance durability and resistant to abuse.

.2 Materials NOT ACCEPTABLE include:

.1 Plywood or composite panel siding.

.2 Vinyl siding.

.3 Flexible Membranes

.1 Building Wrap will be TYVEK

.2 Polyethylene minimum 0.15mm (6 mil) thickness.

.4 Flashing and Trim

.1 Drip edge flashing will be 24 ga. Galvanized steel.

.2 Exposed preformed soffit and gable end drip will be 22 ga. Pre-finished steel.

.3 Sheet metal flashing where required by Building Code.

.5 Rain-ware

.1 Rain-ware includes eaves-troughs, scuppers, hoppers and rainwater leaders.

.2 Rain-ware to be pre-finished galvanized steel.

.3 Eaves-troughs to be continuous with mitered intersecting corners and end caps. Caulk connections to ensure water tightness.

.4 Rainwater leaders to be open-faced with elbow joint 300 mm above the splash pad.

.5 Internal downpipe rainwater leaders are recommended for flat roof designs that incorporate slopes to drain.

## 1.4 INTERIOR CONSTRUCTION

.1 Narrative

.1 This section includes the requirements for interior construction including but not limited to; fixed partitions, interior doors/windows and frames, hardware, finishes, and other interior specialties and accessories.

.2 Refer to Room Data Sheets in Appendix for cross referencing of requirements listed in this Section.

.2 General Requirements

.1 Work shall comply with applicable codes and design standards as a minimum, and in accordance with and approval of authorities having jurisdiction.

.2 Provide barrier free fixtures.

.3 Refer to and incorporate requirements of the City of Winnipeg Universal Design Guidelines.

.3 Quality Assurance

.1 Materials and assemblies installed in the work shall reviewed or inspected and found to be in compliance with industry standards and these specifications prior to acceptance of the work. Items found not to be in compliance shall be removed or corrective measure taken, to assure compliance with standards.

.2 Assemblies requiring fire-ratings shall be reviewed during the course of the work and shall meet the requirements of the applicable Code and as referenced by the Designer of Record (Architect) on the Construction Documents. Items not found in compliance will be required to be removed or corrective measures taken to assure compliance with standards.

.3 Installations shall be performed by qualified installers, who together with the materials and standards specified, shall conform to the requirements of Manufactures' printed installation instruction inclusive of any testing requirements.

.4 Construction Submittals

.1 Product Data

.1 Toilet and Bath Accessories – Manufacturer Units.

.2 Toilet, Shower and Change Room Partitions.

.3 Plumbing Fixtures and Fittings.

.4 Lighting Fixtures and Fittings.

.5 Millwork.

.6 Counter units.

.7 Material samples.

.5 Interior Partitioning

.1 The interior wall partitions will be of unit masonry construction with paint finish.

.2 Water resistant products and/or paint finish to be applied to wet areas.

.6 Fire Separations

.1 Fire separations will be clearly indicated on the drawings along with the reference number for their conformance to standard.

.2 Penetrations of fire separations will be fire-stopped.

.7 Finishes and Millwork

.1 Walls and Doors

.1 Exposed surfaces of walls, doors and frames will be painted.

.2 Submit to Contract Administrator a colour scheme of different colours for partition surfaces, doors and frames for approval.

.2 Floor Finishes

.1 Select and install Interior Hard Floor Finishes components to form complete integral floor system. Ensure performance provides finished interiors for spaces that are appropriate for anticipated usage and traffic in each area with criteria as follows:

.1 Coefficient of friction: to ASTM C1028 (not less than 0.50 for wet and dry conditions) and (0.60 for ramps).

.2 Durability: to ASTM C627. Extra Heavy: passes cycles 1 through 14. Heavy: passes cycles 1 through 12.

Moderate: passes cycles 1 through 10. Light: passes cycles 1 through 6. Residential: passes cycles 1 through

.2 Typically, the flooring in wet and public areas shall be hardened concrete with slip resistant coating applied.

.3 Slip resistant aggregate coating of either aluminum oxide beads or polymer grit additives.

.4 Non-metallic type cement colouring agent.

.5 Ceramic or similar, and Epoxy floor coverings will be considered where proposed as an alternate to exposed finished concrete.

.6 Materials NOT ACCEPTABLE for flooring finish include:

.1 Vinyl Composite Tile or similar.

.2 Resilient floor covering or similar.

.3 Carpet or similar.

.7 Wall base:

.1 Products of low maintenance and high durability for use in wet and public areas such as epoxy matrix terrazzo will be considered.

.2 Apply wall base to areas indicated.

.3 Ceilings

.1 Ceilings in public areas and wet areas including washrooms, change rooms, showers, as well as storage and mechanical rooms will be exposed to structure and painted with low maintenance and water repellent products.

.2 Other Ceilings where indicated will be a Metal Suspension System for Acoustical Tile and Lay-in Panel Ceilings

.3 Ceilings to be durable, resist sag, mold and mildew resistant and scrubbable, water resistant.

.4 Gypsum Wall Board is not acceptable for ceilings.

.4 Painting

.1 Visible surfaces which are not pre-finished materials are to be painted with water repellent paint.

.2 Apply paint finishes when conditions forecast for entire period of application fall within manufacturer's recommendations.

.3 Paint products to conform to Canadian General Standards (CGSB) standards. Use of environmentally safe products.

.5 Counter Units [Other than Wet Areas/Washrooms]

.1 Construction will be to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC) latest.

.2 Millwork fabricated Countertops will be 20mm (3/4") thick fir plywood faced with 1.15mm (0.05") high-pressure laminate. 100mm (4") high backsplash and ends where counter meets a wall will be required.

.3 Doors and Drawer Fronts will be 19 mm (3/4") fir plywood core with (GP 28). 75mm (3") high-pressure decorative plastic laminate laid up on both edges. All 4 edges of door and drawer fronts will have 3mm (1/8") thick impact-resistant PVC hot melt glue applied edging.

.4 Drawers will be 12mm (1/2") MCP sides, back and sub front. 1mm (0.04") impact resistance PVC to top edges. 12mm (1/2") MCP drawer bottoms.

.5 Interior shelving will be 16mm (5/8") MCP with 3mm PVC edges.

.6 Counter Units [Washrooms/Wet Areas]

.1 Stainless steel countertops, brackets and fittings are required for wet and public areas.

.7 Interior Window Frames and Glazing

.1 Provide 18 ga. welded steel hollow metal window frames to suit total wall thickness. Provide fire label where required by wall construction.

.2 Provide wired glazing for required fire protection ratings.

.8 Door Hardware

.1 Provide the services of a certified hardware consultant to prepare the hardware schedule. Provide, as far as feasible, locks, hinges, pivots, and closers of one lock, hinge, pivot or closer manufacturer's make. Modify hardware as necessary to provide features indicated or specified.

.2 All door hardware is to be "Grade 1 Commercial" quality.

.3 All locksets and latch sets are to be lever-type.

.4 Use ULC listed and labeled hardware for doors in fire separations and exit doors.

.5 All locksets will be under the City's Master Key System and Sub Master Key. Consult with Contract Administrator prior to keying.

.6 Furnish one file key, one duplicate key and one working key for each key exchange.

.7 Provide armor, mop and kick plates on all doors with closers and doors leading to corridors or circulation spaces. Provide mop plates on all doors in rooms that have mop-able floor finish.

.8 Non-removable hinge pins where door swings out.

.9 Specialties

.1 Provide the following accessories and as required by the Building Code, confirm with the City:

.1 Grab bars to suit accessibility code and City of Winnipeg Accessibility Standards.

.2 Vandal resistant mirror(s) over sinks.

.3 Collapsible coat hooks.

.2 Washroom accessories will be either wall mounted (complete with proper backing) or wall semi-recessed as appropriate.

.10 Miscellaneous Specialties

.1 Fire Extinguishers

.1 Provide fire extinguishers as required by National Fire Code. Extinguishers will be mounted in recessed wall opening or on face of wall with wall brackets.

.2 Fire extinguishers will be refillable or rechargeable, be equipped with a gauge indicating content level or pressure, and have a dispersal hose for controlled discharge. Type as required.

.2 Exterior Building Signage

.1 Provide exterior surface mounted building signage consisting of the facility name in individual die-cut letters screwed to exterior at an appropriate scale to be read from the street.

.2 Type, layout and location to be approved by the Contract Administrator.

## 1.5 PLUMBING FITTINGS & FIXTURES

.1 Narrative

.1 This section includes the design and provision of interior plumbing fittings and fixtures.

.2 General Requirements

.1 Work shall comply with applicable codes and design standards as a minimum, and in accordance with and approval of authorities having jurisdiction.

.2 Provide a plumbing accessories and devices as necessary and required for a complete and usable system.

.3 Provide drain lines and valves for flushing water from building systems for winterizing the building and preventing freezing of lines during the winter.

.4 Provide grease interceptor where applicable.

.3 Quality Assurance

.1 Materials and assemblies installed in the work shall be inspected and found to be in compliance with industry standards and these specifications prior to acceptance of the work. Items found not to be in compliance shall be removed or corrective measures taken, to assure compliance with standards.

.4 Material Standards

.1 Materials, equipment, and other appurtenances shall comply with applicable Underwriters Laboratories Canada, (ULC) Inc., or applicable standards of a similar independent testing organization. All materials shall be new, and shall bear the label of Underwriters Laboratories whenever standards have been established and label service is normally and regularly furnished by the agency. All equipment provided shall be listed and labelled suitable for the specified purpose, environment, and application and installed in accordance with manufacturer's recommendations.

.2 Fittings and Fixtures: CSA approved, similar product types from same manufacturer, preferably Canadian made.

.3 Sinks shall be stainless steel drop-in, or, integral with stainless steel countertops.

.4 Faucets and fittings to be stainless steel.

.5 Shower floor drain trench covers to be stainless steel.

.5 Construction Submittals

.1 Product data:

.1 Water closets.

.2 Urinals.

.3 Lavatories Sinks, faucets/

.4 Shower Taps and mixing valves.

.5 Floor drains

.6 Continuous floor trench drains and covers.

.6 Plumbing Standards

.1 All domestic hot and cold water lines will be insulated with pipe insulation. Plumbing vent lines will be insulated.

.2 All pipe penetrations through fire rated assemblies are to be fire-stopped to maintain the rating. A ULC reference number acceptable to the Provincial Department of Labour will be provided for each fire-stop installation.

.7 Plumbing Scope of Work

.1 The scope of work required under this section includes:

.2 The supply and installations of plumbing fixtures and related equipment and trim including:

.1 Floor Drains:

.1 Washrooms.

.2 Mechanical Room.

.2 Hose Bibs

.1 Allow 2. One at each of east and west elevation.

.3 Water Closets and Urinals.

.1 Washrooms

.4 Stainless Steel Sinks

.1 Washrooms

.5 Floor Sink / Mop Sink

.1 Janitor Closet.

.6 Showers Taps and Mixing Valves

.1 Change rooms.

**1.6 HVAC**

.1 Narrative

.1 Provide a heating, ventilation, and air conditioning (HVAC) system including accessories and devices as necessary and required for a complete and usable system which meets the performance criteria of the RFP.

.2 This section must be used in conjunction with all parts of the RFP, in order for Contract Administrator to determine the full requirements of this section.

.2 General Requirements

.1 All work shall comply with applicable codes and design standards as a minimum, and in accordance with and approval of Authorities Having Jurisdiction.

.3 Quality Assurance

.1 Materials and assemblies installed in the work shall be inspected and found to be in compliance with industry standards and these specifications prior to acceptance of the work. Items found not to be in compliance shall be removed or corrective measures taken, to assure compliance with standards.

.4 Material Standards

.1 Materials, equipment, fixtures, and other appurtenances shall comply with applicable Underwriters Laboratories, (ULC) Inc., or applicable standards of a similar independent testing organization. All materials shall be new, and shall bear the label if Underwriters Laboratories whenever standards have been established and label service is normally and regularly furnished by the agency. All equipment provided shall be listed and labelled suitable for the specified purpose, environment, and application and installed in accordance with manufacturer’s recommendations. All insulation shall be asbestos free.

.5 Training

.1 After installation of the equipment and systems, provide individual training courses for The City's staff covering items contained in the Operations and Maintenance manuals. Provide one (1) video format of the training course(s) to be used as refresher courses and to train additional personnel.

.2 Training shall include discussion as well as hands on maintenance, replacement of typical components and repair type maintenance training for parts typically replaces or repaired in the field. Submit training plan 14 calendar days prior to training sessions. Training plan shall include scheduling, content, outline, and training material handouts.

.6 Service Support

.1 The equipment items shall be supported by service organizations that are reasonable convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.

.7 Mechanical Services

.1 Contractor will file all necessary notices and approval layouts, obtain and pay for all Local Authority and Fire Underwriters Inspections, approvals and permits applicable to each Mechanical Service. Any changes required to secure Local Authorities approval will be without cost to the The City.

.2 The design, manufacture, installation, welding and tests of piping and other equipment shall conform to the Regulations of the A.S.M.E. Code and the Provincial Department of Labour.

.3 All certificates required by Local Authorities will be provided to The City before acceptance of the building.

.4 Three bound sets of all brochures or literature supplied by the manufacturers of each piece of equipment will be delivered to The City, including:

.1 Complete list of mechanical equipment supplied and installed,

.2 Correct installation procedures,

.3 Manufacturer’s recommended operating and maintenance instructions.

.5 Written guarantees and warranties will be required on all mechanical equipment and installations including materials, work and operations. In addition guarantee heating systems through one complete heating season, guarantee cooling system through one complete cooling season, and provide to The City all equipment manufacturer’s guarantees specified in excess of one (1) year.

.6 As-Built Drawings of all mechanical work including invert elevations for all new underground services will be provided to The City.

.7 All special structural work required for installation of all supports, equipment bases and pits will be supplied and erected. Mount all major pieces of equipment such as pumps, compressors, fans, etc., on 100mm (4”) high concrete reinforced pads in accordance with standard details and to suit equipment.

.8 HVAC Standards

.1 Ventilation systems will meet or exceed required air changes as required per applicable Codes and Standards.

.2 Ductwork will be insulated to prevent condensation.

.3 Ductwork will be insulated to prevent the transmission of fan noise.

.4 The air and hydronic systems will be balanced following installation.

.5 All ductwork penetrations through fire-rated assemblies are to be provided with fire dampers and fire-stopped to maintain the required rating.

.6 All mechanical piping lines will be insulated with pipe insulation.

.9 HVAC System

.1 The building will be climate-controlled with heating and ventilation of enclosed occupied spaces, as well as cooling to the control office, guard station and staff room.

.2 The energy source for all HVAC equipment will be electricity or natural gas.

.3 The occupied spaces will be serviced by forced air system providing cooling (kitchen only), ventilation, and supplemental heating.

.4 The HVAC system will be designed to meet or exceed Energy Efficiency Standards.

.10 Equipment Labelling

.1 All mechanical equipment will be labelled.

.2 Lamacoid labels are not required.

## 1.7 ELECTRICAL POWER AND LIGHTING AND COMMUNICATIONS

.1 Narrative

.1 Provide an interior electrical system as described in the Project Program including accessories and devices as necessary and required for a complete and usable system.

.2 This section must be used in conjunction with all parts of the RFP, in order for Contract Administrator to determine the full requirements of this section.

.2 General Requirements

.1 All work shall comply with applicable codes and design standards as a minimum, and in accordance with and approval of Authorities Having Jurisdiction.

.2 It is to be assumed that the current service to the site is at it's maximum and there is no additional capacity in the existing service to the site.

.3 Contractor is to calculate the required loads for the Project and assist The City with arranging for an upgrade to the existing service.

.3 Quality Assurance

.1 Materials and assemblies installed in the work shall be inspected and found to be in compliance with industry standards and these specifications prior to acceptance of the work. Items found not to be in compliance shall be removed or corrective measures taken, to assure compliance with standards.

.4 Material Standards

.1 Materials, equipment, fixtures, and other appurtenances shall comply with applicable Underwriters Laboratories, (ULC) Inc., or applicable standards of a similar independent testing organization. All materials shall be new, and shall bear the label if Underwriters Laboratories whenever standards have been established and label service is normally and regularly furnished by the agency. All equipment provided shall be listed and labelled suitable for the specified purpose, environment, and application and installed in accordance with manufacturer's recommendations.

.5 Service Support

.1 The equipment items shall be supported by service organizations that are reasonable convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.

.6 Electric Utility

.1 Any Capital costs for the connection of the electric utility must be included in the Bid Price.

.2 The Contractor will arrange and pay for all permits and fees required to provide electric utility power to the project, including connect and disconnect cost for temporary and permanent service.

.7 Lighting

.1 Lighting levels throughout the building will be to current standards and acceptable for the type of function of the occupiable space or unless otherwise noted.

.2 Emergency and exit lights with directional arrows will meet code requirements.

.4 Exterior lighting will be required at entrances and exits and at each overhead door. Exterior lighting will have photocell control with manual override switches.

.5 All lighting shall meet energy efficiency Standards.

.6 All lighting will have vandal resistant protective guards and concealed fastening.

.8 Smoke/Heat Detectors

.1 Heat Detectors at Kitchen and spaces where applicable by AHJ and by Code.

.9 Voice

.1 Provide the following telephone connections from Mechanical Room Hub to the following demarks.

.1 Guard Room: 1 data, 1 voice

.2 Admin & Ticketing: 1 data, 1 voice

.3 Pool Supervisor's Office: 1 data, 1 voice.

.4 First Aid Room: 1 voice.

.2 Confirm location of outlet boxes with the Contract Administrator.

.10 Multi Media

.1 Provide outlets, cabling and wiring for Audio Visual, Intercom, Speakers, Television (options for Satellite and Cable TV) multi-media equipment, from control source in the Office, to the following locations:

.1 Guard office.

.2 Admin & Ticketing.

.3 Final locations to be determined with Contract Administrator.

.11 CCTV Security Cameras

.1 Provide vandal resistant outdoor IP cameras (high-definition color), cabling and wiring for closed circuit security system complete with display monitor. Unit shall be capable of recording multiple streams, with remote access and archiving.

**END OF SECTION**

## Part 1 General

### 1.1 NARRATIVE

.1 This section includes the requirements for the foundation of the building including any footings, piles, piers, pile caps, grade beams, foundation walls, slabs, and earthwork, also perimeter insulation and foundation drainage.

.2 Refer to the General Requirements and design in accordance to meet the objectives for the use and maintenance of this facility.

.3 Brackets where shown or left blank are provided to identify specific selections to be determined or used in the design proposal.

### 1.2 SUMMARY

.1 Section Includes:

- .1 The performance and installation criteria for foundation types for buildings.
- .2 Piling/Caissons - Driven:
  - .1 Material: precast concrete
  - .2 [Pile load testing].
- .3 Piling/Caissons - Drilled:
  - .1 Material: concrete with casing removed.
  - .2 Type: end bearing belled base.
  - .3 [Pile load testing].
- .4 Grade Beams:
  - .1 Material: [concrete]
  - .2 Under Beams: cardboard void forms.
- .5 Strip Footings:
  - .1 Material: concrete, reinforced.
- .6 Spread Footings:
  - .1 Material: concrete, reinforced.
- .7 Concrete Raft Slab:
  - .1 Material: concrete, reinforced.
- .8 Foundation Walls:
  - .1 Material cast-in-place concrete.
- .9 Retaining Walls:
  - .1 Material: cast-in-place concrete or reinforced masonry.

### 1.3 DESIGN/PERFORMANCE LOADS

.1 Seismic Resistance:

- .1 Seismic Zone: 0.
- .2 Design seismic resistance and horizontal acceleration of foundation structure to applicable code at the place of the project.
- .3 Design foundation to ensure yielding will occur in the superstructure and not the foundation.

.2 Foundation Support Loads: [see Structural Specifications]

.1 [___] kPa average, vertical.

.2 [___] kPa hydrostatic uplift.

.3 Water Table:

.1 Average: [___] mm below [finish grade] [project benchmark datum].

.2 Ground Water Level Change Anticipated - Average: [___] mm [upward] [downward].

.4 Frost Line: [___] mm below finish grade.

.5 Substrata Soil Data:

.1 Descending layers of strata are as follows:

.1 Average of [___] mm topsoil.

.2 Average of [___] mm [subsoil] [___].

.3 Average of [___] mm [granular subsoil] [___].

.6 Wind Loads:

.1 Average Net Load: [___] kPa considering exposure factors, gusting, windward positive and leeward negative pressures, and flexing; with an annual probability of [1 in 10] [1 in 30] [1 in 50] [1 in 100].

.7 Vibration Isolation:

.1 Low frequency vibration from railroad tracks [___] m minimum from property line.

.2 Low frequency vibration from underground rapid transit with rails [___] m below project benchmark datum.

.3 Design foundations for resonance and fatigue resistance caused by equipment and machines.

.4 Design foundations for resonance and sway resistance caused by dynamic load movement within the superstructure.

**1.4 SUBMITTALS**

.1 Submit Shop Drawings, Project Data, and WHMIS MSDS in accordance with submittal procedures in general requirements.

.2 Shop Drawings: required, with seal of Professional Structural Engineer in Province of Manitoba Canada.

**1.5 QUALITY ASSURANCE**

.1 Health and Safety:

.1 Do construction occupational health and safety in accordance with Health and Safety Requirements.

**Part 2 Products**

**2.1 MATERIALS**

**2.2 DRIVEN PILES**

.1 Concrete Filled Steel Piles:

.1 ASTM A252, single length steel pipe [with conical tip] [___].

.2 Reinforcement: deformed steel bars.

.3 Concrete Materials: concrete Materials: [___] Mpa 28 day compressive strength using Type [10 - Normal] [50 - Sulphate Resisting] cement.

.2 Rolled Steel Section Piles:

.1 ASTM A690, structural steel, rolled [H] [___] sections.

**2.3 DRILLED CONCRETE PIERS (CAISSONS)**

.1 Shaft Liner: single length [ASTM A252, steel pipe] [AASHTO M36, corrugated steel pipe].

.2 Reinforcement: deformed steel bars.

.3 Concrete Materials: [___] MPa 28 day compressive strength using Type [10 - Normal] [50 - Sulphate Resisting] cement.

**2.4 PILE LOAD TESTING EQUIPMENT**

.1 Equipment Type, Load Carrying Device, Load, and Instrumentation: Conform to ASTM D1143 [and [ASTM D3966] [ASTM D3689] ] [___] equipment of same type as will be used for pile placement of the Work.

**2.5 CONCRETE GRADE BEAMS**

.1 Reinforcement: deformed steel bars.

.2 Concrete Materials: [___] MPa 28 day compressive strength using Type [10 - Normal] [50 - Sulphate Resisting] cement.

**2.6 CONCRETE FOOTINGS**

.1 Reinforcement: deformed steel bars.

.2 Concrete Materials: [___] MPa 28 day compressive strength using Type [10 - Normal] [50 - Sulphate Resisting] cement.

**2.7 FOUNDATION WALLS**

.1 Concrete Materials:

.1 Forms: [Plywood.] [Moulded polystyrene foam, cored [vertically] [and] [horizontally] for reinforcing [and high slump concrete fill] [___]].

.2 Reinforcement: deformed steel bars.

.3 Concrete: [___] MPa 28 day compressive strength using Type [10 - Normal] [50 - Sulphate Resisting] cement; [normal] [high] slump mix.

.2 Masonry: CMU, load bearing, modular size.

**Part 3 Execution**

**3.1 INSTALLATION - DRIVEN PILES**

.1 Drill under-sized holes to facilitate driving.

.2 Auger or drill shaft bottom into bearing stratum.

.3 Drive piles to [refusal] [defined load supporting capacity].

.4 Cut off tops of piles.

.1 Wood Piles: apply preservative to exposed ends of cut-off piles.

.2 Concrete Piles: place reinforcing steel and concrete grout at and within top of pile for subsequent work.

**3.2 INSTALLATION - DRILLED CONCRETE PIERS - CAISSONS**

.1 Drill to [defined bearing stratum] [___].

.2 Form pier shafts [and belled bases] [shear rings].

.3 [Place steel liners immediately after drilling] [___].

.4 Place reinforcing steel and concrete.

.5 [Progressively raise shaft liner] [___].

**3.3 INSTALLATION - CONCRETE GRADE BEAMS**

.1 Component to support and resist imposed loads.

.2 Place over top of pile foundations.

.3 Dimensions.

.1 Nominal Thickness: [___] mm.

.2 Height: from top of piles up to horizontal ledge or support surface under exterior wall construction.

.4 Form for component configuration and dimensions.

.5 [Continue reinforcement up to [___] from pile foundation] [___].

.6 Place reinforcing steel and concrete.

.7 Trowel top surface smooth and level.

**3.4 INSTALLATION - CONCRETE FOOTINGS**

.1 Footings to support and resist imposed loads.

.2 Dimensions.

.1 Nominal Thickness: [___] mm.

.2 Nominal Width: [200] [___] mm wider than foundation wall above.

.3 Form for component configuration and dimensions.

.4 Place reinforcing steel and concrete.

.5 Trowel top surface smooth and level.

**3.5 INSTALLATION - FOUNDATION WALLS**

.1 Foundation wall to support and transfer imposed loads to foundation.

.2 Concrete:

.1 Nominal Wall Thickness: [___] mm.
.2 Form for component configuration and dimensions.
.3 Place reinforcing steel and concrete.
.4 Place 'L' shaped anchors with threaded end for anchoring wood plate.
.5 Trowel top surface smooth and level.

.3 Masonry:

.1 Foundation wall to support and transfer imposed loads to foundation.
.2 Nominal Wall Thickness: [___] mm.
.3 Place units in running bond to modular coursing.
.4 Use Type [M] [S] [N] mortar for joints and grade beams.
.5 Grout fill top 2 courses and embed 'L' shaped anchors with threaded end for anchoring wood plate.
.6 Trowel top surface smooth and level.

.4 Wood:

.1 Foundation wall to support and transfer imposed loads to foundation.
.2 Nominal Wall Thickness: [___] mm.
.3 Stud Spacing: [300] [400] [___] mm.
.4 Sheathing Thickness: [19] [___]mm.
.5 Preservative treat all wood components.
.6 Place thermal insulation between studs; cover with sheeting, staple in place.
.7 Trowel top surface smooth and level.

.5 Cored Foam Plastic:

.1 Foundation wall to support and transfer imposed loads to foundation.
.2 Nominal Wall Thickness: [___] mm.
.3 Place foam forms to foundation configuration and dimensions.
.4 Place reinforcing steel within cores; place high slump concrete and rod for voids.
.5 Place 'L' shaped anchors with threaded end for anchoring wood plate.
.6 Trowel top surface smooth and level.

## 3.6 QUALITY CONTROL

.1 Field Tests: [not required] [required].

.2 Field Inspection: [not required] [required].

.3 Pile Load Testing: [not required] [required as follows].

.1 ASTM D1143, test piles under static axial compressive load to [___].
.2 ASTM D3689, test individual piles under static axial tensile load to [___].
.3 ASTM D3966, test piles under lateral load to [___].

.4 Load test the following:

.1 Test [6] [___] indicator piles at locations as directed.
.2 One test for first [100] [___] piles.
.3 One test for next [250] [___] piles.
.4 One test for each additional [500] [___] piles.

.5 Subject piles to [1-3/4] [2] [___] times design load.

.6 Acceptable Permanent Set of Piles After Load Testing: [3][6] [___] mm.

.7 If tested piles do not conform to requirements, perform additional testing of other piles.

**END OF SECTION**

## Part 1 General

### 1.1 NARRATIVE

.1 This section includes the requirements for constructing the floor based on a structurally reinforced concrete floor assembly.

.2 The intent is to have a concrete finished floor with a slip resistant and coloured coating for low maintenance and durability purposes primarily in the wet and public areas of the building.

.3 Refer to the General Requirements and design in accordance to meet the objectives for the use and maintenance of this facility.

.4 Brackets where shown or left blank are provided to identify specific selections to be determined or used in the design proposal.

### 1.2 SUMMARY

.1 Section Includes:

.1 Concrete and concrete materials.
- .1 Reinforcing.
- .2 Concrete materials.
- .3 Accessories.

.2 Structural interior concrete block support walls.

.3 Floor construction fireproofing.

.4 Floor construction firestopping and smoke seals.

### 1.3 DESIGN PERFORMANCE REQUIREMENTS

.1 Floors:

.1 Limit floor joist deflection due to specified live load to [___] span . Limit floor joist deflection due to specified load to [___] of span.

.2 Design floor for specific mechanical equipment weights but uniform dead load not to be less than [3.6] [___] kPa in addition to self weight.

.3 Provide mechanical pads under floor mounted equipment. Provide sleeves, raceways and integrate mechanical and electrical requirements.

.4 Design live load not to be less than 3.6 kPa.

.5 Construction to mitigate vibration caused by mechanical equipment.

.2 Vertical and lateral load resisting elements.

.1 Design vertical and lateral load resisting walls in reinforced concrete masonry.

.2 Interior walls: non-loadbearing and non-lateral load resisting to permit future modifications.

.3 Exterior walls to accommodate planned openings and modest, future modifications.

.4 Interior columns: regularly spaced and to accommodate architectural requirements.

.5 Reinforce walls for mounted items and openings.

.6 Base plates for steel columns: conceal below floor on grade.

.7 Lateral loads due to wind or earthquake are to be resisted by braced frames around perimeter of building or moment resisting frames in combination with reinforced concrete masonry walls.

.1 Do not use tension diagonal braces.

.3 Structural steel:

.1 Design details and connections to [CAN/CSA-S16] [CSA S136] [CSA S136.1] to resist forces, moments, shears and allow for movements.

.2 Steel structure to be exposed or may be exposed in future renovations. Steel structural elements to be regular with uniform spacing of elements. Welds or bolted connections to be neat and compact. Bridging to be straight with neat, compact connections.

.4 Metal fabrications:

.1 Design metal fabrications to withstand service loads and service environment.

.5 Cast-in-place concrete:

.1 Design cast-in-place concrete in accordance with CAN/CSA-A23.3.

.6 Floor construction fireproofing:

.1 Design fireproofing as follows:

.1 Floors [___] hrs.

.2 Structure [___] hrs.

.2 Use only ULC, UL, WH, and NRC/IRC certified systems. Use tested assemblies or as determined by standard calculation method.

.7 Floor construction firestopping and smoke seal.

.1 Asbestos-free materials and systems installed in accordance with tested assemblies acceptable to authorities having jurisdiction to provide effective barrier against passage of fire, smoke and gasses, firefighter's hose stream, and where specifically designated, passage of liquids.

.2 System to provide fire-resistance rating (flame and temperature) not less than fire-resistance rating of surrounding floor, wall or other assembly.

.3 Service penetration components and assemblies, including back-up materials and supports to be certified in accordance with [ULC-S115] [CAN/ULC-S101] [and be ULC listed] [by authority having jurisdiction].

.4 Design combined and/or built-up site systems in accordance with ULC, FM or WH system restrictions and technical evaluation acceptable to authorities having jurisdiction.

.1 Ensure systems provide flame and temperature rating in accordance with those outlined in NBC, and provide effective barrier against passage of flame, smoke and gasses.

.5 Sealants and putty for overhead and vertical joints: non-sagging; seals for floors are to be self-levelling.

.6 Compressive strength of products to provide self support at penetrating item, and their integrity as tested in ULC vertical application.

.7 Products: compatible with abutting dissimilar architectural coatings and finishes at floors, walls, ceilings and waterproofing membranes.

## 1.4 SUBMITTALS

.1 Make submittals in accordance with General Requirements.

.2 Shop drawings:

.1 Submit shop drawings to indicate project layout, including details, sequence of erection formwork removal fabrication and erection detail materials list design calculations.

.2 Submit drawings stamped and signed by qualified professional engineer registered or licensed in the Province of Manitoba, Canada.

.3 Co-ordinate submittal requirements and provide submittals required.

.4 Quality Assurance Submittals:

.1 Test Reports: submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.

.2 Manufacturer's Instructions: comply with manufacturer's written data, including product technical bulletins, product catalog installation instructions, product carton installation instructions, and data sheet.

.3 Manufacturer's Field Services: submit to Engineer verifying compliance of Work, as described in PART 3.

.5 Submit WHMIS MSDS in accordance with General Requirements including - Hazardous Materials.

.6 Indicate and provide MSDS for following:

.1 Sealants.

.2 Tape.

.3 Proprietary Joints.

.7 Hazardous Materials: provide description of Hazardous Materials and Notification of Filing with proper authorities having jurisdiction prior to beginning of Work as required.

## 1.5 QUALITY ASSURANCE

.1 Companies to be certified under [CSA W47.1 for fusion welding of steel joists] [CSA W55.3 for resistance welding].

.2 Site Meetings: as part of Manufacturer's Services, schedule site visits, to review Work, at stages listed.

.1 After delivery and storage of products, and when preparatory Work 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.

.3 Health and Safety:

.1 Do construction occupational health and safety in accordance Workplace Health & Safety Guidelines.

.2 Provide copy of Safe Work Plan.

## 1.6 DELIVERY, STORAGE AND HANDLING

.1 Waste Management and Disposal:

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Place materials defined as hazardous or toxic in designated containers in accordance with General Requirements Environmental Procedures, or, as

instructed Authority Having Jurisdiction. [Conservation Manitoba, City of Winnipeg].

.3 Handle and dispose of hazardous materials in accordance with Regional and Municipal regulations.

## Part 2 Products

### 2.1 STRUCTURAL STEEL

.1 Columns and beams supporting floors:

.1 Structural steel: to [[CSA G40.20/G40.21] [___] Grade [350W] [___]] [and] [CSA S136].

.2 Anchor bolts: to [CSA G40.20/G40.21, Grade 300W] [ASTM A36/A36M].

.3 Bolts, nuts and washers: to [ASTM A307] [ASTM A325] [ASTM A325M] [ASTM A490] [ASTM A490M].

.4 Welding materials: to [CAN/CSA-W48] [CAN/CSA-W59] and certified by Canadian Welding Bureau.

.5 Shop paint primer: to [MPI #23] [MPI #76] [CAN/CGSB-1.40] [___].

.6 Hot dip galvanizing: galvanize steel, where indicated, to CAN/CSA-G164, minimum zinc coating of [600] [___] $g/m^2$.

.2 Fabrication.

.1 Fabricate structural steel in accordance with [CAN/CSA-S16] [CSA S136] [and in accordance with [approved] [reviewed] shop drawings].

.2 Clean, prepare surfaces and shop prime structural steel in accordance with [CAN/CSA-S16] [CSA S136] [MPI INT 5.1 [___]] [___] [except where members to be encased in concrete].

### 2.2 METAL

.1 Steel sections, rolled steel, bar stock and plates: to CSA G40.21, Grade 300W or 350W to suit project requirements.

.2 Hollow structural sections: to CSA G40.21, Grade [300W] [350W].

.3 Steel pipe: to ASTM A53/A53M, Type E or S, Grade B, use ANSI Schedule 40, black or galvanized finish to suit expose.

.4 Galvanized sheet steel: to ASTM A653/A653M, structural quality sheets, specially treated by phosphate conversion process where steel is to be exposed and finish painted.

.5 Welding materials: to CAN/CSA-W59.

.6 Welding electrodes: to CAN/CSA-W48.

.7 Field connection bolts and anchorbolts.

.1 Structural connectors: ASTM A325M, heavy structural bolt, hexagonal nut and 1 hardened washer.

.2 Non-structural connectors: ASTM A307, hexagonal bolt, nut and washer.

.8 Galvanizing:

.1 ASTM A123/A123M for zinc (hot galvanized) coatings on products fabricated from rolled, pressed and forged steel shapes, plates, bars and strip.

.2 CAN/CSA-G164 for galvanizing of irregularly shaped articles.

.3 ASTM A123/A123M zinc coating (hot dip) on assembled steel products.

.9 Shop paint prepaint finish:

.1 Cold phosphate treatment to galvanized surfaces: ASTM D2092.

.2 Primer for interior exposure: [MPI #76] [___].

.10 Touch-up for galvanized surfaces: to [MPI #18] .[CAN/CGSB-1.181] [___], zinc rich ready mix organic primer.

.11 Fabrication:

.1 Fabricate Work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.2 Fabricate in accordance with reviewed shop drawings.

.3 Fabricate structural components to requirements of CAN/CSA-S16.

.4 Supply fastenings, anchors and accessories required for fabrication and erection.

.5 Hot dip galvanize items occurring on or in exterior wall or slab.

**2.3 CAST-IN-PLACE CONCRETE**

.1 Reinforcing:

.1 Reinforcing steel: billet steel, grade [300] [350] [400], deformed bars to CAN/CSA-G30.18. [Refer to Structural Specificationss].

.2 Cold-drawn annealed steel wire ties: to [ASTM A496] [ASTM A497/A497M] [___].

.3 Deformed steel wire for concrete reinforcement: to ASTM A496.

.4 Welded steel wire fabric to ASTM A185: provide in flat sheets only.

.5 Welded deformed steel wire fabric: to [ASTM A496] [ASTM A497/A497M] [___].

.6 Epoxy coating of non-prestressed reinforcement: to ASTM A775/A775M.

.7 Galvanizing of non-prestressed reinforcement: to CAN/CSA-G164.

.8 Chairs, bolsters, bar supports, spacers to CAN/CSA-A23.1: select materials to eliminate rust spots or other blemishes at concrete surfaces.

.2 Concrete materials:

.1 Portland cement: to [CAN/CSA-A3001] [ASTM C150].

.2 Supplementary cementing materials: to [CAN/CSA-A3001].

.3 Water: to CAN/CSA-A23.1/A23.2.

.4 Aggregates to [CAN/CSA-A23.1/A23.2] [ASTM C332]: coarse aggregates, density to suit concrete design requirements.

.5 Air entraining admixture: to ASTM C260.

.6 Chemical admixtures and retarders: to ASTM C494/C494M.

.3 Accessories.

.1 Curing compound: to [CAN/CSA-A23.1] [ASTM C309].

.2 Waterstops: purpose made, material type, size and shape suitable for intended end use.

.3 Joint fillers: premoulded, to [ASTM D1751] [ASTM D1752].

.4 Polyethylene film: to CAN/CGSB-51.34.

.5 Floor hardener: metallic, non-metallic or chemical types and colour to suit project and design requirements.

.6 Typically the flooring in the wet and public areas shall be hardened concrete with slip resistant coating applied.

.7 Slip resistant aggregate coating of either aluminum oxide beads or polymer grit addtives.

**2.4 CONCRETE LOAD-BEARING BLOCK**

.1 Concrete block to CSA A165.1: H/15/A/M, hollow, normal weight, S/15/A/M, solid, normal weight for top course.

.2 Provide purpose-made shapes for lintels and bond beams.

.1 Provide additional special shapes required by project design.

.3 Mortar: to [CAN/CSA-A3002] [___], proportion specification, Type N: loadbearing walls.

.4 Reinforcing bars: to CAN/CSA-G30.18, Grade 400, deformed.

.5 Concrete aggregate: to CAN/CSA-A23.1/A23.2, 10 mm maximum size.

**2.5 FLOOR CONSTRUCTION FIREPROOFING**

.1 Sprayed fireproofing: ULC certified cementitious or asbestos-free fireproofing qualified for use in ULC Designs specified.

.2 Curing compound: type recommended by fireproofing manufacturer, qualified for use in ULC Designs specified.

.3 Sealer: type recommended by fireproofing manufacturer, qualified for use in ULC Design specified.

**2.6 FLOOR CONSTRUCTION FIRESTOPPING AND SMOKE SEAL**

.1 Fire stopping and smoke seal systems: in accordance with ULC-S115.

.1 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of ULC-S115 and not to exceed opening sizes for which they are intended.

.2 Service penetration components, assemblies and back-up materials: certified by ULC in accordance with ULC-S115 and listed in ULC Guide No.40U19.

.3 Service penetration firestop components: certified by ULC in accordance with ULC-S115 and listed in ULC Guide No.40U19.13 and ULC Guide No. 40U19.15 under the Label Service of ULC.

.4 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.

.5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.

.6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and mechanical items requiring sound and vibration control: elastomeric seal.

.7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

.8 Water, when applicable: potable, clean and free from injurious amounts of deleterious substances.

.9 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

.10 Sealants for vertical joints: non-sagging.

.11 Fibre firestopping: bearing ULC label, mineral fibre material capable of being compressed into space at top of masonry partitions.

## Part 3 Execution

### 3.1 INSTALLATION: STRUCTURAL STEEL

.1 Columns and Beams:

.1 Install steel structure, details and connections in accordance with requirements of CAN/CSA-S16 and CSA S136 with CSA S136.1 to resist forces, moments and shears.

.2 Welds or bolted connections to be neat and compact.

### 3.2 INSTALLATION: METAL FABRICATIONS

.1 Do welding Work in accordance with CAN/CSA-W59 unless specified otherwise.

.2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.3 Exposed fastening devices to match finish and be compatible with material through which they pass.

.4 Make field connections with bolts to CAN/CSA-S16, or weld.

.5 Provide suitable means of anchorage including dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.6 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.

.7 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

### 3.3 INSTALLATION: CAST-IN-PLACE CONCRETE

.1 Cast-in-place concrete:

.1 Do cast-in-place concrete Work and testing in accordance with CAN/CSA-A23.1/A23.2 except where specified otherwise. Observe hot and cold weather requirements of CAN/CSA-A23.1/A23.2.

.2 Finish concrete in accordance with CAN/CSA-A23.1/A23.2

.3 Concrete exposed to public view to have smooth form finish.

.2 Concrete floor finishes:

.1 Formed surfaces exposed to view: in accordance with CAN/CSA-A23.1/A23.2.

.2 Interior floor slabs [to be left exposed] [to receive epoxy] [carpet] [sheet vinyl] [to receive other covering] [___] requiring smooth surface: initial finishing operations followed by final finishing comprising mechanical floating and steel trowelling as

specified in CAN/CSA-A23.1/A23.2 to produce hard, smooth, dense trowelled surface free from blemishes; finishing tolerance classification: Flat.

.3 Floor slabs to receive mortar bed for ceramic or quarry tile: screed to correct grade to provide broomed texture: finishing tolerance classification: Conventional.

.4 Cut and form control joints in slabs at locations indicated, in accordance with CAN/CSA-A23.1/A23.2: fill with specified joint sealer/filler.

.5 Install premoulded joint filler in expansion and isolation joints full depth of slab flush with finished surface.

.6 Cure and protect concrete in accordance with CAN/CSA-A23.1/A23.2: do not use curing compounds where bond is required by subsequent topping or coating.

.7 Apply floor treatment in accordance with sealer manufacturer's written instructions.

**3.4 INSTALLATION: CONCRETE LOAD-BEARING BLOCK**

.1 Mixing:

.1 In accordance with [CAN/CSA-A3002] [___].

.2 Concrete mix: compressive strength 25 MPa at [28] [56] [___] days, 100 mm slump at time of deposit.

.3 Protection: in accordance with CSA A371, except following requirements supplement Clause 5.15.2.

.1 Maintain temperature of mortar between 5 degrees C and 50 degrees C until used.

.4 Installation: in accordance with CSA A371.

.1 Joints of uniform thickness: tolerances suggested in CSA A371.

.2 Align vertical joints.

.3 Do masonry reinforcing, tying and connecting in accordance with CSA A370 and CSA A371.

.4 Control joints: provide continuous vertical control joints in block partitions to suit design requirements.

.5 Install reinforced block lintels at openings.

.6 Place reinforcing bars in cavities and fill cavity with concrete to suit design requirements.

**3.5 INSTALLATION: FLOOR CONSTRUCTION FIREPROOFING**

.1 Apply bonding adhesive or primer to substrate if recommended by manufacturer.

.2 Apply fireproofing to correspond with tested assemblies, or acceptable calculation procedures to provide following fire resistance ratings.

.3 Apply fireproofing over substrate, building up to required thickness to cover substrate with monolithic blanket of uniform density and texture.

.4 Apply fireproofing directly to open web joists without use of expanded lath.

.1 Tamp smooth, surfaces [visible in finished Work] [___].

.2 Apply curing compound to surface of cementitious fireproofing as required by manufacturer.

.3 Apply sealer to surface of mineral fibre fireproofing as required by manufacturer [in ventilation plenums] [where fireproofing is to be painted] [___].

## 3.6 INSTALLATION: FLOOR CONSTRUCTION FIRESTOPPING AND SMOKE SEAL

.1 Install fire stopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.

.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.

## 3.7 FIELD QUALITY CONTROL

.1 Manufacturer's Services:

.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.

.2 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 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

.2 Verification:

.1 Floors:

.1 Provide proof of live load and deflection requirements specified.

.2 Provide proof of specific measures to mitigate vibration.

.2 Vertical and lateral load resisting elements: provide proof of vertical and lateral design loads.

.3 Structural steel:

.1 Provide proof of design loads for steel joist, including live load and deflection.

.2 Provide calculations for details and connections to resist forces, moments, shears and describe measures to allow for movement.

.4 Steel deck:

.1 Provide calculations for limit states design.

.2 Provide proof of live loads and deflection calculations.

.5 Floor construction fireproofing: provide certification that fireproofing materials and systems provide required and specified floor and structure fire resistence ratings.

.6 Floor construction firestopping and smoke seal.

.1 Provide certification that firestopping and smoke seal materials and systems provide required and specified fire resistence ratings including effective barrier against passage of fire, smoke and gasses.

.2 Provide test data for passage of fire, smoke and gasses, and hose stream.

**END OF SECTION**

## Part 1 General

### 1.1 NARRATIVE

.1 This section includes the requirements for constructing the roof in either cast-in-place concrete, precast concrete planks, structural steel framing steel joists and metal decking, or, wood trusses for use in sloped and/or flat roof design.

.2 Refer to the General Requirements and design in accordance to meet the objectives for the use and maintenance of this facility.

.3 Brackets where shown or left blank are provided to identify specific selections to be determined or used in the design proposal.

### 1.2 SUMMARY

.1 Section Includes:

- .1 The performance and installation criteria for building roof types.
- .2 Concrete:
  - .1 Forms, reinforcement, cast-in-place concrete, and finishing for roof structure.
  - .2 Precast concrete cored planks.
  - .3 Post-tensioned concrete,[two-way or four-way slab.
- .3 Structural Steel:
  - .1 Structural steel framing, anchor bolts, base plates.
  - .2 Structural frame accessories, and shop finishing.
- .4 Structural Steel Joists:
  - .1 Structural steel joists for roof framing.
  - .2 Anchorage, bearing plates, and shop finishing.
- .5 Cold formed metal joist and purlin framing, bracing, fasteners and accessories.
- .6 Structural metal roof decking.
- .7 Wood framing:
  - .1 Structural roof framing.
  - .2 Roof sheathing.
  - .3 Wood blocking and furring.

### 1.3 DESIGN AND PERFORMANCE REQUIREMENTS

.1 Design to current design data and standards for Winnipeg, Manitoba and as per Structural Engineer’s technical specifications.

- .1 Seismic Zone.
- .2 Wind Loads.
- .3 Roof Loads:
- .4 Deflection of Roof:
- .5 Deflection of Supporting Members.
- .6 Maximum Allowable Deflection of Flat or Sloped Decking.

.2 Fire Resistance Rating in accordance with MBC building classification.

.3 Design assembly by a Professional Structural Engineer licensed in the Province of Manitoba, Canada.

**1.4 SYSTEM DESCRIPTION**

.1 Concrete:

.1 Design, engineer, and construct form work, reinforcement, and structural concrete, temporary shoring and bracing to conform to design and code requirements.

.2 Structural Steel:

.1 Design Requirements: CISC Limit States Design.

.3 Structural Steel Joists:

.1 Design Requirements: SJI Load Tables and Weight Tables, joist headers, and other supplementary framing.

.4 [Metal Roof Decking] [Wood Roof Decking].

.1 Design deck layout, spans, fastening, and joints.

.2 Span Design: [multiple] [double] [single].

.3 Calculate structural stress design and maximum vertical deck deflection of [1:240] [1:180] [___].

.4 Design to provide movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to temperature ranges.

.5 Wood Framing:

.1 Design, engineer, and fabricate structural framing, temporary shoring and bracing to conform to design and code requirements.

**1.5 SUBMITTALS**

.1 Submit Shop Drawings, Product Data, WHMIS MSDS, in accordance with submittal procedures outlined in General Requirements.

**1.6 QUALITY ASSURANCE**

.1 Health and Safety:

.1 Do construction occupational health and safety in accordance with Regional and Municipal regulatory Health and Safety Requirements.

**1.7 QUALITY STANDARDS**

.1 Concrete:

.1 Design: CAN/CSA-A23.3.

.2 Formwork and Concrete: CAN/CSA-A23.1/A23.2.

.3 Reinforcement: CRSI Manual of Standard Practice.

.4 Welding Reinforcement: CSA W186.

.2 Structural Steel:

.1 Design: CAN/CSA-S16.1.

.3 Metal Decking:

.1 Steel Deck Institute (SDI) Design Manual for Composite Decks, Form Decks, Roof Decks, Cellular Metal Floor Deck with Electrical Distribution.

.4 Cold Formed Metal Framing: calculate structural properties of framing members to:

.1 CSSBI requirements.

.2 AWCI - Specifications Guide.

.3 MFMA - Guidelines.

.5 Dimension Lumber Framing:

.1 Wood Member Design: CAN/CSA O86.1M - Working Stress.

.2 Lumber Grading Rules: NLGA.

.3 Glue Laminated Design:

.1 AITC 117 (Design).

.2 Manufacturer/Fabricator: certified by AITC.

.4 Plywood Grading Agency: APA.

.6 Wood Lumber Trusses:

.1 Wood Member Design: CAN/CSA O86.1M, limited stress.

.2 Metal Plates in accordance to ANSI/TPI-1.

.3 Lumber Grading Rules: NLGA.

.4 Plywood Grading Agency: APA.

## 1.8 DELIVERY, STORAGE AND HANDLING

.1 Prepare and provide a Waste Management and Disposal Plan for review and acceptance by The City.

# Part 2 Products

## 2.1 CONCRETE

.1 Form Materials:

.1 Sheet Type: [Plywood [Lumber] [Prefabricated steel] ] [Prefabricated glass fibre].

.2 Pan Type: [steel] [fiberglass Reinforced Plastic (FRP)].

.3 Accessories: [Dovetail anchor slots] [Flashing reglets].

.2 Reinforcement Materials:

.1 Reinforcing Steel: ASTM A615/A615M, [deformed] [plain] billet steel bars, [plain] [galvanized] finish.

.2 Welded Steel Wire Fabric: [Deformed] [Plain] type, [plain] [galvanized] finish.

.3 Concrete Materials:

.1 Concrete: CAN/CSA-A23.1/A23.2M.

.2 Cement: CSA A3000, [Normal Type 1] [Sulphate Resistant Type 5] [___], Portland type.

.3 Fine and Coarse Aggregate: ASTM [C33, normal weight] [C330, lightweight].

.4 Accessories:

.1 Curing Compound and Sealer: [Acrylic] [Chlorinated liquid rubber] [___] type, [clear] [translucent].

.5 Concrete Design Mixes:

.1 Mix and deliver concrete to ASTM C94/C94M, Alternative No.[2] [3].

.2 Design Mixes: minimum 28 Day compressive strength:

.1 Roof Framing Members: [___] Mpa, [___] slump.

.2 Self Supporting Slabs: [___] Mpa, [___] slump.

.3 Concrete on Metal Deck: [___] MPa, [___] slump.

**2.2 STRUCTURAL STEEL**

.1 Products:

.1 Structural Steel Members: CAN/CSA-G40.20/G40.21.

.2 Structural Tubing: [ASTM A500, Grade [B] [___]] [ASTM A501].

.3 Pipe: [ASTM A53/A53M, Grade B] [___].

.2 Accessories:

.1 Shear Stud Connectors: ASTM A108, forged steel, headed, unfinished.

.2 Welding Materials: CSA W59.

.3 Fabrication.

.1 Fabricate members to CISC requirements.

.2 Shop Assembly: fabricate to the degree necessary to accomplish effective site erection without cutting or modification to framing members.

.3 Shop/Factory Finishing: [shop primed] [unprimed].

**2.3 STRUCTURAL STEEL JOISTS**

.1 Products:

.1 Open Web Joists Members: SJI Type [K Open Web] [Longspan LH] [Deep Longspan DLH][Joist Girders].

.2 Anchor Bolts, Nuts and Washers: ASTM A325 [galvanized].

.3 Structural Steel For Supplementary Framing and Joist Leg Extensions: CAN/CSA-G40.20/G40.21.

.4 Shear Stud Connectors : ASTM A108, forged steel, headed, unfinished.

.2 Fabrication:

.1 Fabricate to achieve end bearing of:

.1 [62] mm on steel.

.2 [100] mm on masonry.

.2 Provide [bottom] [and] [top] chord extensions.

.3 [Frame special sized openings in joist web framing to suit air ducts].

.4 Space stud shear connectors at [___] mm on centre.

.5 Shop/Factory Finishing: [shop primed] [unprimed].

**2.4 COLD FORMED METAL FRAMING**

.1 Joists and Purlins: sheet steel, [channel] [hat] [open box] shape, [solid] [opened] web, [__] mm wide.

.2 Accessories:

.1 Plates, Gussets, Clips: sheet steel, thickness determined for conditions encountered.

.2 Fasteners: self-drilling, self-tapping screws, bolts, nuts and washers, galvanized.

.3 Welding: CSA W59.

.3 Fabrication:

.1 Shop Assembly: fit and assemble in sections ready for site installation.

.2 Shop/Factory Finishing: [primed].

**2.5 METAL DECKING**

.1 Product:

.1 [Sheet Steel] [Acoustic (Perforated) Steel] [Composite Steel] [Cellular]: [CSSBI] [ASTM A653/A653M], Structural Quality, galvanized, [precoated with [silicone] [___] coloured coating] [___].

.2 Bearing Plates and Angles: CAN/CSA G40.20/G40.21 steel, [galvanized] [unfinished].

.3 Welding Materials: CSA W59.

.2 Accessories.

.1 Deck Accessories: metal closure strips, [wet concrete stops] [cant strips] [cover plates], [and] [sump pans] [sump plates].

.2 Flute Closures: closed cell foam rubber.

.3 Fabrication:

.1 Flute Profile: to Steel Deck Institute (SDI) [NR] [IR] [WR].

.2 Nominal Height: [38] [___] mm.

.3 Side joints: [lapped] [lock seam] [___].

.4 Flute sides: [plain vertical face] [diagonally ribbed for improved concrete bond].

.5 Shop/Factory Finishing: [galvanized] [shop pre-coated] [prime painted].

## 2.6 WOOD FRAMING AND SHEATHING

.1 Dimension Lumber Framing:

.1 [Beam] [Joist] [and] [Rafter] Framing: select structural [No. 1] [No. 2] [No. 3] grade.

.2 Non-structural Light Framing: [stud] [no. 2].

.3 Species: [Spruce/Pine/Fir].

.4 Exposed framing: appearance grade.

.5 Wood Treatment: [AWPA C1] [AWPA C2] [AWPA C9] [AWPA C20] [AWPA C27] [AWPA C28].

.2 Wood Trusses:

.1 Lumber : softwood lumber of fabricators choice to suit grading rules and load requirements.

.2 [Plywood] [Particleboard] Connectors: graded by APA.

.3 Steel Connectors: die stamped with integral teeth, galvanized.

.4 Truss Bridging: type, size and spacing recommended by truss manufacturer.

.5 Accessories:

.1 Wood Blocking and Plate Members: softwood lumber, [S/P/F] [___] species, [construction] [___] grade.

.2 Fasteners and Anchors: [hot dipped galvanized] [electro-galvanized] steel.

.3 Bearing Plates: [hot dipped galvanized] [electro-galvanized] steel.

.6 Fabrication:

.1 Fabricate trusses to achieve structural requirements.

.2 Provide [bottom] [and] [top] chord extensions.

.3 Brace wood trusses for support during transit.

.4 Fabricate to achieve minimum end bearing on supports.

.7 Treatment.:

.1 Fire Retardant Treatment: AWPA C20, [Exterior] [Interior] Type.

.2 Wood Preservative Treatment: [pressure treatment, AWPA C1] [surface application, [clear] [coloured] ].

.3 Glue Laminated Lumber:

.1 [Softwood] [Lumber of fabricators choice to suit grading rules and load requirements].

.2 Accessories:

.1 Steel Connections and Brackets: CAN/CSA-G40.20/G40.21, [galvanized] [prime painted].

.2 Fasteners: steel, [unfinished] [galvanized].

.3 Adhesive: AITC for [wet] and low temperature [winterizing] condition of service.

.3 Fabrication:

.1 Fabricate structural members to AITC [Premium] grade.

.2 Fabricate member with camber built in.

.3 Fabricate steel hardware and connections with joints neatly fitted, welded, and ground smooth.

.4 Treatment:

.1 Wood Treatment: AWPA C20/C28 including fire retardancy.

.5 Shop/Factory Finishing:

.1 After trimming, seal with compatible [penetrating sealer] [sealer coat to AITC requirements].

.2 Do not seal.

.4 Roof Sheathing:

.1 Plywood Sheathing: [CSA O151.1] [APA [Rated Sheathing] [Structural I] [Structural II], Exposure [1] [2] ].

.2 Particleboard Sheathing: [APA Waferboard] [APA Oriented Strand Board] [APA Structural Particleboard].

.5 Accessories:

.1 Building Paper: [no. 15 asphalt felt] [spun bonded polyethylene].

## Part 3 Execution

### 3.1 INSTALLATION - GENERAL

.1 Ensure roof assemblies are installed in an independent manner which will minimize damage to adjacent installations during repair, removal or disassembly.

.2 Leave connections exposed or accessible.

.3 Attach materials to facilitate future disassembly, deconstruction, reuse and recycling.

.4 Isolate materials from adjacent materials to minimize contamination and to facilitate future disassembly, deconstruction, reuse and recycling.

### 3.2 CONCRETE

.1 Cure concrete and finish surfaces.

.2 Concrete Finish Under Roof Assembly: [wood floated] [steel trowelled].

### 3.3 STRUCTURAL STEEL

.1 Allow for erection loads and temporary bracing to maintain structure safe, plumb, and true alignment.

.2 Complete erection and installation of permanent bracing.

.3 Field weld components.

.4 Field connect members with threaded fasteners.

.5 After erection, prime welds, abrasions, and surfaces not protected.

.6 Grout under base plates.

**3.4 STRUCTURAL STEEL JOISTS**

.1 Erect and bear joists on supports.

.2 Allow for erection loads, provide temporary bracing.

.3 Field weld joist seat to steel bearing surface.

.4 Frame horizontal roof openings greater than 450 mm with supplementary framing.

.5 Do not alter structural members without approval.

.6 Prime welds and surfaces not shop primed.

**3.5 COLD FORMED STEEL JOISTS AND PURLINS**

.1 Space at [300] [400] [600] mm on centre, connect to supports.

.2 Provide web stiffeners at reaction points.

.3 Set members parallel and [level] [sloped] with lateral bracing and bridging.

.4 Locate joist end bearing directly over load distributing member.

**3.6 WOOD FRAMING AND SHEATHING**

.1 Erection - Framing:

.1 Erect framing members to applicable code, level and plumb.

.2 Frame double joist headers at roof openings; rigidly into joists.

.3 Bridge framing in excess of [2.3] m span.

.2 Erection - Trusses:

.1 Install trusses to manufacturer's instructions.

.2 Set members level and plumb, in correct position.

.3 Provide for erection loads with sufficient temporary bracing to maintain structure plumb and in true alignment.

.4 Do not field cut or alter structural members.

.5 Place headers and supports to frame openings.

.6 Frame openings between trusses with lumber.

.7 Apply preservative treatment to wood in contact with cementitious materials, roofing, and related metal flashings.

.3 Erection - Glue Laminated Members:

.1 Set members [level] [sloped] and plumb, in correct positions.

.2 Provide temporary bracing and anchors to hold members in place.

.3 Fit members accurately without trimming or cutting.

.4 Swab and seal interior surfaces of field drilled holes in members, with primer.

.4 Erection - Sheathing:

.1 Install sheathing with long edge perpendicular to framing with end joints staggered. Secure sheet edges over firm bearing.

.2 Secure sheathing with [ringed nails].

.3 Install sheathing to [simple span

.4 Use sheathing clips between sheets between roof framing members. [Provide solid edge blocking between sheets].

.5 Place building paper over roof sheathing.

**3.7 QUALITY CONTROL**

.1 Field Inspection: required.

**END OF SECTION**

## Part 1 General

### 1.1 NARRATIVE

.1 This section includes the requirements for the construction of the exterior wall assemblies.

.2 Refer to the General Requirements and design in accordance to meet the objectives for the use and maintenance of this facility.

.3 Brackets where shown or left blank are provided to identify specific selections to be determined or used in the design proposal.

### 1.2 SUMMARY

.1 Section Includes:

.1 Materials, components, installation and performance requirements of exterior wall systems.

.2 Exterior Wall Exterior Skin:

.1 Exterior Wall Construction.

.2 Exterior Wall Vapour Retarders, Air Barriers, and Insulation.

.3 Exterior Wall Interior Skin.

.4 Exterior Wall Assemblies.

.5 Exterior Louvers, Grilles, and Screens.

### 1.3 DESIGN PERFORMANCE REQUIREMENTS

.1 Provide continuous, complementary and compatible air/vapour/thermal barriers throughout building elements.

.2 Provide complete enclosure assembly, including exterior skin, inner air/vapour seal membrane, thermal insulation.

.1 Design components sufficiently robust to serve as final interior finish.

.3 Design wall components and assemblies to resist air leakage caused by static air pressure across wall assembly, including connections to windows, glass, doors and other interruptions to maximum air leakage rate of: 0.01 L/s/$m^2$ when subjected to a pressure differential of 75Pa.

.4 Design wall components and assemblies to resist air leakage caused by dynamic air pressure across wall assembly, including connections to windows, glass, doors and other interruptions to maximum air leakage rate of 0.01 L/s/$m^2$ when subjected to hourly wind design loads in accordance with NBC, using 1 in 10 year probability.

.5 Provide continuity of air seal materials and assemblies.

.6 Design wall to provide for thermal movement of component materials caused by ambient temperature range from [-30 to 80] degrees C without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.

.7 Include expansion joints to accommodate movement in wall system and between wall system and building structure, caused by structural movements, without permanent distortion, damage to infills, racking of joints, breakage of seals, or water penetration.

.8 Design members to withstand dead load and wind loads calculated in accordance with NBC and applicable local regulations, to maximum allowable deflection of 1/180 of span.

.9 Water Tightness: design exterior facade and wall panels to rain screen principles as published by National Research Council. Prevent water infiltration into interior systems.

.10 Provide for positive drainage of condensation occurring within wall construction and water entering at joints, to exterior face of wall in accordance with "Rain Screen Principles" as described by NRC/IRC. Discharge drainage water to avoid staining of finishes, puddling or formation of icicles.

.11 Ensure total absence of condensation on interior surfaces under the following minimum conditions:

.1 Interior: 22 degrees C, 30% RH, still air.

.2 Exterior: -30 degrees C, 60 km/hr wind.

.12 Vapour seal building enclosure to withstand, without failure, design RH at design ambient temperature condition, maintained against interior atmospheric pressure of 250 Pa.

.13 Provide minimum thermal resistance of RSI [3.5].

.14 Permeance through wall system not to exceed [3] ng/(Pa.s.$m^2$).

.15 Preformed metal cladding:

.1 Design system to accommodate specified erection tolerances of structure.

.2 Design system to permit easy replacement of components.

.16 Masonry:

.1 Design masonry walls in accordance with CSA A371.

.2 Design masonry walls as double wythe insulated cavity wall.

.1 Exterior wythe: 100 mm brick and/or 100mm concrete block.

.2 Interior wythe: 200 concrete block.

.3 Design masonry walls for maximum deflection of 1/720 under design wind loads.

.17 Sealants:

.1 Select sealant to suit particular conditions of job, with careful adherence to manufacturer's instructions for application.

.2 Do not use sealant to hide or make up for design or construction errors or faults.

.3 Provide sealant colour to match adjacent surfaces. Provide sealant resistant to ultra-violet degradation or fading.

## 1.4 SUBMITTALS

.1 Make submittals in accordance with Procedures in General Requirements.

.2 Submit Shop Drawings, Product Data and WHMIS MSDS.

.3 Provide detailed, technical information which describes products such as is published by manufacturer and/or supplier.

.4 Shop Drawings:

.1 Submit shop drawings to indicate project layout, including details.

.2 Submit exterior walls elevations for special grid patterns.

.5 Samples:

.1 Submit samples of each selection, of available, optional forms, patterns, textures and/or colours from range offered by manufacturer/supplier, and will, when reviewed and accepted, form basis of quality of Work.

.2 One sample will be returned, marked to indicate acceptance.

.6 Closeout Submittals: submit maintenance data and O&M.s

**1.5 QUALITY ASSURANCE**

.1 Construct mock-ups for Quality Control. One in-place mock-up of wall construction assembled to full scale at 1200 x 1200 mm size.

.2 Site Meetings: as part of Manufacturer's Services, schedule site visits, to review Work, at stages listed.

.1 After delivery and storage of products, and when preparatory Work 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.

.3 Health and Safety:

.1 Do construction occupational health and safety in accordance Health and Safety Requirements.

.4 Waste Management and Disposal:

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

**1.6 WARRANTY**

.1 For materials 12 month warranty period

.2 Project Warranty: refer to City of Winnipeg Specifications for project warranty provisions.

.3 Contractor warrants in accordance with General Conditions (GC) - that entire building enclosure will be water and weathertight, structurally sound and free from distortion; exterior finish will not craze, peel or otherwise corrode, or discolour; exterior cladding will not develop excessive fading or non-uniformity of colour and will be free from blemishes, or distortion due to thermal movement of wall or normal movements of building structure; gaskets, tape and sealant will be free from deterioration from sunlight, weather or oxidation and from permanent deformation and free of leaks under load; for period of 10 years from date of final date of Substantial Performance.

**Part 2 Products**

**2.1 MATERIALS**

.1 Preformed Metal Cladding:

.1 Metal panels exposed to exterior: sheet steel, commercial grade to ASTM A653/A653M with zinc coating, factory finished both sides conforming to test procedures of CSSBI.

.2 Profile:.

.3 Exterior corners: of same profile, material and finish as adjacent siding material.

.4 Exposed joint (perpendicular to profile): ends shop cut clean and square, backed with tight fitting filler lapping back of joint, exposed components colour matched to siding.

.5 Accessories: cap flashings, drip flashings, internal corner flashings, copings and closures for head, jamb, sill and corners, of same material, thickness and finish as exterior siding, brake formed to shape.

.2 Structural Metal Framing Sub-girts: commercial grade to ASTM A653/A653M with zinc coating, to accept liner and exterior sheet with structural attachment to building frame.

.3 Non-Structural Metal Framing:

.1 Non-loadbearing channel stud framing to ASTM C645: roll formed hot dipped galvanized steel sheet, complete with knock-out service holes.

.2 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes.

.4 Structural Steel Stud Framing:

.1 Loadbearing channel stud framing: to ASTM A653/A653M, galvanized steel studs.

.2 Floor and ceiling tracks: to ASTM A653/A653M. Profile and section properties to conform to: CSA S136. Minimum grade A. FY = 33 ksi.

.3 All section properties to be computed on the basis of metal thickness shown.

.4 Bridging channels, clips, etc: to CSA S136 and ASTM A653/A653M.

.5 Non-loadbearing truss stud framing system:

.1 Studs: truss-type bent rod web, welded construction, with cold drawn steel wire rods having tensile strength of 620 MPA. Design studs for clip attachment of gypsum lath or wire tying of metal lath.

.2 Floor track: snap-in type formed to hold studs securely in place, fabricated from steel sheet. Size to suit studs.

.3 Ceiling track: channel shaped track for use with stud shoes. Size to suit studs.

.4 After fabrication, apply one shop coat of [CAN/CGSB-1.40] [MPI #23] [___]primer to steel surfaces. Clean surfaces before painting.

.5 Metal channel stiffener: cold rolled steel, coated with rust inhibitive coating.

.6 Accessories:

.1 Screws: to CSA A370, head colour same as exterior sheet.

.2 Powder actuated fasteners: galvanized, peened ballistic point, plastic cap of same colour as exterior sheet.

.3 Gaskets: purpose made, manufacturer's standard.

.4 Touch-up paint: as recommended by panel manufacturer.

.5 Isolation coating: alkali resistant epoxy resin.

.6 Acoustical sealant: to [Section 07 92 00 - Joint Sealing] [___].

.7 Insulating strip: rubberized, moisture resistant, with self sticking adhesive on one face.

.7 Masonry:

.1 Mortar and grout for masonry to CSA A179.

.2 Use same brands of materials and source of aggregate for entire project.

.3 Colour: ground coloured natural aggregates or metallic oxide pigments.

.4 Mortar for masonry.

.1 Loadbearing: type N or S based on Property or Proportion specifications to suit application.

.2 Non-Loadbearing: type N or S based on Property or Proportion specifications to suit application.

.5 Following applies regardless of mortar types and uses specified above.

.1 Mortar for grouted reinforced masonry: type S or M based on Property or Proportion specifications to suit application.

.2 Mortar for pointing: type designed to suit application based on Proportion specifications.

.3 Mortar for glass block: 1 part Portland cement, 1 part hydrated lime, 4 parts aggregate by volume.

.4 White mortar: use to produce mortar type specified.

.5 Coloured mortar: use colouring admixture not exceeding 10% of cement content by mass, or integrally coloured masonry cement, to produce coloured mortar to match approved sample.

.6 Parging mortar: type to suit application to CSA A179.

.7 Bar reinforcement: to CSA A371 and CSA G30.18, grade to suit application.

.8 Wire reinforcement: to CSA A371 and ASTM A82, ladder or truss type.

.9 Connectors: to CSA A370 and CSA S304.1.

.10 Corrosion protection: to CSA S304.1, galvanized.

.11 Standard concrete block masonry units: to CSA A165.1. Size: modular.

.12 Special shapes: provide square and bull-nosed units for exposed corners. Provide purpose-made shapes for lintels and bond beams. Provide additional special shapes as required.

.13 Prefaced concrete masonry units: to CSA A165.3.

.14 Acoustical concrete block units: to CSA A165 Series purpose made with slots to provide acoustical characteristics specified. Size: modular.

.15 Special fire resistant concrete block units: to CSA A165. Size: modular. Aggregate used in units and equivalent thickness of units to Supplement to the National Building Code of Canada, Chapter 2 for fire-resistance ratings indicated.

.16 Burned clay brick: to CAN/CSA-A82.1, Grade: SW.

.17 Calcium silicate brick: to [CSA A82.3] [ASTM C73] [___], Grade: SW.

.18 Concrete brick masonry unit: to CSA A165.2, Type: I.

.8 Gypsum Board:

.1 Exterior sheathing: to [ASTM C79/C79M] [ASTM C1177/C1177M] [___].

.2 Metal furring runners, hangers, tie wires, inserts, anchors: to [___], galvanized.

.3 Water resistant board: to ASTM C630/C630M.

.4 Metal furring runners, hangers, tie wires, inserts, anchors: to [___] galvanized.

.5 Gypsum board furring channels: galvanized steel.

.6 Steel drills screws to: ASTM C1002.

.7 Casing beads, corner beads: commercial grade sheet steel with zinc finish to ASTM A653/A653M, perforated flanges. One piece length per location.

.8 Acoustic sealant: to [___].

.9 Polyethylene: to CAN/CGSB-51.34, Type 2.

.10 Insulating strip: rubberized, moisture resistant, with self sticking permanent adhesive on one face, lengths as required.

.11 Joint compound: to ASTM C475/C475M, asbestos-free.

.12 Texture finish: asbestos-free, standard white texture coating and primer-sealer, recommended by gypsum board manufacturer.

.9 Metal Liner Panel:

.1 Liner sheet: commercial quality to ASTM A653/A653M with zinc coating, prefinished. Conforming to film test procedures of CSSBI.

.10 Air and Vapour Barriers:

.1 Wall components and assemblies to resist air leakage caused by static air pressure across exterior wall assembly, to maximum air leakage rate of [___] $L/s.m^2$ when subjected to pressure differential of [75] [___] Pa as measured in accordance with [ASTM E73] [ASTM E330].

.2 Wall components and assemblies to resist air leakage caused by dynamic air pressure across exterior wall assembly, to maximum air leakage rate of [___] $L/s.m^2$ when subjected to hourly wind design loads in accordance with NBC, using 1 in 10 year probability, as measured in accordance with [ASTM E783] [ASTM E330].

.11 Insulation:

.1 Compressive strength, thickness and design RSI value to suit wall assembly application.

.2 RSI value: 3.5.

.3 Insulation adhesive: purpose made, designed to adhere insulation to selected substrate, compatible with insulation type.

.4 Insulation clips:

.1 Impale type as recommended by insulation manufacturer for each application.

.12 Sealants:

.1 Colour selected by Consulant from standard available colour range.

.2 To meet expansion, cohesion, adhesion and weather requirements of joint.

.3 Typical joint applications include:

.1 Between window frames and masonry.

.2 Between door frames and walls.

.3 Perimeter joints, window frames, preformed metal siding components.

.4 Primers: type recommended by sealant manufacturer.

.5 Joint fillers:

.1 General: compatible with primers and sealants, outsized 30 to 50%.

.6 Bond breaker: pressure sensitive plastic tape, which will not bond to sealants.

.13 Fireproofing:

.1 Sprayed fireproofing: ULC, UL, WH and NRC/IRC certified fireproofing qualified for use in ULC, UL, WH and NRC/IRC Designs.

.2 Curing compound: type recommended by fireproofing manufacturer, qualified for use in ULC, UL, WH and NRC/IRC Designs.

.3 Sealer: type recommended by fireproofing manufacturer, qualified for use in ULC, UL, WH and NRC/IRC Design.

.14 Firestopping and Smoke Seals:

.1 Fire stopping and smoke seal systems: in accordance with ULC-S115. Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of ULC-S115 and not to exceed opening sizes for which they are intended and conforming to special requirements specified in ULC, UL, WH and NRC/IRC.

.2 Service penetration assemblies: certified by ULC, UL, WH and NRC/IRC in accordance with ULC-S115.

.3 Service penetration firestop components: certified by ULC, UL, WH and NRC/IRC in accordance with ULC-S115.

.4 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

.5 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.

.6 Sealants for vertical joints: non-sagging.

.15 Metal Flashings and Trim:

.1 Prefinished metal flashings to suit application, protect components being flashed, and prevent intrusion of water

.2 Finish: factory applied coating, colour selected by Contract Administrator.

.3 Plastic cement: to CAN/CGSB-37.5.

.4 Underlay for flashing: to suit application.

.5 Cleats: of same material and temper as sheet metal, wide as required.

.6 Thickness: same as sheet metal being secured.

.7 Fasteners: of same material as sheet metal. Length and thickness suitable for application.

.8 Washers: of same material as sheet metal.

.9 Touch-up paint: as recommended by metal flashing manufacturer.

.16 Exterior Louvres:

.1 Prefinished metal louvers, sized to suit openings, and projects air flow design requirements.

.2 Fasteners: same material as fabricated items.

.3 Insect screens: with 60% free area, secured to frame.

.4 Birdscreens: aluminum wire cloth secured to extruded aluminum frame.

.5 Extruded aluminum louvres:

.1 Louvres constructed from aluminum extrusions.

.2 Blades, mullions and frame extrusions arranged as indicated.

.3 Concealed vertical stiffeners installed and spaced to meet required loads.

.4 Bird and insect screen attached to louver face as required.

.6 Adjustable louvres:

.1 Manually adjustable louvres constructed from aluminum extrusions.

.2 Blades, mullions and frame extrusions with centre pivot stormproof type blades arranged to suit design requirements.

.17 Rough Carpentry:

.1 Lumber: [certified,], S4S, moisture content 19% or less in accordance with : [CAN/CSA-O141] , Standard Grading Rules [NLGA].

.2 Glued end-jointed (finger-jointed) lumber is not acceptable.

.3 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers: S2S. Board sizes: "Standard" or better grade. Dimension sizes: "Standard" light framing or better grade.

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

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

.6 Nails, spikes and staples: to CSA B111.

.7 Bolts: complete with nuts and washers.

.8 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.

.9 Surface-applied wood preservative: clear copper napthenate or 5% pentachlorophenol solution, water repellent preservative.

.10 Provide pressure treated materials for the following applications:

.1 Wood cants, fascia backing, curbs, nailers, sleepers on roof deck.

.2 Wood furring on outside surface of exterior walls.

.11 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding and other work as required.

.12 Provide backboards for mounting electrical equipment. Use 19 mm thick DFP. Install on 19 x 38 mm furring around perimeter and at maximum 300 mm intermediate spacing. Treat electrical equipment back boards with fire retardant paint.

## Part 3 Execution

### 3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalog installation instructions, product carton installation instructions, and datasheet.

### 3.2 INSTALLATION

.1 Maintain following installation tolerances:

.1 Maximum variation from plane or location shown on shop drawings: [10] mm per 10 m of length and up to [20] mm per 100 m.

.2 Maximum offset from true alignment between two adjacent members abutting end to end, in line: 0.75 mm.

.2 Preformed metal cladding:

.1 Accurately fit and rigidly frame together joints, corners and mitres.

.2 Match components carefully to produce perfect continuity of line and design.

.3 Make joints and connections toward exterior weathertight.

.4 Materials in contact to have hairline joints.

.5 Co-ordinate location of visible joints.

.3 Structural metal framing:

.4 Structural steel stud framing:

.1 Erect structural steel stud framing in accordance with engineered shop drawings.

.2 Erect metal studding to tolerance of 1:1000.

.3 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs.

.4 Install continuous insulating strips to isolate studs from uninsulated surfaces.

.5 Masonry:

.1 Do masonry Work in accordance with CSA A371.

.2 Strike flush joints concealed in walls and joints in walls to receive plaster, tile, insulation, or other applied material except paint or similar thin finish coating.

.3 Cut out for electrical switches, outlet boxes, and other recessed or built-in objects.

.4 Build in items required to be built into masonry.

.5 Brace door jambs to maintain plumb; fill spaces between jambs and masonry with mortar.

.6 Use grout to CSA A179 where grout is used in lieu of solid units.

.7 Construct continuous control joints as required.

.8 Build-in continuous expansion joints as required.

.9 Do masonry mortar and grout Work in accordance with CSA A179 except where specified otherwise.

.10 Do masonry reinforcement in accordance with [CSA A370] [CSA A371] [CSA A23.1] and [CAN3-S304.1].

.6 Gypsum Board:

.1 Install Gypsum Board in accordance with ASTM C1002 except as noted otherwise.

.2 Install Work level to tolerance of 1:1200.

.3 Construct and locate control joints where required set in gypsum board facing and supported independently on both sides of joint.

.4 Construct expansion joints, at building expansion and construction joints; provide continuous dust barrier.

.5 Rigidly secure frames to furring or framing systems

.6 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

.7 Air Barriers and Vapour Retarders:

.1 Vapour Retarders:

.1 Ensure services are installed and inspected prior to installation of retarder.

.2 Air barriers:

.1 Provide continuity of air seal materials and assemblies; install materials in accordance with manufacturers' instructions to achieve performance criteria.

.8 Insulation:

.1 Install insulation after building substrate materials are dry.

.2 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.3 Do not enclose insulation until it has been inspected by Contract Administrator.

.9 Sealant:

.1 Install backer rod to provide joint design of 1/3 depth to width ratio.

.2 Tool sealant to smooth concave finish.

.10 Fireproofing:

.1 Apply bonding adhesive or primer to substrate if recommended by manufacturer.

.2 Apply fireproofing to correspond with tested assemblies, or acceptable calculation procedures to provide required fire resistance ratings.

.3 Apply fireproofing over substrate, building up to required thickness to cover substrate with monolithic blanket of uniform density and texture.

.4 Apply curing compound to surface of cementitious fireproofing as required by manufacturer.

.5 Apply sealer to surface of mineral fibre fireproofing as required by manufacturer.

.11 Firestopping and Smoke Seals:

.1 Verify fire-resistance rating of installed fire stopping assembly not less than fire-resistance rating of surrounding wall assembly.

.2 Use elastomeric seal for fire stopping and smoke seals at openings intended for ease of re-entry such as cables do not use cementitious or rigid seal at such locations.

.3 Use elastomeric seal for fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control; do not use cementitious or rigid seal at such locations.

.4 Install firestopping and smoke seal at:

.1 Penetrations through fire resistance rated partitions and walls.

.2 Edge of floor slabs at curtain wall and precast concrete panels.

.3 Top of fire-resistance rated masonry and gypsum board partitions.

.4 Intersection of fire-resistance rated masonry and gypsum board partitions.

.5 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.

.6 Openings and sleeves installed for future use through fire separations.

.7 Around mechanical and electrical assemblies penetrating fire separations.

.8 Rigid ducts: greater than 129 $cm^2$: 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.

## 3.3 FIELD QUALITY CONTROL

.1 Manufacturer's Services:

.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit manufacturer's Field Reports as described in PART 1 - SUBMITTALS.

.2 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 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

.2 Verification:

.1 Verification requirements in accordance with Section [01 47 17 - Sustainable Requirements: Contractor's Verification] [___], include:

.1 Materials and resources.

.2 Storage and collection of recyclables.

.3 Construction waste management.

.4 Local/regional materials.

.5 Certified wood.

.6 Low-emitting materials.

.2 Exterior metal studs: Contract Administrator will review final installation of exterior steel studs prior to commencement with other Work. Correct noted deficiencies prior to continuing with wall assembly.

**END OF SECTION**

## Part 1 General

### 1.1 NARRATIVE

.1 This section includes the requirements for the selection, design, construction and installation of the exterior windows.

.2 Refer to the General Requirements and design in accordance to meet the objectives for the use and maintenance of this facility.

.3 Brackets where shown or left blank are provided to identify specific selections to be determined or used in the design proposal.

### 1.2 SUMMARY

.1 Section Includes:

.1 Performance and installation criteria: aluminum windows.

### 1.3 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-12.20-[M89], Structural Design of Glass for Buildings.

.2 Canadian Standards Association (CSA International)

.1 CAN/CSA A440/A440.1-[00], Windows/User Selection Guide to CSA Standard A440/A440.1[00].

.2 CSA A440.4-[98], Window and Door Installation.

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

.3 National Building Code of Canada (NBC)

### 1.4 SYSTEM DESCRIPTION

.1 Provide thermally broken, aluminum window assemblies consisting of but not limited to the following:

.1 Sliding: horizontal double operating.

.2 Fixed.

.3 Glazing: removable double glazing insulating glass tempered Low-E coating with storms.

.4 Screens: on ventilating portion of windows

.5 Hardware: locks spring loading keyed equipped to permit pole opening under screen stay bar assembly.

.6 Finish: anodized. Finish to last a minimum of 10 years without loss of colour, gloss, or deterioration in appearance.

.7 Colour: clear aluminum or as selected by Contract Administrator.

### 1.5 DESIGN REQUIREMENTS

.1 Design, fabricate and install window assembly in accordance with CAN/CSA A440.

.2 Design window assembly in accordance with following Climatic Design Data for Winnipeg Manitoba, contained in the National Building Code.

.3 Design window system to accommodate following without detrimental effect.

.1 Cyclic 40 degrees C daily, thermal swing of components.

.2 Cyclic, dynamic loading and release of loads such as wind loads.

.3 Relative humidity of : 27-50%.

.4 13 mm vertical deflection in the supporting structure and movement of supporting structure due to live, dead load, and creep or deflection, seismic load, sway displacement and similar items.

.4 Design window assembly in accordance with following minimum CAN/CSA A440 classification ratings: [BASED ON SELECTION OF WINDOW]

.1 Air Tightness: [A1] [A2] [A3] [fixed].

.2 Water Tightness: [B1] [B2] [B3] [B4] [B5] [B6] [B7].

.3 Wind Load Resistance: [C1] [C2] [C3] [C4] [C5].

.4 Screen: [S1] [S2].

.5 Glazing: [G1] [G2].

.6 Condensation Resistance: temperature index, I .

.7 Resistance to Forced Entry: [F1] [F2].

.5 Select glass thickness to CAN/CGSB-12.20. Perform stress analysis. Design units to accommodate live, dead, lateral, wind, seismic, handling, transportation, and erection loads.

.6 Design and detail controlled drainage path to discharge water, which enters into, or forms within windows assembly, to exterior. Prevent accumulation or storage of water within window assembly.

.7 Design and detail air/vapour retarder and rain screen products and assemblies into continuous and integrated window envelope. Optimize windows design to align envelope layers, to minimize thermal bridges, and to provide required air and vapour diffusion control throughout exterior envelope assembly.

.8 Design anchorage inserts for installation as part of other Sections of the Work. Design anchorage assemblies to accommodate construction and installation tolerances.

## 1.6 SUBMITTALS

.1 Submit Shop Drawings, Samples, Product Data, WHMIS MSDS as per Procedures in General Requirements.

.2 Submit certification from window manufacturer that window system conforms to design requirements specified herein.

## 1.7 QUALITY ASSURANCE

.1 Health and Safety:

.1 Do construction occupational health and safety in accordance with Health and Safety Requirements.

## 1.8 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store, and handle windows in accordance with CSA A440.4, Appendix A.

## 1.9 MAINTENANCE DATA

.1 Provide operation and maintenance data for windows for incorporation into operation and maintenance manual.

## Part 2 Products

### 2.1 MATERIALS

.1 Sustainable Requirements:

.1 Products in accordance with CAN/CSA A440 and this Section will be acceptable if construction details and installation meet intent of Drawings and Specifications.

.2 Include all materials, products, accessories, and supplementary parts necessary to complete assembly and installation of Work of this Section.

.3 Incorporate only new materials.

.4 Isolation coating: alkali resistant bituminous paint.

.5 Joint sealers: in accordance with Section 07 92 00 - Joint Sealing.

### 2.2 FABRICATION

.1 Fabricate sections free from defects impairing appearance, strength and durability.

## Part 3 Execution

### 3.1 INSTALLATION

.1 Install in accordance with CSA-A440.4, reviewed shop drawings, and manufacturer's installation instruction.

.2 Install windows securely, in correct location, level, square, plumb, at proper elevations, free of warp or twist.

.3 Fill voids between window framing and adjacent construction with foam insulation to provide air seal around window frame.

**END OF SECTION**

## Part 1 General

### 1.1 NARRATIVE

.1 This section includes the requirements for the provision of exterior doors and hardware..

.2 Refer to the General Requirements and design in accordance to meet the objectives for the use and maintenance of this facility.

.3 Brackets where shown or left blank are provided to identify specific selections to be determined or used in the design proposal.

.4 Hardware:

.1 In addition to the requirements of the Door Hardware, provide exit doors with necessary panic hardware, door closers, and exit signage.

.5 Provide Security Gates with Hardware in accordance with Miscellaneous Specialties.

### 1.2 SUMMARY

.1 Section Includes:

.1 Materials, installation, and performance design requirements of Exterior Entrance Doors, Exterior Utility Doors and Large Exterior Special Doors.

.2 Exterior Entrance Doors and Utility doors:

.1 Steel insulated exterior doors and pressed steel frames.

.2 Operation.

.3 Hardware.

.4 Glazing.

.5 Joint sealants.

.3 Large Exterior Special Doors:

.1 Steel overhead doors.

.2 Operators.

.3 Hardware.

.4 Glazing.

.5 Joint Sealants.

### 1.3 DESIGN PERFORMANCE REQUIREMENTS

.1 Exterior Entrance Doors: Design frames and doors in exterior walls to:

.1 Accommodate expansion and contraction within service temperature range of -35 to 35 degrees C.

.2 Limit deflection of mullions to maximum 1/175th of clear span when tested to ASTM E330 under wind load of 1.2 kpa.

.3 Allow for deflection of structure to ensure that structural loads are not transmitted to frames.

.2 Exterior Utility Doors:

.1 Design exterior frame assembly to accommodate expansion and contraction when subjected to minimum and maximum surface temperature of -35 to 35 degrees C.

.2 Maximum deflection for exterior steel entrance screens under windload of 1.2 kPa not to exceed 1/175th of span.

.3 Large Exterior Special Doors:

.1 Design exterior door assembly to withstand windload of 1 kPa (20 psf) with a maximum horizontal deflection of 1/240 of opening width.

.2 Design door panel assemblies with thermal insulation factor 1.9 RSI.

.3 Design door assembly to withstand minimum 20,000 cycles per annum..

.4 Door speed: 300 mm per second.

## 1.4 SUBMITTALS

.1 Submit shop drawings, product data and WHMIS MSDS.

.1 Indicate type of door and frame, extrusion profiles, material, method of assembly, hardware arrangement, reinforcement and required clearances, locations of exposed fasteners, openings, [glazed] [louvred,] [fire rating,] operating mechanisms [and electrical connections,] finishes and location of manufacturer's nameplates.

.2 Submit catalogue details for type of doors and frames illustrating profiles, dimensions and methods of assembly.

.3 Include schedule identifying units, with door marks and numbers relating to numbering on drawings and door schedule.

.2 Hardware list: submit contract hardware list and indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.

.3 Quality assurance submittals:

.1 Test reports: submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.

.2 Certificates: submit certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical properties.

.3 Instructions: submit manufacturer's installation instructions.

.4 Closeout Submittals: submit maintenance data for incorporation into operations and maintenance manual.

.1 Provide operation and maintenance data for door closers, locksets, door holders and fire exit hardware.

.2 Supply two sets of wrenches for door closers locksets and fire exit hardware.

.3 Provide maintenance data for cleaning and maintenance of aluminum finishes.

.4 Provide operation and maintenance data for overhead door hardware and components.

## 1.5 DELIVERY, STORAGE AND HANDLING

.1 Waste Management and Disposal:

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

## 1.6 WARRANTY

.1 Warranty: Manufacturer’s limited door and operator system, for material and workmanship for 3 years.

.2 Warranty; Manufacturer’s limited door warrant for 2 years for all parts and components.

## Part 2 Products

### 2.1 MATERIALS: EXTERIOR ENTRANCE AND UTILITY DOORS

.1 Steel doors and frames:

.1 Description: steel, insulated, thermally broken, exterior door[s], and frame[s] complete with hardware, weather-stripping and glazing.

.2 Metal: hot dipped galvanized steel sheet to ASTM A653/A653M, minimum base steel thickness in accordance with CSDMA - Thickness for Component Parts.

.3 Core: insulation manufacture's standard.

.4 Finishes:

.1 Prime painted.

.2 Prefinished: factory applied coating.

.5 Operation:

.1 Barrier free pneumatic door operator where applicable.

.1 Heavy duty pneumatically assisted door closer, capable of multi-door operation, complete with actuators, control boxes, pneumatic tubing and compressed air source.

.2 Self contained control box/compressor combination for independent operation of two door leaves.

.3 Mount operators on either push or pull sides of doors as required to place them inside rooms.

.2 Power Operators:

.1 Power-operated pedestrian doors: to CAN/CGSB-69.26.

.2 Power assist and low energy power operated doors: to CAN/CGSB-69.35.

.6 Fabrication:

.1 Fabricate doors and frames in accordance with CSDMA specifications.

.2 Fabricate frames to profiles and maximum face sizes required.

.3 Blank, reinforce, drill and tap frames and doors for mortised, templated hardware, [and] [electronic hardware] [___] using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.

.4 Fabricate thermally broken doors by using insulated core and separating exterior parts from interior parts with continuous interlocking thermal break.

.5 Fabricate thermally broken frames separating exterior parts form interior parts with continuous interlocking thermal break.

.6 Thermal break: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.

.7 Apply insulation.

.2 Hardware:

.1 Locks and latches:

.1 Bored and preassembled locks and latches: to CAN/CGSB-69.17.

.2 Mortise locks and latches: to CAN/CGSB-69.29.

.3 Lever handles: heavy duty abuse resistant design.

.4 Cylinders: key into keying system [as directed].

.5 Finishes: Satin Chrome.

.2 Butts and hinges: to CAN/CGSB-69.18.

.3 Exit devices: to CAN/CGSB-69.19.

.4 Door controls (closers): to CAN/CGSB-69.20.

.5 Auxiliary locks and associated products: to CAN/CGSB-69.21.

.6 Architectural door trim: to CAN/CGSB-69.22:

.1 Door protection plates.

.2 Push plates.

.3 Push/Pull units.

.7 Auxiliary hardware: to CAN/CGSB-69.32.

.1 Door stops.

.2 Door silencer.

.8 Thresholds: sized to suit door opening and comply with barrier free requirements.

.9 Weatherstripping:

.1 Head and jamb seal: extruded aluminum frame and weatherstripping material.

.2 Door bottom seal: extruded aluminum frame and weatherstripping material.

.10 Astragal: to suit design requirements and door configuration.

.3 Glazing: double glazed, hermetically sealed units, glazing materials and sealant.

.4 Joint sealants:

.1 Provide sealant products:

.2 For primers and sealants, indicate VOC in g/L during application and curing.

.3 Preformed compressible and non-compressible back-up materials, CFC free.

.4 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

.5 Primer: to manufacturer's recommendations.

## 2.2 LARGE EXTERIOR SPECIAL DOORS

.1 Description: Insulated Overhead Coiling Service Door.

.2 Curtain:

.1 Metal: Interlocking roll-formed front and back slats, 24 gauge galvanized steel, flat profile, commercial quality to ASTM A653/A653M zinc coating.

.2 Slat cavity filled with CFC-free foamed in place, polyurethane insulation, RSI-Value 1.9.

.3 Performance: Installed sound rating STC-21.

.4 Finish:

.1 Galvanized Steel: Slats and hood galvanized in accordance with ASTM A 653 and receive rust-inhibitive, roll coating process, including 0.2 mils thick baked on prime paint and 06 mils thick baked-on polyester top coat.

.5 Weatherseals:

.1 Vinyl bottom seal and internal hood seals. Lintel weatherseal.

.6 Bottom Bar, Guides, Brackets:

.1 Galvanized steel angles, Power coated weathered finish, Galvanized steel to support counterbalance and hood.

.7 Counterbalance: Helical torsion spring type housed in a steel tube of pipe barrel, and adjustable by means of an adjusting tension wheel.

.8 Hood: 24 gauge galvanized steel with intermediate supports as required. Provided with internal hood baffle weatherseal.

.9 Manual Operation: Chain Hoist.

.10 Locking: Chain keeper locks for chain hoist operation.

.11 Wall Mounting Condition: Face of Wall mounting.

.12 Insulated Vision Lites: dual wall polycarbonate; 254mm x 25.4mm uniformly spaces openings.

## Part 3 Execution

### 3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalog installation instructions, product carton installation instructions, and data sheet.

### 3.2 INSTALLATION: EXTERIOR ENTRANCE DOORS

.1 Install doors, frames, hardware, glass and glazing, and sealant in accordance with manufacturer's instructions.

.2 Set frames plumb, square, level at correct elevation in alignment with adjacent Work.

.1 Anchor securely to structure without restricting thermal movement.

.3 Maintain continuity of vapour retarder, air barrier and insulation between door frames and building structure.

.4 Sealant:

.1 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.

.2 Prepare surfaces in accordance with manufacturer's directions.

.3 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

.4 Apply bond breaker tape where required to manufacturer's instructions.

.5 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

.6 Caulk between door frames and adjacent building components, bedding of thresholds.

.7 Tool exposed surfaces before skinning begins to give slightly concave shape.

.8 Clean adjacent surfaces immediately and leave Work neat and clean.

.9 Remove excess and droppings, using recommended cleaners as Work progresses.

.10 Remove masking tape after initial set of sealant.

.5 Adjust weatherstripping to form weathertight seal.

.6 Adjust operable parts for correct function.

### 3.3 INSTALLATION: EXTERIOR UTILITY DOORS

.1 Steel doors and frames:

.1 Install doors and frames to CSDMA Installation Guide; install hardware templates, glass and glazing, and sealant to manufacturer's instructions.

.2 Set frames plumb, square, level and at correct elevation.

.3 Secure anchorages and connections to adjacent construction without restricting thermal movement.

.4 Maintain continuity of vapour retarder, air barrier and insulation between door frames and building structure.

.2 Sealant:

.1 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.

.2 Prepare surfaces in accordance with manufacturer's directions.

.3 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

.4 Apply bond breaker tape where required to manufacturer's instructions.

.5 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

.6 Caulk between door frames and adjacent building components, bedding of thresholds.

.7 Tool exposed surfaces before skinning begins to give slightly concave shape.

.8 Clean adjacent surfaces immediately and leave Work neat and clean.

.9 Remove excess and droppings, using recommended cleaners as Work progresses.

.10 Remove masking tape after initial set of sealant.

.3 Adjust weatherstripping to form weathertight seal.

.4 Adjust operable parts for correct function.

## 3.4 INSTALLATION: LARGE EXTERIOR SPECIAL DOORS

.1 Install in accordance with manufacturer’s instructions.

.2 Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

.3 Securely and rigidly brace components suspended from structure. Secure guides to structural members only.

.4 Fit and align assembly including hardware, level and plumb, to provide smooth operation.

.5 Coordinate installation of sealants and backing materials at frame perimeter.

.6 Install perimeter trim and closures.

## 3.5 FIELD QUALITY CONTROL

.1 Manufacturer's Services:

.1 Manufacturer's Field Services: obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product.

.2 Manufacturer's Field Services: 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 Schedule site visits, to review Work, at as directed in PART 1.

**END OF SECTION**

## Part 1 General

### 1.1 NARRATIVE

.1 This section includes the requirements for thermal and moisture protection of roof construction and interior elements.

.2 Performance criteria are provided for selection and design of alternate roof designs. Contractor to submit product specifications and performance characteristics for proposed roof design.

.3 Refer to the General Requirements and design in accordance to meet the objectives for the use and maintenance of this facility.

.4 Brackets where shown or left blank are provided to identify specific selections to be determined or used in the design proposal.

### 1.2 DESIGN AND PERFORMANCE REQUIREMENTS

.1 Performance: watertight roof system.

.2 Wind Loads: to Southern Manitoba Design Data.

### 1.3 SUBMITTALS

.1 Submit shop drawings, printed product literature specifications and datasheets and samples in accordance with submittals procedures in General Requirements.

.2 Quality Control Submittals:

.1 Manufacturer's Instructions: manufacturer's installation instructions.

.2 Manufacturer's Field Reports: manufacturer's field reports specified.

### 1.4 QUALITY STANDARDS

.1 Sloped Roofing:

.1 [CRCA] [NRCA Steep Roofing Manual].

.2 CDA Handbook.

.3 SMACNA - Manual.

.2 Flat Roofing:

.1 [CRCA Manual] [NRCA Roofing and Waterproofing Manual].

.2 Fire Hazard Classification: ULC Class [A].

.3 Roof Assembly Classification: FM Class [I-60] [I-90] Construction.

### 1.5 QUALITY ASSURANCE

.1 Conduct pre-installation meeting.

### 1.6 WARRANTY

.1 Warranty for Water tightness: [Twenty-five] years.

.2 Sheet Metal Roofing Components: Warranty for colour fastness - [Twenty-five] years.

## Part 2 Products

### 2.1 SLOPED ROOF - SHEET METAL

.1 Precoated Galvanized Steel: zinc coating, shop precoated, colour selected from manufacturer's colour range.

.1 Emissivity of [0.9] as per ASTM E408.

.2 Initial Reflectance of [0.65].

.3 Three year reflectance of [0.5] as per ASTM E903.

.2 Copper: cold rolled, [natural] finish.

.3 Accessories:

.1 Fasteners: electrolytically compatible.

.2 Underlayment: asphalt saturated felt.

.3 Slip Sheet: [rosin sized building paper.

.4 Eave (Ice Dam) Protection: asphalt saturated felts.

### 2.2 FLAT ROOF - CONVENTIONAL BITUMINOUS [optional]

.1 Products (from the bottom up):

.1 Densdeck Sheathing Over Metal Decking: [15] mm thick, fire rated.

.2 Sheet Vapour Retarder: [asphalt/kraft paper laminate] [foil and fibrous mesh] [fire resistant].

.3 Insulation: polyisocyanurate and extruded polystyrene; thermal resistance RSI of 4.9.

.4 Insulation Top Cover: expanded perlite.

.5 Conventional Bitumen and Felts: Asphalt type, asphalt saturated organic felts.

.6 Modified Bitumen: styrene-butadiene-styrene (SBS) modified asphalt, reinforced, granule surfaced.

.7 Three Ply Membrane:

.8 Aggregate: roofers pea gravel.

.9 Flexible Flashings: modified bitumen, SBS type.

.10 Traffic Pads: bitumen impregnated boards with granular surface.

### 2.3 FLAT ROOF - PROTECTED MEMBRANE – BITUMINOUS [optional]

.1 Products (from the bottom up):

.1 Densdeck Over Metal or Wood Decking: [15] mm thick, fire rated.

.2 Bitumen: asphalt type.

.3 Roofing Felts: [asphalt saturated organic] type.

.4 Three Ply Membrane:

.5 Insulation: extruded polystyrene; thermal resistance RSI of 4.9.

.6 Water Pervious Fabric: woven polyethylene.

.7 Ballast: course gravel.

.8 Flexible Flashings: [modified bitumen, SPS type].

## Part 3 Execution

### 3.1 MANUFACTURER'S INSTRUCTIONS

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

### 3.2 INSTALLATION - GENERAL

.1 Ensure roof assemblies are installed in an independent manner which will minimize damage to adjacent installations during repair, removal or disassembly.

.2 Leave connections exposed or accessible.

.3 Attach materials to facilitate future disassembly, deconstruction, reuse and recycling.

.4 Isolate materials from adjacent materials to minimize contamination and to facilitate future disassembly, deconstruction, reuse and recycling.

### 3.3 SLOPED ROOF - SHEET METAL

.1 Installation:

.1 Extend eave protection membrane upslope beyond interior face of exterior wall.

.2 Place underlayment over area not protected by eave protection.

.3 [Space flat seams evenly] [Finish standing seams perpendicular to roof surfaces] [Space high batten seams evenly].

### 3.4 FLAT ROOF - PLY MEMBRANE

.1 Application - Conventional Design:

.1 Densdeck sheathing over deck surface,] [sheet vapour retarder,] [insulation in [two layers], [3] ply membrane assembly, [aggregate surfacing,] [traffic pads].

.2 Application - Protected Membrane Design:

.1 [Densdeck sheathing over deck surface,] [2] ply membrane assembly, insulation, aggregate ballast, [traffic pads]..

### 3.5 FIELD QUALITY CONTROL

.1 Field Inspection: [required].

.2 Manufacturer's Field Services:

.1 [Required].

.2 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.

**END OF SECTION**

## Part 1 General

### 1.1 SUMMARY

.1 Section Includes:

.1 Performance and installation criteria.

.1 Roof Vents: formed sheet metal or plastic, with attachment flanges.

.2 Attic Vents: [domed] [linear ridge] type of sheet metal, to permit installation with sloped roofing.

.3 Smoke and heat vents.

.4 Roof Hatch: formed metal hinged lid set on metal frame and roof curb.

.2 Refer to the General Requirements and design in accordance to meet the objectives for the use and maintenance of this facility.

.3 Brackets where shown or left blank are provided to identify specific selections to be determined or used in the design proposal.

### 1.2 DESIGN AND PERFORMANCE REQUIREMENTS

.1 Wind Loads: withstand dead and live loads, pressure and suction of wind as calculated in accordance with code.

.2 Roof Loads Applied to Roof Opening Product: in accordance with MBC for:

.1 Uniformly Distributed:

.2 Snow Load Progressively Distributed:

.1 Minimum: [___] kPa.

.2 Maximum: [___] kPa.

.3 Roof Snow and Rain Loads, Graduated: Minimum of [___] kPa with the wind factor, slope (drift) factor, and accumulation factor.

.4 Roof Load, Concentrated: minimum of [___] kN over an area of [___] $m^2$.

.3 Deflection of Roof Surrounding Roof Opening Product:

.1 Deflection of Any Supporting Member.

.2 Maximum Allowable Deflection of Flat or Sloped Decking.

.4 Fire Resistance Rating: conform to [ULC] Assembly Design No. [___].

.5 Permitted Air Leakage: [0.03] L/s/m of crack length with a reference differential pressure of 75 Pa.

.6 Thermal Resistance of Assembly: RSI of [_].

.7 Water leakage: None.

### 1.3 SUBMITTALS

.1 Submit shop drawings, product data and WHMIS MSDS in accordance with procedures under General Requirements.

.2 Quality Standards:

.1 SMACNA - Architectural Sheet Metal Manual.

### 1.4 QUALITY ASSURANCE

.1 Health and Safety.

.1 Do construction occupational health and safety in accordance with Section Health and Safety Requirements.

## Part 2 Products

### 2.1 ROOF OPENING PRODUCTS

.1 Roof Vents:

.1 Material: [aluminum] [pre-coated galvanized steel].

.2 Attachment Flanges: same material as vent, perforated for fasteners.

.2 Attic Vents:

.1 Material: [aluminum] [galvanized steel] [pre-coated galvanized steel]

.2 Profile: [domed] [linear ridge] type.

.3 Attachment Flanges: same material as vent, perforated for fasteners.

.4 Bird screen: [12] mm mesh.

.3 Smoke and Heat Vents:

.1 Assembly: dome assembly, sealed air tight.

.2 Curb: thermally broken.

.1 Smoke and Heat Venting: spring loaded hinge mechanism and ULC listed fusible link for automatic activation.

.2 Ventilation: pivot hinge and lifting/latching mechanism that allow units to be opened.

.3 Attachment Flanges: same material as vent, perforated for fasteners.

.4 Roof Hatch:

.1 Unit: [prime painted steel], [single] leaf type.

.2 Fire Rated Latch:

.3 Fire Rated Opener: automatic opening upon break of fusible link or automatic opening upon activation of alarm system.

.4 Integral metal curb with rigid insulation.

.5 Flush metal cover with insulation; sandwiched with interior liner; continuous flexible gasket to provide weatherproof seal.

.6 Attachment Flanges: same material as hatch curb, perforated for fasteners.

## Part 3 Execution

### 3.1 INSTALLATION

.1 Conform to drawing details and SMACNA and CRCA manuals.

.2 Place and seal items permanently watertight.

.3 Maintain continuity of adjacent air barrier and vapour retarder throughout assembly.

### 3.2 QUALITY CONTROL

.1 Field Inspection: required.

**END OF SECTION**

## Part 1 General

### 1.1 NARRATIVE

.1 This section includes the requirements for the provision of interior partitions to areas separating spaces and areas.

.2 The design intent is to provide partitions that are highly durable and easily maintainable for use in wet areas and spaces that will be exposed to the open air environment during summer months and subject to minimal heating in the winter months.

.3 Refer to the General Requirements and design in accordance to meet the objectives for the use and maintenance of this facility.

.4 Brackets where shown or left blank are provided to identify specific selections to be determined or used in the design proposal.

### 1.2 SYSTEM DESCRIPTION / PERFORMANCE REQUIREMENTS

.1 Fire and sound performance:

.1 Where assembly has fire resistance rating, base assembly rating on tested assemblies from NBC, NRC, ULC, UL or WH.

.1 Refer to Room Data and Concept Floor plan for location of partitions requirement fire resistance rating.

.2 Sound performance: build interior fixed and interior demountable partitions between adjacent spaces to provide Sound Transmission Class, tested to ASTM E90.

.1 Minimum sound transmission rating of fixed partitions between offices/change rooms/washrooms/storage room/ and mechanical roof: in accordance with MBC.

.2 Interior Demountable Partitions:

.1 Are not acceptable

.3 Interior Fixed Partitions:

.1 Masonry:

.1 Use MPa concrete to CSA-A23.1/A23.2 where concrete fill is used in lieu of solid units.

.2 Install building paper below voids to be filled with [concrete] [grout]; keep paper [25] mm back from faces of units.

.3 Construct continuous control joints [as required].

.4 Build in continuous expansion joints [as required]

.5 Do masonry mortar and grout Work in accordance with CSA A179.

.6 Install [reinforced concrete block] [or] [reinforced concrete] lintels over openings.

.7 Do masonry reinforcements [bar and wire] in accordance with [CSA A370], [CSA A371] [and] [CSA-A23.1/A23.2].

.4 Submit Product Data, Shop Drawings, Samples, in accordance with procedures in General Requirements.

.5 Shop Drawings:

.1 Submit shop drawing to indicate elevations, partition modules, materials, components, finishes, door and glazed opening, balustrades, firestopping, fastening to adjacent structure and assembly details.

.6 Closeout submittals: submit maintenance data for incorporation into operations and maintenance manual.

.7 Quality Assurance Submittals:

.1 Manufacturer's Instructions: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheet.

**1.3 QUALITY ASSURANCE**

.1 Construct mock-ups in accordance with procedures in General Requirements.

.2 Mock-up will be used:

.1 To judge quality of Work, substrate, preparation, operation of equipment and material application.

.2 To determine compliance with performance requirements.

.3 To test surface for pinholes.

.4 Locate [where directed].

.5 Allow [48] hours for inspection of mock-up before proceeding with Work.

.3 Site Meetings:

.1 Site Meetings: schedule site visits, to review Work, at stages listed.

.1 After delivery and storage of products, and when preparatory Work 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.

.4 Health and Safety:

.1 Do construction occupational health and safety in accordance with Health and Safety Requirements.

**Part 2 Products**

**2.1 MATERIALS**

.1 Interior Fixed Partitions:

.1 Mortar and grout for unit masonry to CSA A179.

.2 Use same brands of materials and source of aggregate for entire project. Colour: ground coloured natural aggregates or metallic oxide pigments.

.3 Mortar for interior masonry:

.1 Loadbearing: Type [N] [S] [M] based on [Property] [Proportion] specifications.

.2 Loadbearing: Type [O] [N] based on [Property] [Proportion] specifications

.3 Parging mortar: Type to CSA A179.

.4 Bar reinforcement: to [CSA A371] [and] [ASTM A185], Grade.

.5 Wire reinforcement: to [CSA A371] [and] [ASTM A497/A497M], [ladder] [truss] type.

**2.2 SYSTEM PERFORMANCE**

.1 Materials: as required to achieve specified performance criteria; functionally compatible with adjacent materials and components, and meets minimum requirements and relevant standards.

.2 Performance will provide finished Interior Partitions for spaces required by program that are appropriate for anticipated usage and traffic in each area.

## Part 3 Execution

### 3.1 INSTALLATION

.1 Install Interior Partitions and accessories in accordance with manufacturer's written instructions, product data, reference standards and authorities having jurisdiction.

### 3.2 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports.

.2 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.

### 3.3 CLEANING

.1 Remove rubbish and surplus materials.

.2 Clean installed products in accordance with manufacturer's recommendation.

.3 [Standard] [and] [Decorative] block: allow mortar droppings on masonry to partially dry, then remove by means of trowel, followed by rubbing lightly with small piece of block and finally by brushing.

.4 Glazed block: clean masonry as Work progresses using soft, clean cloths, within few minutes after laying. Upon completion, when mortar has set so that it will not be damaged by cleaning, clean with soft sponge or clean cloths, brush, and clean water. Polish with soft, clean cloths.

**END OF SECTION**

## Part 1 General

### 1.1 NARRATIVE

.1 This section includes the requirements for epoxy wall coatings as an alternate product or method for protecting the interior walls and partitions and provided a long term durable and water repellent surface for use in wet and public areas with high traffic and high humidity and where environment will be subject to climatic changes throughout the year.

.2 Refer to the General Requirements and design in accordance to meet the objectives for the use and maintenance of this facility.

.3 Brackets where shown or left blank are provided to identify specific selections to be determined or used in the design proposal.

### 1.2 SUMMARY

.1 Section Includes:

.1 Epoxy wall coatings.

### 1.3 PERFORMANCE REQUIREMENTS

.1 Epoxy wall coating components to form integral, seamless wall coating meeting the following performance characteristics:

.1 Compressive strength: to ASTM C579, 79.28 MPa after 7 days.
.2 Tensile strength: to ASTM C307, 15.16 MPa.
.3 Flexural strength: to ASTM C580, 34.47 MPa.
.4 Bond strength: to ASTM C882 550 psi.
.5 Linear shrinkage: to ASTM C883.
.6 Hardness: to ASTM D2240, Shore D durometer 85-90.
.7 Water absorption; to ASTM C413, 0.01 % maximum.
.8 Flammability: to CAN/ULC-S102.2, flame spread 49, smoked developed 304.
.9 Elongation: to ASTM D638, 14 %.
.10 Coefficient of friction: to ASTM D2047, 0.6.
.11 Abrasion resistance: to ASTM D1044, CS-17 wheel, 0.1 g maximum weight loss.
.12 Impact resistance: to MIL D 3134, 0.225 mm.
.13 Chemical resistance: no chemical attack or discolouration when tested in accordance with ASTM D1308 at 72 degrees F for 7 days.
.14 Pin holing: no pin holing permitted.

### 1.4 SUBMITTALS

.1 Submit Product Data, Shop Drawings, WHMS MSDS, Samples in accordance with submittal procedures in General Requirements.

.2 Quality Assurance Submittals: submit the following:

.1 Test Reports: submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.
.2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
.3 Instructions: submit manufacturers installation instructions.

.4 Manufacturers Field Services: submit copies of manufacturers field reports.

.3 Closeout Submittals:

.1 Maintenance Data: submit maintenance data for incorporation into Operations & Maintenance manual.

**1.5 QUALITY ASSURANCE**

.1 Health and Safety:

.1 Do construction occupational health and safety in accordance with Health and Safety Requirements.

.2 Installer Qualifications: company or person experienced in performing Work of this section specializing in installation of Work similar to that required for this project, with minimum five years documented experience and approved by epoxy wall coating material manufacturer.

**1.6 ENVIRONMENTAL REQUIREMENTS**

.1 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

**1.7 WARRANTY**

.1 For epoxy wall coating materials the 12 month warranty period prescribed in subsection GC 32.1 of General Conditions "C" is extended to [60] months.

.1 Extended warranty period must include warranty against delamination of epoxy wall system from substrate, and other failure of system to provide complete, integral, seamless wall covering meeting specified performance requirements, for specified time period.

**Part 2 Products**

**2.1 MATERIALS**

**2.2 MANUFACTURER**

.1 All epoxy wall system materials from same manufacturer.

.2 Ensure compatibility for epoxy wall materials including primers, resins, hardening agents, finish coats and sealer coats.

**2.3 MATERIALS**

.1 Materials: as required to achieve specified performance criteria; functionally compatible with adjacent materials and components.

**Part 3 Execution**

**3.1 EXAMINATION**

.1 Site Verification of Conditions: verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.

**3.2 PREPARATION**

.1 Prepare substrate surfaces in accordance with epoxy wall coating material manufacturer's instructions.

**3.3 INSTALLATION**

.1 Comply with manufacturer's written installation instructions.

.2 Install epoxy wall coating material at the rate and to thickness required to achieve complete conformance with the specified performance requirements.

.3 Apply in compliance with manufacturer's product data, including product technical bulletins, application and installation instructions.

**3.4 PROTECTION**

.1 Protection: protect installed product and finish surfaces from damage during construction.

**END OF SECTION**

## Part 1 General

### 1.1 NARRATIVE

.1 This sections include the requirements for provision of ceiling finishes to areas and spaces applicable.

.2 Refer to Room Data Sheets for type of ceiling finish suggested.

.3 Refer to the General Requirements and design in accordance to meet the objectives for the use and maintenance of this facility.

.4 Brackets where shown or left blank are provided to identify specific selections to be determined or used in the design proposal.

### 1.2 SUMMARY

.1 Section Includes:

.1 Performance criteria for Ceiling Finish Systems.

### 1.3 FIRE RATINGS

.1 Fire-resistance rated floor/ceiling and roof/ceiling assembly: certified by Canadian Certification Organization, accredited by Standards Council of Canada.

### 1.4 SUBMITTALS

.1 Submit Product Data, Shop Drawings and samples in accordance with procedures in General Requirements.

### 1.5 QUALITY ASSURANCE

.1 Health and Safety:

.1 Do construction occupational health and safety in accordance Health and Safety Requirements.

.2 For installers for Work of this Section, use company and/or persons which have experience of, and have specialized in, installation Work similar to that required for the Work described in this Section for this Project, [with minimum [5] years documented experience] [approved or certified, in writing, by manufacturer/supplier].

.3 Construct mock-up when and where directed.

.4 Mock-up may remain as part of Work.

### 1.6 DELIVERY, STORAGE AND HANDLING

.1 Ensure that sufficient units have been ordered, and will be delivered, from single production run, to complete Work.

.2 Ensure that special, units or components are ordered, with sufficient lead time, so that they are manufactured with required, standard units so that colours and textures are consistent for all units required to complete Work.

.3 Deliver, store and handle units with any practices required or recommended by manufacturer/supplier.

.4 Deliver units to Site in effective, protective tear-proof wrapping. Handle products so as to ensure protection from damage.

.5 Store materials, in clean, dry, secure location, in conditions conducive to their protection and preservation. Ensure that materials do not come in contact with ground, snow, ice, or with other damp surfaces.

**1.7 ENVIRONMENTAL WORK CONDITIONS**

.1 Maintain uniform minimum temperature before and during installation as well as after completion.

**1.8 WARRANTY**

.1 Indicate requirement for, and extent of, extended warranties, if appropriate.

**1.9 MAINTENANCE**

.1 Extra Materials:

.1 Obtain extra materials from same production run as installed materials.

.2 Store where directed by The City.

## Part 2 Products

**2.1 WORK IN PLACE**

.1 Paint surfaces in accordance with Section [C3040 - Painting].

.2 Do Work to comply with following criteria for appearance.

.1 Ceiling system: [paint] [applied to pre-installed substrate] [suspended from overhead structure] [panelled] [seamless].

.1 Seamless.

.2 Applied units.

.3 Lay-in panels.

.4 Colour [TBD].

.5 Texture/modelling.

.6 Reflectance [90%]

.7 Edges: [square].

.8 Joints: [butt].

.3 Do Work to comply with following criteria for Physical Attributes:

.1 Dimensional:

.1 Modular/standard.

.2 Load capacity:

.1 In addition to its own weight, ensure that anchorages, suspension system, framing, and panels, of suspended ceiling system, are capable of supporting weight of all ancillary and related components of the ceiling assembly.

.3 Resistance to Environment:

.1 Atmospheric: in an environment in which system can be expected to find itself, in terms of visible or invisible spectrum of natural or artificial light, temperature, and humidity, installed products assemblies or systems will be durable and physically and dimensionally stable and that finish will not change colour or stain, wrinkle, crack, or delaminate, and that it will be resistant to insect infestation, mould and fungal growth. Ensure that supporting components, anchorages and fastenings will not deform, fail, or corrode, causing misalignment, staining, and deterioration.

.2 The building will be maintained at minimum temperature during off season to protect building systems and materials. Ceiling system shall be compatible thus.

.3 Chemical: resistance to corrosive chemical environment.

.4 Physical: resistant to vibration, differential movement, air movement

.4 Do Work to comply with following criteria for Performance.

.1 Integrity:

.1 Ceiling system must, when installed in environment established, be sound, rigid, durable and properly related to the building structure. It must maintain specified dimensional tolerances and be free of deformation delamination, and/or discolouration during service life.

.2 Accessibility:

.1 For a suspended modular unit panelled ceiling, accessibility is required to be at [every] panel. Removal and replacement must be effected without special tools and without damage to panels or to suspension system.

.3 Sound Ratings:

.1 NRC: for type and use of facility.

.2 Ceiling plenum sound transmission range

.3 Sound transmission across partitions

.4 Sound transmission through ceiling space separators

.4 Fire Containment/Prevention:

.1 Ceiling system must be designed, complete with resistance to displacement in the event of differential pressures due to fire or air/gas/smoke movement, and tested to afford a ULC Rating of Assembly

.5 Do Work to comply with following criteria for maintainability:

.1 Have surface of ceiling finished to allow cleaning [by dry brush] [wet mop, cloth or brush] without causing damage, staining or deterioration wearability.

.2 Spare components to effect repair, replacement, and relocation, must be available.

## Part 3 Execution

### 3.1 EXAMINATION

.1 Before Work of this Section begins, establish that preparatory Work, on which Work of this Section depends, or other Work which must be completed before being covered up by Work of this Section, is properly carried out. Report any difficulties or deficiencies encountered and which must be corrected.

.2 Where applicable, allow previous, completed, preparatory Work to dry out before beginning installation of Work of this Section.

.3 Installation, once begun, will be considered to indicate that Site conditions are acceptable to installing trade.

### 3.2 MANUFACTURER'S INSTRUCTIONS

.1 Comply with manufacturer's written requirements, recommendations, or specifications, including any available product technical bulletins, for handling, storage, installation, adjustment, protection, and cleaning instructions.

**3.3 COMPLIANCE**

.1 Do Work related to suspension system in accordance with [ASTM C636].

.2 For suspended ceilings, erect hangers and runner channels in accordance with [ASTM C840] [___].

.3 Do furring and lathing Work in accordance with [ASTM C841] [___].

.4 Prepare surfaces to receive plaster in accordance with [ASTM C842] [___].

.5 Do Work related to gypsum Board in accordance with [ASTM C840] [___].

**3.4 INSTALLATION**

.1 Relate installed ceiling system effectively to ensure compatibly with condition and nature of adjacent materials, elements/assemblies, junctions/joins/joints, control/movement joints, and anchorages/fastenings/adhesives.

.2 Lay out modular unit ceiling system using [system according to reflected ceiling plan] [centre line of ceiling both ways, to provide balanced borders at room perimeter] [with border units not less than 50% of standard unit width].

.3 Install wall mouldings to provide correct ceiling height at a tolerance of [1:1200]

.4 Ensure that ceiling pattern is square with adjoining walls, unless shown differently.

.5 Have ceiling system relate to all movement joints which occur in building structure such as are required to respond to possible thermal and structural movement. Design and construct joints to allow flexibility to extent necessary to match movement which may be experienced. Ensure that joint is able to resist air and moisture infiltration through joint. Arrange Work so that appearance of joint creates an acceptably neat and properly aligned result.

.6 Ensure that suspension system has capacity to support elements to which it relates. [Where required by codes, standards, and manufactures recommendations, install separate suspension members for this purpose] .

.7 As required, subdivide space above suspended ceiling systems with separators to achieve compartmentalization for containment of combustion or sound attenuation.

**3.5 INTERFACE WITH OTHER WORK**

.1 Co-ordinate Work which is part of, or related to, ceiling systems, to accommodate components provided under other Sections, such as light fixtures, diffusers, speakers, sprinkler heads, detectors, security equipment, mechanical system terminals, and other penetrations, which are to be incorporated into ceiling system.

**3.6 PROTECTION AND CLEANING**

.1 Protect adjacent surfaces, components, and equipment from contamination due to Work of this Section. Prevent infiltration of debris dust and fluids from entering ducts, pipes, conduit, and other voids and spaces.

.2 Prevent contact between dissimilar metals and between materials which may cause staining and/or corrosion

.3 Protect the Work of this Section from soiling or damage, during and upon completion of installation, from other construction operations.

.4 Keep the Work of this Section clean during and after installation. Remove dust, stains, debris surplus and waste materials, packing materials and labels in accordance with manufacturer/suppliers' recommendations and Contract.

**3.7 SCHEDULE**

.1 Refer to Room Data Sheets / Room Finish Schedule.

**END OF SECTION**

## Part 1 General

### 1.1 NARRATIVE

.1 This section includes the requirements for hard surface floor finishes where proposed as an alternate method to exposed concrete.

.2 Refer to Room Data Sheets for locations and areas for finishes.

.3 Refer to the General Requirements and design in accordance to meet the objectives for the use and maintenance of this facility.

.4 Brackets where shown or left blank are provided to identify specific selections to be determined or used in the design proposal.

### 1.2 SUBMITTALS

.1 Submit shop drawings, product data and samples in accordance with procedures in General Requirements.

.2 Manufacturer's Instructions:

.1 Submit floor surface manufacturer's installation instructions.

.3 Manufacturer's Reports:

.1 Arrange involvement of floor surface manufacturer's representative and submit copies of manufacturer's field reports to ensure proper installation.

### 1.3 CLOSEOUT SUBMITTALS

.1 Maintenance Data: submit maintenance data for incorporation into operations and maintenance manual.

### 1.4 QUALITY ASSURANCE

.1 Qualifications:

.1 Installer/Supplier Qualifications: submit letter of competence issued by manufacturer indicating [5] years minimum experience related to installation of product on similar projects.

.1 Submit proof that flooring installer has successfully completed manufacturer's training program. Include date of and signature of authorized manufacturer representative.

.2 Accredited manufacturer, contractor and installer must perform installation Work. Submit letter of manufacturer's certification and compliance.

### 1.5 SITE CONDITIONS

.1 Ambient Conditions:

.1 Conform to manufacturer's recommended air temperature, relative humidity and substrate moisture content using calcium chloride moisture test.

### 1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

.2 Store materials protected from exposure to harmful weather conditions in dry, ventilated conditions.

**1.7 WARRANTY**

.1 For Interior Hard Floor Finishes materials the 12 months warranty period is extended to [60] months.

.2 Extended warranty period must include warranty against Interior Hard Floor Finishes meeting specified performance requirements, for specified time period.

.3 Manufacturer's Warranty: submit for acceptance, manufacturer's standard warranty document executed by authorized company official.

**Part 2 Products**

**2.1 DESIGN PERFORMANCE REQUIREMENTS**

.1 Performance Requirements:

.1 Select and install Interior Hard Floor Finishes components to form complete integral floor system. Ensure performance provides finished interiors for spaces that are appropriate for anticipated usage and traffic in each area with criteria as follows:

.1 Coefficient of friction: to ASTM C1028 (not less than 0.50 for wet and dry conditions) and (0.60 for ramps).

.2 Durability: to ASTM C627. Extra Heavy: passes cycles 1 through 14. Heavy: passes cycles 1 through 12. Moderate: passes cycles 1 through 10. Light: passes cycles 1 through 6. Residential: passes cycles 1 through 3.

**2.2 MATERIALS**

.1 Tile Materials:

.1 Ceramic Floor Tile: Slip-resistent.

.2 Base: coved; type, size, colour and texture to match adjacent flooring material.

.2 Mortar, Adhesive and Grout Materials:

.1 Portland Cement: to CAN/CSA-A5, Type 10.

.2 Hydrated Lime: to ASTM C207, Type [N] [NA] [S] [SA].

.3 Sand: to ASTM C144.

.4 Dry-Set Portland Cement Mortar: to ANSI A118.1.

.5 Latex-Portland Cement Mortar: to ANSI A118.4.

.6 Commercial Portland Cement Grout: to ANSI A118.6.

.7 Latex-Portland Cement Grout: to ANSI A118.6.

.8 Epoxy Adhesive and Grout: to ANSI A118.3.

.9 Furan Mortars and Grout: to ANSI A118.5.

.3 Accessories:

.1 Reinforcing Mesh: [50 x 50 mm] [___] mesh size, fabricated from 1.6 mm thick galvanized steel wire; welded fabric design.

.2 Latex Additive: formulated for use in Portland cement mortars and grouts.

.3 Organic Adhesive: to ANSI A136.1, Type [1] [2].

.4 Water: potable, clean and free of chemicals and contaminants detrimental to mortar or grout mixes.

.5 Transition Strips: purpose made metal extrusion; stainless steel, anodized aluminum type.

.6 Reducer Strips: purpose made metal extrusion [stainless steel] [brass] [zinc] [anodized aluminum] type; maximum slope of 1:2.

.7 Prefabricated Movement Joints: purpose made, having a Shore A Hardness not less than 60 and elasticity of plus or minus 40 percent.

.8 Joint Sealant

.9 Sealer: to CAN/CGSB-25.20, Type [1] [2]; as recommended by tile manufacturer.

**2.3 SOURCE QUALITY CONTROL**

.1 Ensure flooring components and materials are from single manufacturer.

**Part 3 Execution**

**3.1 APPLICATION**

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

**3.2 PREPARATION**

.1 Ensure concrete has cured [28] days minimum and is within smoothness tolerances recommended by floor surface manufacture for specific flooring to be installed.

.2 Do not proceed in areas where dust is being generated.

.3 Verify that substrate conditions which have been previously installed under other sections or contracts, are acceptable for product installation in accordance with manufacturer's instructions prior to installation of flooring surface.

**3.3 INSTALLATION**

.1 Install interior hard floor finishes, tile, mortar, adhesive and accessories in accordance with manufacturer's written instructions, product data, reference standards and authorities having jurisdiction.

.2 Do ceramic tile Work to [TTMAC Specification Guide].

**3.4 FIELD QUALITY CONTROL**

.1 Manufacturer's Services:

.1 Ensure manufacturer's representative reviews Work involved in handling, installation/application, protection and cleaning, of its product[s]. Submit written reports, in acceptable format, to verify compliance of Work with Contract.

.2 Manufacturer's Site Review: provide manufacturer's site review consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.3 Replace broken, cracked, hollow sounding or damaged tile.

**3.5 CLEANING**

.1 Clean installed products in accordance to manufacturer's recommendation.

.2 Apply floor sealer in accordance with manufacturer's instructions.

**END OF SECTION**

## Part 1 General

### 1.1 NARRATIVE

.1 Section Includes:

.1 Performance specification for epoxy floor surfaces.

.2 For requirements where epoxy floor coating is an alternate to exposed finished concrete.

.2 Refer to the General Requirements and design in accordance to meet the objectives for the use and maintenance of this facility.

.3 Brackets where shown or left blank are provided to identify specific selections to be determined or used in the design proposal.

### 1.2 PERFORMANCE REQUIREMENTS

.1 Select and install epoxy floor coating components to form complete, integral, seamless flooring system meeting the following performance characteristics:

.1 Compressive strength: to ASTM C579, [79.28 MPa after 7 days

.2 Tensile strength: to ASTM C307, [15.16 MPa]

.3 Flexural strength: to ASTM C580, [34.47 MPa] [___].

.4 Bond strength: to ASTM C882 [550 psi]

.5 Linear shrinkage: to ASTM C883, nil.

.6 Water absorption; to ASTM C413, [0.01] [___] % maximum.

.7 Flammability: to CAN/ULC-S102.2, flame spread 49, smoked developed 304.

.8 Elongation: to ASTM D638, [14%].

.9 Coefficient of friction: to ASTM D2047, [0.6]

.10 Abrasion resistance: to ASTM D1044, CS-17 wheel, 0.1 g maximum weight loss.

.11 Impact resistance: to MIL D 3134, [0.225] mm.

.12 Chemical resistance: no chemical attack or discolouration when tested

.13 Pin holing: no pin holing permitted. Pin holing to be tested using holiday test.

### 1.3 SUBMITTALS

.1 Submit Shop Drawings, Samples, Product Data, WHMIS MSDS as per Procedures in General Requirements

.2 Quality Assurance Submittals:

.1 Test Reports: submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.

.2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.3 Instructions: submit manufacturers installation instructions.

.4 Manufacturers Field Services: submit copies of manufacturers field reports.

.3 Maintenance Data: submit maintenance data for incorporation into operations and maintenance manual.

**1.4 QUALITY ASSURANCE**

.1 Health and Safety:

.1 Do construction occupational health and safety in accordance Health and Safety Requirements

.2 Installer Qualifications: company or person experienced in performing Work of this section [with minimum [five] years documented experience] [and] [approved by epoxy flooring material manufacturer].

**1.5 ENVIRONMENTAL REQUIREMENTS**

.1 Moisture: ensure substrate is within moisture limits prescribed by manufacturer.

.2 Temperature: maintain ambient temperature

.3 Relative humidity: maintain relative humidity [in accordance with manufacturer's written instructions]

.4 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

**1.6 DELIVERY, STORAGE AND HANDLING**

.1 Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

.2 Identify "best before date" for all packaged epoxy materials and notify [Contract Administrator] of delivered materials are approaching stipulated expiry date.

.3 Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.

.4 Waste Management and Disposal:

.1 Deposit packaging materials in appropriate container on site for recycling or reuse.

.2 Avoid using landfill waste disposal procedures when recycling facilities are available.

.3 Collect and separate plastic, paper packaging and corrugated cardboard.

.4 Dispose of corrugated cardboard, polystyrene and plastic packaging material in appropriate on-site bin.

**1.7 WARRANTY**

.1 Project Warranty: refer to CCDC 2 for project warranty provisions.

.2 Warranty: five (5) years against delamination of epoxy flooring system from substrate, and other failure of system to provide complete, integral, seamless floor covering meeting specified performance requirements.

**Part 2 Products**

**2.1 MANUFACTURER**

.1 Epoxy flooring materials from same manufacturer.

.2 Ensure compatibility for epoxy flooring materials including primers, resins, hardening agents, finish coats and sealer coats.

**2.2 MATERIALS**

.1 Materials: as required to achieve specified performance criteria; functionally compatible with adjacent materials and components.

**Part 3 Execution**

**3.1 EXAMINATION**

.1 Site Verification of Conditions: verify substrate conditions are acceptable for product installation in accordance with manufacturer's instructions.

**3.2 PREPARATION**

.1 Prepare substrate surfaces in accordance with epoxy floor coating material manufacturer's instructions.

**3.3 PREPARATION OF CONCRETE FLOOR SUBSTRATES**

.1 Ensure Work penetrating substrate has been completed before preparing substrate and applying coating.

.2 Protect coated surfaces, equipment, fixtures and fittings.

.3 Clean and prepare surfaces in accordance with manufacturer's instructions.

.1 Chemical cleaning: clean surfaces with detergent, trisodium phosphate or other proprietary concrete cleaner.

.2 Mechanical cleaning: Mechanically clean concrete surfaces using mechanical cleaning [impact tools] [scabblers] [scarifiers] tool in accordance with manufacturer's written instructions.

.3 Blast Cleaning: blast clean concrete surface using [sandblasting] [shotblasting] [waterblasting].

.4 Acid etching: clean concrete surface with acid to remove sufficient cement paste to provide a roughened surface.

.5 Flame cleaning: clean concrete floor surfaces with a multi-flame oxy-acetylene blowpipe flame cleaning machine; blowpipe speed 0.02 m/s - 0.03 m/s.

**3.4 INSTALLATION**

.1 Comply with manufacturer's instructions.

.2 Prime clean [concrete] subfloor as recommended by manufacturer.

.3 Apply epoxy sub-floor filler to cracks, depressions and low spots to achieve floor level to a tolerance of 1:500; allow to cure.

.4 Prime [concrete] and subfloor filler substrate surfaces as recommended by manufacturer.

.5 Install epoxy floor coating material at the rate and to thickness required to achieve complete conformance with the specified performance requirements.

**3.5 CLEANING**

.1 Repair or replace damaged installed products.

.2 Clean installed products in accordance with manufacturer's instructions prior to [Contract Administrator's] acceptance.

.3 Remove construction debris from project site and legally dispose of debris.

**3.6 PROTECTION**

.1 Protection: protect installed product and finish surfaces from damage during construction.

**END OF SECTION**

## Part 1 General

### 1.1 NARRATIVE

.1 This section includes the requirement for painting surfaces and materials.

### 1.2 SUBMITTALS

.1 Submit Shop Drawings, Samples, Product Data, WHMIS MSDS as per Procedures in General Requirements.

### 1.3 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for paints and coatings for incorporation into operations and maintenance manual, supplemented as follows.

.2 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 number[s].

.4 MPI environmentally friendly classification system rating.

### 1.4 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Materials:

.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.

.2 Store where directed.

### 1.5 QUALITY ASSURANCE

.1 Qualifications:

.1 Painting Applicator: as defined by local jurisdiction, qualified and engaged in painting and decorating Work.Apprentices may be employed provided they work under direct supervision of a qualified painting applicator in accordance with trade regulations.

### 1.6 DELIVERY, STORAGE AND HANDLING

.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] [as indicated on] established colour schedule.

.3 Provide and maintain dry, temperature controlled, secure storage.

.4 Observe manufacturer's recommendations for storage and handling.

.5 Store materials and supplies away from heat generating devices.

.6 Store temperature sensitive products above minimum temperature as recommended by manufacturer.

.7 Remove paint materials from storage only in quantities required for same day use.

.8 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

**1.7 SITE CONDITIONS**

.1 Ambient Conditions:

.1 Heating, Ventilation and Lighting:

.1 Ventilate enclosed spaces.

.2 Perform painting Work when 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 minimum before, during and after paint application and until paint has cured sufficiently.

.3 Where required, provide continuous ventilation for [seven] days minimum after completion of application of paint.

.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 painting Work when lighting level of [323] lux minimum is provided on surfaces to be painted.

.2 Temperature, Humidity and Substrate Moisture Content Levels:

.1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and applied product manufacturer, do not perform painting Work when:

.1 Ambient air and substrate temperatures are below [10] degrees C for both interior and exterior Work.

.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).

.3 Conduct moisture tests using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test".

.4 Test concrete, masonry and plaster surfaces for alkalinity as required.

**Part 2 Products**

**2.1 PERFORMANCE CRITERIA**

.1 Provide paint products meeting MPI ratings based on VOC (EPA Method 24) content levels.

**2.2 MATERIALS**

.1 Only paint materials listed in MPI Approved Products List (APL) are acceptable for use on this project.

.2 Materials for paint systems: ensure project products are from single manufacturer.

.3 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids to be as follows:

.1 Ensure calculation of VOCs does not include water or tinting colourant added at point of sale.

.2 Be [water-based] [water soluble] [water clean-up]

.3 Be [non-flammable] [biodegradable]

.4 Do not contain [methylene chloride], [chlorinated hydrocarbons], [toxic metal pigments].

.5 Primer: maximum VOC limit [250] g/L [to Standard GS-11].

.6 Enamel Finish: maximum VOC limit [150] g/L [to SCAQMD Rule 1113].

.7 Paints: maximum VOC limit [150] /L [to SCAQMD Rule 1113].

.4 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalnt chromium or their compounds.

.5 Facility lacking secondary treatment.

**2.3 COLOURS**

.1 Provide Colour Schedule after Contract award. Submit proposed Colour Schedule for approval by The City.

.2 Selection of colours will be from manufacturers full range of colours.

.3 Where specific products are available in restricted range of colours, selection will be based on limited range.

.4 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

**2.4 MIXING AND TINTING**

.1 Perform colour tinting operations prior to delivery of paint to site.

.2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.

.3 Add thinner to paint according to manufacturer's written recommendations. Do not use organic solvents to thin water-based paints.

.4 Thin paint for spraying in accordance with paint manufacturer's written instructions.

.5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

**2.5 GLOSS/SHEEN RATINGS**

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

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

| Gloss Level Category | Units @ 60 Degrees | Units @ 85 Degrees |
|---|---|---|
| G6 - gloss finish | 70 to 85 | |
| G7 - high gloss finish | > 85 | |

.2 Gloss level ratings of painted surfaces:] [as indicated on Finish Schedule].

**2.6 EXTERIOR PAINTING SYSTEMS**

.1 Concrete Vertical Surfaces: including horizontal soffits

.1 EXT 3.1H Water repellent paintable finish.

.2 EXT 3.1J Concrete stain finish.

.2 Concrete Horizontal Surfaces:

.1 Apply [water repellent] finishes to exterior concrete vertical surfaces in accordance with Section - Concrete Finishing].

.2 EXT 3.2G Clear sealer.

.3 Clay Masonry Units: pressed and extruded brick

.1 EXT 4.1G Water repellent paintable finish.

.2 EXT 4.1H High-build latex finish.

.3 EXT 4.1J Epoxy/polyurethane finish.

.4 Concrete Masonry Units: smooth and split face block and brick

.1 Apply water repellent finish to concrete masonry surfaces in accordance with Concrete Unit Masonry section.

.2 EXT 4.2J Water repellent paintable finish (not for light weight block).

.3 EXT 4.2L Alkali resistant primer/latex [low gloss] finish.

.5 Structural Steel and Metal Fabrications:

.1 EXT 5.1A Quick dry enamel [low gloss] finish.

.2 EXT 5.1H Epoxy/polyurethane finish.

.3 EXT 5.1J High build epoxy/polyurethane finish.

.6 Galvanized Metal: [doors,] [frames,] [railings,] [miscellaneous steel,] [pipes,] [overhead decking,] [ducts,] [gutters,] [flashing,] [___]

.1 EXT 5.3C Epoxy finish.

.2 EXT 5.3D Vinyl wash primer/polyurethane finish (for high contact/traffic areas).

.7 Glue Laminated Beams and Columns:

.1 EXT 6.1D Semi-transparent stain/varnish [satin] finish.

.2 EXT 6.1H Clear polyurethane finish.

.3 EXT 6.1J Pigmented polyurethane finish.

.4 EXT 6.1K Clear alkyd varnish [insert gloss level] finish.

**2.7 INTERIOR PAINTING SYSTEMS**

.1 Paint interior surfaces in accordance with the following MPI Architectural Painting Specification Manual requirements:

.1 Concrete Vertical Surfaces: (including horizontal soffits)

.1 INT 3.1J Water repellent paintable finish.

.1 Maximum VOC limit [___] g/L [to Standard GS-11] [to SCAQMD Rule 1113].

.2 INT 3.1K Concrete stain finish.

.1 Maximum VOC limit [___] g/L [to Standard GS-11] [to SCAQMD Rule 1113].

.2 Concrete Horizontal Surfaces: (floors and stairs)

.1 Apply [water repellent] [and] [stain] finishes to exterior concrete vertical surfaces

.2 INT 3.2E Concrete stain finish.

.1 Maximum VOC limit [___] g/L [to Standard GS-11] [to SCAQMD Rule 1113].

.3 INT 3.2F Concrete floor sealer.

.1 Maximum VOC limit [___] g/L [to Standard GS-11] [to SCAQMD Rule 1113]

.3 Clay Masonry Units: (pressed and extruded brick)

.1 Apply water repellent finish to clay masonry surfaces in accordance with Section - Clay Tile Masonry]

.2 INT 4.1J Water repellent paintable finish.

.1 Maximum VOC limit [___] g/L [to Standard GS-11] [to SCAQMD Rule 1113].

.4 Concrete Masonry Units: (smooth and split face block and brick)

.1 Apply water repellent finish to concrete masonry surfaces in accordance with Section - Concrete Unit Masonry

.2 INT 4.2M Water repellent paintable finish (not for light weight block).

.1 Maximum VOC limit [___] g/L [to Standard GS-11] [to SCAQMD Rule 1113].

.5 Structural Steel and Metal Fabrications:

.1 INT 5.1A Quick dry enamel [insert gloss level] finish.

.1 Maximum VOC limit [___] g/L [to Standard GS-11] [to SCAQMD Rule 1113].

.6 Galvanized Metal: ([doors,] [frames,] [railings,] [miscellaneous steel,] [pipes,] [overhead decking,] [ducts,] [___])

.1 INT 5.3A Latex [semi gloss finish.

.1 Maximum VOC limit [___] g/L [to Standard GS-11] [to SCAQMD Rule 1113].

.2 INT 5.3D Epoxy finish.

.1 Maximum VOC limit [___] g/L [to Standard GS-11] [to SCAQMD Rule 1113].

.3 INT 5.3E Wash primer/epoxy finish.

.1 Maximum VOC limit [___] g/L [to Standard GS-11] [to SCAQMD Rule 1113].

.7 Glue Laminated Beams and Columns:

.1 INT 6.1D Clear polyurethane varnish [insert gloss level] finish.

.1 Maximum VOC limit [___] g/L [to Standard GS-11] [to SCAQMD Rule 1113].

.2 INT 6.1G Semi transparent stain finish.

.1 Maximum VOC limit [___] g/L [to Standard GS-11] [to SCAQMD Rule 1113].

.3 INT 6.1H Solid colour stain finish.

.1 Maximum VOC limit [___] g/L [to Standard GS-11] [to SCAQMD Rule 1113].

.4 INT 6.1J Semi transparent stain/polyurethane varnish [insert gloss level] finish.

.1 Maximum VOC limit [___] g/L [to Standard GS-11] [to SCAQMD Rule 1113].

## Part 3 Execution

### 3.1 COMPLIANCE

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

### 3.2 GENERAL

.1 Perform preparation and painting operations in accordance with MPI Painting Specifications Manual except where specified otherwise.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

### 3.3 EXAMINATION

.1 Exterior painting Work: inspected by MPI Accredited Paint Inspection Agency (inspector) acceptable to the specifying authority and the local Painting Contractor's Association. Painting contractor to notify Paint Inspection Agency a minimum of [one] [___] week prior to commencement of Work and provide a copy of project painting specification and Finish Schedule (as well as plans and elevation drawings if available).

.2 Exterior surfaces requiring painting: inspected by both painting contractor and Paint Inspection Agency who will notify [Contract Administrator] in writing of defects or problems, prior to commencing painting Work, or after surface preparation if unseen substrate damage is discovered.

.3 Where assessed degree of surface degradation of DSD-1 to DSD-3 before preparation of surfaces for painting is revealed to be DSD-4 after preparation, repair or replacement of such unforeseen defects discovered are to be corrected, as mutually agreed, before painting is started.

.4 Where "special" painting or coating system applications (i.e. elastomeric coatings or non-MPI listed products or systems) are to be used, paint or coating manufacturer to provide as part of Work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost.

### 3.4 PREPARATION

.1 Perform preparation and operations for exterior painting in accordance with MPI Architectural Painting Specification Manual Repainting requirements except where otherwise specified.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

.3 Clean and prepare exterior surfaces to be painted in accordance with MPI Architectural Painting Specification Manual requirements. Refer to the MPI Manual in regard to specific requirements and as follows:

.1 Remove dust, dirt, and other surface debris by wiping with dry, clean cloths

.2 Wash surfaces with a biodegradable detergent and 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 painted 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 painted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements. Remove such contaminates from surfaces, pockets and corners to be painted 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 pre-treatment as soon as possible after cleaning and before deterioration occurs.

.6 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to [1000] mm.

## 3.5 EXISTING CONDITIONS

.1 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings. Do not proceed with Work until conditions fall within acceptable range as recommended by manufacturer.

.2 Maximum moisture content as follows:

.1 Stucco, Plaster and Gypsum Board: [12] %.

.2 Concrete: [12] %.

.3 Clay and Concrete Block/Brick: [12] %.

.4 Wood: [15] %.

## 3.6 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], [building occupants] [and general public] in and about building.

.5 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Store items and re-install after painting is completed. and accessories.

.6 Move and cover 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 occupied areas.

## 3.7 APPLICATION

.1 Brush and Roller Application:

.1 Apply paint in 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

.5 Remove runs, sags and brush marks from finished Work and repaint.

.2 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 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.

.3 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access .

.4 Apply coats of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.6 Sand and dust between coats to remove visible defects.

.7 Finish exterior and interior surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and exterior projecting ledges.Finish inside of cupboards and cabinets as specified for outside surfaces.

.8 Finish closets and alcoves as specified for adjoining rooms.

.9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

.10 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.

.3 Apply paint when previous coat of paint is dry or adequately cured.

.11 Additional Interior Application Requirements:

.1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

.2 Apply paint in occupied facilities during silent hours. Schedule operations to approval of [Departmental Representative] [Engineer] [Contract Administrator] [___] such that painted surfaces will have dried and cured sufficiently before occupants are affected.

.12 Additional Exterior Application Requirements:

.1 Apply paint finishes when conditions forecast for entire period of application fall within manufacturer's recommendations.

.2 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.

.3 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.

.4 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.

.5 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.

.6 Paint occupied facilities in accordance with approved schedule only.

## 3.8 MECHANICAL/ELECTRICAL EQUIPMENT

.1 Paint exterior and interior finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment. Colour and texture to match adjacent surfaces, except as indicated.

.2 In boiler room, mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.

.3 In other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.

.4 Touch up scratches and marks on factory painted finishes and equipment with paint supplied by manufacturer of equipment.

.5 Do not paint over nameplates.

.6 Keep sprinkler heads free of paint.

.7 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.

.8 Paint fire protection piping [red].

.9 Paint disconnect switches for fire alarm system and exit light systems in red enamel.

.10 Paint natural gas piping [yellow].

.11 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

## 3.9 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

.1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

## 3.10 CLEANING

.1 Clean-up.

.1 Remove paint where spilled, splashed, splattered or sprayed as Work progresses using means and materials that are not detrimental to affected surfaces.

.2 Clean equipment and dispose of wash water used for water borne materials, solvents used for oil based materials as well as other cleaning and protective materials (i.e. rags, drop cloths, and masking papers), paints, thinners, paint removers/strippers in accordance with safety requirements of authorities having jurisdiction.

.3 Clean painting equipment in leak-proof containers that will permit particulate matter to settle out and be collected. Sediment remaining from cleaning operations to be recycled or disposed of in manner acceptable to authorities having jurisdiction

**3.11 RESTORATION**

.1 Clean and re-install hardware items removed before painting operations commenced.

.2 Remove protective coverings and warning signs as soon as practical after painting operations cease.

.3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect freshly completed surfaces from paint droppings and dust.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition approved by Contract Administrator.

**END OF SECTION**