

# Construction of a new building

Sept-Îles, QC

SPECIFICATIONS - ISSUED FOR TENDER  
ARCHITECTURE/STRUCTURE

PART 1 OF 3  
AUGUST 4, 2016

**SPECIFICATIONS: PART 1 OF 3 ARCHITECTURE/STRUCTURE**

<b><u>Division</u></b>	<b><u>Section</u></b>
<b>DIVISION 01</b>	01 11 00 – Summary of Work 01 29 83 – Laboratory Services 01 31 19 – Project Meetings 01 32 16.07 – Construction Progress Schedule – Bar (GANNT) Chart 01 33 00 – Submittal Procedures 01 35 29.06 – Health and Safety Requirements 01 35 43 – Environmental Procedures 01 41 00 – Regulatory Requirements 01 45 00 – Quality Control 01 51 00 – Temporary Utilities 01 52 00 – Construction Facilities 01 56 00 – Temporary Barriers and Enclosures 01 61 00 – Common Product Requirements 01 71 00 – Examination and Preparation 01 73 00 – Work Execution 01 74 11 – Cleaning 01 74 21 – Construction/Demolition waste management and disposal 01 77 00 – Closeout procedures 01 78 00 – Closeout Submittals 01 79 00 – Demonstration and training 01 91 51 – Building management manual (BMM)
<b>DIVISION 03</b>	03 10 00 – Concrete Forming and Accessories 03 20 00 – Concrete Reinforcing 03 30 00 – Cast-in-Place Concrete 03 35 00 – Concrete Finishing 03 35 05 – Concrete Floor Hardeners
<b>DIVISION 04</b>	04 05 00 – Common Work Results for Masonry 04 05 12 – Masonry Mortar and Grout 04 05 19 – Masonry Anchorage and Reinforcing 04 05 23 – Masonry Accessories 04 21 13 – Brick Masonry 04 22 00 – Concrete Unit Masonry
<b>DIVISION 05</b>	05 12 23 – Structural Steel for Buildings 05 21 00 – Steel Joist Framing 05 31 00 – Steel Decking 05 41 00 – Structural Metal Stud Framing 05 50 00 – Metal Fabrications
<b>DIVISION 06</b>	06 10 00 – Rough Carpentry 06 40 00 – Architectural Woodwork
<b>DIVISION 07</b>	07 11 13 – Bituminous Dampproofing 07 21 13 – Board Insulation 07 21 16 – Blanket Insulation 07 21 29.03 – Sprayed Insulation 07 26 16 – Under Slab Vapor Barrier 07 27 00 – Air Barriers 07 42 43 – Composite Wall Panels 07 52 16 – Modified Bituminous Membrane Roofing 07 62 00 – Sheet Metal Flashing and Trim

	07 72 00 – Roof Accessories
	07 81 00 – Applied Fireproofing
	07 84 00 – Firestopping
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<b>DIVISION 08</b>	08 11 00 – Metal Doors and Frames
	08 14 16 – Flush Wood Doors
	08 31 00.01 – Access doors – Mechanical (see pat 2 of 3)
	08 36 13.02 – Sectional Metal Doors
	08 51 13 – Aluminium Windows
	08 71 00 – Door Hardware
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<b>DIVISION 09</b>	09 21 16 – Gypsum Board Assemblies
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<b>DIVISION 23</b>	23 05 00 – Common work results - mechanical
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- 23 07 13 – Thermal Insulation for Ducting
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- 23 23 00 – Refrigerant piping
- 23 31 14 – Metal Ducts – Low Pressure to 500 Pa
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- 23 33 14 – Dampers - Balancing
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- 25 01 11 – EMCS: Start-up, Verification and Commissioning
- 25 01 12 – EMCS: Training
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- 25 10 01 – EMCS: Local Area Network (LAN)
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- 26 05 01 – Common Work Results
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- 26 05 21 – Wires and Cables (0-1000 V)
- 26 05 27 – Grounding - Primary
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- 26 05 29 – Hangers and Supports for Electrical Systems
- 26 05 31 – Splitters, Junction, Pull Boxes and Cabinets
- 26 05 32 – Outlet Boxes, Conduit Boxes and Fittings
- 26 05 34 – Conduits, Conduit Fastenings and Conduit Fittings
- 26 05 43.01 – Installation of Cables in Trenches and in Ducts
- 26 09 23.04 – Lighting Control Devices LED/Fluorescent Dimming
- 26 12 16.01 – Dry Type Transformers up to 600 V Primary
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- 26 27 26 – Wiring Devices
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- 26 29 10 – Motor Starters to 600 V
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- 26 36 23 – Automatic Transfer Switches
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- 26 82 33.02 – Commercial Convectors
- 26 82 39.01 – Unit heaters - Electric

**DIVISION 28**

- 28 31 02 – Fire Alarm System

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A003	SITE DETAILS
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A101	ROOF PLAN
A110	REFLECTED CEILING PLAN
A200	EXTERIOR ELEVATIONS
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A300	BUILDING SECTIONS
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A400	INTERIOR ELEVATIONS
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A500	DETAILS - ENVELOPE
A502	DETAILS - ROOFING
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A504	DETAILS - INTERIOR
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A551	DETAILS - MILLWORK
A600	WALLS & TYPICAL PARTITIONS
A601	WINDOW, DOOR & FRAME SCHEDULES
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S000	GENERAL NOTES ET DETAILS
S001	GENERAL NOTES ET DETAILS
S002	GENERAL NOTES ET DETAILS
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S100	FOUNDATION – GROUND FLOOR PLAN
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**MECHANICAL**

M000	DRAWINGS LIST AND LEGENDS
M100	GROUND FLOOR - FIRE PROTECTION
M200	GROUND FLOOR - PLUMBING
M201	GROUND FLOOR - STORM DRAINAGE
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**ELECTRICAL**

E000	DRAWING LIST AND LEGEND
E001	SITE PLAN - ELECTRICAL SERVICES AND SINGLELINE DIAGRAM
E100	GROUND FLOOR - LIGHTING AND EMERGENCY EXIT
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E200	ROOF PLAN
E300	MISCELLANEOUS DETAILS - PART 1
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**CIVIL**

C1	CIVIL DRAWING LIST AND LEGEND
C2	TOPOGRAPHICAL SURVEY PLAN
C3	GENERAL NOTES
C4	CIVIL SITE PLAN
C5	MUNICIPAL SERVICES AND GRADING PLAN
C6	DETAILS
C7	DETAILS
C8	DETAILS
C9	DETAILS
C10	DETAILS
C11	DETAILS
C12	DETAILS

**END OF SECTION**

**Part 1 General**

**1.1 WORK COVERED BY CONTRACT DOCUMENTS**

- .1 Work of this Contract comprises general construction of a new GRC building, located at Sept-Îles, Québec.

**1.2 CONTRACT METHOD**

- .1 Construct Work under stipulated price contract.
- .2 Relations and responsibilities between Contractor and subcontractors, Design-Builder and suppliers assigned by Owner are as defined in Conditions of Contract. Assigned Subcontractors must, in addition:
  - .1 Furnish to Contractor, bonds covering faithful performance of subcontracted work and payment of obligations thereunder when Consultant.
  - .2 Purchase and maintain liability insurance to protect Contractor from claims for not less than limits of liability which Contractor is required to provide to Consultant.

**1.3 OWNER FURNISHED ITEMS**

- .1 Owner Responsibilities:
  - .1 Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions, and certificates to Contractor.
  - .2 Deliver supplier's bill of materials to Contractor.
  - .3 Arrange and pay for delivery to site in accordance with Progress Schedule.
  - .4 Inspect deliveries jointly with Contractor.
  - .5 Submit claims for transportation damage.
  - .6 Arrange for replacement of damaged, defective or missing items.
  - .7 Arrange for manufacturer's field services; arrange for and deliver manufacturer's warranties and bonds to Contractor.
- .2 Contractor Responsibilities:
  - .1 Designate submittals and delivery date for each product in progress schedule.
  - .2 Review shop drawings, product data, samples, and other submittals. Submit to Consultant notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.
  - .3 Receive and unload products at site.
  - .4 Inspect deliveries jointly with Owner; record shortages, and damaged or defective items.
  - .5 Handle products at site, including uncrating and storage.
  - .6 Protect products from damage, and from exposure to elements.
  - .7 Assemble, install, connect, adjust, and finish products.
  - .8 Provide installation inspections required by public authorities.
  - .9 Repair or replace items damaged by Contractor or subcontractor on site (under his control).

**1.4 EXISTING SERVICES**

- .1 Notify Consultant and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Consultant 48 hours' notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize

- duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian and vehicular traffic.
- .3 Provide alternative routes for personnel, pedestrian and vehicular traffic.
  - .4 Establish location and extent of service lines in area of work before starting Work. Notify Consultant of findings.
  - .5 Submit schedule to and obtain approval from Consultant for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
  - .6 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.
  - .7 Where unknown services are encountered, immediately advise Consultant and confirm findings in writing.
  - .8 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
  - .9 Record locations of maintained, re-routed and abandoned service lines.
  - .10 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

**1.5 DOCUMENTS REQUIRED**

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

**Part 2 Products**

**2.1 NOT USED**

- .1 Not used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not used.

**END OF SECTION**



**PART 1 GENERAL**

**1.1 APPOINTMENT AND PAYMENT**

- .1 Consultant will appoint and pay for services of testing laboratory except as follows:
  - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
  - .2 Inspection and testing performed exclusively for Contractor's convenience.
  - .3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
  - .4 Mill tests and certificates of compliance.
  - .5 Tests specified to be carried out by Contractor under supervision of Consultant.
- .2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, Contractor will pay costs for additional tests or inspections as required by Consultant to verify acceptability of corrected work.

**1.2 CONTRACTOR'S RESPONSIBILITIES**

- .1 Provide labour, equipment and facilities to:
  - .1 Provide access to Work for inspection and testing.
  - .2 Facilitate inspections and tests.
  - .3 Make good Work disturbed by inspection and test.
  - .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
- .2 Notify Consultant 48 hours in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Consultant.

**PART 2 PRODUCTS**

**2.1 NOT USED**

- .1 Not Used.

**PART 3 EXECUTION**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 03 36 20 – Concrete surfaces finishing

**1.2 ADMINISTRATIVE**

- .1 Consultant must schedule and administer project meetings throughout the progress of the work.
- .2 Consultant must prepare agenda for meetings.
- .3 Consultant must distribute written notice of each meeting four days in advance of meeting date.
- .4 Consultant must provide physical space and make arrangements for meetings.
- .5 Consultant must preside at meetings.
- .6 Consultant must record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7 Consultant must reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants and affected parties not in attendance.
- .8 Representatives of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of the party that each represents.

**1.3 PRECONSTRUCTION MEETING**

- .1 Within 15 days after award of contract, consultant must request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Owner, Consultant, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
- .3 Consultant must establish time and location of meeting and notify parties concerned a minimum of 5 days before meeting.
- .4 Consultant must incorporate mutually agreed variations to contract documents into agreement, prior to signing.
- .5 Agenda to include:
  - .1 Appointment of official representatives of Work participants.
  - .2 Schedule of Work: in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.
  - .3 Schedule of submission of shop drawings, samples and colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .4 Requirements for temporary facilities, site signage, offices, storage sheds, utilities and fences in accordance with Section 01 52 00 - Construction Facilities.
  - .5 Delivery schedule of specified material and equipment.
  - .6 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
  - .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

- .8 Owner provided products.
- .9 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .10 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
- .11 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
- .12 Monthly progress claims, administrative procedures, photographs, hold backs.
- .13 Appointment of inspection and testing agencies or firms.
- .14 Insurances, transcript of policies.

**1.4 PROGRESS MEETINGS**

- .1 Consultant must establish a schedule of progress meetings which will take place during course of work and 2 weeks prior to project completion.
- .2 Major Subcontractors involved in Work, Consultant and Owner are to be in attendance.
- .3 Consultant must notify parties a minimum of 5 days prior to meetings.
- .4 Consultant must record minutes of meetings and circulate to attending parties and affected parties not in attendance within 5 days after meeting.
- .5 Agenda to include the following:
  - .1 Review, approval of minutes of previous meeting.
  - .2 Review of Work progress since previous meeting.
  - .3 Field observations, problems, conflicts.
  - .4 Problems which impede construction schedule.
  - .5 Review of off-site fabrication delivery schedules.
  - .6 Corrective measures and procedures to regain projected schedule.
  - .7 Revision to construction schedule.
  - .8 Progress schedule, during succeeding work period.
  - .9 Review submittal schedules: expedite as required.
  - .10 Maintenance of quality standards.
  - .11 Review proposed changes for effects on construction schedule and on completion date.
  - .12 Other

**PART 2 PRODUCTS**

**2.1 NOT USED**

- .1 Not Used.

**PART 3 EXECUTION**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1 General****1.1 DEFINITIONS**

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

**1.2 REQUIREMENTS**

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

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**1.3 SUBMITTALS**

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

**1.4 PROJECT MILESTONES**

- .1 Project milestones form interim targets for Project Schedule.
  - .1 Contractor to complete all excavation work within 25 working days of Award of Contract date.
  - .2 Contractor to complete all infrastructure work within 40 working days of Award of Contract date.
  - .3 Contractor to complete all superstructure work within 65 working days of Award of Contract date.
  - .4 The building should be closed off and weatherproof no later than 105 days after Award of Contract date.
  - .5 Finishing and interior design, as well as electrical and mechanical installations, must be completed no later than 125 working days after Award of Contract date.
  - .6 Interim Certificate of Completion (substantial completion) must be issued no later than 130 days after Award of Contract date.

**1.5 MASTER PLAN**

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

**1.6 PROJECT SCHEDULE**

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
  - .1 Award.
  - .2 Shop Drawings, Samples.
  - .3 Permits.
  - .4 Mobilization.
  - .5 Excavation.
  - .6 Filling.
  - .7 Building footing.

- .8 Floor slab.
- .9 Construction steel.
- .10 Wall covering.
- .11 Interior architectural elements (walls, floors, ceilings).
- .12 Plumbing
- .13 Lighting.
- .14 Electricity.
- .15 Piping.
- .16 Controls.
- .17 Heating, Ventilating, and Air Conditioning.
- .18 Millwork.
- .19 Fire Systems.
- .20 Testing and Commissioning.
- .21 Supplied equipment long delivery items.
- .22 Engineer supplied equipment required dates.

**1.7 PROJECT SCHEDULE REPORTING**

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

**1.8 PROJECT MEETINGS**

- .1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
- .2 Also discuss delays due to bad weather and negotiate measures to make up for it.

**Part 2 Products**

**2.1 Not Used**

- .1 Not used.

**Part 3 Execution**

**3.1 Not Used**

- .1 Not used.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 ADMINISTRATIVE**

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

**1.2 SHOP DRAWINGS AND PRODUCT DATA**

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Submit drawings stamped and signed by professional engineer registered or licensed in Canada, in the province of Québec.
- .3 Shop drawings must indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 10 days for Consultant's review of each submission.
- .5 Adjustments made on shop drawings by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.

- .6 Make changes in shop drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter, containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, product data and sample.
  - .5 Other pertinent data.
- .8 Submissions include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
  - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
  - .5 Details of appropriate portions of Work as applicable:
    - .1 Fabrication details and materials.
    - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
    - .3 Setting or erection details.
    - .4 Characteristics such as power, flow or capacity.
    - .5 Performance characteristics.
    - .6 Standards.
    - .7 Operating weight.
    - .8 Wiring diagrams.
    - .9 Single line and schematic diagrams.
    - .10 Relationship to adjacent work.
- .9 After Consultant's review, distribute copies.
- .10 Submit one (1) electronic copy of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.
- .11 Submit (1) electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit (1) electronic copy of test reports for requirements requested in specification Sections and as requested by Consultant.
  - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accordance with specified requirements.



- .2 Testing must have been within 3 years of date of contract award for project.
- .13 Submit (1) electronic copy of certificates for requirements requested in specification Sections and as requested by Consultant.
  - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
  - .2 Certificates must be dated after award of project contract complete with project name.
- .14 Submit (1) electronic copy of manufacturer's instructions for requirements requested in specification Sections and as requested by Consultant.
  - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit (1) electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Consultant.
- .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Submit (1) electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Consultant.
- .18 Delete information not applicable to project.
- .19 Supplement standard information to provide details applicable to project.
- .20 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, one electronic copy will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

### **1.3 SAMPLES**

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

**1.4 MOCK-UPS**

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

**1.5 PHOTOGRAPHIC DOCUMENTATION**

- .1 Submit electronic and hard copy of colour digital photography in jpg format, high resolution, monthly with progress statement as directed by Consultant.
- .2 Project identification: name and number of project and date of exposure indicated.
- .3 Number of viewpoints: 4 locations.
  - .1 Viewpoints and their location as determined by Consultant.
- .4 Frequency of photographic documentation: weekly

**1.6 CERTIFICATES AND TRANSCRIPTS**

- .1 Immediately after award of Contract, submit documents required by the Committee on Health and Safety in the workplace.
- .2 Submit transcription of insurance immediately after award of Contract.

**PART 2 PRODUCTS**

**2.1 NOT USED**

- .1 Not Used.

**PART 3 EXECUTION**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 REFERENCES**

- .1 Canada Labor Code - Part II, Canadian Occupational Safety and Health Regulations.
- .2 Province of Québec
  - .1 Act Respecting Occupational Health and Safety, L.R.Q., c. S-2.1 (current edition) – Updated 2005

**1.2 SUBMITTALS**

- .1 Submit the documents required according to section 01 33 00 Submittal Procedures.
- .2 Submit, no later than seven (7) days after the date of service of the execution order and before mobilization of the labor force, a health and safety plan established specifically for construction and comprising the following elements.
  - .1 Results of risks/hazards assessments specific to worksite safety.
  - .2 Results of analysis of risks/hazards to Health and Safety associated with each task and activity.
- .3 Submit weekly, to Consultant and relevant authority, one copy of site inspection sheet report, duly completed by Contractor's authorized Representative.
- .4 Submit copies of guidelines or reports prepared by Health and Safety federal, provincial and territorial government inspectors.
- .5 Submit copies of accident/incident reports.
- .6 Submit WHMIS safety data sheets (MSDS).
- .7 Consultant will examine Health and Safety plan prepared by Contractor for work site and will issue comments within 7 days of receipt of document. If necessary, Contractor will revise Health and Safety plan and submit it again to Consultant no later than 7 days after receipt of Consultant's comments.
- .8 Consultant's review of the Health and Safety final plan prepared by the Contractor for the work site should not be interpreted as an endorsement of that plan and does not limit the overall responsibility of the Contractor in terms of Health and Safety during construction work.
- .9 Medical surveillance: where there is a law, a regulation or a prescribed security program, submit, before starting work, certification of medical surveillance of the personnel working on site. Ask Consultant for additional certification for any new employee working on site.
- .10 Emergency plan: outline procedures and steps to follow in case of emergency on site.

**1.3 NOTICE OF PROPOSED WORK**

- .1 Before start of work, send notice of proposed work to the relevant provincial authorities.
- .2 Contractor must assume role of Prime Contractor for each work area and not for the whole complex. Contractor must acknowledge this responsibility in writing within three (3) weeks of

Award of Contract. Contractor must send acknowledgement of receipt written to the CSST along with notice of work commencement.

- .3 Contractor must agree to divide and identify the site appropriately, in order to define time and space at any time during the project duration.

#### **1.4 HAZARDS ASSESSMENT**

- .1 Identify all security hazards inherent in execution work at the site.

#### **1.5 MEETINGS**

- .1 Organize Health and Safety meeting with Consultant before start of work, and provide overall guidance.

#### **1.6 LEGAL AND REGULATORY REQUIREMENTS**

- .1 Perform work in accordance with section 01 41 00 - regulatory requirements.

#### **1.7 GENERAL REQUIREMENTS**

- .1 Write up Health and Safety plan specific to work site, based on risks/hazards assessment carried out prior to undertaking work. Implement plan and ensure compliance in all respects until demobilization of all site personnel. Health and Safety plan must take into account project specifics.
- .2 Consultant may address comments in writing if plan shows anomalies or if it raises concerns, and may require submission of a revised plan which will correct these anomalies or eliminate these concerns.

#### **1.8 RESPONSIBILITIES**

- .1 Assume responsibility of Health and Safety of people present on site, as well as protection of property located on site; assume also, in areas adjacent to work site, protection of people and environment insofar as they are affected by the work.
- .2 As part of construction work, Contractor must be Prime Contractor as described in Quebec Occupational Health and Safety Act, to perform only work being part of its scope and of areas defined and described in the specifications herein.
- .3 Respect, and ensure that employees respect, safety requirements outlined in contract documents, ordinances, applicable local, territorial, provincial and federal laws and regulations, as well as in Health and Safety plan prepared for the work site.

#### **1.9 COMPLIANCE REQUIREMENTS**

- .1 Comply with Occupational Health and Safety Act, L.R.Q., c. S - 2.1, and with Safety Code for the Construction Industry, c. S - 2.1, r. 4.

#### **1.10 UNFORESEEN CIRCUMSTANCES**

- .1 In presence of conditions, risks/hazards or specific or unforeseen factors affecting safety during execution of work, notify Health and Safety coordinator and follow procedures in

accordance with the laws and regulations of relevant province, and notify Consultant verbally and in writing.

**1.11 DISPLAY OF DOCUMENTS**

- .1 Ensure that documents, articles, orders and relevant opinions are displayed, prominently, on site, in accordance with laws and regulations of relevant province and after reviewing with Consultant.

**1.12 INSPECTION OF SITE AND CORRECTION OF HAZARDOUS SITUATIONS**

- .1 Immediately take all necessary measures to correct any lapses from legislative or regulatory requirements and any hazards identified by the relevant authority or by the consultant.
- .2 Submit to Consultant written confirmation of all measures taken to correct lapses and hazardous situations.
- .3 Consultant may order cessation of work if, in his/her view, there is any hazard or threat to the safety or health of site personnel or the public or to the environment and if Contractor does not remedy situation in a satisfactory manner.

**1.13 BLASTING**

- .1 Blasting and other use of explosives are allowed solely if Consultant has submitted written instructions on the matter.

**1.14 CARTRIDGE OPERATED DEVICES**

- .1 Only use cartridge operated devices if instructed in writing by Consultant

**1.15 WORK TERMINATION**

- .1 Prioritize Health and Safety of public and site personnel, and protection of the environment, when faced with issues related to cost and schedule of work.

**PART 2 PRODUCTS**

**2.1 NOT USED**

- .1 Not Used.

**PART 3 EXECUTION**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 REFERENCES**

- .1 Definitions:
  - .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
  - .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.
- .2 Reference Standards:
  - .1 Canadian Construction Documents Committee (CCDC)
    - .1 CCDC 2-2008 Stipulated Price Contract.
  - .2 U.S. Environmental Protection Agency (EPA)/Office of Water
    - .1 EPA 832/R-92-005-92, Storm Water Management for Construction Activities, Chapter 3.
    - .2 EPA General Construction Permit (GCP) 2012.

**1.2 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and required data sheets and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 43 - Environmental Procedures.
- .3 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Consultant.
- .4 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
- .5 Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .6 Include in Environmental Protection Plan:
  - .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
  - .2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
  - .3 Names and qualifications of persons responsible for training site personnel.
  - .4 Descriptions of environmental protection personnel training program.
  - .5 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to

- assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .6 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
  - .7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.
    - .1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.
  - .8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
    - .1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
  - .9 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
  - .10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
  - .11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
  - .12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
  - .13 Waste Water Management Plan identifying methods and procedures for management and discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
  - .14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.
  - .15 Pesticide treatment plan to be included and updated, as required.

### **1.3 FIRES**

- .1 Fires and burning of rubbish on site is not permitted.

### **1.4 DRAINAGE**

- .1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations, EPA 832/R-92-005, Chapter 3.
- .2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sediment control plan.
- .3 Provide temporary drainage and pumping required to keep excavations and site free from water.

- .4 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

### **1.5 SITE CLEARING AND PLANT PROTECTION**

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

### **1.6 WORK ADJACENT TO WATERWAYS**

- .1 Construction equipment to be operated on land only.
- .2 Use waterway beds for borrow material only after written receipt of approval from Consultant.
- .3 Waterways to be kept free of excavated fill, waste material and debris.
- .4 Design and construct temporary crossings to minimize erosion to waterways.
- .5 Do not skid logs or construction materials across waterways.
- .6 Avoid indicated spawning beds when constructing temporary crossings of waterways.
- .7 Blasting is allowed only above water and 100 m minimum from indicated spawning beds.

### **1.7 POLLUTION CONTROL**

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

### **1.8 HISTORICAL/ARCHAEOLOGICAL CONTROL**

- .1 Provide historical, archaeological, cultural resources, biological resources, and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on project site: and identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in area are discovered during construction.



- .2 Plan: include methods to assure protection of known or discovered resources and identify lines of communication between Contractor and Consultant.

## **1.9 NOTIFICATION**

- .1 Consultant will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 Contractor: after receipt of such notice, inform Consultant of proposed corrective action and take such action for approval by Consultant.
  - .1 Take action only after receipt of written approval by [Departmental Representative] [DCC Representative] [Consultant].
- .3 Consultant will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

## **PART 2 PRODUCTS**

### **2.1 NOT USED**

- .1 Not Used.

## **PART 3 EXECUTION**

### **3.1 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Bury rubbish and waste materials on site where directed after receipt of written approval from Consultant.
- .3 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.
- .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .5 Waste Management: separate waste materials for reuse, recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 REFERENCES AND CODES**

- .1 Perform Work in accordance with National Building Code of Canada (NBC) including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.
- .2 Meet or exceed requirements of:
  - .1 Contract documents.
  - .2 Specified standards, codes and referenced documents.

**1.2 HAZARDOUS MATERIAL DISCOVERY**

- .1 Asbestos: demolition of spray or trowel-applied asbestos is hazardous to health. Stop work immediately when material resembling spray or trowel-applied asbestos is encountered during demolition work. Notify Consultant.
- .2 PCB: Polychlorinated Biphenyl: stop work immediately when material resembling Polychlorinated Biphenyl is encountered during demolition work. Notify Consultant.
- .3 Mould: stop work immediately when material resembling mould is encountered during demolition work. Notify Consultant.

**1.3 BUILDING SMOKING ENVIRONMENT**

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

**PART 2 PRODUCTS**

**2.1 NOT USED**

- .1 Not Used.

**PART 3 EXECUTION**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 INSPECTION**

- .1 Allow Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Consultant's instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Consultant will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, Contractor must correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Consultant shall pay cost of examination and replacement.

### **1.2 INDEPENDENT INSPECTION AGENCIES**

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

### **1.3 ACCESS TO WORK**

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

### **1.4 PROCEDURES**

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

**1.5 REJECTED WORK**

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

**1.6 REPORTS**

- .1 Submit 4 copies of inspection and test reports to Consultant.
- .2 Provide copies to subcontractor of work being inspected or tested and to the manufacturer or fabricator of material being inspected or tested.

**1.7 TESTS AND MIX DESIGNS**

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

**1.8 MOCK-UPS**

- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.
- .2 Construct in locations as specified in specific Section acceptable to Consultant.
- .3 Prepare mock-ups for Consultant's review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 If requested, Consultant will assist Contractor in preparing schedule fixing dates for preparation.
- .6 Mock-ups may remain as part of Work.

**1.9 MILL TESTS**

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

**1.10 EQUIPMENT AND SYSTEMS**

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

**PART 2 PRODUCTS**

**2.1 NOT USED**

.1 Not Used.

**PART 3 EXECUTION**

**3.1 NOT USED**

.1 Not Used.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 REFERENCES**

- .1 U.S. Environmental Protection Agency (EPA) / Office of Water
  - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

**1.2 ACTION AND INFORMATIONAL SUBMITTALS**

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

**1.3 INSTALLATION AND REMOVAL**

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

**1.4 DEWATERING**

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

**1.5 WATER SUPPLY**

- .1 Provide continuous supply of potable water for construction use.
- .2 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.
- .3 Pay for utility charges at prevailing rates.

**1.6 TEMPORARY HEATING AND VENTILATION**

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- .2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
  - .1 Facilitate progress of Work.
  - .2 Protect Work and products against dampness and cold.
  - .3 Prevent moisture condensation on surfaces.
  - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
  - .5 Meet health regulations requirements for safe working environment.
- .4 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress.
- .5 Ventilating:
  - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.

- .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
- .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
- .4 Ventilate storage spaces containing hazardous or volatile materials.
- .5 Ventilate temporary sanitary facilities.
- .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .6 Permanent heating system of building, not to be used when available.
- .7 Ensure Date of Substantial Performance and Warranties for heating system do not commence until entire system is in as near original condition as possible and is certified by Consultant.
- .8 Pay costs for maintaining temporary heat, when using permanent heating system.
- .9 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
  - .1 Conform to applicable codes and standards.
  - .2 Enforce safe practices.
  - .3 Prevent abuse of services.
  - .4 Prevent damage to finishes.
  - .5 Vent direct-fired combustion units to outside.
- .10 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

**1.7 TEMPORARY POWER AND LIGHT**

- .1 Provide and pay for temporary power during construction for temporary lighting and operating of power tools, to a maximum supply of 230 volts, 30 amps.
- .2 Arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.
- .3 Temporary power for electric cranes and other equipment requiring in excess of above is responsibility of Consultant.
- .4 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

**1.8 TEMPORARY COMMUNICATION FACILITIES**

- .1 Contractor must provide and pay for temporary telephone, fax, data, hook up, lines, equipment necessary for own use and use of Consultant.

**1.9 FIRE PROTECTION**

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

**PART 2 PRODUCTS**

**2.1 NOT USED**

- .1 Not Used.

**PART 3 EXECUTION**

**3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL**

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

**END OF SECTION**



**PART 1 GENERAL**

**1.1 REFERENCES**

- .1 Canadian Construction Documents Committee (CCDC)
  - .1 CCDC 2-1994, Stipulated Price Contract.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
  - .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
- .3 Canadian Standards Association (CSA International)
  - .1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CSA-0121-M1978(R2003), Douglas Fir Plywood.
  - .3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
  - .4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.
- .4 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as of: May 14, 2004.
- .5 U.S. Environmental Protection Agency (EPA) / Office of Water
  - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

**1.2 ACTION AND INFORMATIONAL SUBMITTALS**

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

**1.3 INSTALLATION AND REMOVAL**

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

**1.4 SCAFFOLDING**

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

**1.5 HOISTING**

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

**1.6 SITE STORAGE/LOADING**

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

**1.7 CONSTRUCTION PARKING**

- .1 Parking will be permitted on site provided it does not disrupt performance of Work.
- .2 Provide and maintain adequate access to project site.
- .3 Clean runways and taxi areas where used by Contractor's equipment.

**1.8 SECURITY**

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

**1.9 OFFICES**

- .1 Provide office heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.
- .2 Provide marked and fully stocked first-aid case in a readily available location.
- .3 Subcontractors to provide their own offices as necessary. Direct location of these offices.
- .4 Consultant's Site office.
  - .1 Provide temporary office for Consultant
  - .2 Inside dimensions minimum 3.6 m long x 3 m wide x 2.4 m high, with floor 0.3 m above grade, complete with 4 50% opening windows and one lockable door.
  - .3 Insulate building and provide heating system to maintain 22 degrees C inside temperature at -20 degrees C outside temperature.
  - .4 Finish inside walls and ceiling with plywood, hardboard or wallboard and paint in selected colours. Finish floor with 19 mm thick plywood.
  - .5 Install electrical lighting system to provide min 750 lx using surface mounted shielded commercial fixtures with 10 % upward light component.
  - .6 Provide private washroom facilities adjacent to office complete with flush or chemical type toilet, lavatory and mirror and maintain supply of paper towels and toilet tissue.
  - .7 Equip office with 1 x 2 m table, 4 chairs, 6 m of shelving 300 mm wide, one 3 drawer filing cabinet, one plan rack and one coat rack and shelf.
  - .8 Maintain in clean condition.

**1.10 EQUIPMENT, TOOL AND MATERIALS STORAGE**

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

**1.11 SANITARY FACILITIES**

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.
- .3 When permanent water and drain connections are completed, provide temporary water closets and urinals complete with temporary enclosures, inside building. Permanent facilities may be used on approval of Consultant.

**1.12 CONSTRUCTION SIGNAGE**

- .1 Provide and erect project sign, within three weeks of signing Contract, in a location designated by Consultant.
- .2 Construction sign 2 x 2 m, of wood frame and plywood construction painted with exhibit lettering produced by a professional sign painter.
- .3 Indicate on sign, name of Owner, Consultant and Contractor, design style as established by Consultant.
- .4 No other signs or advertisements, other than warning signs, are permitted on site.
- .5 Locate project identification sign where indicated by Consultant and construct as follows:
  - .1 Build concrete foundation, erect framework, and attach signboard to framing.
  - .2 Paint surfaces of signboard and framing with one coat primer and two coats enamel. Colour white on signboard face, black on other surfaces.
  - .3 Apply vinyl sign face overlay to painted signboard face in accordance with installation instruction supplied.
- .6 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.
- .7 Maintain approved signs and notices in good condition for duration of project, and dispose of off-site on completion of project or earlier if directed by Consultant.

**1.13 PROTECTION AND MAINTENANCE OF TRAFFIC**

- .1 Provide access and temporary relocated roads as necessary to maintain traffic.
- .2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Consultant.
- .3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

- .4 Protect travelling public from damage to person and property.
- .5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .7 Construct access and haul roads necessary.
- .8 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.
- .9 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .10 Dust control: adequate to ensure safe operation at all times.
- .11 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Consultant.
- .12 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.
- .13 Provide snow removal during period of Work.
- .14 Remove, upon completion of work, haul roads designated by Consultant.

**1.14 CLEAN-UP**

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

**PART 2 PRODUCTS**

**2.1 NOT USED**

- .1 Not Used.

**PART 3 EXECUTION**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 REFERENCES**

- .1 Canadian General Standards Board (CGSB)
  - .1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
  - .2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
- .2 Canadian Standards Association (CSA International)
  - .1 CSA-O121-M1978 (R2003), Douglas Fir Plywood.
- .3 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as Of: May 14, 2004.

**1.2 INSTALLATION AND REMOVAL**

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

**1.3 HOARDING**

- .1 Erect temporary site enclosures using 38 x 89 mm construction grade lumber framing at 600 mm centres and 1200 x 2400 x 13 mm exterior grade fir plywood to CSA O121.
- .2 Apply plywood panels vertically flush and butt jointed.
- .3 Provide one lockable truck entrance gate and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.
- .4 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.
- .5 Paint public side of site enclosure in selected colours with one coat primer to CAN/CGSB 1.189 and one coat exterior paint to CGSB 1.59. Maintain public side of enclosure in clean condition.
- .6 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

**1.4 GUARD RAILS AND BARRICADES**

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

**1.5 WEATHER ENCLOSURES**

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

**1.6 DUST TIGHT SCREENS**

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

**1.7 ACCESS TO SITE**

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

**1.8 PUBLIC TRAFFIC FLOW**

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

**1.9 FIRE ROUTES**

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

**1.10 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY**

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

**1.11 PROTECTION OF BUILDING FINISHES**

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

**1.12 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse/ recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

**PART 2 PRODUCTS**

**2.1 NOT USED**

- .1 Not Used.

**PART 3 EXECUTION**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 REFERENCES**

- .1 Within text of each specifications section, reference may be made to reference standards.
- .2 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .3 If there is question as to whether products or systems are in conformance with applicable standards, Consultant reserves right to have such products or systems tested to prove or disprove conformance.
- .4 Cost for such testing will be borne by Consultant in event of conformance with Contract Documents or by Contractor in event of non-conformance.

**1.2 QUALITY**

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

**1.3 AVAILABILITY**

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

**1.4 STORAGE, HANDLING AND PROTECTION**

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Remove and replace damaged products at own expense and to satisfaction of Consultant.
- .9 Touch-up damaged factory finished surfaces to Consultant's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

**1.5 TRANSPORTATION**

- .1 Pay costs of transportation of products required in performance of Work.
- .2 Transportation cost of products supplied by Owner will be paid for by Consultant. Unload, handle and store such products.

**1.6 MANUFACTURER'S INSTRUCTIONS**

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

**1.7 QUALITY OF WORK**

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



**1.8 CO-ORDINATION**

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

**1.9 CONCEALMENT**

- .1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
- .2 Before installation inform Consultant if there is interference. Install as directed by Consultant.

**1.10 REMEDIAL WORK**

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

**1.11 LOCATION OF FIXTURES**

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

**1.12 FASTENINGS**

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

**1.13 FASTENINGS - EQUIPMENT**

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
- .3 Bolts may not project more than one diameter beyond nuts.

- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

**1.14 PROTECTION OF WORK IN PROGRESS**

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

**1.15 EXISTING UTILITIES**

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

**PART 2 PRODUCTS**

**2.1 NOT USED**

- .1 Not Used.

**PART 3 EXECUTION**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 REFERENCES**

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

**1.2 QUALIFICATIONS OF SURVEYOR**

- .1 Qualified registered land surveyor, licensed to practice in Place of Work, acceptable to Consultant.

**1.3 SURVEY REFERENCE POINTS**

- .1 Existing base horizontal and vertical control points are designated on drawings.
- .2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to Consultant.
- .4 Report to Consultant when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

**1.4 SURVEY REQUIREMENTS**

- .1 Establish two permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.
- .2 Establish lines and levels, locate and lay out, by instrumentation.
- .3 Stake for grading, fill and topsoil placement as well as landscaping features.
- .4 Stake slopes and berms.
- .5 Establish pipe invert elevations.
- .6 Stake batter boards for foundations.
- .7 Establish foundation, column locations and floor elevations.
- .8 Establish lines and levels for mechanical and electrical work.

**1.5 EXISTING SERVICES**

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

**1.6 LOCATION OF EQUIPMENT AND FIXTURES**

- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Consultant of impending installation and obtain approval for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment when required by Consultant.

**1.7 RECORDS**

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

**1.8 ACTION AND INFORMATIONAL SUBMITTALS**

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

**PART 2 PRODUCTS**

**2.1 NOT USED**

- .1 Not Used.

**PART 3 EXECUTION**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 ACTION AND INFORMATIONAL SUBMITTALS**

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

**1.2 MATERIALS**

- .1 Material /equipment to perform identical installation.
- .2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

**1.3 PREPARATION**

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

**1.4 EXECUTION**

- .1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.
- .2 Fit several parts together, to integrate with other Work.
- .3 Uncover Work to install ill-timed Work.
- .4 Remove and replace defective and non-conforming Work.

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

**1.5 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse / recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

**PART 2 PRODUCTS**

**2.1 NOT USED**

- .1 Not Used.

**PART 3 EXECUTION**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 PROJECT CLEANLINESS**

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site, unless approved by Consultant.
- .3 Clear snow and ice from access to building, bank/pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site, containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .7 Dispose of waste materials and debris off site.
- .8 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .9 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .10 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .11 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .12 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

**1.2 FINAL CLEANING**

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris including that caused by Owner or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site, unless approved by Consultant.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

- .8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors as well as ceilings.
- .9 Clean lighting reflectors, lenses, and other lighting surfaces.
- .10 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .11 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.
- .12 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .13 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .14 Remove dirt and other disfiguration from exterior surfaces.
- .15 Clean and sweep roofs, gutters, areaways, and sunken wells.
- .16 Sweep and wash clean paved areas.
- .17 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.
- .18 Clean roofs, downspouts, and drainage systems.
- .19 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
- .20 Remove snow and ice from access to building.

**1.3 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse/ recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

**PART 2 PRODUCTS**

**2.1 NOT USED**

- .1 Not Used.

**PART 3 EXECUTION**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**



**PART 1 GENERAL**

**1.1 REFERENCES**

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

**1.2 ADMINISTRATIVE REQUIREMENTS**

- .1 Pre-warranty Meeting:
  - .1 Convene meeting one week prior to contract completion with Consultant in accordance with Section 01 31 19 - Project Meetings to:
    - .1 Verify Project requirements.
    - .2 Review warranty requirements and manufacturer's installation instructions.
  - .2 Consultant to establish communication procedures for:
    - .1 Notifying construction warranty defects.
    - .2 Determine priorities for type of defects.
    - .3 Determine reasonable response time.
  - .3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.
  - .4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Two weeks prior to Substantial Performance of the Work, submit to Consultant, four final copies of operating and maintenance manuals in French.
- .3 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
- .4 Provide evidence, if requested, for type, source and quality of products supplied.

**1.4 FORMAT**

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used, correlate data into related consistent groupings.
  - .1 Identify contents of each binder on spine.
- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

- .5 Arrange content by systems or logical order, under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab.
  - .1 Bind in with text; fold larger drawings to size of text pages.
- .9 Provide 1:1 scaled CAD files in dwg format on CD.

## **1.5 CONTENTS - PROJECT RECORD DOCUMENTS**

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

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

- .1 Maintain, at site for Consultant, one record copy of:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders and other modifications to Contract.
  - .5 Reviewed shop drawings, product data, and samples.
  - .6 Field test records.
  - .7 Inspection certificates.
  - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction.
  - .1 Provide files, racks, and secure storage.

- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
  - .1 Label each document "Project Record" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
  - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Consultant.

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

- .1 Record information on set of blue line opaque drawings.
- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress.
  - .1 Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
  - .1 Measured depths of elements of foundation in relation to finish first floor datum.
  - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
  - .4 Field changes of dimension and detail.
  - .5 Changes made by change orders.
  - .6 Details not on original Contract Drawings.
  - .7 References to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction, including:
  - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
  - .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.
- .7 Provide digital photos, if requested, for site records.

## **1.8 FINAL SURVEY**

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

## **1.9 EQUIPMENT AND SYSTEMS**

- .1 For each item of equipment and each system include description of unit or system, and component parts.
  - .1 Give function, normal operation characteristics and limiting conditions.

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

**1.10 MATERIALS AND FINISHES**

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

**1.11 MAINTENANCE MATERIALS**

- .1 Spare Parts:
  - .1 Provide spare parts, in quantities specified in individual specification sections.

- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to location as directed by Consultant; place and store.
- .4 Receive and catalogue items.
  - .1 Submit inventory listing to Consultant.
  - .2 Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.
- .2 Extra Stock Materials:
  - .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
  - .2 Provide items of same manufacture and quality as items in Work.
  - .3 Deliver to location as directed by Consultant; place and store.
  - .4 Receive and catalogue items.
    - .1 Submit inventory listing to Consultant.
    - .2 Include approved listings in Maintenance Manual.
  - .5 Obtain receipt for delivered products and submit prior to final payment.
- .3 Special Tools:
  - .1 Provide special tools, in quantities specified in individual specification section.
  - .2 Provide items with tags identifying their associated function and equipment.
  - .3 Deliver to location as directed by Consultant; place and store.
  - .4 Receive and catalogue items.
    - .1 Submit inventory listing to Consultant.
    - .2 Include approved listings in Maintenance Manual.

**1.12 DELIVERY, STORAGE AND HANDLING**

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

**1.13 WARRANTIES AND BONDS**

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Consultant for approval.
- .3 Warranty management plan to include required actions and documents to assure that Consultant receives warranties to which it is entitled.
- .4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

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

- .4 Contractor's plans for attendance at 4 and 9 month post-construction warranty inspections.
- .5 Procedure and status of tagging of equipment covered by extended warranties.
- .6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.
- .10 Respond in timely manner to oral or written notification of required construction warranty repair work.
- .11 Written verification to follow oral instructions.
  - .1 Failure to respond will be cause for the Consultant to proceed with action against Contractor.

**1.14 WARRANTY TAGS**

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

**PART 2 PRODUCTS**

**2.1 NOT USED**

- .1 Not Used.

**PART 3 EXECUTION**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 04 05 12 - Masonry mortar and grout
- .2 Section 04 05 19 - Masonry anchorage and reinforcing
- .3 Section 04 05 23 - Masonry accessories
- .4 Section 04 21 13 - Brick masonry
- .5 Section 05 41 00 - Structural metal stud framing
- .6 Section 05 50 00 - Metal fabrications
- .7 Section 07 21 13 - Board insulation
- .8 Section 07 21 16 - Blanket insulation
- .9 Section 07 21 19 - Sprayed insulation
- .10 Section 07 27 00 - Air barriers
- .11 Section 07 90 00 - Sealing products
- .12 Section 09 21 16 - Gypsum board assemblies

**1.2 REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CSA-A165 Series-04, Standards on Concrete Masonry Units.
  - .2 CSA A179-04, Mortar and Grout for Unit Masonry.
  - .3 CSA-A371-04, Masonry Construction for Buildings.

**1.3 ACTION SUBMITTALS**

- .1 Product Data:
  - .1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, limitations and colours in accordance with Division 1 – General Requirements
- .2 Manufacturer's Instructions:
  - .1 Submit implementation instructions provided by manufacturer.

**1.4 INFORMATION SUBMITTALS**

- .1 Certificates: provide manufacturer's product certificates certifying materials comply with specified requirements.
- .2 Test and Evaluation Reports:
  - .1 Provide certified test reports in accordance with Division 1 – General Requirements.
  - .2 Test reports to certify compliance of masonry units and mortar ingredients with specified performance characteristics and physical properties.
  - .3 Provide data for masonry units, in addition to requirements set out in referenced CSA and ASTM Standards, indicating initial rates of absorption.



**1.5 DELIVERY, STORAGE, AND HANDLING**

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

**1.6 PROTECTION**

Protect masonry and adjacent structures from dirt and other damage. Protect completed works from mortar splatter using non-staining coverings.

**1.7 QUALITY ASSURANCE**

- .1 All work in this Section will be carried out by skilled operatives with valid experience in this type of work. The work shall be carried out according to the profession's best practices, the rules of the art and the 2005 National Building Code's technical requirements.

**1.8 SITE CONDITIONS**

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

**1.9 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- .1 Masonry materials are specified in relevant Sections.

**PART 3 EXECUTION**

**3.1 MANUFACTURER'S INSTRUCTIONS**

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

**3.2 EXAMINATION**

- .1 Examine conditions, substrates and work to receive masonry.
- .2 Verification of Conditions:
  - .1 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 concrete block.
  - .2 Verify that field conditions are acceptable and are ready to receive work.
  - .3 Verify that built-in items are in proper location, and ready for roughing into masonry work.
- .3 Commencing installation means acceptance of existing substrates.

**3.3 PREPARATION**

- .1 Surface Preparation: prepare surface in accordance with manufacturer's written recommendations and co-ordinate with Division 1, General Requirements.
- .2 Establish and take necessary steps to protect lines, levels, and coursing.
- .3 Protect adjacent materials from damage and disfiguration.
- .4 Brace masonry structures temporarily during and after work implementation until permanent lateral supports are in place.

**3.4 INSTALLATION**

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

**3.5 CONSTRUCTION**

- .1 Exposed masonry:
  - .1 Remove chipped, cracked, and otherwise damaged units in exposed masonry, in accordance with CSA A-165, article 82.1, and replace with undamaged units.
- .2 Jointing:
  - .1 Allow joints to set just enough to remove excess water, and then tool with round jointer to provide smooth, joints true to line, compressed, uniformly concave joints where concave joints are indicated.
- .3 Cutting:
  - .1 Cut out for electrical switches, outlet boxes, and other recessed or built-in objects.
  - .2 Make cuts straight, clean, and free from uneven edges.
- .4 Building-In:
  - .1 Build in items required to be built into masonry.
  - .2 Prevent displacement of built-in items during construction. Check plumb, location and alignment frequently, as work progresses.
  - .3 Brace door jambs to maintain plumb. Fill spaces between jambs and masonry with mortar.
- .5 Support of loads:
  - .1 Use 25 MPa concrete where concrete fill is used in lieu of solid units.
  - .2 Use grout to CSA A179 where grout is used in lieu of solid units.
  - .3 Install building paper below voids to be filled with concrete or grout; keep paper 25 mm back from faces of units.
- .6 Provision for movement:
  - .1 Leave 3 mm space below shelf angles.
  - .2 Leave 25 mm space between top of non-load bearing walls and partitions and structural elements. Do not use wedges.
  - .3 Build masonry to tie in with stabilizers, with provision for vertical movement.
- .7 Loose steel lintels:
  - .1 Install loose steel lintels. Centre over opening width.
- .8 Control joints:
  - .1 Construct continuous control joints every 6 m centre to centre and as indicated.
- .9 Movement joints:
  - .1 Build-in continuous movement joints as indicated.

.10 Interface with other work:

.1 Fix masonry structures @400 mm c/c.

### **3.6 SITE TOLERANCES**

.1 Tolerances in notes to CSA-A371, article 5.3 apply.

### **3.7 PREPARATION FOR CLEANING OF MASONRY**

.1 Ensure that walls are weatherproof, that damaged sections have been repaired and that severely damaged joints have been corrected.

.2 Only use plastic or non-ferrous tools.

.3 Mask and seal doors and windows with 6 mils polyethylene and seal all joints with duct tape.

.4 Cleaning agents should only be used specifically with the Architect's prior consent. In the opposite case, they are strictly prohibited.

### **3.8 CLEANING**

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Upon completion of installation and verification of performance of installation, remove surplus materials, rubbish, tools and equipment barriers.

### **3.9 PROTECTION OF FINISHED WORK**

.1 Temporary Bracing:

.1 Provide temporary bracing of masonry work during and after erection until permanent lateral support are in place and constitute appropriate bracing.

.2 Bracing must be approved by Consultant.

.3 Brace masonry walls as necessary to resist wind pressure and lateral forces during construction.

.2 Moisture Protection:

.1 Keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until completed and protected by flashing or other permanent construction.

.2 Cover completed and partially completed work not enclosed or sheltered with waterproof covering at end of each work day. Anchor securely in position.

.3 Air Temperature Protection: protect completed masonry as recommended.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 04 05 00 - Common Work Results for Masonry
- .2 Section 04 05 12 - Masonry mortar and grout
- .3 Section 04 05 19 - Masonry anchorage and reinforcing
- .4 Section 04 05 23 - Masonry accessories
- .5 Section 04 21 13 - Brick masonry
- .6 Section 07 21 13 - Board insulation
- .7 Section 07 21 16 - Blanket insulation
- .8 Section 07 21 19 - Sprayed insulation
- .9 Section 07 90 00 - Sealing products

**1.2 REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CAN/CSA A179-F04 (C2014), Mortar and Grout for Unit Masonry.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Product Data:
  - .1 Provide manufacturer's printed product literature, specifications and datasheets. Include product characteristics, performance criteria, and limitations in accordance with Division 1 - General Requirements.
- .2 Manufacturer's Instructions:
  - .1 Provide manufacturer's installation instructions.

**1.4 QUALITY ASSURANCE**

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties, and in accordance with section 04 05 00 - Common Work Results for Masonry supplemented as follows:
  - .1 Submit laboratory test reports in accordance with Division 1, General Requirements.
- .2 Certificates: certificates signed by manufacturer certifying that products and materials comply with specified performance characteristics and criteria and physical requirements.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver, store and handle masonry mortar and grout materials in accordance with Division 1, General Requirements, supplemented as follows:
  - .1 Deliver prepackaged, dry-blended mortar mix to project site in labelled plastic-lined bags each bearing name and address of manufacturer, production codes or batch numbers, and colour or formula numbers.

- .2 Maintain mortar, grout and packaged materials clean, dry, and protected against dampness, freezing, traffic and contamination by foreign materials.

## **1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Use same brand materials and source of aggregate for entire project.
- .2 Mortar and grout: in accordance with CSA A179.
- .3 Aggregate: when 6 mm thick joints are prescribed, it must be feasible for aggregate used to go through 1.18 mm sieve.
- .4 Mortar for exterior masonry works, above ground level:
  - .1 Mortar used in case of load-bearing walls: type S prepared according to specifications based on dosage.
  - .2 Mortar used in case of non-load-bearing walls: type N prepared according to specifications based on dosage.
- .5 Mortar for interior masonry works:
  - .1 Non-load-bearing walls: type N mortar, according to specifications based on dosage.
- .6 Non-staining grout: consisting of one (1) part Portland cement, 1/8 hydrated lime and two (2) parts sieved aggregate (mesh size 80), and aluminium stearate, calcium stearate and ammonium stearate up to a content of 2 per cent by weight of cement.
- .7 Non-staining mortar: to make a mortar that does not stain, use masonry cement that does not stain as a hydraulic binder.
- .8 Parging mortar: type S, in accordance with CSA A179.
- .9 Grout: in accordance with CSA A179, table 3.
- .10 LEED Requirements; provide mortar and grout made from products from which at least 90% (in weight) are extracted, collected and processed within a radius of 800 km (transport by truck) or 2 400 km (transport by train or ship) to final manufacturing site. Final

manufacturing site must be located within a radius of 800 km (transport by truck) or 2 400 km (transport by train or ship) from construction site.

## **2.2 COLOUR ADDITIVES**

- .1 Use colouring agents that do not exceed 10% of the cement content by mass, or integrally coloured masonry cement, to produce coloured mortar to match approved sample. Admixtures to be approved prior to use. Use in accordance with the specific manufacturer's recommendations.
- .2 Powder: inorganic mineral oxide pigment.

## **2.3 MIXES**

- .1 Admixtures: prepare a grout of semi-liquid consistency.
- .2 Add pigments and admixtures in accordance with manufacturer's instructions. Ensure mixture and colouring consistency.
- .3 Repointing mortar: hydrate repointing mortar beforehand first mixing dry ingredients; continue mixing by adding just enough water to obtain a damp mass which is hard to handle and which keeps its shape when mixed into a ball. Let stand for at least 1 hour but no longer than 2 hours, then mix again by adding enough water to get the consistency suitable for repointing.

## **PART 3 EXECUTION**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

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

### **3.2 CLEANING**

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

### **3.3 PROTECTION OF COMPLETED WORK**

- .1 Cover completed and partially completed work not enclosed or sheltered with waterproof covering at end of each work day. Anchor securely in position.

### **3.4 SCHEDULE, LISTS AND TABLES**

- .1 Use coloured mortar for exterior and interior masonry walls.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 04 05 00 - Common Work Results for Masonry
- .2 Section 05 41 00 - Structural Metal Stud Framing
- .3 Section 07 21 13 - Board Insulation
- .4 Section 07 21 16 - Blanket Insulation
- .5 Section 07 21 19 - Sprayed Insulation
- .6 Section 07 27 00 – Air Barriers

**1.2 REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-A23.1/A23.2-F00, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CAN/CSA A370-F94 (C1999), Connectors for Masonry.
  - .3 CAN/CSA A371- F94 (C1999), Masonry Construction for Buildings.
  - .4 CSA G30.14 FM1983 (C1998), Serrated Steel Wire for Concrete Reinforcement
  - .5 CAN/CSA G30.18-FM92, Billet-Steel Bars for Concrete Reinforcement.
  - .6 CSA-S304.1-F94 (C2001), Design of Masonry Structures (Limit states design).
  - .7 CSA W186-FM1990 (C1998), Welding of Reinforcing Bars in Reinforced Concrete Construction.
  - .8 CSA A179 F94, Mortar and Grout for Stone Masonry Works

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Product Data:
  - .1 Provide manufacturer's printed product literature, specifications and datasheets illustrating products to be incorporated into project for specified products.
  - .2 Provide two copies of Workplace Hazardous Materials Information System (WHMIS) - Material Safety Data Sheets (MSDS) in accordance with Division 1 – General Requirements. Data sheets must specify VOC emission rate from epoxy resin based coatings, hot galvanizing coatings and retouching coatings.
- .2 Shop Drawings:
  - .1 Provide shop drawings in accordance with Division 1 – General Requirements.
  - .2 Provide shop drawings detailing bar bending details and placing drawings
  - .3 On placing drawings, indicate sizes, spacing, location and quantities of reinforcement and connectors.
- .3 Manufacturer's Instructions:
  - .1 Provide manufacturer's installation instructions.



#### **1.4 QUALITY ASSURANCE**

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

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

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

### **PART 2 PRODUCTS**

#### **2.1 MATERIALS**

- .1 Reinforcement bars: Steel to CAN/CSA A371 and CAN/CSA G30.18, Grade 400.
- .2 Reinforcement wires: scaled or meshed, to CSA A371 and CSA G30.14; 4.76 mm heavy duty calibre; lateral crossed rods.
- .3 Connectors: to CAN/CSA A370 and CSA-S304.1. Rod attachment system and (or) adjustable plate, consisting of vertical L shaped plate, supported by the wall covering and attached to the structural frame via the wall covering.
  - .1 Provide holes at inner end of L-shaped plate, for fixation purposes; also provide holes at outer end, for V-shaped fixation purposes, making it possible to vertically adjust up to 36 mm for installation or assembly of V-shaped anchorages.
  - .2 Build L-shaped plate with 1.52 mm thick stainless steel, length suitable for application. For V-shaped anchorages, use 4.76 mm diameter stainless steel wire.
  - .3 Provide stainless steel fasteners, for work fixation to the structural frame work; type and size suitable for relevant structural resistance force.
  - .4 Established parameters:
    - .1 Free play: maximum 0.80 mm
    - .2 Deflection to 0.45 kN:
      - .1 no free play: 0.50 mm
      - .2 with free play: maximum 1.30 mm
      - .3 calculated load: 0,67 kN.
      - .4 deflection in relation to calculated load (no free play): 0.61 mm.

- .4 Masonry anchors: triangular, flexible type, 4.76 mm rod steel with 8 mm flexible rods anchored to the masonry walls. Length depending on application and in accordance with manufacturer's recommendations.
  - .1 Acceptable products: 'BLOK-LOK FLEX-O-LOK BLT9' and adjustable anchorages 'FLEX-O-LOK Type C' or approved equivalent.
- .5 Masonry anchors: triangular, flexible type, 4.76 mm rod steel with 8 mm flexible rods anchored to steel stud walls. Length depending on application and in accordance with manufacturer's recommendations.
  - .1 Acceptable products: "BLOK-LOK BL-200" or approved equivalent
- .6 Masonry anchors: horizontal steel wire mesh reinforcement, steel rod, size 9. Length depending on application and in accordance with manufacturer's recommendations.
  - .1 Acceptable products: "BLOK-LOK BL-200" or approved equivalent.
- .7 Corrosion protection: to CSA-S304, hot-dip galvanized G70.

## **2.2 FABRICATION**

- .1 Fabricate reinforcing in accordance with CAN/CSA-A23.1 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
- .2 Fabricate connectors and anchorages in accordance with CAN/CSA A370.
- .3 Obtain Consultant's approval for locations of reinforcement splices other than shown on placing drawings.
- .4 Upon approval of Consultant, weld reinforcement in accordance with CSA W186.
- .5 Ship reinforcement and connectors, clearly identified in accordance with drawings.

## **2.3 SOURCE QUALITY CONTROL**

- .1 Upon request, provide Consultant with certified copy of mill test report of reinforcement steel and connectors, showing physical and chemical analysis, a minimum of 5 weeks prior to commencing reinforcement work.
- .2 Upon request inform Consultant of proposed source of material to be supplied.

## **PART 3 EXECUTION**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

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

### **3.2 INSTALLATION**

- .1 Supply and install masonry connectors and reinforcement in accordance with CAN/CSA A370, CAN/CSA A371, CAN/CSA-A23.1 and CSA-S304.1 unless indicated otherwise.
- .2 Prior to placing concrete, mortar and grout, obtain Consultant's approval of placement of reinforcement and connectors.
- .3 Supply and install additional reinforcement to masonry as indicated.

**3.3 BONDING AND TYING**

- .1 Bond walls of two or more wythes using metal connectors in accordance with CSA-S304.1, CAN/CSA A371 and as indicated.
- .2 Tie masonry veneer to backing in accordance with NBC, CSA-S304.1, CAN/CSA A371 and as indicated.

**3.4 REINFORCED LINTELS AND BOND BEAMS**

- .1 Reinforce masonry beams, masonry lintels and bond beams as indicated.
- .2 Place and grout reinforcement in accordance with CSA-S304.1, CAN/CSA A371, and CAN/CSA A179.

**3.5 GROUTING**

- .1 Grout masonry in accordance with CSA-S304.1, CAN/CSA A371 and CAN/CSA A179 and as indicated.

**3.6 ANCHORS**

- .1 Supply and install metal anchors as indicated.

**3.7 LATERAL SUPPORT AND ANCHORAGE**

- .1 Supply and install lateral support and anchorage in accordance with CSA-S304.1 and as indicated.

**3.8 MOVEMENT JOINTS**

- .1 Reinforcement will not be continuous across movement joints unless otherwise indicated.

**3.9 FIELD BENDING**

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

**3.10 FIELD TOUCH-UP**

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

**3.11 CLEANING**

- .1 Once installation is done, remove surplus materials, excess materials, rubbish, tools and equipment.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 04 05 00 – Common Work Results for Masonry
- .2 Section 04 05 12 – Masonry Mortar and Grout
- .3 Section 04 05 19 – Masonry Anchorage and Reinforcement
- .4 Section 04 05 23 – Masonry Accessories
- .5 Section 04 22 00 – Concrete Unit Masonry
- .6 Section 07 27 00 – Air Barriers
- .7 Section 07 92 00 – Joint Sealants

**1.2 REFERENCES**

- .1 ASTM International Inc.
  - .1 ASTM D2240-02b, Standard Test Method for Rubber Property - Durometer Hardness.
- .2 Canadian Standards Association (CSA International)
  - .1 CAN/CSA A371-94 (C1999) - Masonry Construction for Buildings.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Product Data:
  - .1 Provide manufacturer's printed product literature, specifications and datasheets. Include product characteristics, performance criteria, and limitations, in accordance with Division 1 – General Requirements.
  - .2 Provide two copies of Workplace Hazardous Materials Information System (WHMIS) - Material Safety Data Sheets (MSDS) in accordance with Division 1 – General Requirements. Data sheets must specify VOC emission rate from materials used as joint fillers and adhesives for lap joints.
- .2 Manufacturer's Instructions:
  - .1 Submit installation instructions as per provided by manufacturer.

**1.4 QUALITY ASSURANCE SUBMITTALS**

- .1 Test reports: submit certified test reports certifying that products, materials and equipment meet requirements regarding physical characteristics and performance criteria.
- .2 Certificates: submit documents signed by manufacturer certifying that products, materials and equipment meet requirements regarding physical characteristics and performance criteria.

**1.5 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.

- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Joint fillers for lap joints: special made elastomer material, hardness 20, measured with durometer in accordance with ASTM D2240 and with section 07 92 00 – Joint Sealants, dimensions and shape prescribed.
- .2 Lap adhesive: recommended by masonry flashing manufacturer.
- .3 Weep hole vents: special made polypropylene tubes, color matching color of existing mortar, height 89mm. Acceptable products: «CELLVENT» by Blok-Lok.
- .4 Mechanical fasteners: stainless steel.
- .5 Flashings for masonry: Dur-O-Wall DA1525, flashing with drip edge, size 26 (0.45 mm) x 2440 mm length x 38 mm width with 10 mm fold back, in stainless steel.
- .6 Mortar diverters, dimensions and shape suitable for the wall cavity.
  - .1 Wall cavity 25mm
  - .2 Acceptable products 'Mortar-Net' by Mortar Net Solutions
- .7 Rubber flashings: membrane composed of rubberized SBS bitumen in accordance with Section 07 27 00 – Air Barriers.

## **PART 3 EXECUTION**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

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

### **3.2 INSTALLATION: MATERIALS**

- .1 Install continuous movement joint fillers in movement joints at locations indicated on drawings.
- .2 Lap adhesive: apply adhesive to flashing lap joints.
- .3 Mechanical fasteners: install fasteners to suit application and in accordance with manufacturer's written installation instructions.
- .4 Reglets: install reglets at locations indicated on drawings.

- .5 Brick vents: install brick vents at locations indicated on drawings.

### **3.3 PREPARATION: JOINTS**

- .1 Install continuous movement joint fillers in movement joints at locations indicated on drawings.
- .2 In vertical joints of veneered and cavity walls' outer wythe, immediately above flashings, install weep hole events 400 mm from centre maximum, in horizontal plane.
- .3 Mortar diverters: install purpose made diverters in cavities where indicated and as directed, size and shape to suit purpose and function.

### **3.4 INSTALLATION: ACCESSORIES**

- .1 Build in flashings in masonry in accordance with CAN/CSA A371.
  - .1 Install flashings under exterior masonry bearing on foundation walls, slabs, shelf angles, and steel angles over openings, and at base of cavity wall and where cavity is interrupted by horizontal members or supports and as shown on drawings. Install flashings under weep hole courses and as indicated.
  - .2 In cavity walls and veneered walls, carry flashings from front edge of exterior masonry, under outer wythe, then up backing not less than 150 mm, and as follows:
    - .1 For masonry backing, embed or bond flashing 25 mm in joints.
    - .2 For concrete backing, insert or bond flashing into reglets.
    - .3 For wood frame backing, staple flashing to walls behind paper.
    - .4 For gypsum board and glass fibre faced sheathing backing, bond to wall using manufacturer's recommended adhesive.
  - .3 Lap joints 150 mm and seal with adhesive.
- .2 Form flashing (end dams) at lintels, sills and wall ends to prevent water from travelling horizontally past flashing ends.

### **3.5 CLEANING**

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 04 05 00 - Common Work Results for Masonry
- .2 Section 05 41 00 – Structural Metal Stud Framing
- .3 Section 07 21 13 – Board Insulation
- .4 Section 07 21 16 – Blanket Insulation
- .5 Section 07 21 19 – Sprayed Insulation
- .6 Section 07 27 00 – Air Barriers

**1.2 REFERENCES**

- .1 ASTM International Inc.
  - .1 ASTM C73-05, Standard Specification for Calcium Silicate Brick (Sand-Lime Brick).
  - .2 ASTM C216-07a, Standard Specification for, Facing Brick (Solid Masonry Units Made of Clay or Shale).
- .2 Brick Industry Association (BIA)
  - .1 Technical Note No. 20-2006, Cleaning Brick Work.
- .3 Canadian Standards Association (CSA International)
  - .1 CAN/CSA A82-06, Fired Masonry Brick Made From Clay or Shale).
  - .2 CAN/CSA-A165 Series-F2004, CSA Standards on Concrete Masonry Units.
  - .3 CAN/CSA A371-F04, Masonry Construction for Buildings.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Product Data:
  - .1 Provide manufacturer's printed product literature, specifications and data sheet in accordance with Division 1 – General Requirements.
- .2 Manufacturer's Instructions:
  - .1 Provide manufacturer's installation instructions.
- .3 Samples:
  - .1 Provide unit samples in accordance with Division 1 - General Requirements.

**1.4 QUALITY ASSURANCE SUBMITTALS**

- .1 Provide Certificates: in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .2 Test and Evaluation Reports: submit certified test reports in accordance with Section 04 05 00 - Common Work Results for Masonry, supplemented as follows:
- .3 Pre-Installation Meetings: conduct pre-installation meeting in accordance with Section 04 05 00 - Common Work Results for Masonry to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

- .4 Mock-ups:
  - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control and requirements of Section 04 05 00 - Common Work Results for Masonry supplemented as follows:
    - .1 Construct mock-up panel of exterior brick construction 1200 x 1800 mm.
- .5 Delivery, Storage, and Handling:
  - .1 Deliver, store and handle brick unit masonry in accordance with Section 01 61 00 - Common Product Requirements.

## **1.5 SITE CONDITIONS**

- .1 Ambient Conditions: assemble and erect components only when temperature is above 4 degrees C.

## **1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURED UNITS**

- .1 Face brick:
  - .1 Fired clay brick: to CAN/CSA A82.
    - .1 Type: Modular
    - .2 Grade: EG.
    - .3 Size: 92 x 57 x 194mm.
    - .4 Colour and texture: Manganese Ironspot Smooth Modular, by Endicott Clay Products
- .2 Reinforcement:
  - .1 Reinforcement in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing .
- .3 Connectors:
  - .1 Connectors in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing .



- .4 Flashings:
  - .1 Flashing: in accordance with Section 04 05 23 - Masonry Accessories.
- .5 Mortar Mixes:
  - .1 Mortar and mortar mixes in accordance with Section 04 05 12 - Masonry Mortar and Grout.
- .6 Grout Mixes:
  - .1 Grout and grout mixes in accordance with Section 04 05 12 - Masonry Mortar and Grout.
- .7 Cleaning Compounds:
  - .1 Use low VOC products in compliance with SCAQMD Rule 1168.
  - .2 Compatible with substrate and acceptable to masonry manufacturer for use on products.
  - .3 Cleaning compounds compatible with brick masonry units and in accordance with manufacturer's written recommendations and instructions.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

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

### **3.2 PREPARATION**

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

### **3.3 APPLICATION**

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

### **3.4 INSTALLATION**

- .1 Construction to conform to CAN/CSA A371.
- .2 Bond: stretcher.
- .3 Coursing height: 200 mm for three/two bricks and three/two joints.
- .4 Jointing: concave where exposed or where paint or similar thin finish coating is specified.
  - .1 Mixing and blending: mix units within each pallet and with other pallets to ensure uniform blend of colour and texture.
  - .2 Clean unglazed clay masonry as work progresses.
  - .3 Reinforcement:
    - .1 Install reinforcing in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.
  - .4 Connectors:
    - .1 Install connectors in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.

- .5 Flashings:
  - .1 Install flashings in accordance with Section 04 05 23 - Masonry Accessories.
- .6 Mortar Placement:
  - .1 Place mortar in accordance with Section [04 05 12 - Masonry Mortar and Grout].
- .7 Grout Placement:
  - .1 Place grout in accordance with Section 04 05 12 - Masonry Mortar and Grout.
- .8 Repair/Restoration:
  - .1 Upon completion of masonry, fill holes and cracks, remove loose mortar and repair defective work.
- .9 Field Quality Control:
  - .1 Site Tests, Inspection: in accordance with Section 04 05 00 - Common Work Results for Masonry supplemented as follows.
  - .2 Manufacturer's Field Services: in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .10 Tolerances:
  - .1 To CAN/CSA A371 unless noted below.

### **3.5 CLEANING**

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
- .3 Clean unglazed clay masonry: 10 m<sup>2</sup> area of wall designated by Consultant as directed below and leave for one week. If no harmful effects appear and after mortar has set and cured, protect windows, sills, doors, trim and other work, and clean brick masonry as follows.
  - .1 Remove large particles with wood paddles without damaging surface. Saturate masonry with clean water and flush off loose mortar and dirt.
  - .2 Scrub with solution of 25 mL trisodium phosphate and 25 mL household detergent dissolved in 1 L of clean water using stiff fibre brushes, then clean off immediately with clean water using hose. Alternatively, use proprietary compound recommended by brick masonry manufacturer in accordance with manufacturer's directions.
  - .3 Repeat cleaning process as often as necessary to remove mortar and other stains.
  - .4 Use acid solution treatment for difficult to clean masonry as described in Technical Note No.20 by the Brick Industry Association.
- .4 Clean concrete brick masonry as work progresses.
  - .1 Allow mortar droppings on masonry to partially dry then remove by means of trowel, followed by rubbing lightly with small piece of brick and finally by brushing.
- .5 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.
- .6 Waste Management: separate waste materials for reuse/ recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

**3.6**

**PROTECTION**

- .1 Brace and protect brick masonry in accordance with Section 04 05 00 - Common Work Results for Masonry.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 04 05 00 – Common Work Results for Masonry
- .2 Section 04 05 12 – Masonry Mortar and Grout
- .3 Section 04 05 19 – Masonry Anchorage and Reinforcement

**1.2 REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CAN3-A165 Series-F94(C2000) CSA Standards on Concrete Masonry Units, covers: A165.1, A165.2, A165.3.

**1.3 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- .1 Concrete block units
  - .1 Fire rated concrete block units with fire-resistance rating, recognized by organization accredited by National Building Code of Canada, in accordance with CAN/CSA-A165 (CAN/CSA-A165.1), classification H/15/A/M, light:
    - .1 Dimensions - modular
    - .2 Special shape units: in accordance with indications; special shape units adapted for this purpose must be used for lintels, beams and bond beams. Provide additional special shapes as indicated.

**PART 3 EXECUTION**

**3.1 INSTALLATION**

- .1 Standard concrete block units:

- .1 Bond: set courses, stretcher bond
- .2 Coursing height: 200 mm for one block and one joint.
- .3 Jointing: concave where exposed or where paint or other finish coating is specified.
- .2 Clean block faces using soft cloths before mortar hardens rake to 10 mm depth. After completion of block laying fill joints with pointing mortar then point to provide concave joints. Repeat cleaning of faces.
- .3 Concrete lintels:
  - .1 Where steel or reinforced concrete lintels aren't prescribed, build reinforced concrete lintel above openings in masonry work.
  - .2 Supports at end of lintels: at least 200 mm and according to drawings.

### **3.2 REPAIR/RESTORATION**

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

### **3.3 CLEANING**

- .1 Standard Concrete Unit Masonry: Allow mortar droppings on masonry to partially dry then remove by means of trowel, followed by rubbing lightly with small piece of block. Clean wall surface with suitable brush.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Construction steel for buildings – Structural Engineer’s drawings and specifications.
- .2 Section 04 05 00 – Common Work Results for Masonry
- .3 Section 04 05 19 – Masonry Anchorage and Reinforcement
- .4 Section 09 91 13 – Exterior Painting
- .5 Section 09 91 23 – Interior Painting

**1.2 REFERENCES**

- .1 ASTM International
  - .1 ASTM A53/A53M-07, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  - .2 ASTM A269-08, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
  - .3 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .2 CSA International
  - .1 CSA G40.20/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2 CAN/CSA G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3 CSA S16-09, Design of Steel Structures.
  - .4 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
  - .5 CSA W59-M03 (R2008), Welded Steel Construction (Metal Arc Welding) Metric.
- .3 Environmental Choice Program
  - .1 CCD-047-98(R2005), Architectural Surface Coatings.
  - .2 CCD-048-98(R2006), Surface Coatings - Recycled Water-borne.
- .4 Green Seal Environmental Standards (GS)
  - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
- .5 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .6 The Master Painters Institute (MPI)
  - .1 Architectural Painting Specification Manual - current edition.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:

- .1 Submit manufacturer's instructions, printed product literature and data sheets for sections, plates, pipe, tubing, bolts and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
  - .1 For finishes, coatings, primers, and paints applied on site: indicate VOC concentration in g/L.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
  - .2 Indicate materials, core thicknesses, finishes, connections, and joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

#### **1.4 QUALITY ASSURANCE**

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

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

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan and a Waste Reduction Work plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, packaging materials as specified in Construction Waste Management Plan and Waste Reduction Work plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal

#### **1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.

- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.
- .5 Send unused metal elements to a metal recycling facility approved by Departmental Representative.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Steel sections and plates: to CSA G40.20/G40.21, Grade 300W.
- .2 Steel pipe: to ASTM A53/A53M, standard series, black galvanized finish.
- .3 Welding materials: to CSA W59.
- .4 Welding electrodes: to CSA W48 Series.
- .5 Bolts and anchor bolts: to ASTM A307.
- .6 Aluminum sheet: plain or embossed pattern in accordance with indications, specified thickness, finish and colour.
- .7 Stainless steel tubing: to ASTM A269, Type 302, commercial grade, seamless welded with AISI No.4 finish.
- .8 Grout: non-shrink, non-metallic, flowable, 15 MPa resistance at 24 hours.

### **2.2 FABRICATION**

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

### **2.3 FINISHES**

- .1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m<sup>2</sup> to CAN/CSA-G164.
- .2 Chromium plating: chrome on steel with plating sequence of 0.009 mm thickness of copper 0.010 mm thickness of nickel and 0.0025 mm thickness of chromium.
- .3 Shop coat primer: in accordance with CAN/CGSB 1.40.
- .4 Zinc primer: zinc rich, ready mix to CAN/CGSB 1.181

### **2.4 ISOLATION COATING**

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



.3 Wood.

## **2.5 SHOP PAINTING**

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

## **2.6 ANGLE LINTELS**

- .1 Steel angles: sizes indicated for openings. Provide 150 mm minimum bearing at ends.
- .2 Weld or bolt back-to-back angles to profiles as indicated.
- .3 Finish: galvanized for outdoors and primed for indoors.

## **2.7 ACCESS LADDERS**

Aluminium access ladder with closed protective cage against falls from a height, when danger exists for worker to fall more than 5 meters to ground, roof, or floor. Applications of system include:

- .1 Ladder total width – 605 mm
- .2 Distance between vertical side rails – 525 mm
- .3 Diameter of levels – 50 x 35 mm (profile)
- .4 Distance between levels – 300 mm
- .5 Vertical extension of side rail above inlet surface – 900 to 1100 mm
- .6 Weight
  - .1 Level sections – 2.9 kg/m (ex.: fixing brackets and fasteners)
  - .2 Cage sections – 8.3 kg/m
- .7 Approved product: modular ladder system KATT series 7000 from Skyline or equivalent approved by architect.

## **2.8 CHANNEL FRAMES**

- .1 Fabricate frames from steel, sizes of channel and opening as indicated.
- .2 Weld channels together to form continuous frame for jambs and head of openings, sizes as indicated.
- .3 Weld 25 x 500 x 4.8 mm thick steel strap anchors to channel jamb frame at 400 mm on centre.
- .4 Finish: prime coat painted.

**PART 3 EXECUTION**

**3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for metal fabrications installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

**3.2 ERECTION**

- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
- .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .4 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .5 Supply components for work by other trades in accordance with shop drawings and schedule.
- .6 Make field connections with bolts to CSA S16 or by welding.
- .7 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.
- .8 Touch-up rivets, field welds, bolts and burnt or scratched surfaces with primer after completion of:
  - .1 Primer: maximum VOC limit 250 g/L, to GS-11.
- .9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.
  - .1 Primer: maximum VOC limit 250 g/L, to GS-11.

**3.3 ACCESS LADDERS**

- .1 Install access ladders in locations as indicated.
- .2 Erect ladders 150 mm clear of wall on bracket supports.

**3.4 CHANNEL FRAMES**

- .1 Install steel channel frames to openings as indicated.

**3.5 CLEANING**

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

- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse / recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**3.6 PROTECTION**

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

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 07 42 43 – Composite Wall Panels
- .2 Section 07 52 16 - Elastomeric Roof Membranes.
- .3 Section 07 62 00 – Sheet Metal Flashing and Trim
- .4 Section 09 91 13 – Exterior Painting
- .5 Section 09 91 23 – Interior Painting

**1.2 REFERENCES**

- .1 CSA International
  - .1 CAN/CSA-G164-FM92-C1998, Hot-dip galvanizing of irregularly shaped objects
  - .2 CSA O121-FM 1978 Douglas Fir Plywood.
  - .3 CSA O141-F91 (C1999), Softwood Lumber.
  - .4 CSA O151-FM1978 (1998), Canadian Softwood Plywood.
- .2 American Society for Testing and Materials (ASTM International)
  - .1 ASTM D 226-06 Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
- .3 National Lumber Grades Authority (NLGA)
  - .1 Standard Grading Rules for Canadian lumber, 2000
- .4 Council of Forest Industries (COFI)
- .5 Forest Stewardship Council (FSC)
  - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship
  - .2 FSC-STD-20-002-2004, Structure and Content of Forest Stewardship Standards V2-1.
  - .3 Bodies Certified by FSC.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .3 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1 SCAQMD Rule 1113-[A2011], Architectural Coatings.
  - .2 SCAQMD Rule 1168-[A2005], Adhesives and Sealants Applications.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

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

.2 Product Data:

- .1 Submit manufacturer's instructions, printed product literature and data sheets for wood products and accessories and include product characteristics, performance criteria, physical size, finish and limitations.

**1.4 QUALITY ASSURANCE**

- .1 MARKING WOOD: CLASSIFICATION STAMP OF AN ORGANIZATION RECOGNIZED BY THE ACCREDITATION BOARD OF THE CANADIAN COMMISSION FOR TIMBER STANDARDIZATION.
- .2 MARKING PLYWOOD PANELS, ORIENTED STRAND BOARD AND WAFERBOARDS (OSB) AND WOOD COMPOSITE PANELS: ACCORDING TO RELEVANT STANDARDS OF CSA AND ANSI.

**1.5 DELIVERY, STORAGE AND HANDLING**

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

**1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

**PART 2 PRODUCTS**

**2.1 CONSTRUCTION TIMBER**

- .1 Lumber: softwood, S4S, moisture content 19% (S-dry) or less in accordance with following standards:
  - .1 CSA O141.
  - .2 NLGA Standard Grading Rules for Canadian Lumber.
  - .3 Products without added urea formaldehyde.
- .2 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:
  - .1 Board sizes: "Standard" or better grade.
  - .2 Dimension sizes: "Standard" light framing or better grade.

**2.2 WALL PANELS**

- .1 Plywood Douglas fir (DFP): to CSA O121, classification "construction", "standard" category.
  - .1 No urea formaldehyde.
- .2 Plywood Douglas fir (DFP): conforms to CSA O121, classification "construction", "outside" category.
  - .1 No urea formaldehyde.

**2.3 ACCESSORIES**

- .1 Nails, spikes and staples: use is forbidden.
- .2 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.
- .3 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.
- .4 Adhesive: one-component, polymer-based and water-repellent.
  - .1 Acceptable Products: "Titebond III" or equivalent approved by Architect.

**2.4 FINISH**

- .1 Galvanized Metal: galvanized fasteners to CAN / CSA-G164 for interior work in humid environments.

**PART 3 EXECUTION**

**3.1 INSTALLATION**

- .1 Install in accordance with requirements of NBC.

- .2 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.
- .3 Install furring to support siding applied vertically where sheathing is not suitable for direct nailing. Align and plumb faces of furring and blocking to tolerance of 1:600.
- .4 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .5 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized steel fasteners.

### **3.2 ASSEMBLY**

- .1 Assemble, anchor, fix, tie and brace elements to ensure strength and rigidity required.
- .2 If necessary, countersink holes so that bolt heads do not protrude.

### **3.3 LISTS AND TABLES**

- .1 Supply and install panels required for installation of electrical equipment, as indicated. Use G1S plywood 19 mm thickness, placed on a frame 19 mm x 38 mm, reinforced with elements same size placed at 300 mm intervals maximum. Paint panels and wood elements with fireproof paint system no. P10. Refer to Section 09 91 13 Painting - Exterior- and Section 09 91 23 Painting - Interior

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 06 10 10 – Structural Carpentry
- .2 Section 07 92 00 – Joint Sealants
- .3 Section 09 21 16 – Gypsum Board Assemblies
- .4 Section 09 91 23 – Interior Painting

**1.2 REFERENCES**

- .1 American National Standards Institute (ANSI)
  - .1 ANSI A208.1-09, Particleboard.
  - .2 ANSI A208.2-09, Medium Density Fiberboard (MDF) for Interior Applications.
  - .3 ANSI/HPVA HP-1-10, Standard for Hardwood and Decorative Plywood.
- .2 ASTM International
  - .1 ASTM E1333-10, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.
  - .2 ASTM D2832-92(R2011), Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
  - .3 ASTM D5116-10, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
- .3 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
  - .1 Architectural Woodwork Quality Standards Illustrated, 8th edition, Version 1.0 (2009).
- .4 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.
- .5 CSA International
  - .1 CSA B111-74(R2003), Wire Nails, Spikes and Staples.
  - .2 CSA O112.10-08, Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure).
  - .3 CSA O121-08, Douglas Fir Plywood.
  - .4 CSA O141-05(C2009), Softwood Lumber.
  - .5 CSA O151-09, Canadian Softwood Plywood.
  - .6 CSA O153-M1980(C2008), Poplar Plywood.
  - .7 CAN/CSA-Z809-08, Sustainable Forest Management.
- .6 Forest Stewardship Council (FSC)
  - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
- .7 Health Canada/Workplace Hazardous Materials Information System (WHMIS)



- .1 Material Safety Data Sheets (MSDS).
- .8 International Organization for Standardization (ISO)
  - .1 ISO 14040-2006, Environmental Management-Life Cycle Assessment - Principles and Framework.
  - .2 ISO 14041-98, Environmental Management-Life Cycle Assessment - Goal and Scope Definition and Inventory Analysis.
- .9 National Electrical Manufacturers Association (NEMA)
  - .1 ANSI/NEMA LD-3-05, High-Pressure Decorative Laminates (HPDL).
- .10 National Hardwood Lumber Association (NHLA)
  - .1 Rules for the Measurement and Inspection of Hardwood and Cypress 2011.
- .11 National Lumber Grades Authority (NLGA)
  - .1 Standard Grading Rules for Canadian Lumber 2008.
- .12 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1 SCAQMD Rule 1113-A2011, Architectural Coatings.
  - .2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.
- .13 Sustainable Forestry Initiative (SFI)
  - .1 SFI-2010-2014 Standard.

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

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for architectural woodwork and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3 Shop Drawings:
  - .1 Indicate details of construction, profiles, jointing, fastening and other related details.
    - .1 Scales: profiles full size, details half full size.
  - .2 Indicate materials, thicknesses, finishes and hardware.
  - .3 Indicate locations of service outlets in casework, typical and special installation conditions, and connections, attachments, anchorage and location of exposed fastenings.
- .4 Samples:
  - .1 Submit for review and acceptance of each unit.
  - .2 Samples will be returned to Contractor for inclusion into work.
  - .3 Submit duplicate samples of specified wood material: sample size 300 mm x 300 mm or 300 mm long.
  - .4 Submit duplicate samples of laminated plastic for colour selection.

- .5 Submit duplicate samples of laminated plastic joints, edging, cut-outs and post formed profiles.
- .5 Certifications: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .6 Sustainable Design Submittals:
  - .1 Wood Certification: submit vendor's or manufacturer's Chain-of-Custody Certificate number for CAN/CSA-Z809 or FSC or SFI certified wood.
    - .1 Submit vendor's or manufacturer's FSC Chain-of-Custody Certificate number.
  - .2 Low-Emitting Materials:
    - .1 Submit listing of adhesives and sealants as well as paints and coatings used in building; comply with VOC and chemical component limits or restrictions requirements.
    - .2 Submit listing of composite wood products used in building, stating that they contain no added urea-formaldehyde resins.
    - .3 Submit listing of laminate adhesives used in building, stating that they contain no urea-formaldehyde.

#### **1.4 QUALITY ASSURANCE**

- .1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Sustainable Standards Certification:
  - .1 Certified Wood: submit listing of wood products and materials used in accordance with CAN/CSA-Z809 or FSC or SFI.
- .3 Plywood, particleboard, OSB and wood based composite panels to CSA and ANSI standards.

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

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
  - .1 Protect millwork against dampness and damage during and after delivery.
  - .2 Store millwork in ventilated areas, protected from extreme changes of temperature or humidity.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect architectural woodwork from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

#### **1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.

- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Softwood lumber: unless specified otherwise, S4S finish (dimensioned on four sides), moisture content 7% maximum 9% in accordance with following standards:
  - .1 CSA O141.
  - .2 CAN/CSA-Z809 or FSC or SFI certified.
  - .3 NLGA Standard Grading Rules for Canadian Lumber.
  - .4 AWMAC custom, premium grade, moisture content as specified.
- .2 Machine stress-rated lumber is acceptable for all purposes.
- .3 Ensure manufacturing process adheres to Lifecycle Assessment (LCA) Standards to ISO 14040/14041 LCA Standards and CSA Z760-94 Life Cycle Assessment.
- .4 Hardwood lumber: moisture content 9% or less in accordance with following standards:
  - .1 National Hardwood Lumber Association (NHLA).
  - .2 CAN/CSA-Z809 or FSC or SFI certified.
  - .3 AWMAC custom premium grade, moisture content as specified.
- .5 Douglas fir plywood (DFP): to CSA O121, standard construction, CAN/CSA-Z809 or FSC or SFI certified.
  - .1 Plywood resin to contain no added urea-formaldehyde.
- .6 MDF (medium density fibreboard) core: to ANSI A208.2, Grade MD, 16 mm thick, density 769 kg/m<sup>2</sup>, CAN/CSA-Z809 or FSC or SFI certified.
  - .1 Medium density fibreboard performance requirements to: ANSI A208.2.
  - .2 MDF resin to contain no added urea-formaldehyde.
- .7 Laminated plastic for flatwork: to NEMA LD3, Grade VGL, Type TP, 1.5 mm thick; integral colour, wood effect, decorative face, printed pattern, one colour or multicolor layers, gloss, satin, furniture, matt, textured or emboss finish.
- .8 Laminated plastic backing sheet: Grade QR, Type TP, TS, TL minimum of 0.5 mm thick or same thickness and colour as face laminate.
- .9 Laminated plastic liner sheet: Grade QO, Type TL, 0.5 mm thick, white colour.
  - .1 Product with no added urea-formaldehyde.
- .10 Nails and staples: to CSA B111.

- .11 Wood screws: copper, brass, stainless steel, steel, plain, type and size to suit application.
- .12 Splines: in accordance with most suitable choice for usage.
- .13 Sealant: in accordance with Section 07 92 00 - Joint Sealants
  - .1 Sealants: VOC limit 250 g/L maximum to SCAQMD Rule 1168.
- .14 Laminated plastic adhesive:
  - .1 Adhesive: contact adhesive to CAN/CGSB-71.20
    - .1 VOC emission trials must be carried out in accordance with ASTM D 2369 and ASTM D 2832.
    - .2 Acceptable products: products complying with directive PCE-44.
    - .3 VOC limit 250 g/L maximum to SCAQMD Rule 1168, Adhesives and Sealants applications.
    - .4 Products with no added urea-formaldehyde.
  - .2 Sealant: VOC limit 30 g/L maximum to SCAQMD Rule 1168.
  - .3 Clear Wood Finishes: VOC limit 350 g/L maximum to GS-11, SCAQMD Rule 1113.
  - .4 Paints: VOC limit 50 g/L maximum to GS-11, SCAQMD Rule 1113.

## **2.2 MANUFACTURED UNITS**

- .1 Casework:
  - .1 Fabricate caseworks to AWMAC premium custom quality grade.
  - .2 Furring, blocking, nailing strips, grounds and rough bucks and sleepers.
    - .1 S2S finish units are acceptable
    - .2 Board sizes: "standard" or better grade.
    - .3 Dimension sizes: "standard" light framing or better grade.
    - .4 Urea-formaldehyde free.
  - .3 Framing softwood, pine.
  - .4 Case bodies (ends, divisions and bottoms).
    - .1 Douglas fir plywood, square edged, 16 mm thick, plastic laminate surface.
  - .5 Backs:
    - .1 Douglas fir plywood, DFP, square edged, 16 mm thick, plastic laminate surface.
  - .6 Shelving:
    - .1 Medium Density Fibreboard (MDF), square edged, 19 mm thick, plastic laminate surface.
- .2 Drawers:
  - .1 Fabricate drawers to AWMAC premium custom grade supplemented as follows:
  - .2 Sides and Backs.
    - .1 Douglas fir plywood (DFP) square edged, 16 mm thick, plastic laminate surface.
  - .3 Bottoms:
    - .1 Douglas fir plywood (DFP) square edged, 6 mm thick, plastic laminate surface.
  - .4 Fronts:

- .1 Medium Density Fibreboard (MDF), square edged, 19 mm thick, plastic laminate surface.
- .3 Casework Doors:
  - .1 Fabricate doors to AWMAC premium custom grade supplemented as follows:
  - .2 Douglas fir plywood (DFP) square edged, 16 mm thick, plastic laminate surface.
- .4 Counter Tops:
  - .1 Except otherwise stated, fabricate preformed counter tops with Douglas fir plywood, 19mm and 16mm thick laminated, moisture content not exceeding 8%, with sanded faces, square edged, plastic laminate surface.
  - .2 Include backsplashes in plastic laminate, shape edged at rear and at end of counters, and borders shaped at front edge, as indicated.
  - .3 Finish underside of counter in plastic laminate, support grade.
  - .4 Install finish strips, PVC, 3 mm thick on edge at front of counters, as indicated. Width must match countertop thickness as borders will remain exposed after installation. Color identical to plastic laminate.

## **2.3 FINISH HARDWARE**

- .1 Handles: architect's choice or according to drawings.
- .2 Hinges 100 degrees clip: 71 M 255-180 by Richelieu;
- .3 Drawer slides: type full extension, side-mounted, steel ball-bearings, safety switchblade, such as Richelieu 2632 series.
- .4 Pads: MP 301-11, transparent by Richelieu.
- .5 Shelf Brackets: 340.010-30 by Richelieu;
- .6 Screw Covers, plastic, white, insert into 10 mm diameter countersink holes, to conceal wall furniture anchor screws.
- .7 Rack for adjustable shelves:
  - .1 Cabinets: metal, recessed, u-shaped, zinc finish steel, such as series 120 by Richelieu, zinc finish steel supports, type CP-21-2G by Richelieu.
  - .2 Warehouses and similar premises: 32 mm wide metal double jamb, white finish, appropriate length, type series 185 by Richelieu, double-notched metal supports, white finish, appropriate length, type series 190 by Richelieu.
- .8 Locks: for furniture with master-key and sub-master-key system such as Best or approved equivalent.
- .9 Hanger bar: tubular steel, chrome-plated, 30 mm diameter and 2 mm thick.

## **2.4 OTHER MATERIAL**

- .1 Aluminium: natural anodized aluminium, dimensions on plans. All fasteners must be concealed.

## **2.5 FABRICATION**

- .1 Check all dimensions before proceeding with fabrication.

- .2 Set nails and countersink screws apply plain wood filler to indentations, sand smooth and leave ready to receive finish.
- .3 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.
- .4 Shelving to cabinetwork to be adjustable unless otherwise noted.
- .5 Provide cut-outs for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.
- .6 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.
- .7 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.
- .8 Ensure adjacent parts of continuous laminate work match in colour and pattern.
- .9 Veneer laminated plastic to core material in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 3000 mm. Keep joints 600 mm from sink cut-outs.
- .10 Form shaped profiles and bends as indicated, using post forming grade laminate to laminate manufacturer's instructions.
- .11 Use straight self-edging laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.
- .12 Apply laminate backing sheet to reverse side of core of plastic laminate work.
- .13 Apply laminated plastic liner sheet to interior of cabinetry.

## **2.6 FINISHING**

- .1 Finish in accordance with Section 09 91 23 - Interior Painting.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

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

### **3.2 INSTALLATION**

- .1 Do architectural woodwork to Quality Standards of AWMAC.
- .2 Install prefinished millwork at locations shown on drawings.
  - .1 Position accurately, level, plumb straight.
- .3 Fasten and anchor millwork securely.

- .1 Supply and install heavy duty fixture attachments for wall mounted cabinets.
- .4 Use draw bolts in countertop joints.
- .5 Scribe and cut as required to fit abutting walls and to fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.
- .6 At junction of plastic laminate counter back splash and adjacent wall finish, apply small bead of sealant in accordance with Section 07 92 00 - Joint Sealants.
- .7 Apply bituminous coating over wood framing members in contact with masonry or cementitious construction.
- .8 Fit hardware accurately and securely in accordance with manufacturer's written instructions.

### **3.3 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
  - .1 Clean cabinet work inside cupboards drawers and outside surfaces.
  - .2 Remove excess glue from surfaces.
- .3 Waste Management: separate waste materials for reuse/ recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### **3.4 PROTECTION**

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

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Division 03 – Concrete
- .2 Section 07 21 13 – Board Insulation
- .3 Section 07 26 16 – Under Slab Vapour Barrier

**1.2 REFERENCES**

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-37.2-M88, Emulsified Asphalt, Mineral-Colloid Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.
  - .2 CAN/CGSB-37.3-M89, Application of Emulsified Asphalts for Dampproofing or Waterproofing.
  - .3 CAN/CGSB-37.5-M89, Cutback Asphalt Plastic Cement.
  - .4 CGSB 37-GP-6Ma-83, Asphalt, Cutback, Unfilled, for Dampproofing.
  - .5 CGSB 37-GP-9Ma-83, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
  - .6 CGSB 37-GP-11M-76(C1984), Application of Cutback Asphalt Plastic Cement.
  - .7 CGSB 37-GP-12Ma-84, Application of Unfilled Cutback Asphalt for Dampproofing.
  - .8 CGSB 37-GP-15M-76(C1984), Application of Asphalt Primer for Asphalt Roofing, Dampproofing and Waterproofing.
  - .9 CAN/CGSB-37.16-M89, Filled, Cutback, Asphalt for Dampproofing and Waterproofing.
  - .10 CAN/CGSB-37.28-M89, Reinforced Mineral Colloid Type, Emulsified Asphalt for Roof Coatings and for Waterproofing.
  - .11 CGSB 37-GP-36M-76, Application of Filled Cutback Asphalts for Dampproofing and Waterproofing.
  - .12 CGSB 37-GP-37M-77, Application of Hot Asphalt for Dampproofing or Waterproofing.
- .2 CSA International
  - .1 CAN/CSA-A123.4-04(C2008), Asphalt for Construction of Built-Up Roof Coverings and Waterproofing Systems.
- .3 Health Canada
  - .1 Workplace Hazardous Materials Information System (WHMIS)
    - .1 Material Safety Data Sheets (MSDS).

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:



- .1 Submit manufacturer's instructions, printed product literature and data sheets for bituminous damp proofing application and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3 Manufacturer's Instructions: provide to indicate special handling criteria, installation sequence, cleaning procedures.

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

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

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

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

#### **1.6 SITE CONDITIONS**

- .1 Ambient Conditions: temperature, relative humidity, moisture content.
  - .1 Apply damp proofing materials only when surfaces and ambient temperatures are within manufacturers' prescribed limits.
  - .2 Do not proceed with Work when wind chill effect would tend to set bitumen before proper curing takes place.
  - .3 Maintain air temperature and substrate temperature at damp proofing installation area above 5 degrees C for 24 hours before, during and 24 hours after installation.
  - .4 Do not apply damp proofing in wet weather.
- .2 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of asphalt, sealing compounds, primers and caulking materials.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- .1 Acceptable products: only use products sourced from same manufacturer for execution of work of each system in this section.
- .2 Geotextile and bentonite membrane with built-in polyethylene lining: Acceptable products: "Volclay Voltex DS" by Cetco or equivalent, approved by architect.
- .3 Drainage board (vertical): non-woven polypropylene with 223 L/min/m vertical water flow. Acceptable products: Bakor DB 2000 or equivalent, approved by architect.
- .4 Asphalt:
  - .1 For application and curing at temperatures above 5 degrees C: to CAN/CGSB-37.2.
    - .1 Package label or bill of lading for bulk hot liquid asphalt must indicate type, flash point, equiviscous temperature range and final blowing temperature.
    - .2 Color: black
    - .3 Solid Content:  $\pm 57\%$
    - .4 Minimum application temperature:  $+5^{\circ}\text{C}$
    - .5 Weight: approximately 1.0 kg/l
    - .6 Coverage Rate per layer: 0.5 to 1.5 l/m<sup>2</sup>
    - .7 Complete drying time: 50% RH, 20°C, from 1 to 24 hours depending on thickness.
    - .8 Acceptable products: Bakor DB 2000 or equivalent, approved by architect.
  - .2 For application and curing at temperatures above 0 degrees C but below 5 degrees C: to CAN/CGSB-37.16.
    - .1 Package label or bill of lading for bulk hot liquid asphalt must indicate type, flash point, equiviscous temperature range and final blowing temperature.
    - .2 Color: black
    - .3 Solid Content:  $\pm 54\%$
    - .4 Weight: approximately 1.01 kg/l
    - .5 Coverage Rate per layer: 0.5 to 1.5 l/m<sup>2</sup>
    - .6 Complete drying time: 50% RH, 20°C, 4 hours depending on thickness.
    - .7 Acceptable products: Bakor 710-11 or equivalent, approved by architect.
- .5 Sealing compound: plastic compound by Polybitume to CAN/CGSB-37.29.
  - .1 Color: black
  - .2 Solid Content:  $\pm 54\%$
  - .3 Weight: approximately 1.01 kg/l
  - .4 Coverage Rate per layer: at 3 mm thick, 0.3 l/m<sup>2</sup>
  - .5 Drying time to touch: 50% RH, 20°C,  $\pm 4$  hours depending on thickness.
  - .6 Water vapour permeance: 2.9 ng/Pa.m<sup>2</sup>.s
  - .7 Acceptable products: Bakor 570-05 or equivalent, approved by architect.
- .6 Asphalt primer (base layer): to CAN/CGSB-37.2.
- .7 Accessories: according to manufacturer's recommendations.

**PART 3 EXECUTION**

**3.1 EXAMINATION**

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

**3.2 WORKMANSHIP**

- .1 Keep hot asphalt:
  - .1 Below its flash point.
  - .2 At or below its final blowing temperature.
  - .3 Within its equiviscous temperature range at place of application.

**3.3 PREPARATION**

- .1 Before applying damp proofing:
  - .1 Seal exterior joints between foundation walls and footings, joints between concrete floor slab and foundation and around penetrations through damp proofing with sealing compound.

**3.4 APPLICATION**

- .1 Do damp proofing in accordance with CAN/CGSB-37.3 and manufacturer's recommendations.
- .2 Do sealing work in accordance with CGSB 37-GP-11M.
- .3 Do priming of surface in accordance with CGSB 37-GP-15M.
- .4 Apply primer to CGSB primer standard.
- .5 Apply damp proofing in accordance with applicable CGSB application standard.

**3.5 SCHEDULE**

- .1 Apply continuous, uniform coating to entire exterior faces of foundation walls from 50 mm below finished grade level to and including tops of foundation wall footings.
- .2 Apply continuous, uniform coating to exterior side of foundation walls enclosing rooms below finished grade. Include exterior portion of interior walls where floors in adjacent rooms are at different elevations.
- .3 Apply two additional coats of damp proofing to vertical corners and construction joints for a minimum width of 230 mm on each side, and all around and for 230 mm along pipes passing through walls.

**3.6 CLEANING**

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

- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse/ recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**3.7 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by damp proofing application.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Division 03 - Concrete
- .2 Section 04 05 12 – Masonry Mortar and Grout
- .3 Section 04 05 19 – Masonry Anchorage and Reinforcement
- .4 Section 04 05 23 – Masonry Accessories
- .5 Section 04 21 13 – Brick Masonry
- .6 Section 07 11 13 – Bituminous Damp Proofing
- .7 Section 07 27 00 – Air Barriers
- .8 Section 09 21 16 – Gypsum Board Assemblies

**1.2 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM E96/E96M-05, Standard Test Methods for Water Vapour Transmission of Materials.
- .2 Canadian Gas Association (CGA)
  - .1 CAN/CGA-B149.1-F05, Natural Gas and Propane Installation Code Handbook.
  - .2 CAN/CGA-B149.2-F05, Propane Storage and Handling Code.
- .3 Underwriters Laboratories of Canada (ULC)
  - .1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Division 1 – General Requirements.
  - .2 Submit three copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's insulation products and adhesives.

**1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Division 1 – General Requirements.
- .2 Storage: in accordance with manufacturer's written instructions.

**1.5 MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse/ recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.

- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

## **PART 2 PRODUCTS**

### **2.1 INSULATION**

- .1 Foundation walls insulation: extruded polystyrene (XPS), to code requirements, in accordance with CAN/ULC-S701, Type 4 with latex modified concrete surface, thickness 9 mm, up to at least 300 mm below final ground level
  - .1 Thermal Resistance: RSI 0, 87 / 25 mm to ASTM C518
  - .2 Compressive strength: 240 kPa (35 psi) to ASTM D1621.
  - .3 Water absorption: ASTM D2842: <0, 7% in volume.
  - .4 Water vapour permeance: 0,8 permanent to ASTM E96.
  - .5 Insulation thickness: 2 inches, 51 mm.
  - .6 Acceptable products: STYROFOAM™ Tech-Crete Blanks by DOW Chemical, “CFI Wall Panels” by T. Clear Corp. or equivalent, approved by architect.

### **2.2 ADHESIVE**

- .1 Adhesive (for polystyrene insulation): to CGSB 71-GP-24 and according to insulating boards ‘manufacturer’s recommendations.

### **2.3 ACCESSORIES**

- .1 Clips, fasteners, flash and trim: according to insulating boards ‘manufacturer’s recommendations.

## **PART 3 EXECUTION**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

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

### **3.2 WORKMANSHIP**

- .1 Install insulation after building substrate materials are dry.
- .2 Install insulation to maintain continuity of thermal protection to building elements and spaces.
- .3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.

- .4 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.
- .5 Offset both vertical and horizontal joints in multiple layer applications.
- .6 Do not enclose insulation until it has been inspected and approved by architect.

### **3.3 EXAMINATION**

- .1 Examine substrates and immediately inform architect in writing of defects.
- .2 Prior to commencement of work ensure: Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

### **3.4 PERIMETER FOUNDATION INSULATION**

- .1 Extend boards 2400 mm minimum below finish grade where there is a basement. Install on exterior face of perimeter foundation wall with adhesive.
- .2 Extend boards to top of foundation footing where there is no basement. Install on exterior face of perimeter foundation wall with adhesive.

### **3.5 CONCRETE COVERING REPAIR**

- .1 Concrete covering over insulation boards must be touched up with patching mortar where damaged during fabrication or installation.
- .2 Remove from area that needs to be repaired all traces of deteriorated concrete, as well as dust, oil, grease and other materials that could prevent proper adhesion.
- .3 Apply mortar in accordance with manufacturer's written instructions.
- .4 Fill all pores and voids. Form and finish surfaces for proper adhesion of membrane.
- .5 Do not exceed time of usage. Maintain conditions recommended for hardening and recommended for complete process.
- .6 Surface finish: gypsum application on concrete covering.

### **3.6 CLEANING**

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 04 05 00 – Common Work Results for Masonry
- .2 Section 04 05 19 – Masonry Anchorage and Reinforcement
- .3 Section 04 05 23 – Masonry Accessories
- .4 Section 05 41 00 – Structural Metal Stud Framing
- .5 Section 06 10 00 – Rough Carpentry
- .6 Section 07 27 00 – Air Barriers
- .7 Section 07 42 43 – Composite Wall Panels
- .8 Section 08 44 13 – Glazed Aluminium Curtain Walls
- .9 Section 08 50 00 – Windows
- .10 Section 09 21 16 – Gypsum Assemblies

**1.2 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM C553-13 Standard Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.
  - .2 ASTM C665-12, Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
  - .3 ASTM C1320-10, Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.
- .2 Canadian Gas Association (CGA)
  - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
  - .2 CAN/ CGA-B149-F10, Propane Storage and Handling Code, contains B149.1-10, Natural Gas and Propane Installation Code, and B149.2-10, Propane Storage and Handling Code.
- .3 Underwriters Laboratories of Canada (ULC)
  - .1 CAN/ULC-S604-2012, Type A Chimneys.
  - .2 CAN/ULC-S702-2012, Standard for Mineral Fibre Insulation.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet. Data sheet must indicate characteristics of products, performance criteria, dimensions, limitations and finish.
- .3 Certificates:



.1 Submit documents signed by manufacturer certifying that products, materials and equipment meet requirements regarding physical characteristics and performance criteria.

.4 Test Reports:

.1 Submit test reports certifying that products, materials and equipment comply with requirements as to physical characteristics and performance criteria.

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

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

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect prescribed material from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

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

.1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.

.2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.

.3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.

.4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

### **PART 2 PRODUCTS**

#### **2.1 INSULATION**

.1 Batt and blanket mineral fibre: to CAN/ULC S702.

.1 Type: 1

.2 Thickness: as indicated

.3 Acceptable Products:

.1 Acoustic Insulation: "Roxul AFB" or equivalent, approved by architect.

.2 Thermal Insulation: "Roxul Plus MB" or equivalent approved by architect

.3 Cavity Wall: "Roxul CavityRock DD" or equivalent approved by architect

#### **2.2 ACCESSORIES**

.1 Insulation clips:

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

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- .1 Verify conditions: before application of blanket insulation, ensure that condition of previously implemented surfaces/supports under other sections or contracts is acceptable and allows to carry out work in accordance with manufacturer's written instructions.
  - .1 Perform visual inspection of surfaces/ supports in presence of Consultant.
  - .2 Immediately inform Consultant of any unacceptable condition detected.
  - .3 Start installation work only after unacceptable conditions have been corrected and written approval of Consultant received.

#### **3.2 INSULATION INSTALLATION**

- .1 Install insulation to maintain continuity of thermal protection to building elements and spaces and to ASTM C1320.
- .2 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
- .3 Do not compress insulation to fit into spaces.
- .4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN/ULC-S604 Type A chimneys and Type B and L vents in accordance with CSA B149.1 and CSA B149.2.
- .5 Do not enclose insulation until it has been inspected and approved by Consultant.

#### **3.3 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse/ recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED SECTIONS**

- .1 Section 04 05 00 - Maçonnerie exigences générales concernant les résultats des travaux.
- .2 Section 07 27 00 - Systèmes d'étanchéité à l'air.
- .3 Section 07 42 43 - Panneaux métalliques composites pour le bâtiment.
- .4 Section 07 84 00 – Protection coupe-feu
- .5 Section 08 11 00 - Portes et bâtis en métal.
- .6 Section 08 44 13 – Murs-rideaux vitrés à ossatures d'aluminium.
- .7 Section 08 50 00 – Fenêtres.

**1.2 REFERENCES**

- .1 Canadian Urethane Foam Contractors' Association Inc. (CUFCA)
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .3 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S101-04, Fire Endurance Tests of Building Construction and Materials.
  - .2 CAN/ULC-S102-03, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
  - .3 CAN/ULC-S705.1-01, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, And Material Specification.
  - .4 CAN/ULC-S705.2-05, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, and Application.

**1.3 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit two (2) copies WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 Submittal procedures.
- .3 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.

- .1 Test reports: submit certified test reports for insulation from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
- .2 Submit test reports in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics.

#### **1.4 QUALITY ASSURANCE**

- .1 Applicators responsible for onsite installation of foam insulation to conform to CUFCA Quality Assurance Program.
- .2 Qualification
  - .1 Installer: person specializing in implementation of sprayed insulation, approved by manufacturer.
  - .2 Manufacturer: Company with experience in manufacturing products similar to those that will be implemented in the framework of this project, and having sufficient production capacity required to deliver products on time.
- .3 Mock-up:
  - .1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
  - .2 Construct mock-up 10 m<sup>2</sup> minimum, of sprayed insulation including one inside corner and one outside corner.
  - .3 Mock-up may be part of finished work.
  - .4 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with sprayed insulation work.
- .4 Health and Safety Requirements: worker protection:
  - .1 Protect workers as recommended by CAN/ULC-S705.2 and manufacturer's recommendations:
  - .2 Workers must wear gloves, respirators, dust masks, long sleeved clothing, eye protection, protective clothing, when applying foam insulation.
  - .3 Workers must not eat, drink or smoke while applying foam insulation.

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

- .1 Packaging, shipment, handling and delivery. Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials and equipment to site in original factory packaging, labeled with name and address of manufacturer.
- .3 Storage and Handling Requirements:
  - .1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store materials and equipment required to protect against marks, scratches and nicks.
  - .3 Replace defective or damaged materials with new.

**1.6 SITE CONDITIONS**

- .1 Ventilate area in accordance with Section 01 51 00 - Temporary Utilities.
- .2 Ventilate area to receive insulation by introducing fresh air and exhausting air continuously during and 24 hour after application to maintain non-toxic, unpolluted, safe working conditions.
- .3 Provide temporary enclosures to prevent spray and noxious vapours from contaminating air beyond application area.
- .4 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of insulation materials.
- .5 Apply insulation only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- .1 Insulation: spray polyurethane to CAN/ULC-S705.1 and complying with the following performance objective. Medium density material made from renewable vegetable oil and recycled plastic, does not include any substances that contribute to depletion of ozone layer.
  - .1 Acceptable Products: "HEATLOK SOYA" by Demilec, "JM Corbond III" Johns Manville or equivalent approved by Architect.
- .2 Sealing foam / mono-component polyurethane adhesive "DuraFoam 24S".
- .3 Primers: to manufacturer's recommendations, taking into account condition of surfaces to be insulated.

**PART 3 EXECUTION**

**3.1 EXAMINATION**

- .1 Verification of Conditions: before spraying insulation, ensure that condition of surfaces / materials previously implemented under other sections or contracts is acceptable and can perform work in accordance with manufacturer's written instructions.
  - .1 Visual inspection of surfaces / materials in presence of Consultant.
  - .2 Immediately inform Consultant of unacceptable conditions detected.
  - .3 Proceed with installation only after correcting unacceptable conditions and written approval of Consultant.

**3.2 APPLICATION**

- .1 Apply insulation to clean surfaces in accordance with CAN/ULC-S705.2 and manufacturer's printed instructions.

- .2 Use primer where recommended by manufacturer.
- .3 Apply sprayed foam insulation in thickness as indicated..

### **3.3 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each working day.
- .2 Final Cleaning: upon completion remove materials / surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
  - .1 Remove insulation materials that have spilled or fell to the ground during implementation, and leave work ready for gypsum boards implementation.
- .3 Waste Management: separate waste for recycling and re-use, in accordance with Section 01 74 21 - Management and disposal of construction / demolition waste.
  - .1 Remove containers and recycling bins and dispose of materials at appropriate facility.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 SECTION CONTENT**

This section describes the requirements for, but not limited to, the supply and installation of vapor barrier polyethylene part of the concrete slabs on grade.

**1.2 RELATED REQUIREMENTS**

- .1 Division 03 - Concrete.
- .2 Section 04 05 00 - Common Work Results for Masonry.
- .3 Section 04 05 19 - Masonry Anchorage and Reinforcing
- .4 Section 04 22 00 - Concrete Unit Masonry
- .5 Section 06 10 10 - Rough Carpentry.
- .6 Section 07 11 13 - Bituminous Dampproofing.
- .7 Section 07 21 13 - Board Insulation.
- .8 Division 22 - Plumbing.

**1.3 REFERENCES**

- .1 American Society for Testing and Materials (ASTM)
  - .1 ASTM D 1709 - 09 Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method.
  - .2 ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
  - .3 ASTM E 154 - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs.
  - .4 ASTM E 1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
  - .5 ASTM E 1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
  - .6 ASTM F 1249-01 Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor.
- .2 American Concrete Institute (ACI)
  - .1 ACI 302.1R-96 Vapor Barrier Component (plastic membrane) is not less than 10 mils thick.

**1.4 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:

- .1 Submit manufacturer's printed product literature, specifications and datasheet and include:
  - .1 Product characteristics.
  - .2 Performance criteria.
  - .3 Limitations.
- .3 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS).
- .4 Quality assurance submittals:
  - .1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .2 Instructions: submit manufacturer's installation instructions and comply with written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

## **1.5 ENVIRONMENTAL REQUIREMENTS**

- .1 Product not intended for improper use, or permanent exposure to weather.
- .2 Do not apply on frozen ground.

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

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
  - .1 Protect prefabricated constructions against moisture and damages during their delivery or after.
  - .2 Store prefabricated constructions in well ventilated premises protected against moisture or extreme temperature variations.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect cabinetry from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

## **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse/recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Develop a waste reduction plan for the work covered in this section, in accordance with Section 01 74 21 - Management and disposal of construction / demolition waste.
- .3 Collect and separate all paper packaging materials, plastic, polystyrene, corrugated cardboard and place them in appropriate on-site bins for recycling in accordance with Waste Reduction Plan.



- .4 Packaging waste management: collect all packaging waste for reuse/recycling/return of pallets, boxes, padding, other packaging waste, to manufacturer, as per Waste Reduction Plan and according to Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

## **PART 2 PRODUCTS**

### **2.1 SHEET VAPOUR BARRIER**

- .1 Plastic vapour retarder
  - .1 Specification: membrane in virgin polyefin resin, to ASTM E 1745 as follows:
    - .1 Maximum water vapour permeance (ASTM E 154, Sections 7, 8, 11, 12,13), ASTM E 96, Method B or ASTM F 1249)
      - .1 As received : 0,0093 perm
      - .2 After wetting and drying : 0,0122 perm
      - .3 Temperature and plastic flow resistance: 0,0121 perm
      - .4 Low temperature effect and flexibility: 0,0138 perm
      - .5 Resistance to deterioration caused by organisms and substances from floor in direct contact: 0,0123 perm
    - .2 Puncture resistance (ASTM D 1709) : 4394 g
    - .3 Tensile resistance (ASTM E 154, Section 9) : 84 lb/po
  - .2 Acceptable Products : "PERMINATOR" 15 mils byW. R. MEADOWS. or equivalent approved by Architect.

### **2.2 ACCESSOIRES**

- .1 Joint sealing tape: air tight adhesive tape, apply with light pressure, type recommended by manufacturer of vapor barrier, 100 mm wide.
- .2 Sealant: compatible with vapor barrier used and recommended by manufacturer. Compliant with Section 07 92 00 - Joint Sealants.
- .3 Molded vapor barrier elements to manufacturer's recommendations.
- .4 Hose clamps
  - .1 Fabricate hose clamps with vapor barrier material and pressure sensitive tape according to manufacturer's instructions.

## **PART 3 EXECUTION**

### **3.1 MANUFACTURERS INSTRUCTIONS**

- .1 Conformance: comply with manufacturer's written requirements, recommendations and specifications including all available data sheets, instructions relative to maintenance and handling, storage and product installation, and technical instructions in data sheets.

**3.2 PREPARATION**

- .1 Prepare surfaces in accordance with manufacturer's written instructions.
- .2 Level, compress or roll ground or granulate below slab base

**3.3 INSTALLATION**

- .1 Install vapour barrier in accordance with manufacturer's written instructions and to ASTM E 1643-98.
- .2 Ensure services are installed and inspected prior to installation of retarder.
- .3 Install sheet vapour retarder on warm side of exterior ceiling wall, assemblies prior to installation of gypsum board to form continuous barrier.
- .4 Use sheets of largest practical size to minimize joints.
- .5 Unroll vapour barrier where slab will be poured. Cut to dimensions if required.
- .6 All joints and connections, lateral or butt jointed, will overlap width 150 mm, cover up with joint sealing tape, 100 mm wide. The area where tape is applied should be free of dust, dirt and moisture so as to allow maximum self-adhesion.
- .7 Inspect for continuity. Repair punctures and tears with sealing tape before work is concealed.

**3.4 PERIMETER SEALS**

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

**3.5 VAPOUR BARRIER TRAVERSAL**

- .1 Seal protrusions as per manufacturer's written indications.

**3.6 CLEANING**

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

**END OF SECTION**

**PART 1 GENERAL**

**1.1 SECTION CONTENT**

- .1 Units designed to ensure a continuous seal between the envelope elements and the building's openings and penetrations.

**1.2 RELATED REQUIREMENTS**

- .1 Section 04 22 00 – Concrete Unit Masonry
- .2 Section 07 21 16 – Blanket Insulation
- .3 Section 07 31 13 – Asphalt Shingles
- .4 Section 07 42 43 – Composite Wall Panels
- .5 Section 07 92 00 – Joint Sealants
- .6 Section 08 11 00 – Metal Doors and Frames
- .7 Section 08 50 00 – Windows
- .8 Section 09 21 16 – Gypsum Board Assemblies
- .9 Structure drawings, concrete and steel

**1.3 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM D4541-02, Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
  - .2 ASTM E330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls, by Uniform Static Air Pressure Difference.
  - .3 ASTM E783-02, Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors.
  - .4 ASTM E1186-03, Standard Practices for Air Leakage Site Detection in Building Envelope and Air Retarder Systems.

**1.4 PERFORMANCE REQUIREMENTS**

- .1 Select and implement wall and roof units so that there are as few air leaks as possible, caused by static pressure exerted by the air on the outside walls, soffits, roof, and also windows, glazing, doors, roof hatches, skylights and all other interruptions in the walls and roof insulation. When it is subjected to a differential pressure of 75 Pa, air barrier system must not show a permeability rate greater than 0.02 L/s.m<sup>2</sup>, measured according to ASTM E73 ASTM E330.
- .2 Select and implement wall and roof units so that there are as few air leaks as possible, caused by static pressure exerted by the air on the outside walls, soffits, roof, and also windows, glazing, doors, roof hatches, skylights and all other interruptions in the walls and roof insulation. When it is subjected for an hour to wind pressures likely to occur once a decade, according to the NBC, air barrier system must not have a permeability rate greater than 0.02 L/s.m<sup>2</sup>, measured according to ASTM E783 ASTM E330.

- .3 If continuous qualitative tests are required throughout the implementation of the air barrier, they must be carried out using methods established in ASTM E1186 ASTM D4541.
- .4 Ensure continuity between materials and air and vapour barrier systems, and materials described in sections 03 30 00 - Cast-in-place Concrete, 07 21 13 – Board Insulation and 07 92 00 – Joint Sealants.

## **1.5 DOCUMENTS / SAMPLES TO SUBMIT**

- .1 Submit required shop drawings in conformance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit required Material Safety Data Sheets MSDS from Workplace Hazardous Materials Information System WHMIS - in accordance with Section 01 35 29.06 Health and Safety Requirements.
- .3 Shop drawings: submitted shop drawings must bear seal and signature of a competent engineer recognized or authorized to practice in Canada, in the province of Quebec.
  - .1 Shop drawings must show special jointing characteristics.
- .4 Quality assurance: submit following documents in accordance with section 01 45 00 - quality control.
  - .1 Manufacturer's instructions: submit manufacturer's instructions, including any indication regarding particular handling, implementation and cleaning methods.

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

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 Common product requirements.
- .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .3 Prevent accidental spills. Where appropriate, notify Consultant immediately and proceed to clean-up.
- .4 In case of accidental spill, clean soiled surfaces and make good as per original condition.

## **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.

- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

## **1.8 IMPLEMENTATION CONDITIONS**

- .1 It is prohibited to install solvent curing sealants and vapour release adhesive materials in enclosed spaces without ventilation.
- .2 Ventilate enclosed spaces in accordance with Division 1 – General Requirements.
- .3 Maintain temperature and humidity recommended by materials manufactures before, during and after installation.

## **1.9 SEQUENCING**

- .1 Sequence work in accordance with section 01 32 16.07 – Construction Progress Schedule – Bar (GANTT) Chart.
- .2 Ensure installation of air-barriers and vapour-barriers coincide with installation of other related material and insulation systems.

## **1.10 WARRANTY**

- .1 For work covered by this section, i.e. 07 27 00 – Air Barriers, the 12 month warranty period will be extended to 36 months.
- .2 Provide warranty in accordance with section 01 78 00 – Closeout Submittals, to be delivered after completion of work.
- .3 Warranty must cover implemented seal compounds and sheet sealing.
  - .1 not providing air and water barrier as intended
  - .2 showing a loss of adhesion or cohesion;
  - .3 not properly setting.

## **PART 2 PRODUCTS**

### **2.1 SEALING MATERIALS**

- .1 Seals
  - .1 Self-adhesive membrane: self-adhesive rubberized bitumen SBS, integrally laminated to high-density polyethylene film, nominal total thickness of 1,0 mm.
    - .1 Acceptable products: "Blueskin SA" Bakor or equivalent approved by architect.
  - .2 Self-adhesive membrane for intramural flashing: self-adhesive rubberized bitumen SBS, integrally laminated to high-density polyethylene film. Membrane must have following physical properties;
    - .1 Membrane thickness: 1mm (40 mils)
    - .2 Film Thickness: 4, 0 mils

- .3 Flow (ASTM D5147): successful test at 110°C
  - .4 Puncture Resistance: 134 lbf (ASTM E 154)
  - .5 Tensile Strength (film): 39 500 kPa (ASTM D882)
  - .6 Tear Resistance: 200 N MD (ASTM D1004)
  - .7 Low Temperature Flexibility: -30°C (CGSB 37-GP-56M)
  - .8 Acceptable products: "Blueskin SA" Bakor or equivalent approved by architect.
- .2 Accessories
- .1 Primer / adhesive for self-adhesive air-barrier primary membrane, water resistant, for self-adhesive connective membrane and for adhesive rubberized bitumen SBS membranes applied at temperatures superior to -4 °C. It is a polymer based adhesive emulsion, fast drying; its physical properties are as follows:
    - .1 Weight: 1, 0 kg/l.
    - .2 Solids by volume : 53 %.
    - .3 Odor free and water based
    - .4 Application temperature: -4°C @ 40°C
    - .5 Drying time (initial setting): 30 minutes at 50 % HR and 20° C.
    - .6 Acceptable products: "Blueskin SA" Bakor or equivalent approved by architect.
  - .2 Substrate cleaner: non corrosive, compatible with adjoining materials.
  - .3 Use primary air barrier membrane / liquid vapour-barrier Air-Bloc 21 manufactured by Bakor. It is a single component synthetic solvent based rubber membrane, applied with a trowel to a wet film thickness of 3.2 mm (120 mils) and its characteristics are as follows:
    - .1 Air Permeability: 0,013 L/s•m<sup>2</sup> à 75 Pa.
    - .2 Water Vapor Permeance: 1.7 ng/Pa.m<sup>2</sup>.s. (0, 03 perms)
    - .3 Thickness: 3.2mm (120 mils)
    - .4 Chemical Resistance: resist to salt and to slightly alkalis and salt solutions
    - .5 Acceptable products: "Air Bloc 21" by Bakor or equivalent approved by architect.

### **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 GENERAL REQUIREMENTS**

- .1 Perform work according to the requirements of the Sealant and Caulking Guide Specification published by the Sealant and Waterproofer's Institute, when it comes to methods of implementation and materials.
- .2 Perform work according to the requirements of the Professional Contractor Quality Assurance Program of the National Air Barrier Association and requirements relating to materials and their implementation.

- .3 Perform work according to the requirements in the Professional Contractor Quality Assurance Program of the Canadian Urethane Foam Contractor's Association and requirements relating to materials and their implementation.

### **3.3 EXAMINATION**

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

### **3.4 PREPARATION**

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

### **3.5 INSTALLATION**

- .1 Install materials in accordance with manufacturer's instructions.
- .2 Install Self-Adhesive membrane between window and door frames and adjacent wall seal materials and between roof decking and sealing materials. Caulk to ensure complete seal. Position lap seal over firm bearing.
- .3 Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- .4 Perimeter of wall opening: install seal by covering wall sealing to a total adhesion width of 150 mm, on a solid support, and edge of window frame to a total adhesion width of 25 mm. Seal edge with a sealant compound.

### **3.6 CLEANING**

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

**3.7 PROTECTION OF WORK**

- .1 Protect finished work
- .2 Do not permit adjacent work to damage work of this section.
- .3 Ensure finished work is protected from climatic conditions.

**END OF SECTION**



**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 04 21 13 – Brick Masonry
- .2 Section 05 41 00 – Structural Metal Stud Framing
- .3 Section 07 21 16 – Blanket Insulation
- .4 Section 07 21 19 – Sprayed Insulation
- .5 Section 07 27 00 – Air Barriers
- .6 Section 07 62 00 – Sheet Metal Flashing and Trim
- .7 Section 07 92 00 – Joint Sealants

**1.2 REFERENCES**

- .1 The Aluminum Association, Inc. (AA)
  - .1 AA DAF45-03, Designation System for Aluminum Finishes.
- .2 American Society for Testing and Materials International (ASTM)
  - .1 ASTM A167-99(2004), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
  - .2 ASTM A240/A240M-05a, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
  - .3 ASTM A480/A480M-05, Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.
  - .4 ASTM D523-89(R1999), Standard Test Method for Specular Gloss.
  - .5 ASTM D822-01, Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
- .3 Canadian General Standards Board (CGSB)
  - .1 CGSB 19-GP-14M-76(R1984), Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.
- .4 Green Seal Environmental Standards
  - .1 Standard GC-03-93, Anti-Corrosive Paints.
  - .2 Standard GS-11-97, Architectural Paints.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .6 South Coast Air Quality Management District (SCAQMD), California State
  - .1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

**1.3 DESIGN REQUIREMENTS**

- .1 Design metal cladding to allow for thermal movement of component materials caused by variation in ambient temperature range of 80 degrees C without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.
- .2 Maximum deviation from vertical and horizontal alignment of erected panels: 1 to 1000.

**1.4 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature for cladding system materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit two copies WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 29.06 – Health and Safety.
- .3 Shop Drawings:
  - .1 Shop drawings: submit drawings stamped and signed by professional engineer registered or licensed in the Province of Quebec, Canada.
  - .2 Indicate dimensions and thickness of panels, fastening and anchoring methods, detail and location of joints and gaskets, thermal movement provision, wall openings, head, jamb and sill details, materials and finish, compliance with design criteria and requirements of related work.
- .4 Samples:
  - .1 Submit duplicate 100 x 100 mm samples of [wall] [soffit] system, representative of materials, finishes and colours.
- .5 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.
  - .1 Certificates: submit certificates signed by manufacturer certifying that composite wall panels comply with specified performance characteristics and physical properties.
  - .2 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence and cleaning procedures.

**1.5 QUALIFICATIONS**

- .1 Manufacturer: company specializing in producing composite wall panels with 5 documented years of experience and sufficient capacity to produce and deliver required units without causing delay in work.
- .2 Installer: person specializing in composite wall panel installations approved by manufacturer.
- .3 Mock-ups: construct mock-ups in accordance with Section 01 45 00 - Quality Control and to requirements supplemented as follows:
  - .1 Provide mock-up for evaluation of surface finishes and workmanship.
  - .2 Provide initial production units for job-site assembly with other materials for review and approval.

- .3 Co-ordinate type and location of mock-ups with project requirements.
- .4 Accepted units will be used as standard for acceptance of production units.
- .5 Remove and replace units which are not accepted.
- .6 Do not proceed with remaining work until workmanship, colour, and finish are accepted by Consultant.
- .7 Refinish mock-up area as required to produce acceptable work.
- .8 When accepted, mock-up will demonstrate minimum standard of quality required for this work.
  - .1 Approved mock-up may remain as part of finished work.
- .4 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section, with Contractor's representative and Consultant in accordance with Section 01 32 16.07 - Construction Progress Schedule - Bar (GANTT) Chart to:
  - .1 Verify project requirements.
  - .2 Review installation and substrate conditions.
  - .3 Co-ordination with other building sub trades.
  - .4 Review manufacturer's installation instructions and warranty requirements.

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

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver, store and protect material in accordance with panel manufacturer's recommendations.
- .3 Do not expose panels with strippable film to direct sunlight or extreme heat.

## **1.7 MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse/ recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Exterior cladding panels: to ASTM A653/A653M, grade 3, pre-finished galvanizing Z275 on polyester-covered silicone-modified (PMS) layer.

- .1 Type 2 cladding: 0.46 mm (cal 26) thickness, bare metal. Acceptable product: corrugated 7/8 by Vicwest or equivalent approved by architect. Color: Silver QC-7500.
- .2 Architectural panels: 4 mm thickness, aluminium cover-sheet, high-performance alloy, 3105-H14, 0.51 mm thickness, fire retardant extruded core by "Alpolic / FR Core". Acceptable product: Vicwest 3 system - dry Joint by Vicwest or equivalent approved by architect. Color: RVW White (4-RVW-G45).
  - .1 Covering system will include all panel stiffeners, clips, trim, required accessories and sealants to meet applicable codes with regards to wind loads as well as air and water infiltrations. All systems to be designed according to "open rain-screen principles".
- .3 Sub-girts:
  - .1 All sub-girts will be Grade A steel, to ASTM A653/A653M, galvanizing Z275, manufactured according to dimensions and profiles shown in drawings, thickness determined by structure calculations (see section 1.5.2.3) however not inferior to 1.5 mm.
  - .2 All sub-girts will be notched so as to fit interior cladding shape and so as to make it possible to fix these sub-girts through interior cladding directly on the structure.

## **2.2 ACCESSORIES**

- .1 Flashing: in accordance with Section 07 62 00 – Sheet Metal Flashing and Trim. Material should match cladding where exposed. Galvanized material in concealed areas. If necessary, custom build so as to take architectural details into account. Use only preformed outer corner pieces. Double back exposed edges.
- .2 Fasteners: metal fasteners suitable for selected profile type, according to manufacturer's recommendations.
- .3 Sealant: refer to section 07 92 00 – Joint Sealants.
- .4 Ceiling mouldings: 0.61 mm (cal 24) thickness bare metal, to ASTM A653/A653M, grade 230, pre-finished galvanizing Z275 on polyester-covered silicone-modified (PMS) layer, color identical to cladding.
- .5 Screws: to ANSI B18.6.4, stainless steel with pre-painted hexagonal head, color identical to cladding and embedded EPDM washer, according to manufacturer's recommendations.
- .6 Touch-up paint: in accordance with metal panels' manufacturer's recommendations and used only with Consultant's permission.
- .7 Insulating coating: bituminous paint, solution of alkali-resistant epoxy resins.
- .8 Thermal Barriers: 3mm thick foam rubber edge over minimum width of 25mm to cover sub-girt face, provided in rolls, covered with protective paper.
- .9 Closing edges: soft PVC single-cell foam, same shape as metal cladding, Arctic climate type.
- .10 Metal Seals: same finish and thickness as adjacent panels.

**PART 3 EXECUTION**

**3.1 MANUFACTURER'S INSTRUCTIONS**

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

**3.2 EXAMINATION**

- .1 Before installation examine alignment of substrate and notify Consultant in writing if substrate does not comply with requirements of panel installer.

**3.3 INSTALLATION**

- .1 Install composite panels in accordance with manufacturer's written instructions and shop drawings.
  - .1 Allow for thermal movement.
- .2 Maintain following installation tolerances:
  - .1 Maximum variation from plane or location shown on shop drawings: 10 mm/10 m of length and up to 20 mm/100 m.
  - .2 Maximum deviation for vertical member: 3 mm in an 8.5 m run.
  - .3 Maximum deviation for a horizontal member: 3 mm in an 8.5 m run
  - .4 Maximum offset from true alignment between two adjacent members abutting end to end, in line: 0.75 mm.
- .3 Remove strippable coating from panels as they are erected.

**3.4 CLEANING**

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

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 06 10 10 – Structural Frame
- .2 Section 07 72 69 – Roof Anchors and Safety Restraints
- .3 Section 07 92 00 – Joint Sealants

**1.2 REFERENCES**

- .1 The Aluminum Association Inc. (AAI)
  - .1 AAI-Aluminum Sheet Metal Work in Building Construction-2002.
  - .2 AAI DAF45-03, Designation System for Aluminum Finishes.
- .2 American Society for Testing and Materials International (ASTM)
  - .1 ASTM A167-99(2004), Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
  - .2 ASTM A240/A240M-07e1, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
  - .3 ASTM A606-04, Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.
  - .4 ASTM A653/A653M-07, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .5 ASTM A792/A792M-06a, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
- .3 Canadian Roofing Contractors Association (CRCA)
  - .1 Roofing Specifications Manual 1997.
- .4 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
  - .2 CAN/CGSB-93.1-M85, Sheet Aluminum Alloy, Prefinished, Residential.
- .5 Canadian Standards Association (CSA International)
  - .1 CSA A123.3-05, Asphalt Saturated Organic Roofing Felt.
  - .2 AAMA/WDMA/CSA 101/I.S.2/A440-2008, Standard/Specification for Windows, Doors, and Unit Skylights.
  - .3 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .6 Green Seal Environmental Standards
  - .1 Standard GS-03-93, Anti-Corrosive Paints.
  - .2 Standard GS-11-97, Architectural Paints.
  - .3 Standard GS-36-00, Commercial Adhesives.
- .7 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

- .1 Material Safety Data Sheets (MSDS).

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

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit two copies WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3 Samples:
  - .1 Submit duplicate 50 x 50 mm samples of each type of sheet metal material, finishes and colours.
- .4 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.
  - .1 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence and cleaning procedures.

### **1.4 QUALITY ASSURANCE**

- .1 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning on-site installation, with Consultant in accordance with Section 01 32 16.07 - Construction Progress Schedule - Bar (GANNT) Chart to:
  - .1 Verify project requirements.
  - .2 Review installation and substrate conditions.
  - .3 Co-ordination with other building sub trades.
  - .4 Review manufacturer's installation instructions and warranty requirements.

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

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

### **1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

**PART 2 PRODUCTS**

**2.1 SHEET METAL MATERIALS**

- .1 Zinc coated steel sheet: commercial quality to ASTM A653/A653M, with Z275 designation zinc coating.
- .2 Stainless steel sheet: to ASTM A240/A240M, Type 304 with brushed #4 finish.

**2.2 PREFINISHED STEEL SHEET**

- .1 VOC content of surface coatings and touch-up products for prefinished metal sheet products shall not exceed 250 g/L.
- .2 Prefinished steel with factory applied polyvinyl chloride.
  - .1 Class F1S
  - .2 Colour selected by Consultant from manufacturer's standard range.
  - .3 Specular gloss: 30 units +/- 5 in accordance with ASTM D523.
  - .4 Coating thickness: not less than 25 micrometres.
  - .5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20 % to ASTM D822 as follows:
    - .1 Outdoor exposure period 1000 hours.
    - .2 Humidity resistance exposure period 1000 hours.

**2.3 ACCESSORIES**

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Plastic cement: to CAN/CGSB 37.5.
- .3 Underlay for metal flashing: dry sheathing to CAN/CGSB-51.32.
- .4 Sealants: to 07 92 00 – Joint Sealants
- .5 Cleats: of same material, and temper as sheet metal, minimum 50 mm wide. Thickness and width same as sheet metal being secured.
- .6 Fasteners: of same material as sheet metal and concealed.
- .7 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
- .8 Touch-up paint: as recommended by prefinished material manufacturer.
- .9 Fasteners: only screw type with acceptable protective layer against corrosion are permitted.
- .10 For membrane drilling work, fasteners must only be screw type.

**2.4 FABRICATION**

- .1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA 'FL' series details and as indicated.
- .2 Fabricate aluminum flashings and other sheet aluminum work in accordance with AAI-Aluminum Sheet Metal Work in Building Construction.
- .3 Unless otherwise indicated, fabricate simple seam joints.
- .4 Fabricate 25 mm joints with concealed overlap corners.
- .5 Form pieces in 2400 mm maximum lengths.



- .1 Make allowance for expansion at joints.
- .6 Hem exposed edges on underside 12 mm.
  - .1 Mitre and seal corners with sealant.
- .7 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .8 Apply protective coating to metal surfaces to be embedded in concrete or mortar.

## **2.5 METAL FLASHINGS**

- .1 Form flashings, copings and fascias to profiles indicated.

## **2.6 REGLETS AND COUNTER FLASHINGS**

- .1 Form recessed reglets of sheet metal to be built-in concrete and masonry work for base flashings as detailed in drawings and in accordance with CRCA FL series details. Provide slotted fixing holes and steel/plastic washer fasteners.

## **PART 3 EXECUTION**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

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

### **3.2 INSTALLATION**

- .1 Install sheet metal work in accordance with indications.
- .2 Use concealed fastenings except where approved by Consultant before installation.
- .3 Provide underlay under sheet metal. Secure in place and lap joints 100 mm.
- .4 Counter flash bituminous flashings at intersections of roof with vertical surfaces and curbs. Flash joint using simple seams forming tight fit over hook strips.
- .5 Lock end joints and caulk with sealant.
- .6 Install pans, where shown around items projecting through roof membrane.

### **3.3 CLEANING**

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

**END OF SECTION**

**PART 1 GENERAL**

**1.1 SECTION CONTENT**

- .1 The content of this section consists in the furnishing of all works, materials, equipment and services required to furnish and install prefabricated roof accessories, as indicated in drawings, as specified hereafter and as required for a complete project.

**1.2 RELATED REQUIREMENTS**

- .1 Section 06 10 00 – Carpentry (Abridged)
- .2 Section 07 52 00 – Modified Bituminous Membrane roofing.
- .3 Section 07 62 00 - Sheet Metal Flashing and Trim.
- .4 Section 07 92 00 – Joint Sealants
- .5 Division 22 - Plumbing
- .6 Division 23 - Heating, ventilation and air conditioning.
- .7 Division 26 - Electricity

**1.3 REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CSA B272-93, Prefabricated self-sealing roof vent.

**1.4 DOCUMENTS AND SAMPLES SUBMITTALS**

- .1 Shop drawings
  - .1 Provide required shop drawings in accordance with Division 1 General requirements.
  - .2 Shop drawings must show components and fastening devices, and indicate their dimensions and construction details.
  - .3 Structural items, such as mechanical platforms and anchors for cables, including all connections and related fastening devices, must be conceived by a structural engineer who is a permanent member of the Ordre des Ingénieurs du Québec (Order of engineers of Quebec). Each submitted drawing must be signed and sealed by this engineer.
- .2 Product data sheets:
  - .1 Submit complete product data sheets including installation instructions by manufacturer for each item.
- .3 Certification after installation
  - .1 After installation, provide a written certificate signed by the engineer responsible for the shop drawings, stating that all structural items were installed in compliance with signed shop drawings.
- .4 Maintenance instructions

- .1 Provide maintenance instructions for each roof accessory to incorporate in the maintenance manual specified in Division 1 - General requirements.

## **1.5 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Examine architectural, mechanical, and electrical drawings, and furnish roof accessories as required for a complete project. Items indicated on drawings are typical and do not show all specific conditions. They are there to establish a general level of acceptability for quality and performance of roofing accessories.
- .2 Furnish products complying with following requirements:
  - .1 To CSA B272-93 (Prefabricated self-sealing roof vent);
  - .2 Maintenance free design.
- .3 Removable cap Stack jack flashing : Removable cap Stack jack flashing 457mm high; 'aluminum alloy 1100-0T mill finish, of 1,6mm thick; conforming to standard CSA B272-93; with removable cap and EPDM base joint; bituminous painted deck flange; stainless steel vandal-proof cap.
  - .1 Approved products: Model SJ-27 by Thaler Metal Industries or equivalent approved by Architect.
- .4 Roof curbs: 610 mm high heavy gage galvanized steel. continuous mitered and welded corner seams integral base plate, pressure treated strapping and insulated with 38 mm thick rigid fibreglass board insulation, complete with interior walls prefinished for curbs.
  - .1 Approved product: Model RT-3 by Journault Jourplex or equivalent approved by Architect. Insulated roof curb cover: complying with roof curb requirements and as recommended by manufacturer.
- .5 Double roof hatch with built-in fence, 915mm x 915mm: lid must be galvanized steel and insulated with 1 " thick fiberglass covered inside with a galvanized steel sheet, size 16. Frame, height 12 ", will be insulated with 1 " thick fiberglass, it will be located in upper part

and there will be a 4 " fastening flange in its lower part. The galvanized steel hatch will be covered with a coat of primer. The security fence will consist of two swivel fold sides on hinges and a retractable portion at the top of each door when open (if required). These units, once deployed, shall have a height of 1070 mm (42 "), dimension outside the access door and will be located under the security fences when closed. The mesh will be kept open by a hook on the access door panel. The safety fence and mesh must be constructed out of a galvanized steel frame 25 mm in diameter (1 "diameter) and bars of galvanized steel 20 mm in diameter (0.78" diam.), with 125 mm (4.92 ") spacing. One side of the built-in security fence will be equipped with a hinged door with a latch.

- .1 Approved product: Model RD by Journault Jourplex or equivalent approved by Architecte.
- .6 Security post: provide and install a telescopic security post made of galvanized steel fitted with a return spring made of a special alloy for corrosive conditions on all ladders accessible through roof hatch. The security post is made of high-strength galvanized steel with a telescopic section that will lock automatically when fully open. Upward and downward movement must be controlled by a spring mechanism. The mechanism is retained at different levels using fasteners in accordance with manufacturer's specifications.
  - .1 Approved product: security post telescopic model PS2 by Journault Jourplex or equivalent approved by Architect.
- .7 Furnish other items as required, including pipe supports, duct flashings, penetrating cables flashing etc. of same quality as items specified..
- .8 Coordinate with architecture, mechanical and electrical appropriate sections to establish dimensions and correct locations of these items.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for roof hatch installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Consultant.
  - .2 Inform Consultant of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

#### **3.2 MANUFACTURER'S INSTRUCTIONS**

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

#### **3.3 INSTALLATION**

- .1 Install constituent parts level and aligned.
- .2 Ensure continuity of air barrier and vapor retardant systems that are part of the building envelope.

- .3 Install roof hatches and seal, leaving room needed for expansion and contraction.
- .4 Secure prefabricated frames to structure.
- .5 Apply layer of insulation coating on aluminum and copper surfaces coming into contact with different materials.
- .6 Secure hatches to their frame and seal.

### **3.4 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### **3.5 PROTECTION**

- .1 Protect installed equipment and components from any damage during construction.
- .2 Repair adjacent material and equipment damaged by installation of roof hatches.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Division 05 – Structural Steel.
- .2 Section 07 21 19 – Sprayed Insulation.
- .3 Section 07 84 00 – Fire Stopping
- .4 Section 09 91 23 – Interior Painting
- .5 Division 22 - Plumbing
- .6 Division 23 – Heat and Ventilation
- .7 Division 26 - Electricity

**1.2 REFERENCES**

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .2 Underwriter's Laboratories of Canada (ULC)
  - .1 CAN-ULC-S101-04, Standard Methods of fire Endurance Tests of Building Construction and Materials.
  - .2 CAN-ULC-S102-03, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
  - .3 CAN-ULC S124-06, Standard Methods of Test for the Assessment of Plastic Foam Protective Coatings.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Division 1 – General Requirements.
- .2 Manufacturer's instructions: submit manufacturer's instructions, including any indication regarding particular handling, implementation and cleaning methods.
- .3 Test Reports: submit product data including certified copies of test reports verifying fireproofing applied to substrate as constructed on project will meet or exceed requirements of Specification.
- .4 Submit data sheets required in accordance with Division 1 – General Requirements.

**1.4 QUALITY ASSURANCE**

- .1 Installation of sprayed fireproof coating will be implemented by a firm of good reputation approved by manufacturer of the products, with at least five (5) years of experience in the field.
- .2 Work must be performed by workers qualified in the installation of sprayed fireproof coating.
- .3 All components of sprayed fireproof coating system must come from the same manufacturer.

**1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver packaged materials in original unopened containers, marked to indicate brand name, manufacturer and ULC markings.
- .2 Store and protect materials from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.
- .3 Damaged or opened containers will be rejected.

**1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

**1.7 AMBIENT CONDITIONS**

- .1 At temperatures less than 5 degrees C, ensure that 5 degrees C air and substrate temperature is maintained during and for 24 hours after application. Ensure that natural ventilation to properly dry the fireproofing during and subsequent to its application is provided. In enclosed areas lacking openings for natural ventilation, ensure that interior air is circulated and exhausted to the outside.
- .2 Maintain relative humidity within limits recommended fireproofing manufacturer.
- .3 Ensure that natural ventilation to properly dry fireproofing during and subsequent to its application is provided.
- .4 In enclosed areas lacking openings for natural ventilation, provide minimum of [4] air exchanges per hour by forced air circulation.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- .1 Sprayed fireproofing: ULC certified cementitious (made with 60% to 80% Portland cement) fireproofing qualified for use in ULC Designs specified.
  - .1 Acceptable products: Monokote Z-106 manufactured by Grace Construction Products Ltd or equivalent approved by Architect.
- .2 Sprayed fireproofing on rigid insulation (thermal barrier): ULC certified cementitious fireproofing qualified for use in ULC Designs specified.
  - .1 Acceptable products: Monokote Z-106 manufactured by Grace Construction Products Ltd or equivalent approved by Architect.

- .3 Curing compound: type recommended by fireproofing manufacturer, qualified for use in ULC Designs specified.
- .4 Sealer: type recommended by fireproofing manufacturer, qualified for use in ULC Design specified.
- .5 Water: acids or alkali-free or free from other organic matter that could affect result as well as drinkable.

### **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 PREPARATION**

- .1 Substrate: free of material, which would impair bond.
- .2 Verify that painted substrates are compatible and have suitable bonding characteristics to receive fireproofing.
- .3 Remove incompatible materials.
- .4 Ensure that items required to penetrate fireproofing are placed before installation of fireproofing.
- .5 Ensure that ducts, piping, equipment, or other items which would interfere with application of fireproofing are not positioned until fireproofing work is completed.

#### **3.3 APPLICATION**

- .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 fire resistance ratings as indicated on drawings and in accordance with CAN-ULC S124 for thermal barrier.
- .3 Apply fireproofing over substrate, building up to required thickness to cover substrate with monolithic blanket of uniform density and texture.
- .4 Apply sealant product on coating in ventilation plenums as per manufacturer's recommendations.

#### **3.4 EXAMINATION AND TESTS**

- .1 Examination and testing of fire proofing will be carried out by laboratory chosen by owner.
- .2 Owner will assume test costs in accordance with requirements of General Requirements and Division 1.

#### **3.5 PATCHING**

- .1 Patch damage to fireproofing caused by testing or by other trades before fireproofing is concealed, or if exposed, before final inspection.



**3.6 CLEANING**

- .1 Clean surfaces not indicated to receive fireproofing of sprayed material within 24 hours period after application.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 CONTENT**

- .1 The present section looks at systems of fire and smoke barriers not prescribed in any other section or to which the other sections refer to.
- .2 Refer to relevant sections for requirements relating to any other systems of fire and smoke barriers.
- .3 Systems of fire and smoke barriers used in various installations must be coordinated with those prescribed in other sections. Preferably, only one product, by same manufacturer, shall be used for all joints of same kind throughout work.

**1.2 RELATED REQUIREMENTS**

- .1 Division 4 – Masonry
- .2 Section 05 12 23 – Structural Steel for Buildings
- .3 Section 07 81 00 – Applied Fireproofing
- .4 Section 07 92 00 – Joint Sealants
- .5 Section 09 22 16 – Non Structural Metal Framing
- .6 Section 09 21 16 – Gypsum Board Assemblies
- .7 Division 22 - Plumbing
- .8 Division 23 – Heat and Ventilation
- .9 Division 26 - Electricity

**1.3 REFERENCES**

- .1 Underwriter's Laboratories of Canada (ULC)
  - .1 ULC-S115-1995, Fire Tests of Fire stop Systems.

**1.4 SAMPLES**

- .1 Provide submittals in accordance with Division 1 – General Requirements.
- .2 Submit duplicate 300 x 300 mm samples showing actual fire stop material proposed for project.

**1.5 SHOP DRAWINGS**

- .1 Provide shop drawings in accordance with Division 1 – General Requirements.
- .2 Submit shop drawings to show location, proposed material, reinforcement, anchorage, fastenings and method of installation. Construction details should accurately reflect actual job conditions.

**1.6 PRODUCT DATA**

- .1 Submit required data sheet in accordance with Division 1 – General Requirements.

- .2 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations for materials and prefabricated units. Descriptions must be sufficiently complete to recognize materials and units onsite. Join manufacturer's written instructions relating to installation mode.

## **1.7 WARRANTY**

- .1 In accordance with requirements in Division 1, submit a written guarantee for work subject to this section, for a period of three (3) years from provisional date of acceptance of work.

## **1.8 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Fire stopping and smoke seal systems: in accordance with CAN-ULC-S115.
  - .1 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of CAN-ULC-S115 and not to exceed opening sizes for which they are intended.
  - .2 Fire stop system rating: as indicated on drawings or in accordance with systems already in place.
    - .1 Reference product: A/D Firebarrier Silicone compound for 1 h and 2 h ULC and FM systems.
    - .2 Reference product: A/D Firebarrier for 1 h and 2 h ULC and FM systems.
- .2 Service penetration assemblies: systems tested to CAN-ULC-S115, appearing in manual # 40 U19 published by ULC.
- .3 Service penetration fire stop components: certified by test laboratory to CAN-ULC-S115. appearing in manual # 40 U19.13 and # 40 U19.15 published by 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 other mechanical items requiring sound and vibration control: elastomeric seal.

- .7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- .9 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.
- .10 Sealants for vertical joints: non-sagging.

### **PART 3 EXECUTION**

#### **3.1 PREPARATION**

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

#### **3.2 INSTALLATION**

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

#### **3.3 SEQUENCES OF OPERATION**

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

#### **3.4 EXAMINATION**

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

**3.5 LOCATION OF FIRESTOPPING SYSTEMS**

- .1 Fire stop and smoke seal at:
  - .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board 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 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
  - .7 Openings and sleeves installed for future use through fire separations.
  - .8 Around mechanical and electrical assemblies penetrating fire separations.
  - .9 Rigid ducts: greater than 129 cm<sup>2</sup> : 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.

**3.6 CLEANING**

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

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 05 50 00 – Metal Fabrications
- .2 Section 06 40 00 – Architectural Woodwork
- .3 Section 07 42 43 – Composite Wall Panels.
- .4 Section 07 62 00 – Sheet Metal Flashing and Trim
- .5 Section 08 11 00 – Metal Doors and Frames
- .6 Section 08 50 00 – Windows
- .7 Section 09 21 16 – Gypsum Board Assemblies

**1.2 SECTION 09 22 16 – NON STRUCTURAL METAL FRAMING REFERENCES**

- .1 ASTM International
  - .1 ASTM C919-08, Standard Practice for Use of Sealants in Acoustical Applications.
- .2 Canadian General Standards Board (CGSB)
  - .1 CGSB 19-GP-5M-1984, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
  - .2 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
  - .3 CGSB 19-GP-14M-76, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
  - .4 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
  - .5 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.
- .3 General Services Administration (GSA) - Federal Specifications (FS)
  - .1 FS-SS-S-200-E(2)1993, Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .5 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

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

- .2 Manufacturer's product data sheet to describe:
  - .1 Caulking compound.
  - .2 Primers.
  - .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
- .3 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements
- .3 Samples:
  - .1 Submit 2 samples of each type of material and colour.
  - .2 Cured samples of exposed sealants for each colour where required to match adjacent material.
- .4 Manufacturer's Instructions:
  - .1 Submit instructions to include installation instructions for each product used.

#### **1.4 CLOSEOUT SUBMITTALS**

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

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

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect joint sealants from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

#### **1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

## **1.7 SITE CONDITIONS**

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

## **1.8 ENVIRONMENTAL REQUIREMENTS**

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Health Canada.
- .2 Observe manufacturer's recommendations regarding substrate temperature, relative humidity and moisture content specific to sealants implementation and drying, as well as special guidelines for their use.
- .3 Ventilate area of work as directed by Departmental Representative by use of approved portable supply and exhaust fans.

## **1.9 QUALITY CONTROL**

- .1 The implementation of different sealants will be carried out by a firm of good reputation approved by the manufacturers of the products, with at least five (5) years of experience in the field and with necessary equipment as well as employing qualified workmen to carry out work in a satisfactory manner.

## **1.10 WARRANTY**

- .1 For work subject to this section, section 07 92 00 – Joint Sealants, the 12 month warranty period is extended to 60 months.
- .2 For each section with caulking to perform, provide a guarantee stating that sealing work is guaranteed against deterioration, cracking, erosion, loss of consistency, contraction, leakage, loss of adhesion and cohesion and tarnishing and staining of adjacent surfaces.



**PART 2 GENERAL**

**2.1 SEALANT MATERIALS**

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

**2.2 SEALANT MATERIAL DESIGNATIONS**

- .1 Sealant compound for acoustic insulation: in accordance with ULC-S115, ITS (TCC) 52 minimum.
  - .1 Approved Products: « Tremstop Acrylic » or equivalent approved by architect.
    - .1 Color: White
  - .2 Mould resistant interior sealant compound: in accordance with CAN/CGSB 19.22-M90.
    - .1 One component silicone rubber sealant.
    - .2 Leakage, subsidence: none.
    - .3 Application temperature range: -37°C to 60°C
    - .4 After curing for 7 days at 25°C and 50% HR
      - .1 Maximum tensile strength: 2.1 mPa
      - .2 Pullout resistance: 4.4 N/m
      - .3 Peel strength: 3.5 N/m
    - .5 Color: Translucent white
    - .6 Approved products: « Dow Corning 786 » or equivalent approved by Architect.
  - .3 Exterior sealant compound: one component neutral silicone sealant compound.
    - .1 One component neutral silicone sealant compound.
    - .2 Leakage, subsidence: none.
    - .3 Curing time: 50% HR, 25°C 10mm thick: 7 to 14 days
    - .4 Full adhesion, cured joint: 14 to 21 days
    - .5 Maximum COV content: 23 g/L
    - .6 After 7 days curing at 25°C and 50% HR
      - .1 Maximum tensile strength: 0.70 mPa
      - .2 Pullout resistance: 4.4 N/m
    - .7 Color: to be selected by Consultant
    - .8 Approved products: « Dow Corning 790 » or equivalent approved by Architect.
- .4 Floor sealant compound: two component elastomeric sealing material, superior quality, polyurethane based in accordance with CAN/CGSB 19.24-M90, approved by USDA and certified by Canadian Food Inspection Agency.
  - .1 Joint movement: ±50%

- .2 Tear resistance: ASTM D624: 7.88 N/mm
- .3 Tensile resistance at break: 0.62 mPa
- .4 Curing rate ASTM C679
  - .1 Touch dry: 8 to 10 hours
  - .2 Completely dry: 3 days
- .5 Color: to be selected by Consultant
- .6 Approved products: « Sikaflex 2c NS EZ de Sika » or equivalent approved by Architect.
- .5 Preformed compressible and non-compressible back-up materials:
  - .1 Extruded closed cell polyethylene cell foam backer rod
  - .2 Size: oversize 30 to 50 %.
  - .3 Bond breaker tape
  - .4 Polyethylene bond breaker tape which will not bond to sealant
- .6 Preformed sealant compounds:
  - .1 Sealant system will be preformed, pre-compressed and self-expanding. Expansion foam will be alveolar foam impregnated with a non-dryable water-based acrylic polymer.
  - .2 Approved products: « Backerseal by Emseal » or equivalent approved by Architect.

### **2.3 JOINT CLEANER**

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

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

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

### **3.2 SURFACE PREPARATION**

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.

- .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .4 Ensure joint surfaces are dry and frost free.
- .5 Prepare surfaces in accordance with manufacturer's directions.

### **3.3 PRIMING**

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

### **3.4 BACKUP MATERIAL**

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

### **3.5 MIXING**

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

### **3.6 APPLICATION**

- .1 Drawings do not indicate all places which must be sealed, however it does not take away responsibility from Contractor to seal all places where such products are normally required to obtain a continuous barrier to air, water, humidity, sound, dust, smoke or noxious gases. This article also applies to all other sections that should refer to this one for supply and/or installation of sealants.
- .2 Apply sealant in accordance with manufacturer's written instructions, in following places:
  - .1 Perimeter of openings in exterior walls (prefabricated masonry or concrete blocks or units), with structures adjacent to finish covering;
  - .2 Expansion joints in exterior wall.
- .3 Apply mold resistant sealant to all interior joints, and in accordance with drawings, including the following locations without limitation:
  - .1 Perimeter of door and window frames.
  - .2 Perimeter of all units in ceilings and walls (diffusers, electrical appliances, door frames, electrical outlets, inner corners of masonry walls, above baseboards)
  - .3 Perimeter of all stainless steel works, clocks, etc.
  - .4 Perimeter of work plan and laboratory furniture.
  - .5 At vertical control joints implemented at intersection of masonry walls (blocks/blocks, blocks/concrete);
  - .6 Joints implemented at top of non-load bearing masonry walls, at soffit of steel elements.
  - .7 At perimeter of sanitary appliances;
  - .8 At exposed control joints in drywall installations.

- .4 Apply soundproofing sealant to perimeter of all elements in acoustic walls (upper and lower joints, all openings through bulkhead, electrical boxes, etc.) in accordance with indications.
- .5 Apply floor sealants to expansion joints implemented in concrete slabs, inside and in accordance with indications.
- .6 Sealant application;
  - .1 Implement sealant according to manufacturer's written instructions.
  - .2 In order to implement neat joints, apply masking tape on edge of surfaces to repoint if needed.
  - .3 Apply sealant by forming continuous bead.
  - .4 Apply sealant using gun equipped with an appropriate size nozzle.
  - .5 Pressure must be strong enough to allow for proper filling of voids and perfect sealing of joints.
  - .6 Install joints to form continuous sealing bead free of edges, folds, subsidence, air voids and coated dirt.
  - .7 Before a peel forms over joints, shape exposed surfaces in order to give them a slightly concave profile.
  - .8 Remove excess sealant as work progresses, until end of work.
- .4 Curing:
  - .1 Cure sealants in accordance with sealant manufacturer's instructions.
  - .2 Do not cover up sealants until proper curing has taken place.

### **3.7 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 00 10 - General Instructions.
  - .1 Leave Work area clean at end of each day.
  - .2 Clean adjacent surfaces immediately.
  - .3 Remove excess and droppings, using recommended cleaners as work progresses.
  - .4 Remove masking tape after initial set of sealant.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 00 10 - General Instructions.
- .3 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.
  - .1 Remove waste bins and recycling bins from site and dispose of materials at appropriate facilities.

### **3.8 PROTECTION**

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

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 05 50 00 – Metal Fabrications
- .2 Section 06 10 10 – Structural Carpentry
- .3 Section 07 21 16 – Blanket Insulation
- .4 Section 07 27 00 – Air Barriers
- .5 Section 07 92 00 – Joint Sealants
- .6 Section 08 71 00 - Quincaillerie pour portes.
- .7 Section 08 80 50 - Glazing
- .8 Section 09 21 16 – Gypsum Board Assemblies
- .9 Section 09 91 13 – Exterior Painting
- .10 Section 09 91 23 – Interior Painting
- .11 Division 26 – Electricity

**1.2 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM A653/A653M-06a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
- .3 Canadian Standards Association (CSA International)
  - .1 CSA-G40.20-F04/G40.21-F04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2 CSA W59-F03, Welded Steel Construction (Metal Arc Welding).
- .4 Canadian Steel Door Manufacturers' Association (CSDMA)
  - .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, 2000.
  - .2 CSDMA, Selection and Usage Guide for Commercial Steel Doors, 1990.
- .5 National Fire Protection Association (NFPA)
  - .1 NFPA 80-99, Standard for Fire Doors and Fire Windows.
  - .2 NFPA 252-03, Standard Methods of Fire Tests of Door Assemblies.
- .6 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S701-01, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
  - .2 CAN/ULC-S702-97, Standard for Thermal Insulation, Mineral Fibre, for Buildings.
  - .3 CAN/ULC-S704-03, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

- .4 CAN4-S104-M80, Standard Method for Fire Tests of Door Assemblies.
- .5 CAN4-S105-M85, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

### **1.3 SYSTEM DESCRIPTION**

- .1 Design Requirements:
  - .1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35 degrees C to 35 degrees C.
  - .2 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 for ratings specified or indicated.
  - .3 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104 and listed by nationally recognized agency having factory inspection services.

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

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide product data: in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Provide shop drawings: in accordance with Section 01 33 00 - Submittal Procedures.
  - .1 Shop drawings must indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed and louvered, arrangement of hardware fire rating and finishes.
  - .2 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors, exposed fastenings and reinforcing finishes.
  - .3 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
- .4 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.

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

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

### **1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- .1 Steel doors:
  - .1 Hot dipped galvanized steel sheet: to ASTM A653M, ZF75 zinc coating, and minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.
  - .2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653M, ZF75 zinc coating.

**2.2 DOOR CORE MATERIALS**

- .1 Honeycomb construction:
  - .1 Structural small cell, 24.5 mm maximum kraft paper 'honeycomb', weight: 36.3 kg per ream minimum, density: 16.5 kg/m<sup>3</sup> minimum sanded to required thickness. Product with no added urea-formaldehyde.
- .2 Hollow Steel Insulated core:
  - .1 Polyurethane: to CGSB 51-GP-21M.rigid, modified polyisocyanurate, closed cell board. Density 32 kg/m<sup>3</sup>.

**2.3 ADHESIVES**

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

**2.4 PRIMER**

- .1 Touch-up prime CAN/CGSB-1.181.

**2.5 PAINT**

- .1 Field paint steel doors and frames in accordance with Sections 09 91 23 - Interior Painting and 09 91 13 - Exterior Painting. Protect weather-strips from paint. Provide final finish free of scratches or other blemishes.

**2.6 ACCESSORIES**

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

- .5 Fire labels: metal riveted.
- .6 Sealant Products: silicone based, mold resistant, in accordance with section 07 92 00 - Joint Sealants.
- .7 Glazing: tempered glass, in accordance with 08 80 50 – Glazing.
- .8 Make provisions for glazing as indicated and provide necessary glazing stops.
  - .1 Provide removable stainless steel glazing beads for use with glazing tapes and compounds and secured with countersunk stainless steel screws.
  - .2 Design exterior glazing stops to be tamperproof.

## **2.7 FRAMES FABRICATION GENERAL**

- .1 Fabricate frames in accordance with CSDMA specifications.
- .2 Fabricate frames to profiles and maximum face sizes as indicated.
- .3 Exterior frames: 1.6 mm welded, thermally broken type construction.
- .4 Interior frames: 1.6 mm welded.
- .5 Exterior and interior frames larger than 915 mm: 1.9 mm thickness, welded.
- .6 Blank, reinforce, drill and tap frames for mortised, templated hardware, electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
- .7 Protect mortised cut-outs with steel guard boxes.
- .8 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
- .9 Manufacturer's nameplates on frames and screens are not permitted.
- .10 Conceal fastenings except where exposed fastenings are indicated.
- .11 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .12 Insulate exterior frame components with polyurethane insulation.

## **2.8 FRAME ANCHORAGE**

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

## **2.9 FRAMES: WELDED TYPE**

- .1 Welding in accordance with CSA W59.
- .2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.
- .3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.



- .4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.
- .5 Securely attach floor anchors to inside of each jamb profile.
- .6 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.

## **2.10 DOOR FABRICATION GENERAL**

- .1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.
- .2 Exterior doors: hollow steel construction. Interior doors: honeycomb construction.
- .3 Blank, reinforce, drill doors and tap for mortised, templated hardware as well as electronic hardware.
- .4 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .5 Reinforce doors where required, for surface mounted hardware. Provide flush PVC top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.
- .6 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .7 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in conformance with CAN4-S104 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.
- .8 Manufacturer's nameplates on doors are not permitted.

## **2.11 DOORS: HONEYCOMB CORE CONSTRUCTION**

- .1 Form face sheets for exterior doors from 1.6 mm sheet steel with honeycomb polyurethane core laminated under pressure to face sheets.
- .2 Form face sheets for interior doors from 1.6 mm sheet steel with honeycomb core laminated under pressure to face sheets.

## **2.12 THERMALLY BROKEN DOORS AND FRAMES**

- .1 Fabricate thermally broken doors by using insulated core and separating exterior parts from interior parts with continuous interlocking thermal break, installed mechanically.
- .2 Thermal break: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.

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

**3.3 FRAME INSTALLATION**

- .1 Set frames plumb, square, level and at correct elevation.
- .2 Secure anchorages and connections to adjacent construction.
- .3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.
- .4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
- .5 Caulk perimeter of frames between frame and adjacent material.
- .6 Maintain continuity of air barrier and vapour retarder.

**3.4 DOOR INSTALLATION**

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

**3.5 FINISH REPAIRS**

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

**3.6 GLAZING**

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

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 08 11 00 – Metal Doors and Frames
- .2 Section 08 71 00 – Door Hardware
- .3 Section 08 80 50 - Glazing
- .4 Section 09 91 23 – Interior Painting

**1.2 REFERENCES**

- .1 Architectural Woodwork Manufacturers Association of Canada (AWMAC).
  - .1 Quality Standards for Architectural Woodwork 1998.
- .2 Canadian General Standards Board (CGSB).
  - .1 CAN/CGSB-71.19-M88, Adhesive, Contact, Sprayable.
  - .2 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.
- .3 Canadian Standards Association (CSA International).
  - .1 CSA A440.2-98, Energy Performance of Windows and Other Fenestration Systems.
  - .2 CSA O115-M1982 (R2001), Hardwood and Decorative Plywood.
  - .3 CAN/CSA O132.2 Series-F90(C1998), Wood Flush Doors.
  - .4 CAN/CSA-O132.5-M1992(R1998), Stile and Rail Wood Doors.
  - .5 CAN/CSA-Z808-96, A Sustainable Forest Management System: Guidance Document.
  - .6 CSA Certification Program for Windows and Doors 2000.
- .4 Environmental Choice Program (ECP).
  - .1 CCD-045-92, Sealants and Caulking Compounds.
  - .2 CCD-046-92, Adhesives.
- .5 National Fire Protection Association (NFPA).
  - .1 NFPA 80-1999, Standard for Fire Doors and Fire Windows.
  - .2 NFPA 252-1999, Standard Method of Fire Tests of Door Assemblies.
- .6 Underwriters' Laboratories of Canada (ULC).
  - .1 CAN-4S104M-80(C1985), Fire Tests of Door Assemblies.
  - .2 CAN4-S105M-85 (C1992), Fire Door Frames Meeting the Performance Required by CAN4-S104.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

- .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
  - .1 For caulking materials during application and curing.
  - .2 For door materials and adhesives.

.2 Shop Drawings:

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate door types and cut-outs for glazing and louvres, sizes, core construction, transom panel construction and cut-outs.

**1.4 SAMPLES**

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit one 300 x 300 mm corner sample of each type wood door.
- .3 Show door construction, core, glazing detail and faces.
- .4 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.

**1.5 QUALITY ASSURANCE**

- .1 Regulatory Requirements:
  - .1 Wood fire rated doors: labelled and listed by an organization accredited by Standards Council of Canada.
- .2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .4 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Section 01 31 19 – Project Meetings.

**1.6 DELIVERY, STORAGE, AND HANDLING**

- .1 Storage and Protection:
  - .1 Protect doors from dampness. Arrange for delivery after work causing abnormal humidity has been completed.
  - .2 Store doors in well ventilated room, off floor, in accordance with manufacturer's recommendations.
  - .3 Protect doors from scratches, handling marks and other damage.
  - .4 Store doors away from direct sunlight.

**1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.

- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

## **PART 2 PRODUCTS**

### **2.1 FIRE RATED WOOD DOORS**

- .1 Wood doors: tested in accordance with CAN4-S104 and NFPA 252 to achieve rating as scheduled.

### **2.2 WOOD FLUSH DOORS**

- .1 Solid core: to CAN/CSA-O132.2.1.
  - .1 Acceptable Products:
    - .1 « 5-FSPC-EME » fabricated by Lambton Doors or equivalent approved by Architect.
  - .2 Construction:
    - .1 Solid particleboard core: stile and rail frame bonded to particleboard core with wood lock blocks and special wood blocking, 5-ply construction.
  - .3 Face Panels:
    - .1 Hardwood; veneer grades: Grade I (Premium), white birch essence, quarter slice cut.
    - .2 Laminated plastic: with hardwood plywood subface.
  - .4 Adhesive: Type I (waterproof)
  - .5 No added urea-formaldehyde products.

### **2.3 GLAZING**

- .1 Glass: tempered glass in accordance with section 08 80 50 – Glazing.

### **2.4 FABRICATION**

- .1 Vertical edge strips to match face veneer.
- .2 Prepare doors for louvres and glazing. Provide to match face veneer glazing stops with mitred corners, model LB2, as per fabricated by Lambton Doors or equivalent approved by Architect.
- .3 Bevel vertical edges of single acting doors 3 mm in 50 mm on lock side and 1.5 mm in 50 mm on hinge side.
- .4 Radius vertical edges of double acting doors to 60 mm radius.

**2.5 FINISH**

- .1 Wooden doors must be dyed on-site in accordance with section 09 91 23 – Interior Painting. Weather stripping units must not be paint coated. Finished surfaces must be free of scratches or other imperfections.

**PART 3 EXECUTION**

**3.1 MANUFACTURER'S INSTRUCTIONS**

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

**3.2 INSTALLATION**

- .1 Unwrap and protect doors in accordance with CAN/CSA-O132.2 Series, Appendix A.
- .2 Install labelled fire rated doors to NFPA 80.
- .3 Install doors and hardware in accordance with manufacturer's printed instructions and CAN/CSA-O132.2 Series, Appendix A.
- .4 Adjust hardware for correct function.
- .5 Install glazing in accordance with Section 08 80 50 - Glazing.
- .6 Install stops.

**3.3 ADJUSTMENT**

- .1 Re-adjust doors and hardware just prior to completion of building to function freely and properly.

**3.4 CLEANING**

- .1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
- .2 Remove traces of primer, caulking; clean doors and frames.
- .3 Clean glass and glazing materials with approved non-abrasive cleaner.
- .4 On completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 05 50 00 - Metal fabrications
- .2 Section 09 91 13 - Exterior Painting

**1.2 REFERENCES**

- .1 Aluminum Association (AA)
  - .1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.
- .2 American Society for Testing and Materials International, (ASTM).
  - .1 ASTM A1008/A1008M-10, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
  - .2 ASTM D523-08, Standard Test Method for Specular Gloss.
  - .3 ASTM D822-01(2006), Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
- .3 Canada Green Building Council (CGBC)
  - .1 LEED Canada - NC Version 1.0-2004 , LEED ( Leadership in Energy and Environmental Design ) Rating System of green buildings for new constructions and major renovations (Reference Kit ) (including addendum 2007).
  - .2 LEED Canada - CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design) Rating System for sustainable buildings for interior design of commercial spaces.
- .4 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.
  - .2 CAN/CGSB- 1213-04, Wash primer (pre-treatment coating or bonding layer ) for steel and aluminum.
  - .3 CAN / CGSB- 1181-99, zinc-rich coating, organic and prepared.
- .5 CSA International
  - .1 CAN/CSA- G164 - FM92 (C2003) Hot-dip galvanizing of irregularly shaped objects .
- .6 Environmental Choice Program (ECP)
  - .1 DCC- 016-97 (R2005), Thermal Insulation.
  - .2 DCC- 047-98 (R2005), Architectural Coatings.
  - .3 DCC- 048-98 (R2006), Recycled Aqueous Suspension Coatings
- .7 Green Seal Environmental Standards (GS)
  - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
- .8 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1 SCAQMD Rule 1113-A2007, Architectural Coatings.

**1.3 DOCUMENTS/SAMPLES SUBMITTALS**

- .1 Submit documents and samples required in accordance with Section 01 33 00 - / Submittal Procedures.
- .2 Product Data:

- .1 Submit product data and instructions and manufacturer's documentation for doors, hardware and accessories. The technical data must include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submitted shop drawings must be stamped and signed by professional engineer registered or licensed in Canada, in the province of Quebec.
  - .2 Shop drawings must indicate sizes, service rating, types, materials, operating mechanisms, glazing locations and details, hardware and accessories, required clearances, electrical connections, fastenings to structure.
- .4 Certification: submit certificates signed by manufacturer certifying that products and materials comply with specifications in terms of physical characteristics and performance criteria.
- .5 Test Reports: Submit test reports certifying that products, materials and equipment comply with requirements in terms of physical characteristics and performance criteria.
- .6 Reports of verifications carried out by manufacturer
  - .1 Reports of verifications carried out onsite by manufacturer: must be submitted no later than three (3) days after controls prescribed in section FIELD QUALITY CONTROL, in PART 3, manufacturer's written reports indicating that work conforms to specified criteria.

#### **1.4 CLOSEOUT SUBMITTALS**

- .1 Submit documents/information required in accordance with Section 01 78 00 / Closeout Submittals.
- .2 Operation and Maintenance Sheets: provide instructions for use and maintenance of sectional metal doors, for inclusion into E.E. manual.

#### **1.5 QUALITY ASSURANCE**

- .1 Certificates: submit certificates signed by manufacturer certifying that products and materials comply with specifications in terms of physical characteristics and performance criteria.

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

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

### **Part 2 Products**

#### **Part 2**

##### **2.1 DESIGN CRITERIA**

- .1 Exterior doors and rails must be designed to withstand a wind load of one (1) kPa, with a decline in horizontal plane not superior to 1/240 the width of doorway.



- .2 Sectional doors must have a thermal resistance of R-16 or RSI 2.8 ( $k = 0.357 \text{ W / m}^2\text{K}$ ).
- .3 Doors and rails must be designed to withstand at least 15,000 switching cycles per year and must have a total life of 10 years.

## **2.2 MATERIALS**

- .1 Galvanized steel sheet: commercial quality, zinc coating Z275.
- .2 Steel sheet: commercial quality to ASTM A1008 / A1008M, type ( E) for surface mounting.
- .3 Aluminum sheet: all purpose, even rolling mill finish.
- .4 Anodized aluminum sheet: anodisable aluminum sheet, smooth finish.
- .5 Aluminum profiles: AA6063 -T5 alloy by Aluminum Association.
- .6 Paint primer: to CAN / CGSB - 1.105, in case of metal structures, CAN / CGSB- 1.213 in case of aluminum and CAN / CGSB- 1.181 in case of galvanized steel.
- .7 Thermal insulation: in accordance with design requirements and Directive DCC - 016.
- .8 Cables: stranded cable, galvanized steel, to aircraft type.

## **2.3 DOORS**

- .1 Doors: insulated sectional flush doors made of steel panels roll-shaped, 44.5 mm thick.
- .2 Panels: continuous rectangular frame with vertical stiffeners 600 mm from center.
- .3 Assembly of elements: arc or spot welding or by riveting (coated rivets), or by means of adhesive and self-tapping screws in accordance with manufacturer's recommendations.
- .4 Paint primers: doors covered with layer of primer upon completion of assembly. Doors must be made from pre-painted steel elements. Pre-painted steel elements should not be welded together; this method burns paint and makes touch-ups difficult to carry out.
- .5 Doors dimensions and characteristics as indicated on drawings.
- .6 Polyurethane foam free of CFC injected at high pressure between panel layers, density of 40.4 kg / m<sup>3</sup> (2.5 lb / ft<sup>3</sup>) thermal resistance RSI 1.6 by 25 mm (1 ") thickness, total insulating values R-16, RSI 2.8 ( $k = 0.357 \text{ W/m}^2\text{K}$ ).
- .7 Panels are made of steel sheets gauge 26, roll shaped and electronically injected with high pressure polyurethane for a total minimum thickness of 44.5 mm.
  - .1 Acceptable Products: G-5000 model, as manufactured by Garaga or equivalent approved by Architect.

## **2.4 INDUSTRIAL HARDWARE (DOOR 601.3)**

- .1 Guide rails: standard configuration, 75 mm wide, galvanized steel, 2.66 mm thick, bare metal.
- .2 Supports for guide rails: continuous, galvanized steel brackets, 2.3 mm thick, bare metal.
- .3 Balancing springs: oil tempered torsion springs, strong, equipped with supports meeting manufacturer's specifications.
  - .1 Drum: 200 mm diameter, die-cast aluminum.
  - .2 Shaft: 32 mm diameter, galvanized steel.
- .4 Upper roller-carriers: galvanized steel, 3.04 mm thick, adjustable.
- .5 Rollers: hardened steel, grease lubricated, with free lateral movement, ball bearing, 75mm in diameter, solid steel bandage.
- .6 Supports for rollers: adjustable, galvanized steel, at least 2.5 mm thick.

- .7 Hinges: robust, consistent with manufacturer's recommendations.
- .8 Cable: aircraft cable, galvanized steel, 6 mm in diameter

## **2.5 COMMERCIAL HARDWARE (DOOR 506.3 & 302.3)**

- .1 Guide rails: standard configuration, 50 mm wide, galvanized steel, at least 1.9 mm thick, bare metal.
- .2 Supports for guide rails: continuous, galvanized steel brackets to 2.3 mm thick, bare metal.
- .3 Balancing springs: oil tempered torsion springs, strong, equipped with supports meeting manufacturer's specifications.
  - .1 Drum: 100 mm diameter, die-cast aluminum.
  - .2 Shaft: 25 mm diameter, galvanized steel.
- .4 Upper roller-carriers: galvanized steel, at least 3.04 mm thick, adjustable.
- .5 Rollers: hardened steel, grease lubricated, with free lateral movement, ball bearing, at least 50 mm in diameter, with forged bandage.
- .6 Supports for rollers: adjustable, galvanized steel, at least 2.5 mm thick.
- .7 Hinges: commercial grade, to manufacturer's recommendations.
- .8 Cable: aircraft cable, galvanized steel, at least 3 mm in diameter

## **2.6 ACCESSORIES**

- .1 Supports for horizontal rails and door openers: galvanized steel, type and dimensions suitable for installation.
- .2 Rail guards: 1500 mm high, shaped steel sheet, 5 mm thick.
- .3 Pusher Springs.
- .4 Lock and operational devices:
  - .1 Locking devices, horizontal bars, with night latch.
- .5 Horizontal sliding lock bolts, two (2) per door, install on the inside.
- .6 Weather-stripping.
  - .1 Weather-stripping, extruded neoprene, U-shaped, full width, install at bottom of doors.
  - .2 Weather-stripping, extruded aluminum and quality vinyl for intense cold, install on jambs and top rail of door frames, to manufacturer's specifications.
- .7 Hardware parts in ferrous metal galvanized at a rate of at least 300 g/m<sup>2</sup>, in accordance with CAN/CSA- G164.

## **2.7 ALUMINUM SURFACES FINISHES**

- .1 Exposed surfaces of aluminum components must be finished according to "Designation System for Aluminum Finishes "by Aluminum Association.

## **2.8 TYPES OF OPERATIONS**

- .1 Doors will have following accessories, depending on operation type:
  - .1 Mechanical: chain hoist, galvanized steel
- .2 Safety device in case cable breaks must have following characteristics.
  - .1 Ability to immobilize door on detection of cable break when door shuts, maximum load 500 kg.

**2.9 ELECTRICAL DOOR OPENERS**

- .1 Electrical door openers: drag.
- .2 Electrical engines, control devices, remote stations with push buttons, relays and other electrical equipment: CSA approved.
- .3 Electrical power supply: [ ] V, tri-phased, 60 Hz.
  - .1 Engine: [ ] kW, [ ] V [ ] phased.
- .4 Control devices comprising one (1) instantly reversible engine, built in, one (1) Solenoid brake, one (1) thermal protection device against surges, three (3) heating elements and control relays, as appropriate.
- .5 Controls Devices: [ ].
  - .1 Remote stations with push buttons: mounted [flush] [surface] in [ ] [s] place, fitted with push buttons marked [ "OPEN-STOP-CLOSE" ] [ "SECURITY LOCKOUT" ] [ / ] [ "OPEN-STOP-CLOSE" ] [ "SAFETY LOCK" ], [key operated].
  - .2 Control cable: Remote station with cable for doors to open, and [photocell] [timer] to shut.
- .6 Safety switch: all switches concealed in rubber safety edge evaluator placed at bottom of doors and across their width; in the presence of an obstacle, this device causes the door to stop and go back up.
- .7 Manual operation of doors with control shaft door-opener.
  - .1 A device operated from ground, must allow release of opener and manual door operation in case power supply failure.
  - .2 The opener should include the following.
    - .1 (1) Lock switch for interruption of electrical supply while opener is in manual operation mode.
    - .2 One (1) built in chain hoist for manual door operation in case of power supply failure.
- .8 Manual operation of doors with drag door opener.
  - .1 Openers must be connected to door by a device allowing uncoupling rapidly in case of power supply failure.
- .9 Ignition lighting devices and automatic extinguishing, equipped with timer.
- .10 Door operational speed: 300 mm / s.
- .11 Control transformers: for 24 V control voltage, a.c.
- .12 Mounting brackets: galvanized steel, thickness and size appropriate for installation.

**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Verification of Conditions : prior to installation of sectional metal doors, make sure condition of surfaces / materials previously implemented under other sections or contracts is acceptable and allows for work to be carried out according to manufacturer 's written instructions.
  - .1 Visual inspection of surfaces / materials in presence of Consultant.
  - .2 Immediately inform Consultant of unacceptable conditions detected.
  - .3 Proceed with installation only after correcting unacceptable conditions and obtaining written approval from Consultant.

**3.2 INSTALLATION**

- .1 Manufacturer's Instructions: comply with the requirements with manufacturer 's written data , including product technical bulletins, installation instructions specified in the product catalogs and on packaging cartons, as well as records of indications techniques
- .2 Install doors and hardware in accordance with manufacturer's instructions.
- .3 Rigidly support rail and operator and secure to supporting structure.
- .4 Touch-up steel doors with primer where galvanized finish damaged during fabrication.
- .5 Install operator including electrical motors, controller units, pushbutton stations, relays and other electrical equipment required for door operation. All electrical connections must be done by a certified electrician.
- .6 Lubricate and adjust door operating components to ensure smooth opening and closing of doors.
- .7 Adjust weather-stripping to form a weather tight seal.
- .8 Adjust doors for smooth operation.

**3.3 FIELD QUALITY CONTROL**

- .1 Verifications carried out on site by manufacturer
  - .1 Take necessary measures to have manufacturer of products of the present section examine the work relating to handling, installation/application, and protection and cleaning of his products and work, and afterwards submit written reports in an acceptable format, that will permit to verify if works have been realized according to contract terms, within three (3) days after execution of work.
  - .2 Retain 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 The manufacturer's representative must be present before and during execution of crucial steps of installation, joints and tests.
  - .4 Schedule site visits to review work at following stages:
    - .1 After delivery and storage of products, and when preparatory work on which work of this Section depends is complete, but before installation begins.
    - .2 Twice during progress of Work at 25% and 60% complete.
    - .3 Upon completion of Work, after cleaning is carried out.

**3.4 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each working day .
- .2 Final Cleaning: upon completion remove materials / surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
  - .1 Remove any trace of primer. Clean doors and frames.

- .2 Clean glass surfaces with approved non-abrasive cleaning product.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction / demolition waste / Management and Disposal.
  - .1 Remove recycling bins and containers and dispose of materials at appropriate facilities.

**3.5 PROTECTION**

- .1 Protect installed products and components against damage during construction.
- .2 Repair damage to adjacent materials and equipment caused by installation of sectional metal doors.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 07 21 13 Board Insulation
- .1 .2 Section 07 26 16 Blanket Insulation
- .2 .3 Section 07 21 29.03 Sprayed Insulation – Polyurethane Foam
- .3 .4 Section 07 27 00 Air Barriers
- .1 .5 Section 07 42 43 Composite Metal and Glass Wall Panels
- .6 Section 07 62 00 Sheet Metal Flashing and Trim
- .4 .7 Section 07 92 00 Joint Sealants
- .8 Section 08 80 50 Glazing

**1.2 DEFINITIONS**

- .1 Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufacturers Association– AAMA Glossary.

**1.3 PERFORMANCE REQUIREMENTS FOR CASEMENT WINDOWS**

- .1 Overall performance: A system of windows with aluminum frames must withstand the effects of the following performance requirements without exceeding the performance criteria or failure due to faulty construction, manufacture or installation, or other construction defects.
  - .1 Casement windows Performance Requirements: Provide aluminum windows of performance indicated that comply with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS).
    - .1 Performance Class and Grade: AW-PG70-C
  - .2 Air Infiltration: The test specimen shall be tested in accordance with ASTM E283 at a minimum size of 36" x 60" (914 x 1524). The level of air infiltration must not be greater than 0.10 pi3m/pi2 to a differential static pressure of 6.24 lb/pi2 (300 Pa). The test specimen shall meet the A3 rating of less than 0.55 (m3/h)/m at 1,57 lb/pi2 (75 Pa) when tested in accordance with CAN/CSA-A440-00 Windows.
  - .3 Water Resistance: The test specimen shall be tested in accordance with ASTM E547 and ASTM E331 at a minimum size of 36" x 60" (914 mm x 1524 mm). There must not be any leakage as defined in the test method to a differential static pressure of 15 lb/pi2 (720 Pa). The test specimen shall meet the B7 rating with no water leakage at 15 lb/pi2 (720 Pa) when tested in accordance with CAN/CSA-A440-00 Windows.
  - .4 Uniform Load Deflection: A minimum difference of static pressure of 70 lb/pi2 (3352 Pa) should be applied in a positive sense, and then in a negative sense, in accordance with ASTM E 330. There must not be any deflection over L/175 of the scope of any framework element. The test specimen shall meet the C5 rating when tested in accordance with CAN/CSA-A440-00 Windows.
  - .5 Uniform Load Structural: A minimum static air pressure difference of 105 lb/pi2 (5028 Pa) shall be applied in the positive and negative direction in accordance with ASTM E330. The unit shall be evaluated after each load and will be subject to a 0.2% maximum permanent deformation.

- .6 Component Testing: Window components shall be tested in accordance with procedures described in AAMA/WDMA/CSA 101/I.S.2/A440 and AAMA 910.
- .7 Thermal Transmittance (U-Factor): When tested to AAMA Specification 1503, the thermal transmittance (U-Factor) shall not be more than;
  - .1 Insulating glass 1 in. (25.4 mm):
    - .1 Swing casement opening outwards: U-Factor shall not be greater than 0.43 BTU/ h/ft<sup>2</sup>/°F according to AAMA 1503 with low emissivity coated glass of 1/4 in. (6.35 mm) outside, spacer Technoform TGI, 1/2 inch (12.7 mm), and clear glass of ¼ inch (6.35 mm) inside.
- .8 Condensation Resistance Test (CRF): When tested in accordance with AAMA Specification 1503 and CAN/CSA-A440, the condensation resistance factor (CFR) shall not be less than;
  - .1 In swing Casement opening outwards: CRF not less than 71 (frame) and 69 (glass).
- .9 Temperature index (I): provide aluminium windows with established thermal performance in accordance with the CSA-A440 standard at temperature (I) index higher than:
  - .1 Swing casement opening outwards: (I) greater than 62 (frame) and 64 (glass).
- .10 Sound transmission index (STC) and indoor-outdoor transmission index (OITC): when subjected to tests according to AAMA 1801, sound transmission and indoor-outdoor transmission (OITC) indices should not be less in:
  - .1 Swing casement opening outwards: STC must not be less than 35; OITC must not be less than 28.
- .11 Forced Entry Resistance: All windows shall conform to ASTM F588, Grade 10.
- .12 Thermal Barrier Test: Thermal break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.

#### **1.4 PERFORMANCE REQUIREMENTS: FIXED WINDOWS**

- .1 Overall performance: A system of windows with aluminum frames must withstand the effects of the following performance requirements without exceeding the performance criteria or failure due to faulty construction, manufacture or installation, or other construction defects.
- .2 Casement windows Performance Requirements: Provide aluminum windows of performance indicated that comply with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS).
  - .1 Performance Class and Grade: AW-PG70-FW
  - .2 Air Infiltration: The test specimen shall be tested in accordance with ASTM E283 at a minimum size of 60" x 99" (1524 x 2515 mm). The level of air infiltration must not be greater than 0.10 ft<sup>3</sup>/ft<sup>2</sup> to a differential static pressure of 6.24 lb/ft<sup>2</sup> (300 Pa). The test specimen shall meet the A3 rating of less than 0.25 (m<sup>3</sup>/h)/m at 1,57 lb/ft<sup>2</sup> (300 Pa) when tested in accordance with CAN/CSA-A440-00 Windows.
  - .3 Water Resistance: The test specimen shall be tested in accordance with ASTM E547 and ASTM E331 at a minimum size of 36" x 60" (914 mm x 1524 mm). There must not be any leakage as defined in the test method to a differential static pressure of 15 lb/ft<sup>2</sup> (720 Pa). The test specimen shall meet the B7 rating with no water leakage at 15 lb/ft<sup>2</sup> (720 Pa) when tested in accordance with CAN/CSA-A440-00 Windows.

- .4 Uniform Load Deflection: A minimum difference of static pressure of 70 lb/pi2 (3352 Pa) should be applied in a positive sense, and then in a negative sense, in accordance with ASTM E 330. There must not be any deflection over L/175 of the scope of any framework element. The test specimen shall meet the C5 rating when tested in accordance with CAN/CSA-A440-00 Windows.
- .5 Uniform Load Structural: A minimum static air pressure difference of 105 lb/pi2 (5028 Pa) shall be applied in the positive and negative direction in accordance with ASTM E330. The unit shall be evaluated after each load and will be subject to a 0.2% maximum permanent deformation.
- .6 Component Testing: Window components shall be tested in accordance with procedures described in AAMA/WDMA/CSA 101/I.S.2/A440 and AAMA 910.
- .7 Thermal Transmittance (U-Factor): When tested to AAMA Specification 1503, the thermal transmittance (U-Factor) shall not be more than;
  - .1 Insulating glass 1 in. (25.4 mm):
    - .1 Swing casement opening outwards: U-Factor shall not be greater than 0.43 BTU/ h/pi2/°F according to AAMA 1503 with low emissivity coated glass of 1/4 in. (6.35 mm) outside, spacer Technoform TGI, 1/2 inch (12.7 mm), and clear glass of ¼ inch (6.35 mm) inside.
- .8 Condensation Resistance Test (CRF): When tested in accordance with AAMA Specification 1503 and CAN/CSA-A440, the condensation resistance factor (CFR) shall not be less than 77 (frame) and 72 (glass)
- .9 Temperature index (I): provide aluminium windows with established thermal performance in accordance with the CSA-A440 standard at temperature (I) index greater than 73 (frame) and 66 (glass) for AAMC6400 window and 70 (frame) and 67 (glass) for AAMC6500 window.
- .10 Sound transmission index (STC) and indoor-outdoor transmission index (OITC): when subjected to tests according to AAMA 1801, sound transmission and indoor-outdoor transmission (OITC) indices should not be less in:
  - .1 Insulating glass of 1 in. (25.4 mm) with clear glass 3/16 in. (4.76 mm) outside, spacer 3/8 inch (9.5 mm) aluminum and laminated clear glass of 7/16-inch (11.1 mm) inside:
    - .1 STC must not be less than 38; OITC must not be less than 32.
- .11 Forced Entry Resistance: All windows shall conform to ASTM F588, Grade 10.
- .12 Thermal Barrier Test: Thermal break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.

## **1.5 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for curtain wall components, anchorage and fasteners, glass and infill, and internal drainage details and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:



- .1 Submit drawings stamped and signed by the professional engineer who designed the structural support framing, it must be a recognized professional in the Province of Quebec, Canada.
- .2 Shop drawings must indicate clearly nature of materials, include full size details of the headrail, jambs and window sill, as well as profiles of the constituent elements, showing Interior and exterior trim, the junctions between the combined windows, it must indicate work ratings and details of the anchorages, it must show where to apply protective coating, and include a description of related elements, caulking product, as well as exposed finishes, and fasteners. Shop drawings must also indicate location of manufacturer's data plate.
- .4 Samples:
  - .1 Submit each unit for review and acceptance.
  - .2 Samples will be delivered to Contractor and will constitute part of the work.
  - .3 Submit complete window sample full size, for each window type.
  - .4 Samples should clearly show details of blind frame, frame and windowsill, type of glazing and sealing, type of mosquito net, finish and hardware. They should also show location of manufacturer's data plate.
  - .5 Submit 150 mm long samples, for headrail, jambs, support, stiles, mullions, showing elements profiles.
- .5 Product Test Reports:
  - .1 Submit substantiating engineering data, based on evaluation of comprehensive tests performed by a qualified preconstruction testing agency, for glazed aluminum windows, indicating compliance with performance requirements.
  - .2 All test reports that refer to the NAFS standard must include on first page a summary of the results including the following:
    - .1 Manufacturer of the product.
    - .2 Type of product.
    - .3 Model/serial number of product.
    - .4 Main designation of product.
    - .5 Secondary designation of product.
      - .1 Positive pressure.
      - .2 Negative pressure.
      - .3 Pressure test for resistance to water infiltration.
      - .4 Level of infiltration and exfiltration of air acceptable in Canada.
    - .6 Date of completion of tests.
  - .3 Content of report will also include the following information:
    - .1 Testing dates.
    - .2 Dates of report writing.
    - .3 Retention period of test-related information.
    - .4 Location of test facilities.
    - .5 Exhaustive description of test specimens, including notably the following.
      - .1 Anodized finish, weather resistance characteristics.
      - .2 Resistance to condensation.

- .3 .3 Resistance to breakage in case of fall, with sash windows (vertical translation) only.
- .4 .4 Blocking-resistance, in case of sliding windows (horizontal translation) only.
- .5 .5 Strength and rigidity of frame, in case of casement windows.
- .6 .6 Pullout resistance (frame) in case of vinyl windows.
- .7 .7 Resistance to tampering.
- .8 .8 Resistance to deformation (mullions), in case of combined/composite windows.
- .6 Complete description of modifications, if necessary.
- .7 Conclusion
- .8 Drawings certified by testing laboratory, if provided.

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

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

## **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

## **1.8 CLOSEOUT SUBMITTALS**

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

## **1.9 QUALITY ASSURANCE**

- .1 Installer qualifications: company specializing in performing the work of this section with documented experience in installing successfully identical or similar units to those required for this project and other similar projects in size and magnitude.
- .2 Manufacturer qualifications: company specializing in manufacturing the products specified in this section with documented experience, including test reports and calculations.
- .3 Source Limitations: Obtain aluminum curtain wall system through one source from a single manufacturer.
- .4 Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. See Division 01, "Products Requirements". Do not modify size and dimensions.
- .5 Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If revisions are proposed, submit comprehensive explanatory data to Architect for review.
- .6 Models: build models to verify selections made following submission of samples, demonstrate visual effects and establish quality standards for materials and execution.
- .7 Build a model for indicated window types at locations shown on drawings.
- .8 Pre-installation conferences: hold a conference on project site to meet requirements Division 01 - "Project Management and Coordination".

## **1.10 AMBIENT CONDITIONS**

- .1 Field measurements: check aluminum windows openings by taking measurements on site before fabrication and indicate on shop drawings.

## **1.11 WARRANTY**

- .1 Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty.
- .2 Warranty Period: Two (2) years from Date of Substantial Completion of the project.

## **PART 2 PRODUCTS**

### **2.1 WINDOWS**

- .1 Casement windows: aerator depth of swing window opening outwards 3-3/8 in. (85.7 mm), depth of frame 152mm.
  - .1 Acceptable product: AAMC6600 (AW-PG70-C) series Casement Windows opening outwards by Kawneer or equivalent approved by Architect.
- .2 Fixed windows: 152 mm frame depth.
  - .1 Acceptable product: AAMC6600 (AW-PG70-FW) series by Kawneer - or equivalent approved by Architect.

## **2.2 MATERIALS**

- .1 Aluminum Extrusions: Alloy and temper recommended by glazed aluminum curtain wall manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" (1.8 mm) wall thickness at any location for the main frame and components.
- .2 Thermal Barrier: The thermal barrier shall be by Kawneer consisting of two parallel glass fiber-reinforced nylon strips installed continuously and mechanically bonded to the aluminum.
- .3 Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors, and other components.
- .4 Anchors, Clips, and Accessories: Aluminum or nonmagnetic stainless steel complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- .5 Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated
- .6 Sealant: For sealants required within fabricated curtain wall system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

## **2.3 GLAZING**

- .1 Glazing: Comply with section 08 80 50 "Glazing", for glass and glazing requirements applicable to glazed aluminum window units.
- .2 Glazing Systems for casement windows: Glazing method shall be a wet/dry type in accordance with manufacturer's standards. Exterior glazing shall be silicone back bedding sealant. Interior glazing shall be snap-in type glazing beads with an interior gasket in accordance with AAMA 702 or ASTM C864

## **2.4 HARDWARE FOR CASEMENT WINDOWS**

- .1 General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and securely lock aluminum windows, and sized to accommodate sash weight and dimensions.
- .2 Casement Window Typical Hardware:
  - .1 Locking
    - .1 Multipoint locks single handle (standard)
  - .2 Hinging
    - .1 Butt Hinges
    - .2 Concealed hinges (casement opening outwards)
- .3 Other
  - .1 Crank device (casement opening outwards)

## **2.5 ACCESSORY MATERIALS**

- .1 Dividers, support inserts, sealants and adhesion barrier: fixed permanent types, manufacturer's standard, hardness recommended by manufacturer, compatible with sealing products and meeting system performance requirements.

- .2 Gaskets, sealants and grouts for frame system recommended by manufacturer for type of joints.
- .3 Sealants and grouts for perimeter joints of window system as indicated in "Sealants", Division 7.
- .1 .4 Perimeter anchors: when steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- .2 .5 Optional interior trim: Extruded aluminum, hardness and alloy 6063-T6 extruded in accordance with profiles and details shown.
  - .1 Interior trim: minimum wall thickness of interior moldings will be 0.062 inches (1.57 mm). Face trim is fixed rigidly to a concealed mounting flange. Visible fixings will not be accepted. The mounting flange is extruded aluminum, hardness and alloy 6063-T6. The minimum wall thickness will be 0.062 inch (1.57 mm). Molding flanges will be provided with a length of 4 inches (101.6 mm) and will be installed with a maximum spacing center to center of 18 inches (457.2 mm).
- .6 Coupling mullions: Extruded aluminum, alloy and hardness 6063-T6, according to profiles and dimensions shown on drawings. Mullions must provide structural properties to withstand wind pressure as specified in standards and performance criteria.
- .1 .7 Optional Screens: Extruded aluminum frames, alloy and hardness 6063-T6, corner joints; fibreglass mesh 18 x 16; frame finish to match aluminum windows; Extruded vinyl grooves, removable to allow replacement of screen.

## **2.6 FABRICATION (CASEMENT WINDOWS)**

- .1 Fabricate components that, when assembled, have the following characteristics:
  - .1 Profiles that are sharp, straight, and free of defects or deformations.
  - .2 Accurately fit and secure joints and corners. Make joints flush, and weatherproof.
  - .3 Means to drain water through joints, condensation occurring in context of frame elements and moisture moving within system to the outside.
  - .4 Physical and thermal isolation of glazing from framing members.
  - .5 Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  - .6 Provisions for glazing replacement onsite.
  - .7 Fasteners, anchors, and connection devices concealed from view to greatest extent possible.
- .2 Carpentry for window vent or window frame: miter joint and cutting and / or mechanical stamping; window vent or window frame corner joints sealed at factory.
- .3 Fabricate aluminum windows of specified sizes. Include complete system for assembling components and anchoring windows.
- .4 Fabricate aluminum windows that can be glazed again without dismantling sash or frame.
- .5 Improved thermal construction: Fabricate aluminum windows with a thermal barrier having low integrated conductance, concealed between exterior materials and window jambs exposed on the inside, so as to eliminate metal to metal direct contact. Thermal barriers shall be designed in accordance with AAMA TIR A8.
  - .1 Thermal Barrier: The thermal barrier must be by Kawneer composed of two strips of fiber-reinforced nylon parallel glass installed continuously and mechanically bonded to aluminum.

- .6 Glazing beads: Provide contact pressure glazing beads in accordance with Division 08, "Glazing" section, and indicated glazing system. Provide glazing beads matching frame.

## **1.7 2.7 FABRICATION (FIXED WINDOWS)**

- .1 Fabricate components that, when assembled, have the following characteristics:
  - .1 Profiles that are sharp, straight, and free of defects or deformations.
  - .2 Accurately fit and secure joints and corners. Make joints flush, and weatherproof.
  - .3 Means to drain water through joints, condensation occurring in context of frame elements and moisture moving within system to the outside.
  - .4 Physical and thermal isolation of glazing from framing members.
  - .5 Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  - .6 Provisions for glazing replacement onsite.
  - .7 Fasteners, anchors, and connection devices concealed from view to greatest extent possible.
- .2 Window frames: Fabricate assembly components using standard installation instructions from manufacturer.
- .3 After fabrication clearly indicate on components their respective locations in project as specified in workshop drawings.
- .4 Improved thermal construction: Fabricate aluminum windows with a thermal barrier having low integrated conductance, concealed between exterior materials and window jambs exposed on the inside, so as to eliminate metal to metal direct contact. Thermal barriers shall be designed in accordance with AAMA TIR A8.
- .5 Thermal Barrier: The thermal barrier must be by Kawneer composed of two strips of fiber-reinforced nylon parallel glass installed continuously and mechanically bonded to aluminum.

## **2.8 ALUMINUM FINISHES FOR WINDOW FRAMES**

- .1 Finish coatings: conform to AA (Aluminum Association) designations.
  - .1 Interior: Kawneer PermanodicMC AA-M10C21A31, AAMA 611, catégorie architecturale II anodisation transparente (Couleur Naturel no 17) (standard).
  - .2 Exterior : Kawneer PermafluorMC (70 % PVDF), AAMA 2605, revêtement de fluoropolymère (Couleur QC 56063 orange).

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for aluminum curtain wall installation in accordance with manufacturer's written instructions. Visually inspect substrate in presence installer. Verify rough opening dimensions, tolerances, and method of attachment with other work. Verify wall openings and adjoining air and vapour barrier materials are ready to receive work of this Section.

- .1 .1 Masonry Surfaces: Visibly dry and free of excess mortar, sand and other construction debris.

- .2 .2 Wood structure walls: Dry, clean, in good condition, correctly nailed, free of any void and offset at the joints. Check that nail heads are driven at surface level in openings and less than 3 inches (76.2 mm) thereof.
- .3 .3 Metal Surfaces: Dry, clean, free from grease, oil, dirt, rust, corrosion and solder dross; no sharp edges or gaps at the joints.
- .4 .4 Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION**

- .1 Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing windows, hardware, accessories, and other components.
- .2 Install aluminum framed window system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- .3 Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.
- .4 Install aluminum framed window system and components to drain condensation, water penetrating joints, and moisture migrating within system to the exterior.
- .5 Separate aluminum from dissimilar materials to prevent corrosion or electrolytic action at points of contact

### **3.3 FIELD QUALITY CONTROL**

- .1 Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.
  - .1 Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.
- .2 Testing Services: Testing and inspecting of installed windows shall take place as follows:
  - .1 Testing Methodology: Testing Standard shall be per AAMA 502 including reference to ASTM E 783 for Air Infiltration Test and ASTM E 1105 for Water Penetration Test.
    - .1 Air Infiltration Test: Conduct test in accordance with ASTM E 783 at a minimum uniform static test pressure of 1.57 psf (75 Pa) for CW or 6.24 psf (300 Pa) for AW. The maximum allowable rates of air leakage for field testing shall not exceed 1.5 times the project specifications.
    - .2 Water Infiltration Test: Water penetration resistance tests shall be conducted in accordance with ASTM E 1105 at a static test pressure equal to 2/3 the specified water test pressure.
  - .2 Testing Extent: Architect shall select window units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer's representative present.
- .3 Test Reports: Shall be prepared according to AAMA 502.

### **3.4 ADJUSTING, REPAIRS AND PROTECTION**

- .1 Adjust operating sashes, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weather tight closure. Lubricate hardware and moving parts.

- .2 Clean aluminum surfaces immediately after installing windows. Avoid damaging the coatings and protective finishes. Remove excess sealant, glazing materials, dirt and other substances.
- .3 Clean the glass immediately after installing windows. Follow manufacturer's written recommendations for final cleaning and maintenance. Remove non-permanent labels and clean surfaces.
- .4 Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- .5 Protect window surfaces from contaminants from construction operations. Also, monitor surfaces of adjacent windows, exterior concrete and masonry surfaces, as well as below them during construction to locate dirt, grime, alkaline deposits, stains or other contaminants. If contaminating substances come into contact with the surfaces of windows, remove contaminants immediately following manufacturer's written recommendations.

**END OF SECTION**



**PART 1 GENERAL**

**1.1 WORK SCOPE**

- .1 This section, without necessarily being limited, includes supply and installation of hardware items described herein, in accordance with hardware slip. It includes all pieces of hardware required for the installation of steel doors, wood and other materials if specified.

**1.2 RELATED REQUIREMENTS**

- .1 Section 08 11 00 – Metal Doors and Frames.
- .2 Section 08 11 16 – Aluminium Doors and Frames.
- .3 Section 08 14 16 – Flush Wood Doors.
- .4 Division 26 – Electricity.

**1.3 EXCLUDED WORK**

- .1 Certain types of electrical work as prescribed in hardware groups.

**1.4 REFERENCES**

- .1 Standardized position of hardware must meet requirements of Canadian Guide to Metric Conversion for Steel Doors and Frames (Modular construction) prepared by Association of Canadian Manufacturers of Steel Doors and Frames.
- .2 Hardware must be in accordance with American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA).

**1.5 REGULATORY BODIES REQUIREMENTS**

- .1 Use hardware parts certified and labelled by ULC standards for fire doors and emergency exits.

**1.6 MAINTENANCE DATA SHEET:**

- .1 Provide maintenance data sheet, list of parts and manufacturer's instructions for each type of door, lock, stop door and accessories for emergency exits and attach to maintenance manual referred to in section on General Conditions.
- .2 Instruct maintenance personnel how to clean and take care of hardware parts. Organize a meeting on information and training lasting a minimum of two hours.

**1.7 MAINTENANCE EQUIPMENT:**

- .1 Provide wrenches needed for door closers, locks and emergency exit accessories.

**1.8 DELIVERY AND HANDLING:**

- .1 Store finish hardware parts in a locked room, clean and in a dry place.
- .2 Identify each piece of hardware with number of door and floor where door is installed.

**1.9 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with requirements of General Conditions; submit sample of each type of piece of hardware used.
- .2 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and supplier's signature.
- .3 Samples, once duly labelled, will be submitted to Architect for the purpose of verification and approval.
- .4 Submit samples at least 15 days before presenting hardware slip.
- .5 Samples will be stored at site office for the duration of the work and will be given to supplier once work completed.

**1.10 CERTIFICATIONS**

- .1 Only authorized distributors of the specified products having conducting business in Quebec are eligible to bid on this project.
- .2 Company retained to provide supplies of this section shall have in its employ an AHC consultant, active and valid member of DHI chapter of Quebec. The AHC certified consultant will be responsible for the implementation of the project and for its coordination with the various parties and this during the whole duration of the work.

**PART 2 PRODUCTS**

**2.1 MATERIAL**

<b>Material</b>	<b>Manufacturers</b>
Hinges	MCKINNEY
Locks	SARGENT / SOUTHERN STEEL
Door Closers	NORTON
Guard Plates	ROCKWOOD
Stoppers	ROCKWOOD
Stop Arms	RIXSON
Thresholds	PEMKO
Seals	PEMKO
Electric Latch	HES
Miscellaneous	SEE SPECIFICATIONS

**2.2 REQUIREMENTS**

- .1 Except in cases prescribed in the hardware slip, all hardware parts required for this work will be robust and institutional. Refer to the list for finish requirements.
- .2 Submit a hardware list in ten copies in accordance with prescriptions in hardware matrix and hardware slip, article 5.0. Hardware lists should include for installation coordination purposes digital and written description of each item as well as all comments listed in hardware list, as specified in this document..

- .3 Hardware slip is provided as a guide to establish type, function, quality and minimum weight of the required items. It should not be interpreted as quantity list. The Contractor must therefore verify the list along with the plans and must provide all additional hardware items that are not in this list but that are required to complete the installation of doors.
- .4 Fabricate hardware parts in accordance with operative ANSI standards.
- .5 In the absence of ANSI standards, the hardware part must be able to fulfil its function and be of recognized usage.
- .6 Application for equivalent product acceptance should be submitted in writing to the Architect at least 10 working days before bid closing date. It must be accompanied by technical specifications of specified products versus proposed equivalents, submitted in a clear and readable matrix which highlights main characteristics. The Architect is committed to respond in writing at least 5 working days before the bid closing date. Products will only be considered to be equivalent if they have matching mechanical and functional characteristics and meet the same ANSI/BHMA standards, with equal warranty or greater than specified product and with no impact to owner's stocks of maintenance and their willingness to standardize facilities. Any requests for acceptance that does not meet these criteria will be considered as void and will receive a negative answer.
- .7 Submit six copies for approval, elevations of each one of the doors with electrified components, including detailed diagrams of electrical connections and operating mode. These documents will be used by professionals during construction work and two copies will be given to the owner for future reference.

### **2.3 FASTENINGS**

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

### **2.4 PROTECTION AGAINST VANDALISM**

Even if not specifically described in this section or listed in hardware list, provide protection parts such as protectors-latch, hinge with non-removable plug, etc., for all exterior doors.

### **2.5 KEYING**

- .1 Cylinders and permanent keys will be provided by the RCMP.
- .2 Supply Sargent standard temporary cylinders for construction key system.
- .3 5 KA1 key copies for exterior doors.
- .4 5 KA2 key copies for interior doors.

**PART 3 EXECUTION**

**3.1 INSTALLATION**

- .1 Provide full instructions and installation templates to door and steel frame manufacturer so as to allow for factory preparation of planned hardware.
- .2 Each piece of hardware must be accompanied by the manufacturer's installation instructions.
- .3 Install hardware parts in standard positions in accordance with the Canadian Manufacturers Association requirements for steel frames and doors.
- .4 Installation will be carried out by installers who are familiar with this type of hardware. It includes adjustment and verification of the various components during installation and before work acceptance.
- .5 Install hardware parts level, with screws and bolts supplied by manufacturer in accordance with instructions. Parts will be recessed flush with door faces. Adjust moving parts so that doors operate smoothly.

**3.2 ELECTRIFIED HARDWARE INSTALLATION**

- .1 Contractor will select services of specialized firm with minimum of three (3) years of experience in installation of electrified hardware licensed as construction contractor, subcategory 4250 and 4252, license issued by the R.E.C.Q.
- .2 Where specified, all electrified hinges, electrified locks and panic-locks connections will be implemented using fast connectors Molex Type, E-Lynx system by ASSA ABLOY. All electrical cables of E-Lynx type specified in hardware slip will be coordinated with door elevations, electrical boxes location and components with which they are used.

**3.3 RESPONSABILITY**

- .1 Finish hardware parts will be suitably adapted to specified use and will be suitable for designated location. In the event that specified or requested hardware does not meet projected or requested requirements, a modification may be agreed or adapted to designated location. Hardware provider will seek necessary correction or modification promptly long enough in advance to avoid a delay in fabrication and in hardware delivery.
- .2 During construction, provider will make necessary checks to ensure that supplied finish hardware is properly installed and will inform Contractor.

**3.4 EXAMINATION**

- .1 After end of work, an examination will be performed by the Architect's Consultant to certify that delivered and installed hardware is as per specifications and approved list.
- .2 Criteria for Consultant's examination purposes:
  - .1 Before requesting hardware examination, Contractor must carry out verification and confirm in written request that it has been done.
  - .2 If in Consultant's opinion, work seems completed, initial examination will be carried out methodically and if applicable, a list of work to correct will be issued.
- .3 Once Contractor will have confirmed having corrected any defects identified, defects will be checked by Consultant.

- .4 If work is not completed and the Consultant must issue additional lists and perform other verifications; the cost of these will be borne by the Contractor until work is certified by the Consultant. Each additional visit will be charged to the Contractor at the rate of \$ 1500.00 each + taxes for the first 15 doors + 50.00\$ + taxes per additional door thereafter.
- .5 Contractor shall also provide Architect and Consultant with assistance during examinations.

### 3.5 HARDWARE GROUPS

- .1 See hardware groups slip annexed further in this document

**NOTE:** ALL DOORS AND FRAMES WITH ACCESS CONTROL (LC) MUST BE EQUIPPED WITH BUILT-IN CONDUITS.

**Group 1** Door(s): 101.1

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Entrance – CALI PALI 914 x 2133 battants larges</i>		
1	Charnière continue MCK-12HD x 2133mm	628	MCKINNEY
1	Serrure mortaise (F13) 8225 LNL CMC	626	SARGENT
1	Bras d'arrêt encastré 1-336	630	RIXSON
1	Contact magnétique 1076M-SPDT Brun 1" diam. ( <i>conduit 1"</i> )		SENTROL
1	Gâche électrique 1006CDB x 2005M3	630	HES
1	Protège-pêne 150	630	HES
1	Ouvre-porte HA-8	628	HUNTER
2	Bouton poussoir 10PBR45LL	630	BEA
1	Détecteur de présence BODYGUARDIII-C		BEA
1	Diagramme des raccordements électriques SCC-DR-12-160405-GR1		ARD

- Door and aluminium frame, coordinate all hardware items with their construction.
- Threshold and seals provided by doors and aluminium frames manufacturer.
- Electrical conduits, electrical connection boxes, draw strings, fire alarm panel contacts and 120V power supply are all supplied, installed and connected by electricity.
- All electrified components including the wires connecting them and specified in this group of hardware are supplied, installed and connected as per this section. Where required, contacts to the fire alarm panel and 120V power supply will be connected by electricity.

**Group 1.1** Door(s): 308.1

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Entrée – CAI PAI 914 x 2133</i>		
3	Charnières mortaises T4A3386 114mm x 114mm NRP	630	MCKINNEY
1	Serrure mortaise (F15) 8250 LNL WBS CMC	626	SARGENT
1	Ferme-porte 351-PS	689	SARGENT
1	Protège-pêne 325	626	ROCKWOOD
1	Plaque de protection K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Judas DS2000	AL.S	DOOR SCOPE
1	Jeu de coupe-froid 312CR 1/915mm x 2/2134mm	628	PEMKO
1	Balai 315CN x 915mm	628	PEMKO
1	Seuil 274x224AFGT x 915mm	719	PEMKO
1	Contact magnétique 1076M-SPDT Brun 1" diam. ( <i>conduit 1"</i> )		SENTROL
1	Transfert de courant 4612-1 ( <i>pour raccordement d'une serrure électrifiée future</i> )		ADAMS RITE

**Group 2** Door(s): 308.1

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Entrée – CAI PAI 914 x 2133</i>		
3	Charnières mortaises T4A3386 114mm x 114mm NRP	630	MCKINNEY
1	Serrure mortaise (F15) 8250 LNL WBS CMC	626	SARGENT
1	Ferme-porte 351-PS	689	SARGENT
1	Protège-pêne 325	626	ROCKWOOD
1	Plaque de protection K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Judas DS2000	AL.S	DOOR SCOPE
1	Jeu de coupe-froid 312CR 1/915mm x 2/2134mm	628	PEMKO
1	Balai 315CN x 915mm	628	PEMKO
1	Seuil 274x224AFGT x 915mm	719	PEMKO
1	Contact magnétique 1076M-SPDT Brun 1" diam. ( <i>conduit 1"</i> )		SENTROL
1	Transfert de courant 4612-1 ( <i>pour raccordement d'une serrure électrifiée future</i> )		ADAMS RITE

- Electrical conduits, electrical connection boxes, draw strings, fire alarm panel contacts and 120V power supply are all supplied, installed and connected by electricity.
- All electrified components including the wires connecting them and specified in this group of hardware are supplied, installed and connected as per this section. Where required, contacts to the fire alarm panel and 120V power supply will be connected by electricity

**Group 3 • Door(s): 102**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Vestibule entrée public – CA PA 914 x 2133</i>		
3	Charnières mortaises T4A3786 114mm x 114mm NRP	652	MCKINNEY
1	Serrure mortaise 8271 LNL WBS CMC	626	SARGENT
1	Ferme-porte 351-PS	689	SARGENT
1	Protège-pêne 325	626	ROCKWOOD
1	Plaque de protection K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Butoir au mur 415	626	ROCKWOOD
1	Garniture d'étanchéité autocollante S773GR x 17'		PEMKO
1	Seuil tombant encastré 420APKL x 915mm	719	PEMKO
1	Transfert de courant 4612-1		ADAMS RITE
1	Contact magnétique 1076M-SPDT Brun 1" diam. ( <i>conduit 1"</i> )		SENTROL
1	Diagramme des raccordements électriques SCC-DR-12-160405-GR3		ARD
	Contrôle d'accès : lecteur de carte, boîtier d'alimentation/contrôleur, requête de sortie		Par Sécurité

- Electrical conduits, electrical connection boxes, draw strings, fire alarm panel contacts and 120V power supply are all supplied, installed and connected by electricity.
- All electrified components including the wires connecting them and specified in this group of hardware are supplied, installed and connected as per this section. Where required, contacts to the fire alarm panel and 120V power supply will be connected by electricity.



**Group 4 • Door(s) : 103**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Toilette public – CA PB 914 x 2133</i>		
3	Charnières mortaises TA2314 114mm x 101mm NRP	626	MCKINNEY
1	Serrure mortaise (F07) 8204 LNL WBS CMC	626	SARGENT
1	Ferme-porte 1431-UO	689	SARGENT
2	Plaque de protection K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Butoir au mur 415	626	ROCKWOOD

Note : la clé pour la toilette doit être demandée à la réception.

**Groupe 4.1 • Porte(s) : 604**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Toilette mixte – CA PB 914 x 2133</i>		
3	Charnières mortaises TA2314 114mm x 101mm NRP	626	MCKINNEY
1	Serrure mortaise (F22) 8265 LNL WBS	626	SARGENT
1	Ferme-porte 351-UO	689	SARGENT
2	Plaque de protection K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Butoir au mur 415	626	ROCKWOOD

**Group 5 • Door(s) : 201 204**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Bureau privé, salle de travail – 914 x 2133</i>		
3	Charnières mortaises TA2714 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise (F13) 8225 LNL WBS CMC	626	SARGENT
1	Butoir au plancher 445H	626	ROCKWOOD
1	Coupe-son 312CR 1/915mm x 2134mm	628	PEMKO
1	Coupe-son autocollant S773GR x 17'		PEMKO
1	Seuil tombant encastré 434ARL (porte bois) / 420APKL (porte acier) x 915mm	719	PEMKO

**Groupe 6 • Door(s) : 202**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Bureau privé</i>		
3	Charnières mortaises TA2714 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise (F04) 8205 LNL WBS CMC	626	SARGENT
1	Bras d'arrêt encastré 2-346 90°	630	RIXSON

**Groupe 6.1 • Door(s) : 205**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Papeterie – CA PB 914 x 2133</i>		
3	Charnières mortaises TA2714 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise (F01) 8215 LNL WBS	626	SARGENT
1	Butoir au plancher 445H	626	ROCKWOOD
1	Béquille 461L	626	ROCKWOOD

**Group 7 • Door(s): 203.1 203.2**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
1	Jeu de rail complet avec chariots, butoirs et guides CC-410-W x 1830mm x 2 DR KIT	628	KN CROWDER
2	Poignées encastrées C-90B	626	KN CROWDER

**Group 8 • Door(s): 301**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Salle d'exercice – CA PB 914 x 2133</i>		
3	Charnières mortaises TA2714 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise (F15) 8250 LNL WBS CMC	626	SARGENT
1	Plaque de protection K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Butoir au plancher 445H	626	ROCKWOOD
1	Béquille 461L	626	ROCKWOOD

**Group 9 • Door(s): 302.1**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Garage - CA PA 914 x 2133</i>		
3	Charnières mortaises T4A3786 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise (F13) 8225 LNL WBS CMC	626	SARGENT
1	Ferme-porte 351-PS	689	SARGENT
1	Plaque de protection K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Judas DS2000	AL.S	DOOR SCOPE
1	Garniture d'étanchéité autocollante S773GR x 17'		PEMKO
1	Seuil tombant encastré 420APKL x 915mm	719	PEMKO

**Group 9.1 • Door(s): 704**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Garage - CA PA 914 x 2133</i>		
3	Charnières mortaises T4A3786 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise (F01) 8215 LNL WBS	626	SARGENT
1	Ferme-porte 351-PS	689	SARGENT
1	Plaque de protection K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Judas DS2000	AL.S	DOOR SCOPE
1	Garniture d'étanchéité autocollante S773GR x 17'		PEMKO
1	Seuil tombant encastré 420APKL x 915mm	719	PEMKO

**Group 10 • Door(s) : 302.2**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Garage – CAI PAI 914 x 2133</i>		
3	Charnières mortaises T4A3386 114mm x 114mm NRP	630	MCKINNEY
1	Serrure mortaise (F15) 8250 LNL WBS CMC	626	SARGENT
1	Protège-pêne 325	626	ROCKWOOD
1	Ferme-porte 351-PS	689	SARGENT
1	Plaque de protection K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Judas DS2000	AL.S	DOOR SCOPE
1	Coupe-froid 312CR 1/915mm x 2/2134mm	628	PEMKO
1	Balai 315CN x 915mm	628	PEMKO
1	Seuil 274x224AFGT x 915mm	719	PEMKO
1	Contact magnétique 1076M-SPDT Brun 1" diam. (conduit 1")		SENTROL

**Group 10.1 • Door(s) : 601.2**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Garage – CAI PAI 914 x 2133</i>		
3	Charnières mortaises T4A3386 114mm x 114mm NRP	630	MCKINNEY
1	Serrure mortaise (F13) 8225 LNL WBS CMC	626	SARGENT
1	Protège-pêne 325	626	ROCKWOOD
1	Ferme-porte 351-PS	689	SARGENT
1	Plaque de protection K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Judas DS2000	AL.S	DOOR SCOPE
1	Coupe-froid 312CR 1/915mm x 2/2134mm	628	PEMKO
1	Balai 315CN x 915mm	628	PEMKO
1	Seuil 274x224AFGT x 915mm	719	PEMKO
1	Contact magnétique 1076M-SPDT Brun 1" diam. (conduit 1")		SENTROL

**Group 11 • Door(s): 303**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Entreposage général – CA PB 914 x 2133</i>		
3	Charnières mortaises TA2714 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise (F13) 8225 LNL WBS CMC	626	SARGENT
1	Butoir au mur 415	626	ROCKWOOD
1	Béquille 461L	626	ROCKWOOD

**Group 12 • Door(s): 304.1**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Salle d'entrevue du public – CA PA 914 x 2133 52CTS</i>		
3	Charnières mortaises T4A3786 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise (F15) 8250 LNL WBS CMC	626	SARGENT
1	Ferme-porte 351-PS	689	SARGENT
1	Plaque de protection K1050 B4A CSK 203mm x 865mm	630	ROCKWOOD
1	Coupe-son 312CR 1/915mm x 2/2133mm	628	PEMKO
1	Coupe-son autocollant S773GR x 17'		PEMKO
1	Seuil tombant encastré 420APKL x 915mm	719	PEMKO

**Group 13 • Door(s): 304.2**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Salle d'entrevue du public – CA PA 914 x 2133 52CTS</i>		
3	Charnières mortaises T4A3786 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise (F15) 8250 LNL CMC MDR	626	SARGENT
1	Protège-pêne 325	626	ROCKWOOD
1	Ferme-porte 351-PS	689	SARGENT
1	Plaque de protection K1050 B4A CSK 203mm x 865mm	630	ROCKWOOD
1	Coupe-son 312CR 1/915mm x 2/2134mm	628	PEMKO
1	Coupe-son autocollant S773GR x 17'		PEMKO
1	Seuil tombant encastré 420APKL x 915mm	719	PEMKO

**Group 14 • Door(s): 306.1 306.2**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Salle d'entrevue du public – CA PA 914 x 2133 52CTS</i>		
3	Charnières mortaises T4A3786 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise (F13) 8225 LNL WBS CMC	626	SARGENT
1	Ferme-porte avec arrêt intégré 351-PS	689	SARGENT
1	Plaque de protection K1050 B4A CSK 203mm x 865mm	630	ROCKWOOD
1	Coupe-son 312CR 1/915mm x 2/2134mm	628	PEMKO
1	Coupe-son autocollant S773GR x 17'		PEMKO
1	Seuil tombant encastré 420APKL x 915mm	719	PEMKO

**Group 15 • Door(s): 307 407**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Entreposage administratif – CA PA 914 x 2133</i>		
3	Charnières mortaises TA2714 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise (F15) 8250 LNL WBS CMC	626	SARGENT
1	Ferme-porte 351-PS	689	SARGENT
1	Plaque de protection K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Butoir au mur 415	626	ROCKWOOD
1	Contact magnétique 1076M-SPDT Brun 1" diam. (conduit 1")		SENTROL

**Group 15a • Door(s): 404 405**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Entreposage administratif – CA PA 914 x 2133</i>		
3	Charnières mortaises TA2714 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise (F13) 8225 LNL WBS CMC	626	SARGENT
1	Ferme-porte 351-PS	689	SARGENT
1	Plaque de protection K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Butoir au mur 415	626	ROCKWOOD
1	Contact magnétique 1076M-SPDT Brun 1" diam. (conduit 1")		SENTROL

**Group 15b • Door(s): 408**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Entreposage administratif – CA PA 914 x 2133</i>		
3	Charnières mortaises TA2714 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise (F15) 8250 LNL WBS CMC	626	SARGENT
1	Ferme-porte 1431-UO	689	SARGENT
1	Plaque de protection K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Butoir au mur 415	626	ROCKWOOD
1	Contact magnétique 1076M-SPDT Brun 1" diam. (conduit 1")		SENTROL



**Group 15.1 • Door(s): 402A 402B**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Entreposage administratif – CA PA 914 x 2133</i>		
3	Charnières mortaises TA2714 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise (F15) 8250 LNJ WBS CMC	630	SARGENT
1	Ferme-porte 1431-UO	689	SARGENT
1	Plaque de protection K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Butoir au mur 415	626	ROCKWOOD
1	Contact magnétique 1076M-SPDT Brun 1" diam. (conduit 1")		SENTROL

**Group 16 • Door(s): 309**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Cuisinette/repos – CA PA 914 x 2133</i>		
3	Charnières mortaises TA2714 114mm x 100mm NRP	652	MCKINNEY
1	Serrure mortaise (F01) 8215 LNL WBS CMC	626	SARGENT
1	Plaque de protection K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Butoir au mur 415	626	ROCKWOOD

**Group 17 • Door(s): 310 311**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Toilette homme / toilette femme – CA PB 914 x 2133</i>		
3	Charnières mortaises T4A3386 114mm x 101mm NRP	626	MCKINNEY
1	Poignée à tirer et plaque à pousser 111x73C/73CL	630	ROCKWOOD
1	Ferme-porte 1431-PS	689	SARGENT
1	Plaque de protection K1050 B4E CSK 610mm x 865mm	630	ROCKWOOD

**Group 18 • Door(s): 312**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Entreposage administratif – CA PA 914 x 2133</i>		
3	Charnières mortaises TA2714 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise F07 8204 LNL WBS CMC	630	SARGENT
1	Ferme-porte 1431-UO	689	SARGENT
1	Plaque de protection K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Butoir au mur 415	626	ROCKWOOD
1	Béquille 461L	626	ROCKWOOD

**Group 19 • Door(s): 401**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Entreposage – CA PA 2/914 x 2133</i>		
6	Charnières mortaises TA2714 114mm x 114mm NRP	652	MCKINNEY
2	Verrous manuels encastrés 555 x 305mm	626	ROCKWOOD
1	Gâche anti-poussière 570	626	ROCKWOOD
1	Serrure mortaise (F13) 8225 LNL WBS CMC 808-7/8”Lip	626	SARGENT
1	Ferme-porte 1431-UO	689	SARGENT
1	Bras d’arrêt surface 9-336	630	RIXSON
2	Plaque à pied K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Butoir au mur 415	626	ROCKWOOD
2	Béquilles 461L	626	ROCKWOOD
1	<i>Astragale Fourni par le manufacturier des portes</i>		

**Group 19.1 • Door(s) : 602 603**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Entreposage – CA PA 2/914 x 2133</i>		
6	Charnières mortaises TA2714 114mm x 114mm NRP	652	MCKINNEY
2	Verrous manuels encastrés 555 x 305mm	626	ROCKWOOD
1	Gâche anti-poussière 570	626	ROCKWOOD
1	Serrure mortaise (F13) 8225 LNL WBS CMC 808-7/8”Lip	630	SARGENT
1	Ferme-porte 351-PS	689	SARGENT
1	Bras d’arrêt surface 9-336	630	RIXSON
2	Plaque à pied K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
2	Béquilles 461L	626	ROCKWOOD
1	<i>Astragale</i> <i>Fourni par le manufacturier des portes</i>		

**Group 20 • Door(s) : 403**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Entreposage administratif – CA PA 914 x 2133</i>		
3	Charnières mortaises TA2714 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise (F15) 8250 LNL WBS CMC	626	SARGENT
1	Ferme-porte avec arrêt intégré 351-PS	689	SARGENT
1	Plaque de protection K1050 B4E CSK 203mm x 865mm	630	ROCKWOOD
1	Contact magnétique 1076M-SPDT Brun 1” diam. (conduit 1”)		SENTROL

**Group 21 • Door(s) : 406**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Équipement – CA PA 914 x 2133 52CTS</i>		
3	Charnières mortaises T4A3786 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise (F15) 8250 LNL WBS CMC	626	SARGENT
1	Ferme-porte 351-PS	689	SARGENT
1	Plaque de protection K1050 B4A CSK 203mm x 865mm	630	ROCKWOOD
1	Coupe-son 312CR 1/915mm x 2/2134mm	628	PEMKO
1	Coupe-son autocollant S773GR x 17'		PEMKO
1	Seuil tombant encastré 420APKL x 915mm	719	PEMKO

**Group 21.1 • Door(s) : 701.1**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Équipement – CAI PAI 914 x 2133 UL1H</i>		
3	Charnières mortaises T4A3786 114mm x 101mm NRP	652	MCKINNEY
1	Serrure mortaise (F15) 8250 LNL WBS CMC	626	SARGENT
1	Ferme-porte 1431-PS	689	SARGENT
1	Plaque de protection K1050 B4A CSK 203mm x 865mm	630	ROCKWOOD
1	Coupe-son 312CR 1/915mm x 2/2134mm	628	PEMKO
1	Coupe-son autocollant S773GR x 17'		PEMKO
1	Seuil tombant encastré 420APKL x 915mm	628	PEMKO

**Group 22 • Door(s) : 501 502A 502B**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Bloc cellulaire</i>		
1	Jeu de charnières HTB386 MSP Option A	630	MCKINNEY
1	Serrure mortaise sécuritaire (F14) 36-9226 LNL WBS CMC	626	SARGENT
1	Ferme-porte 36-MC-351-PS	626	SARGENT
1	Judas DS2000	AL.S	DOOR SCOPE
1	Butoir au mur 1270CVPV	626	TRIMCO
1	Gâche électrique 1006CDB x 2005M3 x 157	630	HES
1	Contact magnétique 1076M-SPDT Brun 1" diam. (conduit 1")		SENTROL
1	Diagramme des raccordements électriques SCC-DR-12-160405-GR22		ARD

- Electrical conduits, electrical connection boxes, draw strings, fire alarm panel contacts and 120V power supply are all supplied, installed and connected by electricity.
- All electrified components including the wires connecting them and specified in this group of hardware are supplied, installed and connected as per this section. Where required, contacts to the fire alarm panel and 120V power supply will be connected by electricity.

**Group 22.1 • Door(s): 504 508**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Entreposage - CA PA 914 x 2133 - Bloc cellulaire</i>		
3	Charnières mortaises T4A3786 114mm x 114mm NRP TXS	652	MCKINNEY
1	Serrure morte (F18) 36-9220 WBS CMC	626	SARGENT
1	Jeu de poignées encastrées 1111B-BTB Torx	630	TRIMCO
1	Ferme-porte avec arrêt intégré 36-MC-351-PS	689	SARGENT
1	Plaque de protection K1050 B4E CSK 254mm x 865mm Torx	630	ROCKWOOD

**Group 22.2 • Door(s): 506.1**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Baie de sécurité – CA PA 914 x 2133</i>		
1	Jeu de charnières HTB386 MSP Option A	630	MCKINNEY
1	Serrure mortaise (F14) 36-9226 LNL WBS CMC	626	SARGENT
1	Ferme-porte 36-MC-351-PS	689	SARGENT
2	Plaque de protection K1050 B4E CSK 254mm x 865mm Torx	630	ROCKWOOD
1	Judas DS2000	AL.S	DOOR SCOPE

**Group 22.3 • Door(s): 506.2**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Baie de sécurité – CAI PAI 914 x 2438</i>		
4	Charnières mortaises T4A3386 114mm x 114mm NRP TXS	652	MCKINNEY
1	Serrure mortaise (F14) 36-9226 LNL WBS CMC	626	SARGENT
1	Ferme-porte 36-MC-351-PS	689	SARGENT
1	Plaque de protection K1050 B4E CSK 254mm x 865mm Torx	630	ROCKWOOD
1	Coupe-froid 312CN 1/915mm x 2/2438mm Torx	628	PEMKO
1	Balai 315SSN x 915mm Torx	630	PEMKO
1	Seuil 256A x 915mm Torx	628	PEMKO

Group 22.4 • Door(s): 507.1

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Salle de rencontre, salle d'entrevue – CA PA 52CTS 915 x 2134</i>		
3	Charnières mortaises T4A3786 114mm x 114mm NRP TXS	652	MCKINNEY
1	Serrure mortaise (F14) 36-9226 LNL WBS CMC	626	SARGENT
1	Ferme-porte 36-MC-351-PS	689	SARGENT
1	Plaque de protection K1050 B4E CSK 254mm x 865mm Torx	630	ROCKWOOD
1	Butoir au mur 1270CVPV	626	TRIMCO
1	Judas DS2000	AL.S	DOOR SCOPE
1	Coupe-son 312CN 1/915mm x 2/2134mm Torx	628	PEMKO
1	Coupe-son autocollant S773GR x 17'		PEMKO
1	Seuil tombant 420APKL x 914mm		PEMKO
1	Seuil 1715 x 914mm	719	PEMKO
1	Contact magnétique 1076M-SPDT Brun 1" diam. (conduit 1")		SENTROL
1	Gâche électrique 1006CDB x 2005M3 x 157	630	HES
1	Protège-pêne 150	630	HES

Group 22.4a • Door(s): 507.2

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Salle de rencontre, d'entrevue—CA PA 52CTS 915 x 2134</i>		
3	Charnières mortaises T4A3786 114mm x 114mm NRP TXS	652	MCKINNEY
1	Serrure mortaise (F14) 36-9226 LNL WBS CMC	626	SARGENT
1	Ferme-porte 36-MC-351-PS	689	SARGENT
1	Plaque de protection K1050 B4E CSK 254mm x 865mm Torx	630	ROCKWOOD
1	Butoir au mur 1270CVPV	626	TRIMCO
1	Judas DS2000	AL.S	DOOR SCOPE
1	Coupe-son 312CN 1/915mm x 2/2134mm Torx	628	PEMKO
1	Coupe-son autocollant S773GR x 17'		PEMKO
1	Seuil tombant 420APKL x 914mm		PEMKO
1	Seuil 1715 x 914mm	719	PEMKO
1	Contact magnétique 1076M-SPDT Brun 1" diam. (conduit 1")		SENTROL



**Group 22.4b • Door(s): 513**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Salle de rencontre, d'entrevue-CA PA 52CTS 915 x 2134</i>		
3	Charnières mortaises T4A3786 114mm x 114mm NRP TXS	652	MCKINNEY
1	Serrure mortaise (F07) 36-9204 LNL WBS CMC	626	SARGENT
1	Ferme-porte 36-MC-1431-UO	689	SARGENT
1	Plaque de protection K1050 B4E CSK 254mm x 865mm Torx	630	ROCKWOOD
1	Butoir au mur 1270CVPV	626	TRIMCO
1	Coupe-son 312CN 1/915mm x 2/2134mm Torx	628	PEMKO
1	Coupe-son autocollant S773GR x 17'		PEMKO
1	Seuil tombant 420APKL x 914mm		PEMKO
1	Seuil 1715 x 914mm	719	PEMKO
1	Contact magnétique 1076M-SPDT Brun 1" diam. (conduit 1")		SENTROL

**Group 22.5 • Door(s): 509**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Toilette garde – 915 x 2134 CA PA</i>		
3	Charnières mortaises H-TA2314 114mm x 101mm NRP	626	MCKINNEY
1	Serrure mortaise (F22) 36-9265 LNL WBS	626	SARGENT
1	Plaque de protection K1050 B4E CSK 254mm x 865mm Torx	630	ROCKWOOD
1	Butoir au mur 1270CVPV	626	TRIMCO

**Group 22.6 • Door(s): 510**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Conciergerie – CA PA 914 x 2133</i>		
	<i>Voir exigences et spécifications du maître de l'ouvrage</i>		
3	Charnières mortaises T4A3786 114mm x 101mm NRP TXS	652	MCKINNEY
1	Serrure mortaise (F07) 36-9204 LNL WBS CMC	626	SARGENT
1	Ferme-porte 36-MC-351-UO	689	SARGENT
1	Plaque de protection K1050 B4E CSK 254mm x 865mm Torx	630	ROCKWOOD
1	Butoir au mur 1270CVPV	626	TRIMCO

**Group 22.7 • Door(s): 511**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Salle mécanique cellules - CA PA 914 x 2133 52CTS</i>		
3	Charnières mortaises H-T4A3786 114mm x 114mm NRP TXS	652	MCKINNEY
1	Serrure morte (F18) 36-9220 WBS CMC	626	SARGENT
1	Jeu de poignées encastrées 1111B-BTB Torx	630	TRIMCO
1	Ferme-porte 36-MC-351-PS	689	SARGENT
2	Plaque de protection K1050 B4E CSK 254mm x 865mm Torx	630	ROCKWOOD
1	Béquille 461L Torx	626	ROCKWOOD
1	Coupe-son 312CN 1/915mm x 2/2133mm Torx	628	PEMKO
1	Coupe-son autocollant S773GR x 17'		PEMKO
1	Seuil tombant encastré 420PAKL x 914mm Torx	719	PEMKO

**Group 22.8 • Door(s) : 512**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Poste de garde - CA PA 915 x 2135</i>		
3	Charnières mortaises H-T4A3786 114mm x 114mm NRP TXS	652	MCKINNEY
1	Serrure mortaise (F14) 36-9226 LNL WBS CMC	626	SARGENT
1	Protège-pêne 325 Torx	626	ROCKWOOD
1	Ferme-porte 36-MC-351-PS	689	SARGENT
1	Plaque de protection K1050 B4E CSK 254mm x 865mm Torx	630	ROCKWOOD
1	Judas DS2000	AL.S	DOOR SCOPE
1	Coupe-son 312CN 1/915mm x 2/2135mm Torx	628	PEMKO
1	Coupe-son autocollant S773GR x 17'		PEMKO
1	Seuil tombant encastré 420PAKL x 915mm Torx	719	PEMKO

**Group 23 • Door(s) : 601.1**

QTÉ	DESCRIPTION	FINI	MANUFACTURIER
	<i>Garage – CA PA 914 x 2133</i>		
3	Charnières mortaises T4A3386 114mm x 101mm NRP	630	MCKINNEY
1	Serrure mortaise (F13) 8225 LNL WBS CMC	626	SARGENT
1	Protège-pêne 325	626	ROCKWOOD
1	Ferme-porte avec arrêt intégré 351-PS	689	SARGENT
1	Plaque de protection K1050 B4E CSK 254mm x 865mm	630	ROCKWOOD
1	Judas DS2000	AL.S	DOOR SCOPE
1	Garniture d'étanchéité autocollante S773GR x 17'		PEMKO
1	Seuil tombant encastré 420APKL x 914mm	719	PEMKO

**Group 24 • Door(s) : 701.2**

<b>QTÉ</b>	<b>DESCRIPTION</b>	<b>FINI</b>	<b>MANUFACTURIER</b>
	<i>Mécanique-électrique – CA PA 2/915 X 2134 52CTS</i>		
6	Charnières mortaises T4A3386 114mm x 114mm NRP	630	MCKINNEY
1	Jeu de verrous semi-automatiques 2849	630	ROCKWOOD
1	Coordonateur 3092		TRIMCO
1	Serrure mortaise (F15) 8250 LNL WBS CMC 808-7/8”Lip	626	SARGENT
1	Protège-pêne 325	626	ROCKWOOD
2	Ferme-portes avec arrêt intégré 351-PS	689	SARGENT
2	Plaque de protection K1050 B4E CSK 254mm x 865mm	630	ROCKWOOD
1	Coupe-froid 312CR 1/1830mm x 2/2134mm	628	PEMKO
2	Balais 315CN x 915mm	628	PEMKO
1	Seuil 274x224AFGT x 1830mm	719	PEMKO
1	Astragale 375CR x 2134mm	628	PEMKO

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 08 11 00 – Metal Doors and Frames
- .2 Section 08 11 16 – Aluminium Doors and Frames
- .3 Section 08 14 16 – Flush Wood Doors
- .4 Section 08 50 00 – Windows.

**1.2 REFERENCES**

- .1 ASTM International
  - .1 ASTM C542-05, Standard Specification for Lock-Strip Gaskets.
  - .2 ASTM D790-07e1, Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
  - .3 ASTM D1003-07e1, Standard Test Method for Haze and Luminous Transmittance of Plastics.
  - .4 ASTM D1929-96(R2001)e1, Standard Test Method for Determining Ignition Temperature of Plastics.
  - .5 ASTM D2240-05, Standard Test Method for Rubber Property - Durometer Hardness.
  - .6 ASTM E84-10, Standard Test Method for Surface Burning Characteristics of Building Materials.
  - .7 ASTM E330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
  - .8 ASTM F1233-08, Standard Test Method for Security Glazing Materials and Systems.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
  - .2 CAN/CGSB-12.2-M91, Flat, Clear Sheet Glass.
  - .3 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.
  - .4 CAN/CGSB-12.4-M91, Heat Absorbing Glass.
  - .5 CAN/CGSB-12.6-M91, Transparent (One-Way) Mirrors.
  - .6 CAN/CGSB-12.8-97, Insulating Glass Units.
  - .7 CAN/CGSB-12.8-97 (Amendment), Insulating Glass Units.
  - .8 CAN/CGSB-12.9-M91, Spandrel Glass.
  - .9 CAN/CGSB-12.10-M76, Glass, Light and Heat Reflecting.
  - .10 CAN/CGSB-12.11-M90, Wired Safety Glass.
  - .11 CAN/CGSB-12.12-M90, Plastic Safety Glazing Sheets.
  - .12 CAN/CGSB-12.13-M91, Patterned Glass.
- .3 Environmental Choice Program (ECP)
  - .1 CCD-045-95(R2005), Sealants and Caulking Compounds.

- .4 Glass Association of North American (GANA)
  - .1 GANA Glazing Manual - 2008.
  - .2 GANA Laminated Glazing Reference Manual - 2009.
- .5 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.
- .6 Underwriters' Laboratories of Canada (ULC)
  - .1 ULC-S332 Standard for burglary resisting glazing material

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

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for glass, sealants, and glazing accessories and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Québec, Canada.
- .4 Samples:
  - .1 Submit for review and acceptance of each unit.
  - .2 Samples will be returned to Contractor for inclusion into work.
- .5 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .6 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

### **1.4 CLOSEOUT SUBMITTALS**

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

### **1.5 QUALITY ASSURANCE**

- .1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .2 Mock-ups:
  - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
  - .2 Construct mock-up to include glass glazing, and perimeter air barrier and vapour retarder seal.
  - .3 Mock-up will be used:
    - .1 To judge quality of work, substrate preparation, operation of equipment and material application.
  - .4 Locate where indicated.

- .5 Allow 24 hours for inspection of mock-up before proceeding with work.
- .6 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

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

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect glazing and frames from nicks, scratches, and blemishes.
  - .3 Protect prefinished aluminum surfaces with protective wrapping.
  - .4 Replace defective or damaged materials with new.

## **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

## **1.8 AMBIENT CONDITIONS**

- .1 Ambient Requirements:
  - .1 Install glazing when ambient temperature is 10 degrees C minimum. Maintain ventilated environment for 24 hours after application.
  - .2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

## **PART 2 PRODUCTS**

### **2.1 FLAT GLASS**

- .1 Safety Glass: to CAN/CGSB-12.1, transparent, 6 mm thick.
  - .1 Type: 2-tempered.
  - .2 Class: B-float.
  - .3 Category: 1.
- .2 Wired Glass: to CAN/CGSB-12.11, transparent, 6 mm thick.

- .1 Type: 1-polished on both sides (transparent).
- .2 Mesh type: 3, square mesh.

## **2.2 INSULATING GLASS UNITS**

- .1 Performance Requirements:
  - .1 Light transmission percentage:
    - .1 Visible: 65
    - .2 Solar: 31
    - .3 UV Rays: 32
  - .2 Light reflection percentage:
    - .1 Visible outside: 10
    - .2 Visible inside: 11
    - .3 Solar: 32
  - .3 Thermal transmission coefficient (U coefficient): maximum 0.24 in winter, maximum 0.21 in summer.
  - .4 Shading coefficient: 0.41
  - .5 Solar Heat Gain Coefficient (SHGC): 0.36
  - .6 Solar Heat Gain Coefficient light ratio: 1.81
- .2 Insulating glass (type VT-1): to CAN/CGSB 12.8, two glass panes, 25 mm thick.
  - .1 Glass: to CAN/CGSB 12.
  - .2 Outside pane: tempered float tinted, 6 mm thick. Color: chosen from manufacturer's full range.
  - .3 Air space: 13 mm with low thermal conductivity spacers, « Super Spacer Premium Plus et Premium », by Edgetech or equivalent approved by Architect.
  - .4 Inside pane: tempered float transparent, 6 mm thick.
  - .5 Coating applied on glass: low emissivity, « Ti-AC 36 » by AGC Flat Glass North America or equivalent approved by Architect, applied to side #2.
- .3 Inert gas fill: argon, fill proportion: 90%.
- .4 Sealant: in accordance with Section 07 92 00 - Joint Sealants.
- .5 Security Window Film: laminate labelled as meeting ULC-S332 for burglar resistant by Ace or equivalent approved by architect.

## **2.3 ACCESSORIES**

- .1 Setting blocks: neoprene or EPDM or silicone, 80-90 Shore A durometer hardness to ASTM D2240, to suit glazing method, glass light weight and area.
- .2 Spacer shims: neoprene or silicone, 50-60 Shore A durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application.
- .3 Glazing tape:
  - .1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D2240; coiled on release paper; black colour.



- .2 Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume 2 %, designed for compression of 25 %, to effect an air and vapour seal.
- .4 Glazing splines: resilient, polyvinyl chloride or silicone, extruded shape to suit glazing colour: black.
- .5 Glazing clips: manufacturer's standard type.
- .6 Lock-strip extruded gaskets: to ASTM C542.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for glazing installation in accordance with manufacturer's written instructions.
  - .1 Verify that openings for glazing are correctly sized and within tolerance.
  - .2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.
  - .3 Visually inspect substrate in presence of Consultant.
  - .4 Inform Consultant of unacceptable conditions immediately upon discovery.
  - .5 Proceed with installation only after unacceptable conditions have been remedied.

#### **3.2 PREPARATION**

- .1 Clean contact surfaces with solvent and wipe dry.
- .2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- .3 Prime surfaces scheduled to receive sealant.

#### **3.3 INSTALLATION: EXTERIOR WET/DRY METHOD (PREFORMED TAPE AND SEALANT)**

- .1 Manufacturer's instructions: in accordance with requirements and manufacturer's written recommendations and specifications including data sheets, technical information and implementation instructions displayed in product catalogues and packaging.
- .2 Perform work in accordance with GANA Glazing Manual, GANA Laminated Glazing Reference Manual for glazing installation methods.
- .3 Cut glazing tape to length and set against permanent stops, 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.
- .4 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.
- .5 Place setting blocks at 1/4 or 1/3 points, with edge block maximum 150 mm from corners.
- .6 Rest glazing on setting blocks and push against tape and heel head of sealant with sufficient pressure to attain full contact at perimeter of light or glass unit.
- .7 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line.
- .8 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.

- .9 Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

### **3.4 INSTALLATION: INTERIOR WET/DRY METHOD (TAPE AND SEALANT)**

- .1 Perform work in accordance with GANA Glazing Manual, GANA Laminated Glazing Reference Manual for glazing installation methods.
- .2 Cut glazing tape to length and install against permanent stops, projecting 1.6 mm above sight line.
- .3 Place setting blocks at  $\frac{1}{4}$  or  $\frac{1}{3}$  points, with edge block maximum 150 mm from corners.
- .4 Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of light or unit.
- .5 Install removable stops, with spacer shims inserted between glazing and applied stops at 600 mm intervals, 6 mm below sight line.
- .6 Fill gaps between light and applied stop with sealant to depth equal to bite on glazing, to uniform and level line.
- .7 Trim protruding tape edge.

### **3.5 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
    - .1 Remove traces of primer, caulking.
    - .2 Remove glazing materials from finish surfaces.
    - .3 Remove labels.
    - .4 Clean glass using approved non-abrasive cleaner in accordance with manufacturer's instructions.
  - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management: separate waste materials for reuse / recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### **3.6 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 After installation, mark each light with an "X" by using removable plastic tape or paste.
  - .1 Do not mark heat absorbing or reflective glass units.
- .3 Repair damage to adjacent materials caused by glazing installation.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 06 10 11 – Carpentry (Abridged)
- .2 Section 07 84 00 – Fire Stopping
- .3 Section 07 92 00 – Joint Sealants
- .4 Section 09 22 16 – Non Structural Metal Framing
- .5 Section 09 51 13 – Acoustical Panel Ceilings
- .6 Section 09 91 13 – Interior Paint
- .7 Division 22 - Plumbing
- .8 Division 23 - Mechanical
- .9 Division 26 - Electricity

**1.2 REFERENCES**

- .1 Aluminum Association (AA)
  - .1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.
- .2 ASTM International
  - .1 ASTM C475-02(2007), Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
  - .2 ASTM C514-04(2009e1), Standard Specification for Nails for the Application of Gypsum Board.
  - .3 ASTM C557-03(2009)e1, Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
  - .4 ASTM C840-08, Standard Specification for Application and Finishing of Gypsum Board.
  - .5 ASTM C954-07, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
  - .6 ASTM C1002-07, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
  - .7 ASTM C1047-09, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
  - .8 ASTM C1280-99, Standard Specification for Application of Gypsum Sheathing.
  - .9 ASTM C1177/C1177M-08, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

- .10 ASTM C1178/C1178M-08, Standard Specification for Glass Mat Water-Resistant Gypsum Backing Board.
- .11 ASTM C1396/C1396M-09a, Standard Specification for Gypsum Wallboard.
- .3 Association of the Wall and Ceilings Industries International (AWCI)
  - .1 AWCI Levels of Gypsum Board Finish-97.
- .4 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
  - .2 CAN/CGSB-71.25-M88], Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.
- .5 Green Seal Environmental Standards (GS)
  - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
- .6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1 SCAQMD Rule 1113-A2007, Architectural Coatings.
  - .2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.
- .7 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S102-07, Standard Method of Test of Surface Burning Characteristics of Building Materials and Assemblies.

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

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for gypsum board assemblies and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
  - .1 Submit for review and acceptance of each unit.
  - .2 Samples will be returned for inclusion into work.
  - .3 Submit 300 x 300 mm size sample of vinyl faced gypsum board and 300 mm long samples of corner and casing beads, vinyl mouldings, shadow mould, cornice cap, textured finishes, insulating strip.

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

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

- .1 Store gypsum board assemblies materials level off ground, indoors, in a dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect gypsum board assemblies from nicks, scratches, and blemishes.
- .3 Protect from weather, elements and damage from construction operations.
- .4 Handle gypsum boards to prevent damage to edges, ends or surfaces.
- .5 Protect prefinished aluminum surfaces with wrapping and strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
- .6 Replace defective or damaged materials with new.

### **1.5 AMBIENT CONDITIONS**

- .1 Maintain temperature 10 degrees C minimum, 21 degrees C maximum for 48 hours prior to and during application of gypsum boards and joint treatment, and for 48 hours minimum after completion of joint treatment.
- .2 Apply board and joint treatment to dry, frost free surfaces.
- .3 Ventilation: ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Standard board: to ASTM C1396/C1396M, thickness as indicated, Type X, 1200 mm wide x maximum practical length, ends square cut, edges bevelled.
- .2 Water-resistant board: to ASTM C1396/C1396M, Type X, thickness as indicated 1200 mm wide x maximum practical length.
- .3 Exterior gypsum soffit board: to ASTM C1396/C1396M, thickness as indicated, 1200 mm wide x maximum practical length.
- .4 Glass mat water-resistant gypsum backing board: to ASTM C1178/C1178M, thickness as indicated, 1200 mm wide x maximum practical length.
- .5 Metal furring runners, hangers, tie wires, inserts, and anchors: to CSA A82.30.
- .6 Drywall furring channels: 0.5 mm core thickness galvanized steel for screw attachment of gypsum board.
- .7 Screws for internal partitioning, self-tapping, anticorrosive coating, trumpet head, by 'Phillips', appropriate length and size: to ASTM C954.
- .8 Stud adhesive: to CAN/CGSB-71.25 and ASTM C557.
- .9 Laminating compound: as recommended by manufacturer, asbestos-free.

- .10 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, zinc-coated by electrolytic process, 0.5 mm base thickness, perforated flanges, one piece length per location.
- .11 Sealants: in accordance with Section 07 92 00 - Joint Sealants.
  - .1 VOC limit 250 g/L maximum to SCAQMD Rule 1168.
  - .2 Acoustic sealant: in accordance with Section 07 92 00 - Joint Sealants.
- .12 Polyethylene: to CAN/CGSB-51.34, Type 2.
- .13 Insulating strip: rubberized, moisture resistant, 3 mm thick, 12 mm wide, with self-sticking permanent adhesive on one face, lengths as required.
- .14 Joint compound: to ASTM C475, asbestos-free.

## **2.2 FINISHES**

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

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for gypsum board assemblies installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Consultant.
  - .2 Inform Consultant of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

### **3.2 ERECTION**

- .1 Do application and finishing of gypsum board to ASTM C840 except where specified otherwise.
- .2 Do application of gypsum sheathing to ASTM C1280.
- .3 Erect hangers and runner channels for suspended gypsum board ceilings to ASTM C840 except where specified otherwise.
- .4 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .5 Install work level to tolerance of 1:1200.
- .6 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles.

- .7 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .8 Fur for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .9 Fur above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- .10 Install wall furring for gypsum board wall finishes to ASTM C840, except where specified otherwise.
- .11 Fur openings and around built-in equipment, cabinets, access panels, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .12 Fur duct shafts, beams, columns, pipes and exposed services where indicated.

### **3.3 APPLICATION**

- .1 Apply gypsum board after bucks, anchors, blocking, sound attenuation, electrical and mechanical work have been approved.
- .2 Apply single or double layer gypsum board to metal furring or framing using screw fasteners for first layer, screw fasteners for second layer. Maximum spacing of screws 300 mm on centre.
  - .1 Single-Layer Application:
    - .1 Apply gypsum board on ceilings prior to application of walls to ASTM C840.
    - .2 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints.
  - .2 Double-Layer Application:
    - .1 Install gypsum board for base layer and exposed gypsum board for face layer.
    - .2 Apply base layer to ceilings prior to base layer application on walls; apply face layers in same sequence. Offset joints between layers at least 250 mm.
    - .3 Apply base layers at right angles to supports unless otherwise indicated.
    - .4 Apply base layer on walls and face layers vertically with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.
- .3 Apply single or double layer gypsum board to concrete block surfaces, where indicated, using laminating adhesive.
  - .1 Comply with gypsum board manufacturer's recommendations.
  - .2 Brace or fasten gypsum board until fastening adhesive has set.
  - .3 Mechanically fasten gypsum board at top and bottom of each sheet.
- .4 Exterior Soffits and Ceilings: install exterior gypsum board perpendicular to supports; stagger end joints over supports. Install with 6 mm gap where boards abut other work.
- .5 Apply water-resistant gypsum board. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads.

- .6 Apply 12 mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts, in partitions where perimeter sealed with acoustic sealant.
- .7 Apply board using laminating adhesive on base layer of gypsum board.
- .8 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.
- .9 Install gypsum board on walls vertically to avoid end-butt joints. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs, except where local codes or fire-rated assemblies require vertical application.
- .10 Install gypsum board with face side out.
- .11 Do not install damaged or damp boards.
- .12 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

### **3.4 INSTALLATION**

- .1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm on centre.
- .2 Install casing beads around perimeter of suspended ceilings.
- .3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.
- .4 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.
- .5 Construct control joints of preformed units set in gypsum board facing and supported independently on both sides of joint.
- .6 Provide continuous polyethylene dust barrier behind and across control joints.
- .7 Locate control joints at changes in substrate construction at approximate 10 m spacing on long corridor runs at approximate 15 m spacing on ceilings.
- .8 Install control joints straight and true.
- .9 Construct expansion joints as detailed, at building expansion and construction joints. Provide continuous dust barrier.
- .10 Install expansion joint straight and true.
- .11 Install cornice cap where gypsum board partitions do not extend to ceiling.



- .12 Fit cornice cap over partition, secure to partition track with two rows of sheet metal screws staggered at 300 mm on centre.
- .13 Splice corners and intersections together and secure to each member with 3 screws.
- .14 Install access doors to electrical and mechanical fixtures specified in respective sections.
  - .1 Rigidly secure frames to furring or framing systems.
- .15 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.
- .16 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with AWCI Levels of Gypsum Board Finish:
  - .1 Levels of finish:
    - .1 Level 4: embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.
- .17 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
- .18 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.
- .19 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .20 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .21 Mix joint compound slightly thinner than for joint taping.
- .22 Apply thin coat to entire surface using trowel or drywall broad knife to fill surface texture differences, variations or tool marks.
- .23 Allow skim coat to dry completely.
- .24 Remove ridges by light sanding or wiping with damp cloth.

### **3.5 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day. Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**3.6 PROTECTION**

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

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED SECTIONS**

- .1 Section 06 10 00 – Carpentry (Abridged)
- .2 Section 07 92 00 – Joint Sealants
- .3 Section 09 21 16 – Gypsum Board Assemblies
- .4 Division 23 – Mechanical
- .5 Division 26 – Electricity

**1.2 REFERENCES**

- .1 American Society for Testing and Materials International, (ASTM).
  - .1 ASTM C645-11a, Specification for Nonstructural Steel Framing Members.
  - .2 ASTM C754-11, Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .2 Environmental Choice Program (ECP).
  - .1 CCD-047a-98 (R2005) Paints - Surface Coatings.
  - .2 CCD-048-95 (R2006) Surface Coatings - Recycled Water-borne.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .4 The Master Painters Institute (MPI)
  - .1 Architectural Painting Specification Manual – current edition.
    - .1 MPI #26, Primer, Galvanized Metal, Cementitious.
- .5 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for metal framing and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
  - .1 Submit duplicate 300 mm long sample of vinyl faced gypsum board and 300 mm long samples of non-structural metal framing.

**1.4 QUALITY ASSURANCE**

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

**1.5 DELIVERY, STORAGE AND HANDLING**

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

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- .1 Non-load bearing channel stud framing: to ASTM C645, 0.91 mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board.
  - .1 Knock-out service holes at 460 mm centres.
- .2 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes, 32 mm flange height.
- .3 Metal channel stiffener: 19 x 38 mm size, 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.
- .4 1.52mm sheet steel (16 ga) thick hot rolled commercial grade ASTM A366 and welded mesh to 305mm between axes closer to steel posts.
- .5 Acoustical sealant: to section 07 92 00 – Joint Sealants.
- .6 Insulating strip: rubberized, moisture resistant 3 mm thick foam strip, 12 mm wide, with self-sticking adhesive on one face, lengths as required.

**PART 3 EXECUTION**

**3.1 EXAMINATION**

- .1 Verification of conditions: before proceeding with the installation of non-structural metal framing, ensure that the condition of previously developed surfaces implemented in other

sections or contracts is acceptable and allows to carry out the work in accordance with manufacturer's written instructions.

- .1 Perform visual inspection of surfaces in the presence of Consultant.
- .2 Immediately inform Consultant of any detected unacceptable condition.
- .3 Start installation work only after unacceptable conditions have been remedied and written approval received from Consultant.

### **3.2 ERECTION**

- .1 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.
- .2 Install damp proof course under stud shoe tracks of partitions on slabs on grade.
- .3 Place studs vertically at 406 mm on centre and not more than 50mm from abutting walls, and at each side of openings and corners.
  - .1 Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.
- .4 Erect metal studding to tolerance of 1:1000.
- .5 Attach studs to bottom track using screws.
- .6 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.
- .7 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.
- .8 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified.
  - .1 Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.
- .9 Install heavy gauge single jamb studs at openings.
- .10 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs.
  - .1 Secure tracks to studs at each end, in accordance with manufacturer's instructions.
  - .2 Install intermediate studs above and below openings in same manner and spacing as wall studs.
- .11 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.

- .12 Provide 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.
- .13 Install steel studs or furring channel between studs for attaching electrical and other boxes.
- .14 Extend partitions to ceiling height except where noted otherwise on drawings.
- .15 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs.
  - .1 Use double track slip joint as indicated.
- .16 Install continuous insulating strips to isolate studs from uninsulated surfaces.
- .17 Install two continuous beads of acoustical sealant and an insulating strip under studs and tracks around perimeter of sound control partitions.

### **3.3 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### **3.4 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by non-structural metal framing's installation.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 03 35 00 – Concrete Finish
- .2 Section 03 35 05 – Concrete Floor Hardening
- .3 Section 07 92 10 – Joint Sealants

**1.2 REFERENCES**

- .1 American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI)
  - .1 ANSI A108.1-99, Specification for the Installation of Ceramic Tile (Includes ANSI A108.1A-C, 108.4-.13, A118.1-.10, ANSI A136.1).
  - .2 ANSI 137.1, Standards for Ceramic Tile.
- .2 American Society for Testing and Materials (ASTM International)
  - .1 ASTM C 979-05, Standard Specification for Pigments for Integrally Coloured Concrete.
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-75.1-M88, Tile, Ceramic.
- .4 Terrazzo Tile and Marble Association of Canada (TTMAC)
  - .1 Tile Specification Guide 09 30 00, 2000, Tile Installation Manual.
  - .2 Tile Maintenance Guide 2000.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Division 1 – General Requirements.
- .2 Provide manufacturer's information on the following:
  - .1 Ceramic tiles, marked to show each type, size, and shape required.
  - .2 Chemical resistant mortar and grout (Epoxy and Furan).
  - .3 Dry-set Portland cement mortar and grout.
  - .4 Levelling compound.
  - .5 Latex cement mortar and grout.
  - .6 Fasteners.
- .3 Provide samples:
  - .1 Floor tile: submit duplicate sample panels of each colour, texture, size, and pattern of tile, full length.
  - .2 Trim shapes, bullnose cap and cove including bullnose cap and base pieces at internal and external corners of vertical surfaces, each type, colour, and size.
- .4 Provide instructions on maintenance of ceramic tiling and add to manual mentioned in Division 1 – General Requirements.

**1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .2 Store materials to avoid contamination or damage.
- .3 Store materials in dry location and protect against frost and dirt.
- .4 Store cement materials (hydraulic binders) on a dry surface.

**1.5 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with Division 1 – General Requirements.
- .2 Remove from site all packaging materials and send to appropriate recycling facilities.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Send unused adhesives, sealants to an authorized site for dangerous waste collection, approved by Engineer.
- .5 It is forbidden to dump adhesives and sealants in sewers, in running water, in a lake, on the ground or at any other place where it may present a risk to health or to the environment.
- .6 Send broken ceramic tiles to a local recycling facility approved by Engineer.

**1.6 AMBIENT CONDITIONS**

- .1 Maintain air temperature and structural base temperature at ceramic tile installation area above 12 degrees C for 48 hours before, during, and 48 hours after, installation.
- .2 Do not install tiles at temperatures less than 12 degrees C or above 38 degrees C.
- .3 Do not apply epoxy mortar and grouts at temperatures below 15 degrees C or above 25 degrees C.

**1.7 EXTRA MATERIALS**

- .1 Provide required extra materials in accordance with Division 1 – General Requirements.
- .2 Provide additional tiles representing at least 5% of the total number of each type and colour of tiles required for the work, and store where indicated.
- .3 Equipment and additional materials provided must come from the same production batch than those installed.

**PART 2 PRODUCTS**

**2.1 FLOOR TILES**

- .1 Ceramic tiles CE1 to CAN/CGSB-75.1-M88, Type 4, Class MR1



- .1 Collection: OXY distributed by OLYMPIA
- .2 Colour: bright grey
- .3 Size: 300 mm X 600 mm X 10 mm
- .2 Ceramic tiles for bathroom floors CE2 to ANSI A137.1, porcelain mosaic, 6" X 6".
  - .1 Acceptable Products: Global Collection Globalgrip 76410 V as per manufactured by MOSA or equivalent approved by Architect.
- .3 Ceramic tiles for bathroom floors CE3 to ANSI A137.1, porcelain mosaic, 6" X 6".
  - .1 Acceptable Products: Global Collection Globalgrip 75520 V as per manufactured by MOSA or equivalent approved by Architect.
- .4 Ceramic tiles for shower flooring CE4 to ANSI A137.1, porcelain mosaic, 6" X 6".
  - .1 Acceptable Products: Global Collection 75520 AS, 75520 VD, 75520 HD as per manufactured by MOSA or equivalent approved by Architect.
- .5 Ceramic tiles for walls: to ANSI A137.1, porcelain mosaic, 6" X 6".
  - .1 Acceptable Products: Global Collection 16840 and 15150 as per manufactured by MOSA or equivalent approved by Architect.

## **2.2 BASE TILE**

- .1 Base: coved; tiled, type, size, colour and texture to match adjacent flooring material.

## **2.3 TRIM SHAPES**

- .1 Conform to applicable requirements of adjoining floor and wall tile.
- .2 Use slip resistant trim shapes for horizontal surfaces of showers, overflow ledges, recessed steps, shower curbs, drying area curbs, and stools.
- .3 Use trim shapes sizes conforming to size of adjoining field wall tile, including existing spaces, unless specified otherwise.
- .4 Internal and External Corners: provide trim shapes as follows where indicated.
  - .1 Bullnose shapes for external corners including edges.
  - .2 Coved shapes for internal corners.
  - .3 Special shapes for:
    - .1 Base to floor internal corners to provide integral coved vertical and horizontal joint.
    - .2 Base to floor external corners to provide bullnose vertical edge with integral coved horizontal joint. Use as stop at bottom of openings having bullnose return to wall.
    - .3 Wall top edge internal corners to provide integral coved vertical joint with bullnose top edge.
    - .4 Wall top edge external corners to provide bullnose vertical and horizontal joint edge.

**2.4 BOND COAT**

Portland latex modified cement mortar: to ANSI A108.1, two-component universal dry-set mortar.

**2.5 GROUT**

.1 Colouring Pigments:

- .1 Pure mineral pigments, limeproof and nonfading, complying with ASTM C979.
- .2 Colouring pigments to be added to grout by manufacturer.
- .3 Job coloured grout are not acceptable.
- .4 Use in Commercial Cement Grout, Dry-Set Grout, and Latex Cement Grout.

.2 Dry-Set Grout: Portland Latex Cement Grout: to ANSI A108.1, fast curing, high early strength, polymer-modified, stain resistant, sanded mix for floors, unsanded mix for walls.

- .1 Acceptable Products: TEC TA550 as per manufactured by Centura or equivalent approved by Architect.

**2.6 ACCESSORIES**

.1 Transition Strips: purpose made metal extrusion; stainless steel type.

.2 Reducer Strips: purpose made metal extrusion; stainless steel.

.3 Sealant: in accordance with Section 07 92 00 - Joint Sealants.

.4 Floor primer and protective coating: to tile and grout manufacturer's recommendations.

.5 Thresholds: marble, 16 mm thick, rounded edges, honed finish to exposed surfaces, size to suit door opening and frame width.

**2.7 MIXES**

.1 Dry set mortar: mix to manufacturer's instructions.

.2 Mix bond and levelling coats, and grout to manufacturer's instructions.

**2.8 PATCHING AND LEVELLING COMPOUND**

.1 Cement base, acrylic polymer compound, manufactured specifically for resurfacing and leveling concrete floors. Products containing gypsum are not acceptable.

.2 Have not less than the following physical properties:

- .1 Compressive strength - 25 MPa.
- .2 Tensile strength - 7 MPa.
- .3 Flexural strength - 7 MPa.
- .4 Density - 1.9.

.3 Capable of being applied in layers up to 50 mm thick, being brought to feather edge, and being trowelled to smooth finish.

- .4 Ready for use in 48 hours after application.

## **2.9 CLEANING COMPOUNDS**

- .1 Specifically designed for cleaning masonry and concrete and which will not prevent bond of subsequent tile setting materials including patching and leveling compounds and elastomeric waterproofing membrane and coat.
- .2 Materials containing acid or caustic material are not acceptable.

## **PART 3 EXECUTION**

### **3.1 WORKMANSHIP**

- .1 Do tile work in accordance with TTMAC Tile Installation Manual 2006/2007, "Ceramic Tile", except where specified otherwise.
- .2 Apply tile or backing coats to clean and sound surfaces.
- .3 Fit tile around corners, fitments, fixtures, drains and other built-in objects. Maintain uniform joint appearance. Cut edges smooth and even. Do not split tiles.
- .4 Maximum surface tolerance 1:800.
- .5 Make joints between tile uniform and approximately 1.5 mm wide, plumb, straight, true, even and flush with adjacent tile. Ensure sheet layout not visible after installation. Align patterns.
- .6 Lay out tiles so perimeter tiles are minimum 1/2 size.
- .7 Sound tiles after setting and replace hollow-sounding units to obtain full bond.
- .8 Make internal angles square, external angles rounded.
- .9 Use round edged tiles at termination of wall tile panels, except where panel abuts projecting surface or differing plane.
- .10 Install divider strips at junction of tile flooring and dissimilar materials.
- .11 Allow minimum 24 hours after installation of tiles, before grouting.
- .12 Clean installed tile surfaces after installation and grouting cured.

### **3.2 WALL TILE**

- .1 Install in accordance with TTMAC, 303 W-2000 and 305 W-2000 according to case.

### **3.3 FLOOR TILE**

- .1 Install in accordance with TTMAC, 314 F-2000.

**3.4 FLOOR SEALER AND PROTECTIVE COATING**

- .1 Apply in accordance with manufacturer's instructions.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 SECTION CONTENT**

- .1 Materials and installation method associated with acoustic elements designed to be placed directly on a substrate or to be integrated in a suspended ceiling.

**1.2 RELATED REQUIREMENTS**

- .1 Division 1 – General Requirements.
- .2 Section 095300.01 – Acoustical Suspension.
- .3 Division 21 – Fire fighting.
- .4 Division 22 – Plumbing.
- .5 Division 23 – Heating and Ventilation.
- .6 Division 26 – Electricity.

**1.3 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM C423-02a, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
  - .2 ASTM E1264-98, Standard Classification for Acoustical Ceiling Products.
  - .3 ASTM E1477-98a (2003), Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
- .2 Canadian Standards Association (CSA International)
  - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

**1.4 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit samples in accordance with Division 1 – General Requirements.
- .2 Submit duplicate samples of each type acoustical units.

**1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Protect on site stored or installed absorptive material from moisture damage.
- .2 Store extra materials required for maintenance, where directed.

**1.6 ENVIRONMENTAL REQUIREMENTS**

- .1 Permit wet work to dry before beginning to install.
- .2 Maintain uniform minimum temperature of 15 degrees C and humidity of 20 % to 40 % before and during installation.
- .3 Store materials in work area 48 hours prior to installation.

**1.7 EXTRA MATERIALS**

- .1 Provide extra materials of acoustic units in accordance with Division 1 – General Requirements.
- .2 Provide acoustical units amounting to 2 % of gross ceiling area for each pattern and type required for project.

- .3 Ensure extra materials are from same production run as installed materials.
- .4 Clearly identify each type of acoustic unit, including colour and texture.
- .5 Deliver to Owner, upon completion of the work of this section.

**1.8 SCOPE OF WORK**

- .1 PROVIDE ALL MATERIALS, PRODUCTS, EQUIPMENT, TOOLS, LABOR AND SERVICES REQUIRED FOR EXECUTION OF WORK DESCRIBED IN THIS SECTION AND / OR SHOWN IN DRAWINGS, SO THAT COMPLETED WORK PERFECTLY FULFILLS PURPOSE FOR WHICH THEY ARE INTENDED.
- .2 INCLUDES ALL ACCESSORIES AND MANUALS, THOUGH NOT NECESSARILY MENTIONED IN PRESENT SPECIFICATIONS OR SHOWN IN DRAWINGS, REQUIRED FOR PROPER AND FULL EXECUTION OF WORK ACCORDING TO QUALITY STANDARDS REFERENCED AND / OR ACCEPTED BY THE INDUSTRY AND IN ACCORDANCE WITH BEST SKILLS IN THE INDUSTRY.
- .3 THE SCOPE OF WORK INCLUDES RESTORATION AND ADDITIONAL INSTALLATION OF ACOUSTIC TILES IN THE EXISTING CEILINGS, PRESERVED AND MODIFIED BY DEMOLITION OR REDEVELOPMENT.

**1.9 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- .1 Acoustic units for suspended ceiling system: to ASTM E1264.
  - .1 Acceptable Products: "Optima" as manufactured by Armstrong or equivalent approved by Architect, type XII, Form 2, Pattern E, Class A.
    - .1 Colour: white.
    - .2 Tile Type 01 (TA1), 3354 model, dimensions: 24 "x 24 " x 1 " thick.
  - .2 Acceptable Products: "Ultima " as manufactured by Armstrong or equivalent approved by Architect Type IV , Form 2, Pattern E, Class A.
    - .1 Colour: white.
    - .2 Tile Type 02 (TA2) 1941 model, dimensions: 24 "x 24" x 1 " thick.
  - .3 Acceptable Products: "Woodworks Open Cell " as manufactured by Armstrong or equivalent approved by Architect Type IV, Form 2, Class A.

- .1 Colour: Maple
- .2 Tile Type 03 (CS1), 6622 model, dimensions: 24 "x 24" x 2 1/4 "thick
- .2 Adhesive: low VOC type, recommended by acoustic unit manufacturer.
- .3 Staples, nails and screws: to CSA B111 non-corrosive finish as recommended by acoustic unit manufacturer.

**PART 3 EXECUTION**

**3.1 EXAMINATION**

- .1 Do not install acoustical panels and tiles until work above ceiling has been inspected by Consultant.

**3.2 INSTALLATION**

- .1 Install acoustical panels and tiles in ceiling suspension system.

**3.3 APPLICATION**

- .1 Install acoustical units parallel to building lines with edge unit not less than 50% of unit width and with directional pattern running in same direction. Refer to reflected ceiling plan.
- .2 Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding.

**3.4 INTERFACE WITH OTHER WORK**

- .1 Co-ordinate with Section 09 53 00.01 - Acoustical Suspension.
- .2 Co-ordinate ceiling work to accommodate components of other sections, such as light fixtures, diffusers, speakers, and sprinkler heads, to be built into acoustical ceiling components.

**3.5 CLEANING**

- .1 Arrange for the soundproofing elements to remain clean. Immediately remove all contamination, finger marks and other dirt. Scratched elements, damaged, improperly installed or badly cut-out will be removed and replaced.

**3.6 PROTECTION**

- .1 To protect soundproofing elements against damage, cover with polyethylene or cardboard.
- .2 Leave protective elements in place until risk of damage is eliminated.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Division 1 – General Requirements
- .2 Section 09 22 16 – Non Structural Metal Framing
- .3 Section 09 21 16 – Gypsum Board Assemblies
- .4 Section 09 51 13 – Acoustical Panel Ceilings
- .5 Division 23 – Built In Mechanical Devices
- .6 Division 26 – Built In Lighting Devices

**1.2 REFERENCES**

- .1 American Society for Testing and Materials (ASTM International)
  - .1 ASTM C 635-00, Specifications for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
  - .2 ASTM C 636-96, Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
- .2 CISCA (The Ceilings & Interior Systems Construction Association) - « Ceiling System Handbook » 2012.

**1.3 DESIGN CRITERIA**

- .1 Design Requirements: maximum deflection: 1/360th of span to ASTM C635/ASTM C635M deflection test.

**1.4 SHOP DRAWINGS**

- .1 Submit shop drawings in accordance with Division 1 - General requirements.
- .2 Shop drawings must clearly indicate spacing details and methods of fixing anchor and suspension, methods of jointing primary and secondary sections, level shift details, suspension mode of acoustic elements near ceiling and lateral support elements and accessories.

**1.5 DOCUMENTS/SAMPLES TO SUBMIT**

- .1 Submit required samples and documents in accordance with Division 1 – General Requirements.
- .2 Submit a full size sample of each type of ceiling suspension system.
- .3 Each sample must show assembly and installation details, connection to walls, built-in appliances, splints, fitting mode, finish and installation method of acoustic elements.

**1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in



accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Grids: to ASTM C635.
- .2 14mm (9/16") suspension Exposed Suprafine XL system tempered thermo steel to ASTM C635, Intermediate duty and having the following characteristics:
  - .1 Material; hot-dipped galvanized steel.
  - .2 Construction: Double-web construction, web height with peaked roof top bulb and bottom flange with prefinished thermo tempered steel capping.
  - .3 Cross Tee: Rotary-stitched for additional torsional strength and extra stability, Staked-on end detail allows easy cross tee removal and remounting.
  - .4 Face dimension: 14mm (9/16").
  - .5 Core height: main tees: 43 mm (1-11/16").
  - .6 Cross tees: 43 mm (1-11/16").
  - .7 Profile : Exposed tee
  - .8 Grid dimensions: appropriate to dimensions of soundproofing ceiling panels.
  - .9 Colors; General: white.
  - .10 Surface finish: baked polyester paint.
  - .11 Connection cross tee /main tee: overlapping
- .3 Hanger wire: galvanized soft annealed steel wire:
  - .1 3.6 mm diameter for access tile ceilings.
- .4 Hanger inserts: purpose made.
- .5 Carrying channels: U Shape: hot dipped galvanized steel with dimensions and thickness as recommended by manufacturer of suspension assembly.
- .6 Accessories: splices, clips, wire ties, retainers and wall moulding flush, to complement suspension system components, as recommended by system manufacturer.
- .7 Ceiling suspension systems "Suprafine XL "by Armstrong, G-60 with dip galvanizing / aluminum coating.

## **Part 3 Execution**

### **3.1 INSTALLATION**

- .1 Unless otherwise indicated, install frame elements in accordance with ASTM C 636 standards and CISCA - "Ceiling System Handbook"
- .2 Install suspension grids per manufacturer's instructions and calculating criteria used and tested by certification bodies.
- .3 Do not undertake installation of a suspended ceiling grid before Consultant has verified and approved facilities that will be concealed in the ceiling void.
- .4 Fix hangers to upper frame using mounting methods recommended by the system manufacturer.
- .5 Place hangers no more than 1200 mm center distance and less than 150 mm from ends of main Tees.

- .6 Trace two perpendicular medians on ceiling to ensure symmetry of installation on edges of the room. Place grid so that width of edge elements is not less than 50% of standard width of elements and in accordance with reflected ceiling drawing.
- .7 Coordinate installation of grid elements with location of other ceiling mounted elements.
- .8 Install wall-ceiling trim joints which mark off exact ceiling height.
- .9 Once completed, grid must be able to support additional loads, such as light fixtures, diffusers, meshes and speakers.
- .10 Where light fixtures and diffusers are, provide additional hangers installed 150 mm at the most from every angle, and every 600 mm at the most around the device.
- .11 Anchor transverse profiles to supporting profiles to obtain a rigid assembly.
- .12 Install a border around openings to accommodate light fixtures, diffusers and speakers, same thing where ceiling levels shift.
- .13 Edges of finished ceiling must be square along walls and they must show no flatness deviation larger than 1: 1000.

### **3.2 CLEANING**

- .1 Touch up painted surfaces showing scratches, abrasions or other flaws.
- .2 Clean exposed surfaces of acoustical ceilings, including moldings and hangers according to manufacturer's recommendations. Nicked elements, badly cut-out, damaged or improperly installed will be removed and replaced to the satisfaction of Architect.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 SECTION CONTENT**

This section describes requirements for, but not limited to, supply and installation of resilient sheet floorings, baseboards, installation products, all related accessories as well as levelling and preparation of surfaces.

**1.2 RELATED REQUIREMENTS**

- .1 Division 1 - General Requirements.
- .2 Section 01 74 11 – Cleaning.

**1.3 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM F1303-04, Standard Specification for Sheet Vinyl Floor Covering with Backing.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).

**1.4 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide product data in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .1 Submit duplicate 300 x 300 mm sample pieces of sheet material, and 300 mm long base, nosing, feature strips, treads, edge strips.
- .4 Closeout Submittals:
  - .1 Provide maintenance data for resilient flooring for incorporation into manual specified in Division 1 – General Requirements.

**1.5 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

**1.6 AMBIENT CONDITIONS**

- .1 Maintain air temperature and structural base temperature at flooring installation area above 20 degrees for 48 hours before, during and 48 hours after installation.

**1.7 MAINTENANCE**

- .1 Extra Materials:
  - .1 Provide extra materials of resilient sheet flooring and adhesives in accordance with Division 1 – General Requirements.
  - .2 Provide 5% of total quantity of each colour, pattern and type flooring material required for project for maintenance use.
  - .3 Extra materials one piece and from same production run as installed materials.
  - .4 Identify each roll of sheet flooring and each container of adhesive.
  - .5 Deliver to Owner upon completion of work of this section.
  - .6 Store where directed by Owner.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- .1 Sheet vinyl without backing: to ASTM F1303, commercial type.
  - .1 Acceptable products: Type 1 (RS1) « Melodia » by Johnsonite, with built-in base, 2.0mm, color 965 Grey Matter.
- .2 Resilient base: rubber, coved, measuring at least 4'- 0 "length x 4" height x 3 mm thick, with premoulded end stops and external corners and only for specified color:
  - .1 Floor coverings in vinyl sheet (RS1): TA5 Colonial Grey CG by Johnsonite or equivalent approved by Architect
- .3 Primers and adhesives: of types recommended by resilient flooring manufacturer for specific material on applicable substrate, above, on or below grade.
- .4 Sub-floor filler and leveller: as recommended by flooring manufacturer for use with their product.
- .5 Base finish with PVC cove: radius 1 1/2 ", with finishing trim

**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 SITE VERIFICATION OF CONDITIONS**

- .1 Ensure concrete floors are clean and dry by using test methods recommended by flooring manufacturer.

**3.3 PREPARATION**

- .1 Remove existing resilient flooring.
- .2 Remove or treat old adhesives to prevent residual, old flooring adhesives from bleeding through to new flooring and/or interfering with the bonding of new adhesives.
- .3 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.
- .4 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.
- .5 Prime to resilient flooring manufacturer's printed instructions.

**3.4 APPLICATION: FLOORING**

- .1 Provide high ventilation rate, with maximum outside air, during installation, and for 48 to 72 hours after installation. If possible, vent directly to outside. Do not let contaminated air recirculate through district or whole building air distribution system. Maintain extra ventilation for at least one month following building occupation.
- .2 Apply adhesive uniformly using recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.
- .3 Lay flooring with seams parallel to building lines to produce a minimum number of seams. Border widths minimum 1/3 width of full material.
- .4 Align joints with other existing joints and elements. Use center of vertical mullions of curtain walls as reference or as shown on drawings.
- .5 Run sheets in direction of traffic. Double cut sheet joints and continuously seal and heat weld according to manufacturer's printed instructions.
- .6 Heat weld seams of linoleum sheet flooring in accordance with manufacturer's printed instructions.
- .7 As installation progresses, and immediately after installation roll flooring with 45 kg minimum roller to ensure full adhesion or in accordance with manufacturer's recommendation.
- .8 Cut flooring around fixed objects.
- .9 Install feature strips and floor markings where indicated. Fit joints tightly.
- .10 Install flooring in pan type floor access covers. Maintain floor pattern.
- .11 Continue flooring over areas which will be under built-in furniture.
- .12 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.
- .13 Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.
- .14 Install metal edge strips at unprotected or exposed edges where flooring terminates.

**3.5 APPLICATION: STAIRS**

- .1 Install stair covering one piece for full width of stair. Adhere over entire surface and fit accurately.

**3.6 APPLICATION: BASE**

- .1 Lay out base to keep number of joints at minimum.
- .2 Clean substrate and prime with one coat of adhesive.
- .3 Apply adhesive to back of base.
- .4 Set base against wall and floor surfaces tightly by using 3 kg hand roller.
- .5 Install straight and level to variation of 1:1000.
- .6 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.
- .7 Cope internal corners. Use premoulded corner units for right angle external corners. Use formed straight base material for external corners of other angles.
- .8 Use toeless type base where floor finish will be carpet, coved type elsewhere.
- .9 Install toeless type base before installation of carpet on floors.
- .10 Heat weld base in accordance with manufacturer's printed instructions.

**3.7 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.

**3.8 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Remove excess adhesive from floor, base and wall surfaces without damage.
- .3 Clean, seal and wax floor and base surface to flooring manufacturer's printed instructions.

**3.9 PROTECTION**

- .1 Protect new until time of final inspection
- .2 Prohibit traffic on floor for 48 hours after installation.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 03 35 00 – Concrete Finish
- .2 Section 09 65 16 – Resilient Sheet Flooring
- .3 Section 09 68 16 – Sheet Carpeting

**1.2 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM F1066-04, 2010 e1, Standard Specification for Vinyl Composition Floor Tile.
  - .2 ASTM F1344-04, 12 e1, Standard Specification for Rubber Floor Tile.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-25.20-95, Surface Sealer for Floors.
  - .2 CAN/CGSB-25.21-95, Detergent-Resistant Floor Polish.
- .3 South Coast Air Quality Management District (SCAQMD), California State
  - .1 SCAQMD Rule 1168-A2011, Adhesives and Sealants Applications.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for metal framing and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
  - .1 Submit duplicate 300 mm long samples tile flooring, size as prescribed, and duplicate 300 mm long samples base.

**1.4 EQUIPMENT/ REPLACEMENT MATERIAL**

- .1 Equipment /replacement material
  - .1 Provide tiles, baseboards and adhesive required for flexible coatings maintenance, in accordance with section 01 78 00 – Closeout Submittals.
  - .2 Provide 5% of total quantity of flooring tiles of each color, pattern and type required to maintain work in good condition.
  - .3 Additional materials and equipment must come from same production batch as those installed.
  - .4 Identify each tile box and each adhesive container.
  - .5 Hand to Consultant after completion of work covered by this section.
  - .6 Store them at location specified by Consultant.

**1.5 DELIVERY, STORAGE AND HANDLING**

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

**1.6 IMPLEMENTATION**

- .1 Ambient Conditions
  - .1 Maintain ambient temperature in implementation area as well as temperature of the medium intended to receive coating above 20 degrees C for a period of 48 hours before installation, during installation and during 48 hours after completion of work.

**1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- .1 Vinyl composition tile (TU): to ASTM F1066, Composition 1 - non asbestos - Class 2 - through pattern tile, smooth surface 2 mm thick, size: 300 mm2.
  - .1 Acceptable products: "Azrock VCT" by Tarkett or equivalent approved by Architect.
    - .1 Color: V-208 Powder Grey CG
    - .2 Color: V-220 Cast Pewter CG
- .2 Electro Static Dissipating tile (ESD): in accordance with ASTM F970, 2.0 mm thick, size: 610 mm x 610 mm Color 350 Skylar CG.
  - .1 Acceptable products: IQ granite SD manufactured by Johnsonite or equivalent approved by Architect.



- .3 Rubber tile: to ASTM F1344, square tile, glued, 6 mm thick, 965 mm sides, color standard grey #21 10%.
  - .1 Acceptable products: « Sport mat flooring » by Dinoflex or equivalent approved by Architect
- .4 Flexible baseboard: vinyl, straight for carpets and coved for other floorings, at least 1200 mm long x 100 mm high x 3 mm thick, with precast salient angles and end pieces for coved baseboards only, color as indicated:
  - .1 Vinyl floor tile (TU) covering: TA5 Colonial Grey CG by Johnsonite or equivalent approved by Architect.
  - .2 Carpet floor covering (TA): 28 Medium Grey CG
  - .3 Rubber tile floor covering (CA): TA5 Colonial Grey CG by Johnsonite or equivalent approved by Architect.
  - .4 Electro Static Dissipating floor tile covering (TVA): TA5 Colonial Grey CG by Johnsonite or equivalent approved by Architect.
- .5 Primers and adhesives: waterproof, recommended by flooring manufacturer for specific material on applicable substrate, above, at or below grade.
- .6 Metal edge strips (copper): According to the recommendations of the manufacturer.
- .7 Polish: electro static dissipating; according to the recommendations of the manufacturer of the floor covering.
- .8 Adhesive: maximum VOC limit 150 g/L to SCAQMD Rule 1168.
- .9 Adhesive: maximum VOC limit 150 g/L to SCAQMD Rule 1168.
  - .1 Adhesive: maximum VOC limit 60 g/L to SCAQMD Rule 1168.
  - .2 Sheets of prefabricated rubber flooring: use two-component PU 105 polyurethane by Mapei.
- .10 Sub-floor filler and leveller: as recommended by flooring manufacturer for use with their product.
- .11 Reduction mouldings, vinyl, profile 2.0 mm to 0 mm thickness, appropriate model by "Johnsonite", or approved equivalent, width and color chosen from range of products offered by manufacturer.
- .12 Sealer: type recommended by manufacturer of floor covering.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- .1 Verification of the conditions: before proceeding with installation of flexible tile floor coverings, make sure that condition of surfaces previously implemented under terms of written manufacturer's instructions.
  - .1 Perform visual inspection of surfaces in presence of Consultant.
  - .2 Immediately inform Consultant of any detected unacceptable condition.
  - .3 Start installation of work only after unacceptable conditions have been corrected and Consultant's written approval received.

### **3.2 INSPECTION**

- .1 Ensure concrete floors are dry, by using test methods recommended by tile manufacturer.

### **3.3 SUB-FLOOR TREATMENT**

- .1 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.
- .2 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.
- .3 Prime to flooring manufacturer's printed instructions.

### **3.4 TILE APPLICATION**

- .1 Provide high ventilation rate, with maximum outside air, during installation, and for 48 to 72 hours after installation. If possible, vent directly to outside. Do not let contaminated air recirculate through district or whole building air distribution system. Maintain extra ventilation for at least one month following building occupation.
- .2 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturer's instructions. Do not spread more adhesive than can be covered by flooring before initial set takes place.
- .3 Install electro static dissipating tile strictly according to written instructions of manufacturer, using installation system for ESD (Electro Static Dissipation) tiles with ESD S-202 adhesive and copper grounding bands, in accordance with recommendations of tile manufacturer.
- .4 Install tiles forming joints parallel to building lines so as to obtain symmetric pattern. Width of a peripheral tile should not be less than half the width of a normal tile.
- .5 Install flooring to square grid pattern.
- .6 As installation progresses, and after installation, roll flooring in 2 directions with 45 kg minimum roller to ensure full adhesion.
- .7 Cut tile and fit neatly around fixed objects.
- .8 Install flooring in pan type floor access covers. Maintain floor pattern.
- .9 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.
- .10 Terminate flooring at centerline of door in openings where adjacent floor finish or colour is dissimilar.
- .11 Install metal edge strips at unprotected or exposed edges where flooring terminates.

### **3.5 BASE APPLICATION**

- .1 Lay out base to keep number of joints at minimum. Base joints at maximum length available or at internal or premoulded corners.
- .2 Clean substrate and prime with one coat of adhesive.
- .3 Apply adhesive to back of base.
- .4 Set base against wall and floor surfaces tightly by using 3 kg hand roller.

- .5 Install straight and level to variation of 1:1000.
- .6 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.
- .7 Cope internal corners. Use premoulded corner units for right angle external corners. Use formed straight base material for external corners of other angles, minimum [300] mm each leg. Wrap around toeless base at external corners.
- .8 Install toeless type base before installation of carpet on floors.

### **3.6 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
  - .1 Clean floor and baseboards in accordance with written instructions of the floor manufacturer.
- .3 Carefully remove excess adhesive on floor, baseboards and walls.
- .4 Remove debris from newly coated floor and clean all dirt or grease according to manufacturer's recommendations.
- .5 Do not seal or wax newly coated floor.
- .6 Proceeds to initial maintenance of floor covering once installed, according to flooring manufacturer's recommendations.
- .7 Waste Management: separate waste materials for reuse / recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### **3.7 PROTECTION**

- .1 Protect new floors from time of final set of adhesive until final inspection.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 SECTION CONTENT**

- .1 Supply labor, materials, tools and equipment necessary for implementation of a complete resinous floor covering system as specified in this section, including surface preparation.

**1.2 RELATED REQUIREMENTS**

- .1 Section 03 30 00 – Cast in Place Concrete
- .2 Section 03 35 00 - Concrete Finishing
- .3 Section 03 35 05 – Concrete Floor Hardening

**1.3 ABBREVIATIONS/ ACRONYMS**

- .1 W.f.t. Wet Film Thickness (e.f.m.)

**1.4 REFERENCES**

- .1 American Society for Testing and Materials (ASTM)
  - .1 ASTM C307-03 (2012) Standard Test Method for flexural strength of chemical resistant mortars, grout and monolithic floorings.
  - .2 ASTM C413-01(2012): Standard Test Method for Absorption of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
  - .3 ASTM C579-01(2012): Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
  - .4 ASTM C580-02 (2012): Standard Test Method for flexural strength and modulus of elasticity of chemical resistant mortars, grouts, monolithic flooring and polymer concrete.
  - .5 ASTM C884/C884M-98 (2010): Standard Test Method for Thermal Compatibility between Concrete and an Epoxy-Resin Overlay.
  - .6 ASTM D635-10: Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
  - .7 ASTM D696-08e1: Standard Test method for coefficient of linear thermal expansion of plastics between -30 ° C and 30 ° C with a silica glass dilatometer.
  - .8 ASTM D2369-10e1: Standard Test Method for Volatile Content of Coatings.
  - .9 ASTM D2794-93 (2010): Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
  - .10 ASTM D3273: Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
  - .11 ASTM D4060-10: Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
  - .12 ASTM F2170-11: Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

- .13 ASTM F2659-10: Standard Guide for Preliminary Evaluation of Comparative Moisture Condition of Concrete, Gypsum Cement and Other Floor Slabs and Screeds Using a Non-Destructive Electronic Moisture Meter.
- .14 ASTM G21-13: Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- .2 Canadian Standards Association (CSA)
  - .1 CSA A23.1-14/A23.2-14: Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete.
- .3 International Concrete Repair Institute (ICRI)
  - .1 ICRI Guideline N° 310.2R-2013: Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings and Polymer Overlays.
- .4 United States Department of Defense:
  - .1 MIL-PRF-24613A (SH) 11-2007: Performance Specification: Deck Covering Materials, Interior, Cosmetic Polymeric.

## **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Meeting prior to installation :
  - .1 Organise meeting before installation two weeks prior to beginning of work pertaining to this Section in accordance with Section 01 31 19 – Project Meetings. Request participation from all parties directly involved with work in this section, including Contractor, Departmental Representative, the manufacturer's technical representative and all other subcontractors, in order to review;
    - .1 Surface preparation
    - .2 Primer application
    - .3 Installation
    - .4 Curing and protection
    - .5 Coordination with other work

## **1.6 SUBMISSIONS**

- .1 Submit specifications in accordance with section 01 33 00 – Submittal Procedures.
- .2 Product information: Submit manufacturer's product data sheet, including physical properties, options relative to product appearance including color, surface textures and gloss.
- .3 Data sheet: Submit manufacturer's security data sheet for each product used.
- .4 Samples for initial section: Submit manufacturer's color panels showing full range of available colors for each type of material for topcoat as per indications in Departmental Representative's initial section.
- .5 Samples to check: Submit samples of each implemented color and material, with adequate texture to mimic real conditions, on representative substrate samples and as follows in order to be verified by Departmental Representative.
  - .1 Use representative colors for sample preparation and for examination purposes, submit again until desired gloss, color and texture are obtained.

- .2 List materials and implementation for each layer of each sample; label each sample to identify location and implementation.
- .3 Submit samples on following substrates so that their colors and textures are verified by Departmental Representative:
  - .1 Hard panel: Provide two (2) samples measuring 100 mm<sup>2</sup> for each color and finish

## **1.7 CLOSURE SUBMISSIONS**

- .1 Install fence submissions section 01 78 00 – Documents – éléments à remettre à l'achèvement des travaux.
- .2 Instructions and data relating to maintenance: Submit manufacturer's written recommendations relating to maintenance for: repair, cleaning and maintenance procedures; ensure that installer's name and details are enclosed.

## **1.8 QUALITY ASSURANCE**

- .1 Qualifications relating to the manufacturer:
  - .1 Manufacturer must be certified ISO 9001. All liquid materials including primers, resins, curing agents, coatings, finish coatings and sealants must be fabricated and tested in accordance with a quality control system to registered ISO 9001
- .2 Qualifications relating to the applicator:
  - .1 Applicators: Call upon professional applicators with broad experience in the implementation of resin based floor covering systems using materials similar and comparable in magnitude to the ones described in this section, and meeting the following requirements:
    - .1 Applicators will have followed the floor covering manufacturer's training program for specified products.
    - .2 Applicators must be registered, licenced or approved in writing by the floor covering's manufacturer for specified products.
  - .2 Applicator's experience: Five years (5) at least in implementation similar to specified system. Applicator must submit list of five (5) projects similar in size, magnitude and complexity.
- .3 Model mock-up:
  - .1 Build one (1) model 10 m<sup>2</sup> (100 ft<sup>2</sup>) of each type and color resinous floor covering in an acceptable place according to consulting engineer, to prove quality of finished system, compliance to manufacturer 's installation instructions and to requirements of this section in accordance with 01 45 00 - Quality Control .
  - .2 Provide consulting engineer with ways to analyze and accept project, obtain written approval before continuing with work.
  - .3 Once accepted, model will serve as minimum quality standard for rest of work of this section. The model must remain on site for duration of the work.

## **1.9 DELIVERY, STORAGE AND HANDLING**

- .1 Delivery:

- .1 Deliver materials onsite in original boxes and packaging, undamaged, labelled with product name and manufacturer, batch number and manufacture date.
- .2 When received, inspect products onsite to ensure they were not damaged during transport. Do not start work before delivered materials inspection.
- .2 Storage :
  - .1 Store materials in accordance with manufacturer's written recommendations.
  - .2 Keep boxes and containers shut until use. Materials must be stored in dry place, protected from the elements.
  - .3 Do not expose materials to excessive heat or frost.
  - .4 Conservation: in accordance with manufacturer's written recommendations for each material used.
- .3 Handling :
  - .1 Protect materials during handling and installation to avoid any damage or contamination.
  - .2 Prepare materials to use in accordance with manufacturer's written recommendations before installation.
  - .3 Take down batch numbers quantities of materials delivered onsite or stored.

#### **1.10 SITE CONDITIONS**

- .1 Do not perform work outside temperature ranges and prescribed environmental conditions without having received agreement in writing from manufacturer:
  - .1 Material temperature: Precondition material for at least 24 hours between 18 et 30 °C (65 et 86 °F).
  - .2 Substrate and ambient temperature: Minimum/Maximum = 10/30 °C (50/86 °F).
  - .3 Substrate temperature must be at least 3 °C (5 °F) above measured dew point.
  - .4 Any mixing operation and implementation performed when ambient or substrate temperatures are below 18 °C (65 °F) will reduce product workability and slow down curing rate.
  - .5 Relative ambient humidity: maximum 85 % (during implementation and curing).
  - .6 Measure and confirm results of acceptable trials for relative ambient humidity, substrate and ambient temperature and dew point.
- .2 Substrate Humidity
  - .1 Concrete substrate humidity content must be  $\leq 4$  % per weight, as measured with moisture meter calibrated for concrete type Tramex® CME/CMExpert.
  - .2 Furthermore, it is possible to perform internal relative humidity trials in accordance with ASTM F2170 and values must be  $\leq 85$  %.
  - .3 If concrete substrate humidity content is above 4 % per weight and/or if the results of the relative humidity trials exceed 85 % H.R., Departmental Representative may suggest adding humidity reduction systems or humidity tolerant primers.
- .3 Provide temporary public services, particularly electricity, water, a temporary ventilation system, and lighting used by the applicator.

- .4 Maintain higher ambient temperature during 48 hours prior to and following installation or complete curing. Minimum temperature 10 °C (50 °F) and maximum temperature 30 °C (85 °F). Do not apply product when temperatures are increasing (ambient and substrate).
- .5 Install signalling and protection devices at site entrances to stop traffic and of other trades intervention in work area during application and curing of floor covering.
- .6 Ensure that ventilation and air circulation are sufficient in work area.

### **1.11 WARRANTY**

- .1 Submit details of warranty in accordance with Section 01 78 00 – Closeout Submittals.
- .2 Submit written warranty of applicator signed and issued in name of owner to ensure work of this section against defective workmanship and materials for a period of one (1) year from date of substantial work completion.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURER**

- .1 Manufacturer (design basis). Sika Canada Inc. 601 Delmar Avenue - Pointe Claire (QC) H9R 4A9 Tel. : (514) 697-2610 / Fax. : (514) 697-3087 - Website: <http://www.sika.ca>
- .2 Substitutions: Consulting Engineer may consider other manufacturers with similar products to the manufacturer listed above during construction period, provided they meet requirements in terms of performance and aesthetics as per above-named products. Organize bids for substitutions in accordance with Division 1 before starting work of this section.

### **2.2 SYSTEM**

- .1 Resin based floor covering system: self-levelling epoxy floor covering, plain colour, ultra smooth, glossy finish, resin-rich, containing fine aggregates, with the following properties;
  - .1 Compression resistance: 56 MPa (8122 lb/po<sup>2</sup>) at 28 days, in accordance with ASTM C579
  - .2 Tensile strength: 11 MPa (1595 lbs / square inch) to 28 days in accordance with ASTM C307
  - .3 Bending strength: 5 MPa (725 lb / square inch) to 28 days in accordance with ASTM C580
  - .4 Thermal compatibility: Accomplished, in accordance with ASTM C884
  - .5 Indentation: 4, 0 %, in accordance with MIL-PRF-24613
  - .6 Impact Resistance: 2, 03 joules, in accordance with ASTM D2794
  - .7 Abrasion Resistance: 0, 07 g, in accordance with ASTM D4060. (CS17/1000 cycles/1000 g)
  - .8 Thermal expansion coefficient: 0.53 x 10<sup>-4</sup> mm / mm / °C (0.29 x 10<sup>-4</sup> in / in / °F) in accordance with ASTM D696
  - .9 Water absorption: 0, 3 %, in accordance with ASTM C413
  - .10 Extraction resistance: > 2 MPa (> 290 lb/po<sup>2</sup>) with concrete breakdown, in accordance with CSA/CAN A23.2-6B



- .11 Flammability: 20 mm (0.78 po), in accordance with ASTM D635
- .12 Fungi growth resistance: Rated 1, in accordance with ASTM G21
- .13 Mold Growth Resistance: Rated 10, in accordance with ASTM D3273
- .14 VOC Content:  $\leq 50$  g/L, in accordance with ASTM D2369
- .15 Thickness: minimum 3 mm (120 mils)
- .16 System (design basis): Sika Canada Inc., Sikafloor® Morritex Broadcast System.

## **2.3 COMPONENTS**

- .1 Self-levelling primer: two component epoxy finish, glossy, plain colour, high solid content, low odor, low VOC content, with the following properties:
  - .1 Application thickness:
    - .1 Primer: 203  $\mu\text{m}$  (8 mils) (e.f.m.)
    - .2 Self-levelling layer: 1143  $\mu\text{m}$  (45 mils) (e.f.m.)
    - .3 Finish: 508  $\mu\text{m}$  (20 mils) (e.f.m.)
  - .2 Compression resistance: 56 MPa (8122 lb/po<sup>2</sup>), in accordance with ASTM D695
  - .3 Tensile strength: 7, 4 MPa (1073 lb/po<sup>2</sup>), in accordance with ASTM D638
  - .4 Extraction resistance:  $> 2$  MPa (290 lb/po<sup>2</sup>), in accordance with ASTM D4541
  - .5 Hardness: 76 Shore D, in accordance with ASTM D2240
  - .6 VOC Content:  $\leq 50$  g/L, in accordance with ASTM D2369
  - .7 Impact resistance: 5, 88 joules, in accordance with ASTM D2794
  - .8 Abrasion resistance: 0, 11 g loss, in accordance with ASTM D4060 (CS17/1000 cycles/1000 g)
  - .9 Product (design basis): Sika Canada Inc., Sikafloor® 261.
- .2 Silica aggregates for application: Coarse texture No. 16 (angular) from 0.6 to 2.0 mm.
  - .1 Products (design basis): Bell & MacKenzie Co. Ltd
- .3 Finish layer resistant to chemical products: two component transparent finish layer, urethane-aliphatic based, UV-resistant and non- yellowing, with following properties:
  - .1 VOC content:  $\leq 240$  g/L, in accordance with ASTM D2369
  - .2 Abrasion resistance: 0,082 g loss, in accordance with ASTM D4060 (CS17/1000 cycles/1000 g)
  - .3 Extraction resistance:  $> 5, 8$  MPa ( $> 840$  lb/po<sup>2</sup>), in accordance with ASTM D4541
  - .4 Classification relative to fire spread: 5, in accordance with CAN/ULC S102
  - .5 Classification of produced smoke: 94, in accordance with CAN/ULC S102
  - .6 Product (design basis): Sika Canada Inc., Sikafloor® Sika Duochem 942
- .4 Epoxy mortar for cove skirting: three component epoxy mortar, low odor, plain colour and low VOC content with primer to implement cove skirting and vertical finish.
  - .1 Compression resistance: 41 MPa (5946 lb/po<sup>2</sup>) at 28 days, in accordance with ASTM D695
  - .2 Tensile strength: 36 MPa (5221 lb/po<sup>2</sup>) at 28 days, in accordance with ASTM D638
  - .3 Hardness: 83 Shore D, in accordance with ASTM D2240

- .4 COV content:  $\leq 5$  g/L, in accordance with ASTM D2369
- .5 Extraction resistance:  $> 1,7$  MPa (246 lb/po<sup>2</sup>) with concrete breakdown at 100 %, in accordance with ASTM D4541
- .6 Product (design basis): Sika Canada Inc., Sikafloor® Morritex Epoxy Cove Mortar.

## **2.4 COLORS**

- .1 Colors to be choose by the architect from the standard range of colors offered by the manufacturer.

## **2.5 ACCESSORIES**

- .1 Provide all cleaning products, cleaning cloths, sanding materials and products for final cleaning required in accordance with manufacturer's recommendations.

## **PART 3 EXECUTION**

### **3.1 INSPECTION**

- .1 Inspect surfaces where floor covering system will be installed. Submit notice in writing to Departmental Representative and contractor if surfaces are not acceptable. Surface preparation or implementation should not be started if unacceptable conditions have not been corrected. Do not install floor covering system over substrate treatments for mold, repairs or upgrading which are not made by same manufacturer.
- .2 Surface must be clean, solid and dry.
- .3 Preliminary testing :
  - .1 Substrate humidity :
    - .1 Measure and confirm acceptable result trials for substrate humidity content, relative ambient humidity, substrate, ambient and dew point temperatures.
    - .2 Confirm and note above results at least once every three (3) hours during implementation or more frequently when conditions change (ex.: ambient temperature increase or reduction, relative humidity increase or reduction, etc.).
  - .2 Substrate compression resistance must be at least 25 MPa (3625 lb/po<sup>2</sup>) at 28 days and tensile strength minimum of 1,5 MPa (218 lb/po<sup>2</sup>) during implementation.
- .4 Ensure that concrete substrate is in accordance with minimal requirements specified by floor covering's manufacturer.
- .5 Do not install floor covering system over soil/cement setting beds. Scrape soil/cement setting beds down to structural concrete substrate. Level or restore tilt in order to obtain slope/drainage in accordance with manufacturer's minimal requirements.
- .6 Do not install floor covering system over asphalt (or bitumen) membranes, soft wood, aluminum, copper or ester and vinyl/ polyester composites reinforced with glass fibre.
- .7 Install over bricks or varnished/ glazed tiles, structural frames, and steel only with manufacturer's written recommendation for appropriate methods to prepare surfaces.

### **3.2 SURFACE PREPARATION**

- .1 Prepare surface over which floor covering systems will be installed in accordance with manufacturer's written recommendations.
- .2 Remove all traces of dirt, oil, grease, wax, milt, curing agents, aqueous concrete curing agents or any other surface contaminants.
- .3 Remove all traces of sealant, finish and painting.
- .4 All rough patches, rough areas, etc. must be treated to obtain a level surface before implementation.
- .5 Remove any concrete parts in disrepair (deteriorated) thanks to appropriate mechanical methods.
- .6 Concrete: Clean and prepare with sandblasting or any other equivalent mechanical means so as to obtain a textured surface, free of milt or any other contaminants. Provide CSP level in accordance with guideline ICRI N° 310-2R and manufacturer's written recommendations.
- .7 Surface chemical preparation: bush hammering with acid is prohibited and will invalidate the manufacturer's warranty.
- .8 Control joints and cracks: repair and treat control joints and surface cracks with standard products from the manufacturer's range in accordance with their use.

### **3.3 APPLICATION**

- .1 Mix and apply material in accordance with manufacturer's written guidelines and procedures. Respect manufacturer's recommended covering rates unless a thicker covering is specified in this section.
- .2 Follow manufacturer's written recommendations relative to extremities and junctions to walls, drains, doorsteps, pillars, and floor to floor transitions.
- .3 Do not apply when temperatures increase (ambient and substrate).
- .4 Apply resin based floor covering carefully to avoid any overlapping, voids, marks or irregularities that could remain visible when the work is completed. Apply so as to obtain an even result when it comes to colour, gloss and texture, within limits imposed by materials and work area.
- .5 Apply selected silica aggregates in wet resin.
- .6 Match colors and textures to samples accepted by Engineering Consultant.
- .7 Build cove skirting height 100 mm (4 po), radius 25 mm (1 po) in accordance with manufacturers written guidelines. Minimum thickness should be 3 mm (1/8 po).
- .8 Install L shaped rods, white alloy, or zinc based, specified heights, straight and levelled.

### **3.4 CLEANING**

- .1 Discard all waste issued from resin based floor covering implementation in accordance with environmental laws applicable in the area where work site is located and in accordance with requirements of authorities having jurisdiction.
- .2 Dispose of containers at waste disposal units licensed for their recycling or disposal accordingly.

**3.5 PROTECTION**

- .1 Protect finished floor so that other trades do not damage it.
- .2 Protect other recently implemented products from humidity, condensation and any contact with water for at least 72 hours.
- .3 Verify air circulation and its variations. Protect work area against dust contamination, rubble, particles and other that may produce imperfections and deficiencies in finished surface.
- .4 Respect manufacturer's written recommendations relative to curing, wait times and reactivation.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 SECTION CONTENT**

- .1 Supply labor, materials, tools and equipment necessary for implementation of a complete resinous floor covering system as specified in this section, including surface preparation.

**1.2 RELATED REQUIREMENTS**

- .1 Section 03 30 00 – Cast in Place Concrete
- .2 Section 03 35 00 – Concrete Finishing
- Section 03 35 05 – Concrete Floor Hardening

**1.3 ABBREVIATIONS/ ACRONYMS**

- .1 W.f.t. Wet Film Thickness (e.f.m.)

**1.4 REFERENCES**

- .1 American Society for Testing and Materials (ASTM)
  - .1 ASTM D638-10: Standard Test Method for plastics elongation properties.
  - .2 ASTM D695-10: Standard Test Method for rigid plastics compression properties.
  - .3 ASTM D2240- 05 (2010): Standard Test Method for Rubber Property-Durometer Hardness.
  - .4 ASTM D2369-10e1: Standard Test Method for Volatile Content of Coatings.
  - .5 ASTM D4060-10: Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
  - .6 ASTM D4541-09e1: Standard Test Method for extraction resistance of coats with portable adherence testing devices.
  - .7 ASTM F2170-11: Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
  - .8 ASTM F2659-10: Standard Guide for Preliminary Evaluation of Comparative Moisture Condition of Concrete, Gypsum Cement and Other Floor Slabs and Screeds Using a Non-Destructive Electronic Moisture Meter.
- .2 Association canadienne de normalisation (CSA)
  - .1 CSA A23.1-14/A23.2-14: Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete.
- .3 International Concrete Repair Institute (ICRI)
  - .1 Directive ICRI N° 310.2R-2013: Performance Specification: Deck Covering Materials, Interior, Cosmetic Polymeric.

**1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Meeting prior to installation :
  - .1 Organise meeting before installation two weeks prior to beginning of work pertaining to this Section in accordance with Section 01 31 19 – Project Meetings. Request participation from all parties directly involved with work in this section, including

Contractor, Engineering Consultant, the manufacturer's technical representative and all other subcontractors, in order to review;

- .1 Surface preparation
- .2 Primer application
- .3 Installation
- .4 Curing and protection
- .5 Coordination with other work

## **1.6 SUBMISSIONS**

- .1 Submit specifications in accordance with section 01 33 00 – Submittal Procedures
- .2 Product information: Submit manufacturer's product data sheet, including physical properties, options relative to product appearance including color, surface textures and gloss.
- .3 Data sheet: Submit manufacturer's security data sheet for each product used.
- .4 Samples for initial section: Submit manufacturer's color panels showing full range of available colors for each type of material for topcoat as per indications in Departmental Representative's initial section.
- .5 Samples to check: Submit samples of each implemented color and material, with adequate texture to mimic real conditions, on representative substrate samples and as follows in order to be verified by Departmental Representative.
  - .1 Use representative colors for sample preparation and for examination purposes, submit again until desired gloss, color and texture are obtained.
  - .2 List materials and implementation for each layer of each sample; label each sample to identify location and implementation.
  - .3 Submit samples on following substrates so that their colors and textures are verified by Departmental Representative:
    - .1 Hard panel: Provide two (2) samples measuring 100 mm<sup>2</sup> for each color and finish
  - .4 Obtain written approval from Departmental Representative prior to start work of this section. Accepted samples will be used as final reference for finish approval.

## **1.7 CLOSURE SUBMISSIONS**

- .1 Install fence submissions section 01 78 00 – Documents – éléments à remettre à l'achèvement des travaux.
- .2 Instructions and data relating to maintenance: Submit manufacturer's written recommendations relating to maintenance for: repair, cleaning and maintenance procedures; ensure that installer's name and details are enclosed.

## **1.8 QUALITY ASSURANCE**

- .1 Qualifications relating to the manufacturer:
  - .1 Manufacturer must be certified ISO 9001. All liquid materials including primers, resins, curing agents, coatings, finish coatings and sealants must be fabricated and tested in accordance with a quality control system to registered ISO 9001
- .2 Qualifications relating to the applicator:

- .1 Applicators: Call upon professional applicators with broad experience in the implementation of resin based floor covering systems using materials similar and comparable in magnitude to the ones described in this section, and meeting the following requirements:
  - .1 Applicators will have followed the floor covering manufacturer's training program for specified products.
  - .2 Applicators must be registered, licenced or approved in writing by the floor covering's manufacturer for specified products.
- .2 Applicator's experience: Five years (5) at least in implementation similar to specified system. Applicator must submit list of five (5) projects similar in size, magnitude and complexity.
- .3 Model mock-up:
  - .1 Build one (1) model 10 m<sup>2</sup> (100 ft<sup>2</sup>) of each type and color resinous floor covering in an acceptable place according to consulting engineer, to prove quality of finished system, compliance to manufacturer 's installation instructions and to requirements of this section in accordance with 01 45 00 - Quality Control .
  - .2 Provide consulting engineer with ways to analyze and accept project, obtain written approval before continuing with work.
  - .3 Once accepted, model will serve as minimum quality standard for rest of work of this section. The model must remain on site for duration of the work.

## **1.9 DELIVERY, STORAGE AND HANDLING**

- .1 Delivery:
  - .1 Deliver materials onsite in original boxes and packaging, undamaged, labelled with product name and manufacturer, batch number and manufacture date.
  - .2 When received, inspect products onsite to ensure they were not damaged during transport. Do not start work before delivered materials inspection.
- .2 Storage:
  - .1 Store materials in accordance with manufacturer's written recommendations.
  - .2 Keep boxes and containers shut until use. Materials must be stored in dry place, protected from the elements.
  - .3 Do not expose materials to excessive heat or frost.
  - .4 Conservation: in accordance with manufacturer's written recommendations for each material used.
- .3 Handling:
  - .1 Protect materials during handling and installation to avoid any damage or contamination.
  - .2 Prepare materials to use in accordance with manufacturer's written recommendations before installation.
  - .3 Take down batch numbers quantities of materials delivered onsite or stored.

## **1.10 SITE CONDITIONS**

- .1 Do not perform work outside temperature ranges and prescribed environmental conditions without having received agreement in writing from manufacturer:

- .1 Material temperature: Precondition material for at least 24 hours between 18 & 30 °C (65 et 86 °F).
  - .2 Substrate and ambient temperature : Minimum/Maximum = 10/30 °C (50/86 °F).
  - .3 Substrate temperature must be at least 3 °C (5 °F) above measured dew point.
  - .4 Any mixing operation and implementation performed when ambient or substrate temperatures are below 18 °C (65 °F) will reduce product workability and slow down curing rate.
  - .5 Relative ambient humidity: maximum 85 % (during implementation and curing).
  - .6 Measure and confirm results of acceptable trials for relative ambient humidity, substrate and ambient temperature and dew point.
- .2 Substrate Humidity
- .1 Concrete substrate humidity content must be ≤ 4 % per weight, as measured with moisture meter calibrated for concrete type Tramex® CME/CMExpert.
  - .2 Furthermore, it is possible to perform internal relative humidity trials in accordance with ASTM F2170 and values must be ≤ 85 %.
  - .3 If concrete substrate humidity content is above 4 % per weight and/or if the results of the relative humidity trials exceed 85 % H.R., Departmental Representative may suggest adding humidity reduction systems or humidity tolerant primers.
- .3 Provide temporary public services, particularly electricity, water, a temporary ventilation system, and lighting used by the applicator.
- .4 Maintain higher ambient temperature during 48 hours prior to and following installation or complete curing. Minimum temperature 10 °C (50 °F) and maximum temperature 30 °C (85 °F). Do not apply product when temperatures are increasing (ambient and substrate).
- .5 Install signalling and protection devices at site entrances to stop traffic and of other trades intervention in work area during application and curing of floor covering.
- .6 Ensure that ventilation and air circulation are sufficient in work area.

## **1.11 WARRANTY**

- .1 Submit details of warranty in accordance with Section 01 78 00 – Closeout Submittals.
- .2 Submit written warranty of applicator signed and issued in name of owner to ensure work of this section against defective workmanship and materials for a period of one (1) year from date of substantial work completion.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURER**

- .1 Manufacturer (design basis). Sika Canada Inc. 601 Delmar Avenue - Pointe Claire (QC) H9R 4A9 Tel. : (514) 697-2610 / Fax. : (514) 697-3087 - Website: <http://www.sika.ca>
- .2 Substitutions: Consulting Engineer may consider other manufacturers with similar products to the manufacturer listed above during construction period, provided they meet requirements in terms of performance and aesthetics as per above-named products. Organize bids for substitutions in accordance with Division 1 before starting work of this section.



## **2.2 MATERIALS**

- .1 Resin based floor coating: two component epoxy finish, plain colour, glossy, high solid content, free of silicone, low viscosity, self-priming, and characteristics as follows:
  - .1 Application Thickness :
    - .1 Primer : 203 µm (8 mils) (e.f.m.)
    - .2 Body coat: 381 µm (15 mils) (e.f.m.)
  - .2 Flexural Rigidity: 45 MPa (6572 lb/po<sup>2</sup>), in accordance with ASTM D638
  - .3 Extraction resistance: 2, 7 MPa (392 lb/po<sup>2</sup>), in accordance with ASTM D4541
  - .4 Hardness: 85 Shore D, in accordance with ASTM D2240
  - .5 VOC Content: ≤ 5 g/L, in accordance with ASTM D2369
  - .6 Abrasion Resistance: 120 mg loss, in accordance with ASTM D4060 (CS17/1000 cycles/1000 g)
  - .7 Product (design basis): Sika Canada Inc., Sikafloor® Fastflor CR®.
- .2 Epoxy mortar for cove skirting: three component epoxy mortar, low odor, plain colour and low VOC content with primer to implement cove skirting and vertical finish.
  - .1 Compression resistance: 41 MPa (5946 lb/po<sup>2</sup>) at 28 days, in accordance with ASTM D695
  - .2 Tensile strength: 36 MPa (5221 lb/po<sup>2</sup>) at 28 days, in accordance with ASTM D638
  - .3 Hardness: 83 Shore D, in accordance with ASTM D2240
  - .4 COV content: ≤ 5 g/L, in accordance with ASTM D2369
  - .5 Extraction resistance: > 1, 7 MPa (246 lb/po<sup>2</sup>) with concrete breakdown at 100 %, in accordance with ASTM D4541
  - .6 Product (design basis): Sika Canada Inc., Sikafloor® Morritex Epoxy Cove Mortar.

## **2.3 COLORS**

- .1 Colors to be choose by the architect from the standard range of colors offered by the manufacturer, except where otherwise specified.
- .2 Color RAL 1011 Brown beige : in room 501, 502, 502A, 503, 504, 505, 506, 507, 508, 510, 511, 512 and 513.

## **2.4 ACCESSORIES**

- .1 Provide all cleaning products, cleaning cloths, sanding materials and products for final cleaning required in accordance with manufacturer's recommendations.

## **PART 3 EXECUTION**

### **3.1 INSPECTION**

- .1 Inspect surfaces where floor covering system will be installed. Submit notice in writing to Departmental Representative and contractor if surfaces are not acceptable. Surface preparation or implementation should not be started if unacceptable conditions have not been corrected. Do not install floor covering system over substrate treatments for mold, repairs or upgrading which are not made by same manufacturer.
- .2 Surface must be clean, solid and dry.

- .3 Preliminary testing :
  - .1 Substrate humidity :
    - .1 Measure and confirm acceptable result trials for substrate humidity content, relative ambient humidity, substrate, ambient and dew point temperatures.
    - .2 Confirm and note above results at least once every three (3) hours during implementation or more frequently when conditions change (ex.: ambient temperature increase or reduction, relative humidity increase or reduction, etc.).
  - .2 Substrate compression resistance must be at least 25 MPa (3625 lb/po<sup>2</sup>) at 28 days and tensile strength minimum of 1,5 MPa (218 lb/po<sup>2</sup>) during implementation.
- .4 Ensure that concrete substrate is in accordance with minimal requirements specified by floor covering's manufacturer.
- .5 Do not install floor covering system over soil/cement setting beds. Scrape soil/cement setting beds down to structural concrete substrate. Level or restore tilt in order to obtain slope/drainage in accordance with manufacturer's minimal requirements.
- .6 Do not install floor covering system over asphalt (or bitumen) membranes, soft wood, aluminum, copper or ester and vinyl/ polyester composites reinforced with glass fibre.
- .7 Install over bricks or varnished/ glazed tiles, structural frames, and steel only with manufacturer's written recommendation for appropriate methods to prepare surfaces.

### **3.2 SURFACE PREPARATION**

- .1 Prepare surface over which floor covering systems will be installed in accordance with manufacturer's written recommendations.
- .2 Remove all traces of dirt, oil, grease, wax, milt, curing agents, aqueous concrete curing agents or any other surface contaminants.
- .3 Remove all traces of sealant, finish and painting.
- .4 All rough patches, rough areas, etc. must be treated to obtain a level surface before implementation.
- .5 Remove any concrete parts in disrepair (deteriorated) thanks to appropriate mechanical methods.
- .6 Concrete: Clean and prepare with sandblasting or any other equivalent mechanical means so as to obtain a textured surface, free of milt or any other contaminants. Provide CSP level in accordance with guideline ICRI N° 310-2R and manufacturer's written recommendations.
- .7 Surface chemical preparation: bush hammering with acid is prohibited and will invalidate the manufacturer's warranty.
- .8 Control joints and cracks: repair and treat control joints and surface cracks with standard products from the manufacturer's range in accordance with their use.

### **3.3 APPLICATION**

- .1 Mix and apply material in accordance with manufacturer's written guidelines and procedures. Respect manufacturer's recommended covering rates unless a thicker covering is specified in this section.
- .2 Follow manufacturer's written recommendations relative to extremities and junctions to walls, drains, doorsteps, pillars, and floor to floor transitions.

- .3 Do not apply when temperatures increase (ambient and substrate).
- .4 Apply resin based floor covering carefully to avoid any overlapping, voids, marks or irregularities that could remain visible when the work is completed. Apply so as to obtain an even result when it comes to colour, gloss and texture, within limits imposed by materials and work area.
- .5 Match colors and textures to samples accepted by Engineering Consultant.
- .6 Build cove skirting height 100 mm (4 po), radius 25 mm (1 po) in accordance with manufacturers written guidelines. Minimum thickness should be 3 mm (1/8 po).
- .7 Install L shaped rods, white alloy, or zinc based, specified heights, straight and levelled.

### **3.4 CLEANING**

- .1 Discard all waste issued from resin based floor covering implementation in accordance with environmental laws applicable in the area where work site is located and in accordance with requirements of authorities having jurisdiction.
- .2 Dispose of containers at waste disposal units licensed for their recycling or disposal accordingly.

### **3.5 PROTECTION**

- .1 Protect finished floor so that other trades do not damage it.
- .2 Protect other recently implemented products from humidity, condensation and any contact with water for at least 72 hours.
- .3 Verify air circulation and its variations. Protect work area against dust contamination, rubble, particles and other that may produce imperfections and deficiencies in finished surface.
- .4 Respect manufacturer's written recommendations relative to curing, wait times and reactivation.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED SECTIONS**

- .1 Section 05 50 00 – Metal Fabrications
- .2 Section 05 51 29 – Metal Stairs and Ladders
- .3 Section 07 92 00 – Joint Sealants
- .4 Section 08 11 00 – Metal Doors and Frames
- .5 Division 21 – Fire Protection
- .6 Division 22 - Plumbing
- .7 Division 26 - Electricity

**1.2 REFERENCES**

- .1 Environmental Protection Agency (EPA)
  - .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .3 The Master Painters Institute (MPI)
  - .1 Architectural Painting Specification Manual - February 2004.
  - .2 Standard GPS-1-05, MPI Green Performance Standard for Painting and Coatings.
- .4 National Fire Code of Canada.
- .5 Society for Protective Coatings (SSPC)
  - .1 Systems and Specifications, SSPC Painting Manual 2005.

**1.3 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Contractor: to have a minimum of five years proven satisfactory experience. When requested, provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
  - .2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work
  - .3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.
  - .4 Conform to latest MPI requirements for exterior painting work including preparation and priming.

- .5 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
- .6 Paint materials such as linseed oil, shellac, and turpentine to be highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and to be compatible with other coating materials as required.
- .7 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Consultant.
- .8 Standard of Acceptance:
  - .1 Walls: No defects visible from a distance of 1000mm at 90 degrees to surface.
  - .2 Soffits: No defects visible from floor at 45 degrees to surface when viewed using final lighting source.
  - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

#### **1.4 PERFORMANCE REQUIREMENTS**

- .1 Environmental Performance Requirements:
  - .1 Provide paint products meeting MPI "Environmentally Friendly" E3 ratings based on VOC (EPA Method 24) content levels.
  - .2 Green Performance in accordance with MPI Standard GPS-1.

#### **1.5 SCHEDULING**

- .1 Submit work schedule for various stages of painting to Consultant for approval. Submit schedule minimum of 48 hours in advance of proposed operations.
- .2 Obtain written authorization from Consultant for changes in work schedule.
- .3 Schedule painting operations to prevent disruption of occupants in and about building.

#### **1.6 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 29.06 – Health and Security.
- .3 Upon completion, submit records of products used. List products in relation to finish system and include the following:
  - .1 Product name, type and use.
  - .2 Manufacturer's product number.
  - .3 Colour numbers.
  - .4 MPI Environmentally Friendly classification system rating.
  - .5 Manufacturer's Material Safety Data Sheets (MSDS).

- .4 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .1 Submit duplicate 200 x 300 mm sample panels of each paint with specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards submitted on the following substrate materials:
    - .1 3 mm plate steel for finishes over metal surfaces.
    - .2 13 mm birch plywood for finishes over wood surfaces.
    - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
    - .4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
    - .5 10 mm siding for finishes over wood surfaces.
  - .2 When approved, samples shall become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.
  - .3 Submit full range of available colours where colour availability is restricted.

#### **1.7 QUALITY CONTROL**

- .1 Provide mock-up in accordance with Section 01 45 00 - Quality Control.
- .2 When requested by Consultant or Paint Inspection Agency, prepare and paint designated surface, area, room or item to requirements specified herein, with specified paint or coating showing selected colours, number of coats, gloss/sheen, textures and workmanship to MPI Painting Specification Manual standards for review and approval. When approved, surface, area, room and/or items shall become acceptable standard of finish quality and workmanship for similar on-site work.

#### **1.8 MAINTENANCE**

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

#### **1.9 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements, supplemented as follows:
  - .1 Deliver and store materials in original containers, sealed, with labels intact.
  - .2 Labels: to indicate:
    - .1 Manufacturer's name and address.
    - .2 Type of paint or coating.
    - .3 Compliance with applicable standard.
    - .4 Colour number in accordance with established colour schedule.
  - .3 Remove damaged, opened and rejected materials from site.
  - .4 Provide and maintain dry, temperature controlled, secure storage.
  - .5 Observe manufacturer's recommendations for storage and handling.

- .6 Store materials and supplies away from heat generating devices.
- .7 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.
- .8 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .9 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Consultant. After completion of operations, return areas to clean condition to approval of Consultant.
- .10 Remove paint materials from storage only in quantities required for same day use.
- .11 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
- .12 Fire Safety Requirements:
  - .1 Provide one 9 kg dry chemical fire extinguisher adjacent to storage area.
  - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
  - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.
- .2 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .2 Paint, stain and wood preservative finishes and related materials (thinners, solvents, etc.) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.
  - .3 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
  - .4 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
  - .5 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into the ground the following procedures shall be strictly adhered to:
    - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
    - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
    - .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
    - .4 Dispose of contaminants in an approved legal manner in accordance with hazardous waste regulations.
    - .5 Empty paint cans are to be dry prior to disposal or recycling (where available).
  - .6 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.

- .7 Set aside and protect surplus and uncontaminated finish materials. Deliver to or arrange collection by employees for verifiable re-use or re-manufacturing. Provide adequate transport arrangements if necessary.
- .8 Close and seal tightly partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

## **1.10 AMBIENT CONDITIONS**

- .1 Heating, Ventilation and Lighting:
  - .1 Do not perform painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
  - .2 Where required, provide continuous ventilation for seven (7) days after completion of application of paint.
  - .3 Co-ordinate use of existing ventilation system with Consultant and ensure its operation during and after application of paint as required.
  - .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
  - .5 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities to be provided by General Contractor.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
  - .1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and, applied product manufacturer, perform no painting work when:
    - .1 Ambient air and substrate temperatures are below 10 degrees C.
    - .2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperatures.
    - .3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.
    - .4 Relative humidity is above 85 % or when dew point is less than 3 degrees C variance between air/surface temperature.
    - .5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
  - .2 Perform no painting work when maximum moisture content of substrate exceeds:
    - .1 12 % for concrete and masonry (clay and concrete brick/block).
    - .2 15 % for wood.
    - .3 12 % for plaster and gypsum board.
  - .3 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".
  - .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Surface and Environmental Conditions:
  - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.



- .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits noted herein.
- .3 Apply paint when previous coat of paint is dry or adequately cured.
- .4 Apply paint finishes when conditions forecast for entire period of application fall within manufacturer's recommendations.
- .5 Do not apply paint when:
  - .1 Temperature is expected to drop below 10 degrees C before paint has thoroughly cured.
  - .2 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's limits.
  - .3 Surface to be painted is wet, damp or frosted.
- .6 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.
- .7 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.
- .8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.
- .9 Paint occupied facilities in accordance with approved schedule only. Schedule operations to approval of Consultant such that painted surfaces will have dried and cured sufficiently before occupants are affected.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Paint materials listed in latest edition of MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Paint materials for paint systems: to be products of single manufacturer.
- .3 Only qualified products with E3 "Environmentally Friendly" rating[s] are acceptable for use on this project.
- .4 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids, to be as follows:
  - .1 Be water soluble and water clean-up.
  - .2 Be non-flammable and biodegradable.
  - .3 Be manufactured without compounds which contribute to ozone depletion in upper atmosphere.
  - .4 Be manufactured without compounds which contribute to smog in the lower atmosphere.
  - .5 Do not contain methylene chloride.
- .5 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including, for

- facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).
- .6 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
  - .7 Water-borne surface coatings and recycled water-borne surface coatings must have flash point of 61.0 degrees C or greater.
  - .8 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:
    - .1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
    - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
  - .9 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes must meet a minimum "Environmentally Friendly" E2 rating.
  - .10 Recycled water-borne surface coatings must contain 50 % post-consumer material by volume.
  - .11 Recycled water-borne surface coatings must not contain:
    - .1 Lead in excess of 600.0 ppm weight/weight total solids.
    - .2 Mercury in excess of 50.0 ppm weight/weight total product.
    - .3 Cadmium in excess of 1.0 ppm weight/weight total product.
    - .4 Hexavalent chromium in excess of 3.0 ppm weight/weight total product.
    - .5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.
  - .12 The following must be performed on each batch of consolidated post-consumer material before surface coating is reformulated and canned. These tests must be performed at a laboratory or facility which has been accredited by the Standards Council of Canada.
    - .1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.
    - .2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.
    - .3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

## **2.2 COLOURS**

- .1 Consultant will be provided with Colour Schedule after Contract award.

- .2 Colour schedule will be based upon selection of five (5) base colours and three (3) accent colours. No more than eight colours will be selected for entire project and no more than three colours will be selected in each area.
- .3 Selection of colours will be from manufacturer's full range of colours.
- .4 Where specific products are available in restricted range of colours, selection will be based on limited range.
- .5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

### **2.3 MIXING AND TINTING**

- .1 Perform colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials is allowed only with Consultant's written permission.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Add thinner to paint manufacturer's recommendations. Do not use kerosene or organic solvents to thin water-based paints.
- .4 Thin paint for spraying according in accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Consultant.
- .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.

### **2.4 GLOSS/SHEEN RATINGS**

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

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	
G6 - gloss finish	70 to 85	
G7 - high gloss finish	> 85	

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

### **2.5 EXTERIOR PAINTING SYSTEMS**

- .1 Asphalt Surfaces: zone/traffic marking for drive and parking areas, etc.
  - .1 EXT 2.1A - Latex zone/traffic marking finish.

**PART 3 EXECUTION**

**3.1 MANUFACTURER'S INSTRUCTIONS**

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

**3.2 EXAMINATION**

- .1 Exterior repainting works: inspected by MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor to notify Paint Inspection Agency minimum of one week prior to commencement of work and provide copy of project repainting specification and Finish Schedule.
- .2 Exterior surfaces requiring repainting: inspected by both painting contractor and Paint Inspection Agency who will notify Consultant in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.
- .3 Where assessed degree of surface degradation of DSD-1 to DSD-3 before preparation of surfaces for repainting is revealed to be DSD-4 after preparation, repair or replacement of such unforeseen defects discovered are to be corrected, as mutually agreed, before repainting is started.
- .4 Where "special" repainting or recoating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer to provide as part of work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to Consultant.

**3.3 PREPARATION**

- .1 Perform preparation and operations for exterior painting in accordance with MPI Maintenance Repainting Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.
- .3 Clean and prepare exterior surfaces to be repainted in accordance with MPI Maintenance Repainting Manual requirements. Refer to the MPI Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and surface debris by vacuuming, wiping with dry, clean cloths or compressed air.
  - .2 Wash surfaces with a biodegradable detergent and 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 drying thoroughly. Allow sufficient drying time and test surfaces using electronic moisture meter before commencing work.

- .5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water based paints.
- .6 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.
- .4 Clean metal surfaces to be repainted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements. Remove such contaminants from surfaces, pockets and corners to be repainted by brushing with clean brushes, blowing with clean dry compressed air, or brushing/vacuum cleaning as required.
- .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .6 Do not apply paint until prepared surfaces have been accepted by Consultant.
- .7 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.

### **3.4 EXISTING CONDITIONS**

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Consultant damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
- .2 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings to Consultant. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .3 Maximum moisture content as follows:
  - .1 Stucco: 12 %.
  - .2 Concrete: 12 %.
  - .3 Clay and Concrete Block/Brick: 12 %.
  - .4 Wood: 15 %.

### **3.5 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 Consultant.
- .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 light fixtures, surface hardware on doors, and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Store items and re-install after painting is completed.

- .6 Move and cover exterior furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
- .7 As painting operations progress, place "WET PAINT" signs in pedestrian and vehicle traffic areas to approval of Consultant].

### **3.6 APPLICATION**

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

**3.7 MECHANICAL/ELECTRICAL EQUIPMENT**

- .1 Unless otherwise specified, paint exterior exposed conduits, piping, hangers, duct work and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.
- .2 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .3 Do not paint over nameplates.
- .4 Paint fire protection piping red.
- .5 Paint steel electrical light standards. Do not paint outdoor transformers and substation equipment.

**3.8 FIELD QUALITY CONTROL**

- .1 Inspection:
  - .1 Field inspection of exterior painting operations to be carried out by an independent inspection firm as designated by Consultant.
  - .2 Advise Consultant when each surface and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
  - .3 Co-operate with inspection firm and provide access to areas of work.
- .2 Manufacturer's Field Services:
  - .1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

**3.9 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
  - .1 Remove paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.

**3.10 RESTORATION**

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

**END OF SECTION**



**PART 1 GENERAL**

**1.1 SUMMARY**

- .1 Section 04 22 00 – Concrete Unit Masonry
- .2 Section 05 50 00 – Metal Fabrications
- .3 Section 05 51 29 – Metal Stairs and Ladders
- .4 Section 06 10 00 – Carpentry (Abridged)
- .5 Section 06 40 00 – Architectural Woodwork
- .6 Section 07 92 00 – Joint Sealants
- .7 Section 08 11 00 – Metal Doors and Frames
- .8 Section 09 21 16 – Gypsum Board Assemblies
- .9 Division 21 – Fire Protection
- .10 Division 22 – Plumbing.
- .11 Division 23 – Heating and Ventilation (CVCA).
- .12 Division 26 - Electricity

**1.2 REFERENCES**

- .1 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33
- .2 Environmental Protection Agency (EPA)
  - .1 EPA Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 - 1995, (for Surface Coatings).
- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .4 Master Painters Institute (MPI)
  - .1 MPI Architectural Painting Specifications Manual, 2004.
- .5 National Fire Code of Canada - 1995
- .6 Society for Protective Coatings (SSPC)
  - .1 SSPC Painting Manual, Volume Two, 8th Edition, Systems and Specifications Manual.
- .7 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34 .

**1.3 QUALITY ASSURANCE**

- .1 Qualifications:

- .1 Contractor: minimum of five years proven satisfactory experience. Provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
- .2 Journeymen: qualified journeymen who have "Tradesman Qualification Certificate of Proficiency" engaged in painting work.
- .3 Apprentices: working under direct supervision of qualified trades person in accordance with trade regulations.
- .2 Mock-Ups:
  - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
    - .1 Provide 200 mm x 300 mm mock-up. Prepare and paint designated surface, area, room or item (in each colour scheme) to specified requirements, with specified paint or coating showing selected colours, gloss/sheen, and textures.
    - .2 Mock-up will be used:
      - .1 To judge workmanship, substrate preparation, operation of equipment and material application and workmanship to MPI Architectural Painting Specification Manual standards.
      - .3 Locate where directed.
      - .4 Allow 24 hours for inspection of mock-up before proceeding with work.
      - .5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.
- .3 Pre-Installation Meeting:
  - .1 Convene pre-installation meeting one week prior to beginning work of this Section on-site installations in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.
    - .1 Verify project requirements.
    - .2 Review installation and substrate conditions.
    - .3 Coordination with other building subtrades.
    - .4 Review manufacturer's installation instructions and warranty requirements.
- .4 Health and Safety:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

#### **1.4 SCHEDULING**

- .1 Submit work schedule for various stages of painting to Consultant for review. Submit schedule minimum of 48 hours in advance of proposed operations.
- .2 Obtain written authorization from Consultant for changes in work schedule.
- .3 Schedule painting operations to prevent disruption of occupants.

#### **1.5 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:

- .1 Submit product data and instructions for each paint and coating product to be used.
  - .2 Submit product data for the use and application of paint thinner.
  - .3 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOCs during application and curing.
- .3 Samples:
- .1 Submit full range colour sample chips to indicate where colour availability is restricted.
  - .2 Submit duplicate 200 x 300 mm sample panels of each paint with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:
    - .1 3 mm plate steel for finishes over metal surfaces.
    - .2 13 mm birch plywood for finishes over wood surfaces.
    - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
    - .4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
    - .5 10 mm cedar plywood for finishes over wood surfaces.
  - .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.
  - .4 Test reports: submit certified test reports for paint from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
    - .1 Lead, cadmium and chromium: presence of and amounts.
    - .2 Mercury: presence of and amounts.
    - .3 Organochlorines and PCBs: presence of and amounts.
  - .5 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .6 Manufacturer's Instructions:
    - .1 Submit manufacturer's installation application instructions.
  - .7 Closeout Submittals: submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals include following:
    - .1 Product name, type and use.
    - .2 Manufacturer's product number.
    - .3 Colour numbers.
    - .4 MPI Environmentally Friendly classification system rating.

## **1.6 MAINTENANCE**

- .1 Extra Materials:
  - .1 Deliver to extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Section 01 78 00 - Closeout Submittals.
  - .2 Quantity: provide one - four litre can of each type and colour of primer. Identify colour and paint type in relation to established colour schedule and finish system.

- .3 Delivery, storage and protection: comply with Consultant requirements for delivery and storage of extra materials.

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

- .1 Packing, Shipping, Handling and Unloading:
  - .1 Pack, ship, handle and unload materials in accordance with Section 01 61 00 - Common Product Requirements and manufacturer's written instructions.
- .2 Acceptance at Site:
  - .1 Identify products and materials with labels indicating:
    - .1 Manufacturer's name and address.
    - .2 Type of paint or coating.
    - .3 Compliance with applicable standard.
    - .4 Colour number in accordance with established colour schedule.
- .3 Remove damaged, opened and rejected materials from site.
- .4 Storage and Protection:
  - .1 Provide and maintain dry, temperature controlled, secure storage.
  - .2 Store materials and supplies away from heat generating devices.
  - .3 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.
- .5 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .6 Keep areas used for storage, cleaning and preparation clean and orderly. After completion of operations, return areas to clean condition.
- .7 Remove paint materials from storage only in quantities required for same day use.
- .8 Fire Safety Requirements:
  - .1 Provide one 9 kg dry chemical fire extinguisher adjacent to storage area.
  - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
  - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.
- .9 Waste Management and Disposal:
  - .1 Separate waste materials for reuse/recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
  - .3 Collect and separate for disposal polystyrene packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan (WMP).
  - .4 Separate for reuse/recycling and place in designated containers steel, metal and plastic waste in accordance with Waste Management Plan (WMP).
  - .5 Place materials defined as hazardous or toxic in designated containers.

- .6 Handle and dispose of hazardous materials in accordance with Regional and Municipal regulations.
- .7 Ensure emptied containers are sealed and stored safely.
- .8 Unused paint materials must be disposed of at official hazardous material collections site as approved by Consultant.
- .9 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.
- .10 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
- .11 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
- .12 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground follow these procedures:
  - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
  - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
  - .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
  - .4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.
  - .5 Empty paint cans are to be dry prior to disposal or recycling (where available).
- .13 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
- .14 Set aside and protect surplus and uncontaminated finish materials. Deliver to or arrange collection by employees, individuals, or organizations for verifiable re-use or re-manufacturing.

## **1.8**

### **SITE CONDITIONS**

- .1 Heating, Ventilation and Lighting:
  - .1 Provide heating facilities to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
  - .2 Provide continuous ventilation for seven days after completion of application of paint.
  - .3 Coordinate use of existing ventilation system with Consultant and ensure its operation during and after application of paint as required.
  - .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
  - .5 Provide minimum lighting level of 323 Lux on surfaces to be painted.

- .2 Temperature, Humidity and Substrate Moisture Content Levels:
  - .1 Unless pre-approved written approval by Specifying body, Paint Inspection Agency Authority and product manufacturer, perform no painting when:
    - .1 Ambient air and substrate temperatures are below 10 degrees C.
    - .2 Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.
    - .3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
    - .4 The relative humidity is under 85 % or when the dew point is more than 3 degrees C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 degrees C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
    - .5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
    - .6 Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand 'normal' adverse environmental factors.
  - .2 Perform painting work when maximum moisture content of the substrate is below:
    - .1 Allow new concrete and masonry to cure minimum of 28 days.
    - .2 15 % for wood.
    - .3 12 % for plaster and gypsum board.
  - .3 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
  - .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Surface and Environmental Conditions:
  - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
  - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
  - .3 Apply paint when previous coat of paint is dry or adequately cured.
- .4 Additional interior application requirements:
  - .1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Provide paint materials for paint systems from single manufacturer.
- .3 Only qualified products with E3 "Environmentally Friendly" rating are acceptable for use on this project.

- .4 Conform to latest MPI requirements for interior painting work including preparation and priming.
- .5 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.
- .6 Linseed oil, shellac, and turpentine: highest quality product from approved manufacturer listed in MPI Architectural Painting Specification Manual, compatible with other coating materials as required.
- .7 Provide paint products meeting MPI "Environmentally Friendly" E3 ratings based on VOC (EPA Method 24) content levels.
- .8 Use MPI listed materials having minimum E3 rating where indoor air quality (odour) requirements exist.
- .9 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids:
  - .1 Water-based, Water soluble and Water clean-up.
  - .2 Non-flammable, biodegradable.
  - .3 Manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
  - .4 Manufactured without compounds which contribute to smog in the lower atmosphere.
  - .5 Do not contain methylene chloride.
- .10 Formulate and manufacture water-borne surface coatings with no aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .11 Flash point: 61.0 degrees C or greater for water-borne surface coatings and recycled water-borne surface coatings.
- .12 Ensure manufacture and process of both water-borne surface coatings and recycled water-borne surface coatings does not release:
  - .1 Matter in undiluted production plant effluent generating 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to natural watercourse or sewage treatment facility lacking secondary treatment.
  - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to natural watercourse or a sewage treatment facility lacking secondary treatment.
- .13 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes to meet minimum "Environmentally Friendly" E2 rating.
- .14 Recycled water-borne surface coatings to contain 50 % post-consumer material by volume.
- .15 Recycled water-borne surface coatings must not contain:
  - .1 Lead in excess of 600.0 ppm weight/weight total solids.
  - .2 Mercury in excess of 50.0 ppm weight/weight total product.
  - .3 Cadmium in excess of 1.0 ppm weight/weight total product.
  - .4 Hexavalent chromium in excess of 3.0 ppm weight/weight total product.
  - .5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.

**2.2 COLOURS**

- .1 Colour schedule will be based upon selection of five base colours and three accent colours. No more than eight colours will be selected for entire project and no more than three colours will be selected in each area.
- .2 Selection of colours from manufacturers full range of colours.
- .3 Where specific products are available in restricted range of colours, selection 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.

**2.3 MIXING AND TINTING**

- .1 Perform colour tinting operations prior to delivery of paint to site. Obtain written approval from Consultant for tinting of painting materials.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.
- .4 Thin paint for spraying in accordance with paint manufacturer's instructions.
- .5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

**2.4 GLOSS/SHEEN RATINGS**

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

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

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

**2.5 INTERIOR PAINTING SYSTEMS**

- .1 Asphalt surfaces: zone/traffic marking of interior drive and parking areas:
  - .1 INT 2.1A - Latex zone/traffic marking finish.
- .2 Concrete vertical surfaces: including horizontal soffits:



- .1 INT 3.1A - Latex insert satin like finish (over sealer).
- .3 Concrete masonry units: smooth and split face block and brick:
  - .1 INT 4.2A - Latex insert satin like finish.
- .4 Structural steel and metal fabrications: columns, beams, joists:
  - .1 INT 5.1A - Quick dry enamel gloss finish.
- .5 Galvanized metal: doors, frames, railings, misc. steel, pipes, overhead decking, and ducts.
  - .1 INT 5.3A - Latex insert gloss level, finish G6.
- .6 Spray textured surfaces: ceilings:
  - .1 INT 9.1A - Latex flat finish, spray application only.
- .7 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:
  - .1 INT 9.2A - Latex insert gloss level finish (over latex sealer).

## **2.6 SOURCE QUALITY CONTROL**

- .1 Perform following tests on each batch of consolidated post-consumer material before surface coating is reformulated and canned. Testing by laboratory or facility which has been accredited by Standards Council of Canada.
  - .1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.
  - .2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.
  - .3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

## **PART 3 EXECUTION**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

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

### **3.2 GENERAL**

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

### **3.3 EXAMINATION**

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Consultant damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.

- .2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .3 Maximum moisture content as follows:
  - .1 Stucco, plaster and gypsum board: 12 %.
  - .2 Concrete: 12 %.
  - .3 Clay and Concrete Block/Brick: 12 %.
  - .4 Wood: 15 %.

### **3.4 PREPARATION**

- .1 Protection:
  - .1 Protect existing building surfaces and adjacent structures from paint splatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Consultant.
  - .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
  - .3 Protect factory finished products and equipment.
  - .4 Protect passing pedestrians, building occupants and general public in and about the building.
- .2 Surface Preparation:
  - .1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.
  - .2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
  - .3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of Consultant.
- .3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths or compressed air.
  - .2 Wash surfaces with a biodegradable detergent and 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 drying thoroughly.
  - .5 Prepare surfaces for water-based painting; water-based cleaners should be used in place of organic solvents.
  - .6 Use trigger operated spray nozzles for water hoses.
  - .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.

- .4 Clean following surfaces with high pressure water washing: once Consultant's written approval has been received.
- .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pre-treatment as soon as possible after cleaning and before deterioration occurs.
- .6 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
  - .1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
  - .2 Apply wood filler to nail holes and cracks.
  - .3 Tint filler to match stains for stained woodwork.
- .7 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.
- .8 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes or by blowing with clean dry compressed air followed by vacuum cleaning.
- .9 Touch up of shop primers with primer as specified.
- .10 Do not apply paint until prepared surfaces have been accepted by Consultant.

### **3.5 APPLICATION**

- .1 Method of application to be as approved by Consultant. Apply paint by brush, roller, air sprayer or airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
  - .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
  - .2 Work paint into cracks, crevices and corners.
  - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
  - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
  - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Spray application:
  - .1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
  - .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
  - .3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.
  - .4 Brush out immediately all runs and sags.

- .5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.
- .4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.
- .5 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .7 Sand and dust between coats to remove visible defects.
- .8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.
- .9 Finish inside of cupboards and cabinets as specified for outside surfaces.
- .10 Finish closets and alcoves as specified for adjoining rooms.
- .11 Finish top, bottom, edges and cut-outs of doors after fitting as specified for door surfaces.

### **3.6 MECHANICAL/ELECTRICAL EQUIPMENT**

- .1 Paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as indicated.
- .2 Boiler room, mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.
- .3 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.
- .4 Touch up scratches and marks on factory painted finishes and equipment with paint as 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.
- .12 Do not paint interior transformers and substation equipment.

### **3.7 SITE TOLERANCES**

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

**3.8 FIELD QUALITY CONTROL**

- .1 Interior painting and decorating work shall be inspected by a Paint Inspection Agency (inspector) acceptable to the specifying authority and local Painting Contractor's Association. Painting contractor shall notify Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of project painting specification, plans and elevation drawings (including pertinent details) as well as a Finish Schedule.
- .2 Interior surfaces requiring painting shall be inspected by Paint Inspection Agency who shall notify Consultant and General Contractor in writing of defects or problems, prior to commencing painting work, or after prime coat shows defects in substrate.
- .3 Where "special" painting, coating or decorating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer shall provide as part of this work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to Consultant.
- .4 Standard of Acceptance:
  - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
  - .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
  - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.
- .5 Field inspection of painting operations to be carried out by independent inspection firm as designated by Consultant.
- .6 Advise Consultant when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .7 Cooperate with inspection firm and provide access to areas of work.
- .8 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Consultant.

**3.9 RESTORATION**

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

**END OF SECTION**

**PART 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 05 50 00 - Metal Fabrications.
- .2 Section 06 10 10 - Rough Carpentry
- .3 Section 06 40 00 - Architectural Woodwork
- .4 Section 09 21 16 - Gypsum Board Assemblies
- .5 Section 09 30 13 - Ceramic Tiling
- .6 Section 09 91 23 - Interior Painting
- .7 Section 10 28 10 – Toilet and Bath Accessories

**1.2 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM A167-2004, Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.
- .3 Canadian Standards Association (CSA International)
  - .1 CSA-B651-04, Accessible Design for the Built Environment.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .5 South Coast Air Quality Management District (SCAQMD), California State
  - .1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

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

- .2 Indicate fabrication details, plans, elevations, hardware, and installation details.
- .4 Samples:
  - .1 Submit duplicate 300 x 300 mm samples of panel showing finish on both sides, two finished edges and core construction.
  - .2 Submit duplicate representative samples of each hardware item, including brackets, fastenings and trim.
- .5 Quality control submittals: submit following in accordance with Section 01 45 00 - Quality Control.
  - .1 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.
- .6 Closeout Submittals:
  - .1 Provide maintenance data for plastic laminate for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

#### **1.4 QUALITY ASSURANCE**

- .1 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section and on-site installation, with contractor's representative and Departmental Representative in accordance with Section 01 32 16.07 - Construction Progress Schedule - Bar (GANTT) Chart to:
  - .1 Verify project requirements.
  - .2 Review installation and substrate conditions.
  - .3 Co-ordination with other building subtrades.
  - .4 Review manufacturer's installation instructions and warranty requirements.

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

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Protect finished laminated plastic surfaces during shipment and installation. Do not remove until immediately prior to final inspection.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Remove only in quantities required for same day use.
  - .3 Store and protect asphalt shingles from nicks, scratches, and blemishes.
  - .4 Replace defective or damaged materials with new.

#### **1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse/recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

- .2 Develop a waste reduction plan for the work covered in this section, in accordance with Section 01 74 21 - Management and disposal of construction / demolition waste.
- .3 Collect and separate all paper packaging materials, plastic, polystyrene, corrugated cardboard and place them in appropriate on-site bins for recycling in accordance with Waste Reduction Plan.
- .4 Packaging waste management: collect all packaging waste for reuse/recycling/return of pallets, boxes, padding, other packaging waste, to manufacturer, as per Waste Reduction Plan and according to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **1.7 WARRANTY**

- .1 For work part of section 10 21 13.19 – Plastic Toilet Compartments, warranty goes from 12 months to 60 months.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Solid laminated plastic shower partitions, anchored to floor and wall, for shower cubicles and dressing rooms by Decolam Inc.
- .2 Solid laminated plastic: to CAN3-A172-M79, self-supporting, 19 mm (3/4 inches) thick, finish and colour selected by Departmental Representative.
- .3 Laminated Plastic Sheets: to CAN3-0188.1 - M78 standard type general use, color and finish Consultant's choice.
- .4 Adhesive for laminate: contact adhesive to ONGC 71-GP-20M.
- .5 Stainless steel sheet metal: to ASTM A167-82, Type 304 with brushed finish.
- .6 Sealer: in accordance with 07 92 00 – Joint sealants.
- .7 Headrails: tubular stainless steel dimensions recommended by manufacturer for abuse-resistant sturdy usage.
- .8 Pilaster shoe: 0.8 mm stainless steel, nonferrous metal, height recommended by manufacturer for abuse resistant sturdy usage.
- .9 Attachment: stainless steel tamper proof type screws and bolts.
- .10 Provide suspended channel support for ceiling hung partitions in accordance with Section 05 50 00 - Metal Fabrications.

### **2.2 COMPONENTS**

- .1 Hinges:



- .1 Heavy duty, non-lubricating and nylon bushings.
- .2 Material/finish: stainless steel sturdy casting.
- .3 Swing: inward
- .4 Return movement: gravity
- .5 Adjustable door-open angle.
- .6 Emergency access feature.
- .2 Latch set: built-in, combination latch, door-stop, keeper and bumper, stainless steel, emergency access feature.
- .3 Wall and connecting brackets: stainless steel extrusion or casting.
- .4 Coat hook: combination hook and rubber door bumper, stainless steel.
- .5 Door pull: Barrier-free type suited for out swinging doors, stainless steel.
- .6 Top brace: extruded aluminum with clear anodized finish anti-seize type.
- .7 Stainless steel sheet: to ASTM A167-82, type 304 with brushed finish.
- .8 Fasteners: exposed screws: ordinary or tamper proof. Ordinary screws will be stainless steel and male/female type for hinges. Tamper proof screws will be stainless steel, type 410, for better hardness.
- .9 Sealant: water repellent or glue recommended by manufacturer of laminate.
- .10 Black polypropylene felt embedded on either side of partition (cover-view or talus)

### **2.3 FABRICATION**

- .1 Doors and panels: 25 mm thick, solid plastic laminate panels, to sizes indicated on drawings.
- .2 Pilasters: 32 mm thick, constructed same as door, to sizes recommended by manufacturer, for abuse-resistant sturdy usage.
- .3 Laminate plastic to core material ensuring core and laminate profiles coincide to provide continuous support and bond over entire surface.
- .4 Provide formed and closed edges for doors, panels and pilasters.
  - .1 Mitre and weld corners and grind smooth.
- .5 Provide internal reinforcement at areas of attached hardware and fittings.
  - .1 Temporarily mark location of reinforcement for grab bars and benches.

### **2.4 FINITION**

- .1 Steel parts must be cleaned, rid of grease and neutralized with a treatment product containing phosphate or chromate.
- .2 Doors, jambs , partitions and benches must be same color.

## **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**

- .1 Ensure supplementary anchorage, if required, is in place.
- .2 Do work in accordance with CSA-B651.

### **3.3 ERECTION**

- .1 Partition erection:
  - .1 Install partitions secure, plumb and square.
  - .2 Leave 12 mm space between wall and panel or end pilaster.
  - .3 Anchor mounting brackets to masonry or concrete surfaces using screws and shields: to hollow walls using bolts and toggle type anchors, to steel supports with bolts in threaded holes.
  - .4 Attach panel and pilaster to brackets with through type sleeve bolt and nut.
  - .5 Provide for adjustment of floor variations with screw jack through steel saddles made integral with pilaster. Conceal floor fixings with stainless steel shoes.
  - .6 Provide templates for locating threaded studs through finished ceilings.
  - .7 Equip each door with hinges, latch set, and each stall with coat hook mounted on door, mounting heights 1500 mm. Adjust and align hardware for proper function. Set door open position at 90 degrees from closed position. Install door bumper on wall.
  - .8 Equip out swinging doors with door pulls on inside of door in accordance with CSA-B651.
  - .9 Install hardware.
- .2 Floor supported and overhead braced partition erection:
  - .1 Attach pilasters to floor with pilaster supports and level, plumb, and tighten installation with levelling device.
  - .2 Secure pilaster shoes in position.
  - .3 Secure headrail to pilaster face with not less than two fasteners per face.
  - .4 Set tops of doors parallel with overhead brace when doors are in closed position.
- .3 Screen erection for urinal stalls/ entrance:
  - .1 Provide urinal stall/ entrance screens consisting of panel as indicated.
  - .2 Anchor screen panels to walls with 2 appropriate panel brackets.

**3.4 ADJUSTMENTS**

- .1 Adjust doors and bolts so as to obtain optimal performance.
- .2 Lubricate hardware parts and other moving parts.

**3.5 FIELD QUALITY CONTROL**

- .1 Verifications carried out on site by manufacturer.
  - .1 Manufacturer should make recommendations on product use and make periodic visits to verify whether installation was performed according to recommendations.

**3.6 CLEANING**

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

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 04 22 00 – Concrete Unit Masonry
- .2 Section 09 91 23 – Interior Painting
- .3 Section 09 67 00.01 – Epoxy Flooring – EP1
- .4 Section 09 67 00.02 – Epoxy Flooring – EP3
- .5 Section 09 67 00.03 – Epoxy Flooring – EP2
- .6 Section 09 67 00.04 – Epoxy Flooring – EP4
- .7 Section 09 67 00.05 – Epoxy Wall Covering – M5
- .8 Section 09 72 00 – Special Wall Coverings

**1.2 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM A653/A653M-01a, Standard Specification for Steel Sheet, Zinc-Coated, (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.81-M90, Air Drying and Baking Alkyd Primer for Vehicles and Equipment.
  - .2 CAN/CGSB-1.88-92, Gloss Alkyd Enamel, Air Drying and Baking.
  - .3 CAN/CGSB-1.104-M91, Semigloss Alkyd, Air Drying and Baking Enamel.
- .3 Canadian Standards Association (CSA International)
  - .1 CSA-G40.20-04/G40.21-F02, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2 CAN/CSA-G164-M92(C2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3 CSA W59-F03, Welded Steel Construction (Metal Arc Welding).
- .4 Green Seal Environmental Standards
  - .1 Standard GC-03-93, Anti-Corrosive Paints.
  - .2 Standard GS-11-97, Architectural Paints.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .6 South Coast Air Quality Management District (SCAQMD), California State
  - .1 SCAQMD Rule 1113-04, Architectural Coatings.
- .7 The Master Painters Institute (MPI)
  - .1 Architectural Painting Specification Manual - February 2004.
    - .1 MPI # 76, Quick Dry Alkyd Metal Primer.
    - .2 MPI # 81, Machinery Enamel.

.3 MPI # 96, Quick Dry Enamel Gloss.

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

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature for wire mesh partitions or components, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit two copies WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 29.06 – Health and Safety.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Quebec in Canada.
  - .2 Indicate partition panel modules and types, materials, gauges, finishes, door and other openings, hardware, fastening methods to adjacent structure, ceiling details, and assembly methods.
- .4 Samples:
  - .1 Submit duplicate 300 x 300 mm samples of each type partition and colour and finish on actual base metal.
  - .2 Sample to show basic construction, door construction, hardware, and finishes.
  - .3 Erect trial assembly of at least two modules of each type partition, on site where directed by Consultant.
- .5 Quality control submittals: submit following in accordance with Section 01 45 00 - Quality Control.
  - .1 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.

### **1.4 ACCEPTABLE MATERIAL OR PRODUCTS**

- .1 When materials or products are prescribed by their brand, consult Instructions to Tenderers to know procedures concerning request for approval of materials or substitutes.

### **1.5 QUALITY ASSURANCE**

- .1 Mock-ups:
  - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
  - .2 Erect one of each type door and two of each type partition panel.
  - .3 Allow 24 hours for inspection of mock-up by Consultant before proceeding with work.
  - .4 When accepted, mock-up will demonstrate minimum standard for this work.
  - .5 Mock-up may remain as part of finished work.
- .2 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section, with Consultant in accordance with 01 32 16.07 - Construction Progress Schedule - Bar (GANTT) Chart to:
  - .1 Verify project requirements.

- .2 Review installation and substrate conditions.
- .3 Co-ordination with other building subtrades.
- .4 Review manufacturer's installation instructions and warranty requirements.

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

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials level off ground, indoors, in a dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Only right quantities of materials/equipment to be used on the day must leave the storage area
  - .3 Store and protect asphalt shingles from nicks, scratches, and blemishes.
  - .4 Replace defective or damaged materials with new.

## **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Partition mesh system: according to 'Directive on Physical Security for Controlled Substances Requirements' by Health Canada:
  - .1 Welded mesh: metal, diamond shaped 25 mm x 50 mm, 3.5 mm diameter laminated steel mesh, floor to ceiling.
  - .2 Frame: steel angle 32 mm x 32 mm x 2.7 mm
  - .3 Jamb: hollow steel tubes, square section, 50 mm x 50 mm, backing at least 1.52 mm thick.
  - .4 Anchor clips: brackets and fasteners: Secure anti-theft.
  - .5 Finish: powder coating.
  - .6 Color: to be chosen by Architect among full range of colors offered by manufacturer.

- .7 Hinged doors: manufactured in same way as the panels, reinforced, pre-fitted with frame.
  - .1 Hinged door hardware parts: door stop, latch, three hinges, reinforcement element to attach panic bar, and panic bar 98EO by Von Duprin, finish 626
- .8 Sliding doors: manufactured in same way as panels, reinforced, pre-fitted with frame.
  - .1 Sliding doors must be fitted with the following:
    - .1 box type slide and automatic closure withstanding load of 135 kg, galvanized steel 1.6 mm thick.
    - .2 suspensions each withstanding load of 70 kg, consisting of four (4) shaped bearings, galvanized steel, 54 mm diameter, cement ball type, mounted in forged cadmium-plated steel insert, and a suspension bolt 16 mm diameter for door height adjustment.
    - .3 three (3) suspensions per door.
    - .4 guides, stops, latch and lockout, monitoring contact model 3287 by Sargent.
- .9 Acceptable Products: Cogan Partitions by Cogan Wire and Metal Products Ltd.

## **2.2 ACCESSORIES**

- .1 Master Key Systems, Deadlocks and Locksets: refer to Section 08 71 00 - Door Hardware and to manufacturer's instructions.

## **2.3 FABRICATION**

- .1 Panels consisting of wire mesh:

Modular panels manufactured in workshop designed to be installed between jambs with all components, accessories, hardware and fasteners.

## **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 ERECTION**

- .1 Install mesh enclosures and doors in accordance with manufacturer's printed instructions.
- .2 Erect enclosures plumb, level, straight, rigidly supported, and securely fastened to abutting surfaces, free from superimposed loads.
- .3 Fix to masonry and concrete using lag bolts and shields; to hollow walls using bolts and toggle type anchors; to steel supports with bolts in threaded holes or spot welds.
  - .1 Locate fasteners on interior side where possible for maximum security.
- .4 Install doors and adjust for proper closing, locking and smooth operation.
  - .1 Mount sliding doors on interior side of enclosed area.

**3.3 CLEANING**

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

**END OF SECTION**



**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 06 10 10 – Structural Carpentry
- .2 Section 09 21 16 – Gypsum Board Assemblies
- .3 Section 09 77 00 – Special Wall Coverings
- .4 Section 09 91 23 – Exterior Painting
- .5 Section 10 21 13.19 – Laminate Toilet Partitions

**1.2 REFERENCES**

- .1 ASTM International
  - .1 ASTM A167-99(2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
  - .2 ASTM B456-03, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
  - .3 ASTM A653/A653M-09, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .4 ASTM A924/A924M-09, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.81-M90, Air Drying and Baking Alkyd Primer for Vehicles and Equipment.
  - .2 CAN/CGSB-1.88-92, Gloss Alkyd Enamel, Air Drying and Baking.
  - .3 CGSB 31-GP-107MA-90, Non-inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.
- .3 CSA International
  - .1 CAN/CSA-B651-F04, Accessible Design for the Built Environment.
  - .2 CAN/CSA-G164-M92(C2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Provide manufacturer's printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Quebec, Canada.
  - .2 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, as well as building-in details of anchors for grab bars.

- .4 Samples:
  - .1 Submit samples.
  - .2 Samples will be returned for inclusion into work.
- .5 Sustainable Standards Certification:
  - .1 Low-Emitting Materials: submit listing of laminate adhesives used in building, verifying that they contain no urea-formaldehyde.

#### **1.4 CLOSEOUT SUBMITTALS**

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

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

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

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

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

#### **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

**1.8 WARRANTY**

- .1 For work subject to section 10 28 10 - Toilet and Bath Accessories, 12 months warranty period is extended to 120 months.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- .1 Sheet steel: to ASTM A653/A653M with ZF001 designation zinc coating.
- .2 Stainless steel sheet metal: to ASTM A167, Type 304 with # 4 finish.
- .3 Sustainability Characteristics:
  - .1 Laminate Adhesives:
    - .1 Urea Formaldehyde Free.
- .4 Stainless steel tubing: Type 304, commercial grade, seamless welded 1.2 mm wall thickness.
- .5 Fasteners: concealed screws and bolts hot dip galvanized, exposed fasteners to match face of unit. Expansion shields fibre, lead or rubber as recommended by accessory manufacturer for component and its intended use.

**2.2 COMPONENTS**

- .1 Soap dispenser: stainless steel lid assembly, tamper proof filler lock, mounted, capacity 1.18 l.
  - .1 Acceptable Products: Model B-4112 by Bobrick Washroom Equipment Inc.
- .2 Toilet tissue dispenser: double roll type, stainless steel, mounted.
  - .1 Acceptable Products: Model B-4288 by Bobrick Washroom Equipment Inc.
- .3 Grab bars: 32 mm diameter tubing of stainless steel, 1.6 mm wall thickness, and 85 mm diameter wall flanges, concealed screw attachment, welded to tubular bar. Grab bar material and anchorage to withstand downward pull of 2.2 kN.
  - .1 Acceptable Products: Model B-5806.99 by Bobrick Washroom Equipment Inc.
- .4 Paper towel dispenser and waste container: stainless and semi-recessed.
  - .1 Acceptable Products: Model B-3942 complete with Towelmate and Linermate accessories by Bobrick Washroom Equipment Inc.
- .5 Towel hooks: stainless steel, type 304, satin finish.
  - .1 Acceptable Products: Model B-233 by Bobrick Washroom Equipment Inc.
- .6 Feminine napkin disposal bin: stainless steel, type 304.
  - .1 Acceptable Products: Model B-4354 by Bobrick Washroom Equipment Inc. for bins mounted on toilet partitions.
  - .2 Acceptable Products: Model B-4353 by Bobrick Washroom Equipment Inc. for bins mounted on drywalls.
- .7 Mirrors: wall mounted units, fixed, 6 mm thick, with stainless steel frame.

- .1 Acceptable Products: Model B-165 1830 or dimensions as per indications by Bobrick Washroom Equipment Inc.
- .2 Acceptable Products: Tilt- Mirror, Model B-293 1830 or dimensions as per indications by Bobrick Washroom Equipment Inc.
- .8 Shower rods:
  - .1 Type 1 – For shower cubicles: stainless 25 mm diameter 1 mm wall thickness steel tubing required length 36” with satin chrome finished flanges, concealed mounting clamps, 7 shower curtain hooks.
    - .1 Acceptable Products: Tilt- Mirror, Model B-293 1830 or dimensions as per indications by Bobrick Washroom Equipment Inc.
  - .2 Type 2 – For locker rooms: shower rod, superior industrial strength stainless steel tubing, 1 1/4" diameter, size 18.
    - .1 Acceptable Products: Model 1204 by American Specialties Inc.
- .9 Hooks: stainless steel, type 304, 2 mm diameter. To be used with 25 and 32 mm diameter shower curtain rods.
  - .1 Acceptable Products: stainless steel, model 204-1 by Bobrick Washroom Equipment Inc.
- .10 Shower curtains: 0.2 mm thick vinyl, opaque white, matt finish, anti-bacterial fire resistive self-extinguishing. Washers in brass alloy, nickel plated along top. Bottom and sides will be hemmed. Size: full height x full width.
  - .1 Acceptable Products: vinyl shower curtains by Gary Manufacturing or approved equivalent.

### **2.3 FABRICATION**

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

### **2.4 FINISHES**

- .1 Manufacturer's or brand names on face of units not acceptable.

**PART 3 EXECUTION**

**3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrates and surfaces to receive toilet and bathroom accessories previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's instructions prior to toilet and bathroom accessories installation.
- .2 Inform Consultant of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied.

**3.2 INSTALLATION**

- .1 Install and secure accessories rigidly in place as follows:
  - .1 Stud walls: install steel back-plate to stud prior to plaster or drywall finish. Provide plate with threaded studs or plugs.
  - .2 Hollow masonry units, existing plaster or drywall: use toggle bolts drilled into cell or wall cavity.
  - .3 Solid masonry, marble, stone or concrete: use bolt with lead expansion sleeve set into drilled hole.
  - .4 Toilet and shower compartments: use male to female through bolts.
- .2 Install grab bars on built-in anchors provided by [bar manufacturer].
- .3 Use tamper proof screws/bolts for fasteners.
- .4 Fill units with necessary supplies shortly before final acceptance of building.

**3.3 LISTS AND TABLES**

Place accessories where indicated in accordance with following requirements.

- .1 Towel hooks: provide one per toilet and per shower. Mounting height: 1400 mm from covered floor.
- .2 Mirrors: where indicated. Mounting height: 1000 mm from covered floor.
- .3 Shower curtain rods: where indicated. Mounting height: 2210 mm from covered floor.

**3.4 ADJUSTING**

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

**3.5 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse/ recycling in accordance with Section 01 74 21 - Construction.

- .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**3.6 PROTECTION**

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

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Division 1 – General Requirements
- .2 Section 01 47 15 – Sustainable Requirements - Construction.
- .3 Section 06 10 00.01 – Rough Carpentry (Abridged)
- .4 Section 07 92 10 – Joint Sealants

**1.2 REFERENCES**

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-44.40-01, Steel Clothing Locker.
- .2 American Society for Testing and Materials (ASTM)
  - .1 A1008 - Standard Specification for Steel Sheet, Carbon, Cold-Rolled, Commercial Quality.
  - .2 ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit submittals in accordance with Division 1 – General Requirements.
- .2 Product Data:
  - .1 Provide manufacturer's printed product literature and data sheets for metal lockers and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Quebec in Canada.
  - .2 Indicate on drawings: type and class of locker, thicknesses of metal, fabricating and assembly methods, assembled banks of lockers, tops, rods, hooks, shelves, bases, trim, numbering, filler panels, end/back panels, doors, handles, locking method, ventilation method, finishes.
- .4 Samples:
  - .1 Submit duplicate 50 x 50 mm samples of colour and finish on actual base metal.
  - .2 Samples will be returned for inclusion into work.

**1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Division 1 and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements:
  - .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect metal lockers from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

**1.5 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort and recycle waste in accordance with 01 74 21 – Construction/demolition waste management and disposal.
- .2 Develop a waste reduction plan for work subject to this section, in accordance with 01 74 21 - Construction/demolition waste management and disposal.
- .3 Retrieve and sort all the packaging materials in paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Packaging waste management: retrieve packaging waste for the purpose of recycle/ reuse and recovery of pallets, crates, padding, and other materials of packaging by their manufacturer, in accordance with waste reduction plan guidelines and with section 01 74 21 - Construction/demolition waste management and disposal.

**Part 2 Products**

**2.1 MANUFACTURED UNITS**

- .1 Lockers: to CAN/CGSB-44.40, Type 1-Single full-height locker, Class 1 - One complete locker.
  - .1 Size: 12 " wide x 18 " mm deep x 72 " mm high, steel thickness
  - .2 Assembly: welded construction.
  - .3 Top: flat
  - .4 Color: to be selected by Architect among full range of colors offered by manufacturer.
  - .5 Acceptable Product: Emperor Model as manufactured by Hadrian or equivalent approved by Architect.
- .2 Lockers: large size, to CAN/CGSB-44.40, Type 1-Single full-height locker.
  - .1 Size: 32 " wide x 24 " deep x 72 " high.
  - .2 Assembly: welded construction.
  - .3 Top: flat
  - .4 Color: to be selected by Architect among full range of colors offered by manufacturer.
  - .5 Acceptable Product: Emperor Model as manufactured by Hadrian or equivalent approved by Architect.

**2.2 ACCESSORIES**

- .1 Options: to CAN/CGSB-44.40, hanger rods, steel base, steel end panels, steel trim including corner angles, jamb trim, fillers, number plates, coat hooks in chromium finish.

**2.3 BENCHES**

- .1 Fixed bench with tubular steel pedestal 1-1 / 2 " dia. x 16-1 / 4 " tall with steel flanges size 10 welded at each end.
  - .1 Colour: To be selected by Architect from full range of colors offered by manufacturer.
  - .2 Horizontal surfaces in solid plastic laminate 9 1/2 "x 1-1 / 4" thick x 6'- 0" length.
  - .3 Pedestal minimum spacing: 4'- 0 "c / c
  - .4 Acceptable Product: As manufactured by ASI Storage Solutions Inc., or equivalent approved by Architect.



**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates and surfaces to receive metal lockers previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's instructions prior to metal locker installation.
- .2 Inform Consultant of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied.

**3.2 INSTALLATION**

- .1 Assemble and install lockers in accordance with manufacturer's written instructions.
- .2 Securely fasten lockers to grounds and nailing strips.
- .3 Install wall trim around recessed locker banks.
- .4 Install filler panels (false fronts) where indicated and where obstructions occur.
- .5 Install finished end panels to exposed ends of locker banks.
- .6 Install locker numbers.
- .7 Secure horizontal surfaces of benches and pedestals and anchor to floor with fasteners suitable for floor type.

**3.3 ADJUSTING**

- .1 Adjust metal lockers for correct function and operation in accordance with manufacturer's written instructions.
- .2 Lubricate moving parts to operate smoothly and fit accurately.

**3.4 CLEANING**

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

**3.5 PROTECTION**

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

**END OF SECTION**

**Part 1      General**

**1.1      RELATED REQUIREMENTS**

- .1      Section 03 30 00 - Cast-in-Place Concrete.
- .2      Section 03 35 00 - Concrete Finishing.
- .3      Section 07 92 00 – Joint Sealants
- .4      Section 09 30 13 – Ceramic Tiling

**1.2      REFERENCES**

- .1      The Aluminum Association.
  - .1      Aluminum Standards and Data 2009 Metric SI.
- .2      American Society for Testing and Materials International, (ASTM).
  - .1      ASTM B117 - 09 Standard Practice for Operating Salt Spray (Fog) Apparatus.

**1.3      SUBMITTALS**

- .1      Product Data:
  - .1      Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations, in accordance with Section 01 33 00 – Submittal Procedures.
- .2      Shop Drawings:
  - .1      Submit required shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
  - .2      Shop drawings must indicate dimensions, as well as location and dimensions of recessed areas to receive products specified in this section.

**1.4      DELIVERY, STORAGE AND HANDLING**

- .1      Delivery, storage, packaging and handling
  - .1      Deliver, store and handle materials in accordance with Division 1 - General Requirements.
- .2      Storage and Protection Requirements:
  - .1      Finished exposed surfaces must be covered with a strong adhesive paper or a peelable plastic film before shipping items to site.
  - .2      Surfaces must be rid of their protective coverings only at time of final cleaning of site. Provide necessary instructions for removal of these protections.

**1.5      WASTE MANAGEMENT AND DISPOSAL**

- .1      Separate waste materials for reuse/recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

- .2 Develop a waste reduction plan for the work covered in this section, in accordance with Section 01 74 21 - Management and disposal of construction / demolition waste.
- .3 Collect and separate all paper packaging materials, plastic, polystyrene, corrugated cardboard and place them in appropriate on-site bins for recycling in accordance with Waste Reduction Plan.
- .4 Packaging waste management: collect all packaging waste for reuse/recycling/return of pallets, boxes, padding, other packaging waste, to manufacturer, as per Waste Reduction Plan and according to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Supply and install, at locations and dimensions indicated on drawings of entrance floor grilles
  - .1 Acceptable product: BA-1 model as per fabricated by Grillage Bolar (Canada) Inc. or equivalent approved by Architect.
- .2 All aluminum components are fabricated of 6061-T6 alloy.
- .3 Deflection under live load:
  - .1 Floor grilles to be conceived to accept a uniform load of 1794 Newton applied on a surface of 100 mm square in order to not exceed a deflection of 1/180" for a span of 1220 mm.
- .4 Perimeter frame to be extrusion in shape of "Z" as model "TT" by Bola, for installation on finished floor. At installation, a silicone joint must be applied between the frame and the finished flooring in order to prevent water infiltrations (by others).
- .5 Slats are "T" shape, dimensions: 9,5mm x 3 mm x 32 mm. Spacing between slats must not exceed 4.7 mm Total depth 35 mm, from finished floor.
- .6 Spacing of slats and retaining rods to comply with required load capacity. Grilles to be supplied in sections having dimensions easy to manipulate, to facilitate maintenance.
- .7 Frames to be furnished without a basin. A waterproofing coat shall be applied to concrete surfaces to prevent water infiltrations (by others)
- .8 Sections to have a friction coefficient of 1, 10 and a cleaning efficiency of 59%. Percentage of openings of 40%.
- .9 Deformation under lateral load must not exceed 11 (visual) after application of a maximum load of 6130 Newton (1380 pounds) at an angle of 45 degrees in relation to surface.
- .10 All grille sections to comply to ASTM B117 and able to be subjected to a salty fog for 1000 hours without noticeable changes.
- .11 The manufacturer must be able to confirm this data and provide to Architect necessary documents at the same time as the shop drawings.

**2.2 ACCESSORIES / OPTIONS**

- .1 Locks, GB - 46 (only) 4 per grille: all grille sections will be provided with GB-46 locks. GB-46 locks are made of galvanized steel and Teflon and are secured under grille sections by the manufacturer. The locks will be supplied with a special key in order to use (one per vestibule). All locks must be lubricated (BSRS 2000 water resistant grease) during final implementation of the grilles by General Contractor.
- .2 Lifting hooks: all grilles will be supplied with lifting hooks to facilitate handling sections without effort or risk of damaging grille surface (one per vestibule).
- .3 All frame sections will be provided with noise-blocking cushion as specified by manufacturer. Its function is to reduce noise and vibration that may occur between frame and grille.
- .4 Sealants: mold resistant silicone in accordance with Section 07 92 00 – Joint Sealants.

**2.3 BARRIER COATINGS**

- .1 Aluminium surfaces should be coated with a bituminous paint so as to be to be isolated from the following materials:
  - .1 Metals of different nature, with the exception of stainless steel, zinc and white bronze (in small quantities).
  - .2 Concrete, mortar and other masonry materials.
  - .3 Wood

**Part 3 Execution**

**3.1 INSTALLATION:**

- .1 Install entrance floor grilles square and level with the floor finish in order to permit easy handling of all sections. All sections of frame and intermediate supports must be level and firmly supported on all their length In order to prevent any long term deflection. Repair concrete screed around the grille once in place, with a non-retracting grout.
- .2 Grilles are to be installed only at the end of the works to protect them from any damage. All frames and basins must be cleaned before placing on them the grille sections in order to not exceed the level of the finished floor. All sound deafening cushions damaged during construction must be replaced before final inspection. Protect grille surfaces during construction. Install hinges or notches if required. Ensure all latches are locked if required, and apply grease.

**3.2 CLEANING**

- .1 Clean metal structures after implementation to rid of dust generated by construction or surrounding environment.
- .2 Upon completion remove surplus materials, rubbish, tools and equipment protections.

**END OF SECTION**