

SPECIFICATION

FACILITY BUILDING NEW CONSTRUCTION

**ISLAND LAKE MANITOBA
PROJECT NO. 13-168-01-14, IO 1003959**

TENDER

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Part 1 General

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract comprises construction of a new Facility Building in Island Lake Manitoba on Stevenson Island, as indicated in the contract documents, briefly summarized as follows:
 - .1 Construction of a new single story building with a two car detached garage.
 - .2 New gravel approach and parking lot, site clearing and grading and new landscaping.
 - .3 New water service and septic tank will be incorporated
 - .4 Construction of new Radio Tower see Volume 3 for Tower Construction Details.
 - .5 A One year duration of maintenance services, commencing at substantial completion is to be provided for the Mechanical Systems
 - .6 Two Post Commissioning visits are included and shall be timed to coincide with peak seasonal heating and cooling.
 - .7 For the duration of the construction phase: A subscription to a cloud-based project management site to provide a centralized and secure location for storage and sharing of contract documents and related communications. General Contractor to ensure that all sub-contractors are part of cloud system.

1.2 WINTER ROADS

- .1 All construction materials are to be transported to site on the winter roads during the 2014-2015 winter road system.
- .2 Contractor to ensure that all loads transported to site will comply with all winter road restrictions and regulations

1.3 CONTRACT METHOD

- .1 Refer to instructions to Invitation to Tender and all reference documents.
- .2 Work of Project which will be executed after completion of Work of this Contract, and which is specifically excluded from this Contract.
 - .1 Installation of the building security system.
- .3 Work of this project must include provisions for co-ordinating related work, identified in contract documents, for following principal items.
 - .1 Installation of conduit and other provisions for installation of security systems. This is to include site confirmation of final install location for security components and preparation of associated fixtures, frames, and finishes to receive installation of systems.

1.4 SEPARATE PRICES

- .1 Supply Separate price for construction of Radio Tower See Volume 3.

- .2 Supply separate price for Furniture and Metal Racking Section 12 50 00 Furniture, Section 10 53 13 Metal Storage Shelving and drawing F1.0

1.5 CONTRACTOR USE OF PREMISES

- .1 Unrestricted use of site until Substantial Performance.

1.6 EXISTING SERVICES

- .1 Notify, Consultant and utility companies of intended interruption of services and obtain required permission.
- .2 Provide alternative routes for personnel and vehicular traffic.
- .3 Establish location and extent of service lines in area of work before starting Work. Notify Consultant of findings.
- .4 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.
- .5 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.
- .6 Where unknown services are encountered, immediately advise Consultant and confirm findings in writing.
- .7 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .8 Record locations of maintained, re-routed and abandoned service lines.
- .9 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.7 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 ACCESS AND EGRESS

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

1.2 USE OF SITE AND FACILITIES

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

1.3 BUILDING SMOKING ENVIRONMENT

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

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 Project Supplementary Conditions

1.2 CASH ALLOWANCES

- .1 Include in Contract Price specified cash allowances.
- .2 Cash allowances, unless otherwise specified, cover net cost to Contractor subcontractor of services, products, construction machinery and equipment, freight, handling, unloading, storage installation and other authorized expenses incurred in performing Work.
- .3 Contract Price, and not cash allowance, includes Contractor's overhead and profit in connection with such cash allowance.
- .4 Contract Price will be adjusted by written order to provide for excess or deficit to each cash allowance.
- .5 Where costs under a cash allowance exceed amount of allowance, Contractor will be compensated for excess incurred and substantiated plus allowance for overhead and profit as set out in Contract Documents.
- .6 Include progress payments on accounts of work authorized under cash allowances in Consultant's monthly certificate for payment.
- .7 Prepare schedule jointly with Consultant and Contractor to show when items called for under cash allowances must be authorized by Consultant for ordering purposes so that progress of Work will not be delayed.
- .8 Amount of each allowance, for Work specified in respective specification Sections is as follows:
 - .1 Roof and Building Envelope Inspections \$20,000.00
 - .1 Minimum one roof inspections
 - .2 Minimum three air barrier inspections
 - .3 Minimum one blower door test
 - .2 Footing inspections \$8,000.00
 - .3 Concrete Testing \$25,000.00
 - .4 Masonry grout testing \$8,000.00
 - .5 Compaction testing \$15,000.00
 - .6 Manitoba Hydro \$45,000.00
 - .7 MTS \$50,000.00
 - .8 Sound Transmission testing \$10,000.00
 - .9 Painting Inspection: MPI approved painting inspector \$ 4,500.00
 - .10 Electrical Co-ordination Study: \$3,800.00

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 Schedule and administer project meetings throughout the progress of the work at the call of Departmental Representative or Consultant.
- .2 Prepare agenda for meetings.
- .3 Distribute written notice of each meeting four days in advance of meeting date to Departmental Representative Consultant.
- .4 Provide physical space and make arrangements for meetings.
- .5 Preside at meetings.
- .6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants and, affected parties not in attendance, Departmental Representative, Consultant.
- .8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 PRECONSTRUCTION MEETING

- .1 After award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities. Meeting will be held at the location and time designated by the departmental representative.
- .2 Senior representatives of Departmental Representative Consultant, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .4 Agenda to include:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Schedule of Work: in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.
 - .3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
 - .5 Delivery schedule of specified 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.
- .5 Coordinate filed engineering and layout work with consultant

1.3 PROGRESS MEETINGS

- .1 During course of Work at the discretion of the Consultant and Departmental Representative , schedule progress meetings monthly.
- .2 Contractor, major Subcontractors involved in Work Departmental Representative Consultant are to be in attendance.
- .3 Notify parties minimum 5 days prior to meetings.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 3 days after meeting.
- .5 Agenda to include the following:
 - .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.
 - .5 Review of off-site fabrication delivery schedules.
 - .6 Corrective measures and procedures to regain projected schedule.
 - .7 Revision to construction schedule.
 - .8 Progress schedule, during succeeding work period.
 - .9 Review submittal schedules: expedite as required.
 - .10 Maintenance of quality standards.
 - .11 Review proposed changes for affect on construction schedule and on completion date.
 - .12 Other business.

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 Departmental Representative DCC Representative 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.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Departmental Representative and Consultant 10 within 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 and Consultant 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 As per the main contract documents

1.5 MASTER PLAN

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

1.6 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 Backfill.
 - .7 Building footings.
 - .8 Structural Steel.
 - .9 Siding and Roofing.
 - .10 Interior Architecture (Walls, Floors and Ceiling).
 - .11 Plumbing.
 - .12 Lighting.
 - .13 Electrical.
 - .14 Piping.
 - .15 Controls.

- .16 Heating, Ventilating, and Air Conditioning.
- .17 Millwork.
- .18 Fire Systems.
- .19 Testing and Commissioning.
- .20 Supplied equipment long delivery items.

1.7 PROJECT SCHEDULE REPORTING

- .1 Update Project Schedule on bi-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 Weather related delays with their remedial measures will be discussed and negotiated.

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 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 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 Province of Canada.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 7 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.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .9 After Consultant's review, distribute copies.
- .10 Submit electronic copies 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.

- .11 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative DCC Representative 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 accord with specified requirements.
 - .2 Testing must have been within 3 years of date of contract award for project.
- .12 Submit 6 electronic copies 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.
- .13 Submit electronic copies of manufacturers 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.
- .14 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Consultant.
- .15 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .16 Submit 6 copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Consultant.
- .17 Delete information not applicable to project.
- .18 Supplement standard information to provide details applicable to project.
- .19 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

1.3**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 digital photography in jpg format, fine resolution monthly with progress statement and 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: as directed 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 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Province of Manitoba
 - .1 The Workers Compensation Act RSM 1987 - Updated 2013.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
- .3 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports to authority having jurisdiction, and Consultant.
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 47 15 - Sustainable Requirements: Construction and Section 02 81 01 - Hazardous Materials.
- .7 Consultant will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to Consultant within 5 days after receipt of comments from Consultant.
- .8 Consultant's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Consultant.
- .10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.3 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to beginning of Work.
- .2 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.4 SAFETY ASSESSMENT

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

1.5 MEETINGS

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

1.6 REGULATORY REQUIREMENTS

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

1.7 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Consultant may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.8 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 .
- .3 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.9 COMPLIANCE REQUIREMENTS

- .1 Comply with The Workers Compensation Act, Workplace Safety Regulation, Manitoba.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.10 UNFORSEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, advise Safety Officer and follow procedures in accordance with Acts and Regulations of Province having jurisdiction and advise Consultant verbally and in writing.

1.11 POSTING OF DOCUMENTS

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

1.12 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Consultant.
- .2 Provide Consultant with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Consultant may stop Work if non-compliance of health and safety regulations is not corrected.

1.13 POWDER ACTUATED DEVICES

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

1.14 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

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.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

- .1 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements 01 35 43 - Environmental Procedures.
- .3 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review 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 and EPA 832/R-92-005, Chapter 3.
 - .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 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.
- .14 Pesticide treatment plan to be included and updated, as required.

1.3 FIRES

- .1 Fires and burning of rubbish on site is not permitted .
- .2 Where fires or burning is permitted, prevent staining or smoke damage to structures, materials or vegetation which is to be preserved.
 - .1 Restore, clean and return to new condition stained or damaged work.
- .3 Provide supervision, attendance and fire protection measures as directed.

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.
- .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 designated by Departmental Representative DCC Representative 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 directed by Consultant.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.8 NOTIFICATION

- .1 Departmental Representative or 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 Departmental Representative and Consultant of proposed corrective action and take such action for approval by Departmental Representative and or Consultant.
 - .1 Take action only after receipt of written approval by 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 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.
- .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

Part 1 General

1.1 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 BUILDING SMOKING ENVIRONMENT

- .1 No Smoking allowed on site.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 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 instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

1.2 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies will be engaged by Consultant for purpose of inspecting and/or testing portions of Work.
- .2 Allocated costs: to Section 01 21 00 - Allowances.
- .3 Provide equipment required for executing inspection and testing by appointed agencies.
- .4 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .5 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Consultant at no cost to Consultant. Pay costs for retesting and reinspection.

1.3 ACCESS TO WORK

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

1.4 PROCEDURES

- .1 Notify appropriate agency and 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 Departmental Representative and or 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 .

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.

1.7 TESTS AND MIX DESIGNS

- .1 Furnish test results and mix designs as requested.
- .2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by 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 acceptable to Departmental Representative and or Consultant.
- .3 Prepare mock-ups for Departmental Representative and 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 in preparing schedule fixing dates for preparation.
- .6 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

1.9 MILL TESTS

- .1 Submit mill test certificates as requested 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 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
- .2 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 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.

1.5 TEMPORARY HEATING AND VENTILATION

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- .2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
 - .1 Facilitate progress of Work.
 - .2 Protect Work and products against dampness and cold.
 - .3 Prevent moisture condensation on surfaces.
 - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.

- .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress.
- .5 Ventilating:
 - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
 - .4 Ventilate storage spaces containing hazardous or volatile materials.
 - .5 Ventilate temporary sanitary facilities.
 - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .6 Permanent heating system of building, not to be used when available. Be responsible for damage to heating system if use is permitted.
- .7 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
 - .1 Conform with applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes.
 - .5 Vent direct-fired combustion units to outside.
- .8 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.6 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 Departmental Representative.
- .4 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.
- .5 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Consultant provided that guarantees are not affected. Make good damage to electrical system caused by use under this Contract. Replace lamps which have been used for more than 3 months.

1.7 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 General Standards Board (CGSB)
 - .1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
 - .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-0121-M1978(R2003), Douglas Fir Plywood.
 - .3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
 - .4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.
- .3 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as of: May 14, 2004.

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 temporary stairs.

1.5 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.

1.6 CONSTRUCTION PARKING

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

1.7 SECURITY

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

1.8 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.

1.9 EQUIPMENT, TOOL AND MATERIALS STORAGE

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

1.10 SANITARY FACILITIES

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

1.11 CONSTRUCTION SIGNAGE

- .1 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.
- .2 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.

1.12 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.

1.13 CLEAN-UP

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

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

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 sediment and erosion control drawings sediment and erosion control plan, specific to site, that complies

- with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
- .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 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 enclosure using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m on centre. Provide two lockable truck gate. Maintain fence in good repair.
- .2 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.4 GUARD RAILS AND BARRICADES

- .1 Provide secure, rigid 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 FIRE ROUTES

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

1.9 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.

1.10 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 Be responsible for damage incurred due to lack of or improper protection.

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 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .2 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative and or Consultant reserves right to have such products or systems tested to prove or disprove conformance.
- .3 Cost for such testing will be born by Departmental Representative 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 responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .4 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative and or 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 Departmental Representative and 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, 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 Departmental Representative. 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 Departmental Representative and or 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 Be responsible for coordination and placement of openings, sleeves and accessories.

1.9 CONCEALMENT

- .1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
- .2 Before installation inform 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.
- .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 QUALIFICATIONS OF SURVEYOR

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

1.2 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 Departmental Representative and Consultant.
- .4 Report to Departmental Representative 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.

1.3 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 topsoilplacement and landscaping features.
- .4 Stake slopes and berms.
- .5 Establish pipe invert elevations.
- .6 Stake batter boards for foundations.
- .7 Establish foundation column locationsand floor elevations.
- .8 Establish lines and levels for mechanical and electrical work.

1.4 EXISTING SERVICES

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

1.5 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.

1.6 RECORDS

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 Record locations of maintained, re-routed and abandoned service lines.

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

1.3 PREPARATION

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

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

Part 2 Products

2.1 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.
- .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 and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .6 Dispose of waste materials and debris off site.
- .7 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .9 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .10 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .11 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.2 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.
- .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, foors.
- .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.

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 Class III: non-hazardous waste - construction renovation and demolition waste.
 - .2 Inert Fill: inert waste - exclusively asphalt and concrete.
 - .3 Waste Source Separation Program (WSSP): implementation and co-ordination of ongoing activities to ensure designated waste materials will be sorted into pre-defined categories and sent for recycling and reuse, maximizing diversion and potential to reduce disposal costs.
 - .4 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
 - .5 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
 - .6 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
 - .7 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
 - .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
 - .2 Returning reusable items including pallets or unused products to vendors.
 - .8 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
 - .9 Separate Condition: refers to waste sorted into individual types.
 - .10 Source Separation: act of keeping different types of waste materials separate beginning from the point they became waste.
 - .11 Waste Audit (WA): detailed inventory of estimated quantities of waste materials that will be generated during construction, demolition, deconstruction and/or renovation. Involves quantifying by volume/weight amounts of materials and wastes that will be reused, recycled or landfilled. Refer to Schedule A.
 - .12 Waste Management Co-ordinator (WMC) : contractor representative responsible for supervising waste management activities as well as co-ordinating required submittal and reporting requirements.
 - .13 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials generated by project. Specifies diversion goals, implementation and reporting procedures, anticipated results and responsibilities. Waste Reduction Workplan (Schedule B) information acquired from Waste Audit.
- .2 Reference Standards:

- .1 Canadian Construction Association (CCA)
 - .1 CCA 81-2001: A Best Practices Guide to Solid Waste Reduction.

1.2 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of [waste] [volatile materials] [mineral spirits] [oil] [paint thinner] into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
 - .1 Number and size of bins.
 - .2 Waste type of each bin.
 - .3 Total tonnage generated.
 - .4 Tonnage reused or recycled.
 - .5 Reused or recycled waste destination.
- .4 Remove materials on-site as Work progresses.
- .5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in the waste audit.

1.3 SCHEDULING

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

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 APPLICATION

- .1 Do Work in compliance with WRW and WSSP.
- .2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

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

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Construction/Demolition Waste

Management And Disposal

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- .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] [01 35 21 - LEED Requirements].
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
 - .2 Source separate materials to be reused/recycled into specified sort areas.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE REQUIREMENTS

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: Contractor : conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Departmental Representative and Consultant in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request Departmental Representative and Consultant's inspection.
 - .2 Departmental Representative and Consultant's Inspection:
 - .1 Departmental Representative and Consultant and Contractor to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
 - .3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Equipment and systems: tested, adjusted balanced and fully operational.
 - .4 Certificates required by Fire Commissioner Utility companies: submitted.
 - .5 Operation of systems: demonstrated to Owner's personnel.
 - .6 Commissioning of mechanical systems: and copies of final Commissioning Report submitted to Departmental Representative and Consultant.
 - .7 Work: complete and ready for final inspection.
 - .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Departmental Representative and Consultant, and Contractor.
 - .2 When Work incomplete according to Departmental Representative and Consultant, complete outstanding items and request re-inspection.

1.2 FINAL CLEANING

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-warranty Meeting:
 - .1 Convene meeting one week prior to contract completion with Departmental Representative and Consultant, in accordance with Section 01 31 19 - Project Meetings to:
 - .1 Verify Project requirements.
 - .2 Review warranty requirements manufacturer's installation instructions.
 - .2 Departmental Representative and 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.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

1.3 FORMAT

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

1.4 CONTENTS - PROJECT RECORD DOCUMENTS

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

1.5 AS -BUILT DOCUMENTS AND SAMPLES

- .1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative and 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.
 - .9 Electronic CAD, PDF

- .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 Departmental Representative and Consultant.

1.6 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Consultant .
- .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.

1.7 FINAL SURVEY

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

1.8 EQUIPMENT AND SYSTEMS

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

1.9 MATERIALS AND FINISHES

- .1 Building products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations.

- .1 Provide information for re-ordering custom manufactured products.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Additional requirements: as specified in individual specifications sections.

1.10 MAINTENANCE MATERIALS

- .1 Spare Parts:
 - .1 Provide spare parts, in quantities specified in individual specification sections.
 - .2 Provide items of same manufacture and quality as items in Work.
 - .3 Deliver to site ; place and store.
 - .4 Receive and catalogue items.
 - .1 Submit inventory listing to Departmental Representative.
 - .2 Include approved listings in Maintenance Manual.
 - .5 Obtain receipt for delivered products and submit prior to final payment.
- .2 Extra Stock Materials:
 - .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
 - .2 Provide items of same manufacture and quality as items in Work.
 - .3 Deliver to site ; place and store.
 - .4 Receive and catalogue items.
 - .1 Submit inventory listing to 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 site ; place and store.
 - .4 Receive and catalogue items.
 - .1 Submit inventory listing to Consultant.
 - .2 Include approved listings in Maintenance Manual.

1.11 DELIVERY, STORAGE AND HANDLING

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.

- .4 Store paints and freezable materials in a heated and ventilated room.
- .5 Remove and replace damaged products at own expense and for review by Departmental Representative and Consultant.

1.12 WARRANTIES AND BONDS

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Departmental Representative and Consultant approval.
- .3 Warranty management plan to include required actions and documents to assure that Departmental Representative and 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 Departmental Representative and 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 Departmental Representative to proceed with action against 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 SECTION INCLUDES

- .1 Equipment and systems.
- .2 Materials and finishes.
- .3 Spare parts.
- .4 Maintenance manuals.
- .5 Special tools.
- .6 Storage, handling and protection.

1.2 RELATED SECTIONS

- .1 Section 017800 - Closeout Submittals.
- .2 Section 014500 - Quality Control.

1.3 EQUIPMENT AND SYSTEMS

- .1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. 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. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .6 Provide servicing and lubrication schedule, and list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.
- .8 Include sequence of operation by controls manufacturer.

- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .10 Provide installed control diagrams by controls manufacturer.
- .11 Provide Contractor's coordination 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.
- .15 Additional requirements: As specified in individual specification sections.

1.4 MATERIALS AND FINISHES

- .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. 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 Building Envelope: include copies of drawings of building envelope components, illustrating the interface with similar or dissimilar items to provide an effective air, vapour and thermal barrier between indoor and outdoor environments. Include an outline of requirements for regular inspections and for regular maintenance to ensure that on-going performance of the building envelope will meet the initial building envelope criteria.
- .5 Additional Requirements: as specified in individual specifications sections.

1.5 SPARE PARTS

- .1 Provide spare parts, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to site; place and store.
- .4 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

1.6 MAINTENANCE MATERIALS

- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to site; place and store.
- .4 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

1.7 SPECIAL TOOLS

- .1 Provide special tools, in quantities specified in individual specification section.
- .2 Provide items with tags identifying their associated function and equipment.
- .3 Deliver to site; place and store.
- .4 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

1.8 STORAGE, HANDLING AND PROTECTION

- .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 to satisfaction of Consultant.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE REQUIREMENTS

- .1 Demonstrate scheduled operation and maintenance of equipment and systems to Owner's personnel two weeks prior to date of substantial performance.
- .2 Owner: provide list of personnel to receive instructions, and co-ordinate their attendance at agreed-upon times.
- .3 Preparation:
 - .1 Verify conditions for demonstration and instructions comply with requirements.
 - .2 Verify designated personnel are present.
 - .3 Ensure testing, adjusting, and balancing has been performed and equipment and systems are fully operational.
- .4 Demonstration and Instructions:
 - .1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, , servicing, and maintenance of each item of equipment at agreed upon times, at the designated location.
 - .2 Instruct personnel in phases of operation and maintenance using operation and maintenance manuals as basis of instruction.
 - .3 Review contents of manual in detail to explain aspects of operation and maintenance.
 - .4 Prepare and insert additional data in operations and maintenance manuals when needed during instructions.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit schedule of time and date for demonstration of each item of equipment and each system two weeks prior to designated dates, for Departmental Representative's and Consultant's approval.
- .3 Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.
- .4 Give time and date of each demonstration, with list of persons present.
- .5 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

1.3 QUALITY ASSURANCE

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

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 SUMMARY

- .1 Section Includes:
 - .1 This section is limited to portions of the Building Management Manual (BMM) provided to Departmental Representative and Consultant by Contractor.
- .2 Acronyms:
 - .1 BMM - Building Management Manual.
 - .2 Cx - Commissioning.
 - .3 HVAC - Heating, Ventilation and Air Conditioning.
 - .4 PI - Product Information.
 - .5 PV - Performance Verification.
 - .6 TAB - Testing, Adjusting and Balancing.
 - .7 WHMIS - Workplace Hazardous Materials Information System.

1.2 GENERAL REQUIREMENTS

- .1 Standard letter size paper 216 mm x 279 mm.
- .2 Methodology used to facilitate updating.
- .3 Drawings, diagrams and schematics to be professionally developed.
- .4 Electronic copy of data to be in a format accepted and approved by Departmental Representative and Consultant.

1.3 APPROVALS

- .1 Prior to commencement, co-ordinate requirements for preparation, submission and approval with Departmental Representative and Consultant.

1.4 GENERAL INFORMATION

- .1 Provide Consultant the following for insertion into appropriate Part and Section of BMM:
 - .1 Complete list of names, addresses, telephone and fax numbers of contractor, sub-contractors that participated in delivery of project - as indicated in Section 1.2 of BMM.
 - .2 Summary of architectural, structural, fire protection, mechanical and electrical systems installed and commissioned - as indicated in Section 1.4 of BMM.
 - .1 Including sequence of operation as finalized after commissioning is complete as indicated in Section 2.0 of BMM.
 - .3 Description of building operation under conditions of heightened security and emergencies as indicated in Section 2.0 of BMM.
 - .4 System, equipment and components Maintenance Management System (MMS) identification - Section 2.1 of BMM..

- .5 Information on operation and maintenance of architectural systems and equipment installed and commissioned - Section 2.0 of BMM.
- .6 Information on operation and maintenance of fire protection and life safety systems and equipment installed and commissioned - Section 2.0 of BMM.
- .7 Information on operation and maintenance of mechanical systems and equipment installed and commissioned - Section 2.0 of BMM.
- .8 Operating and maintenance manual - Section 3.2 of BMM.
- .9 Final commissioning plan as actually implemented.
- .10 Completed commissioning checklists.
- .11 Commissioning test procedures employed.
- .12 Completed Product Information (PI) and Performance Verification (PV) report forms, approved and accepted by Departmental Representative DCC Representative Consultant.
- .13 Commissioning reports.

1.5**CONTENTS OF OPERATING AND MAINTENANCE MANUAL**

- .1 For detailed requirements refer to Section 01 78 00 - Closeout Submittals.
- .2 Consultant to review and approve format and organization within 12 weeks of award of contract.
- .3 Include original manufactures brochures and written information on products and equipment installed on this project.
- .4 Record and organize for easy access and retrieval of information contained in BMM.
- .5 Include completed PI report forms, data and information from other sources as required.
- .6 Inventory directory relating to information on installed systems, equipment and components.
- .7 Approved project shop-drawings, product and maintenance data.
- .8 Manufacturer's data and recommendations relating: manufacturing process, installation, commissioning, start-up, O M, shutdown and training materials.
- .9 Inventory and location of spare parts, special tools and maintenance materials.
- .10 Warranty information.
- .11 Inspection certificates with expiration dates, which require on-going re-certification inspections.
- .12 Maintenance program supporting information including:
 - .1 Recommended maintenance procedures and schedule.
 - .2 Information to removal and replacement of equipment including, required equipment, points of lift and means of entry and egress.

1.6 SUPPORTING DOCUMENTATION FOR INSERTION INTO SUPPORTING APPENDICES

- .1 Provide Consultant supporting documentation relating to installed equipment and system, including:
 - .1 General:
 - .1 Finalized commissioning plan.
 - .2 WHMIS information manual.
 - .3 Approved "as-built" drawings and specifications.
 - .4 Procedures used during commissioning.
 - .5 Cross-Reference to specification sections.
 - .2 Architectural and structural:
 - .1 Inspection certificates, construction permits.
 - .2 Roof anchor log books.
 - .3 PV reports.
 - .3 Fire prevention, suppression and protection:
 - .1 Test reports.
 - .2 Smoke test reports.
 - .3 PV reports.
 - .4 Mechanical:
 - .1 Installation permits, inspection certificates.
 - .2 Piping pressure test certificates.
 - .3 Ducting leakage test reports.
 - .4 TAB and PV reports.
 - .5 Charts of valves and steam traps.
 - .6 Copies of posted instructions.
 - .5 Electrical:
 - .1 Installation permits, inspection certificates.
 - .2 TAB and PV reports.
 - .3 Electrical work log book.
 - .4 Charts and schedules.
 - .5 Locations of cables and components.
 - .6 Copies of posted instructions.
- .2 Assist Departmental Representative DCC Representative Consultant with preparation of BMM.

1.7 USE OF CURRENT TECHNOLOGY

- .1 Use current technology for production of documentation. Emphasis on ease of accessibility at all times, maintain in up-to-date state, compatibility with user's requirements.
- .2 Obtain Departmental Representative's and Consultant's approval before starting 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 Dangerous Goods: product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.
 - .2 Hazardous Material: product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.
 - .3 Hazardous Waste: hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.
- .2 Reference Standards:
 - .1 Canadian Environmental Protection Act,1999 (CEPA 1999)
 - .1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).
 - .2 Department of Justice Canada (Jus)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act) 1992, (c. 34).
 - .2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).
 - .3 Green Seal Environmental Standards (GS)
 - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
 - .2 GS-36-00, Commercial Adhesives.
 - .4 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
 - .5 National Research Council Canada Institute for Research in Construction (NRC-IRC)
 - .1 National Fire Code of Canada-2005.
- .3 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, Adhesive and Sealant Applications.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Construction Waste Management:
 - .1 Submit project Waste Management Plan Waste Reduction Workplan highlighting recycling and salvage requirements.

- .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50 75 % of construction wastes were recycled or salvaged
- .2 Low-Emitting Materials: submit listing of adhesives and sealants paints and coatings used in building, comply with VOC and chemical component limits or restrictions requirements.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.
 - .1 When exporting hazardous waste to another country, ensure compliance with Export and Import of Hazardous Waste and Hazardous Recyclable Materials Regulations.
- .4 Storage and Handling Requirements:
 - .1 Co-ordinate storage of hazardous materials Consultant and abide by internal requirements for labelling and storage of materials and wastes.
 - .2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.
 - .3 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada requirements.
 - .4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.
 - .1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.
 - .2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Consultant.
 - .5 Transfer of flammable and combustible liquids is prohibited within buildings.
 - .6 Transfer flammable and combustible liquids away from open flames or heat-producing devices.
 - .7 Solvents or cleaning agents must be non-flammable or have flash point above 38 degrees C.
 - .8 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.
 - .9 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.
 - .10 Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:

- .1 Store hazardous materials and wastes in closed and sealed containers.
- .2 Label containers of hazardous materials and wastes in accordance with WHMIS.
- .3 Store hazardous materials and wastes in containers compatible with that material or waste.
- .4 Segregate incompatible materials and wastes.
- .5 Ensure that different hazardous materials or hazardous wastes are stored in separate containers.
- .6 Store hazardous materials and wastes in secure storage area with controlled access.
- .7 Maintain clear egress from storage area.
- .8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.
- .9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.
- .10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.
- .11 When hazardous waste is generated on site:
 - .1 Co-ordinate transportation and disposal with Departmental Representative.
 - .2 Comply with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.
 - .3 Use licensed carrier authorized by provincial authorities to accept subject material.
 - .4 Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility it will accept material and it is licensed to accept this material.
 - .5 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.
 - .6 Only trained personnel handle, offer for transport, or transport dangerous goods.
 - .7 Provide photocopy of shipping documents and waste manifests to Consultant.
 - .8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide photocopy of completed manifest to Departmental Representative DCC Representative Consultant.
 - .9 Report discharge, emission, or escape of hazardous materials immediately to Departmental Representative Consultant and appropriate provincial authority. Take reasonable measures to control release.
- .12 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

- .13 Report spills or accidents immediately to Departmental Representative Consultant. Submit a written spill report to Departmental Representative Consultant within 24 hours of incident.

Part 2 Products

2.1 MATERIALS

- .1 Description:
 - .1 Bring on site only quantities hazardous material required to perform Work.
 - .2 Maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.
 - .3 Sustainability Characteristics:
 - .1 Adhesives and Sealants in accordance with Section 07 92 00 - Joint Sealants 01 35 21 - LEED Requirements.
 - .1 Adhesives and Sealants: maximum VOC limit g/L to SCAQMD Rule 1168 to GS-36.
 - .2 Primers Paints Coatings in accordance with manufacturer's recommendations for surface conditions and Section 09 91 23 - Interior Painting , 09 91 23.01 - Interior Re-Painting.
 - .1 Primer: maximum VOC limit 250 g/L to GS-11 to SCAQMD Rule 1113.
 - .2 Paints: maximum VOC limit 50 g/L to GS-11 to SCAQMD Rule 1113.

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 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 recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal
 - .1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.
 - .2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.
 - .3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.
 - .4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.

- .5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.
- .6 Dispose of hazardous wastes in timely fashion in accordance with applicable provincial regulations.
- .7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.
- .8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:
 - .1 Hazardous wastes recycled in manner constituting disposal.
 - .2 Hazardous waste burned for energy recovery.
 - .3 Lead-acid battery recycling.
 - .4 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 03 30 00, 03 35 05, 04 05 12.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-O86S1-05, Supplement No. 1 to CAN/CSA-O86-01, Engineering Design in Wood.
 - .3 CSA O121-M1978 (R2003), Douglas Fir Plywood.
 - .4 CSA O151-04, Canadian Softwood Plywood.
 - .5 CSA O153-M1980 (R2003), Poplar Plywood.
 - .6 CAN/CSA-O325.0-92(R2003), Construction Sheathing.
 - .7 CSA O437 Series-93(R2006), Standards for OSB and Waferboard.
 - .8 CSA S269.1-1975(R2003), Falsework for Construction Purposes.
 - .9 CAN/CSA-S269.3-M92 (R2003), Concrete Formwork, National Standard of Canada
- .2 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit shop drawings for formwork and falsework.
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province Manitoba of Canada.
- .3 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 47 15 - Sustainable Requirements: Construction and Section 02 81 01 - Hazardous Materials.
- .4 Co-ordinate submittal requirements and provide submittals required by Section 01 47 15 - Sustainable Requirements: Construction.
- .5 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts.
- .6 Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.

- .7 Indicate sequence of erection and removal of formwork/falsework as directed by Consultant.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Store and manage hazardous materials in accordance with Section 01 47 15 - Sustainable Requirements: Construction.
- .2 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01 47 21 - Construction/Demolition Waste Management and Disposal.
 - .2 Place materials defined as hazardous or toxic in designated containers.
 - .3 Divert unused form release material from landfill to an official hazardous material collections site as approved by the Owner.

Part 2 Products

2.1 MATERIALS

- .1 Materials and resources in accordance with Section 01 47 15 - Sustainable Requirements: Construction.
- .2 Do verification requirements in accordance with Section 01 47 17 - Sustainable Requirements: Contractor's Verification.
- .3 Formwork materials:
 - .1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O121, CAN/CSA-O86CSA O437 Series, CSA-O153.
 - .2 For concrete with special architectural features, use formwork materials to CSA-A23.1/A23.2.
 - .3 Rigid insulation board: to CAN/ULC-S701.
- .4 Tubular column forms: round, spirally wound laminated fibre forms, internally treated with release material.
 - .1 Spiral pattern to show in hardened concrete.
- .5 Form ties:
 - .1 For concrete not designated 'Architectural', use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.
 - .2 For Architectural concrete, use snap ties complete with plastic cones and light grey concrete plugs.
- .6 Form liner:
 - .1 Plywood: high density overlay Douglas Fir to CSA O121, Canadian Softwood Plywood to CSA O151, Poplar to CSA O153, T and G square edge, 19 mm thick.
- .7 Form release agent: biodegradable.

- .8 Form stripping agent: colourless mineral oil, biodegradable, free of kerosene, with viscosity between 70 and 110s Saybolt Universal 15 to 24 mm²/s at 40 degrees C, flashpoint minimum 150 degrees C, open cup.
- .9 Falsework materials: to CSA-S269.1.
- .10 Sealant: to Section 07 92 00 - Joint Sealants.

Part 3 Execution**3.1 FABRICATION AND ERECTION**

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

3.2 REMOVAL AND RESHORING

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
 - .1 7 days for walls and sides of beams.
 - .2 7 days for columns.
 - .3 7 days for beam soffits, slabs, decks and other structural members.
 - .4 3 days for footings and abutments.
- .2 Remove formwork when concrete has reached 70 % of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.
- .3 Provide necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.
- .4 Space reshoring in each principal direction at not more than 3000 mm apart.
- .5 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 03 30 00, 03 35 05, 04 05 1

1.2 REFERENCES

- .1 American Concrete Institute (ACI)
 - .1 SP-66-04, ACI Detailing Manual 2004.
- .2 ASTM International
 - .1 ASTM A82/A82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
 - .2 ASTM A143/A143M-07, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
 - .3 ASTM A185/A185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
 - .4 ASTM A775/A775M-07b, Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
- .3 CSA International
 - .1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A23.3-04(R2010), Design of Concrete Structures.
 - .3 CSA-G30.18-09, Carbon Steel Bars for Concrete Reinforcement.
 - .4 CSA-G40.20/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .5 CAN/CSA-G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .6 CSA W186-M1990 (R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .4 Reinforcing Steel Institute of Canada (RSIC)
 - .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice SP-66.
- .3 Shop Drawings:
 - .1 Submit drawings indicating the following:

- .1 Indicate placing of reinforcement and:
 - .1 Bar bending details, placement plans, clear cover, marks, spacing
 - .2 Lists.
 - .3 Quantities of reinforcement and grade of steel.
 - .4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Consultant, with identifying code marks to permit correct placement without reference to structural drawings.
- .2 Detail lap lengths and bar development lengths to CAN/CSA-A23.3, unless otherwise indicated.

1.4 QUALITY ASSURANCE

- .1 Submit in accordance with Section 01 45 00 - Quality Control and as described in PART 2 - SOURCE QUALITY CONTROL.
 - .1 Mill Test Report: upon request, provide the Consultant with certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning reinforcing work.
 - .2 Upon request submit in writing to the Consultant proposed source of reinforcement material to be supplied.

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 in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Substitute different size bars only if permitted in writing by Consultant.
- .2 Reinforcing steel: billet steel, grade 400, deformed bars to CSA-G30.18, unless indicated otherwise.
- .3 Reinforcing steel: weldable low alloy steel deformed bars to CSA-G30.18.
- .4 Cold-drawn annealed steel wire ties: to ASTM A82/A82M.
- .5 Deformed steel wire for concrete reinforcement: to ASTM A82/A82M.
- .6 Welded steel wire fabric: to ASTM A185/A185M.

- .1 Provide in flat sheets only.
- .7 Welded deformed steel wire fabric: to ASTM A82/A82M.
 - .1 Provide in flat sheets only.
- .8 Epoxy Coating of non-prestressed reinforcement: to ASTM A775/A775M.
- .9 Galvanizing of non-prestressed reinforcement: to CAN/CSA-G164, minimum zinc coating 610 g/m².
 - .1 Protect galvanized reinforcing steel with chromate treatment to prevent reaction with Portland cement paste.
 - .2 If chromate treatment is carried out immediately after galvanizing, soak steel in aqueous solution containing minimum 0.2% by weight sodium dichromate or 0.2% chromic acid.
 - .1 Temperature of solution equal to or greater than 32 degrees and galvanized steels immersed for minimum 20 seconds.
 - .3 If galvanized steels are at ambient temperature, add sulphuric acid as bonding agent at concentration of 0.5% to 1%.
 - .1 In this case, no restriction applies to temperature of solution.
 - .4 Chromate solution sold for this purpose may replace solution described above, provided it is of equivalent effectiveness.
 - .1 Provide product description as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
- .10 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.

2.2 FABRICATION

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

2.3 SOURCE QUALITY CONTROL

- .1 Upon request, provide Consultant with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to beginning reinforcing work.
- .2 Upon request inform the Consultant of proposed source of material to be supplied.

Part 3 Execution

3.1 PREPARATION

- .1 Galvanizing to include chromate treatment.
 - .1 Duration of treatment to be 1 hour per 25 mm of bar diameter.
- .2 Conduct bending tests to verify galvanized bar fragility in accordance with ASTM A143/A143M.

3.2 FIELD BENDING

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

3.3 PLACING REINFORCEMENT

- .1 Place reinforcing steel as indicated on placing drawings in accordance with CSA-A23.1/A23.2.
- .2 Use plain round bars as slip dowels in concrete.
 - .1 Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint.
 - .2 When paint is dry, apply thick even film of mineral lubricating grease.
- .3 Prior to placing concrete, obtain the Consultant's approval of reinforcing material and placement.
- .4 Ensure cover to reinforcement is maintained during concrete pour.

3.4 FIELD TOUCH-UP

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

3.5 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.

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 03 30 00, 03 35 05, 04 05 12

1.2 REFERENCES

- .1 Abbreviations and Acronyms:

- .1 Portland Cement: hydraulic cement, blended hydraulic cement and Portland-limestone cement.

- .1 Type GU, GUb and GUL - General use cement.
- .2 Type MS and MSb - Moderate sulphate-resistant cement.
- .3 Type MH, MHb and MHL - Moderate heat of hydration cement.
- .4 Type HE, HEb and HEL - High early-strength cement.
- .5 Type LH, LHb and LHL - Low heat of hydration cement.
- .6 Type HS and HSb - High sulphate-resistant cement.

- .2 Fly ash:

- .1 Type F - with CaO content less than 15%.
- .2 Type CI - with CaO content ranging from 15 to 20%.
- .3 Type CH - with CaO greater than 20%.

- .3 GGBFS - Ground, granulated blast-furnace slag.

- .2 Reference Standards:

- .1 ASTM International

- .1 ASTM C260/C260M-10a, Standard Specification for Air-Entraining Admixtures for Concrete.
- .2 ASTM C309-07, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- .3 ASTM C494/C494M-10a, Standard Specification for Chemical Admixtures for Concrete.
- .4 ASTM C1017/C1017M-07, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
- .5 ASTM D412-06ae2, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
- .6 ASTM D624-00(2007), Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.
- .7 ASTM D1751-04(2008), Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- .8 ASTM D1752-04a (2008), Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

- .2 CSA International
 - .1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA A283-06, Qualification Code for Concrete Testing Laboratories.
 - .3 CSA A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide testing and inspection results for review by Consultant and do not proceed without written approval when deviations from mix design or parameters are found.
- .3 Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in PART 3 - FIELD QUALITY CONTROL.
- .4 Concrete hauling time: provide for review by Consultant deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

1.4 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
- .2 Provide Consultant, minimum 4 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.
 - .1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.
- .3 Minimum 4 weeks prior to starting concrete work, provide proposed quality control procedures for review by Consultant on following items:
 - .1 Falsework erection.
 - .2 Hot weather concrete.
 - .3 Cold weather concrete.
 - .4 Curing.
 - .5 Finishes.
 - .6 Formwork removal.
 - .7 Joints.
- .4 Quality Control Plan: provide written report to Consultant verifying compliance that concrete in place meets performance requirements of concrete as established in PART 2 - PRODUCTS.
- .5 Sustainability Standards Certification:
 - .1 Construction Waste Management: provide copy of plan.

1.5 DELIVERY, STORAGE AND HANDLING

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

Part 2 Products

2.1 PERFORMANCE CRITERIA

- .1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Consultant and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.

2.2 MATERIALS

- .1 Portland Cement: to CSA A3001, Type GU HS.
 - .1 Reduction in cement from Base Mix to Actual Supplementary Cementing Materials (SCMs) Mix, as percentage.
- .2 Blended hydraulic cement: Type GUb, HSb to CSA A3001.
- .3 Portland-limestone cement: Type GUL to CSA A23.1.
- .4 Water: to CSA A23.1.
- .5 Aggregates: to CSA A23.1/A23.2.
- .6 Admixtures:
 - .1 Air entraining admixture: to ASTM C260.
 - .2 Chemical admixture: to ASTM C494, ASTM C1017. Consultant to approve accelerating or set retarding admixtures during cold and hot weather placing.
- .7 Shrinkage compensating grout: premixed compound consisting of metallic aggregate, Portland cement, water reducing and plasticizing agents to CSA A23.1/A23.2.
 - .1 Compressive strength: 35 MPa at 28 days.
 - .2 Net shrinkage at 28 days: maximum 1%.
- .8 Non premixed dry pack grout: composition of non metallic aggregate Portland cement with sufficient water for mixture to retain its shape when made into ball by hand and capable of developing compressive strength of 35 MPa at 28 days.
- .9 Curing compound: to CSA A23.1/A23.2 white ASTM C309, Type 1-chlorinated rubber Type1-D with fugitive dye.

- .10 Mechanical waterstops: extruded PVC Arctic Grade of sizes indicated
- .11 Weep hole tubes: plastic.
- .12 Dovetail anchor slots: minimum 0.6 mm thick galvanized steel with insulation filled slots.
- .13 Dampproof membrane:
 - .1 Kraft/polyethylene membrane:
 - .1 Plain: .10 mm thick polyethylene film bonded to asphalt treated creped kraft.
 - .2 Reinforced: two .10 mm thick polyethylene films bonded each side of asphalt treated creped kraft paper, reinforced with 13 x 13 mm fibreglass scrim.
 - .3 Membrane adhesive: as recommended by membrane manufacturer.
- .14 Dampproofing:
 - .1 Emulsified asphalt, mineral colloid type, unfilled: to CAN/CGSB-37.2, and to Section 07 11 13 - Bituminous Dampproofing.

Part 3 Execution

3.1 PREPARATION

- .1 Obtain Consultant's written approval before placing concrete.
 - .1 Provide 72 hours minimum notice prior to placing of concrete.
- .2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.
- .3 During concreting operations:
 - .1 Development of cold joints not allowed.
 - .2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.
- .4 Pumping of concrete is permitted only after approval of equipment and mix.
- .5 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .6 Prior to placing of concrete obtain Consultant's approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .7 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .8 In locations where new concrete is dowelled to existing work, drill holes in existing concrete.
 - .1 Place steel dowels of deformed steel reinforcing bars and pack solidly with Hilti Hy 200 epoxy grout to anchor and hold dowels in positions to match steel in walls/slab beams, etc.
- .9 Do not place load upon new concrete until authorized by Consultant.

3.2 INSTALLATION/APPLICATION

- .1 Do cast-in-place concrete work to CSA A23.1/A23.2.
- .2 Sleeves and inserts:
 - .1 Do not permit penetrations, sleeves, ducts, pipes or other openings to pass through joists, beams, column capitals or columns, except where indicated or approved by Consultant.
 - .2 Where approved by Consultant, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere.
 - .3 Sleeves and openings greater than 100 x 100 mm not indicated, must be reviewed by Consultant.
 - .4 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain written approval of modifications from Consultant before placing of concrete.
 - .5 Confirm locations and sizes of sleeves and openings shown on drawings.
 - .6 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.
- .3 Anchor bolts:
 - .1 Set anchor bolts to templates in co-ordination with appropriate trade prior to placing concrete.
 - .2 Grout anchor bolts in preformed holes or holes drilled after concrete has set only after receipt of written approval from Consultant.
 - .3 Protect anchor bolt holes from water accumulations, snow and ice build-ups.
- .4 Grout under base plates using procedures in accordance with manufacturer's recommendations which result in 100% contact over grouted area.
- .5 Finishing and curing:
 - .1 Finish concrete to CSA A23.1/A23.2.
 - .2 Use procedures as reviewed by Consultant or those noted in CSA A23.1/A23.2 to remove excess bleed water. Ensure surface is not damaged.
 - .3 Finish concrete floor to CSA A23.1/A23.2.
 - .4 Provide screed finish where bonded topping terrazzo floor tile is to be applied.
- .6 Waterstops:
 - .1 Install waterstops to provide continuous water seal.
 - .2 Do not distort or pierce waterstop in way as to hamper performance.
 - .3 Do not displace reinforcement when installing waterstops.
 - .4 Use equipment to manufacturer's requirements to field splice waterstops.
 - .5 Tie waterstops rigidly in place.
 - .6 Use only straight heat sealed butt joints in field.
 - .7 Use factory welded corners and intersections unless otherwise approved by Consultant.
- .7 Joint fillers:

- .1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Consultant.
 - .2 When more than one piece is required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.
 - .3 Locate and form construction joints as indicated.
 - .4 Install joint filler.
 - .5 Use 12 mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 12 mm of finished slab surface unless indicated otherwise.
- .8 Dampproof membrane:
- .1 Install dampproof membrane under concrete slabs-on-grade inside building.
 - .2 Lap dampproof membrane minimum 150 mm at joints and seal.
 - .3 Seal punctures in dampproof membrane before placing concrete.
 - .4 Use patching material at least 150 mm larger than puncture and seal.

3.3 SURFACE TOLERANCE

- .1 Concrete tolerance to CSA A23.1 Straightedge Method FF = 25; FL = 20 to tolerance schedule as indicated.

3.4 FIELD QUALITY CONTROL

- .1 Site tests: conduct tests as follows in accordance with Section 01 45 00 - Quality Control and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
 - .1 Concrete pours.
 - .2 Slump.
 - .3 Air content.
 - .4 Compressive strength at 7 and 28 days.
 - .5 Air and concrete temperature.
- .2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Consultant for review to CSA A23.1/A23.2.
 - .1 Ensure testing laboratory is certified to CSA A283.
- .3 Ensure test results are distributed for discussion at pre-pouring concrete meeting between testing laboratory and Consultant.
- .4 General Contractor will pay for costs of tests as specified in Section 01 29 83 - Payment Procedures for Testing Laboratory Services.
- .5 Consultant may request to take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
- .6 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.
- .7 Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 03 30 00, 03 35 05, 04 05 12

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

1.3 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 and 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.

Part 2 Products

2.1 FLOOR HARDENER

- .1 Non-metallic hardener: premixed, dry shake surface hardener, cement to hardener ratio 2 to 1.
 - .1 Volcanic basaltic aggregate (trap rock):
 - .1 Quartz aggregate.
- .2 Metallic floor hardener: premixed, cement to hardener ratio 2 to 1.
- .3 Synthetic non-ferrous hardener.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of slab previously installed under other Sections or Contracts are acceptable for concrete hardener and curing compound application installation in accordance with manufacturer's written instructions.

- .1 Inform Consultant of unacceptable conditions immediately upon discovery.
- .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 HARDENING

- .1 Apply floor hardener aggregate at rate as recommended in accordance with manufacturer's written instructions.
- .2 Apply slip resistant coating on floor surfaces.
- .3 Apply in accordance with manufacturer's written instructions.

3.3 PROTECTION

- .1 Protect finished installation until floor treatment has completely cured.
- .2 Repair damage to adjacent materials caused by concrete floor hardener installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 04 05 12, 0401519, 04 05 23.

1.2 REFERENCES

- .1 CSA Group
 - .1 CAN/CSA-A165 Series-04(R2009), CSA Standards on Concrete Masonry Units (Consists of A165.1, A165.2 and A165.3).
 - .2 CAN/CSA-A179-04(R2009), Mortar and Grout for Unit Masonry.
 - .3 CAN/CSA-A371-04(R2009), Masonry Construction for Buildings.
- .2 International Masonry Industry All-Weather Council (IMIAC)
 - .1 Recommended Practices and Guide Specification for Cold Weather Masonry Construction.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-installation meetings: comply with Section 01 31 19 - Project Meetings. Conduct pre-installation meeting one week prior to commencing work of this Section and on-site installations to:
 - .1 Verify project requirements, including mock-up requirements.
 - .2 Verify substrate conditions.
 - .3 Co-ordinate products, installation methods and techniques.
 - .4 Sequence work of related sections.
 - .5 Co-ordinate with other building subtrades.
 - .6 Review manufacturer's installation instructions.
 - .7 Review masonry cutting operations, methods and tools and determine worker safety and protection from dust during cutting operations.
 - .8 Review warranty requirements.
- .2 Sequencing: sequence with other work in accordance with Section 01 32 16.06 - Construction Progress Schedule - Critical Path Method (CPM) Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart. Comply with manufacturer's written recommendations for sequencing construction operations.
- .3 Scheduling: schedule with other work in accordance with Section 01 32 16.06 - Construction Progress Schedule - Critical Path Method (CPM) Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.

1.4 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 masonry 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 01 35 43 - Environmental Procedures.

1.5 CLOSEOUT SUBMITTALS

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

1.6 EXTRA MATERIALS

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

1.7 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 and in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect material from nicks, scratches, and blemishes.
 - .3 Keep materials dry until use except where wetting of bricks is specified.
 - .4 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.
 - .5 Replace defective or damaged materials with new.

1.8 SITE CONDITIONS

- .1 Ambient Conditions: assemble and erect components when temperatures are above 4 degrees C.
- .2 Weather Requirements: to CAN/CSA-A371 to IMIAC - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.
- .3 Cold weather requirements:
 - .1 To CAN/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 windchill.

- .3 Maintain temperature of masonry above 0 degrees C for minimum of 7 days, after mortar is installed.
- .4 Preheat unheated wall sections in enclosure for minimum 72 hours above 10 degrees C, before applying mortar.
- .2 Hot weather requirements:
 - .1 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.
 - .2 Keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until masonry work is completed and protected by flashings or other permanent construction.
- .3 Spray mortar surface at intervals and keep moist for maximum of 3 days after installation.

1.9 WARRANTY

- .1 For Work in this Section 04 05 00 - Common Work Results for Masonry, 12 months warranty period is extended to 24 months.

Part 2 Products**2.1 MATERIALS**

- .1 Masonry materials are specified elsewhere in related Sections:

Part 3 Execution**3.1 INSTALLERS**

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

3.2 EXAMINATION

- .1 Examine conditions, substrates and work to receive work of this Section.
 - .1 Co-ordinate with Section 01 71 00 - Examination and Preparation.
- .2 Examine openings to receive masonry units. Verify opening size, location, and that opening is square and plumb, and ready to receive work of this Section.
 - .1 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation after unacceptable conditions have been remedied and after receipt of written approval from Consultant.
- .3 Verification of Conditions:
 - .1 Verify that:

- .1 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 brick concrete block.
 - .2 Field conditions are acceptable and are ready to receive work.
 - .3 Built-in items are in proper location, and ready for roughing into masonry work.
- .2 Commencing installation means acceptance of existing substrates.

3.3 PREPARATION

- .1 Surface Preparation: prepare surface in accordance with manufacturer's written recommendations and co-ordinate with Section 01 71 00 - Examination and Preparation.
- .2 Establish and protect lines, levels, and coursing.
- .3 Protect adjacent materials from damage and disfiguration.

3.4 INSTALLATION

- .1 Do masonry work in accordance with CAN/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 CAN/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 accordance with CAN/CSA-A165, in exposed masonry and replace with undamaged units.
- .2 Jointing:
 - .1 Allow joints to set just enough to remove excess water, then tool with round jointer to provide smooth, joints true to line, compressed, uniformly concave joints where concave joints are indicated.
 - .2 Allow joints to set just enough to remove excess water, then rake joints uniformly to 6 mm depth and compress with square tool to provide smooth, compressed, raked joints of uniform depth where raked joints are indicated.
 - .3 Strike flush joints concealed in walls and joints in walls to receive plaster, tile, insulation, or other applied material except paint or similar thin finish coating.
- .3 Cutting:
 - .1 Cut out for electrical switches, outlet boxes, and other recessed or built-in objects.
 - .2 Make cuts straight, clean, and free from uneven edges.
- .4 Building-In:
 - .1 Build in items required to be built into masonry.

- .2 Prevent displacement of built-in items during construction. Check plumb, location and alignment frequently, as work progresses.
- .3 Brace door jambs to maintain plumb. Fill spaces between jambs and masonry with mortar.
- .5 Wetting of bricks:
 - .1 Except in cold weather, wet bricks having initial rate of absorption exceeding 1 g/minute/1000 mm²: wet to uniform degree of saturation, 3 to 24 hours before laying, and do not lay until surface dry.
 - .2 Wet tops of walls built of bricks qualifying for wetting, when recommencing work on such walls.
- .6 Support of loads:
 - .1 Use 20 MPa concrete to Section 03 30 00 - Cast-in-Place Concrete, where concrete fill is used in lieu of solid units.
 - .2 Use grout to CAN/CSA-A179 where grout is used in lieu of solid units.
 - .3 Install building paper below voids to be filled with concrete grout; keep paper 25 mm back from faces of units.
- .7 Provision for movement:
 - .1 Leave 3 mm space below shelf angles.
 - .2 Leave 6 mm space between top of non-load bearing walls and partitions and structural elements. Do not use wedges.
 - .3 Built masonry to tie in with stabilizers, with provision for vertical movement.
- .8 Loose steel lintels:
 - .1 Install loose steel lintels. Center over opening width.
- .9 Control joints:
 - .1 Construct continuous control joints as indicated.
- .10 Movement joints:
 - .1 Build-in continuous movement joints as indicated.
- .11 Interface with other work:
 - .1 Cut openings in existing work as indicated.
 - .2 Openings in walls: to be reviewed by Consultant.
 - .3 Make good existing work. Use materials to match existing.

3.6 SITE TOLERANCES

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

3.7 FIELD QUALITY CONTROL

- .1 Site Tests, Inspection:
 - .1 Perform field inspection and testing in accordance with Section 01 45 00 - Quality Control.

- .2 Notify inspection agency minimum of 72 hours in advance of requirement for tests.

3.8 CLEANING

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

3.9 PROTECTION

- .1 Temporary Bracing:
 - .1 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.
 - .2 Bracing to 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 in 1.9, SITE CONDITIONS.

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 04 05 12, 040519, 04 05 23.

1.2 REFERENCES

- .1 CSA Group
 - .1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A179-04(R2009), Mortar and Grout for Unit Masonry.
 - .3 CAN/CSA-A371-04(R2009), Masonry Construction for Buildings.
 - .4 CAN/CSA-A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
- .2 International Masonry Industry All-Weather Council (IMIAC)
 - .1 Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.
- .3 South Coast Air Quality Management District (SCAQMD)
 - .1 SCAQMD Rule 1168-05, Adhesive and Sealant 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 masonry mortar and grout 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 01 35 43 - Environmental Procedures. Indicate VOC's mortar, grout, parging, colour additives and admixtures. Expressed as grams per litre (g/L).

1.4 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports including sand gradation tests in accordance with CAN/CSA-A179 showing compliance with specified performance characteristics and physical properties, and in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

- .3 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.

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

1.6 SITE CONDITIONS

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

Part 2 Products

2.1 MATERIALS

- .1 Use same brands of materials and source of aggregate for entire project.
- .2 Cement:
 - .1 Portland Cement: to CAN/CSA-A3000, Type GU - General use hydraulic cement (Type 10)
 - .1 Use low VOC products in compliance with SCAQMD Rule 1168.
 - .2 Masonry Cement: to CAN/CSA-A3002 and CAN/CSA-A179, Type S.
 - .3 Mortar Cement: to CAN/CSA-A3002 and CAN/CSA-A179, Type S integral water repellents.
 - .1 Use low VOC products [in compliance with SCAQMD Rule 1168].
 - .4 Packaged Dry Combined Materials for mortar: to CAN/CSA-A179, Type S.
- .3 Aggregate: supplied by one supplier.
 - .1 Fine Aggregate: to CAN/CSA-A179, natural sand.

- .2 Course Aggregate: to CAN/CSA-A179.
- .4 Water: clean and potable.
- .5 Lime:
 - .1 Quick Lime: to CAN/CSA-A179, Type S.
 - .2 Hydrated Lime: to CAN/CSA-A179, Type S.
- .6 Bonding Agent: epoxy type.
- .7 Polymer Latex: organic polymer latex admixture of butadiene-styrene type non-emulsifiable bonding admixture.

2.2 MORTAR MIXES

- .1 Mortar for exterior masonry above grade:
 - .1 Load Bearing: type S based on specifications.
 - .2 Non-Load Bearing: S based on specifications.
- .2 Mortar for interior masonry:
 - .1 Load Bearing: type S based on specifications.
 - .2 Non-Load Bearing: N based on specifications.
- .3 Mortar for Parapet walls, chimneys, unprotected walls: type S based on specifications, CAN/CSA-A179.
- .4 Pointing Mortar: CAN/CSA-A179, Type S using property specification with maximum 2 percent ammonium stearate or calcium stearate per cement weight.
- .5 Stain Resistant Pointing Mortar: one part Portland cement, 1/8 part hydrated lime, and two parts graded (80 mesh) aggregate, proportioned by volume. Add aluminum tristearate, calcium stearate, or ammonium stearate to 2 percent of Portland cement by weight.
- .6 Mortar for foundation walls, manholes, sewers, pavements, walks, patios and other exterior masonry at or below grade: type M based on property proportion specifications, CAN/CSA-A179.
- .7 Following applies regardless of mortar types and uses specified above:
 - .1 Mortar for calcium silicate brick and concrete brick: type O based on proportion specifications.
 - .2 Mortar for stonework: type N based on specifications.
 - .3 Mortar for grouted reinforced masonry: type S based on specifications.

2.3 MORTAR MIXING

- .1 Use pre-blended, pre-coloured mortar prepackaged under controlled factory conditions. Ingredients batching limitations to be within 1% accuracy.
- .2 Mix mortar ingredients in accordance with CAN/CSA-A179 in quantities needed for immediate use.
- .3 Maintain sand uniformly damp immediately before mixing process.

- .4 Do not use anti-freeze compounds including calcium chloride or chloride based compounds.
- .5 Do not add air entraining admixture to mortar mix.
- .6 Use a batch type mixer in accordance with CAN/CSA-A179.
- .7 Pointing mortar: prehydrate pointing mortar by mixing ingredients dry, then mix again adding just enough water to produce damp unworkable mix that will retain its form when pressed into ball. Allow to stand for not less than 1 hour no more than 2 hours then remix with sufficient water to produce mortar of proper consistency for pointing.
- .8 Re-temper mortar only within two hours of mixing, when water is lost by evaporation.
- .9 Use mortar within 2 hours after mixing at temperatures of 32 degrees C, or 2-1/2 hours at temperatures under 10 degrees C.

2.4 GROUT MIXES

- .1 Bond Beams: grout mix 10 to 12.5 MPa strength at 28 days; 200-250 mm slump; premixed type in accordance with CSA A23.1/A23.2 mixed in accordance with CAN/CSA-A179 fine coarse grout.
- .2 Lintels: grout mix 10 to 12.5 MPa strength at 28 days; 200-250 mm slump; premixed type in accordance with CSA A23.1/A23.2 mixed in accordance with CAN/CSA-A179 fine coarse grout.
- .3 Grout: Minimum compressive strength of 12.5 MPa at 28 days. Maximum aggregate size and grout slump: CAN/CSA-A179.

2.5 GROUT MIXING

- .1 Mix batched and delivered grout in accordance with CSA A23.1/A23.2 transit mixed.
- .2 Mix grout ingredients in quantities needed for immediate use in accordance with CAN/CSA-A179 fine coarse grout.
- .3 Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- .4 Do not use calcium chloride or chloride based admixtures.

2.6 MIX TESTS

- .1 Testing Mortar Mix:
 - .1 Test mortar to requirements of Section 01 45 00 - Quality Control, and in accordance with CAN/CSA-A179, for mortar based on property specification proportion specification. Test during construction for:
 - .1 Compressive strength.
 - .2 Consistency.
 - .3 Mortar aggregate ratio.
 - .4 Sand/cement ratio.
 - .5 Water content and water/cement ratio.
 - .6 Air content.

- .2 Testing Grout Mix:
 - .1 Test grout to requirements of Section 01 45 00 - Quality Control, and in accordance with CAN/CSA-A179, for grout based on property specification proportion specification. Test during construction for:
 - .1 Compressive strength.
 - .2 Sand/cement ratio.
 - .3 Water content and water/cement ratio.
 - .4 Slump.

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 masonry 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 PREPARATION

- .1 Apply bonding agent to existing concrete surfaces.

3.3 CONSTRUCTION

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

3.4 MIXING

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

3.5 MORTAR PLACEMENT

- .1 Install mortar to manufacturer's instructions.
- .2 Install mortar to requirements of CAN/CSA-A179.

- .3 Remove excess mortar from grout spaces.

3.6 GROUT PLACEMENT

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

3.7 FIELD QUALITY CONTROL

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

3.8 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Remove droppings and splashings using clean sponge and water.
- .3 Clean masonry with low pressure clean water and soft natural bristle brush.
- .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 04 05 12, 040519, 04 05 23.

1.2 REFERENCES

- .1 ASTM International
 - 1. ASTM A36/A36M-12, Standard Specification for Carbon Structural Steel.
 - 2. ASTM A82/A82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
 - 3. ASTM A167-99 (R2009), Standard Specification Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - 4. ASTM A307-12, Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
 - 5. ASTM A580/A580M-13a, Standard Specification for Stainless Steel Wire.
 - 6. ASTM A641/A641M-09a, Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 - 7. ASTM A666-10, Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- .2 CSA Group
 - .1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A179-04 (R2009), Mortar and Grout for Unit Masonry.
 - .3 CAN/CSA-A370-04 (R2009), Connectors for Masonry.
 - .4 CAN/CSA-A371-04 (R2009), Masonry Construction for Buildings.
 - .5 CSA G30.18-09, Carbon Steel Bars for Concrete Reinforcement.
 - .6 CSA S304.1-04 (R2010), Design of Masonry Structures.
 - .7 CSA W186-M1990 (R2012), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .3 Reinforcing Steel Institute of Canada (RSIC)
 - .1 Steel Manual of Standard Practice, 2004.

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 anchorage and reinforcing materials 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 Manitoba, Canada.
 - .2 Submit drawings detailing bar bending details, anchorage details lists and placement drawings
 - .3 On placement drawings, indicate sizes, spacing, location and quantities of reinforcement and connectors.

1.4 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports including sand gradation tests in accordance with CAN/CSA-A179 showing compliance with specified performance characteristics and physical properties, and in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 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.

1.5 SITE MEASUREMENTS

- .1 Make site measurements necessary to ensure proper fit of members.

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.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground indoors and in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect anchorage and reinforcing materials from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products**2.1 MATERIALS**

- .1 Bar reinforcement: Steel to CAN/CSA-A371 and CSA G30.18, Grade stainless steel to ASTM A167.
- .2 Connectors: to CAN/CSA-A370 and CSA S304.1.

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- .3 Corrosion protection: to CSA S304.1, galvanized to CSA S304.1 and CAN/CSA-A370.
 - .4 Fasteners: installed post-construction:
 - .1 Bolts and Screws: size and type to suit application, locate where indicated.
 - .2 Nails: case-hardened cut or spiral nails, size and type to suit fastening application.
 - .3 Powder-Driven Fasteners: pin styles and lengths to suit fastening application in accordance with manufacturers use, load and hold recommendations.
 - .4 Adhesives: epoxies, mastics and contact cements for fastening applications, use in accordance with manufacturers' recommendations.
 - .5 Ties: hot dip galvanized to CAN/CSA-A370 Table 5.2 steel finish.
 - .1 Corrugated to: CAN/CSA-A370.
 - .2 Unit ties, to CAN/CSA-A370: Z style, fabricated from cold-drawn steel, size to suit application.
 - .3 Adjustable Unit Ties: to CAN/CSA-A370: proprietary type ties, type, style and size to suit application in accordance with manufacturer's recommendations.
 - .4 Joint Reinforcement Ties: to CAN/CSA-A370:
 - .1 Single Wythe Joint Reinforcement: ladder type:
 - .1 Steel wire, hot dip galvanized: to ASTM A641.
 - .2 Cold drawn steel wire conforming to ASTM A82.
 - .3 Stainless steel conforming to ASTM A580, Type 304, 4.8 mm side rods with 4.8 mm cross ties.
 - .2 Multiple Wythe Joint Reinforcement: ladder type: without moisture drip; non-adjustable:
 - .1 Steel wire, hot dip galvanized: to ASTM A641
 - .2 Cold drawn steel wire conforming to ASTM A82.
 - .3 Stainless steel conforming to ASTM A580 Type 304, 4.8 mm side rods with 4.8 mm cross rods.
 - .6 Anchors: to CAN/CSA-A370:
 - .1 Conventional Anchors: type steel bolts with bent bar anchors, shape J, sized to suit application.
 - .2 Wedge Anchors: expansion anchors type wedge and bolt, sized to suit application.
 - .3 Sleeve Anchors: type sleeve and bolt, sized to suit application.
 - .4 Self-Contained Anchors: type double-glass/plastic vial system, with epoxy resin and hardener.
 - .7 Conventional Bolts:
 - .1 Bolts: to ASTM A36, bar stock shop threaded, bent bar anchors, J shaped.
 - .2 Plate anchors: steel to ASTM A36, weld square of circular steel plate perpendicular to axis of steel bar threaded on opposite end.

- .3 Through bolt rods: to ASTM A307 threaded rod or threaded ASTM A36 bar stock.
- .8 Adhesive Anchors: proprietary systems, pre-mixed, self-contained system with double glass vial system to contain epoxy, consisting of resin, hardener and aggregate measure and mix system where epoxy materials are hand-measured and mixed in accordance with manufacturers' written instructions.

2.2 FABRICATION

- .1 Fabricate reinforcing in accordance with CSA A23.1/A23.2 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
- .2 Fabricate connectors 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, minimum 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 EXAMINATION

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

3.2 PREPARATION

- .1 Direct and coordinate placement of metal anchors for masonry supplied to other Sections.

3.3 INSTALLATION

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

- .3 Supply and install additional reinforcement to masonry as indicated.

3.4 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 Install unit, adjustable, single wythe and multiple wythe joint reinforcement where indicated and in accordance with CAN/CSA-A370 and CAN/CSA-A371.
 - .1 Bond walls of two or more wythes using metal connectors in accordance with CAN/CSA-A371 and as indicated.
 - .2 Install horizontal joint reinforcement 400 mm on centre.
 - .3 Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 400 mm each side of opening.
 - .4 Place joint reinforcement continuous in first and second joint below top of walls.
 - .5 Lap joint reinforcement ends minimum 150 mm.
 - .6 Connect stack bonded unit joint corners and intersections with strap anchors 400 mm on centre.

3.5 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 Support and position reinforcing bars in accordance with CAN/CSA-A371.

3.6 GROUTING

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

3.7 ANCHORS

- .1 Supply and install metal anchors in accordance with CAN/CSA-A370 and CAN/CSA-A371 as indicated.

3.8 LATERAL SUPPORT AND ANCHORAGE

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

3.9 MOVEMENT JOINTS

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

3.10 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.

3.11 FIELD QUALITY CONTROL

- .1 Site inspections in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .2 Obtain Consultant approval of placement of reinforcement and connectors, prior to placing mortar grout, concrete.

3.12 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.

3.13 CLEANING

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

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 04 05 12, 040519, 04 05 23.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM D2240-05(2010), Standard Test Method for Rubber Property - Durometer Hardness.
- .2 CSA Group
 - .1 CAN/CSA-A371-04(R2009), Masonry Construction for Buildings.
 - .2 CAN/CSA-ISO 14021-00(R2009), Environmental Labels and Declarations - Self Declared Environmental Claims (Type II Environmental Labelling).
- .3 South Coast Air Quality Management District (SCAQMD)
 - .1 SCAQMD Rule 1168-05, Adhesive and Sealant 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 masonry accessories and include product characteristics, performance criteria, physical size, finish and limitations.

END of SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Manufactured stone veneer, Manufactured stone trim, and application materials.

1.2 RELATED SECTIONS

- .1 Section 05 50 00 – Metal Fabrications.
- .2 Section 07 21 00 – Thermal Insulation.
- .3 Section 07 25 00 – Weather Barrier.
- .4 Section 07 27 00 – Air Barriers.
- .5 Section 07 92 00 – Joint Sealing.

1.3 REFERENCES

- .1 ASTM C39/C39M-10 - Compressive Strength of Cylindrical Concrete Specimens.
- .2 ASTM C67-09 - Sampling and Testing Brick and Structural Clay Tile.
- .3 ASTM C177-10 - Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
- .4 ASTM C192/C192M-07 - Making and Curing Concrete Test Specimens in the Laboratory.
- .5 ASTM C482-02 (2009) - Bond Strength of Ceramic Tile to Portland Cement Paste.
- .6 ASTM E84-10b - Surface Burning Characteristics of Building Materials.
- .7 CAN/CGSB-51.32-M77 - Sheathing, Membrane, Breather Type.
- .8 CAN/CSA A179-04 (R2009) - Mortar and Grout for Unit Masonry.
- .9 CAN/CSA A371-04 (R2009) - Masonry Construction for Buildings.
- .10 ULC/CAN4 S114-M80 – Standard Method of Test for Determination of Non-Combustibility in Building Materials.
- .11 CSA A23.1-09/A23.2-09 - Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
- .12 CSA A3000-08 - Cementitious Materials Compendium.
- .13 CSA G30.18-09 - Carbon-Steel Bars for Concrete Reinforcement.
- .14 CSA S304.1-04 (R2010) – Design of Masonry Structures.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.

- .2 Coordinate construction of suitable enclosures and heating for masonry work during construction if required.
- .3 Pre-installation Meetings: Convene one (1) week before starting work of this section.

1.5 SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data:
 - .1 Submit product literature indicating manufactured masonry and application materials including mortar colour charts, rainscreen material, and weather resistant barrier.
- .3 Samples:
 - .1 Submit 300 x 300 mm (12 x 12 inch) panel containing samples of specified manufactured masonry showing full range of colours and textures and complete with specified mortar.
- .4 Shop Drawings:
 - .1 Masonry Units: Show sizes, profiles, spacing, details, and locations of special shapes.
 - .2 Stone Trim Units: Show sizes, profiles, and locations of each stone trim unit required.
- .5 Quality Assurance – Quality Control:
 - .1 Submit proof of manufacturer and installer qualifications.
 - .2 Submit manufacturer's installation instructions.

1.6 1.6 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission Procedures.
- .2 Submit Maintenance Guide for all installed products.

1.7 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five (5) year documented experience.
- .2 Installer Qualifications: Company with documented experience in installation of manufactured masonry including minimum five (5) projects within 400 mile radius of this Project.

1.8 MOCK-UPS

- .1 Section 01 45 00: Mock-up requirements.
- .2 Provide 1200 x 1200 mm (48 x 48 inch) mock-up of manufactured masonry veneer showing colours and textures, use of reinforcement, mesh, rainscreen drainage, termination details, coursing, mortar, and workmanship.

- .3 Mock-up will be used to judge workmanship, substrate preparation, operation of equipment and material application.
- .4 Approved mock-up will become the standard of acceptance for all masonry work.
- .5 Do not commence work until mock-up has been approved by the Consultant.
- .6 Locate where directed by Consultant.

1.9 DELIVERY, STORAGE, AND HANDLING

- .1 Section 01 66 00 – Product storage and handling requirements.
- .2 Follow manufacturer's instructions.
- .3 Store moisture-sensitive materials in weather protected enclosures.

1.10 PROJECT/SITE CONDITIONS

- .1 Environmental Requirements: Maintain materials and ambient temperature in area of installation at minimum 4°C (40°F) prior to, during, and for 48 hours following installation.
- .2 Comply with requirements of CSA A371 for hot and cold weather requirements for installation of manufactured masonry.

1.11 WARRANTY

- .1 Special Warranty: Provide manufacturer's standard limited warranty against defects in manufacturing for a period of fifty (50) years following date of Substantial Completion.

1.12 EXTRA MATERIALS

- .1 Furnish extra manufactured stone material in a variety of shapes and sizes in quantity equal to three percent of the installed stone.

Part 2 Products**2.1 MANUFACTURER**

- .1 Environmental Stoneworks

2.2 MANUFACTURED MASONRY MATERIALS

- .1 "Clipstone" Mortarless Stone Veneer

2.3 RELATED MATERIALS

- .1 Asphalt Impregnated Building Paper: CAN/CGSB-51.32, heavy duty asphalt-saturated kraft paper, minimum 3.5 lb/100 ft² water resistance rating 30-45 minutes.
- .2 Metal Lath: 1.8 kg/m² (3.4 lb) galvanized expanded rib lath.
- .3 Flashing
- .4 Fasteners:

- .1 Into Wood Studs: Minimum 3 mm (0.120 inch) shank diameter galvanized nails or staples of sufficient length to penetrate 35 mm (1-3/8 inches) minimum into the stud.
- .2 Into Metal Studs: Minimum 11.1 mm (7/16 inch) head diameter, corrosion-resistant, self-drilling, self-tapping, pancake head screws of sufficient length to penetrate 10 mm (3/8 inch) minimum into the stud.
- .5 Mortar: Premixed Type N or mortar mixed using components and proportions following manufactured masonry manufacturer's installation instructions. Comply with CAN/CSA A179.
- .6 Mortar Colour: Iron oxide pigments.
- .7 Sealants: in accordance with Section 07 92 00 - Joint Sealants
- .8 Weep Screed as required for installation over framed construction.

Part 3 Execution**3.1 EXAMINATION**

- .1 Examine substrates upon which manufactured masonry will be installed.
- .2 Coordinate with responsible entity to correct unsatisfactory conditions.
- .3 Commencement of work by installer is acceptance of substrate conditions.

3.2 PREPARATION

- .1 Protection: Prevent work from occurring on the opposite of walls to which manufactured masonry is applied during and for 48 hours following installation of the manufactured masonry.
- .2 Surface Preparation: Follow manufacturer's instructions designated below for the appropriate type of manufactured masonry and substrate.
- .3 Clean surfaces thoroughly and allow to dry prior to installation.

3.3 FLASHINGS

- .1 Install flashings as as shown on Drawings.

3.4 DRAINAGE MAT INSTALLATION

- .1 Install in accordance with manufacturer's instructions.
- .2 Install weather resistant barrier to manufacturer's recommendations and as shown on Drawings.
- .3 Place drainage mat horizontally against exterior wall fabric side out, entangled core to building interior. Starting at bottom of the wall, position first piece of drainage mat where the bottom edge of the veneer will meet ledger board.
- .4 Mechanically fasten using staples, large head nail, or washer and screw using one fastener for each 0.1 m² (1 ft²). When installing over concrete or block back-up walls

that do not accept mechanical fasteners, hold in place with small dabs of glue every 610 mm (24 inches). Do not fasten through flashing.

- .5 Seam adjacent pieces with selvage edge overlapping lower drainage mat piece.
- .6 Trim drainage mat around all penetrations, windows, and doors so that the material is flush to the flashing.

3.5 INSTALLATION

- .1 Install Cultured Stone® products in accordance with manufacturer's Cultured Stone® installation instructions using grouted or mortarless joints.
- .2 .Install architectural trim products in accordance with manufacturer's Cultured Stone® Installation instructions.
- .3 Install/Apply Related Materials specified above in accordance with type of substrate and manufactured masonry manufacturer's installation instructions.

3.6 FIELD QUALITY CONTROL

- .1 .1 Manufacturer's Field Services: Provide 2 periodic site visits, each of approximately one hours duration.

3.7 CLEANING

- .1 Section 01 74 00 - Cleaning and Waste Management.
- .2 Clean manufactured masonry in accordance with manufacturer's installation instructions.

3.8 PROTECTION

- .1 Protect finished work from rain during and for 48 hours following installation.
- .2 Protect finished work from damage during remainder

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 05 2100, 05 3100.

1.2 REFERENCES

- .1 ASTM International Inc.
 - .1 ASTM A36/A36M-08, Standard Specification for Carbon Structural Steel.
 - .2 ASTM A193/A193M-08, Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature or High-Pressure Service and Other Special Purpose Applications.
 - .3 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .4 ASTM A325-07a, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
 - .5 ASTM A325M-08, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength Metric.
 - .6 ASTM A490M-04ae, Standard Specification for High-Strength Steel Structural Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints Metric.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-85.10-99, Protective Coatings for Metals.
- .3 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturers Association (CPMA).
 - .1 Handbook of the Canadian Institute of Steel Construction.
 - .2 CISC/CPMA Standard 2-75, Quick-Drying Primer for use on Structural Steel.
- .4 Canadian Standards Association (CSA International)
 - .1 CSA G40.20/G40.21-04, 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 CAN/CSA-S16-01(R2007), Limit States Design of Steel Structures.
 - .4 CAN/CSA-S136-07, North American Specifications for the Design of Cold Formed Steel Structural Members.
 - .5 CSA W47.1-03, Certification of Companies for Fusion Welding of Steel.
 - .6 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding.
 - .7 CSA W55.3-1965(R2003), Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
 - .8 CSA W59-03, Welded Steel Construction (Metal Arc Welding).
- .5 Master Painters Institute

- .1 MPI-INT 5.1-08, Structural Steel and Metal Fabrications.
- .2 MPI-EXT 5.1-08, Structural Steel and Metal Fabrications.
- .6 The Society for Protective Coatings (SSPC) and National Association of Corrosion Engineers (NACE) International
 - .1 NACE No. 3/SSPC SP-6-06, Commercial Blast Cleaning.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Provide drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
- .3 Erection drawings:
 - .1 Submit erection drawings indicating details and information necessary for assembly and erection purposes including:
 - .1 Description of methods.
 - .2 Sequence of erection.
 - .3 Type of equipment used in erection.
 - .4 Temporary bracings.
- .4 Fabrication drawings:
 - .1 Submit fabrication drawings showing designed assemblies, components and connections are stamped and signed by qualified professional engineer licensed in the Province of Manitoba, Canada.
- .5 Samples :
 - .1 Prepare sample of typical exposed structural connections in accordance with AISC Specifications of Architecturally exposed structural steel for approval of Consultant. Samples to be judged upon alignment of surfaces, uniform contact between surfaces, smoothness and uniformity of finished welds. When approved, sample units will serve as a standard for workmanship, appearance and material acceptable for entire project.
- .6 Source Quality Control Submittals:
 - .1 Submit 2 copies of mill test reports 4 weeks prior to fabrication of structural steel.
 - .1 Mill test reports to show chemical and physical properties and other details of steel to be incorporated in project.
 - .2 Provide mill test reports certified by metallurgists qualified to practice in Province of Manitoba, Canada.
- .7 Fabricator Reports:
 - .1 Provide structural steel fabricator's affidavit stating that materials and products used in fabrication conform to applicable material and products standards specified and indicated.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver materials in manufacturer's original, undamaged containers with identification labels intact.

Part 2 Products**2.1 DESIGN REQUIREMENTS**

- .1 Design details and connections in accordance with requirements of CAN/CSA-S16 and CAN/CSA-S136 with CSA-S136.1 to resist forces, moments, shears and allow for movements indicated.
- .2 Shear connections:
 - .1 Select framed beam shear connections from an industry accepted publication such as "Handbook of the Canadian Institute of Steel Construction" when connection for shear only (standard connection) is required.
 - .2 Select or design connections to support reaction from maximum uniformly distributed load that can be safely supported by beam in bending, provided no point loads act on beam, when shears are not indicated.
- .3 For composite construction select or design minimum end connection to resist reaction resulting from factored movement resistance as tabulated in the "Handbook of the Canadian Institute of Steel Construction" assuming 100% shear connection with depth of steel deck and/or slab shown on drawings.
- .4 Submit sketches and design calculations stamped and signed by qualified professional engineer licensed in Province of Manitoba, Canada for non standard connections.

2.2 MATERIALS

- .1 Structural steel: to CSA-G40.20/G40.21 Grade as indicated 350W and/or CAN/CSA-S136.
- .2 Anchor bolts: to CSA-G40.20/G40.21, ASTM A36/A36M.
- .3 High strength anchor bolts: to ASTM A193/A193M.
- .4 Bolts, nuts and washers: to ASTM A325.
- .5 Welding materials: to CSA W48, Series CSA W59 and certified by Canadian Welding Bureau.
- .6 Shop paint primer: to CISC/CPMA2-75 solvent reducible alkyd, red oxide.
- .7 Hot dip galvanizing: galvanize steel, where indicated, to CAN/CSA-G164, minimum zinc coating of 600 g/m².

2.3 FABRICATION

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

2.4 SHOP PAINTING

- .1 Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA-S16 CAN/CSA-S136 except where members to be encased in concrete.
- .2 Clean members, remove loose mill scale, rust, oil, dirt and foreign matter. Prepare surface according to NACE No.3/SSPC-SP-6.
- .3 Apply one coat of fabricators standard primer in shop to steel surfaces, except:
 - .1 Surfaces to be encased in concrete.
 - .2 Surfaces to receive field installed stud shear connections.
 - .3 Surfaces and edges to be field welded.
 - .4 Faying surfaces of slip-critical connections.
 - .5 Below grade surfaces in contact with soil.
- .4 Apply paint under cover, on dry surfaces when surface and air temperatures are above 5 degrees C.
- .5 Maintain dry condition and 5 degrees C minimum temperature until paint is thoroughly dry.
- .6 Strip paint from bolts, nuts, sharp edges and corners before prime coat is dry.

Part 3 Execution**3.1 APPLICATION**

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

3.2 GENERAL

- .1 Structural steel work: in accordance with CAN/CSA-S16, CAN/CSA-S136.
- .2 Welding: in accordance with CSA W59.
- .3 Companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel structures and/or CSA W55.3 for resistance welding of structural components.

3.3 CONNECTION TO EXISTING WORK

- .1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to Consultant for direction before commencing fabrication.

3.4 MARKING

- .1 Mark materials in accordance with CSA G40.20/G40.21. Do not use die stamping. When steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.
- .2 Match marking: shop mark bearing assemblies and splices for fit and match.

3.5 ERECTION

- .1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16, CAN/CSA-S136 and in accordance with approved erection drawings.
- .2 Field cutting or altering structural members: to approval Consultant.
- .3 Clean with mechanical brush and touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.
- .4 Continuously seal members by continuous welds where indicated. Grind smooth.

3.6 FIELD QUALITY CONTROL

- .1 Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by Consultant.
- .2 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by Consultant.
- .3 Owner will pay costs of tests as specified in Section 01 29 83 - Payment Procedures for Testing Laboratory Services.
- .4 Test shear studs in accordance with CSA W59.

3.7 FIELD PAINTING

- .1 Paint in accordance with Section 09 91 23 - Interior Painting.
 - .1 Touch up damaged surfaces and surfaces without shop coat with primer to NACE No.3/SSPC-SP-6 except as specified otherwise. Apply in accordance: MPI Architectural Painting Specification Manual.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

1.2 05 2100, 05 3100.

1.3 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-85.10-99, Protective Coatings for Metals.
- .2 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturer's Association (CPMA)
 - .1 CISC/CPMA 2-75-1975, Quick-Drying, Primer for Use on Structural Steel.
 - .2 CISC/CPMA 1-73a-1975, Quick-Drying, One-Coat Paint for Use on Structural Steel.
- .3 CSA International
 - .1 CSA G40.20/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA S16-09, Design of Steel Structures.
 - .3 CSA S136-07, North American Specification for the Design of Cold Formed Steel Structural Members.
 - .4 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel.
 - .5 CSA W55.3-08, Certificate of Companies for Resistance Welding of Steel and Aluminum.
 - .6 CSA W59-M03 (R2008), Welded Steel Construction (Metal Arc Welding) Metric.
- .4 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.

1.4 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 steel joist framing and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
 - .2 Indicate on erection drawings, relevant details such as joist mark, depth, spacing, bridging lines, bearing, anchorage and details.

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- .3 Indicate particulars, on shop drawings, relative to joist geometry, framed openings, splicing details, bearing and anchorage. Include member size, properties, specified and factored member loads, and stresses under various loadings, deflection and camber.
 - .4 Delegated Design Submittals:
 - .1 Submit floor vibration analysis as directed by Consultant.
 - .2 Submit 4 copies of calculations and joist design drawings for typical joists to Consultant for approval and review at least 4 weeks prior to fabrication and/or delivery.
- 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.
- Part 2 Products**
- 2.1 DESIGN CRITERIA**
- .1 Design steel joists and bridging to carry loads indicated in joist schedule shown on drawings to CSA S16, CSA S136.
 - .2 Design joists and anchorages for uplift forces as indicated.
 - .3 Ensure joists are manufactured to consider load effects due to fabrication, erection and handling.
 - .4 Limit floor joist deflection due to specified live load to L360 of maximum span and deflection due to specified total load to L240 maximum of span.
- 2.2 MATERIALS**
- .1 Open web steel joists: to CSA S16 CSA S136.
 - .2 Structural steel: to CSA G40.20/G40.21, CSA S136.
 - .3 Welding materials: to CSA W59.
 - .4 Shop paint primer: to MPI - INT 5.1A, MPI - INT 5.1B, CISC/CPMA-1, CISC/CPMA-2.
- 2.3 FABRICATION**
- .1 Fabricate steel joists and accessories as indicated in accordance with CSA S16 CSA S136 and in accordance with approved shop drawings.

- .2 Weld in accordance with CSA W59.
- .3 Provide top and bottom chord extensions where indicated.
- .4 Provide diagonal and horizontal bridgings and anchorages as indicated.

2.4 SHOP PAINTING

- .1 Clean, prepare and shop prime surfaces of steel joists to CSA S16 SSPC SP6.
- .2 Clean members of loose mill scale, rust, oil, dirt and other foreign matter. Prepare surfaces to SSPC SP1 brush blast.
- .3 Apply one coat of CISC/CPMA 2 primer to steel surfaces to achieve dry film thickness of .065 mm to .080 mm maximum except:
 - .1 Surfaces to be encased in concrete.
 - .2 Surfaces to receive field installed stud shear connectors and steel decks.
 - .3 Surfaces and edges to be field welded.
 - .4 Faying surfaces of friction-type connections.
 - .5 Below grade surfaces in contact with soil.
- .4 Apply paint under cover, on dry surfaces when surface and air temperatures are above 5 degrees C.
- .5 Maintain dry condition and 5 degrees C minimum temperature until paint is thoroughly dry.
- .6 Strip paint bolts, nuts, sharp edges and corners before prime coat is dry.

Part 3 Execution

3.1 EXAMINATION

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

3.2 INSTALLATION

- .1 Do structural steel work: to CSA S16 CSA S136.
- .2 Do welding: in accordance with CSA W59.
- .3 Ensure installers are certified to CSA W47.1
- .4 Submit certification that welded joints are qualified by Canadian Welding Bureau.

3.3 CONNECTION TO EXISTING WORK

- .1 Verify dimensions and condition of existing work; report discrepancies and potential problem areas to Consultant for direction before commencing fabrication.

3.4 ERECTION

- .1 Erect steel joists and bridging as indicated to CSA S16 and in accordance with approved erection drawings.
- .2 Complete installation of bridging and anchorages before placing construction loads on joists.
- .3 Field cutting or altering joists or bridging that are not shown on shop drawings: to approval of Consultant.
- .4 Clean and touch up shop primer to bolts, welds, burned or scratched surfaces at completion of erection.

3.5 FIELD PAINTING

- .1 Paint: in accordance with Section 09 91 23 - Interior Painting.
- .2 Touch up all damaged surfaces and surfaces without shop coat with MPI - INT 5.1A, MPI - INT 5.1B, CISC/CPMA-1, CISC/CPMA-2 in accordance with manufacturers' recommendations.

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.

3.7 PROTECTION

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

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 05 2100, 05 3100.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM A653/A653M-09a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM A792/A792M-09a, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
- .3 CSA International
 - .1 CSA C22.2 No.79-1978(R2008), Cellular Metal and Cellular Concrete Floor Raceways and Fittings.
 - .2 CSA S16-09, Design of Steel Structures.
 - .3 CSA S136-07, North American Specification for the Design of Cold Formed Steel Structural Members.
 - .4 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel Structures.
 - .5 CSA W55.3-08, Certification of Companies for Resistance Welding of Steel and Aluminum.
 - .6 CSA W59-03(R2008), Welded Steel Construction, (Metal Arc Welding).
- .4 Canadian Sheet Steel Building Institute (CSSBI)
 - .1 CSSBI 10M-08, Standard for Steel Roof Deck.
 - .2 CSSBI 12M-08, Standard for Composite Steel Deck.
- .5 Green Seal Environmental Standards (GS)
 - .1 GS-11-2008, 2nd Edition, Paints and Coatings.

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 steel decking and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:

- .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
- .2 Submit design calculations if requested by Consultant.
- .3 Indicate deck plan, profile, dimensions, base steel thickness, metallic coating designation, connections to supports and spacings, projections, openings, reinforcement details and accessories.
- .4 Indicate details of temporary shoring of steel deck, such as location, time and duration of placement and removal of shoring for concrete fill decks.

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 decking from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 DESIGN CRITERIA

- .1 Design steel deck to CSA S136, CSSBI 10M, CSSBI 12M.
- .2 Steel deck and connections to steel framing to carry dead, live and other loads including lateral loads, diaphragm action, composite deck action, and uplift as indicated.
- .3 Deflection under specified live load not to exceed 1/240 of span, except that when plaster gypsum board ceilings are hung directly from deck, live load deflection not to exceed 1/360 of span.
- .4 Where vibration effects are to be controlled as indicated, dynamic characteristics of decking system to be designed to be in accordance with CSA S16.

2.2 MATERIALS

- .1 Zinc-iron Alloy (ZF) coated steel sheet: to ASTM A653/A653M structural quality Grade 255, with ZF75 coating, for all steel deck.
- .2 Zinc (Z) coated steel sheet: to ASTM A653/A653M structural quality Grade 255, with ZF75.
- .3 Aluminum-zinc alloy (AZ) coated steel sheet: to ASTM A792/A 792M structural quality grade 255 with AZ 180 coating, chemically treated.
- .4 Acoustic insulation: fibrous glass 17.5 kg/m³ density minimum profiled to suit deck flutes.

- .5 Closures: as indicated in accordance with manufacturer's recommendations.
- .6 Cover plates, cell closures and flashings: steel sheet with minimum base steel thickness of 0.76 mm minimum. Metallic coating same as deck material.

2.3 TYPES OF DECKING

- .1 Composite steel floor deck: base steel thickness, as indicated on drawings

Part 3 Execution

3.1 EXAMINATION

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

3.2 INSTALLATION

- .1 Structural steel work: in accordance with CSA S136 CSSBI 10M CSSBI 12M.
- .2 Welding: in accordance with CSA W59, except where specified otherwise.
- .3 Companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel and/or CSA W55.3 for resistance welding.

3.3 ERECTION

- .1 Erect steel deck as indicated and in accordance with CSA S136, CSSBI 10M, CSSBI 12M and in accordance with approved reviewed erection drawings.
- .2 Lap ends: to 100 mm minimum.
- .3 Weld and test stud shear connectors through steel deck to steel joists/beams below in accordance with CSA W59.
- .4 Immediately after deck is permanently secured in place, touch up metallic coated top surface with compatible primer where burned by welding.
- .5 Prior to concrete placement, steel deck to be free of soil, debris, standing water, loose mill scale and other foreign matter.
- .6 Temporary shoring, if required, to be designed to support construction loads, wet concrete and other construction equipment. Do not remove temporary shoring until concrete attains 75% of its specified 28 day compression strength.
- .7 Place and support reinforcing steel as indicated.

3.4 CLOSURES

- .1 Install closures in accordance with approved details.

3.5 OPENINGS AND AREAS OF CONCENTRATED LOADS

- .1 No reinforcement required for openings cut in deck which are smaller than 150 mm square.
- .2 Frame deck openings with any one dimension greater than 150 mm, frame openings with structural steel as indicated on drawings.
- .3 For deck openings with any one dimension greater than 300 mm and for areas of concentrated load, reinforce in accordance with structural framing details, except as otherwise indicated.

3.6 CONNECTIONS

- .1 Install connections in accordance with CSSBI recommendations as indicated.

3.7 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.

3.8 PROTECTION

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

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Wood-Preservers' Association (AWPA)
 - .1 AWPA M2-01, Standard for Inspection of Treated Wood Products.
 - .2 AWPA M4-06, Standard for the Care of Preservative-Treated Wood Products.
- .2 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA O80 Series-97(R2002) - O80S2-05, Wood Preservation.
 - .2 CSA O80.20-1.1-M97(R2002), This Standard applies to the fire-retardant treatment of lumber by pressure processes..
 - .3 CSA O80.27-1.1-M97(R2002), This Standard covers the fire-retardant treatment of Douglas Fir, hardwood, softwood, and Poplar plywood by pressure processes.
 - .4 CSA O80.201-M89, This Standard covers hydrocarbon solvents for preparing solutions of preservatives.
 - .5 CSA O322-02, Procedure for Certification of Pressure-Treated Wood Materials for Use in Preserved Wood Foundations.
- .4 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)
 - .1 SCAQMD Rule 1113-04, Architectural Coatings.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit Submittal submissions: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Sustainable Submittals:
 - .1 Co-ordinate submittal requirements and provide submittals required by Section 01 47 15 - Sustainable Requirements: Construction.

1.3 QUALITY ASSURANCE

- .1 Regulatory Requirements:
 - .1 Each board or bundle of fire-retardant treated material panel to bear ULC label indicating Flame Spread Classification (FSC), and smoke developed.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 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 MATERIALS

- .1 Preservative: to CSA-O80 Series, water-borne, for clear finish.
- .2 Preservatives: maximum VOC limit 350 g/L.
- .3 Solvent: to CSA-O80.201.

Part 3 Execution

3.1 APPLICATION: FIELD TREATMENT

- .1 Comply with AWPA M4 and revisions specified in CSA O80 Series, Supplementary Requirements to AWPA M2.
- .2 Remove chemical deposits on treated wood to receive applied finish.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 06 10 00, 061500, 061753.

1.2 REFERENCES

- .1 American National Standards Institute/National Particleboard Association (ANSI/NPA)
 - .1 ANSI/NPA A208.1-2009, Particleboard.
- .2 ASTM International
 - .1 ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .3 ASTM C578-11a, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
 - .4 ASTM C1289-11, Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
 - .5 ASTM C1396/C1396M-11, Standard Specification for Gypsum Board.
 - .6 ASTM D1761-06, Standard Test Methods for Mechanical Fasteners in Wood.
 - .7 ASTM D5055-11, Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists.
 - .8 ASTM D5456-11, Standard Specification for Evaluation of Structural Composite Lumber Products.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-11.3-M87, Hardboard.
 - .2 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
 - .3 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction and amendment.
 - .4 CAN/CGSB-71.26-M88, Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems.
- .4 CSA International
 - .1 CAN/CSA-A123.2-03(R2008), Asphalt Coated Roofing Sheets.
 - .2 CAN/CSA-A247-M86 (R1996), Insulating Fiberboard.
 - .3 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
 - .4 CSA O112.9-10, Evaluation of Adhesives for Structural Wood Products (Exterior Exposure).
 - .5 CSA O121-08, Douglas Fir Plywood.
 - .6 CAN/CSA O122-06(R2011), Structural Glued-Laminated Timber.
 - .7 CSA O141-05(R2009), Softwood Lumber.

- .8 CSA O151-09, Canadian Softwood Plywood.
- .9 CSA O153-M1980 (R2008), Poplar Plywood.
- .10 CSA O325-07, Construction Sheathing.
- .11 CSA O437 Series-93(R2011), Standards on OSB and Waferboard.
- .12 CAN/CSA-Z809-08, Sustainable Forest Management.
- .5 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
- .6 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2010.
- .7 Sustainable Forestry Initiative (SFI)
 - .1 SFI-2010-2014 Standard.
- .8 The Truss Plate Institute of Canada
 - .1 Truss Design Procedures and Specifications for Light Metal Plate Connected Wood Trusses 2007.
- .9 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S706-09, Standard for Wood Fibre Insulating Boards for Buildings.

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.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.

1.4 QUALITY ASSURANCE

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

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 Store and protect wood from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products**2.1 FRAMING STRUCTURAL AND PANEL MATERIALS**

- .1 Description:
 - .1 Sustainability Characteristics:
 - .1 Lumber, Finger Jointed Lumber, Glulam, I-Joists, Trusses, SCL, CAN/CSA-Z809 or FSC or SFI certified.
 - .2 Plywood. Particleboard OSB urea-formaldehyde free, CAN/CSA-Z809 or FSC or SFI certified.
 - .2 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 Glulam in accordance with Structural Glued-Laminated Timber CAN/CSA-O122.
 - .4 Wood I-joists in accordance with Prefabricated Wood I-Joists ASTM D5055.
 - .5 Light-frame trusses in accordance with "Truss Design and Procedures for Light Metal Connected Wood Trusses", The Truss Plate Institute of Canada.
 - .6 Structural Composite Lumber (SCL) in accordance with ASTM D5456.
 - .7 Framing and board lumber: in accordance with NBC.
 - .8 Furring, blocking, nailing strips, grounds, rough bucks, curbs, fascia backing and sleepers:
 - .1 Board sizes: "Standard" or better grade.
 - .2 Dimension sizes: "Standard" light framing or better grade.
 - .3 Post and timbers sizes: "Standard" or better grade.
 - .9 Plywood, OSB and wood based composite panels: to CSA O325.
 - .10 Douglas fir plywood (DFP): to CSA O121, standard construction.
 - .11 Canadian softwood plywood (CSP): to CSA O151, standard construction.

- .12 Poplar plywood (PP): to CSA O153, standard construction.
- .13 Interior mat-formed wood particleboard: to ANSI/NPA 208.1.
- .14 Mat-formed structural panelboards (OSB wafer): to CAN O437.
- .15 Insulating fiberboard sheathing: to CAN/CSA-A247 CAN/ULC-S706.
- .16 Glass fibre board sheathing: non-structural, rigid, faced, fiberglass, insulating exterior sheathing board.
- .17 Gypsum sheathing: to ASTM C1396/C1396M.

2.2 ACCESSORIES

- .1 Exterior wall sheathing paper: to CAN/CGSB-51.32
- .2 Polyethylene film: to CAN/CGSB-51.34, Type 1, 0.15 mm thick.
- .3 Roll roofing: to CAN/CSA A123.2, Type S.
- .4 Air seal: closed cell polyurethane or polyethylene.
- .5 Sealants: in accordance with Section 07 92 00 - Joint Sealants.
- .6 Subflooring adhesive: to CAN/CGSB-71.26, cartridge loaded.
- .7 General purpose adhesive: to CSA O112.9.
- .8 Nails, spikes and staples: to CSA B111.
- .9 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.
- .10 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.
- .11 Joist hangers: minimum 1 mm thick sheet steel, galvanized ZF001 coating designation. Hangers to be sized by truss manufacturer.
- .12 Roof sheathing H-Clips: formed "H" shape, thickness to suit panel material, extruded 6063-T6 aluminum alloy type approved by Consultant.
- .13 Fastener Finishes:
 - .1 Galvanizing: to ASTM A123/A123M, ASTM A653, use galvanized fasteners for exterior work and treated lumber.
- .14 Wood Preservative:
 - .1 Preservative Coating: in accordance with manufacturer's recommendations for surface conditions:
 - .1 Preservative: VOC limit 350 g/L maximum to SCAQMD Rule 1113.
 - .2 Coatings: VOC limit 350 g/L maximum to SCAQMD Rule 1113.

Part 3 Execution

3.1 EXAMINATION

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

3.2 PREPARATION

- .1 Treat surfaces of material with wood preservative, before installation.
- .2 Apply preservative by dipping, or by brush to completely saturate and maintain wet film on surface for minimum 3 minute soak on lumber and one minute soak on plywood.
- .3 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

3.3 MATERIAL USAGE

- .1 Roof sheathing:
 - .1 Plywood, DFP or CSP sheathing grade or PP standard sheathing grade, square edge, 12.5 mm thick.
- .2 Exterior wall sheathing:
 - .1 Plywood, DFP or CSP sheathing grade or PP standard sheathing grade, square edge, 12.5 mm thick.
- .3 Subflooring:
 - .1 Plywood, DFP or CSP sheathing grade or PP standard sheathing grade, T and G edge, 19 mm thick.

3.4 INSTALLATION

- .1 Install members true to line, levels and elevations, square and plumb.
- .2 Construct continuous members from pieces of longest practical length.
- .3 Install spanning members with "crown-edge" up.
- .4 Select exposed framing for appearance. Install lumber panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.
- .5 Install subflooring combined subfloor and underlay with panel end-joints located on solid bearing, staggered at least 800 mm.
 - .1 In addition to mechanical fasteners, floor panels secure floor subflooring to floor joists using glue and screws. Place continuous adhesive bead in accordance with

manufacturer's instructions, single-bead on each joist and double-bead on joists where panel ends butt.

- .6 Install all wall sheathing in accordance with manufacturer's printed instructions.
- .7 Install all roof sheathing in accordance with requirements of NBC.
- .8 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding electrical equipment mounting boards, and other work as required.
- .9 Install furring to support siding applied vertically where there is no blocking and where sheathing is not suitable for direct nailing.
 - .1 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .10 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .11 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized steel fasteners.
- .12 Install sleepers as indicated.
- .13 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.
- .14 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .15 Countersink bolts where necessary to provide clearance for other work.
- .16 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

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.

3.6 PROTECTION

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

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 06 10 00, 061500, 061753.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 CSA International
 - .1 CSA B111-74(R2003), Wire Nails, Spikes and Staples.
 - .2 CAN/CSA O80 Series-08, Wood Preservation.
 - .3 CSA O86 Consolidation-09, Engineering Design in Wood.
 - .4 CAN/CSA-Z809-08, Sustainable Forest Management.
- .3 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2010.
 - .2 SCAQMD Rule 1113-A2011, Architectural Coatings.
 - .3 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.
- .4 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 wood decking 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.
- .4 Certifications: submit certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical properties.

1.4 QUALITY ASSURANCE

- .1 Lumber identification: 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.

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 Store and protect wood decking from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

Part 3 Execution

3.1 EXAMINATION

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

3.2 INSTALLATION

- .1 Do wood deck work to CSA O86 except where specified otherwise.
- .2 Install decking to CSA O86, continuous over two span pattern.
- .3 Supply minimum of 1 bearing support for each plank except extend cantilevers over two supports. Install sloping deck with tongues up. Join butt ends with splines to assure tight square fit.
- .4 Stagger end joints in adjacent planks minimum of 0.5 m.
 - .1 Separate joints in same area by at least 2 intervening courses.
 - .2 Avoid joints in first fifth of end spans.
 - .3 Minimize joints in middle third of span.
- .5 Apply preservative to end cuts of pressure treated lumber.

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.

3.4 PROTECTION

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

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 06 10 00, 061500, 061753.

1.2 REFERENCES

- .1 CSA International
 - .1 CAN/CSA O80 Series-08, Wood Preservation.
 - .2 CSA O86 Consolidation-09, Engineering Design in Wood.
 - .3 CSA O141-05(R2009), Softwood Lumber.
 - .4 CSA S307-M1980 (R2001), Load Test Procedure for Wood Roof Trusses for Houses and Small Buildings.
 - .5 CSA S347-99 (R2009), Method of Test for Evaluation of Truss Plates Used in Lumber Joints.
 - .6 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel.
 - .7 CAN/CSA-Z809-08, Sustainable Forest Management.
- .2 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
- .3 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2010.
- .4 National Research Council (NRC)/Institute for Research in Construction (IRC) - Canadian Construction Materials Centre (CCMC)
 - .1 CCMC-on-line edition, Registry of Product Evaluations.
- .5 Truss Plate Institute of Canada (TPIC)
 - .1 TPIC - 2007, Truss Design Procedures and Specifications for Light Metal Plate Connected Wood Trusses (Limit States Design).
- .6 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 wood trusses and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:

- .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
- .2 Include on drawings:
 - .1 Each shop drawing submission showing connection details.
 - .2 Indicate special structural application and specification as according to local authorities having jurisdiction.
 - .3 Indicate TPIC Truss Design Procedure and CSA O86 Engineering Design in Wood and specific CCMC Product Registry number of the truss plates
 - .4 Indicate species, sizes, and stress grades of lumber used as truss members. Show pitch, span, camber, configuration and spacing of trusses. Indicate connector types, thicknesses, sizes, locations and design value. Show bearing details. Indicate design load for members.
 - .5 Submit stress diagram or print-out of computer design indicating design load for truss members. Indicate allowable load and stress increase.
 - .6 Provide certification that trusses meet requirements of CSA S307 and CSA S347.
 - .7 Indicate arrangement of webs or other members to accommodate ducts and other specialties.
 - .8 Show location of lateral bracing for compression members.
 - .9 Test reports: submit certified test reports for prefabricated wood trusses from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
 - .10 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .11 Instructions: submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Fabricator for trusses to show evidence of quality control program such as provided by regional wood truss associations, or equivalent.
 - .2 Fabricator for welded steel connections to be certified in accordance with CSA W47.1.
- .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.

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 Store and protect wood trusses from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
 - .4 Provide bearing supports and bracings. Prevent bending, warping and overturning of trusses.

Part 2 Products

2.1 DESIGN REQUIREMENTS

- .1 Design light metal plate connected wood trusses in accordance with TPIC truss design procedures for wood truss chords and webs in accordance with engineering properties in CSA O86.
- .2 Design light metal plate connected wood trusses in accordance with TPIC truss design procedures for truss joint designs to test engineering properties in accordance with CSA S347 and listed in CCMC Registry of Product Evaluations.
- .3 Design trusses, bracing in accordance with CSA O86.1 for loads indicated for building locality as ascertained by NBC, Climatic Information for Building Design in Canada and minimum uniform and minimum concentrated loadings stipulated in NBC commentary.
- .4 Limit live load deflection to 1/360th of span where gypsum board ceilings are hung directly from trusses.
- .5 Provide camber for trusses as indicated.

2.2 MATERIALS

- .1 Materials and products in accordance with Section 01 47 15 - Sustainable Requirements: Construction.
- .2 Lumber: As required by truss manufacturer and to following standards:
 - .1 CSA O141.
 - .2 NLGA (National Lumber Grading Association), Standard Grading Rules for Canadian Lumber.
 - .3 CAN/CSA-Z809 or FSC or SFI certified.
- .3 Fastenings: to CSA O86.
- .4 Preservative: creosote.

2.3 FABRICATION

- .1 Fabricate wood trusses in accordance with reviewed and approved shop drawings.
- .2 Provide for design camber and roof slopes when positioning truss members.

- .3 Connect members using metal connector plates.

2.4 SOURCE QUALITY CONTROL

- .1 Identify lumber by grade stamp of an agency certified by Canadian Lumber Standards Administration Board.
- .2 Certify by agency accredited by Standards Council of Canada that preservative fire retardant treated wood in accordance with CAN/CSA O80 Series.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.
 - .1 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .2 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 recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.3 ERECTION

- .1 Erect wood trusses in accordance with reviewed and approved shop drawings.
- .2 Handling, installation, erection, bracing and lifting in accordance with manufacturer's instructions.
- .3 Make adequate provisions for handling and erection stresses.
- .4 Exercise care to prevent out-of-plane bending of trusses.
- .5 Install temporary horizontal and cross bracing to hold trusses plumb and in safe condition until permanent bracing and decking are installed.
- .6 Install permanent bracing in accordance with approved shop drawings, prior to application of loads to trusses.
- .7 Do not cut or remove any truss material without approval of Consultant.
- .8 Remove chemical and other surface deposits on treated wood, in preparation for applied finishes.

3.4 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
 - .1 Have manufacturer of products supplied under this Section review work involved in handling, installation/application, protection and cleaning of its products, and

- submit written reports, in acceptable format, to verify compliance of work with Contract.
- .2 Manufacturer's field services: provide manufacturer's field services, consisting of product use recommendations and periodic site visits for inspection of product installation, in accordance with manufacturer's instructions.
 - .3 Schedule site visits to review work at stages listed:
 - .1 After delivery and storage of products, and when preparatory work on which work of this Section depends is complete, but before installation begins.
 - .2 Twice during progress of work at 25% and 60% complete.
 - .2 Upon completion of work, after cleaning is carried out.
 - .3 Obtain reports within three days of review and submit immediately to Consultant.

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.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American National Standards Institute (ANSI)
 - .1 ANSI A208.1-09, Particleboard.
 - .2 ANSI A208.2-09, Medium Density Fibreboard (MDF) for Interior Applications.
 - .3 ANSI/HPVA HP-1-10, American National Standard for Hardwood and Decorative Plywood.
- .2 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
 - .1 Architectural Woodwork Quality Standards, 1st edition, 2009.
- .3 ASTM International
 - .1 ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-11.3-M87, Hardboard.
- .5 CSA International
 - .1 CSA B111-74(R2003), Wire Nails, Spikes and Staples.
 - .2 CSA O121-08, Douglas Fir Plywood.
 - .3 CSA O141-05(R2009), Softwood Lumber.
 - .4 CSA O151-09, Canadian Softwood Plywood.
 - .5 CSA O153-M1980(R2008), Poplar Plywood.
 - .6 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 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2010.
- .8 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.
- .9 Sustainable Forestry Initiative (SFI)
 - .1 SFI-2010-2014 Standard.
- .10 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S104-10, Standard Method for Fire Tests of Door Assemblies.
 - .2 CAN/ULC-S105-09, Standard Specification for Fire Door Frames.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Indicate details of construction, profiles, jointing, fastening and other related details.
 - .2 Indicate materials, thicknesses, finishes and hardware.
- .3 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Submit duplicate 300 x 300 mm samples or 300mm long unless specified otherwise of materials.
- .4 Certifications: submit certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical properties.
- .5 Test and Evaluation Reports: submit certified test reports for composite wood from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.

1.3 QUALITY ASSURANCE

- .1 Lumber by grade stamp of agency certified by Canadian Lumber Standards Accreditation Board (CLSAB).
- .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.
- .4 Wood fire rated frames and panels: listed and labelled by an organization accredited by Standards Council of Canada to CAN/ULC-S104 and CAN/ULC-S105.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 60 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 in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Softwood lumber: S4S, moisture content 19% or less 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 premium grade, moisture content as specified.
 - .5 Machine stress-rated lumber is acceptable.
 - .6 Hardwood lumber: moisture contain 6% or less in accordance:
 - .1 National Hardwood Lumber Association (NHLA).
 - .2 AWMAC premium grade, moisture content as specified.
 - .3 CAN/CSA-Z809 or FSC or SFI certified.
- .2 Panel Material: urea-formaldehyde free
 - .1 CAN/CSA-Z809 or FSC or SFI certified.
 - .2 Douglas fir plywood (DFP): to CSA O121, standard construction.
 - .3 Canadian softwood plywood (CSP): to CSA O151, standard construction.
 - .4 Hardwood plywood: to ANSI/HPVA HP-1.
 - .5 Poplar plywood (PP): to CSA O153, standard construction.
 - .6 Particleboard: to ANSI A208.1.
 - .1 Manufactured with recycled wood fiber
 - .7 Hardboard: to CAN/CGSB-11.3.
 - .8 Medium density fibreboard (MDF): to ANSI A208.2, density 640-800 kg/m³.
 - .1 Manufactured with recycled wood fiber
 - .9 Low density fibreboard: to CSA-A247M.

2.2 ACCESSORIES

- .1 Nails and staples: to CSA B111; galvanized to ASTM A123/A123M for exterior work, interior humid areas and for treated lumber; plain stainless steel finish elsewhere.
- .2 Wood screws: plain steel, type and size to suit application.
- .3 Splines: .Wood
- .4 Adhesive and Sealants: Recommended by 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 wood products installation in accordance with manufacturer's written instructions.
 - .1 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

- .1 Do finish carpentry to Quality Standards of (AWMAC).
- .2 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets, or other projecting, intersecting or penetrating objects.
- .3 Form joints to conceal shrinkage.

3.3 CONSTRUCTION

- .1 Shelving:
 - .1 Install shelving on as indicated.

3.4 INSTALLATION OF SHELVING

- .1 Softwood and popular plywood DFP or CSP or PP grade, grade, square edge, mm thick.
- .2 Hardwood plywood:
 - .1 Thickness: mm.
 - .2 Number of plies: .
 - .3 Face veneer: species, grade, cut, matching requirement.
 - .4 Back veneer: species, grade, cut, matching requirement.
 - .5 Core: .
 - .6 Bond: Type II.
 - .7 Sanding: no sanding touch sanding regular sanding.
 - .8 Grain direction: .
- .3 Particleboard, grade , mm thick.
- .4 Solid wood: species, grade, mm thick.
- .5 MDF grade, mm thick, finish/decorative overlay.
- .6 Edge banding: provide 10 mm thick solid matching wood strip on plywood particleboard edges 12 mm or thicker, exposed in final assembly. Strips same width as plywood particleboard.

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.

3.6 PROTECTION

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

END OF SECTION

Part 1 General

1.1 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 Non-volatile 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(R2009), Softwood Lumber.
 - .5 CSA O151-09, Canadian Softwood Plywood.
 - .6 CSA O153-M1980(R2008), Poplar Plywood.
 - .7 CAN/CSA-Z809-08, Sustainable Forest Management.
- .6 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
- .7 Green Seal Environmental Standards (GS)
 - .1 GS-11-11, Paints and Coatings.
 - .2 GS-36-11, Commercial Adhesives.
- .8 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

- .1 Material Safety Data Sheets (MSDS).
- .9 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.
- .10 National Electrical Manufacturers Association (NEMA)
 - .1 ANSI/NEMA LD-3-05, High-Pressure Decorative Laminates (HPDL).
- .11 National Hardwood Lumber Association (NHLA)
 - .1 Rules for the Measurement and Inspection of Hardwood and Cypress 2011.
- .12 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2010.
- .13 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.
- .14 Sustainable Forestry Initiative (SFI)
 - .1 SFI-2010-2014 Standard.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 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.
- .3 Samples:
 - .1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures
 - .2 .
 - .3 Submit duplicate sample size 300 x 300 mm or 300mm long.
 - .4 Submit duplicate samples of laminated plastic for colour selection.
 - .5 Submit duplicate samples of laminated plastic joints, edging, cutouts and postformed profiles.
- .4 Certifications: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

1.3 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.

1.4 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.
 - .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 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.
- .4 Packaging Waste Management: remove for reuse in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

- .1 Softwood lumber: unless specified otherwise, S4S, moisture content 15 % or less 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 and 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, CSA Z760-94 Life Cycle Assessment.
- .4 Hardwood lumber: moisture content 6 % or less in accordance with following standards:
 - .1 National Hardwood Lumber Association (NHLA).

- .2 CAN/CSA-Z809 or FSC or SFI certified.
- .3 AWMAC 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 Canadian softwood plywood (CSP): to CSA O151, standard construction, CAN/CSA-Z809 or FSC or SFI certified.
 - .1 Plywood resin to contain no added urea-formaldehyde.
- .7 Hardwood plywood: to ANSI/HPVA HP-1, CAN/CSA-Z809 or FSC or SFI certified.
 - .1 Plywood resin to contain no added urea-formaldehyde.
- .8 Poplar plywood (PP): to CSA O153, standard construction, CAN/CSA-Z809 or FSC or SFI certified.
 - .1 Plywood resin to contain no added urea-formaldehyde.
- .9 Interior mat-formed wood particleboard: to ANSI/NPA A208.1, CAN/CSA-Z809 or FSC or SFI certified.
 - .1 Particleboard resin to contain no added urea-formaldehyde.
- .10 Birch plywood: to AWMAC Natural, CAN/CSA-Z809 or FSC or SFI certified.
 - .1 Plywood resin to contain no added urea-formaldehyde.
- .11 Fibreboard must contain less than 10% roundwood by weight, using weighted average over three month period at manufacturing locations.
 - .1 Fibreboard resin to contain no added urea-formaldehyde.
 - .2 CAN/CSA-Z809 or FSC or SFI certified.
- .12 Hardboard:
 - .1 To CAN/CGSB-11.3, CAN/CSA-Z809 or FSC or SFI certified.
 - .2 Hardboard resin to contain no added urea-formaldehyde.
- .13 MDF (medium density fibreboard) core: to ANSI A208.2, density 769 kg/m², 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.
- .14 Thermofused Melamine: to NEMA LD3 Grade VGL.
 - .1 High wear resistant thermofused melamine: equal or exceed 400 cycles (Minimum standard for HPL abrasion test).
- .15 Nails and staples: to CSA B111.
- .16 Wood screws: stainless steel type and size to suit application.
- .17 Splines: wood.
- .18 Sealant: in accordance with Section 07 92 00 - Joint Sealants.

- .1 Sealants: VOC limit 250 g/L maximum to SCAQMD Rule 1168.
- .19 Laminated plastic adhesive:
 - .1 Adhesive: urea resin adhesive to CSA O112.10 contact adhesive to CAN/CGSB-71.20 resorcinol resin adhesive to CSA O112.10 polyvinyl adhesive to CSA O112.10 two component epoxy thermosetting adhesive.
 - .2 Adhesives: VOC limit 30 g/L maximum to GS-36.
 - .3 Clear Wood Finishes: VOC limit 350 550 g/L maximum to GS-11

2.2 Stainless Steel Cabinets/ Counter Tops

- .1 General Stainless steel materials requirements (Counter and Cabinets for Rooms 136 and 138).
 - .1 Fabricate work square, true, straight to suit installation conditions and as indicated
 - .2 Fit and shop assemble equipment ready for erection where possible
 - .3 Debur, smooth and round off raw edges prior to forming
 - .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
 - .5 Stainless sheet steel to ASTM 204/240M Type 304 with AISI No. 4 finish with 2mm thickness or as indicated
 - .6 Hardware and Fastenings: Stainless Steel
 - .7 Welding: sound, non-porous and free from imperfections
 - .1 Weld metal: color matched and corrosion-resistant as parent metal
 - .2 Spot welds. Minimum 3.0 mm in diameter with full penetration
 - .3 Grind exposed welds smooth and polish to match parent metal
 - .4 Grind other welds smooth
 - .5 Welding and finishing is not to impair corrosion resistance of finish article.
 - .6 Welds, except spot welds: continuous unless otherwise indicated
 - .8 Steel Section and tubing plates to CSA G40.20/G40.21
 - .9 Steel Pipe to ASTM A53/A53M
 - .10 Welding Materials to CSA W59
 - .11 Welding electrodes to CSA W48 Series
 - .12 Bolts and anchor bolts to ASTM A307

2.3 MANUFACTURED UNITS

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

- .1 S2S
- .2 Board sizes: "standard" or better grade.
- .3 Dimension sizes: "standard" light framing or better grade.
- .4 Urea-formaldehyde free.
- .3 Framing fir or spruce species, NLGA custom grade.
- .4 Case bodies (ends, divisions and bottoms).
 - .1 Softwood and poplar plywood DFP or CSP or PP custom grade, square edge, 19 mm thick.
 - .2 Particleboard, grade R, 19 mm thick.
 - .3 Solid wood: fir or spruce species, custom grade, 19 mm thick.
- .5 Backs:
 - .1 Softwood and poplar plywood DFP or CSP or PP custom grade, square edge, 19 mm thick.
 - .2 Particleboard, grade R, 6 mm thick.
 - .3 Fibreboard, Medium Density Fibreboard 19 mm thick.
 - .4 Solid wood: spruce species, custom grade, 19 mm thick.
- .6 Shelving:
 - .1 Softwood and poplar plywood DFP or CSP or PP G2G grade, square edge, 16 and 19 mm thick.
 - .2 Particleboard, HPL grade M2, 19 - 25 mm thick.
 - .3 Solid wood: hard maple species, premium grade, 19 mm thick.
 - .4 Edge banding: provide 10 mm thick solid matching wood strip on plywood edges 10 mm or thicker, exposed in final assembly. Strips same width as plywood.
- .2 Drawers:
 - .1 Fabricate drawers to AWMAC premium grade supplemented as follows:
 - .2 Sides and Backs.
 - .1 Softwood and poplar plywood DFP or CSP or PP G2G grade, square edge, 13 mm thick.
 - .2 Fibreboard: medium density fibreboard 13 mm thick.
 - .3 Thermofused melamine: 13 mm thick.
 - .3 Bottoms:
 - .1 Softwood and poplar plywood DFP or CSP or PP G2G grade, square edge, 13 mm thick.
 - .2 Hardboard: type 1, 6 mm thick.
 - .4 Fronts:
 - .1 Softwood and poplar plywood DFP or CSP or PP G2G grade, square edge, 19 mm thick.
 - .2 Particleboard, HPL grade 2000, 16 mm thick.
- .3 Casework Doors:

- .1 Fabricate doors to AWMAC premium grade supplemented as follows:
- .2 Softwood and poplar plywood DFP or CSP or PP G2G grade, square edge, 19 mm thick.
- .3 Particleboard, HPL grade 2000, 19 mm thick.
- .4 Medium Density Fibreboard, laminated with TFM.

2.4**MANUFACTURED UNITS**

- .1 Monitor Room 118 Cabinets:
 - .1 Counter: upper cabinets (open, no doors):
 - .2 Interior of Cabinet: 16mm melamine faced, particleboard core.
 - .3 Exposed panels to match cabinet doors and drawers.
 - .4 Exterior of Cabinet:
 - .2 Ends and interior gables.
 - .3 19mm melamine faced plywood, particleboard core.
 - .4 Plastic laminate countertop:
 - .5 Construction similar to that of washroom vanities, to height indicated on drawings. (no apron for countertop)
 - .6 180° wrap both sides of counter.
 - .7 Shelving:
 - .1 Core 55 lb medium density particleboard, laminated with melamine HPL grade 2000, 25 mm thick.
- .2 Guard Desk Room 135
 - .1 To AWMAC premium quality grade
 - .2 Standard softwood framing species (NLGA) (NHLA) for counter framing including furring, blocking, nailing strips, grounds and rough bucks and sleepers.
 - .3 Prepare for: electrical wiring, outlets, computer grounded outlets etc.
 - .4 Counter top: stainless steel on double 19mm plywood core. 180° wrap.
 - .5 Countertop supports: Pre-manufacture red Steel Brackets – heavy-duty.
 - .6 Stainless Steel, complete with pass through for cables
 - .1 Size: 533 x 610mm
 - .2 Spaced: 406mm O.C.
 - .7 Casework:
 - .1 Exposed sides, front and ends: Particleboard, with plastic laminate finish thickness as indicated on drawings.
 - .2 Unexposed sides, 16 mm particleboard
 - .3 Front side and ends of counters: Particleboard, with plastic laminate finish thicknesses as shown.
 - .4 Bond: Type II.
 - .8 Drawers: To AWMAC standards.
 - .1 Front: Particleboard, with plastic laminate finish 19 mm thick.

- .2 Sides and Back: 13 mm melamine, commercial grade.
- .3 Bottom: 6mm prefinished hardboard.
- .4 Slide, bottom mounted.
- .5 Drawer pulls (125mm aluminum) and locks (nickel plated) as specified.
- .6 Bond: Type II.
- .9 Transaction Counter: Stainless steel with 19 mm plywood core 180° wrap as shown.
- .10 Counter grommets location to be determined.
- .11 Base: Particleboard, with plastic laminate finish 6 mm thick.
- .12 Edge Tape: finish to match laminate.
- .3 Multipurpose Room 104
 - .1 Construction Standard: AWMAC. To custom commercial grade including casework and drawers.
 - .2 Construct cabinets and countertops in locations shown and as depicted on the drawings.
 - .3 Doors and Drawer Fronts: Thermofoil exterior with white melamine interior.
 - .4 Interior of Cabinets: 16mm melamine faced plywood, particleboard core.
 - .5 Exterior Cabinets finish: Particleboard with melamine face to match cabinet doors.
 - .6 Shelving: adjustable.
 - .7 Counter Top: Rounded 180 deg. edge plastic lam top and 100mm backsplash, to counter depths shown. Single piece counter tops with integral backsplash.
 - .8 Intermittent fillers as required.
 - .9 Toe space: coved.
 - .10 Hardware:
 - .1 Pulls: 125mm 'D' pulls.
 - .2 Door Closers: concealed self-closing hinges and door silencers.
 - .3 Drawer slides: heavy duty.
 - .11 All doors and drawers with locks.
 - .12 Finish colour: to be determined.
- .4 Reception Room 102
 - .1 Construction Standard: AWMAC. To custom commercial grade including casework and drawers.
 - .2 Door and Drawer Fronts: Particleboard with melamine finish
 - .1 19 mm Particleboard with melamine finish
 - .2 Interior of Cabinet: 16mm melamine faced plywood, particleboard core.
 - .3 Shelving: adjustable, unless otherwise noted on drawings.
 - .4 Upper cabinets as shown on drawing.
 - .5 Intermittent fillers as required.

- .6 Toe space: rubber base.
- .7 Exterior of Cabinet:
- .3 Plastic laminate countertop:
 - .1 Office counter top: Rounded 180 deg. edge plastic laminate top and 100mm backsplash, to counter depths shown. Single piece counter tops with integral backsplash.
 - .2 Reception counter top to be one piece wrapped to full apron length as indicated on drawings.
- .4 Hardware:
 - .1 Pulls: 125mm 'D' pulls
 - .2 Hinges: self-closing
- .5 Door catches: magnetic
- .5 Washroom Cabinets
 - .1 Construction: To AWMAC standards, commercial grade.
 - .2 Materials: 19mm plywood, plastic laminate finish on all surfaces as shown.
 - .3 Bond: Type II.
 - .4 Ensure vanity top is complete with one-piece laminate finish including backsplash, counter top and apron.
 - .5 Materials as indicated in the drawings.
 - .6 Countertop supports: Pre-manufactured Steel Brackets – heavy-duty.
 - .7 Stainless Steel, complete with pass through for cables
 - .1 Size: 457 x 381mm
 - .2 Spaced: as required.
 - .8 Sealant: clear silicone sealant.
 - .9 Laminate: Colours as selected.

2.5 FABRICATION

- .1 Set nails and countersink screws apply wood filler to indentations, sand smooth and leave ready to receive finish.
- .2 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.
- .3 Shelving to cabinetwork to be adjustable unless otherwise noted.
- .4 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.
- .5 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.
- .6 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.
- .7 Ensure adjacent parts of continuous laminate work match in colour and pattern.

- .8 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 cutouts.
- .9 Form shaped profiles and bends as indicated, using postforming grade laminate to laminate manufacturer's instructions.
- .10 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.
- .11 Apply laminate backing sheet to reverse side of core of plastic laminate work.
- .12 Apply laminated plastic liner sheet where indicated.

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 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative DCC Representative Consultant.

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 water resistant building paper over wood framing members in contact with masonry or cementitious construction.
- .8 Fit hardware accurately and securely in accordance with manufacturer's written instructions.

- .9 Install at location as indicated.
- .10 Site apply laminated plastic to units as indicated.
 - .1 Adhere laminated plastic over entire surface.
 - .2 Make corners with hairline joints.
 - .3 Use full sized laminate sheets.
 - .4 Make joints only where indicated approved Consultant.
 - .5 Slightly bevel arises.
- .11 For site application, offset joints in plastic laminate facing from joints in core.

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 millwork and cabinet work outside surfaces inside cupboards drawers.
 - .2 Remove excess glue from surfaces.

3.4 PROTECTION

- .1 Protect millwork 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

Approved: 2010-06-30

Part 1 General

1.1 RELATED REQUIREMENTS

.1 .

1.2 REFERENCES

.1 American National Standards Institute (ANSI)

.1 ANSI 208.1-09, Particleboard.

.2 ASTM International

.1 ASTM D2832-92(R2011), Standard Guide for Determining Volatile and Non-volatile Content of Paint and Related Coatings.

.2 ASTM D2369-10e1, Standard Test Method for Volatile Content of Coatings.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.

.4 CSA International

.1 CSA O112.10-08, Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure).

.2 CSA O121-08, Douglas Fir Plywood.

.3 CSA O151-09, Canadian Softwood Plywood.

.4 CSA O153-M1980(R2008), Poplar Plywood.

.5 CAN/CSA-Z809-08, Sustainable Forest Management.

.5 Forest Stewardship Council (FSC)

.1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.

.6 Green Seal Environmental Standards (GS)

.1 GS-36-11, Commercial Adhesives.

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

.1 Material Safety Data Sheets (MSDS).

.8 National Electrical Manufacturers Association (NEMA)

.1 ANSI/NEMA LD-3-05, High Pressure Decorative Laminates (HPDL).

.9 Scientific Equipment and Furniture Association (SEFA)

.1 SEFA 8-99, Laboratory Furniture.

.10 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.
- .11 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 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into work.
 - .3 Submit duplicate samples of joints, edging, cutouts and postformed profiles.
 - .3 Certifications: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .1 Wood Certification: submit vendor's manufacturer's Chain-of-Custody Certificate number for CAN/CSA-Z809 or FSC or SFI certified wood.
 - .2 Low-Emitting Materials:
 - .1 Submit listing of composite wood products used in building, stating they contain no added urea-formaldehyde resins, laminate adhesives used in building, stating they contain no urea-formaldehyde.
 - .2 Submit listing of adhesives and sealants sealers used in building, showing compliance with VOC and chemical component limits or restrictions requirements.
- 1.4 CLOSEOUT SUBMITTALS**
 - .1 Provide maintenance data for laminate work for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- 1.5 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.
- 1.6 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 in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

- .2 Store and protect laminate, adhesive, and core materials from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Laminated plastic for flatwork: to NEMA LD3.
 - .1 Type: general purpose.
 - .2 Grade: HGS.
 - .3 Size: 1.27 mm thick.
 - .4 Colour: integral colour throughout, multilayered.
 - .5 Pattern and Finish: Selected from manufacturers full range of available selections. Up to four different patterns / finishes will be selected.
- .2 Laminated plastic for postforming work: to NEMA LD3.
 - .1 Type: postforming.
 - .2 Grade: HGP .
 - .3 Size: 1.016 mm thick.
 - .4 Pattern and Finish: Selected from manufacturers full range of available selections. Up to four different patterns / finishes will be selected.
- .3 Laminated plastic for backing sheet: to NEMA LD3.
 - .1 Type: backer.
 - .2 Grade: BKM BKL.
 - .3 Size: not less than 0.5 mm thick or same thickness as face laminate.
 - .4 Colour: same colour as face laminate.
- .4 Laminated plastic adhesive: Low VOC acceptable to laminate manufacturer
 - .1 Test for acceptable VOC emissions in accordance with ASTM D2369 and ASTM D2832.
- .5 Sealer: water resistant sealer or glue acceptable to laminate manufacturer.
 - .1 Draw bolts and splines: as recommended by fabricator.

2.2 FABRICATION

- .1 Comply with NEMA LD3, Annex A.
- .2 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.
- .3 Ensure adjacent parts of continuous laminate work match in colour and pattern.
- .4 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 2400 3000 mm. Keep joints 600 mm from sink cutouts.

- .5 Form shaped profiles and bends as indicated, using postforming grade laminate to laminate manufacturer's instructions.
- .6 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.
- .7 Apply laminate backing sheet to reverse side of core of plastic laminate work.
- .8 Apply laminated plastic liner sheet to interior of cabinetry.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION

- .1 Install work plumb, true and square, neatly scribed to adjoining surfaces.
- .2 Make allowances around perimeter where fixed objects pass through or project into laminated plastic work to permit normal movement without restriction.
- .3 Use draw bolts and splines in countertop joints. Maximum spacing 450 mm on centre, 75 mm from edge. Make flush hairline joints.
- .4 Provide cutouts for inserts, grilles, appliances, outlet boxes and other penetrations. Round internal corners, chamfer edges and seal exposed core.
- .5 At junction of laminated plastic counter back splash and adjacent wall finish, apply small bead of sealant.

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 to NEMA LD3, Annex B.
 - .2 Remove traces of primer, caulking, epoxy and filler materials and clean doors and frames.
- .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 Cover finished laminated veneered surfaces with heavy Kraft paper or put in cartons during shipment.
- .2 Protect installed laminated surfaces in accordance with manufacturer's written recommendations.
 - .1 Remove protection only immediately before final inspection.
- .3 Protect installed products and components from damage during construction.
- .4 Repair damage to adjacent materials caused by laminate, adhesive, and core materials installation.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ASTM International Inc.
 - .1 ASTM C726-05, Standard Specification for Mineral Fiber Roof Insulation Board.
 - .2 ASTM C728-05, Standard Specification for Perlite Thermal Insulation Board.
 - .3 ASTM D41-05, Standard Specification for Asphalt Primer Used in Roofing, Damp proofing, and Waterproofing.
 - .4 ASTM D448-03a, Standard Classification for Sizes of Aggregate for Road and Bridge Construction.
 - .5 ASTM D449-03, Standard Specification for Asphalt Used in Damp proofing and Waterproofing.
 - .6 ASTM D2178-04, Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
 - .7 ASTM D6162-00a, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fibre Reinforcements.
 - .8 ASTM D6163-00e1, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fibre Reinforcements.
 - .9 ASTM D6164-05, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
- .2 Canadian General Standards Board (CGSB)
 - .1 CGSB 37-GP-9Ma-83, Primer, Asphalt, Unfilled, for Asphalt Roofing, Damp proofing and Waterproofing.
 - .2 CGSB 37-GP-56M-80b(A1985), Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-A123.3-05, Asphalt Saturated Organic Roofing Felt.
 - .2 CSA-A123.4-04, Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems.
 - .3 CSA A231.1/A231.2-06, Precast Concrete Paving Slabs/Precast Concrete Pavers.
- .4 Underwriters Laboratories' of Canada (ULC)
 - .1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
 - .2 CAN/ULC-S702.2-03, Standard for Mineral Fibre Thermal Insulation for Buildings.
 - .3 CAN/ULC-S704-03, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

- .4 CAN/ULC-S706-02, Standard for Wood Fibre Thermal Insulation for Buildings.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide two copies of most recent technical waterproofing components data sheets describing materials' physical properties and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Provide two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements 01 35 43 - Environmental Procedures, and indicate VOC content for:
 - .1 Primers.
 - .2 Asphalt.
 - .3 Sealers.
 - .4 Filter fabric.
- .3 Provide shop drawings and indicate:
 - .1 Flashing, control joints, details.

1.3 QUALITY ASSURANCE

- .1 Sustainability Standards Certification:

1.4 FIRE PROTECTION

- .1 Fire Extinguishers:
 - .1 Maintain one stored pressure rechargeable type with hose and shut-off nozzle,
 - .2 ULC labelled for A, B and C class protection.
 - .3 Sizes 14 kg or as indicated on roof per torch applicator, within 6 m of torch applicator.
- .2 Maintain fire watch for 1 hour after each day's waterproofing operations cease.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Provide and maintain dry, off-ground weatherproof storage.
- .2 Store rolls of felt and membrane in upright position.
 - .1 Store membrane rolls with salvage edge up.
- .3 Remove only in quantities required for same day use.
- .4 Place plywood runways over completed Work to enable movement of material and other traffic.
- .5 Store sealants at +5 degrees C minimum.
- .6 Store insulation protected from weather and deleterious materials.

- .7 Handle waterproofing materials in accordance with manufacturer's written directives, to prevent damage or loss of performance.
- .8 Store and manage hazardous materials in accordance with Section 01 35 29.06 - Health and Safety Requirements 01 35 43 - Environmental Procedures.

1.6 SITE CONDITIONS

- .1 Ambient Conditions
 - .1 Do not install waterproofing when temperature remains below -18 degrees C for torch application, or to manufacturers' recommendations for mop application.
 - .2 Minimum temperature for solvent-based adhesive is -5 degrees C.
- .2 Install waterproofing on dry deck, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into waterproofing system.

1.7 WARRANTY

- .1 For Work of this Section 07 13 52 - Modified Bituminous Sheet Waterproofing , 12 months warranty period is extended to 60 months.

Part 2 Products

- .1 Primer: For application and curing at temperatures between -12 C and 25 C: Acceptable material: Bakor Aqua Tac Primer
- .2 Mastic: Acceptable Product Bakor Polybitume 507-05
- .3 Self-Adhesive Waterproofing Membrane : Acceptable material: Bakor Blueskin WP2000
- .4 Type 4 Insulation: Acceptable Product: Styrofoam SM, 100mm thick
- .5 Prefabricated Drainage Composites: Acceptable Materials: Vertical walls Surface Bakor DBR100

Part 3 Execution

3.1 FIELD QUALITY CONTROL

- .1 Inspections:
 - .1 Inspection and testing of waterproofing application will be carried out by testing laboratory designated by Consultant.
 - .2 Departmental Representative will pay for tests as specified in Section 01 45 00 - Quality Control.
 - .3 Inspection and testing of waterproofing application will be carried out by testing laboratory designated by Consultant.
 - .4 Costs of tests will be paid under cash allowance.

3.2 CLEANING

- .1 Remove bituminous markings from finished surfaces.

- .2 In areas where finished surfaces are soiled caused by work of this section, consult manufacturer of surfaces for cleaning advice and complying with their documented instructions.
- .3 Repair or replace defaced or disfigured finishes caused by work of this section.

END OF SECTION

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C208-95(2001), Specification for Cellulosic Fiber Insulating Board.
 - .2 ASTM C591-01, Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
 - .3 ASTM C612-04, Standard Specification for Mineral Fibre Block and Board Thermal Insulation.
 - .4 ASTM C726-05, Standard Specification for Mineral Fiber Roof Insulation Board.
 - .5 ASTM C728-05, Standard Specification for Perlite Thermal Insulation Board.
 - .6 ASTM C1126-04, Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation.
 - .7 ASTM C1289-05a, Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
 - .8 ASTM E96/E96M-05, Standard Test Methods for Water Vapour Transmission of Materials.
- .2 Canadian Gas Association (CGA)
 - .1 CAN/CGA-B149.1-05, Natural Gas and Propane Installation Code Handbook.
 - .2 CAN/CGA-B149.2-05, Propane Storage and Handling Code.
- .3 Canadian General Standards Board (CGSB)
 - .1 CGSB 71-GP-24M-77(R1983), Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.
- .4 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S604-M91, Standard for Type A Chimneys.
 - .2 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
 - .3 CAN/ULC-S702-97, Standard for Thermal Insulation, Mineral Fibre, for Buildings.
 - .4 CAN/ULC-S704-03, Standard for Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.2 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 Manufacturer's Instructions:

- .1 Submit manufacturer's installation instructions.
- .3 Shop Drawings
 - .1 Submit shop drawings showing attachment details for Z-Girts and flashing

1.3 QUALITY ASSURANCE

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Convene pre-installation meeting one week prior to beginning work of this Section on-site installations in accordance with Section 01 32 16.06 - Construction Progress Schedule - Critical Path Method (CPM) Section 01 32 16.07 - Construction Progress Schedules - Bar (GANNT) Chart.
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordinate with other building subtrades.
 - .4 Review manufacturer's installation instructions and warranty requirements.
- .4 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.4 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 SUSTAINABLE REQUIREMENTS

2.2 INSULATION

- .1 Foundations: Extruded Polystyrene Insulation.
 - .1 Expanded polystyrene (EPS): to CAN/ULC-S701.
 - .1 Acceptable Product Owens Corning or approved equivalent.
 - .1 Type: 4.
 - .2 Compressive strength: 30 psi to ASTM D1621.
 - .3 Thickness: as indicated.
 - .4 Edges: ship lapped.
 - .5 R Value: 5 per inch ASTM C518
 - .6 Water Absorption $\leq 0.7\%$ to ASTM D2842
 - .7 Water Vapour Permeance: 0.6 perm max to ASTM E96
 - .8 Flexural Strength: ≥ 60 PSI to ASTM C203

- .2 Exterior Walls(Masonry, Wood and Steel Stud)
 - .1 Expanded polystyrene (EPS): to CAN/ULC-S701.
 - .1 Acceptable Product Owens Corning Formular C-300.
 - .1 Type: 4.
 - .2 Compressive strength: 30 psi to ASTM D1621.
 - .3 Thickness: as indicated.
 - .4 Edges: shiplapped.
 - .5 R Value: 5 per inch ASTM C518
 - .6 Water Absorption $\leq 0.7\%$ to ASTM D2842
 - .7 Water Vapour Permeance: 0.6 perm max to ASTM E96
 - .8 Flexural Strength: ≥ 60 PSI to ASTM C203

2.3 ADHESIVES

- .1 Manufacturers approved adhesive to Blueskin membrane

2.4 ACCESSORIES

- .1 Z-Girts Supports @ 400 O.C. Z Girts to be thermally Broken and 16 gauge.
 - .1 Girts to be attached to concrete with 2-#10 Concrete anchors @ 400 O.C.
 - .2 Girts to be attached to stud walls with 2- ¼" x 2" Tapcon Anchors @ 600 O.C.
- .2 Install with smooth face outwards

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 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN4-S604 type A chimneys CAN/CGA-B149.1 and CAN/CGA-B149.2 type B L vents.

- .5 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.
- .6 Offset both vertical and horizontal joints in multiple layer applications.
- .7 Do not enclose insulation until it has been inspected and approved by Consultant.

3.3 EXAMINATION

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

3.4 RIGID INSULATION INSTALLATION

- .1 Apply adhesive in accordance with manufacturer's recommendations.
- .2 Leave insulation board joints unbonded over line of expansion and control joints. Bond a continuous 150 mm wide 0.15 mm modified bituminous membrane over expansion and control joints using compatible adhesive and primer before application of insulation.

3.5 PERIMETER FOUNDATION INSULATION

- .1 Exterior application: extend board. Install on exterior face of perimeter foundation wall with adhesive.

3.6 CLEANING

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

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C553-02, Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.
 - .2 ASTM C665-01e1, Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 - .3 ASTM C1320-05, Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.
- .2 Canadian Gas Association (CGA)
 - .1 CAN/CGA-B149.1-05, Natural Gas and Propane Installation Code Handbook.
 - .2 CAN/CGA-B149.2-05, Propane Storage and Handling Code.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .4 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S604-M1991, Type A Chimneys.
 - .2 CAN/ULC-S702-1997, Standard for Mineral Fibre Insulation.

1.2 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 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.

1.3 QUALITY ASSURANCE

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Convene pre-installation meeting one week prior to beginning work of this Section on-site installations in accordance with Section 01 32 16.06 - Construction Progress Schedule - Critical Path Method (CPM) Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordinate with other building subtrades.

- .4 Review manufacturer's installation instructions and warranty requirements.
- .4 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.4 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 INSULATION

- .1 Mineral Wool Batt Insulation : Roxul or Approved Equivalent
 - .1 To Stud depth and spacing required
 - .1 89mm thickness: RSI 2.47 (R14)
 - .2 140mm Thickness: RSI 3.87 (R22)
 - .2 CAN/ULC-S702-97 – Mineral Fiber Thermal Insulation for Buildings Type 1
 - .3 Non Combustible
 - .4 Smoke Development less than 5
 - .5 Flame spread = 0

2.2 SOUND INSULATION

- .1 Mineral Wool Batt Insulation : Roxul Safe and Sound or Approved Equivalent
 - .1 To Stud depth and spacing required
 - .1 89mm thickness: RSI 2.47 (R14)
 - .2 140mm Thickness: RSI 3.87 (R22)
 - .2 CAN/ULC-S702-97 – Mineral Fiber Thermal Insulation for Buildings Type 1
 - .3 Non Combustible
 - .4 Smoke Development less than 5
 - .5 Flame spread = 0

2.3 ACCESSORIES

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

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION – INSULATION - THERMAL

- .1 Install insulation to maintain continuity of thermal protection to building elements and spaces and to ASTM C1320.
- .2 Install insulation with factory applied vapour barrier facing warm side of building spaces and vapour permeable membrane facing cold side. Lap ends and side flanges of membrane over framing members. Retain in position with insulation clips installed as recommended by manufacturer. Tape seal butt ends and lapped side flanges. Do not tear or cut vapour barrier.
- .3 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
- .4 Do not compress insulation to fit into spaces.
- .5 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 CAN/CGA-B149.1 and CAN/CGA-B149.2 Type B L vents.
- .6 Do not enclose insulation until it has been inspected and approved by Consultant.

3.3 INSTALLATION – INSULATION – ACOUSTIC

- .1 Install acoustic batt insulation between studs in sound rated partitions in areas indicated. Ensure batts fill space continuously from floor to ceiling, over door and window openings, below window openings and around corners.
- .2 Coordinate installation of acoustic insulation with other work
- .3 Ensure insulation is packed around cut openings in gypsum board, behind outlet boxes, around plumbing, heating or structural items passing through the system or abutting walls.

3.4 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

1.2 REFERENCES

- .1 Canadian Urethane Foam Contractors' Association Inc. (CUFCA)
- .2 Green Seal Environmental Standards
 - .1 Standard GC-03-93, Anti-Corrosive Paints.
 - .2 Standard GS-11-97, Architectural Paints.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .4 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule 1113-06, Architectural Coatings.
- .5 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S101-04, Fire Endurance Tests of Building Construction and Materials.
 - .2 CAN/ULC-S102-03, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
 - .3 CAN/ULC-S705.1-01, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification.
 - .4 CAN/ULC-S705.2-05, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Application.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.
- .3 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.
 - .1 Test reports: submit certified test reports for insulation from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
 - .2 Submit test reports in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics.

- .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures and .
- .4 Manufacturer's Field Reports: submit to manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

1.4 QUALITY ASSURANCE

- .1 Applicators to conform to CUFCA Quality Assurance Program.
- .2 Qualifications:
 - .1 Installer: person specializing in sprayed insulation installations approved by manufacturer with 5 documented experience.
 - .2 Manufacturer: company with minimum 5 years' experience in producing of material used for work required for this project, with sufficient production capacity to produce and deliver required units without causing delay in work.
- .3 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 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Waste Management and Disposal:
 - .1 Separate waste materials for reuse recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

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 General purpose spray-applied foam insulation:
 - .1 Two component quick cure polyurethane foam. Chemically cured Class "A" with flame spread rating less than 25
 - .2 Dow Froth-Pack or approved equivalent
- .2 Foamed in Place Sealant: - Low Pressure Type single component polyurethane insulation to CAN/ULC-S710.1
 - .1 Dow Great Stuff Window and Door or approved equivalent.
- .3 Primers: in accordance with manufacturer's recommendations for surface conditions.

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 APPLICATION

- .1 Apply insulation to clean surfaces in accordance with CAN/ULC-S705.2 manufacturer's printed instructions.
- .2 Use primer where recommended by manufacturer.
- .3 Apply sprayed foam insulation in thickness as indicated mm.

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 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.33-M89, Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.
 - .2 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.

1.2 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.

1.3 QUALITY ASSURANCE

- .1 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .2 Mock-Ups:
 - .1 Submit mock-ups in accordance with Section 01 45 00 - Quality Control.
 - .2 Construct mock-up of sheet vapour barrier installation including one lap joint, one inside corner and at one electrical box. Mock-up may be part of finished work.
 - .3 Mock-up will be used to judge workmanship, substrate preparation, and material application.
 - .4 Locate where directed where indicated.
 - .5 Allow 24 hours for inspection of mock-up by Departmental Representative DCC Representative Consultant before proceeding with vapour barrier work.

- .3 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may not remain as part of finished work. Remove mock-up and dispose of materials when no longer required and when directed by Departmental Representative DCC Representative Consultant .

1.4 DELIVERY, STORAGE AND HANDLING

- .1 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 SHEET VAPOUR BARRIER

- .1 Polyethylene film: to CAN/CGSB-51.34, 10 mm thick.

2.2 ACCESSORIES

- .1 Joint sealing tape: air resistant pressure sensitive adhesive tape, cloth fabric duct tape type recommended by vapour barrier manufacturer, 50 mm wide for lap joints and perimeter seals, 25 mm wide elsewhere.
- .2 Sealant: compatible with vapour retarder materials, recommended by vapour retarder manufacturer. To Section 07 92 00 - Joint Sealants.
- .3 Staples: minimum 6 mm leg.
- .4 Moulded box vapour barrier: factory-moulded polyethylene box for use with recessed electric switch and outlet device boxes.

Part 3 Execution

3.1 INSTALLATION

- .1 Ensure services are installed and inspected prior to installation of retarder.
- .2 Install sheet vapour retarder on warm side of exterior wall ceiling and floor assemblies prior to installation of gypsum board to form continuous retarder.
- .3 Use sheets of largest practical size to minimize joints.
- .4 Inspect for continuity. Repair punctures and tears with sealing tape before work is concealed.

3.2 EXTERIOR SURFACE OPENINGS

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

3.3 PERIMETER SEALS

- .1 Seal perimeter of sheet vapour barrier as follows:

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

3.4 LAP JOINT SEALS

- .1 Seal lap joints of sheet vapour barrier as follows:
 - .1 Attach first sheet to substrate.
 - .2 Apply continuous bead of sealant over solid backing at joint.
 - .3 Lap adjoining sheet minimum 150 mm and press into sealant bead.
 - .4 Install staples through lapped sheets at sealant bead into wood substrate.
 - .5 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

3.5 ELECTRICAL BOXES

- .1 Seal electrical switch and outlet device boxes that penetrate vapour barrier as follows:
 - .1 Install moulded box vapour barrier.
 - .2 Apply sealant to seal edges of flange to main vapour barrier and seal wiring penetrations through box cover.

3.6 CLEANING

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

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-19.13M-M87, Sealing Compound, One Component, Elastomeric Chemical Curing.
 - .2 CAN/CGSB-19.24M-M90, Multi-Component, Chemical Curing Sealing Compound.
 - .3 CGSB 19-GP-14M-84, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.
- .2 Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification.

1.2 PERFORMANCE REQUIREMENTS

- .1 Provide an air barrier constructed to perform as a continuous air barrier assembly and as a liquid water drainage plane flashed to discharge to the exterior any incidental condensation or water which has penetrated the cladding. Membrane shall accommodate movements of building materials by providing expansion and control joints as required, with accessory air seal materials at such locations, changes in substrate and perimeter conditions.

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, 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 02 81 01 - Hazardous Materials.
 - .3 Provide drawings of special joint conditions .
- .3 Quality Assurance Submittals: submit following in accordance with Section 01 45 00 - Quality Control.
 - .1 Existing Substrate Condition: report deviations, as described in PART 3 - EXAMINATION in writing to Consultant.
 - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures and .
 - .4 Manufacturer's Field Reports: submit manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

1.4 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Applicator: company specializing in performing work of this section with minimum years documented experience with installation of air/vapour barrier systems.
 - .1 Completed installation must be approved by the material manufacturer.
 - .2 Applicator: company:
 - .1 Currently licensed by Liscenced Contractor by the Air Barrier quality Assurance Program (QAP) used by the NABA.
 - .2 Must maintain their license throughout the duration of the project.
 - .3 Project Requirements:
 - .1 Perform Work in accordance with manufacturer's written instructions and this specification.
 - .2 Maintain one copy of manufacturer's written instructions on site.
 - .3 Allow access to Work site by the air barrier membrane manufacturer's representatives.
 - .4 Submit document stating the applicator of the primary air barrier membranes specified in the section is authorized by the manufacturer as suitable for the execution of the work.
 - .4 Components used shall be sourced from one manufacturer, including sheet membrane, air barrier sealants, primers, mastics, flashings and adhesives.
 - .5 Single-Source Responsibility: Obtain air barrier materials from a single manufacturer regularly engaged in manufacturing the product.
 - .6 Provide products which comply with all federal, provincial, and local regulations controlling use of volatile organic compounds (VOCs).
- .2 Mock-Up:
 - .1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
 - .2 Construct typical exterior wall, window module, incorporating window frame and overlap to existing air vapour barrier .
 - .3 Locate where directed.
 - .4 Mock-up may remain as part of finished work.
 - .5 Test mock-up for air and water infiltration in accordance with ASTM E783 and ASTM E1105
- .3 Site Meetings: as part of Manufacturer's Services described in PART 3 - FIELD QUALITY CONTROL, schedule site visits, to review Work, at stages listed.
 - .1 After delivery and storage of products, and when preparatory Work is complete, but before installation begins.
 - .2 Twice during progress of Work at 25% and 60% complete.
 - .3 Upon completion of Work, after cleaning is carried out.

1.5 INSPECTIONS

- .1 In accordance with 02 21 00 - Allowances

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 Avoid spillage: immediately notify Consultant if spillage occurs and start clean up procedures.
- .4 Clean spills and leave area as it was prior to spill.

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 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.

1.8 AMBIENT CONDITIONS

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

1.9 SEQUENCING

- .1 Sequence work in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Charts.
- .2 Sequence work to permit installation of materials in conjunction with related materials and seals.

1.10 WARRANTY

- .1 Provide manufacturer's standard 10-year assembly warranty.
- .2 Warranty: include coverage of installed sealant and sheet materials which:
 - .1 Fail to achieve air tight and watertight seal.
 - .2 Exhibit loss of adhesion or cohesion.
 - .3 Do not cure.

Part 2 Products

2.1 MATERIALS

- .1 Air/vapor barrier membrane components and accessories must be obtained as a single source from the membrane manufacturer to ensure total system compatibility and integrity.
- .2 Acceptable manufacturer: Henry Bakor / Blueskin SA air barrier system or equivalent products approved by Project Manager. All products must be by same manufacturer and approved for use as a complete system and for compatibility with existing and adjacent building materials.

2.2 MEMBRANES

- .1 Primary sheet air/vapor barrier membrane shall be Blueskin SA or approved equivalent.
 - .1 SBS modified bitumen, self-adhering sheet membrane complete with a cross laminated
 - .2 polyethylene film. Membrane shall have the following physical properties:
 - .1 Air leakage: <0.0001 CFM/ft² @1.6 lbs/ft² to ASTM E 2178 and ASTM E 283 and have no increased air leakage when subjected to a sustained wind load of 10.5 lbs/ft² for 1 hour and gust wind load pressure of 62.8 lbs/ft² for 10 seconds when tested at 1.6 lbs/ft² to ASTM E331
 - .2 Tested to ASTM E 2357 for the air barrier assembly,
 - .3 Vapor permeance: 0.05 perms to ASTM E96
 - .4 Membrane Thickness: 0.0394" (40 mils)
 - .5 Low temperature flexibility: -22 degrees F to CGSB 37-GP-56M
 - .6 Elongation: 200% to ASTM D412-modified
 - .7 Meets CAN/CGSB-51-33 Type I Water Vapor Permeance requirements
 - .8 Apply air barriers in strict accordance with manufacturer's instructions, including temperature requirements. For application in low temperatures, use Blueskin SA LT.
- .2 Through-wall flashing membrane (Self-Adhering) shall be Blueskin TWF or approved equivalent.
 - .1 SBS modified bitumen, self-adhering sheet membrane complete with a cross laminated polyethylene film.
 - .2 Membrane shall have the following physical properties:
 - .3 Membrane Thickness: 0.0394 inches (40 mils)
 - .4 Film Thickness: 4.0 mils
 - .5 Flow (ASTM D5147): Pass @ 212 degrees F
 - .6 Puncture Resistance: 134 lbf to ASTM E154
 - .7 Tensile Strength (film): 5723 psi ASTM D882
 - .8 Tear Resistance: 13lbs. MD to ASTM D1004
 - .9 Low temperature flexibility: -22 degrees F to CGSB 37-GP-56M

2.3 PRIMERS

- .1 PRIMERS
- .2 Use primer where recommended by manufacturer.
- .3 Use primer for installation over wood substrate unless manufacturer representative permits installation specific to project conditions without priming.
- .4 Primer must be used for low temperature installations or in situations where required adhesion is not achievable without its use.
- .5 Use primer for laps and improved adhesion at joints and at concrete / steel lap conditions.
- .6 Sealants in accordance with Section 07 92 00 - Joint Sealants.
- .7 Primer for self-adhering membranes at all temperatures shall be by same manufacturer as Air-Barrier membrane, and shall be a quick drying, rubber based adhesive designed to enhance the adhesion of self-adhesive membranes.
- .8 Verify compatibility with all adjacent materials.

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

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

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, continuous and comply with air barrier manufacturer's requirements.
- .3 Report unsatisfactory conditions to Consultant in writing.
- .4 Do not start work until deficiencies have been corrected.
 - .1 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 adhesive sealants in accordance with manufacturer's instructions.

3.5 INSTALLATION

- .1 Install materials in accordance with manufacturer's instructions.

3.6 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
 - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
 - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
 - .3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

3.7 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.

3.8 PROTECTION OF WORK

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

END OF SECTION

Part 1 | GENERAL

1.1 SECTION INCLUDES

- .1 Fiber cement lap siding, panels, single, trim, fascia, moulding and accessories; James Hardie HZ10 Engineered for Climate Siding.
- .2 Factory-finished fiber cement lap siding, panels, single, trim, fascia, moulding and accessories; James Hardie HZ10 Engineered for Climate Siding.

1.2 RELATED SECTIONS

- .1 Section 06 10 00 - Rough Carpentry.
- .2 Section 06 10 00 - Rough Carpentry.
- .3 Section 07 21 16 - Blanket Insulation.

1.3 REFERENCES

- .1 ASTM D3359 - Standard Test Method for Measuring Adhesion by Tape Test, Tool and Tape.
- .2 ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.

1.4 SUBMITTALS

- .1 Submit under provisions of Section 01 30 00.
- .2 Product Data: Manufacturer's data sheets on each product to be used, including:
 - .1 Preparation instructions and recommendations.
 - .2 Storage and handling requirements and recommendations.
 - .3 Installation methods.
- .3 Shop Drawings: Provide detailed drawings of atypical non-standard applications of cementitious siding materials which are outside the scope of the standard details and specifications provided by the manufacturer.
- .4 Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- .5 Verification Samples: For each finish product specified, two samples, minimum size 4 by 6 inches (100 by 150 mm), representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

- .1 Installer Qualifications: Minimum of 4 years experience with installation of similar products.

- .2 Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - .1 Finish areas designated by Architect.
 - .2 Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - .3 Refinish mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Store products in manufacturer's unopened packaging until ready for installation.
- .2 Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.
- .3 Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

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

1.8 WARRANTY

- .1 Product Warranty: Limited, non-pro-rated product warranty.
 - .1 HardiePlank HZ10 lap siding for 30 years.
- .2 Finish Warranty: Limited product warranty against manufacturing finish defects.
 - .1 When used for its intended purpose, properly installed and maintained according to Hardie's published installation instructions, James Hardie's ColorPlus finish with ColorPlus Technology, for a period of 15 years from the date of purchase: will not peel; will not crack; and will not chip. Finish warranty includes the coverage for labor and material.
- .3 Workmanship Warranty: Application limited warranty for 2 years.

Part 2 PRODUCTS

2.1 MANUFACTURERS

- .1 Acceptable Manufacturer: James Hardie Building Products, Inc., which is located at: 26300 La Alameda Suite 400 ; Mission Viejo, CA 92691; Toll Free Tel: 866-274-3464; Tel: 949-367-4980; Fax: 949-367-4981; Email: [request info \(info@jameshardie.com\)](mailto:request_info(info@jameshardie.com)); Web: www.jameshardiecommercial.com
- .2 Requests for approval of equal substitutions will be considered in accordance with provisions of Section 01 60 00.

2.2 SIDING

- .1 HardiePlank HZ10 lap siding, HardiPanel HZ10 vertical siding, HardieSoffit HZ10 panels and HardieShingle HZ10 siding requirement for Materials:
 - .1 Fiber-cement Siding - complies with ASTM C 1186 Type A Grade II.
 - .2 Fiber-cement Siding - complies with ASTM E 136 as a noncombustible material.
 - .3 Fiber-cement Siding - complies with ASTM E 84 Flame Spread Index = 0, Smoke Developed Index = 5.
 - .4 CAL-FIRE, Fire Engineering Division Building Materials Listing - Wildland Urban Interface (WUI) Listed Product.
 - .5 National Evaluation Report No. NER 405 (BOCA, ICBO, SBCCI, IBC, IRC).
 - .6 City of Los Angeles, Research Report No. 24862.
 - .7 Miami Dade County, Florida Notice of Acceptance 07-0418.04.
 - .8 US Department of Housing and Urban Development Materials Release 1263d
 - .9 California DSA PA-019.
 - .10 City of New York M EA 223-93-M.
 - .11 Florida State Product Approval FL889.
 - .12 Texas Department of Insurance Product Evaluation EC-23.
- .2 Trim:
 - .1 HardieTrim HZ10 boards as manufactured by James Hardie Building Products, Inc.
 - .1 Product: 4/4 Boards, 3-1/2 inch (89 mm) width.
 - .2 Product: 4/4 Boards, 5-1/2 inch (140 mm) width.
 - .3 Product: 4/4 Boards, 7-1/4 inch (184 mm) width.
 - .4 Product: 4/4 Boards, 9-1/4 inch (235 mm) width.
 - .5 Product: 4/4 Boards, 11-1/4 inch (286 mm) width.
 - .6 Product: 4/4 NT3 Boards, 3-1/2 inch (89 mm) width.
 - .7 Product: 4/4 NT3 Boards, 5-1/2 inch (140 mm) width.
 - .8 Product: 4/4 NT3 Boards, 7-1/4 inch (184 mm) width.
 - .9 Product: 4/4 NT3 Boards, 9-1/4 inch (235 mm) width.
 - .10 Product: 4/4 NT3 Boards, 11-1/4 inch (286 mm) width.
 - .11 Product: 5/4 Boards, 3-1/2 inch (89 mm) width.
 - .12 Product: 5/4 Boards, 5-1/2 inch (140 mm) width.
 - .13 Product: 5/4 Boards, 7-1/4 inch (184 mm) width.
 - .14 Product: 5/4 Boards, 9-1/4 inch (235 mm) width.
 - .15 Product: 5/4 Boards, 11-1/4 inch (286 mm) width.
 - .16 Product: 5/4 NT3 Boards, 3-1/2 inch (89 mm) width.
 - .17 Product: 5/4 NT3 Boards, 4-1/2 inch (114 mm) width.
 - .18 Product: 5/4 NT3 Boards, 5-1/2 inch (140 mm) width.
 - .19 Product: 5/4 NT3 Boards, 7-1/4 inch (184 mm) width.
 - .20 Product: 5/4 NT3 Boards, 11-1/4 inch (286 mm) width.
 - .21 Texture: Smooth.
 - .22 Texture: Rustic.
 - .23 Texture: Wood Grained.
 - .24 Length: 12 feet (3658 mm).
 - .25 Thickness: 3/4 inch (19 mm).

- .26 Thickness: 1 inch (24 mm).
- .2 Hardie Trim HZ10 Fascia boards as manufactured by James Hardie Building Products, Inc.
- .3 Artisan HZ10 Accent trim as manufactured by James Hardie Building Products, Inc.

2.3 FASTENERS

- .1 Wood Framing Fasteners:
 - .1 Wood Framing: 4d common corrosion resistant nails.
 - .2 Wood Framing: 6d common corrosion resistant nails.
 - .3 Wood Framing: 8d box ring common corrosion resistant nails.
 - .4 Wood Framing: 0.089 inch (2.2 mm) shank by 0.221 inch (5.6 mm) head by 2 inches (51 mm) corrosion resistant siding nails.
 - .5 Wood Framing: 0.093 inch (2.4 mm) shank by 0.222 inch (5.6 mm) head by 2 inches (51 mm) corrosion resistant siding nails.
 - .6 Wood Framing: 0.093 inch (2.4 mm) shank by 0.222 inch (5.6 mm) head by 2-1/2 inches (64 mm) corrosion resistant siding nails.
 - .7 Wood Framing: 0.091 inch (2.3 mm) shank by 0.221 inch (5.6 mm) head by 1-1/2 inches (38 mm) corrosion resistant siding nails.
 - .8 Wood Framing: 0.091 inch (2.3 mm) shank by 0.225 inch (5.7 mm) head by 1-1/2 inches (38 mm) corrosion resistant siding nails.
 - .9 Wood Framing: 0.121 inch (3 mm) shank by 0.371 inch (9.4 mm) head by 1-1/4 inches (32 mm) corrosion resistant roofing nails.
 - .10 Wood Framing: No. 11 gauge 1-1/4 inches (32 mm) corrosion resistant roofing nails.
 - .11 Wood Framing: No. 11 gauge 1-1/2 inches (38 mm) corrosion resistant roofing nails.
 - .12 Wood Framing: No. 11 gauge 1-3/4 inches (44 mm) corrosion resistant roofing nails.
- .2 Metal Framing:
 - .1 Metal Framing: 1-1/4 inches (32 mm) No. 8-18 by 0.375 inch (9.5 mm) head self-drilling, corrosion resistant S-12 ribbed buglehead screws.
 - .2 Metal Framing: 1-5/8 inches (41 mm) No. 8-18 by 0.323 inch (8.2 mm) head self-drilling, corrosion resistant S-12 ribbed buglehead screws.
 - .3 Metal Framing: 1 inch (25 mm) No. 8-18 by 0.323 inch (8.2 mm) head self-drilling, corrosion resistant ribbed buglehead screws.
 - .4 Metal Framing: 1 inch (25 mm) No. 8-18 by 0.311 inch (7.9 mm) head self-drilling, corrosion resistant S-12 ribbed buglehead screws.
 - .5 Metal Framing: 1.5 inch (38mm) [AGS-100] .100 inches by 25 inches (2540 mm by 635 mm) ET&F Pin or equivalent pneumatic fastener.

2.4 FINISHES

- .1 Factory Finish Color for Trim, Soffit and Siding Colors:
 - .1 Color from Manufacturers standard color set.

Part 3 EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- .1 Clean surfaces thoroughly prior to installation.
- .2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- .3 Install a water-resistive barrier is required in accordance with local building code requirements.
- .4 The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements.
- .5 Install Engineered for Climate™ HardieWrap™ weather barrier in accordance with local building code requirements.
- .6 Use HardieWrap™ Seam Tape and joint and laps.
- .7 Install and HardieWrap™ flashing, HardieWrap™ Flex Flashing.

3.3 INSTALLATION - HARDIEPLANK HZ10 LAP SIDING AND ARTISAN HZ10 LAP SIDING

- .1 Install materials in strict accordance with manufacturer's installation instructions.
- .2 Starting: Install a minimum 1/4 inch (6 mm) thick lath starter strip at the bottom course of the wall. Apply planks horizontally with minimum 1-1/4 inches (32 mm) wide laps at the top. The bottom edge of the first plank overlaps the starter strip.
- .3 Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer's installation instructions.
- .4 Align vertical joints of the planks over framing members.
- .5 Maintain clearance between siding and adjacent finished grade.
- .6 Locate splices at least one stud cavity away from window and door openings.
- .7 Use off-stud metal joiner in strict accordance with manufacturer's installation instructions.
- .8 Wind Resistance: Where a specified level of wind resistance is required Hardieplank lap siding is installed to framing members and secured with fasteners described in Table No. 2 in National Evaluation Service Report No. NER-405.

- .9 Face nail to sheathing.
- .10 Locate splices at least 12 inches (305 mm) away from window and door openings.

3.4 INSTALLATION - HARDIETRIM HZ10 BOARDS

- .1 Install materials in strict accordance with manufacturer's installation instructions. Install flashing around all wall openings.
- .2 Fasten through trim into structural framing or code complying sheathing. Fasteners must penetrate minimum 3/4 inch (19 mm) or full thickness of sheathing. Additional fasteners may be required to ensure adequate security.
- .3 Place fasteners no closer than 3/4 inch (19 mm) and no further than 2 inches (51 mm) from side edge of trim board and no closer than 1 inch (25 mm) from end. Fasten maximum 16 inches (406 mm) on center.
- .4 Maintain clearance between trim and adjacent finished grade.
- .5 Trim inside corner with a single board trim both side of corner.
- .6 Outside Corner Board Attach Trim on both sides of corner with 16 gage corrosion resistant finish nail 1/2 inch (13 mm) from edge spaced 16 inches (406 mm) apart, weather cut each end spaced minimum 12 inches (305 mm) apart.
- .7 Allow 1/8 inch gap between trim and siding.
- .8 Seal gap with high quality, paint-able caulk.
- .9 Shim frieze board as required to align with corner trim..
- .10 Fasten through overlapping boards. Do not nail between lap joints.
- .11 Overlay siding with single board of outside corner board then align second corner board to outside edge of first corner board. Do not fasten HardieTrim boards to HardieTrim boards.
- .12 Shim frieze board as required to align with corner trim.
- .13 Install HardieTrim Fascia boards to rafter tails or to sub fascia.

3.5 FINISHING

- .1 Finish unprimed siding with a minimum one coat high quality, alkali resistant primer and one coat of either, 100 percent acrylic or latex or oil based, exterior grade topcoats or two coats high quality alkali resistant 100 percent acrylic or latex, exterior grade topcoat within 90 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.
- .2 Finish factory primed siding with a minimum of one coat of high quality 100 percent acrylic or latex or oil based exterior grade paint within 180 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.

3.6 PROTECTION

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

END OF SECTION

Part 1

1.1

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Aluminum Association (AA)
 - .1 DAF-45-R03, Designation System for Aluminum Finishes - 9th Edition.
 - .2 ASM-35-October 2000, Specifications for Aluminum Sheet Metal Work in Building Construction, Section 5.
- .2 ASTM International
 - .1 ASTM A167-99(2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .2 ASTM A240/A240M-11a, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
 - .3 ASTM A653/A653M-10, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .4 ASTM A792/A792M-10, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot Dip Process.
 - .5 ASTM B32-08, Standard Specification for Solder Metal.
 - .6 ASTM B370-11, Standard Specification for Copper Sheet and Strip for Building Construction.
 - .7 ASTM D523-89(2008), Standard Test Method for Specular Gloss.
 - .8 ASTM D822-01(R2006), Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
 - .9 .
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-37.5-M89, Cutback Asphalt Plastic Cement.
 - .2 CAN/CGSB-37.29-M89, Rubber-Asphalt Sealing Compound.
 - .3 CAN/CGSB-51.32- M77, Sheathing, Membrane, Breather Type.
 - .4 CAN/CGSB-93.1-M85, Sheet Aluminum Alloy, Prefinished, Residential.
- .4 CSA International
 - .1 CSA A123.3-05(2010), Asphalt Saturated Organic Roofing Felt.
- .5 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act (CEPA), 1999.
- .6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .7 National Research Council Canada (NRC)/Institute for Research in Construction (IRC) - Canadian Construction Materials Centre (CCMC)

- .1 CCMC-2011, Registry of Product Evaluations.
- .8 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act (TDGA), 1992.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for sheet metal roofing and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
- .4 Samples:
 - .1 Submit duplicate 300 x 300 mm samples of each sheet metal material.

1.3 QUALITY ASSURANCE

- .1 Mock-ups:
 - .1 Submit mock-ups in accordance with Section 01 45 00 - Quality Control.
 - .2 Fabricate 2000 x 2000 mm sample roofing panel using identical project materials and methods to include typical seam.
 - .3 Mock-up will be used:
 - .1 To judge workmanship, substrate preparation, operation of equipment and material application.
 - .4 Locate where directed.
 - .5 Allow 48 hours for inspection of mock-up by Consultant before proceeding with sheet metal flashing work.
 - .6 When accepted, mock-up will demonstrate minimum standard of quality required for this Work.
 - .7 Approved mock-up may remain as part of finished Work.

1.4 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 in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

- .2 Store and protect sheet metal roofing from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

1.5 WARRANTY

- .1 Provide a manufacturer's written warranty: Furnish panel manufacturer's written warranty covering failure of factory-applied exterior finish within the warranty period. Warranty period for finish: 15 years after the date of Substantial Completion. The values below are based on normal environments and exclude any aggressive atmospheric conditions.

Part 2 Products

2.1 PREFINISHED STEEL SHEET

- .1 The roof system shall be designed and engineered as a system by the manufacturer. The following specifications are a minimum requirement. It remains the Contractor's responsibility to ensure compatibility, sequencing, and engineering of components.
- .2 The metal roofing shall be the ACCU-STEEL Standing Seam Roof System as manufactured by Flynn Canada Limited.

2.2 MATERIALS

- .1 Zinc coated sheet metal to ASTM-A 653, commercial quality, hot dipped galvanized, coating designation Z275, prefinished as specified. Minimum base metal thickness to be 26 GA .
- .2 Paint finishes to be Baycoat Pespectra Series. Colour to be selected from standard colour charts.
- .3 Panel Size: 600mm
- .4 Seam: 50mm

2.3 ACCESSORIES

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Plastic cement: to CAN/CGSB-37.5.
- .3 Underlay: dry sheathing to CAN/CGSB-51.32 asphalt laminated 3.6 to 4.5 kg kraft paper No.15 perforated asphalt felt to CSA A123.3.
- .4 Slip sheet: reinforced sisal paper or a heavy felt kraft paper.
- .5 Sealant: Asbestos-free sealant, compatible with systems materials, recommended by system manufacturer.
- .6 Rubber-asphalt sealing compound: to CAN/CGSB-37.29.
- .7 Cleats: of same material, and temper as sheet metal:50 mm minimum wide.
 - .1 Thickness same as sheet metal being secured
- .8 Fasteners:concealed.

- .9 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
- .10 Solder: to ASTM B32
- .11 Flux: rosin, cut muriatic acid, or commercial preparation suitable for materials to be soldered.
- .12 Touch-up paint: as recommended by sheet metal roofing manufacturer.
- .13 Provide all required prefinished metal flashings and neoprene closures as required and as shown on approved shop drawings.
- .14 Snow guards: To be engineered and supplied by the manufacturer for full compatibility with roofing system. Colour-matched to roofing.
- .15 Flashing: Formed from same material type, finish and colour as the roof sheet. Custom fabricated to suit architectural details, as required.
- .16 Waterproof flashing around roof penetrations:
 - .1 Thaler Metal Industries D-100 flexible flashing, or approved equivalent.
 - .2 The Contractor is responsible to select waterproof flashing of an appropriate sizing and type for the penetration condition, and shall ensure a fully waterproof installation.
 - .3 Coordinate the sequencing and installation of roofing penetrations and detailing to ensure that a fully waterproof installation is attained.
- .17 Exposed materials shall be colour-matched to the roofing system and shall be sized and selected for low visibility.
- .18 Closures: Foam and metal closures to suit profiles selected, to manufacturer's recommendations.

2.4 FABRICATION

- .1 Fabricate aluminum sheet metal in accordance with AA ASM-35.
- .2 Form individual pieces in 2400 mm maximum lengths. Make allowances for expansion at joints.
- .3 Hem exposed edges on underside 12 mm, mitre and seal.
- .4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .5 Apply minimum 0.2 mm dry film thickness coat of plastic cement to both faces of dissimilar metals in contact.
- .6 Protect metals against oxidization by back painting with isolation coating where indicated.
- .7 Tin edges of copper sheets to be soldered for width of 40 mm both sides with solder.

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 sheet metal roofing installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .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 INSTALLATION

- .1 Use concealed fastenings except where approved in writing by Consultant before installation.
- .2 Include underlay under sheet metal roofing.
 - .1 Secure in place and lap joints 100 mm minimum.
- .3 Apply slip sheet over asphalt felt underlay to prevent bonding between sheet metal and felt.
 - .1 Secure with anchorage and lap joints 50 mm minimum in direction of waterflow.
- .4 Install sheet metal roof panels using cleats as per manufacturer's instructions.
- .5 Secure cleats with 2 fasteners each and cover with cleat tabs.
- .6 Align transverse seams in adjacent panels.
- .7 Flash roof penetrations with material matching roof panels, and make watertight.
- .8 Form seams in direction of water-flow and make watertight.
- .9 Perform soldering with well heated coppers, heat seam thoroughly and sweat solder through its full width.
- .10 Clean and flux metals before soldering.
- .11 Follow sheet metal manufacturer's recommendations for soldering procedures.
- .12 As work progresses, neutralize excess flux with 5% to 10% washing soda solution, and thoroughly rinse. Leave work clean and free of stains.

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.

3.4 PROTECTION

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

1.2 REFERENCES

- .1 The Aluminum Association Inc. (AA)
 - .1 Aluminum Sheet Metal Work in Building Construction-2000.
 - .2 AA DAF45-97, Designation System for Aluminum Finishes.
- .2 American Society for Testing and Materials (ASTM International)
 - .1 ASTM A167-99, Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .2 ASTM A240/A240M-02, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
 - .3 ASTM A591/A591M-98, Standard Specification for Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Mass Applications.
 - .4 ASTM A606-01, Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.
 - .5 ASTM A653/A653M-01a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .6 ASTM A792/A792M-02, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
 - .7 ASTM B32-00, Standard Specification for Solder Metal.
 - .8 ASTM B370-98, Standard Specification for Copper Sheet and Strip for Building Construction.
 - .9 ASTM D523-89(1999), Standard Test Method for Specular Gloss.
 - .10 ASTM D822-01, Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
- .3 Canadian Roofing Contractors Association (CRCA)
 - .1 Roofing Specifications Manual 1997.
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-37.5-M89, Cutback Asphalt Plastic Cement.
 - .2 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
 - .3 CAN/CGSB-93.1-M85, Sheet Aluminum Alloy, Prefinished, Residential.
- .5 Canadian Standards Association (CSA International)

- .1 CSA A123.3-98, Asphalt Saturated Organic Roofing Felt.
- .2 CSA-A440-00/A440.1-00 - A440-00, Windows / Special Publication A440.1-00, User Selection Guide to CSA Standard A440-00, Windows.
- .3 CSA B111-1974(R1998), Wire Nails, Spikes and Staples.

1.3 SAMPLES

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit 50 x 50 mm samples of each type of sheet metal material, colour and finish.

Part 2 Products**2.1 PREFINISHED STEEL SHEET**

- .1 Zinc coated (galvanized) steel sheet similar to metal cladding / roofing: commercial quality to ASTM A 653/A 653M, with Z275 (G90) designation zinc coating and SMP finish.

2.2 ACCESSORIES

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Plastic cement: to CAN/CGSB 37.5.
- .3 Cleats: of same material, and temper as sheet metal, minimum 50 mm wide. same as sheet metal being secured.
- .4 Fasteners: of same material as sheet metal, to CSA B111, ring thread flat head roofing nails of length and thickness suitable for metal flashing application.
- .5 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
- .6 Flux: rosin, cut hydrochloric acid, or commercial preparation suitable for materials to be soldered.
- .7 Touch-up paint: as recommended by prefinished material manufacturer.

2.3 FABRICATION

- .1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA 'FL' series details.
- .2 Fabricate aluminum flashings and other sheet aluminum work in accordance with AA-Aluminum Sheet Metal Work in Building Construction.
- .3 Form pieces in 2400 mm maximum lengths. Make allowance for expansion at joints.
- .4 Hem exposed edges on underside 12 mm. Mitre and seal corners with sealant.

- .5 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .6 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

2.4 METAL FLASHINGS

- .1 Form flashings, copings and fascias to profiles indicated steel to match roof and walls.

2.5 EAVES TROUGHS AND DOWNPIPES

- .1 Form eaves troughs and downpipes from 22 GA steel to be chosen from manufacturers standard color set.
- .2 Sizes and profiles as indicated.
- .3 Provide goosenecks, outlets, strainer baskets and necessary fastenings.

Part 3 Execution**3.1 INSTALLATION**

- .1 Install sheet metal work in accordance with CRCA FL series details, FL
- .2 Use concealed fastenings except where approved before installation.
- .3 Provide underlay under sheet metal. Secure in place and lap joints 100 mm.
- .4 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs. Flash joints using S-lock forming tight fit over hook strips.
- .5 Lock end joints and caulk with sealant.
- .6 Install surface mounted reglets true and level, and caulk top of reglet with sealant.
- .7 Turn top edge of flashing into recessed reglet or mortar joint minimum of 25 mm. Lead wedge flashing securely into joint.
- .8 Caulk flashing at cap flashing with sealant.
- .9 Install pans, where shown around items projecting through roof membrane.

3.2 EAVES TROUGHS AND DOWNPIPES

- .1 Install eaves troughs and secure to building at 750 mm on centre as per manufacturers requirements through spacer ferrules. Slope eaves troughs to downpipes as indicated. Solder joints watertight.

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- .2 Install downpipes and provide goosenecks back to wall. Secure downpipes to wall with straps at 1500 mm on centre; minimum two straps per downpipe. Install splash pans as indicated.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .2 Underwriter's Laboratories of Canada (ULC)
 - .1 ULC-S115-2005, Fire Tests of Fire stop Systems.

1.2 DEFINITIONS

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

1.3 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, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.
- .3 Shop Drawings:
 - .1 Submit shop drawings sealed by an Engineer licenced to Practice in the Province of Manitoba to show location, proposed material, reinforcement, anchorage, fastenings and method of installation. Through the fire walls as shown on drawing A2.0
 - .2 Construction details should accurately reflect actual job conditions.

- .4 Samples:
 - .1 Submit duplicate 300 x 300 mm samples showing actual fire stop material proposed for project.
- .5 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.
 - .1 Test reports: in accordance with CAN-ULC-S101 for fire endurance and CAN-ULC-S102 for surface burning characteristics.
 - .1 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties.
 - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures and .
 - .4 Manufacturer's Field Reports: submit to manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

1.4 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installer: company specializing in fire stopping installations and approved by manufacturer.
- .2 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section, with contractor's representative Departmental Representative DCC Representative Consultant in accordance with Section 01 32 16.06 - Construction Progress Schedule - Critical Path Method (CPM) 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.
- .3 Provide shop drawings of proposed ULC listed fire stopping systems for approval by Consultant
- .4 Site Meetings: as part of Manufacturer's Services described in PART 3 - FIELD QUALITY CONTROL, schedule site visits, to review Work, at stages listed.
 - .1 After delivery and storage of products, and when preparatory Work is complete, but before installation begins.
 - .2 Once during progress of Work at 50% complete.
 - .3 Upon completion of Work, after cleaning is carried out.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
 - .3 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate brand name, manufacturer, ULC markings.
- .2 Storage and Protection:
 - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
- .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 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 and conforming to specified special requirements described in PART 3.
- .2 Service penetration assemblies: systems tested to CAN-ULC-S115.
- .3 Service penetration fire stop components: certified by test laboratory to CAN-ULC-S115.
- .4 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.
- .5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.
- .6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.
- .7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- .9 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.
- .10 Sealants for vertical joints: non-sagging.

Part 3 Execution

3.1 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 COORDINATION

- .1 General Contractor is to coordinate work between sub-contractors to ensure proper fire stopping coordination
 - .1 Fire stopping installer is to review site prior to and during installation of work by other trades
 - .2 Ensure that work by all trades is installed in such a manor to meet the requirements of ULC listed fire stopping systems approved for use.
 - .3 Do not enclose shafts, walls and other spaces until completion of all fire stopping work.
 - .4 Photograph completion of fire stopping in all concealed spaces prior to enclosing

3.3 PREPARATION

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

3.4 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.

3.5 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.

3.6 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
 - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
 - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
 - .3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

3.7 CLEANING

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

3.8 SCHEDULE

- .1 All Penetrations through fire wall as shown on sheet A2.0
- .2 Fire stop and smoke seal at:
 - .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
 - .2 Top of fire-resistance rated masonry and gypsum board partitions.
 - .3 Intersection of fire-resistance rated masonry and gypsum board partitions.
 - .4 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.
 - .5 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
 - .6 Openings and sleeves installed for future use through fire separations.
 - .7 Around mechanical and electrical assemblies penetrating fire separations.
 - .8 Rigid ducts: greater than 129 cm² : fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.

END OF SECTION

Part 1 General

1.1 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-1984, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
 - .4 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
 - .5 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.
- .3 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).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

1.3 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.

1.4 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 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.

1.5 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.

1.6 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 Conform to manufacturers recommended installation conditions for applications of sealants
- .3 Ventilate area of work by use of portable supply and exhaust fans.

Part 2 Products

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.
- .4 All sealants to be used in accordance with manufacturers recommended applications
- .5 It remains the contractors responsibility to verify compatibility of the sealant with the substrate, primers, backer rods and weather conditions prior to installation.
 - .1 Bring any discrepancies with the above to the attention of the project manager.

2.2 SEALANT MATERIAL DESIGNATIONS

- .1 Exterior joints in horizontal wearing (concrete) surfaces: Polyurethane, semi-self-levelling, moisture curing, non-staining, non-bleeding, colour as selected.
 - .1 ASTM C920
 - .2 Single Component
 - .3 Pourable
 - .4 Class – Cyclic Movement - 100/50
 - .5 CAN/CGSB – 19.13-M87
 - .6 Acceptable Product: Vulkem 45 SSL – Tremco Sealants, or approved equivalent.
- .2 General exterior use: Silicone, neutral cure ultra-low modulus, moisture curing, nonstaining, nonbleeding, colour as selected.
 - .1 ASTM C920
 - .2 Single Component
 - .3 Non-Sag
 - .4 Class – Cyclic Movement - 100/50
 - .5 Class ‘A’
 - .6 ASTM C1248, C1382, E84
 - .7 CAN/CGSB – 19.13-M87

- .8 Acceptable Product: Spectrem 1 – Tremco Sealants, or approved equivalent.
- .3 Glazing: Silicone, neutral cure, medium modulus, colour as selected.
 - .1 ASTM C920
 - .2 Single Component
 - .3 Non-Sag
 - .4 Class – Cyclic Movement - 50
 - .5 Class ‘A’
 - .6 ASTM C1248
 - .7 CAN/CGSB – 19.13-M87
 - .8 Acceptable Product: Spectrem 2 – Tremco Sealants, or approved equivalent.
- .4 Air-Barrier to Window air-seal sealant: Silyl-terminated polyether polymer (STPe), moisture cure, medium modulus.
 - .1 Compatible with Air-Barrier system.
 - .2 ASTM C920
 - .3 Single Component
 - .4 Non-Sag
 - .5 Class – Cyclic Movement - 25
 - .6 Class ‘A’
 - .7 Acceptable Product: Bakor HE925 BES, or approved equivalent.
- .5 General interior use: painted gypsum, painted concrete, painted concrete block: Acrylic latex, colour as selected.
 - .1 Low VOC.
 - .2 Single Component
 - .3 Non-Sag
 - .2 Class – Cyclic Movement - 12.5
 - .3 Class ‘A’
 - .4 CAN/CGSB 19-GP-14M
 - .5 Acceptable Product: Tremflex 834 – Tremco Sealants, or approved equivalent.
- .6 Plumbing fixtures and general washroom / kitchen (wet-area) usage: sinks, tubs, urinals, water-closets, vanities: Silicone, acetoxy, moisture curing, with fungicide.
 - .1 ASTM C920
 - .2 Single Component
 - .3 Non-Sag
 - .4 Class – Cyclic Movement – 25
 - .5 Class ‘A’

- .6 CAN/CGSB – 19.13-M87
 - .7 Acceptable Product: Tremsil 200 – Tremco Sealants, or approved equivalent.
 - .7 Acoustical Sealant: to ASTM C919: Synthetic rubber, single-component, non-skinning, non-hardening.
 - .1 Single Component
 - .2 Non-Sag
 - .3 Class – Cyclic Movement – N/A
 - .4 CAN/CGSB 19.21 M87
 - .5 Acceptable Product: Acoustical Sealant – Tremco Sealants, or approved
 - .8 Preformed compressible and non-compressible back-up materials:
 - .1 Polyethylene, urethane, neoprene or vinyl foam:
 - .1 Extruded open closed cell foam backer rod.
 - .2 Size: oversize 30 to 50 %.
 - .2 Neoprene or butyl rubber:
 - .1 Round solid rod, Shore A hardness 70.
 - .3 High density foam:
 - .1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m³ density, or neoprene foam backer, size as recommended by manufacturer.
 - .4 Bond breaker tape:
 - .1 Polyethylene bond breaker tape which will not bond to sealant.
- 2.3 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.
 - .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.

3.5 MIXING

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

3.6 APPLICATION

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

3.7 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Clean adjacent surfaces immediately.
 - .3 Remove excess and droppings, using recommended cleaners as work progresses.
 - .4 Remove masking tape after initial set of sealant.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.8 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 SUMMARY

- .1 This section specified caulking and sealants in the following areas
 - .1 Prisoner cells

1.2 SECTION INCLUDES

- .1 Materials, preparation and application for caulking and sealants.
- .2 Text to complete other various Sections containing sealant or caulking specifications, including Section 07 52 00 - Modified Bituminous Membrane Roofing.

1.3 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .3 Section 01 45 00 - Quality Control.
- .4 Section 01 61 00 - Common Product Requirements.

1.4 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C919-02, Standard Practice for Use of Sealants in Acoustical Applications.
- .2 Canadian General Standards Board (CGSB)
 - .1 CGSB 19-GP-5M-1984, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
 - .2 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
 - .3 CGSB 19-GP-14M-1984, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
 - .4 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
 - .5 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.
- .3 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .4 General Services Administration (GSA) - Federal Specifications (FS)
 - .1 FS-SS-S-200-E(2)1993, Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.

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

.1 Material Safety Data Sheets (MSDS).

.6 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.5 SUBMITTALS

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

.2 Manufacturer's product to describe.

.1 Caulking compound.

.2 Primers.

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

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

.4 Submit duplicate samples of each type of material and colour.

.5 Cured samples of exposed sealants for each color where required to match adjacent material.

.6 Submit manufacturer's instructions in accordance with Section 01 33 00 - Submittal Procedures.

.1 Instructions to include installation instructions for each product used.

1.6 DELIVERY, STORAGE, AND HANDLING

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

.2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

1.7 PROJECT CONDITIONS

.1 Environmental Limitations:

.1 Do not proceed with installation of joint sealants under following conditions:

.1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.

.2 When joint substrates are wet.

.2 Joint-Width Conditions:

.1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

- .1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.8 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 Labour Canada.
- .2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

Part 2 Products

2.1 SEALANT MATERIALS

- .1 Pick Proof sealant: Two component 100% solids epoxy gel, no VOC odourless, fast drying, self priming, non-sag for use on horizontal and vertical surfaces.
- .2 Acceptable products: Tremco Peraquik 2252, Sika Anchor Fix 3, Pecora Dynapoxy EP-425, BASF Epolith G
- .3 Where sealants are qualified with primers use only these primers.

2.2 JOINT CLEANER

- .1 Xylol, methyl ethyl ketone or non-corosive type recommended by sealant manufacturer and compatible with joint forming materials.
- .2 Primer: as recommended by manufacturer.

Part 3 Execution

3.1 PROTECTION

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

3.2 SURFACE PREPARATION

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

- .4 Ensure joint surfaces are dry and frost free.
- .5 Prepare surfaces in accordance with manufacturer's directions.

3.3 PRIMING

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

3.4 BACKUP MATERIAL

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

3.5 MIXING

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

3.6 APPLICATION

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

END OF SECTION

Part 1 General

1.1 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 ASTM B29-03, Standard Specification for Refined Lead.
 - .3 ASTM B749-03, Standard Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
 - .2 CGSB 41-GP-19Ma-84, Rigid Vinyl Extrusions for Windows and Doors.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-G40.20-04/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W59-03, 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 80-2007, Standard for Fire Doors and Fire Windows.
 - .2 NFPA 252-03, Standard Methods of Fire Tests of Door Assemblies.
- .6 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule 1113-04, Architectural Coatings.
 - .2 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.
- .7 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.

1.2 SYSTEM DESCRIPTION

- .1 Design Requirements:
 - .1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35 degrees C to 35 degrees C.
 - .2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.
 - .3 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 NFPA 252 for ratings specified or indicated.
 - .4 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104, ASTM E152 NFPA 252 and listed by nationally recognized agency having factory inspection services.

1.3 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 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed louvred, arrangement of hardware fire rating and finishes.
 - .2 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings reinforcing fire rating finishes.
 - .3 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
 - .4 Submit test and engineering data, and installation instructions.
- .4 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
- .5 Submit one 300 x 300 mm corner sample of each type of frame.
 - .1 Show butt cutout glazing stops snap-on trim with clips 300 mm long removable mullion connection.

1.4 DELIVERY, STORAGE AND HANDLING

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

- .1 .
- .2 Hot dipped galvanized steel sheet: to ASTM A653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.
- .3 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653M, ZF75.
- .4 Composites: balance of core materials used in conjunction with lead: in accordance with manufacturers' proprietary design.

2.2 UPSWING ATTIC ACCESS DOORS – 2 Required

- .1 Doors to be 1 hour rated
- .2 Standard of Acceptance: Acudor Acorn Model FW-5050-UP SIZE 622mm x 917mm.

2.3 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/m³ minimum sanded to required thickness.
- .2 Temperature rise rated (TRR): core composition to limit temperature rise on unexposed side of door to 250 degrees C at 60 minutes. Core to be tested as part of a complete door assembly, in accordance with CAN4-S104, ASTM E152 NFPA 252, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency having factory inspection service.

2.4 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.

2.5 PRIMER

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

2.6 PAINT

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

2.7 ACCESSORIES

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Exterior Caps: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma steel.
- .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 Frame Thermal Breaks: Rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19MA
- .5 Metallic paste filler: to manufacturer's standard.
- .6 Fire labels: metal riveted.
- .7 Glazing: see Section 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.

2.8 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: as per door schedule welded construction.
- .4 Interior frames: as per door schedule, welded construction.
- .5 Blank, reinforce, drill and tap frames for mortised, template hardware, electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
- .6 Protect mortised cutouts with steel guard boxes.
- .7 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
- .8 Manufacturer's nameplates on frames and screens are not permitted.
- .9 Conceal fastenings except where exposed fastenings are indicated.
- .10 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .11 Insulate exterior frame components with polyurethane insulation.

2.9 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.

2.10 FRAMES: WELDED TYPE

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

2.11 DOOR FABRICATION GENERAL

- .1 Exterior doors shall be laminated core with core type as indicated on the door schedule.
- .2 Interior doors shall be laminated core with core type as indicated on the door schedule. Longitudinal edges shall be:
 - .1 Unless indicated otherwise on the door schedule: Mechanically interlocked.
 - .2 Where indicated on the door schedule: Mechanically interlocked, tack welded at top and bottom of door, above and below each edge cutout and at 150 mm (6") on center with visible edge seams.
- .3 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.
- .4 Blank, reinforce, drill doors and tap for mortised, templated hardware electronic hardware.
- .5 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .6 Reinforce doors where required, for surface mounted hardware. Provide flush PVC steel top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.
- .7 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .8 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in conformance with CAN4-S104 ASTM E152 NFPA 252 and list by nationally recognized agency having factory inspection service and construct

as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

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

2.12 DOORS: CORE CONSTRUCTION

- .1 Laminated Core Construction
 - .1 Exterior Doors: Both face sheets for exterior doors shall be formed from a sheet of steel with polyisocyanurate core, laminated under pressure to face sheets.
 - .2 Interior Doors: Both face sheets for interior doors shall be formed from a sheet steel with honeycomb, vertical steel stiffener core or temperature rise rated core, (as specified on the

2.13 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.
- .2 Thermal break: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.
- .3 Fabricate thermally broken frames separating exterior parts from interior parts with continuous interlocking thermal break.
- .4 Apply insulation.

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

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 Latchside 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 frames in accordance with Section 08 80 50 - Glazing.

END OF SECTION

Part 1 General**1.1 REFERENCES**

- .1 American Architectural Manufacturers Association (AAMA)
 - .1 AAMA 609/610-09, Cleaning and Maintenance Guide for Architecturally Finished Aluminum.
- .2 ASTM International
 - .1 ASTM E330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .3 Canadian General Standards Board (CGSB)
 - .1 CGSB 1.40-97, Anticorrosive Structural Steel Alkyd Primer.
 - .2 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
 - .3 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.
- .4 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.
- .5 Environmental Choice Program (ECP)
 - .1 CCD-045-95, Sealants and Caulking Compounds.
- .6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for doors and frames and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Indicate materials and profiles and provide full-size, scaled details of components for each type of door and frame. Indicate:
 - .1 Interior trim and exterior junctions with adjacent construction.
 - .2 Junctions between combination units.
 - .3 Elevations of units.

- .4 Core thicknesses of components.
 - .5 Type and location of exposed finishes, method of anchorage, number of anchors, supports, reinforcement, and accessories.
 - .6 Location of caulking.
 - .7 Each type of door system including location.
 - .8 Arrangement of reinforcing for hardware and joints.
 - .9 Arrangement of hardware and required clearances.
- .4 Samples:
- .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into work.
 - .3 Submit one 300 x 300 mm corner sample of each type door and frame.
 - .4 Submit sample showing glazing detail, reinforcement, finish and location of manufacturer's nameplates.
 - .5 Frame sample to show glazing stop, door stop, jointing detail, finish, wall trim.
- .5 Manufacturers Reports:
- .1 Manufacturer's Field Reports: submit manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in Part 3 - FIELD QUALITY CONTROL.

1.3 CLOSEOUT SUBMITTALS

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

1.4 QUALITY ASSURANCE

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

Part 2 Products

2.1 DESIGN CRITERIA

- .1 Design frames and doors in exterior walls to:
 - .1 Accommodate expansion and contraction within service temperature range of -35 to 35 degrees C.
 - .2 Limit deflection of mullions to maximum 1/175th of clear span when tested to ASTM E330 under wind load of 1.2 kPa submit certificate of tests performed.
 - .3 Movement within system.
 - .4 Movement between system and perimeter framing components or substrate.
- .2 Size glass thickness and glass unit dimensions to limits in accordance with CAN/CGSB-12.20.
- .3 Include continuous air barrier and vapour retarder through door system. Primarily in line with inside pane of glass and heel bead of glazing compound.
- .4 Standard of Acceptance: Thermally Broken, 360 Insulclad by Kwaneer or 400A Insuldor by Alumicor

2.2 MATERIALS

- .1 Aluminum extrusions: to Aluminum Association alloy AA6063-T5 T6 anodizing quality.
- .2 Sheet aluminum: to Aluminum Association alloy AA1100- H14 AA5005- H32 H34 anodizing quality.
- .3 Steel reinforcement: to CSA G40.20/G40.21, grade 300 W.
- .4 Fasteners: aluminum stainless steel, finished to match adjacent material.
- .5 Weatherstrip: replaceable mohair backed wool pile.
- .6 Door bumpers: black neoprene.
- .7 Door bottom seal: adjustable door seal of anodized extruded aluminum frame and vinyl weather seal, recessed in door bottom, closed ends, automatic retract mechanism when door is open.
- .8 Isolation coating: bituminous paint.
- .9 Glass: tempered glass to CAN/CGSB-12.1, Type 1 Class A.
- .10 Glazing materials: Section 08 80 50.
- .11 Sealants: colour in accordance with Section 07 92 00 - Joint Sealants.

2.3 ALUMINUM DOORS

- .1 Construct doors of porthole extrusions with minimum wall thickness of 3 mm.
- .2 Door stiles nominal 90 mm wide plus or minus 6 mm.
- .3 Top rail nominal 90 mm wide plus or minus 6 mm.
- .4 Bottom rail nominal 160 mm wide plus or minus 6 mm.

- .5 Reinforce mechanically-joined corners of doors to produce sturdy door unit.
- .6 Glazing stops: interlocking snap-in type for dry glazing. Exterior stops: tamperproof type.
- .7 Supply thermally broken doors for exterior.
- .8 Hardware: See door Hardware Set 21 Section 08 71 00

2.4 ALUMINUM FRAMES

- .1 Construct thermally broken frames of aluminum extrusions with minimum wall thickness of 150 mm.

2.5 ALUMINUM FINISHES

- .1 Integral colour anodic finish: Black
- .2 Appearance and properties of anodized finishes designated by Aluminum Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative.

2.6 STEEL FINISHES

- .1 Finish steel clips and reinforcing steel with zinc coating to CAN/CSA-G164.

2.7 FABRICATION

- .1 Doors and framing to be by same manufacturer.
- .2 Fabricate doors and frames to profiles and maximum face sizes as indicated. Provide minimum 22 mm bite for insulating glazed units.
- .3 Provide structural steel reinforcement as required.
- .4 Fit joints tightly and secure mechanically.
- .5 Conceal fastenings.
- .6 Mortise, reinforce, drill and tap doors, frames and reinforcements to receive hardware using templates provided under Section 08 71 00 - Door Hardware.
- .7 Isolate aluminum from direct contact with dissimilar metals, concrete and masonry.

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 doors and frames 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 INSTALLATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Set frames plumb, square, level at correct elevation in alignment with adjacent work.
- .3 Anchor securely.
- .4 Install doors and hardware in accordance with hardware templates and manufacturer's instructions.
- .5 Adjust door components to ensure smooth operation.
- .6 Make allowances for deflection of structure to ensure that structural loads are not transmitted to frames.
- .7 Glaze aluminum doors and frames in accordance with Section 08 80 50 - Glazing.
- .8 Seal joints to provide weathertight seal at outside and air, vapour seal at inside.
- .9 Apply sealant in accordance with Section 07 92 00 - Joint Sealants. Conceal sealant within the aluminum work except where exposed use is permitted by Consultant.

3.3 FIELD QUALITY CONTROL

- .1 Have manufacturer of products supplied under this Section review Work involved in handling, installation/application, protection and cleaning of its products, and submit written reports in acceptable format to verify compliance of Work with Contract.
- .2 .

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 Perform cleaning of aluminum components in accordance with AAMA 609.1 - Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminum.
 - .3 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
 - .4 Clean aluminum with damp rag and approved non-abrasive cleaner.
 - .5 Remove traces of primer, caulking, epoxy and filler materials; clean doors and frames.
 - .6 Clean glass and glazing materials with approved non-abrasive cleaner.
- .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 aluminum door and frame installation.

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

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

1.2 CLOSEOUT SUBMITTALS

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

1.3 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 in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect access doors from nicks, scratches, and blemishes.
 - .3 Apply temporary protective coating to finished surfaces. Remove coating after installation.
 - .1 Use coatings in accordance with manufacturer's written instructions that are easily removable.
 - .2 Leave protective coating in place until final cleaning of building.
 - .4 Replace defective or damaged materials with new.

Part 2 Products

2.1 ACCESS DOORS

- .1 Sizes: as follows unless indicated:
 - .1 For body entry: 600 x 600 mm minimum.

- .2 For hand entry: 300 x 300 mm minimum.
- .2 Construction: rounded safety corners, concealed hinges, screwdriver latch, anchor straps, able to open 180 degrees.
- .3 Materials:
 - .1 Tiled or marble surfaces : stainless steel with brushed satin.
 - .2 Other areas: prime coated steel.

2.2 EXCLUSIONS

- .1 Lay-in tile ceilings: use unobtrusive identification locators.

Part 3 Execution

3.1 EXAMINATION

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

3.2 INSTALLATION

- .1 Installation: locate access doors within view of equipment and ensure equipment is accessible for operating, inspecting, adjusting, servicing without using special tools.
 - .1 Install masonry surfaces: in accordance with Section 04 05 00 - Common Work Results for Masonry.
 - .2 Install gypsum board surfaces: in accordance with Section 09 21 16 - Gypsum Board Assemblies.

3.3 CLEANING

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

3.4 PROTECTION

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

END OF SECTION

I. PART ONE - GENERAL

1.01 SUMMARY

- A. Work included: Furnishing and installing factory fabricated vault access doors

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM), 100 Bar Harbor Drive, West Conshocken, PA 19428-2959; (610) 832-9585, fax (610) 832-9555
 - 1. ASTM A 36-93a: Standard Specification for Structural Steel
 - 2. ASTM E119 Standard Methods of Fire Tests of Building Construction and Materials
- B. National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 09101 (617) 770-3000, FAX (617) 770-0700
 - 1. NFPA 80 Standard for Fire Doors and Windows
 - 2. NFPA 251 Standard Methods of Fire Tests of Building Construction and Materials
- C. Underwriters Laboratories (UL), 333 Pfingsten Road, Northbrook, IL 60062, (847) 272-8800, FAX (847) 272-8129
- D. International Organization for Standardization (ISO), ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, phone +41 22 749 01 11, fax +41 22 733 34 30
 - 1. ISO 9001:2008 Certified

1.03 SUBMITTALS

- A. Product Data: Provide manufacturer's product data for all materials in this specification.
- B. Shop Drawings: Show profiles, accessories, location, and dimensions.
- C. Samples: Manufacturer to provide upon request; sized to represent material adequately.
- D. Contract Closeout: Vault access door manufacturer shall provide the manufacturer's Warranty prior to the contract closeout [if applicable].

1.04 PRODUCT HANDLING

- A. All materials shall be delivered in manufacturer's original packaging.
- B. Store materials in a dry, protected, well-vented area. The contractor shall thoroughly inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.
- C. Remove protective wrapping immediately after installation if applicable.

1.05 SUBSTITUTIONS

- A. Proposals for substitution products shall be accepted only from bidding contractors and not less than (10) working days before bid due date. Contractor guarantees that proposed substitution shall meet the performance and quality standards of this specification.

1.06 JOB CONDITIONS

- A. Verify that other trades with related work are complete before installing vault access door(s).
- B. Mounting surfaces shall be straight and secure; substrates shall be of proper width.
- C. Refer to the construction documents, shop drawings, and manufacturer's installation instructions.
- D. Observe all appropriate OSHA safety guidelines for this work.

1.07 WARRANTY/GUARANTEE

- A. Manufacturer's standard warranty: Materials shall be free of defects in material and workmanship for a period of (5) five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge. Electrical motors, special finishes, and other special equipment (if applicable) shall be warranted separately by the manufacturers of those products.
- B. Manufacturer's Quality System: Registered to ISO 9001:2008 Quality Standards including in-house engineering for product design activities.

II. PART TWO - PRODUCTS

2.01 MANUFACTURER

- A. The BILCO Company, P.O. Box 1203, New Haven, CT 06505; 1-203-934-6363, Fax: 1-203-933-8478, Web: www.bilco.com

2.02 ACCESS DOOR

- A. Furnish and install where indicated on plans vault access door Type FR, size as shown on drawings. Length denotes hinge side. The vault access door shall be single leaf. The vault access door shall be pre-assembled from the manufacturer.
- B. Performance characteristics:
1. Cover: shall be reinforced to support a minimum live load of 150 psf (732 kg/m²) with a maximum deflection of 1/150th of the span.
 2. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
 3. Operation of the cover shall not be affected by temperature.
 4. Door and frame assembly shall be tested in accordance with ASTM E119 and NFPA 251 and UL Listed as having a 2-hour fire rating when exposed to fire from the underside. In the closed position, the temperature on the unexposed surface of the door shall not exceed 325°F (162°C) above ambient for the duration of the 2-hour period. Manufacturer shall submit a test report certifying this performance.
 5. Door shall be equipped with a fusible link activated closing system that will automatically close and latch the door leaf in the event of fire when heat parts the UL Listed 165° (74°C) fusible link..
- C. Cover: Shall have a 1" (25.4mm) fillable pan to receive concrete. All fill material to be furnished (Note: Finish flooring material up to 1/2" (12.7mm) thick can be installed in the 1" (25.4mm) pan. The remaining depth must be filled with concrete to maintain the fire rating of the door assembly. If finish flooring is not desired, the pan must be filled with 1" (25.4mm) of concrete).
- D. Frame: Shall be extruded aluminum with full anchor flange around the perimeter.
- E. Lifting mechanisms: Manufacturer shall provide the required number and size of compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and to act as a check in retarding downward motion of the cover when closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe fastened to a formed 1/4" (6.3 mm) gusset support plate.
- F. A removable exterior turn/lift handle with a spring loaded ball detent shall be provided to open the and the latch release shall be protected by a flush, gasketed, removable screw plug].
- G. Automatic closing system: Shall be a self-contained, pneumatic, fusible link activated, closing system that will automatically close and latch the door in the event of fire when heat parts the UL Listed 165° (74°C) fusible link.
- H. Hold-open system: Door shall be equipped with a pneumatic hold-open system to automatically hold the door in the open position (90°). A release button for the hold-open system shall be provided and shall reset itself when the cover is closed.
- I. Hardware:
1. Hinges: Shall be a continuous heavy duty Type 316 stainless steel hinge that is accessible only when the cover is in the open position.
 2. Cover shall be fitted with the required number and size of compression spring operators. Springs shall have an electrocoated acrylic finish.
 3. A Type 316 stainless steel snap lock with fixed handle shall be mounted on the underside of the cover and a cable release handle shall be provided to open the cover from the underside.
 4. Hardware: Compression spring tubes shall be an anti-corrosive composite, all fasteners shall be Type 316 stainless steel material, and all other hardware shall be zinc plated and chromate sealed.
- J. Finishes: Factory finish shall be mill finish aluminum with bituminous coating applied to the exterior of the frame.

III. PART THREE - EXECUTION

3.01 INSPECTION

- A. Verify that the vault access door installation will not disrupt other trades. Verify that the substrate is dry, clean, and free of foreign matter. Report and correct defects prior to any installation.

3.02 INSTALLATION

- A. Submit product design drawings for review and approval to the architect or specifier before fabrication.
- B. Door is designed for installation in dry interior applications only. Consult factory if door is to be exposed to exterior or high moisture or humidity conditions. Door should be protected from moisture prior to installation.
- C. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the application prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions.
- D. The installer shall furnish mechanical fasteners consistent with the vault access door manufacturer's instructions.

END OF SECTION

Part 1 General**1.1 SECTION INCLUDES**

- .1 Supply and Installation of detention doors.
- .2 Supply and Installation of detention frames.
- .3 Supply and Installation of detention door hardware.

1.2 RELATED SECTIONS

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections.

1.3 DELIVERY, STORAGE, AND HANDLING

- .1 Store detention doors and frames under cover at building site. Place units in a vertical position with heads up, spaced by blocking, on minimum 102-mm-high wood blocking. Avoid using non-vented plastic or canvas shelters that could create a humidity shelter.
 - .1 Provide minimum 6-mm space between each stacked unit to permit air circulation.

1.4 COORDINATION

- .1 Coordinate installation of anchorages for detention frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be imbedded in concrete or masonry. Deliver such items to Project site in time for installation..

Part 2 Products**2.1 DETENTION DOORS, FRAMES, AND HARDWARE**

- .1 Sliding detention doors in conformance with attached drawings identified as follows:
 - .1 Hollow Metal Door and Presses Steel Frame Shop Drawings
 - .2 Sliding and Swing Cell Doors
 - .3 Level 3 NAAMM 863-98 ASTM F1450-97 Performance Criteria
 - .4 Date: 13 March 2003 and Drawings Date: Sept. 26, 2007 see drawings in appendix A.
- .2 Acceptable Manufacturers
 - .1 Apex Industries
 - .2 Cp Distributors
 - .3 Kach Inc.
 - .4 SWS Detention Group

- .3 Manufactured doors must meet the RCMP standards and without deviation. NO changes or substitutions will be accepted without prior approval from RCMP Departmental Security.

2.2 MATERIALS

- .1 Sheet steel: commercial zinc coated quality to ASTM A653/A653M, wipe coat designation.
- .2 Steel Plates and Shapes: to CAN3-G40.21, Type 250W.
- .3 Sheet Aluminum: Aluminum Association alloy AA1100, mill finish.
- .4 Extruded Aluminum: Aluminium Association alloy AA6063-T5.
- .5 Insulation: 50 mm thick rigid fibreglass AF-545.
- .6 Hardware: tracks, hangers, guides, pulls, locks and hinges, to RCMP standard.
- .7 Security Glass and Gaskets: 6 mm thick Lexan to corridor side, 6 mm air space, 6 mm thick Margard to cell side.
- .8 Security Screws: flay head chip-off type and tamper resistant TORX for glass stops, sized to suit.
- .9 Anchor Bolts: to ASTM A307-82.
- .10 Hardware: locks, double escutcheons, lock buckets and paracentric keys by door supplier. All cell doors to be keyed alike, provide 3 keys total.
- .11 Acceptable locks:
 - .1 Chubb 1030D-1
 - .2 Folger Adams 32D
 - .3 Southern Steel 1030-D1
 - .4 RR Brink 7030D
- .12 Primer: Cor-Pro 470 or epoxy compatible product approved by high build coating manufacturer.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of detention doors and frames.
- .2 Examine roughing-in for embedded and built-in anchors to verify actual locations of detention frame connections before detention frame installation.

.3 For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of detention doors and frames.

.4 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

.1 Remove shipping spreaders installed at factory.

.2 Prior to installation and with shipping spreaders removed, adjust detention frames for squareness, alignment, twist, and plumbness to the following tolerances or manufacturer's tolerances, whichever is greater:

.1 Squareness: Plus or minus 1.6 mm, measured at door rabbet on a line 90 degrees from jamb and perpendicular to frame head.

.2 Alignment: Plus or minus 1.6 mm, measured at jambs on a horizontal line parallel to plane of face.

.3 Twist: Plus or minus 1.6 mm, measured at opposite face corners of jambs on parallel lines, and perpendicular to plan of door rabbet.

.4 Plumbness: Plus or minus 1.6 mm, measured at jambs on a perpendicular line from head to floor.

3.3 INSTALLATION

.1 General: Install detention doors and frames plumb, rigid, properly aligned, and securely fastened in place, complying with drawings, schedules, and manufacturer's written recommendations.

.2 Anchorage: Set detention frame anchorage devices according to details on Shop drawings and per anchorage device manufacturer's written instructions.

.3 Sliding Detention Doors: Fit sliding detention doors in their frames according to manufacturer's written instructions and as required to allow doors to slide without binding.

3.4 ADJUSTING AND CLEANING

.1 Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including detention doors and frames that are warped, bowed, or otherwise unacceptable.

.2 Clean grout and other bonding materials off detention doors and frames immediately after installation.

.3 Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of finish and apply touchup of compatible air-drying finish.

END OF SECTION

Hollow Metal Door & Pressed Steel Frame Shop Drawings

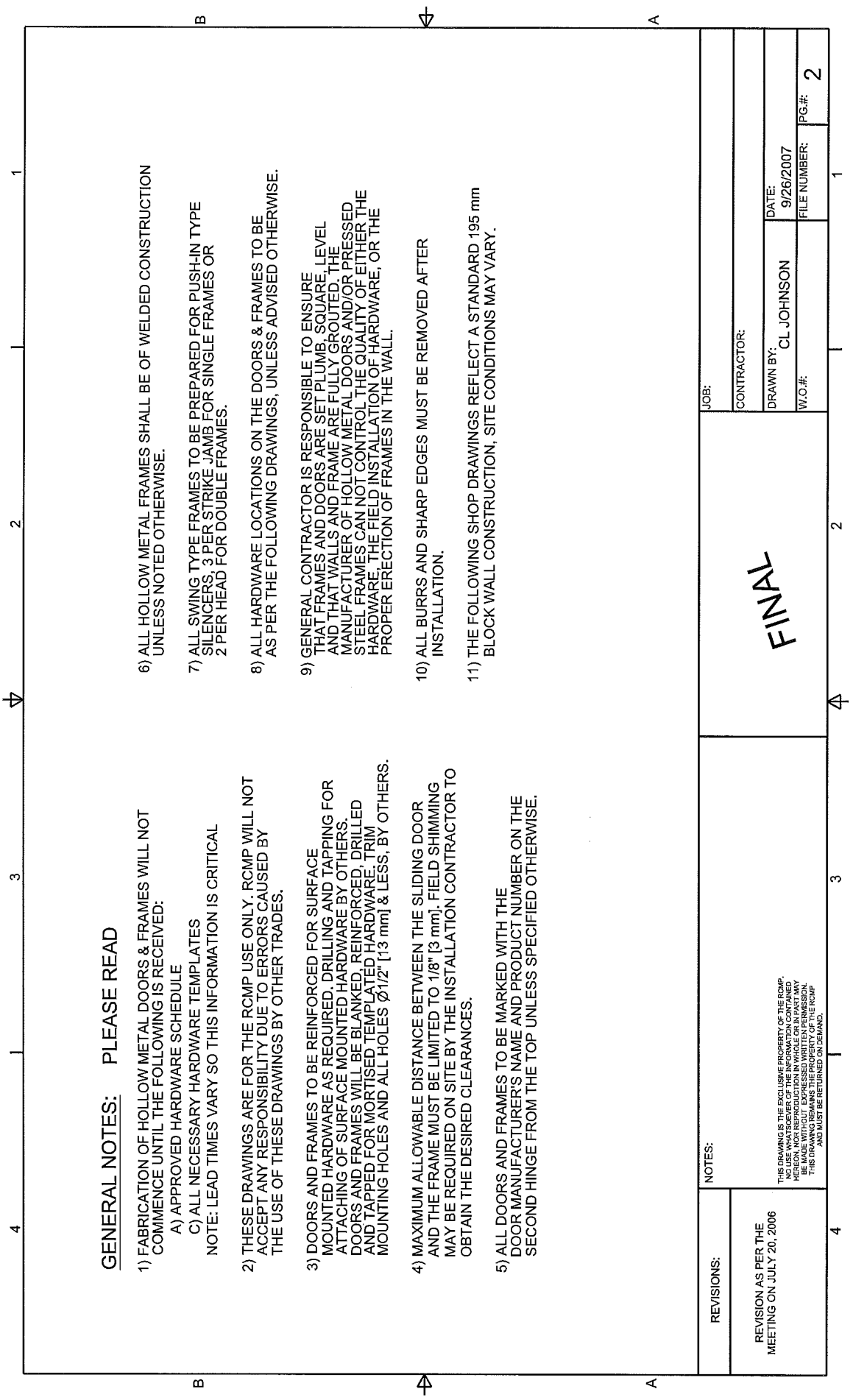
Project: SLIDING AND SWINGING DOORS
LEVEL 3 NAAMM 863-98 ASTM F1450-97 PERFORMANCE CRITERIA

Prepared By: CATRIONA L JOHNSON

Date: SEPTEMBER 26, 2007

FINAL

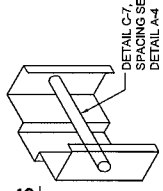
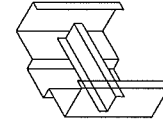
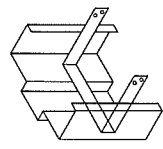
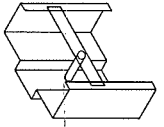
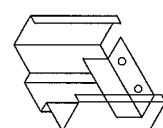
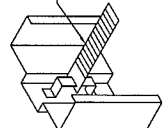
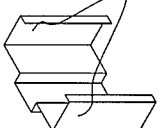
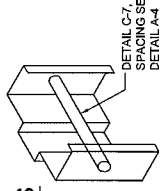
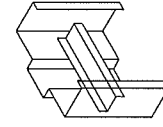
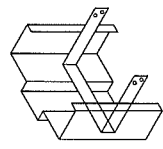
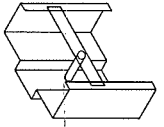
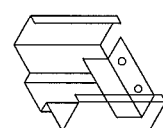
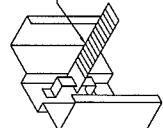
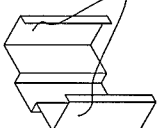
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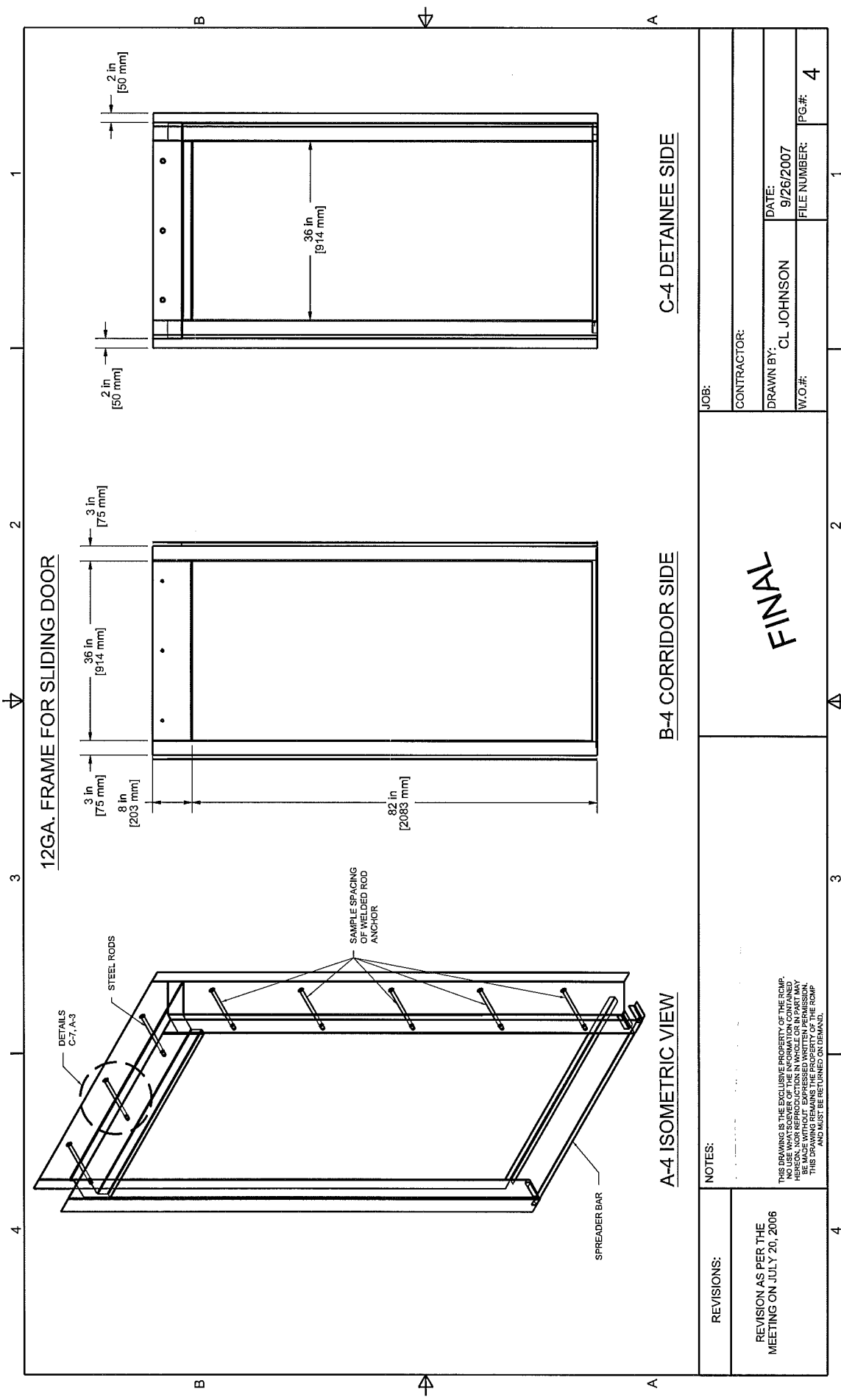


GENERAL NOTES: PLEASE READ

- 1) FABRICATION OF HOLLOW METAL DOORS & FRAMES WILL NOT COMMENCE UNTIL THE FOLLOWING IS RECEIVED:
 - A) APPROVED HARDWARE SCHEDULE
 - C) ALL NECESSARY HARDWARE TEMPLATES
 NOTE: LEAD TIMES VARY SO THIS INFORMATION IS CRITICAL
- 2) THESE DRAWINGS ARE FOR THE RCMP USE ONLY. RCMP WILL NOT ACCEPT ANY RESPONSIBILITY DUE TO ERRORS CAUSED BY THE USE OF THESE DRAWINGS BY OTHER TRADES.
- 3) DOORS AND FRAMES TO BE REINFORCED FOR SURFACE MOUNTED HARDWARE AS REQUIRED. DRILLING AND TAPPING FOR ATTACHING OF SURFACE MOUNTED HARDWARE BY OTHERS. DOORS AND FRAMES WILL BE BLANKED, REINFORCED, DRILLED AND TAPPED FOR MORTISED TEMPLATED HARDWARE, TRIM MOUNTING HOLES AND ALL HOLES $\phi 1/2"$ [13 mm] & LESS, BY OTHERS.
- 4) MAXIMUM ALLOWABLE DISTANCE BETWEEN THE SLIDING DOOR AND THE FRAME MUST BE LIMITED TO 1/8" [3 mm]. FIELD SHIMMING MAY BE REQUIRED ON SITE BY THE INSTALLATION CONTRACTOR TO OBTAIN THE DESIRED CLEARANCES.
- 5) ALL DOORS AND FRAMES TO BE MARKED WITH THE DOOR MANUFACTURER'S NAME AND PRODUCT NUMBER ON THE SECOND HINGE FROM THE TOP UNLESS SPECIFIED OTHERWISE.
- 6) ALL HOLLOW METAL FRAMES SHALL BE OF WELDED CONSTRUCTION UNLESS NOTED OTHERWISE.
- 7) ALL SWING TYPE FRAMES TO BE PREPARED FOR PUSH-IN TYPE SILENCERS, 3 PER STRIKE JAMB FOR SINGLE FRAMES OR 2 PER HEAD FOR DOUBLE FRAMES.
- 8) ALL HARDWARE LOCATIONS ON THE DOORS & FRAMES TO BE AS PER THE FOLLOWING DRAWINGS, UNLESS ADVISED OTHERWISE.
- 9) GENERAL CONTRACTOR IS RESPONSIBLE TO ENSURE THAT FRAMES AND DOORS ARE SET PLUMB, SQUARE, LEVEL AND THAT WALLS AND FRAME ARE FULLY GROUTED. THE MANUFACTURER OF HOLLOW METAL DOORS AND/OR PRESSED STEEL FRAMES CAN NOT CONTROL THE QUALITY OF EITHER THE HARDWARE, THE FIELD INSTALLATION OF HARDWARE, OR THE PROPER ERECTION OF FRAMES IN THE WALL.
- 10) ALL BURRS AND SHARP EDGES MUST BE REMOVED AFTER INSTALLATION.
- 11) THE FOLLOWING SHOP DRAWINGS REFLECT A STANDARD 195 mm BLOCK WALL CONSTRUCTION, SITE CONDITIONS MAY VARY.

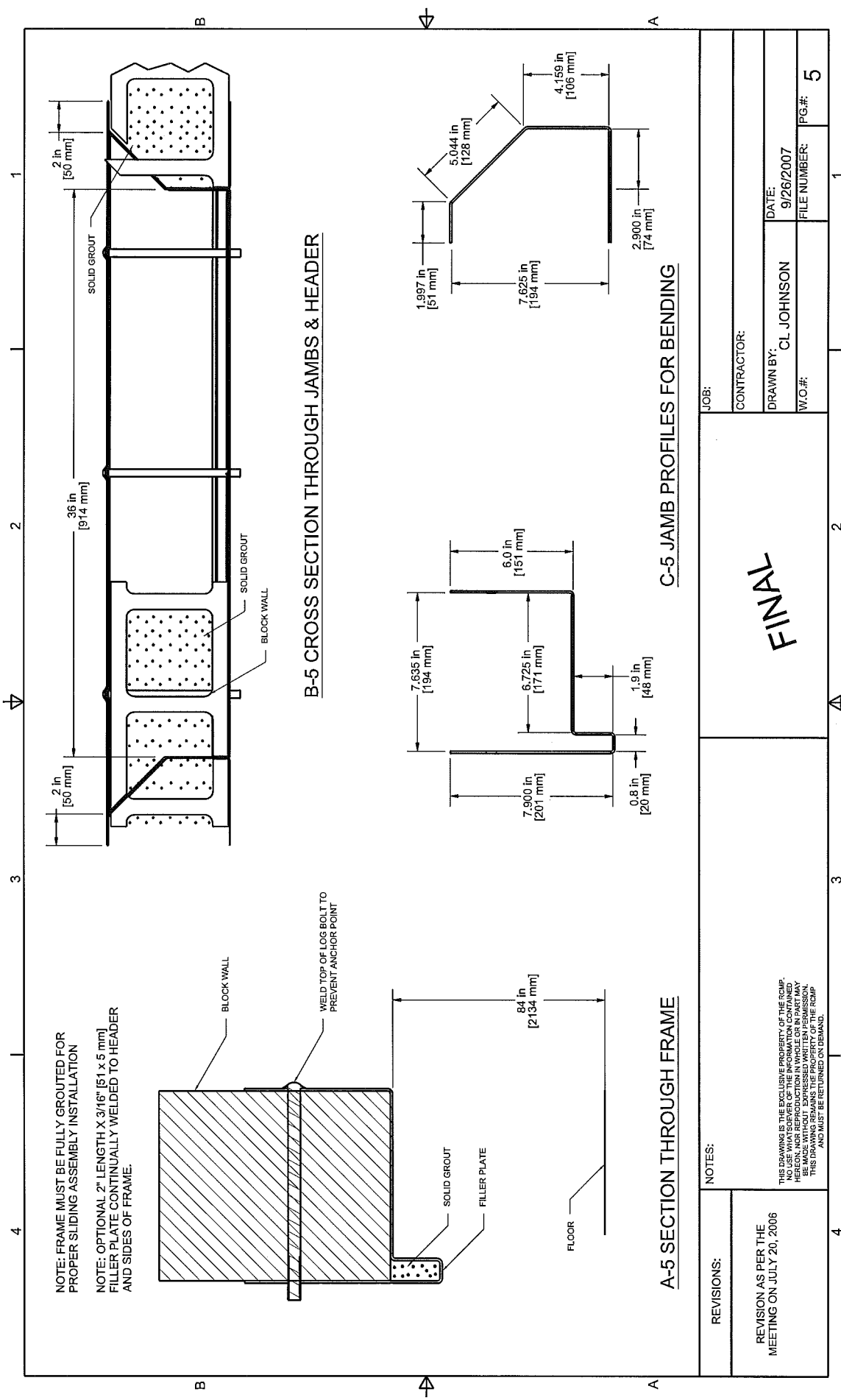
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<p>A-3 ANCHOR TYPES</p>  <p>WELDED ROD ANCHOR</p>  <p>STEEL STUD ANCHOR</p>  <p>WOOD STUD ANCHOR</p>  <p>EXISTING WALL ANCHOR</p>  <p>STANDARD FIXED BASE ANCHOR</p>  <p>CORRUGATED TAIL ANCHOR</p>  <p>CONCRETE BLOCK WALL WIRE ANCHOR</p>	<p>B-3 DOOR AND FRAME HANDING CHART TO DETERMINE HAND(SWING) OF DOOR AND FRAME STAND OUTSIDE - FACING DOOR</p> <table border="1"> <tr> <td>INSIDE</td> <td>INSIDE</td> </tr> <tr> <td>OUTSIDE</td> <td>OUTSIDE</td> </tr> <tr> <td>RIGHT HAND</td> <td>LEFT HAND</td> </tr> </table> <table border="1"> <tr> <td>INSIDE</td> <td>INSIDE</td> </tr> <tr> <td>OUTSIDE</td> <td>OUTSIDE</td> </tr> <tr> <td>RIGHT HAND REVERSE</td> <td>LEFT HAND REVERSE</td> </tr> </table> <table border="1"> <tr> <td>INSIDE</td> <td>INSIDE</td> </tr> <tr> <td>OUTSIDE</td> <td>OUTSIDE</td> </tr> <tr> <td>PAIR OF DOORS LHR/ACTIVE</td> <td>PAIR OF DOORS RHR/ACTIVE</td> </tr> </table> <table border="1"> <tr> <td>INSIDE</td> <td>INSIDE</td> </tr> <tr> <td>OUTSIDE</td> <td>OUTSIDE</td> </tr> <tr> <td>PAIR OF DOORS LHR/ACTIVE</td> <td>PAIR OF DOORS RHR/ACTIVE</td> </tr> </table>	INSIDE	INSIDE	OUTSIDE	OUTSIDE	RIGHT HAND	LEFT HAND	INSIDE	INSIDE	OUTSIDE	OUTSIDE	RIGHT HAND REVERSE	LEFT HAND REVERSE	INSIDE	INSIDE	OUTSIDE	OUTSIDE	PAIR OF DOORS LHR/ACTIVE	PAIR OF DOORS RHR/ACTIVE	INSIDE	INSIDE	OUTSIDE	OUTSIDE	PAIR OF DOORS LHR/ACTIVE	PAIR OF DOORS RHR/ACTIVE	<p>FIRE RATING LABELS</p> <p>A - 3 HOUR B - 1 1/2 HOUR C - 45 MINUTE 20M - 20 MINUTE</p> <p>DOOR MATERIALS</p> <p>HM - HOLLOW METAL DOOR - HONEYCOMB IHM - INSULATED HOLLOW METAL DOOR - POLYSTYRENE SLH - STEEL STIFFENED (LAMINATED-HONEYCOMB) SLP - STEEL STIFFENED (LAMINATED-POLYSTYRENE) SWF - STEEL STIFFENED (WELDED-FIBREGLASS) SCW - SOLID CORE WOOD DOOR HCW - HOLLOW CORE WOOD DOOR PLM - PLASTIC LAMINATED</p> <p>REMOVABLE STOPS</p> <p>PL - PULL SIDE OF DOOR PS - PUSH SIDE OF DOOR</p> <p>ANCHOR TYPES</p> <p>SS - STEEL STUD ANCHOR CT - CORRUGATED TAIL ANCHOR WS - WOOD STUD ANCHOR EWA - EXISTING WALL ANCHOR CB - CONCRETE BLOCK WIRE ANCHOR BA - BASE ANCHOR WR - WELDED ROD ANCHOR</p> <p>HARDWARE</p> <p>PP - PUSH & PULL RIM - RIM PANIC VR - VERTICAL ROD FB - FLUSH BOLT R/F - REINFORCE CVR - CONCEALED VERTICAL ROD</p> <p>DOOR SWINGS</p> <p>LH - LEFT HAND LHR - LEFT HAND REVERSE RH - RIGHT HAND RHR - RIGHT HAND REVERSE</p>	<p>NOTES:</p> <p>THIS DRAWING IS THE EXCLUSIVE PROPERTY OF THE RCMP. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF THE RCMP. THE DRAWING IS TO BE RETURNED ON DEMAND.</p> <p>REVISIONS:</p> <p>REVISION AS PER THE MEETING ON JULY 20, 2006</p>
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	DRAWN BY: CL JOHNSON	DATE: 9/26/2007
W.O.#:	FILE NUMBER:	PG.#: 4

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JOB:	
CONTRACTOR:	
DRAWN BY:	CL JOHNSON
DATE:	9/26/2007
W.O.#:	
FILE NUMBER:	
PG.#:	5

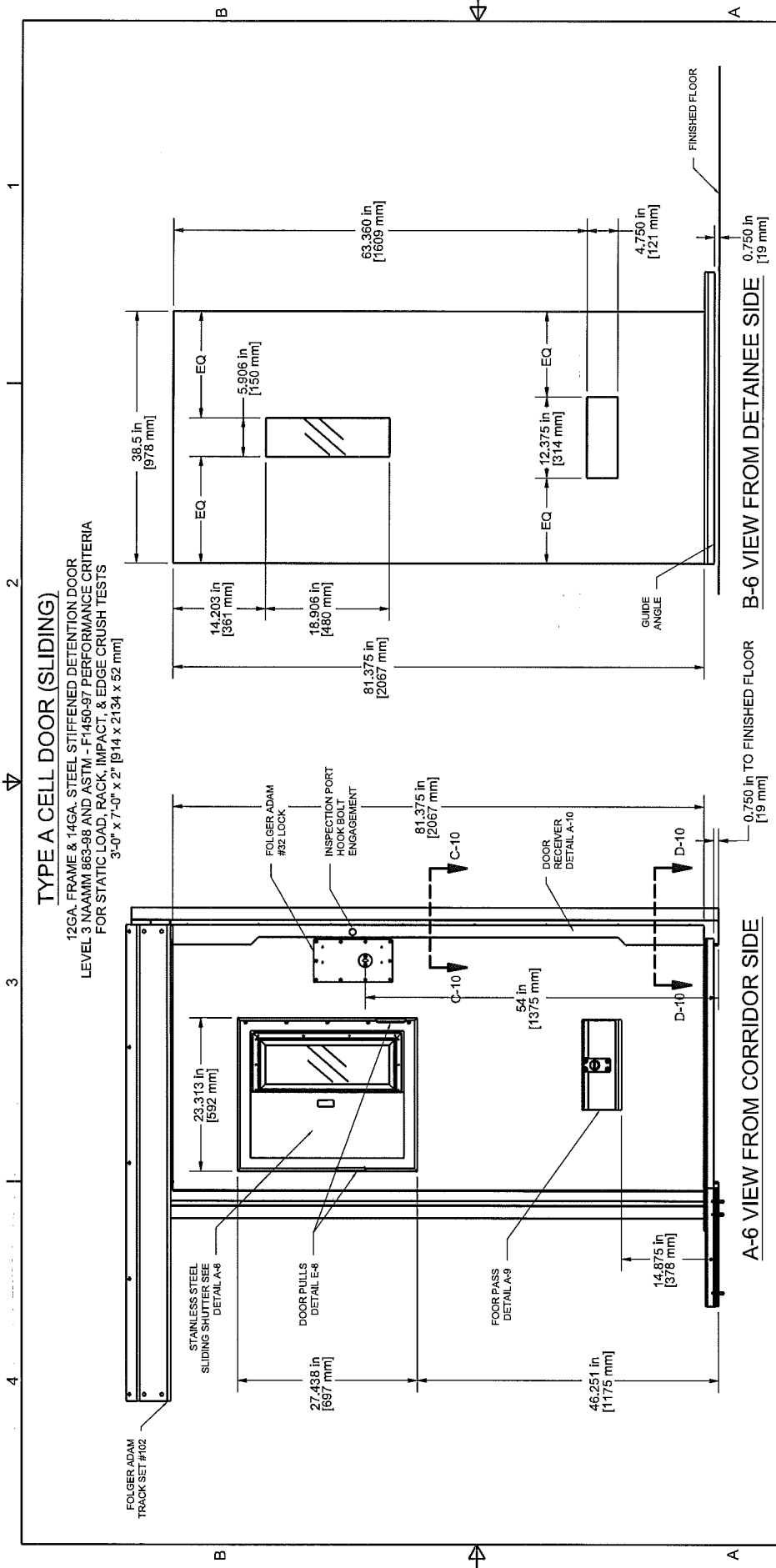
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NOTES:

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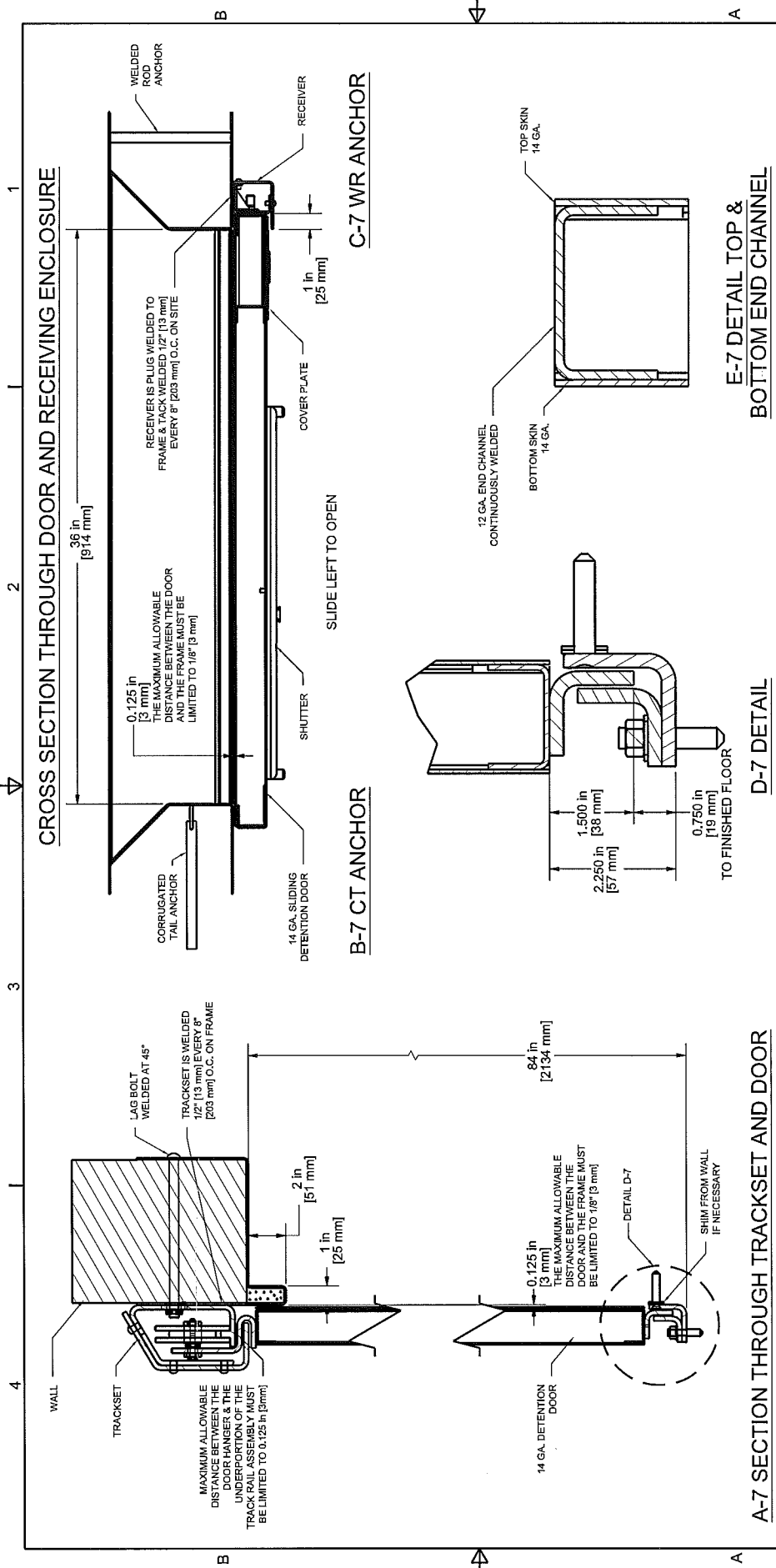
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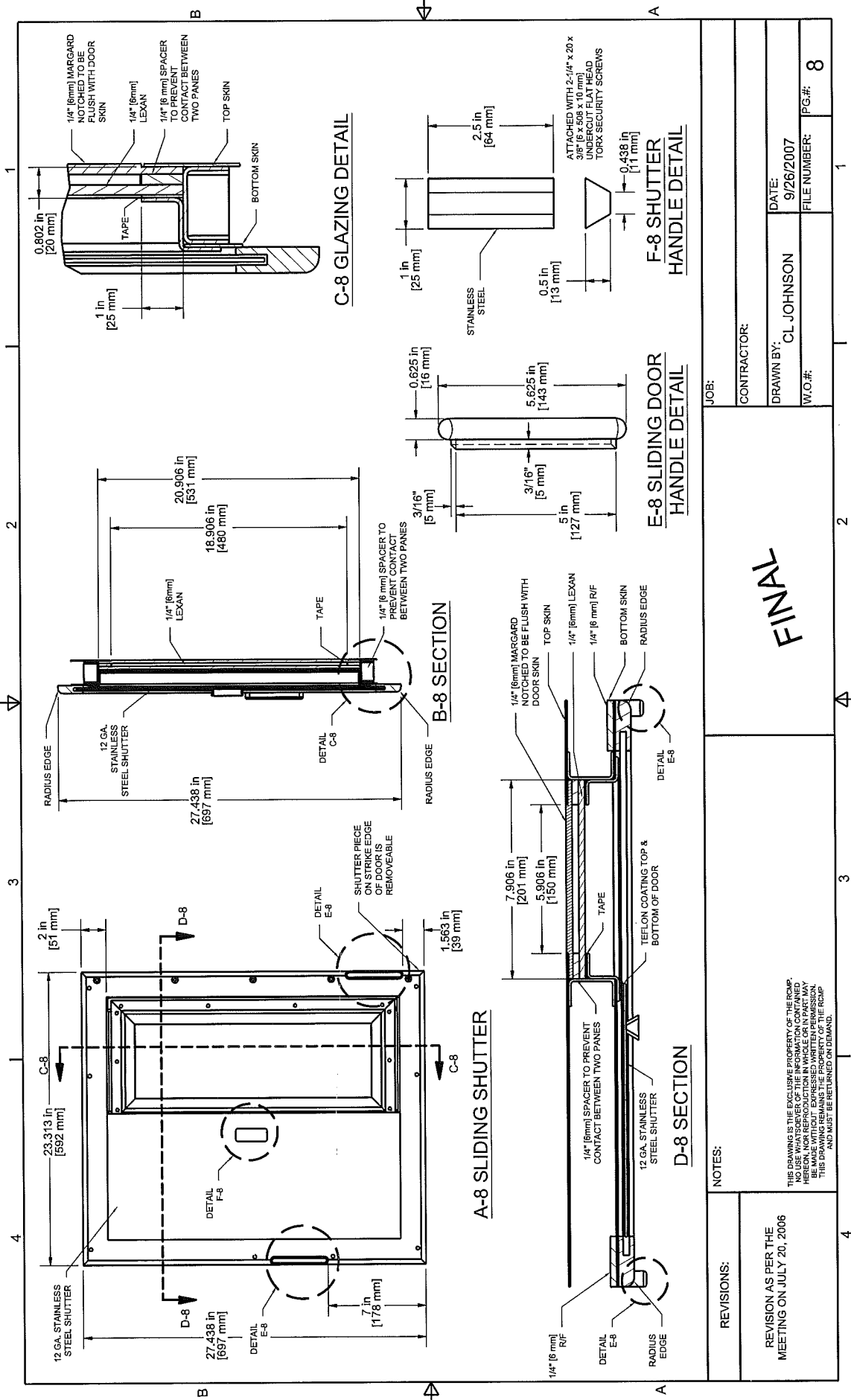
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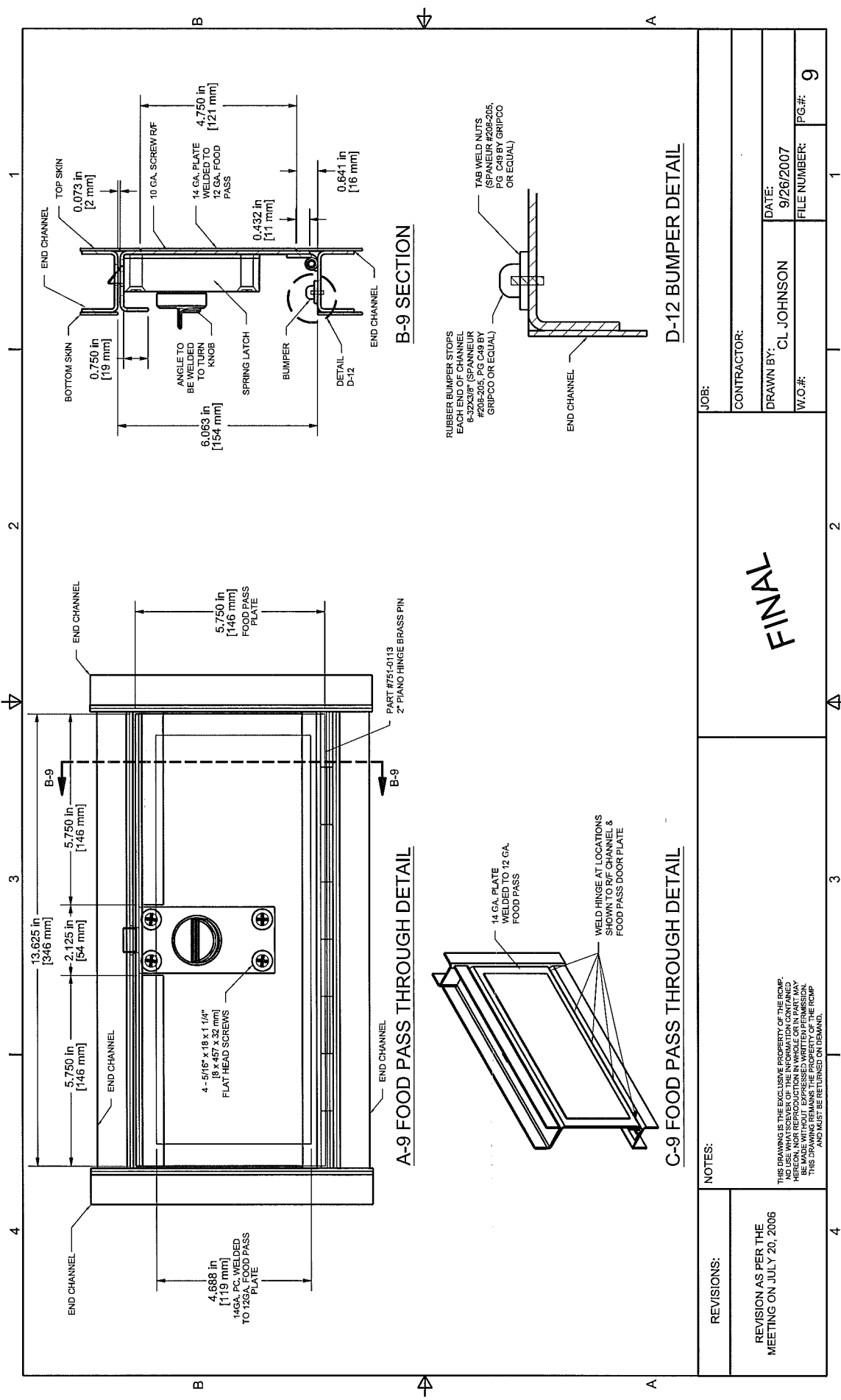
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SEE A-3 FOR ADDITIONAL ANCHOR OPTIONS		<p>FINAL</p> <p>THIS DRAWING IS THE EXCLUSIVE PROPERTY OF THE RCMP. NO USE WHATSOEVER OF THE INFORMATION CONTAINED HEREIN FOR ANY PURPOSES OTHER THAN THAT AUTHORIZED BY THE RCMP IS PERMITTED WITHOUT THE WRITTEN PERMISSION OF THE RCMP. THE DRAWING REMAINS THE PROPERTY OF THE RCMP AND MUST BE RETURNED ON DEMAND.</p>	
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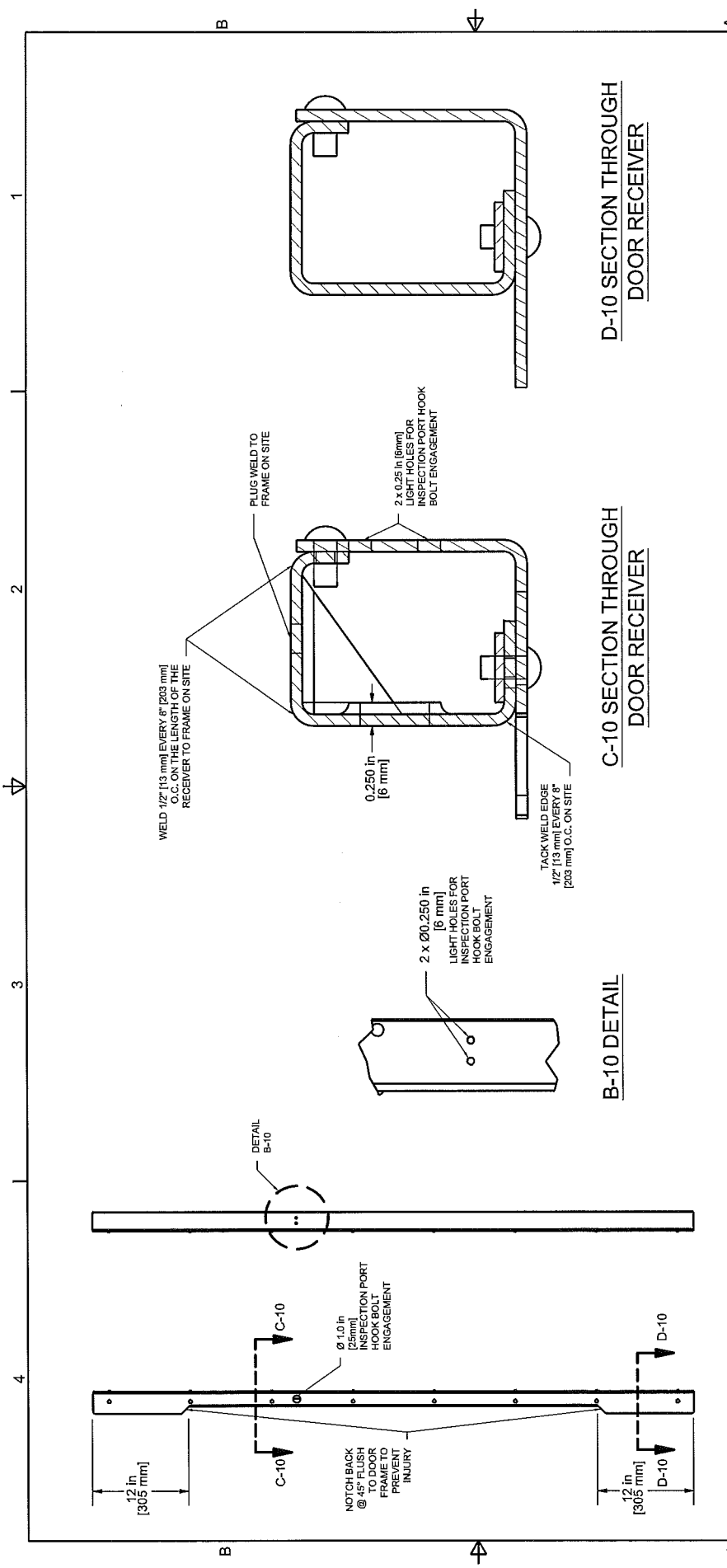
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	FINAL
	JOB:



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	DRAWN BY: CL JOHNSON
	DATE: 9/26/2007
	FILE NUMBER:
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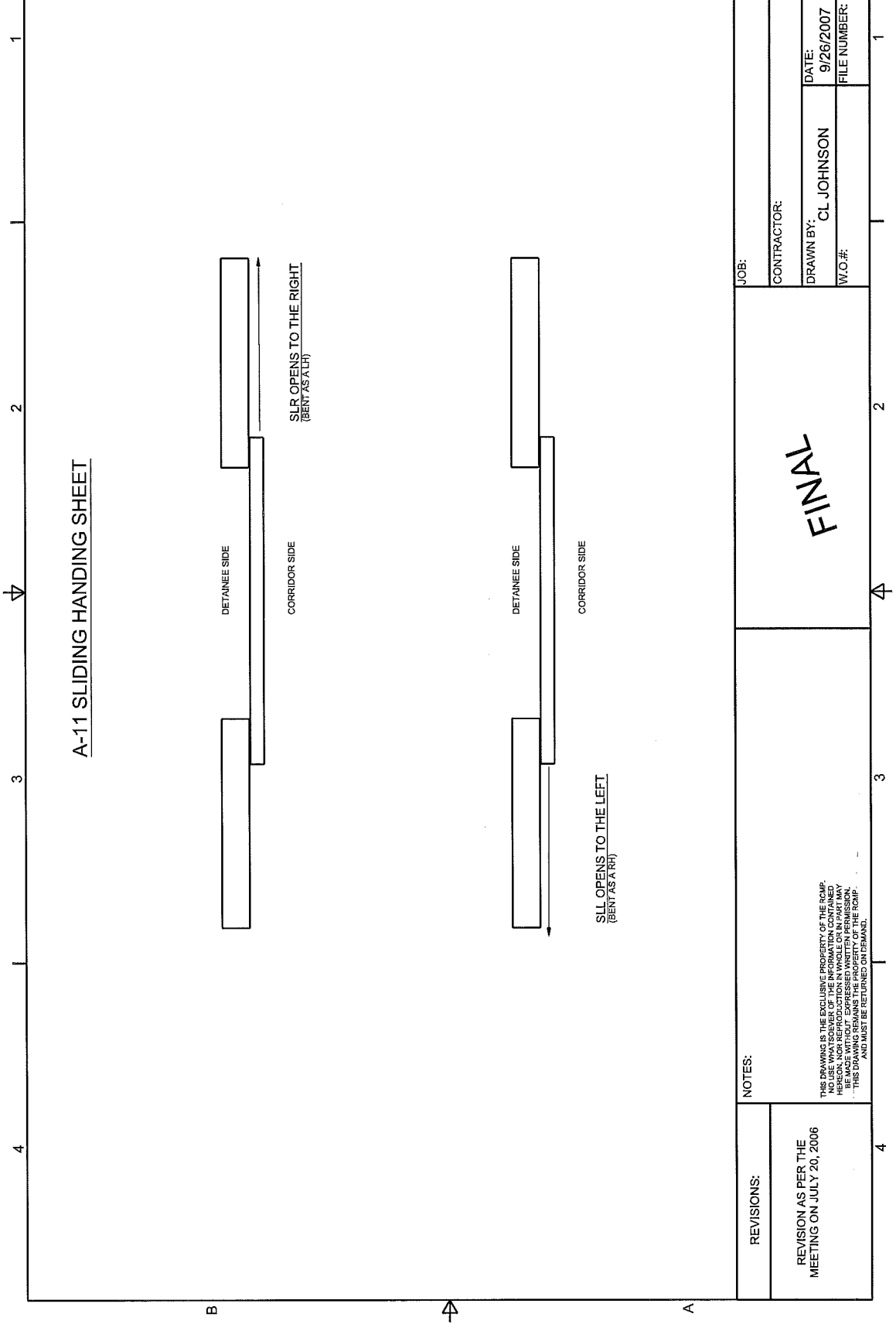
D-10 SECTION THROUGH DOOR RECEIVER

C-10 SECTION THROUGH DOOR RECEIVER

B-10 DETAIL

A-10 DOOR RECEIVER

<p>REVISIONS:</p> <p>REVISION AS PER THE MEETING ON JULY 20, 2006</p>	<p>NOTES:</p> <p>REMOVE ALL BURRS AND SHARP EDGES AFTER WELDING</p>		<p>CONTRACTOR:</p> <p>CL. JOHNSON</p> <p>DATE: 9/26/2007</p> <p>FILE NUMBER: PG.#: 10</p>
	<p>FINAL</p>		
	<p>THIS DRAWING IS THE EXCLUSIVE PROPERTY OF THE RCMP. NO USE WHATSOEVER OF THE INFORMATION CONTAINED HEREIN IS PERMITTED WITHOUT THE WRITTEN PERMISSION OF THE RCMP. THIS DRAWING REMAINS THE PROPERTY OF THE RCMP AND MUST BE RETURNED UPON DEMAND.</p>		
	<p>REVISIONS:</p> <p>REVISION AS PER THE MEETING ON JULY 20, 2006</p>		



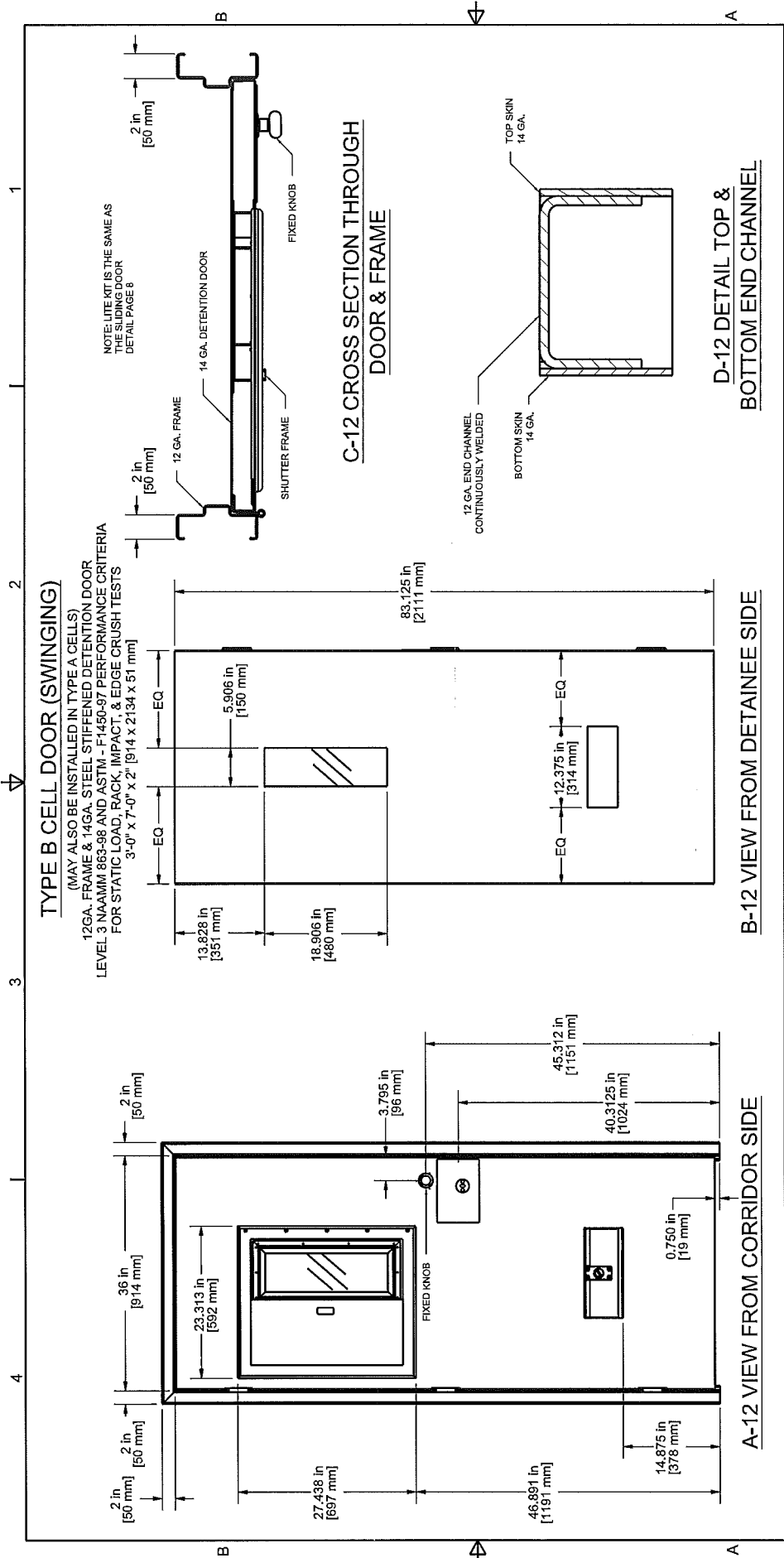
A-11 SLIDING HANDING SHEET

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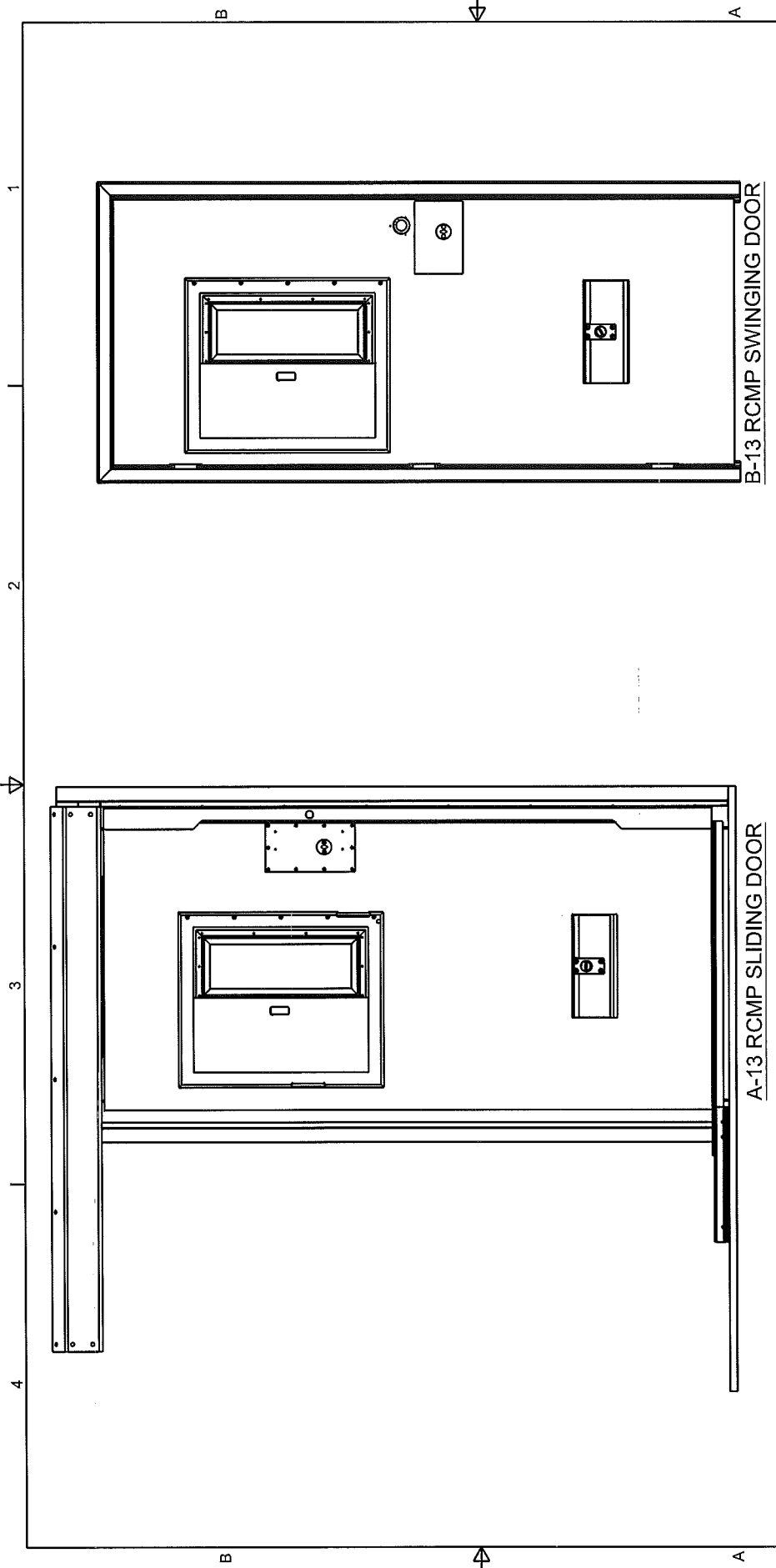
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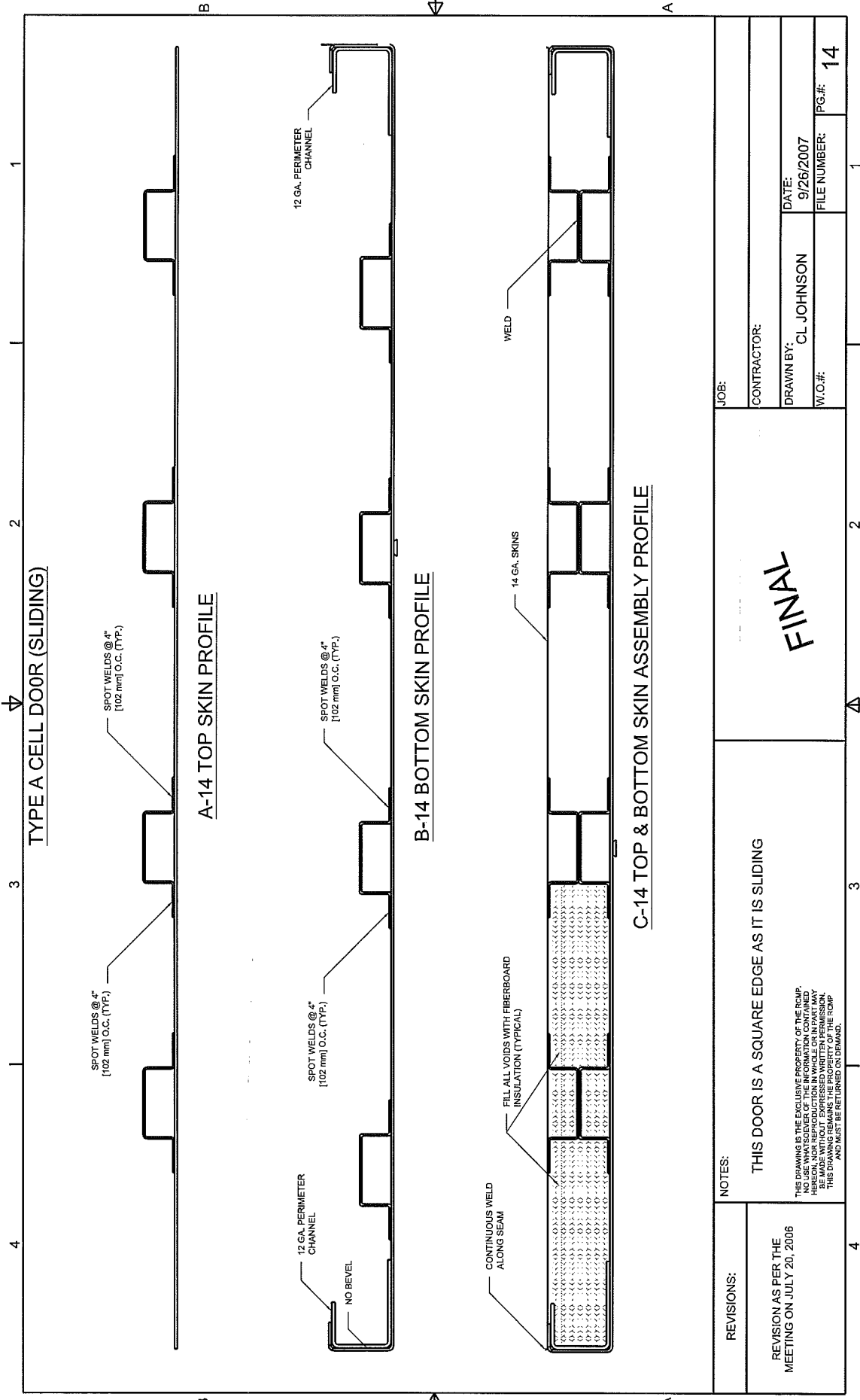
<p>TYPE B CELL DOOR (SWINGING) (MAY ALSO BE INSTALLED IN TYPE A CELLS) 12GA. FRAME & 14GA. STEEL STIFFENED DETENTION DOOR LEVEL 3 NAAMM 863-98 AND ASTM - F1450-97 PERFORMANCE CRITERIA FOR STATIC LOAD, RACK, IMPACT, & EDGE CRUSH TESTS 3'-0" x 7'-0" x 2" [914 x 2134 x 51 mm]</p>		<p>DATE: 9/26/2007</p>
		<p>FILE NUMBER: 12</p>
<p>FINAL</p>		
<p>REVISIONS:</p> <p>REVISION AS PER THE MEETING ON JULY 20, 2006</p>		<p>NOTES:</p> <p>THIS DRAWING IS THE EXCLUSIVE PROPERTY OF THE RCMP. NO USE WHATSOEVER OF THE INFORMATION CONTAINED HEREON, NOR REPRODUCTION IN WHOLE OR IN PART MAY BE MADE WITHOUT THE WRITTEN PERMISSION OF THE RCMP. THIS DRAWING REMAINS THE PROPERTY OF THE RCMP AND MUST BE RETURNED ON DEMAND.</p>
<p>CONTRACTOR:</p>		<p>W.O.#:</p>
<p>JOB:</p>		<p>PG.#: 12</p>



A-13 RCMP SLIDING DOOR

B-13 RCMP SWINGING DOOR

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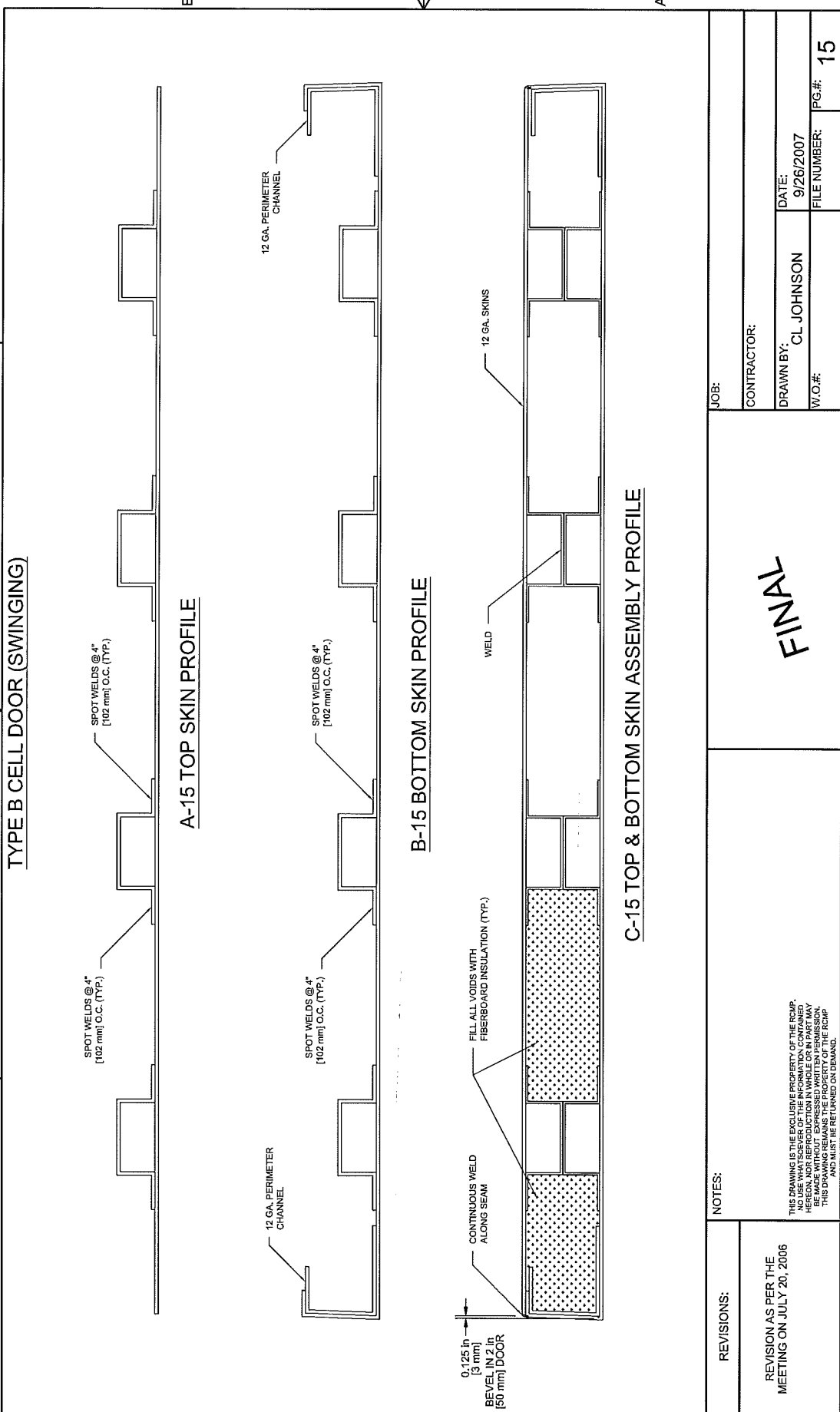
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DRAWN BY:	CL JOHNSON
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FILE NUMBER:	
PG.#:	14

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THIS DOOR IS A SQUARE EDGE AS IT IS SLIDING

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REVISION AS PER THE MEETING ON JULY 20, 2006	



TYPE B CELL DOOR (SWINGING)

A-15 TOP SKIN PROFILE

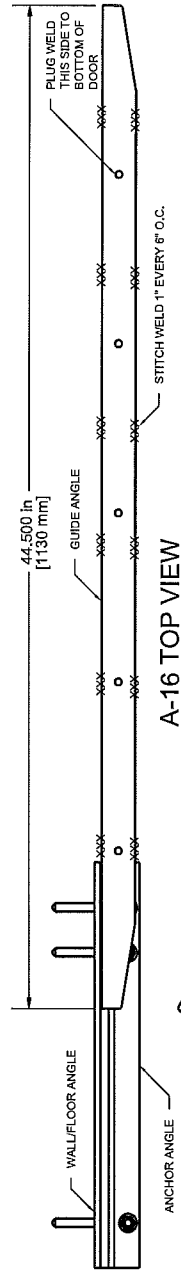
B-15 BOTTOM SKIN PROFILE

C-15 TOP & BOTTOM SKIN ASSEMBLY PROFILE

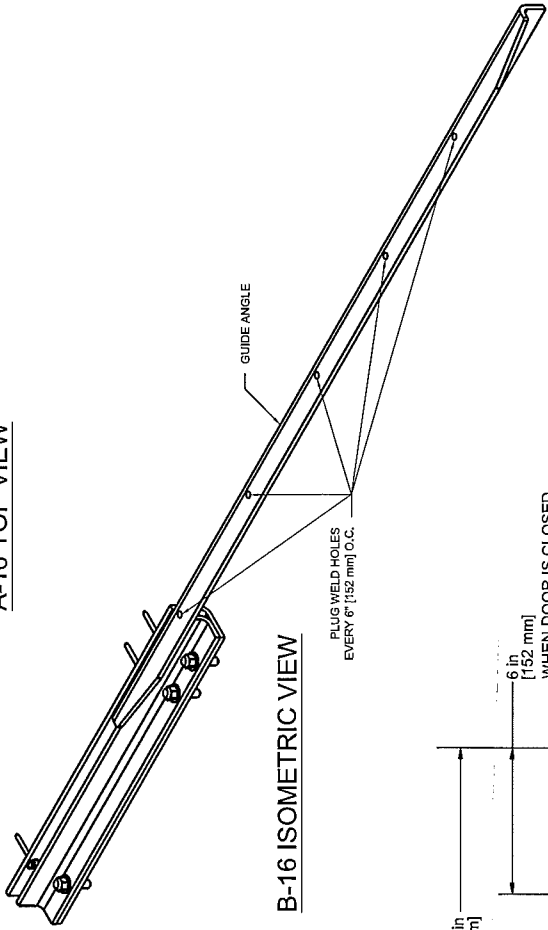
REVISIONS: REVISION AS PER THE MEETING ON JULY 20, 2006	NOTES: THIS DRAWING IS THE EXCLUSIVE PROPERTY OF THE RCP. IT IS TO BE USED ONLY FOR THE PROJECT AND LOCATION SPECIFICALLY IDENTIFIED HEREON. NO REPRODUCTION IN WHOLE OR IN PART MAY BE MADE WITHOUT THE WRITTEN PERMISSION OF THE RCP. THIS DRAWING IS TO BE RETURNED TO THE RCP AND MUST BE RETURNED ON DEMAND.	
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	DRAWN BY: CL JOHNSON	FILE NUMBER:
	W.O.#:	PG.#: 15

FINAL

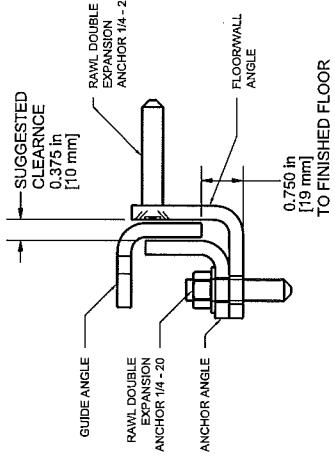
INSTALLATION OF WALL/FLOOR & ANCHOR ANGLE & GUIDE ANGLE



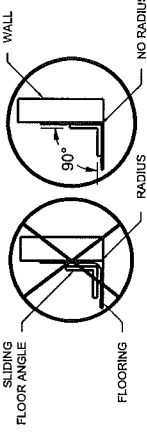
A-16 TOP VIEW



B-16 ISOMETRIC VIEW



D-16 DETAIL



NOTE: FLOORING IS NOT TO HAVE A RADIUS THAT MEETS THE WALL FOR SLIDING UNITS.

E-16 FLOORING DETAIL



C-16 FRONT VIEW

REVISIONS:	JOB:	
	CONTRACTOR:	
REVISION AS PER THE MEETING ON JULY 20, 2006	DRAWN BY:	DATE:
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FINAL		PG.#: 16

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FINAL

Part 1 General

1.1 SECTION INCLUDES

- .1 Non-rated rated acoustic pressed steel frames.
- .2 Non-rated fire rated acoustic hollow metal doors and panels.
- .3 Glazed lite acoustic steel frames.
- .4 Glass and glazing.
- .5 Perimeter and bottom acoustic seals, threshold, and astragal.

1.2 RELATED SECTIONS

- .1 Section 09 81 16 - Acoustic Blanket Insulation: Insulation inside door frames.
- .2 Section 07 92 00 - Joint Sealing: Caulking between doors and adjacent construction.
- .3 Section 08 71 10 - Door Hardware - General.
- .4 Section 09 91 15 - Painting: Field painting of doors frames doors and frames.

1.3 REFERENCES

- .1 ASTM A480/A480M-06b - General Requirements for Flat-Rolled Stainless Heat-Resisting Steel Plate, Sheet, and Strip.
- .2 ASTM A653/A653M-06 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .3 ASTM E90-04 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- .4 ASTM E413-04 - Classification for Rating Sound Insulation.
- .5 AWS D1.1/D1.1M:2006, Structural Welding Code - Steel.
- .6 CSDMA Selection and Usage Guide for Steel Doors and Frames, 1990.
- .7 HMMA 802-92 - Manufacturing of Hollow Metal Doors and Frames.
- .8 HMMA 840-99 - Installation and Storage of Hollow Metal Doors and Frames.
- .9 HMMA 865-03 - Guide Specifications For Swinging Sound Control Hollow Metal Doors and Frames.
- .10 NFPA 80-07 - Standard for Fire Doors and Other Opening Protective.

- .11 UL 10C-98 - Standard for Positive Pressure Fire Tests of Door Assemblies.
- .12 ANSI/ICC A117.1-2003 - Standard for Accessible and Usable Buildings and Facilities

1.4 PERFORMANCE REQUIREMENTS

- .1 Acoustic Performance: Minimum Sound Transmission Class (STC) 51 tested to ASTM E90. Label indicating sound transmission class shall be applied to the door and door frame.
- .2 The entire door assembly is required to meet or exceed field tested performance of STC 51 for all sound doors supplied, using ASTM E 336 "Standard Test Method for Measurement of Airborne Sound Insulation for Buildings"
- .3 Label indicating fire resistance shall be applied to the door and door frame.
- .4 Installed Door and Frame Assembly: Conform to ANSI/ICC A117.1

1.5 SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide product data on door construction and .
- .3 Shop Drawings: Indicate door and frame elevations, anchor types and closure methods, finishes location of cut-outs for hardware , and cut outs for glazing.
- .4 Samples: Submit manufacturer's door finish sample, frame corner sample, as well as perimeter acoustic gasket.
- .5 Test Data:
 - .1 Submit test data indicating compliance with the Sound Transmission Class (STC) requirements. Include laboratory name, test report number, and date of test.
 - .2 Submit certification from test laboratory qualified under the National Voluntary Accreditation Program (NVLAP) of the U.S. Bureau of Standards.
- .6 Installation Instructions: Submit manufacturer's installation instructions.

1.6 QUALITY ASSURANCE

- .1 Perform work to requirements of CSDMA (Canadian Steel Door Manufacturers Association) standards.
- .2 Manufacturer: Minimum 5 years documented experience manufacturing acoustic steel door and frame assemblies.
- .3 Pre-installation Meeting: Convene a pre-installation meeting 2 weeks before start of installation of acoustic door and frame assemblies. Require attendance of parties directly affecting work of this section, including contractor, architect, installer, and manufacturer's representative. Review installation and coordination with other work.

1.7 DELIVERY, STORAGE AND PROTECTION

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Comply with HMMA 840.
- .3 Weld minimum two temporary jamb spreaders per frame prior to shipment.
- .4 Remove doors and frames from wrappings or coverings upon receipt on site and inspect for damage.
- .5 Store in vertical position, spaced with blocking to permit air circulation between components.
- .6 Store materials out of water and covered to protect from damage.
- .7 Clean and touch up scratches or disfigurement caused by shipping or handling with zinc-rich primer.

1.8 WARRANTY

- .1 Manufacturer's Limited Warranty: Five (5) years from date of supply, covering material and workmanship.

Part 2 Products**2.1 MANUFACTURERS**

- .1 AMBICO Limited
- .2 Substitutions: Refer to Section 01 60 00.

2.2 MATERIALS

- .1 Sheet Steel:
 - .1 Galvanized steel to ASTM A653/A653M, ZF180 (A60).
 - .2 Reinforcement Channel: To CSA G40.20/G40.21, coating designation to ASTM A653/A653M, ZF75 .

2.3 ACCESSORIES

- .1 Hinges: Heavy weight butt type by section # 08 71 10
- .2 Glazing Stops: Formed galvanized steel channel, mitred corners; prepared for countersink tamperproof screws.
- .3 Glass: Type as tested to achieve STC and fire ratings. Glass to be factory supplied and pre-installed.

- .4 Primer: Rust inhibitive zinc chromate.
- .5 Threshold: Smooth and flush, to provide a seal for door in closed position.
- .6 Astragal: To be supplied loose ready for field assembly by others
- .7 Perimeter and bottom acoustic seals: To provide a seal for door in closed position.

2.4 FABRICATION

- .1 Manufacture doors and frames to STC rating of 51, measured in accordance with ASTM E90.
- .2 Steel Doors:
 - .1 Sheet steel faces, thickness, design, and core suitable to achieve specified STC performance.
 - .2 Acoustic core construction, longitudinal edges, mechanically inter-locked with visible edge seams.
 - .3 Reinforce doors where surface-mounted hardware is required.
 - .4 Drill and tap for mortised, templated hardware.
 - .5 Top and Bottom Channels: Inverted, recessed, welded steel channels.
 - .6 Astragals: Metal acoustic astragals with integral acoustic seals for double doors.
- .3 Steel Frames:
 - .1 Sheet steel, metal thickness and appropriate to maintain door STC and fire ratings, mitred corners, fully welded seams.
 - .2 Factory assemble and weld frames.
- .4 Factory install glazing.
- .5 Affix permanent metal nameplates to door and frame, indicating manufacturer's name, door tag, and STC rating where it shall be clearly visible.

2.5 FINISHES

- .1 Factory Door Finish: Factory applied zinc chromate primer to be applied to all exposed surfaces

Part 3 Execution

3.1 INSTALLATION

- .1 Install components to manufacturer's written instructions.
- .2 Install steel doors and frames to CSDMA HMMA 840 standards and in accordance with NFPA 80 UL 10C, and local authority having jurisdiction.

- .3 Utilize welders certified by Canadian Welding Bureau (CWB) for field welding.
- .4 Coordinate with masonry gypsum board wall construction for anchor placement.
- .5 Set frames plumb, square, level and at correct elevation.
- .6 Allow for deflection to ensure that structural loads are not transmitted to frame.
- .7 Adjust operable parts for correct clearances and function.
- .8 Install and adjust perimeter and bottom acoustic seals.
- .9 Finish paint in accordance with Section 09 91 15.

3.2 ERECTION TOLERANCES

- .1 Section 01 73 00: Tolerances.
- .2 Installation tolerances of installed frame for squareness, alignment, twist and plumbness are to be no more than $\pm 1/16$ in (1.5mm) in compliance with HMMA 841.

3.3 TESTING

- .1 Sound test to be performed on acoustic rooms to verify that installation of walls and door and frame assemblies meet the minimum acceptable field tested sound rating of STC 46. Testing will be carried out by an Inspection and Testing Agency designated by the Departmental Representative. Manufacturer/installer's Representative may be present to witness the testing.
- .2 Owner will pay for tests out of cash allowances.
- .3 Assemblies failing to meet above performance criteria to be corrected at no cost to the Owner.
- .4 Retesting to confirm corrective action meets acoustic performance requirements will be paid for by the Contractor.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Aluminum Association (AA)
 - .1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.
- .2 ASTM International
 - .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 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.105-M91, Quick-Drying Primer.
 - .2 CAN/CGSB-1.213-04, Etch Primer (Pretreatment Coating or Tie Coat) for Steel and Aluminum.
 - .3 CAN/CGSB-1.181-99, Ready-Mixed, Organic Zinc-Rich Coatings.
- .4 CSA International
 - .1 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .5 Environmental Choice Program (ECP)
 - .1 CCD-016-97(R2005), Thermal Insulation.
 - .2 CCD-047-98(R2005), Architectural Surface Coatings.
 - .3 CCD-048-98(R2006), Surface Coatings - Recycled Water-borne.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
 - .1 Convene pre-installation meeting 1 week prior to beginning work of this Section, with Consultant in accordance with Section 01 31 19 - Project Meetings to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other construction subtrades.
 - .4 Review manufacturer's written installation instructions and warranty requirements.
- .2 Arrange for site visit with Consultant prior to start of Work to examine existing site conditions adjacent to demolition Work.

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 doors, hardware, and accessories and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Indicate sizes, service rating, types, materials, operating mechanisms, glazing locations and details, hardware and accessories, required clearances and electrical connections.
- .4 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .5 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .6 Manufacturers Reports:
 - .1 Manufacturer's Field Reports: submit manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in Part 3 - FIELD QUALITY CONTROL.
 - .1

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 sectional metal doors for incorporation into manual.

1.5 MAINTENANCE MATERIAL SUBMITTALS

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

1.6 QUALITY ASSURANCE

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

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

Part 2 Products

2.1 DESIGN CRITERIA

- .1 Design exterior door assembly to withstand wind load of 1 kPa with a maximum horizontal deflection of 1/120 of opening width.
- .2 Design door panel assemblies with thermal insulation factor 1.2 RSI.
- .3 Design door assembly to withstand minimum 100,000 cycles per annum, and 20 years total life cycle.
- .4 Water Penetration to ASTM E547: absolutely no leak

2.2 MATERIALS

- .1 Galvanized steel sheet: commercial quality Z275 zinc coating.
- .2 Steel sheet: commercial quality to ASTM A1008/A1008M unexposed (U), exposed (E), with plain finish.
- .3 Aluminum extrusions: Aluminum Association alloy AA6063-T5.
- .4 Primer: to CAN/CGSB-1.181, for galvanized steel surfaces.
- .5 Insulation: to meet design requirements.
- .6 Cable: 6mm dia. multi-strand galvanized steel aircraft cable.

2.3 DOORS

- .1 Fabricate 75 mm thick insulated flush panel doors of interlocking roll formed steel sections as indicated.
- .2 Fabricate panel frames from 1.6mm (16 GA) CRS in a continuous box frame with vertical stiffeners 1.6mm (16GA) vertical steel stiffeners at 300 mm centres.
- .3 Fabricate sections from single sheet galvanized steel sheet faces, exterior 1.6MM (16GA) and interior 1.6MM (16 GA).

- .4 Galvanized steel skins roof formed into tongue and groove joint with thermal break and double bubble shaped weather seal.
- .5 Fabricate doors from prepainted steel stock final color by Consultant

2.4 HEAVY DUTY INDUSTRIAL HARDWARE

- .1 Track: standard hardware with 75 mm size 2.66 mm core thickness galvanized steel track: tapered and wedged and mounted for wedge type closing, reinforce as required.
- .2 Track Supports: 2.3 mm core thickness continuous galvanized steel angle track supports.
- .3 Spring counter balance: heavy duty oil tempered torsion spring with manufacturers standard brackets.
 - .1 Drum: 200 mm diameter die cast aluminum.
 - .2 Shaft: 32 mm diameter galvanized steel.
- .4 Top roller carrier: galvanized Steel 3.04 mm thick adjustable.
- .5 Rollers: full floating grease packed hardened steel, ball bearing 75 mm diameter solid steel tire.
- .6 Roller brackets: adjustable, minimum 2.5 mm galvanized steel.
- .7 Hinges: heavy duty, minimum of four 3.04 mm thick galvanized bolted at maximum spacing of 750mm O.C. per section .
- .8 Cable: 6 mm diameter galvanized steel aircraft cable.

2.5 ACCESSORIES

- .1 Overhead horizontal track and operator supports: galvanized steel, type and size to suit installation.
- .2 Track guards: 5 mm thick formed sheet 1500 mm high track guards.
- .3 Pusher springs 100,000 cycle rated
- .4 One Two horizontal sliding lock bolts on interior.
- .5 Weather-stripping:
 - .1 Perimeter Weather Seal: 3 Lip flexible PVC weather seal in extruded aluminum retainer
 - .2 Bottom Weather Seal: U-Shaped, flexible PVC double weather seal, retained in heavy-duty aluminum retainer.
- .6 Finish ferrous hardware items with minimum zinc coating of 300 g/m² to CAN/CSA-G164.

2.6 ELECTRICAL OPERATOR

- .1 Electrical jack shaft type operator.
 - .1 Standard of Acceptance: Dorlec EJH-383

- .2 Electrical motors, controller units, remote pushbutton stations, relays and other electrical components: to CSA approval with adjustable timer "TO CLOSE" feature
- .3 Power supply: 208 V, 3 phase, 60 Hz.
 - .1 Motor: $\frac{3}{4}$ HP high starting torque, class A insulated.
- .4 Controller units with integral motor reversing starter, solenoid operated brake 3 heater elements for overload protection, including pushbuttons and control relays as applicable.
- .5 Operation: Interior.
 - .1 Remote pushbutton stations: adjacent to each door. 24V. Flush Mounted, key operated model Square D 9001KY295 complete with emergency stop button, complete with Abloy CY415 cylinder. Abloy Cylinder supplied by hardware supplier .
- .6 Exterior Operation
 - .1 Remote pushbutton station: adjacent to door. 24V Flush mounted key operate model square D 9001KY195, without emergency stop button, complete with Abloy CY415 cylinder. Abloy cylinder to be supplied by the hardware supplier.
- .7 Safety switch: combination roll rubber with limit switches for full length of bottom rail of bottom section of door, to reverse door to open position when coming in contact with object on closing cycle.
 - .1 Safety switch mechanism c/w one set of photo eyes and one reflector.
- .8 For jack shaft operators:
 - .1 Provide floor level disconnect device to allow for manual operation in event of power failure.
 - .2 Equip Operator with:
 - .1 Electrical interlock switch to disconnect power to operator when in manual operation.
 - .2 Built-in chain hoist for manual operation in event of power failure.
 - .3 Cable fail safe device:
 - .1 Solenoid brake able to stop door immediately if cable breaks on door free fall Braking Capacity 500 kg
- .9 Door speed: 300 mm per second.
- .10 Control transformer: for 24 VAC control voltage.
- .11 Mounting brackets: galvanized steel, size and gauge to suit conditions.

2.7 STANDARD OF ACCEPTANCE

- .1 Facility Building: Standard of Acceptance: Sentinel Thermostop Mark III-166 or equivalent
- .2 Stand Alone Garage: Richard Wilcox Thermatite T175-20

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for sectional metal doors installation in accordance with manufacturer's written instructions.

3.2 INSTALLATION

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

3.3 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 Remove traces of primer; clean doors and frames.
 - .2 Clean glass and glazing materials with approved non-abrasive cleaner.

3.4 PROTECTION

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

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Aluminum Association (AA)
 - .1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.
- .2 ASTM International
 - .1 ASTM A123/A123M-12, Standard Specification for Zinc (Hot-Dip galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM E1748-95(2009), Standard Test Method for Evaluating the Engagement Between Windows and Insect Screens as an Integral System.
- .3 CSA Group
 - .1 AAMA/WDMA/CSA 101/1.S.2/A440-11, NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.
 - .2 CSA A440S1-09, Canadian Supplement to AAMA/WDMA/CSA 101/1.S.2/A440, NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.
 - .3 CAN/CSA-A440.4-07(R2012), Window, Door, and Skylight Installation
 - .4 CAN/CSA-A440.2/A440.3-09, Fenestration energy performance/User guide to CSA A440.2, Fenestration energy performance.
 - .5 CAN/CSA-Z91-02(R2013), Health and Safety Code for Suspended Equipment Operations.
 - .6 CAN/CSA-Z809-08(R2013), Sustainable Forest Management.
- .4 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
- .5 Green Seal (GS)
 - .1 GS-11-11, Paints and Coatings.
- .6 Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.
 - .1 MPI #79, Primer, Alkyd, Anti-Corrosive for Metal.
- .7 Screen Manufacturers Association (SMA)
 - .1 SMA 1201R-2002 Specification for Insect Screens for Windows, Sliding Doors and Swinging Doors.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

- .1 Submit manufacturer's instructions, printed product literature and data sheets for windows 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 Manitoba, Canada.
 - .2 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, interior and exterior trim junction between combination units elevations of unit, anchorage details, location of isolation coating, description of related components and exposed finishes fasteners, and caulking. Indicate location of manufacturer's nameplates.
- .4 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into work.
 - .3 Submit one representative model of each type window.
 - .4 Include frame, sash, sill, glazing and weatherproofing method, insect screens, surface finish and hardware. Show location of manufacturer's nameplates.
 - .5 Include 150 mm long samples of head, jamb, sill, meeting rail mullions to indicate profile.
- .5 Test and Evaluation Reports:
 - .1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications.
 - .2 All test reports that reference the NAFS must include, on the first page, a summary of the results including, at minimum:
 - .1 The product manufacturer.
 - .2 The type of product.
 - .3 The model number/series number.
 - .4 The primary product designation.
 - .5 The secondary product designation.
 - .1 Positive design pressure.
 - .2 Negative design pressure.
 - .3 Water penetration resistance test pressure.
 - .4 Canadian air infiltration and exfiltration levels.
 - .6 The test completion date.
 - .3 The report will also contain the following information:
 - .1 Test dates.
 - .2 Report preparation dates.
 - .3 Test information retention period.
 - .4 Location of testing facilities.
 - .5 Full description of test samples, including:

- .1 Condensation resistance.
- .2 Safety drop - vertical sliding windows only.
- .3 Block operation - sliding windows only.
- .4 Sash strength and stiffness - operable casement projecting.
- .5 Sash pull-off - vinyl windows.
- .6 Forced entry resistance.
- .7 Mullion deflection - combination and composite windows.
- .6 Complete description of amendments, as applicable.
- .7 Conclusion.
- .8 Drawings signed by the testing laboratory, if provided.

1.3 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.

1.4 QUALITY ASSURANCE

- .1 Certifications: 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 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.

Part 2 Products

2.1 MATERIALS

- .1 Materials: to AAMA/WDMA/CSA 101/I.S.2/A440 supplemented as follows:
- .2 All windows by same manufacturer.
- .3 Sash: aluminum thermally broken.
- .4 Main frame: aluminum thermally broken.
- .5 Glass: , in accordance with Section 08 80 50 - Glazing.

- .6 Screens: to ASTM E1748 SMA 1201 on the ventilating portion of the windows.
 - .1 Insect screening mesh: count 18 x 14 .
 - .2 Fasteners: tamper proof.
 - .3 Screen frames: aluminum colour to match window frames.
 - .4 Mount screen frames for interior replacement.
 - .5 Ensure that different types of metal sills are indicated. Also, ensure that accessories are correct for sill type specified.
- .7 Isolation coating: alkali resistant bituminous paint.
- .8 Sealants:
 - .1 As per Manufacturer

2.2 STANDARD OF ACCEPTANCE

- .1 Kwaneer Series 5500 ISOWEB Thermal Window System or approved equivalent

2.3 WINDOW TYPE AND CLASSIFICATION

- .1 Product types:
 - .1 AP - Awning hopper projected windows.
 - .2 BW - Basement window.
 - .3 C - Casement window.
 - .4 DAW - Dual action windows.
 - .5 FW- Fixed window.
 - .6 GH - Greenhouse window.
 - .7 H - Hung window.
 - .8 HE - Hinged rescue window.
 - .9 P - Horizontal pivoted window.
 - .10 HS - Horizontal sliding window.
 - .11 I - Jalousie window.
 - .12 JA - Jal awning window.
 - .13 RWG - Roof window - glass glazed.
 - .14 SHW - Side hinged (inswinging) window.
 - .15 SKG - Unit skylight - glass glazed.
 - .16 SKP - Unit Skylight - plastic glazed.
 - .17 SLT - Side light.
 - .18 SP - Specialty product.
 - .19 TA - Tropical awning window.
 - .20 TDDCC - Tubular daylight device - closed ceiling.
 - .21 TH - Top hinged window.
 - .22 TR - Transom.

- .23 VP - Vertically pivoted window.
- .24 VS - Vertical sliding window.
- .2 Classification rating: to AAMA/WDMA/CSA 101/I.S.2/A440.
 - .1 Primary designation:
 - .1 Canadian air infiltration and exfiltration levels: A3.
 - .2 Water Tightness: B7
 - .3 Wind resistance: C5
 - .4 Condensing resistance: Temperature Index, Frame 61
 - .5 Glazing G2
 - .2 Surface condensation control: compliant with standard CAN/CSA-A440.2/A440.3.
- .3 Sliding Reception Counter Window:
 - .1 Refer to architectural details. Unit to be Kwaneer 1010C sliding mall storefront, or approved equal, complete with Sobinco no. 703 slam shut latch, standard flush pull on inside and AR1890 MS+ lock/deadbolt combination.
- .4 Acoustic Window
 - .1 Fixed Aluminum framed, acoustically sealed fixed glazed window unit with integral horizontal pivoting aluminum louver: factory glazed and sealed with the following parameters
 - .1 Extruded aluminum perimeter frame, 63 mm nominal width, depth to suit glazing thickness
 - .2 Field performance of installed assembly to be STC 46 or better.
 - .3 Glazing: 6mm polycarbonate/ 62mm air space/6mm polycarbonate
 - .4 Horizontal pivoting louver system, hand operated tilting mechanism concealed in frame with removable crank operation of the louver to be from both sides of the room.
 - .5 Provide two cranks with window assembly.
 - .6 Finish: White: three coat baked on Duracron finish
 - .7 Standard of Acceptance: Acoustic Louvre Window as manufactured by Unichel Architectural Corp. 2155 Fernard Lafontaine Blvd. Longueuil, QC, J4G 2J4. Phone: 1800 668 1580

2.4 FABRICATION

- .1 Fabricate in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 supplemented as follows:
- .2 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less and plus or minus 3 mm for units with a diagonal measurement over 1800 mm.
- .3 Face dimensions detailed are maximum permissible sizes.
- .4 Brace frames to maintain squareness and rigidity during shipment and installation.

- .5 Finish steel clips and reinforcement with 380 g/m² zinc coating to ASTM A123/A123M.

2.5 ALUMINUM FINISHES

- .1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.
 - .1 Factory Finishing: Kawneer Permanodic® AA-M12C22A44, AAMA 611, Architectural Class I Color Anodic Coating: BLACK.

2.6 ISOLATION COATING

- .1 Coatings: in accordance with manufacturer's recommendations for surface conditions.
- .2 Isolate aluminum from following components, by means of isolation coating:
 - .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
 - .2 Concrete, mortar and masonry.
 - .3 Wood.

2.7 GLAZING

- .1 Glaze windows in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 and with section 08 80 50 - Glazing

2.8 HARDWARE

- .1 Hardware: stainless steel or white bronze sash locks and aluminum handles to provide security and permit easy operation of units.
- .2 Locks: provide operating sash with spring loading locking device, to provide automatic locking in closed position.
- .3 Include special keyed opening device for windows normally locked.
- .4 Where windows latching devices are located in excess of 1900 mm above floor level:
 - .1 Equip projected units with underscreen stay bar assembly roto operators with locking handle.
- .5 Tie back and life line anchors: to CAN/CSA-Z91,

2.9 AIR BARRIER AND VAPOUR RETARDER

- .1 Equip window frames with factory installed air barrier material for sealing to building air barrier as follows:
 - .1 Material: identical to, or compatible with, building air barrier and vapour retarder materials to provide required air tightness and vapour diffusion control throughout exterior envelope assembly.
 - .2 Material width: adequate to provide required air tightness and vapour diffusion control to building air barrier from interior.

Part 3 Execution

3.1 EXAMINATION

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

3.2 INSTALLATION

- .1 Window installation:
 - .1 Install in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.
 - .2 Arrange components to prevent abrupt variation in colour.
- .2 Sill installation:
 - .1 Install metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Use one piece mm lengths at each location.
 - .2 Cut sills to fit window opening.
 - .3 Secure sills in place with anchoring devices located at ends joints of continuous sills and evenly spaced 600 mm on centre in between.
 - .4 Fasten expansion joint cover plates and drip deflectors with self tapping stainless steel screws.
 - .5 Maintain 6 to 9 mm space between butt ends of continuous sills. For sills over 1200 mm in length, maintain 3 to 6 mm space at each end.
- .3 Caulking:
 - .1 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip deflectors in bedding compound. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.
 - .2 Apply sealant in accordance with Section 07 92 00 - Joint Sealants. Conceal sealant within window units except where exposed use is permitted 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.

3.4 PROTECTION

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

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- .2 Repair damage to adjacent materials caused by window installation.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)
 - .1 ANSI/BHMA A156.9-2003, Cabinet Hardware.
 - .2 ANSI/BHMA A156.11- 2004, Cabinet Locks.
 - .3 ANSI/BHMA A156.16-2008, Auxiliary Hardware.
 - .4 ANSI/BHMA A156.18-2006, Materials and Finishes.
 - .5 ANSI/BHMA A156.20-2006, Strap and Tee Hinges and Hasps.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

1.3 CLOSEOUT SUBMITTALS

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

1.4 QUALITY ASSURANCE

- .1 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 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 Package items of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .4 Storage and Handling Requirements:
 - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect cabinet hardware from nicks, scratches, and blemishes.
 - .3 Protect prefinished surfaces with wrapping strippable coating.
 - .4 Replace defective or damaged materials with new.

Part 2 Products**2.1 HARDWARE ITEMS**

- .1 Use one manufacturer's product for all similar items.

2.2 CABINET HARDWARE

- .1 Cabinet hardware: to ANSI/BHMA A156.9, designated by letter B and numeral identifiers listed in Hardware Schedule as listed below.
- .2 Cabinet hardware: to CAN/CGSB-69.25, provide as required and/or as shown on drawings.
 - .1 Hinges: Richelieu 79T555180.
 - .2 Pulls: Richelieu 33285 195 128mm c/c brushed nickel wire.
 - .3 Sliding Door Pulls: Richelieu 40250-900
 - .4 Small Drawer Sliders: Accuride T2632-2G-18; Hettich KA5632 full extension.
 - .5 Large Drawer Sliders: Accuride 3832-2G-28; Hettich KA5632 full extension.
 - .6 Pull Out Shelf Slider: Accuride T340-2G-22.
 - .7 File Drawer Sliders: Accuride 4034-C-26; Hettich KA555.
 - .8 Door Bumpers: Richelieu BP303-11, 10mm self adhesive clear nylon.
 - .9 Counter-Top Grommets: Richelieu 1657690 156mm x 65mm oblong black plastic.
 - .10 Gable Grommets: Richelieu 60.0910-90 60mm black plastic.
 - .11 Wire management Moulding: Richelieu PF56-90.
 - .12 Drawer Locks and Door Locks: National C8703 Disc Tumbler.
 - .13 Keyboard Trays: Richelieu 14647-90.
 - .14 Keyboard: Richelieu 500159890.

- .15 Sliding CPU Support: Accuride T340-2G-22.
- .16 Shelf Standards: K & V 255
- .17 Shelf Clips: K & V 256
- .3 Cabinet locks: to ANSI/BHMA A156.11, designated by letter E and numeral identifiers as listed below.
 - .1 Door or drawer locks: half mortised into back of door or drawer, type cam lock with straight extended lever.
 - .2 Cylinders: key into keying system as directed.
 - .1 Approved Products: Hafele, Cylinder Module System – Cam Locks, Cat. No. 235.08.303 (horizontal installation in drawers) and Cat. No. 235.08.358 (vertical installation in doors) or approved equivalent. Finished to zinc die cast, unfinished.
 - .2 Approved Products: Hafele, Cylinder Module System – Lock Cores, Cat. No. 210.04.727 – 107 TA or approved equivalent.
 - .3 Finish to nickel matte.

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.

2.4 KEYING

- .1 Cabinet locks to be keyed alike in groups and master keyed. Submit keying schedule for approval.
- .2 Provide keys in duplicate for every lock in this Contract.
- .3 Provide three master keys.
- .4 Stamp keying code numbers on keys and cylinders.

Part 3 Execution

3.1 INSTALLATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Install hardware to standard hardware location dimensions in accordance with manufacturer's recommendations and to project design requirements.
- .3 Install key control cabinet and establish key control set-up.

3.2 ADJUSTING

- .1 Adjust cabinet hardware for optimum, smooth operating condition.
- .2 Lubricate hardware and other moving parts.
- .3 Adjust cabinet door hardware to ensure tight fit at contact points with frames.

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 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.
 - .3 Remove protective material from hardware items where present.
 - .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.4 DEMONSTRATION

- .1 Keying System Setup and Cabinet:
 - .1 Set up key control system with file key tags, duplicate key tags, numerical index, alphabetical index and key change index, label shields, control book and key receipt cards.
 - .2 Place file keys and duplicate keys in key cabinet on their respective hooks.
 - .3 Lock key cabinet and turn over key to Departmental Representative DCC Representative Consultant.
- .2 Maintenance Staff Briefing:
 - .1 Brief maintenance staff regarding:
 - .1 Proper care, cleaning, and general maintenance of projects complete hardware.
 - .2 Description, use, handling, and storage of keys.
- .3 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.5 PROTECTION

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

3.6 SCHEDULE

- .1 Install all cabinet and miscellaneous hardware in accordance with manufacturer's instructions.
- .2 Install Hardware as follows:.
 - .1 Door or Drawer locks: as shown on drawings.

- .3 Door Hinges:
 - .1 two per door up to 900mm in height.
 - .2 three per door up to 1500mm in height.
 - .3 four per door over 1500mm in height.
- .4 Door and Drawer Bumpers:
 - .1 two per door up to 900mm in height.
 - .2 three per door over 1200mm in height.
 - .3 two per drawer.
 - .4 two per drawer.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)
 - .1 ANSI/BHMA A156.1-2000, American National Standard for Butts and Hinges.
 - .2 ANSI/BHMA A156.2-2003, Bored and Preassembled Locks and Latches.
 - .3 ANSI/BHMA A156.3-2001, Exit Devices.
 - .4 ANSI/BHMA A156.4-2000, Door Controls - Closers.
 - .5 ANSI/BHMA A156.5-2001, Auxiliary Locks and Associated Products.
 - .6 ANSI/BHMA A156.6-2005, Architectural Door Trim.
 - .7 ANSI/BHMA A156.8-2005, Door Controls - Overhead Stops and Holders.
 - .8 ANSI/BHMA A156.10-1999, Power Operated Pedestrian Doors.
 - .9 ANSI/BHMA A156.12-2005, Interconnected Locks and Latches.
 - .10 ANSI/BHMA A156.13-2002, Mortise Locks and Latches Series 1000.
 - .11 ANSI/BHMA A156.14-2002, Sliding and Folding Door Hardware.
 - .12 ANSI/BHMA A156.15-2006, Release Devices - Closer Holder, Electromagnetic and Electromechanical.
 - .13 ANSI/BHMA A156.16-2002, Auxiliary Hardware.
 - .14 ANSI/BHMA A156.17-2004, Self-closing Hinges and Pivots.
 - .15 ANSI/BHMA A156.18-2006, Materials and Finishes.
 - .16 ANSI/BHMA A156.19-2002, Power Assist and Low Energy Power - Operated Doors.
 - .17 ANSI/BHMA A156.20-2006, Strap and Tee Hinges and Hasps.
- .2 Canadian Steel Door and Frame Manufacturers' Association (CSDMA)
 - .1 CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames - 2009.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for door hardware 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 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.
- .4 After approval samples will be returned for incorporation in Work.
- .4 Hardware List:
 - .1 Submit contract hardware list.
 - .2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.
- .5 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .6 Manufacturer's Instructions: submit manufacturer's installation instructions.

1.3 CLOSEOUT SUBMITTALS

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

1.4 MAINTENANCE MATERIALS SUBMITTALS

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

1.5 QUALITY ASSURANCE

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

1.6 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 Package items of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .4 Storage and Handling Requirements:

- .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect door hardware from nicks, scratches, and blemishes.
- .3 Protect prefinished surfaces with wrapping strippable coating.
- .4 Replace defective or damaged materials with new.

Part 2 Products

2.1 HARDWARE ITEMS

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

2.2 DOOR HARDWARE

- .1 Screws and Fasteners:
 - .1 All hardware is to be installed with the standard fasteners supplied by the manufacturer unless called for otherwise in hardware sets.
- .2 Hinges
 - .1 All hinges shall be Ives and of the size, type, and finish as indicated in the hardware sets.
- .3 Locks
 - .1 Locks shall be mortise type as specified in the hardware sets. All locks to ANSI Grade 1 lever or knob trim. Locks to be Schlage or as specifically approved by Project Manager. No substitute.
- .4 Door Closers
 - .1 All door closers shall be surface mounted with full covers. Manual closers with universal spring size must be adjusted to suit specific opening requirements. Follow manufacturers instructions. Provide LCN Closers as specified. No substitutes.
- .5
- .6 Kickplates
 - .1 To be of brass or bronze construction, .050 thick. Provide Ives series as specified. Screw mounted.
- .7 Pulls
 - .1 To be of brass, bronze, or stainless steel construction. All pulls to be thru bolt mounted. Provide Ives as specified.
- .8 Protective Plates, Push Plates
 - .1 All plates to be of brass or bronze construction. To be .050 thick. Provide Ives as specified. All kickplates on the push side of the door shall be 1 ½" less than the door width. If other hardware interferes with the above recommendations then the plate size shall be modified at the factory to suit the installation. Kickplates to be mounted behind vertical rod exit devices.

- .9 Door Stops and Holders
 - .1 All floor stops to be solid brass or bronze. With rubber bumpers. Stops fastened to brick or concrete shall have wood screws and lead shields. Stops fastened to walls or floors of wood construction shall have wood screws. Provide Ives stops as specified. Concealed overhead stops to be Glynn Johnson as specified.
- .10 Thresholds and Weather-strip
- .11 All weatherstrip, sweeps, automatic door bottoms, shall be anodized aluminum construction with polyurethane or neoprene gasketing as specified. All to be screw in mounting. K.N. Crowder as specified.
- .12 Cylinders
 - .1 Install Schlage cylinders.
 - .2 Owner will replace Schlage lock cylinders with owner supplied and installed Abloy cylinders after construction completion.

2.3 KEYING

- .1 All locks to come with temporary Schlage cylinders.
 - .1 2 keys per lock.
- .2 3 masterkeys.
 - .1 Schlage cylinders will be temporary for use during construction and will be changed by owner after construction completion.

2.4 KEY CONTROL

- .1 Provide a flush wall mounted key control cabinet capable of holding all of the required keys plus 20% for expansion. Provide cabinet

2.5 BARRIER FREE PNEUMATIC DOOR OPERATOR:

- .1 Heavy duty pneumatically assisted door closer, capable of multi-door operation, complete with actuators, control boxes, pneumatic tubing and compressed air source.
- .2 Self contained control box/compressor combination for independent operation of two door leaves.
- .3 Control boxes: complete with electric strike relay.
- .4 Mount operators on either push or pull sides of doors as required to place them inside rooms.
- .5 Actuation of operators by card readers motion detectors.
- .6 Electrical box and actuator: Hardwired low voltage actuator with stainless steel 114 mm round plate, engraved blue filled with handicap symbol. Box 51 mm wide x 102 mm high x 50 mm deep single gang electrical box, flush mounted in wall, locations indicated.
- .7 Supply switched line voltage to control box. Locate switch adjacent to box.

- .8 Supply low voltage wiring to each actuator and 6 mm diameter air tubing to each operator.
- .9 Mount control box in location as directed by Consultant.

2.6 FASTENINGS

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

Part 3 Execution

3.1 INSTALLATION

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

3.2 ADJUSTING

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

3.3 CLEANING

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

3.4 DEMONSTRATION

- .1 Keying System Setup and Cabinet:
 - .1 Set up key control system with file key tags, duplicate key tags, numerical index, alphabetical index and key change index, label shields, control book and key receipt cards.
 - .2 Place file keys and duplicate keys in key cabinet on their respective hooks.
 - .3 Lock key cabinet and turn over key to Departmental Representative Consultant.
- .2 Maintenance Staff Briefing:
 - .1 Brief maintenance staff regarding:
 - .1 Proper care, cleaning, and general maintenance of projects complete hardware.
 - .2 Description, use, handling, and storage of keys.
 - .3 Use, application and storage of wrenches for door closers locksets and fire exit hardware.
- .3 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.5 PROTECTION

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

Part 4 SCHEDULES

4.1 SCHEUDLE OF MATERIALS

- .1 Hinge - Continuous IVES (IVES)
- .2 Hinge IVES (IVES)
- .3 Flush Bolt IVES (IVES)
- .4 Mortise Lockset Schlage Lock Company (SCH)
- .5 Mortise Passage Schlage Lock Company (SCH)
- .6 Mortise Privacy Schlage Lock Company (SCH)

- .7 Electric Strike Von Duprin, Inc. (VDI)
- .8 Door Pull Standard Metal Mfg. (SM)
- .9 Door Closer LCN Closers (LCN)
- .10 Automatic Operator LCN Closers (LCN)
- .11 Kick Plate IVES (IVES)
- .12 Wall Bumper IVES (IVES)
- .13 Overhead Holder/Stop Glynn - Johnson (GJ)
- .14 Weatherstripping K. N. Crowder Mfg., Inc. (KNC)
- .15 Astragal K. N. Crowder Mfg., Inc. (KNC)
- .16 Sweep Strip K. N. Crowder Mfg., Inc. (KNC)
- .17 Door Bottom - Auto K. N. Crowder Mfg., Inc. (KNC)
- .18 Threshold K. N. Crowder Mfg., Inc. (KNC)
- .19 Actuator LCN Closers (LCN)
- .20 Sound Seal Furnished by others (FBO)
- .21 Push Button Release Schlage Lock Company (SCH)
- .22 Door Viewer Dayton (DT)
- .23 Power Transfer Unit Von Duprin, Inc. (VDI)
- .24 Power Supply Von Duprin, Inc. (VDI)

4.2 HARDWARE FINISHES DESCRIPTIONS

- .1 626 Satin Chromium Plated
- .2 627 Satin Aluminum Clear Coated
- .3 628 Satin Aluminum Anodized
- .4 630 Satin Stainless Steel
- .5 652 Satin Chromium Plated
- .6 689 Aluminum Painted

4.3 HARDWARE SETS:

Note all Lever and Handel locksets to have N escutcheon trim.

Hardware Set#: 1

Single: D9

Qty	UOM	Item Type	Item Series/Description	Finish
3.0 EA		Hinge	3CB1HW 4.5 X 4.5 NRP	652
1.0 EA		Mortise Lockset	L9456 07N	626
1.0 EA		Door Closer	4011	689
1.0 EA		Kick Plate	8400 10 X 1 1/2" Less Door Width	630

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1.0 EA	Wall Bumper WS401CVX	626
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Hardware Set#: 2Single: D2 - **NOTE CYLINDER TO FACE ROOM 104**

Qty	UOM Item Type Item Series/Description	Finish
3.0 EA	Hinge 3CB1HW 4.5 X 4.5 NRP	652
1.0 EA	Mortise Lockset L9456 07N	626
1.0 EA	Door Closer 4111 EDA	689
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA	Wall Bumper WS401CVX	626

Hardware Set#: 3

Single: D3

Qty	UOM Item Type Item Series/Description	Finish
3.0 EA	Hinge 3CB1HW 4.5 X 4.5 NRP	652
1.0 EA	Mortise Lockset L9480 07N	626
1.0 EA	Door Closer 4111 EDA	689
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA	Overhead Holder/Stop 104S	630

Hardware Set#: 4

Single: D4

Qty	UOM Item Type Item Series/Description	Finish
1.0 EA	Hinge - Continuous 700 EPT	630
1.0 EA	Mortise Lockset L9456 07N X Command Access DBM (deadbolt monitor switch)	626
1.0	EA Electric Strike 6216 FSE	630
1.0	EA Automatic Operator 4641	689
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA	Overhead Holder/Stop 104S	630
1.0 EA	Weatherstripping W-20S Top Only	628
2.0 EA	Weatherstripping W-50S Sides Only	628
1.0 EA	Sweep Strip W-13S	628
1.0 EA	Threshold CT-45	628
2.0 EA	Actuator 8310-856T	630
1.0 EA	Push Button Release 660 PB	628
1.0 EA	Door Viewer 698B26D	26D
1.0 EA	Power Transfer Unit EPT 10	630
1.0 EA	Power Supply PS902	

Hardware Set#: 5

Single: D11, D12, D13

Qty	UOM Item Type Item Series/Description	Finish
3.0 EA	Hinge 3CB1HW 4.5 X 4 NRP	652
1.0 EA	Mortise Privacy L9044 07N	626

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1.0 EA	Door Closer 4011	689
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA	Wall Bumper WS401CVX	626

Hardware Set#: 6

Single: D14

Qty	UOM Item Type Item Series/Description	Finish
3.0 EA	Hinge 3CB1HW 4.5 X 4 NRP	652
1.0 EA	Mortise Passage L9010 07N	626
1.0 EA	Door Closer 4011	689
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA	Wall Bumper WS401CVX	626

Hardware Set#: 7

Single: D15, D16

Qty	UOM Item Type Item Series/Description	Finish
3.0 EA	Hinge 3CB1HW 4.5 X 4 NRP	652
1.0 EA	Mortise Lockset L9480 07N	626
1.0 EA	Door Closer 4011	689
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA	Wall Bumper WS401CVX	626

Hardware Set#: 8

Single: D17

Qty	UOM Item Type Item Series/Description	Finish
3.0 EA	Hinge 3CB1HW 4.5 X 4 NRP	652
1.0 EA	Mortise Lockset L9480 07N	626
1.0 EA	Door Closer 4011	689
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA	Wall Bumper WS401CVX	626

Hardware Set#: 9

Single: D19

Qty	UOM Item Type Item Series/Description	Finish
3.0 EA	Hinge 3CB1HW 4.5 X 4 NRP	652
1.0 EA	Mortise Lockset L9480 07N	626
1.0 EA	Door Closer 4111 EDA	689
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA	Overhead Holder/Stop 104S	630

Hardware Set#: 10

Single: D20

Qty	UOM Item Type Item Series/Description	Finish
1.0 EA	Hinge - Continuous 700 EPT	630

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1.0 EA	Mortise Lockset L9480 07N X Command Access DBM (deadbolt monitor switch)	626
1.0 EA	Electric Strike 6216 FSE	630
1.0 EA	Automatic Operator 4641	689
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA	Overhead Holder/Stop 104S	630
1.0 EA	Weatherstripping W-20S Top Only	628
2.0 EA	Weatherstripping W-50S Sides Only	628
1.0 EA	Sweep Strip W-13S	628
1.0 EA	Threshold CT-45	628
2.0 EA	Actuator 8310-856T	630
1.0 EA	Push Button Release 660 PB	628
1.0 EA	Door Viewer 698B26D	26D
1.0 EA	Power Transfer Unit EPT 10	630
1.0 EA	Power Supply PS902	

Hardware Set#: 11

Single: D21, D29

Qty	UOM Item Type Item Series/Description	Finish
3.0 EA	Hinge 3CB1HW 4.5 X 4 NRP	652
1.0 EA	Mortise Lockset L9080 42D	626
1.0 EA	Door Closer 4011	689
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA	Wall Bumper WS401CVX	626

Hardware Set#: 12

Single: D23, D24

Qty	UOM Item Type Item Series/Description	Finish
3.0 EA	Hinge 3CB1HW 4.5 X 4.5 NRP	652
1.0 EA	Mortise Lockset L9464	626
1.0 EA	Door Pull H404	630

Hardware Set#: 13

Single: D25

Qty	UOM Item Type Item Series/Description	Finish
3.0 EA	Hinge 3CB1HW 4.5 X 4.5 NRP	652
1.0 EA	Mortise Lockset L9466 42D	626
1.0 EA	Door Pull H404	630
1.0 EA	Door Closer 4111H EDA	689
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA	Wall Bumper WS401CVX	626
1.0 EA	Sound Seal by door supplier	

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Hardware Set#: 14

Single: D26

Qty	UOM	Item Type	Item Series/Description	Finish
3.0 EA			Hinge 3CB1HW 4.5 X 4.5 NRP	652
1.0 EA			Mortise Lockset L9464	626
1.0 EA			Door Pull H404	630
1.0 EA			Overhead Holder/Stop 104S	630

Hardware Set#: 15

Single: D27

Qty	UOM	Item Type	Item Series/Description	Finish
3.0 EA			Hinge 3CB1HW 4.5 X 4.5 NRP	652
1.0 EA			Mortise Lockset L9080 42D	626
1.0 EA			Door Closer 4111 EDA	689
1.0 EA			Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA			Overhead Holder/Stop 104S	630

Hardware Set#: 16

Single: D28

Qty	UOM	Item Type	Item Series/Description	Finish
3.0 EA			Hinge 3CB1HW 4.5 X 4.5 NRP	652
1.0 EA			Mortise Lockset L9466 42D	626
1.0 EA			Door Closer 4111 EDA	689
1.0 EA			Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA			Overhead Holder/Stop104S	630
1.0 EA			Weatherstripping W-20S Top Only	628
2.0 EA			Weatherstripping W-50S Sides Only	628
1.0 SET			Door Bottom - Auto CT-52	628
1.0 EA			Door Viewer 698B26D	26D

Hardware Set#: 17

Single: D30

Qty	UOM	Item Type	Item Series/Description	Finish
3.0 EA			Hinge 3CB1HW 4.5 X 4 NRP	652
1.0 EA			Mortise Lockset L9466 42D	626
1.0 EA			Door Closer 4011	689
1.0 EA			Weatherstripping W-20S Top Only	628
2.0 EA			Weatherstripping W-50S Sides Only	628
1.0 SET			Door Bottom - Auto CT-52	628
1.0 EA			Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA			Wall Bumper WS401CVX	626

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Hardware Set#: 18

Single: D1, D35

Qty	UOM	Item Type	Item Series/Description	Finish
3.0 EA			Hinge 3CB1HW 4.5 X 4 NRP	652
1.0 EA			Mortise Lockset L9456 07N	626
1.0 EA			Door Closer 4011	689
1.0 EA			Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA			Wall Bumper WS401CVX	626

Hardware Set#: 19

Single: D37, D38

Qty	UOM	Item Type	Item Series/Description	Finish
1.0 EA			Hinge - Continuous 700	630
1.0 EA			Mortise Lockset L9466 42D	626
1.0 EA			Door Closer 4111 EDA	689
1.0 EA			Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA			Overhead Holder/Stop 104S	630
1.0 EA			Weatherstripping W-20S Top Only	628
2.0 EA			Weatherstripping W-50S Sides Only	628
1.0 EA			Sweep Strip W-13S	628
1.0 EA			Threshold CT-45	628
1.0 EA			Door Viewer 698B26D	26D

Hardware Set#: 20

Single: D6

Qty	UOM	Item Type	Item Series/Description	Finish
3.0 EA			Hinge 3CB1HW 4.5 X 4.5 NRP	652
1.0 EA			Mortise Lockset L9486 07N	626
1.0 EA			Door Closer 4111 EDA	689
1.0 EA			Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA			Door Viewer 698B26D	26D

Hardware Set#: 21

Single: D5, D18

Qty	UOM	Item Type	Item Series/Description	Finish
3.0 EA			Hinge 3CB1HW 4.5 X 4 NRP	652
1.0 EA			Mortise Passage L9010 07N	626
1.0 EA			Electric Strike 6211 FSE	630
1.0 EA			Automatic Operator 4631	689
1.0 EA			Kick Plate 8400 10 X 1 1/2" Less Door Width	630
2.0 EA			Actuator 8310-856T	630

Hardware Set#: 22

Single: D8

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Qty	UOM	Item Type	Item Series/Description	Finish
3.0	EA		Hinge 3CB1HW 4.5 X 4.5 NRP	652
1.0	EA		Mortise Lockset L9480 07N	626
1.0	EA		Door Closer 4111 EDA	689
1.0	EA		Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0	EA		Overhead Holder/Stop 104S	630
1.0	EA		Sound Seal by door supplier	

Hardware Set#: 23

Pair: D34

Qty	UOM	Item Type	Item Series/Description	Finish
2.0	EA		Hinge - Continuous 700	630
2.0	EA		Flush Bolt FB457 12"	626
1.0	EA		Mortise Lockset L9480 07N	626
1.0	EA		Door Closer 4111 EDA	689
2.0	EA		Kick Plate 8400 10 X 1 1/2" Less Door Width	630
2.0	EA		Overhead Holder/Stop 104S	630
1.0	EA		Weatherstripping W-20S Top Only	628
2.0	EA		Weatherstripping W-50S Sides Only	628
1.0	EA		Astragal W-8SL	627
1.0	EA		Sweep Strip W-13S	628
1.0	EA		Threshold CT-45	628
1.0	EA		Door Viewer 698B26D	26D

Hardware Set#: 24

Single: D31

Qty	UOM	Item Type	Item Series/Description	Finish
3.0	EA		Hinge 3CB1HW 4.5 X 4 NRP	652
1.0	EA		Mortise Lockset L9080 07N	626
1.0	EA		Door Closer 4111 EDA	689
1.0	EA		Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0	EA		Overhead Holder/Stop 104S	630

Hardware Set#: 25

Single: D22

Qty	UOM	Item Type	Item Series/Description	Finish
3.0	EA		Hinge 3CB1HW 4.5 X 4 NRP	652
1.0	EA		Mortise Lockset L9080 42D	626
1.0	EA		Door Closer 4111 EDA	689
1.0	EA		Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0	EA		Overhead Holder/Stop 104S	630

Hardware Set#: 26

Single: D10

Qty	UOM Item Type Item Series/Description	Finish
3.0 EA	Hinge 3CB1HW 4.5 X 4.5 NRP	652
1.0 EA	Mortise Lockset L9480 07N	626
1.0 EA	Door Closer 4011	689
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA	Wall Bumper WS401CVX	626

Hardware Set#: 27

Single: D46

Qty	UOM Item Type Item Series/Description	Finish
3.0 EA	Hinge 3CB1HW 4.5 X 4 NRP	652
1.0 EA	Mortise Privacy L9080 42D	626
1.0 EA	Door Closer 4011	689
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA	Wall Bumper WS401CVX	626

Hardware Set#: 28

Single: D32, D33

Qty	UOM Item Type Item Series/Description	Finish
3.0 EA	Hinge 3CB1HW 4.5 X 4 NRP	652
1.0 EA	Mortise Lockset L9480 07N	626
1.0 EA	Door Closer 4011	689
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA	Wall Bumper WS401CVX	626

Hardware Set#: 29

Single: D7

Qty	UOM Item Type Item Series/Description	Finish
3.0 EA	Hinge 3CB1HW 4.5 X 4.5 NRP	652
1.0 EA	Mortise Lockset L9080 07N	626
1.0 EA	Door Closer 4111 EDA	689
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA	Overhead Holder/Stop 104S	630
1.0 EA	Sound Seal by door supplier	

Hardware Set#: D30

Single: Garage D1, D4

Qty	UOM Item Type Item Series/Description	Finish
1.0 EA	Hinge - Continuous 700	630
1.0 EA	Mortise Lockset L9480 07N	626
1.0 EA	Door Closer 4111 EDA	689
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA	Overhead Holder/Stop 104S	630

1.0 EA	Weatherstripping W-20S Top Only	628
2.0 EA	Weatherstripping W-50S Sides Only	628
1.0 EA	Sweep Strip W-13S	628
1.0 EA	Threshold CT-45	628

Hardware Set#: 31

Single: Garage D3

Qty	UOM Item Type Item Series/Description	Finish
3.0 EA	Hinge 3CB1HW 4.5 X 4 NRP	652
1.0 EA	Mortise Lockset L9480 07N	626
1.0 EA	Door Closer 4011	689
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630
1.0 EA	Wall Bumper WS401CVX	626

Hardware Set#: 32

Single: D43, D44, D45

Qty	UOM Item Type Item Series/Description	Finish
2.0 EA	Hinge 3CB1HW 4.5 X 4 NRP	652
1.0 EA	Mortise Lockset L9466 42D	626
1.0 EA	Door Closer 4011	689
1.0 EA	Weatherstripping W-20S Top Only	628
2.0 EA	Weatherstripping W-50S Sides Only	628
1.0 SET	Door Bottom - Auto CT-52	628
1.0 EA	Kick Plate 8400 10 X 1 1/2" Less Door Width	630

Part 1 General

1.1 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.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
 - .1 Convene pre-installation meeting 1 week prior to beginning work of this Section on-site installation, with Contractor's Representative Departmental Representative DCC Representative Consultant in accordance with Section 01 31 19 - Project Meetings to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.
 - .4 Review manufacturer's written installation instructions and warranty requirements.
 - .2 Arrange for site visit with Departmental Representative DCC Representative Consultant prior to start of Work to examine existing site conditions adjacent to demolition Work.
 - .3 Hold project meetings every week month.
 - .4 Ensure key personnel site supervisor project manager subcontractor representatives attend.
 - .5 Departmental Representative DCC Representative Consultant will submit written verbal notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.

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 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into work.
 - .3 Submit samples of sealant material.
- .4 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .5 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
 - .1 Submit analysis of glass under provisions of Section 01 45 00 - Quality Control.
 - .2 Submit shop testing for glass.

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 directed
 - .5 Allow 48 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 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 wrapping strippable coating.
 - .4 Replace defective or damaged materials with new.

1.7 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 MATERIALS

- .1 Design Criteria:
 - .1 Ensure continuity of building enclosure vapour and air barrier using glass and glazing materials as follow:
 - .1 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.
 - .2 Size glass to withstand wind loads, dead loads and positive and negative live loads to ASTM E330.
 - .3 Limit glass deflection to 1/200 flexural limit of glass with full recovery of glazing materials.
- .2 Flat Glass:
 - .1 Float glass: to CAN/CGSB-12.3, silvering mirror glazing (selected) glazing quality, 6 mm thick.
 - .2 Safety glass: to CAN/CGSB-12.1, transparent , 6 mm thick.
 - .1 Type 1-laminated.
 - .2 Class B-float.
 - .3 Category 11.
 - .3 Silvered mirror glass: 6 mm thick.
 - .1 Type 1A-float glass for normal use.
 - .4 Wired glass: to CAN/CGSB-12.11, 6 mm thick.
 - .1 Type 1-polished both sides (transparent).
 - .2 Wire mesh styles 3-square .
 - .5 Laminated Safety Glass: 6mm thick tempered glass each side of 0.75mm PVB plastic interlayer (Saflex or approved equivalent) for total thickness of 12.75mm
- .3 Insulating Glass Units:
 - .1 Insulating glass units: to CAN/CGSB-12.8, triple unit.
 - .1 Glass coating: single low-e Comfort Ti-AC 40 or approved equivalent.
 - .1 Metallic coating: soft, sputtered.
 - .2 Light transmittance: 0.69
 - .3 Shading co-efficient: 0.45
 - .4 U-Value: 0.3 h·ft²·°F/Btu
 - .2 Tripple Pane
 - .1 Pane 1 – clear glass outer
 - .2 Pane 2 – Low e
 - .3 Pane 3 – Clear glass inner
 - .3 Use tempered glazing where indicated on the window schedules and where required by code.

- .4 Glass thickness: As indicated in window schedule and to Building Code requirements. Minimum 6mm.
 - .5 Inter-cavity space thickness: 12.7mm or to width required to accommodate glazing thickness.
 - .6 Manufacture glass units with dual seal to CGSB 12.8-90 and certified by the Glass Manufacturer's Association.
 - .7 Warm edge spacer: Low conductivity thermal spacer.
 - .1 Super Spacer or approved equivalent.
 - .8 Inert gas fill: argon.
- .4 Sealant: in accordance with Section 07 92 00 - Joint Sealants.

2.2 ACCESSORIES

- .1 Setting blocks: by manufacturer
- .2 Spacer shims: by manufacturer.
- .3 Glazing tape: by manufacturer
- .4 Glazing splines by manufacturer.
- .5 Glazing clips: manufacturer's standard type.
- .6 Lock-strip gaskets: to ASTM C542.
- .7 Mirror attachment accessories:
 - .1 Stainless steel clips.

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.

3.2 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:

- .1 In accordance with manufacturers written instructions as appropriate to conform to air/vapour barrier system

3.4 INSTALLATION: MIRRORS

- .1 Set mirrors with adhesive, applied in accordance with adhesive manufacturer's instructions.
- .2 Set mirrors with clips . Anchor rigidly to wall construction.
- .3 Set in frame.
- .4 Place plumb and level.

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 and mirrors 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.

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.

3.7 SCHEDULE

- .1 Mirrors were indicated on interior elevations and blow up plans
- .2 Unless otherwise noted:
 - .1 Exterior Glazing
 - .1 Tempered
 - .2 Insulated glazing.
- .3 Reception Window: Polycarbonate security glazing.

END OF SECTION

Part 1 General

1.1 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 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
- .5 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.
- .6 Green Seal Environmental Standards (GS)
 - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
- .7 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113-A2007, Architectural Coatings.
 - .2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.
- .8 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-07, Standard Method of Test of Surface Burning Characteristics of Building Materials and Assemblies.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

1.3 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 gypsum board assemblies materials level off ground indoors in 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 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.
- .4 Dispose of waste in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.4 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 regular, Type X, as per drawings, 1200 mm wide x maximum practical length, ends square cut, edges bevelled.
- .2 Gypsum sheathing board: to ASTM C1396/C1396M, regular, Type X, mm thick, 1200 mm wide x maximum practical length.
 - .1 For use in washrooms, change rooms and exercise room.
- .3 Metal furring runners, hangers, tie wires, inserts, anchors: to ASTM C1280.
- .4 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
- .5 Resilient clips drywall furring : 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.
- .6 Nails: to ASTM C514.
- .7 Steel drill screws: to ASTM C1002.
- .8 Stud adhesive: to CAN/CGSB-71.25 ASTM C557.
- .9 Laminating compound: as recommended by manufacturer, asbestos-free.
- .10 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, metal, zinc-coated by hot-dip process, 0.5 mm base thickness, perforated flanges, one piece length per location.
- .11 Cornice cap: 12.7 mm deep x partition width, of 1.6 mm base thickness galvanized sheet steel, prime painted. Include splice plates for joints.
- .12 Sealants: in accordance with Section 07 92 00 - Joint Sealants.
- .13 Polyethylene: to CAN/CGSB-51.34, Type 2.
- .14 Insulating strip: rubberized, moisture resistant, 3 mm thick cork closed cell neoprene strip, 12 mm wide, with self-sticking permanent adhesive on one face, lengths as required.
- .15 Joint compound: to ASTM C475, asbestos-free.

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.

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 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .9 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- .10 Install wall furring for gypsum board wall finishes to ASTM C840, except where specified otherwise.
- .11 Furr openings and around built-in equipment, cabinets, access panels, , on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .12 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .13 Erect drywall resilient furring transversely across studs joists between the layers of gypsum board, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 38 mm common nail 25 mm drywall screw.
- .14 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed.

3.3 APPLICATION

- .1 Apply gypsum board after bucks, anchors, blocking, sound attenuation, electrical and mechanical work have been approved.

- .2 Apply single layer gypsum board to wood /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 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 where wall tiles coating to be applied adjacent to slop sinks janitors closets. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads. Do not apply joint treatment on areas to receive tile finish.
- .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 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.
- .8 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.
- .9 Install gypsum board with face side out.
- .10 Do not install damaged or damp boards.

- .11 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

3.4 ACCOUSTIC ASSEMBLIES

- .1 Apply 12mm dia bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes and ducts and other penetrations.
- .2 Acoustic rated rooms will be tested to ensure a minimum STC 46 Rating is achieved
- .3 Any tests indicating the minimum STC 46 rating has not been achieved will be corrected at the contractor's expense.
- .4 Retesting of acoustic rated rooms to confirm compliance with the STC rating will be at the contractors' expense.

3.5 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 using contact adhesive for full length 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 Install shadow mould at gypsum board/ceiling juncture as indicated. Minimize joints; use corner pieces and splicers.
- .6 Construct control joints of two back-to-back casing beads set in gypsum board facing and supported independently on both sides of joint.
- .7 Provide continuous polyethylene dust barrier behind and across control joints.
- .8 Locate control joints at changes in substrate construction.
- .9 Install control joints straight and true.
- .10 Construct expansion joints as detailed, at building expansion and construction joints. Provide continuous dust barrier.
- .11 Install expansion joint straight and true.
- .12 Install cornice cap where gypsum board partitions do not extend to ceiling.
- .13 Fit cornice cap over partition, secure to partition track with two rows of sheet metal screws staggered at 300 mm on centre.
- .14 Splice corners and intersections together and secure to each member with 3 screws.
- .15 Install access doors to electrical and mechanical fixtures specified in respective sections.

- .1 Rigidly secure frames to furring or framing systems.
- .16 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.
- .17 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 0: no taping, finishing or accessories required.
 - .2 Level 1: embed tape for joints and interior angles in joint compound. Surfaces to be free of excess joint compound; tool marks and ridges are acceptable.
 - .3 Level 2: embed tape for joints and interior angles in joint compound and apply one separate coat of joint compound over joints, angles, fastener heads and accessories; surfaces free of excess joint compound; tool marks and ridges are acceptable.
 - .4 Level 3: embed tape for joints and interior angles in joint compound and apply two separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.
 - .5 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.
 - .6 Level 5: embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; apply a thin skim coat of joint compound to entire surface; surfaces smooth and free of tool marks and ridges.
- .18 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.
- .19 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.
- .20 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .21 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .22 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.
- .23 Mix joint compound slightly thinner than for joint taping.
- .24 Apply thin coat to entire surface using trowel or drywall broad knife to fill surface texture differences, variations or tool marks.
- .25 Allow skim coat to dry completely.
- .26 Remove ridges by light sanding or wiping with damp cloth.

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.
- .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.

3.7 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 REFERENCES

- .1 ASTM International
 - .1 ASTM C645-11a, Standard Specification for Non-structural Steel Framing Members.
 - .2 ASTM C754-11, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .2 Environmental Choice Program (ECP)
 - .1 CCD-047-98(R2005), Architectural 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.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for metal framing and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
 - .1 Submit duplicate 300 mm long samples of non-structural metal framing.

1.3 QUALITY ASSURANCE

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

1.4 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 in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect metal framing 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, stud size as indicated on drawings, roll formed from 0.53mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board.
 - .1 Knock-out service holes at 460 mm centres.
- .2 Non-Load bearing channel heavy duty stud framing: to ASTM C645, stud size as indicated on drawings, roll formed from 1.43mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board.
 - .1 Knock-out service holes at 460 mm centres.
 - .2 For installation around Room 103
- .3 Floor tracks: to ASTM C645, in widths to suit stud sizes, 32 mm flange height. Ceiling tracks to be 50mm flange heights
- .4 Metal channel stiffener: 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.
- .5 Acoustical sealant: in accordance with Section 07 92 00 - Joint Sealants.
- .6 Insulating strip: rubberized, moisture resistant 3 mm thick cork strip, 12 mm wide, with self-sticking adhesive on one face, lengths as required.
- .7 Metal Mesh: ¾", 10 GA flat expanded steel metal mesh. Base metal thickness 0.120. Metalex KF09 or equal.
- .8 Metal washers: 19mm dia steel washers
- .9 Security screws: Torx head

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 non-structural metal framing application in accordance with manufacturer's written instructions.

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 spacing shown on drawings and not more than 50 mm 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 and ceiling 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 track 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 50 mm leg ceiling tracks.
- .16 Install continuous insulating strips to isolate studs from uninsulated surfaces.
- .17 Install two continuous beads of acoustical sealant insulating strip under studs and tracks around perimeter of sound control partitions.

3.3 ACOUSTIC WALLS

- .1 Ensure that no back to back electrical boxes, ducts or conduit are installed in the same stud spaces or attached to the same stud.
- .2 Install two continuous beads of acoustical sealant under studs and tracks around perimeter of acoustically rated partitions. Ensure tight fit to adjacent substrate. Fill gaps prior to installation of gypsum board.

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 recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal 01 35 21 - LEED Requirements.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by non-structural metal framing application.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Section Includes:

- .1 Materials and application of acoustical units for direct application or for application and installation within a suspended ceiling.

1.2 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 General Standards Board (CGSB)

- .1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction and Amendment No. 1 1988.
- .2 CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.

.3 Canadian Standards Association (CSA International)

- .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.4 Department of Justice Canada (Jus)

- .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
- .2 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

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

- .1 Material Safety Data Sheets (MSDS).

.6 Underwriter's Laboratories of Canada (ULC)

- .1 CAN/ULC-S102-2003, Surface Burning Characteristics of Building Materials and Assemblies.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data: submit WHMIS MSDS in accordance with Section 01 47 15 - Sustainable Requirements: Construction and Section 02 81 01 - Hazardous Materials.
- .3 Submit duplicate 300x300 size samples of each type acoustical units.

1.4 QUALITY ASSURANCE

- .1 Regulatory Requirements:

- .1 Fire-resistance rated floor/ceiling and roof/ceiling assembly: certified by Canadian Certification Organization accredited by Standards Council of Canada.
- .2 Mock-up:
 - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
 - .2 Construct mock-up 10 m² minimum of each type acoustical panel ceiling including one inside corner one outside corner.
 - .3 Construct mock-up where directed.
 - .4 Allow 48 hours for inspection of mock-up by Consultant before proceeding with ceiling work.
 - .5 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may not remain as part of the finished work.
- .3 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

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 by Departmental Representative Consultant.
- .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.
 - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
 - .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard 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 Plastic waste in accordance with Waste Management Plan.
 - .5 Place materials defined as hazardous or toxic in designated containers in accordance with Section 01 35 43 - Environmental Procedures.
 - .6 Handle and dispose of hazardous materials in accordance with Regional and Municipal, regulations.

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% before and during installation.40
- .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 Section 01 78 00 - Closeout Submittals.
- .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 Departmental Representative, upon completion of the work of this section.

Part 2 Products

2.1 SUSTAINABLE REQUIREMENTS

- .1 Materials and products in accordance with Section 01 47 15 - Sustainable Requirements: Construction.

2.2 MATERIALS

- .1 Acoustic units for Type 1: to CAN/CGSB-92.1 ASTM E1264.
 - .1 Type Armstrong Fine Fissured High Acoustics Tegular, medium texture or approved equivalent.
 - .1 Standard of Acceptance Armstrong Item: 1828 2'x2'x3/4" Angled Tegular
 - .2 Pattern non directional fissured.
 - .3 Textures: medium.
 - .4 Flame spread rating of 25 or less in accordance with CAN/ULC-S102.
 - .5 Smoke developed 25 or less in accordance with CAN/ULC-S102.
 - .6 Noise Reduction Coefficient (NRC) designation of 0.70.
 - .7 Light Reflectance (LR) range of 0.85 to ASTM E1477.
 - .8 Ceiling plenum sound transmission range of 40.
 - .9 Edge type square.
 - .10 Colour white.
 - .11 Size: as shown on drawings x 19mm thick.
 - .12 Shape flat .
 - .13 Surface coverings: low VOC paint.

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.
- .2 In fire rated ceiling systems, secure lay-in panels with hold-down clips and protect over light fixtures, diffusers, air return grilles and other appurtenances according to Certification Organizations design requirements.

3.3 APPLICATION

- .1 Install acoustical units 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, sprinkler heads, to be built into acoustical ceiling components.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ASTM International
 - .1 ASTM C635/C635M-07, Standard Specifications for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 - .2 ASTM C636/C636M-08, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
- .2 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for acoustical suspension and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Indicate lay-out, insert and hanger spacing and fastening details, splicing method for main and cross runners, location of access splines change in level details, access door dimensions, and locations and acoustical unit support at ceiling fixture lateral bracing and accessories.
- .4 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into work.
 - .3 Submit one representative model of each type ceiling suspension system.
 - .4 Ceiling system to show basic construction and assembly, treatment at walls, recessed fixtures, splicing, interlocking, finishes, acoustical unit installation.

1.3 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

- .2 Operation and Maintenance Data: submit operation and maintenance data for acoustical suspension for incorporation into manual.

1.4 QUALITY ASSURANCE

- .1 Fire-resistance rated suspension system: certified by a Canadian Certification Organization accredited by Standards Council of Canada.
- .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 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 acoustical ceiling tiles and tracks from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 DESIGN CRITERIA

- .1 Design Requirements: maximum deflection: 1/360th of span to ASTM C635/ASTM C635M deflection test.

2.2 MATERIALS

- .1 Intermediate duty system to ASTM C635/ASTM C635M.
 - .1 Standard of Acceptance: Armstrong 15/16" Prelude
- .2 Basic materials for suspension system: commercial quality cold rolled steel.
- .3 Suspension system: non fire rated, made up as follows:
 - .1 1 directional exposed tee bar grid.
- .4 Exposed tee bar grid components: shop painted satin sheen. Components die cut. Main tee with double web, rectangular bulb and 25 mm rolled cap on exposed face. Cross tee with rectangular bulb; web extended to form positive interlock with main tee webs; lower flange extended and offset to provide flush intersection.
- .5 Hanger wire: galvanized soft annealed steel wire:
 - .1 3.6 mm diameter for access tile ceilings.
 - .2 2.6 mm diameter for other ceilings.

- .6 Hanger inserts: purpose made.
- .7 Carrying channels: 38 x 19 mm channel, of 1.6 mm thick painted steel.
- .8 Accessories: splices, clips, wire ties, retainers and wall moulding flush , to complement suspension system components, as recommended by system 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 acoustical ceiling tile and track installation in accordance with manufacturer's written instructions.

3.2 INSTALLATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Installation: to ASTM C636/C636M except where specified otherwise.
- .3 Install suspension system to manufacturer's instructions and Certification Organizations tested design requirements.
- .4 Do not erect ceiling suspension system until work above ceiling has been inspected and approved by Consultant.
- .5 Secure hangers to overhead structure using attachment methods acceptable to Consultant.
- .6 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees.
- .7 Lay out system according to reflected ceiling plan.
- .8 Ensure suspension system is co-ordinated with location of related components.
- .9 Install wall moulding to provide correct ceiling height No pieces shorter than 1200 mm.
- .10 Completed suspension system to support super-imposed loads, such as lighting fixtures diffusers grilles and speakers.
- .11 Support at light fixtures diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .12 Interlock cross member to main runner to provide rigid assembly.
- .13 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.
- .14 Install access splines to provide 10 % ceiling access.
- .15 Finished ceiling system to be square with adjoining walls and level within 1:1000.
- .16 Expansion joints:

- .1 Supply and install "Z" shaped metal trim pieces at each side of expansion joint. Design to accommodate plus or minus 25 mm movement and maintain visual closure. Finish metal components to match adjacent exposed metal trim. Provide backing plates behind butt joints.

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 Touch up scratches, abrasions, voids and other defects in painted surfaces.

3.4 PROTECTION

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

END OF SECTION

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Supply and installation of the indoor resilient multipurpose surfacing
- B. Application of the game lines
- C. References for the correct construction and preparation of concrete slabs to receive resilient flooring.

1.2 SUBMITTALS

- A. Product Data:
Manufacturer's promotional brochures, specifications and installation instructions
- B. Samples:
 - 1. Submit for selection and approval two (2) sets of the indoor resilient multipurpose surfacing, manufacturer's brochures, samples or sample boards of all of the available colors, textures and styles.
 - 2. Submit color samples of all the available game line paint colors for selection and approval.
- C. Closeout Submittals:
 - 1. Submit three (3) copies of the indoor resilient multipurpose surfacing and manufacturer's maintenance instructions.
 - 2. Submit three (3) copies of the material and installation warranties as specified.

1.3 QUALITY ASSURANCE

- A. Qualifications:
 - 1. The indoor resilient multipurpose surfacing shall have been actively marketed for a minimum of five (5) years.
 - 2. The indoor resilient multipurpose surfacing shall be manufactured in an ISO 9001 certified plant.
 - 3. The indoor resilient multipurpose surfacing supplier shall be an established firm experienced in the field and appointed as a distributor by the manufacturer of the indoor resilient multipurpose surfacing.
 - 4. The installer of the indoor resilient multipurpose surfacing shall have a minimum of five (5) years experience in the field installing indoor resilient multipurpose surfacing and have worked on at least five (5) projects of similar size, type and complexity.
- B. Certifications:
 - 1. Installer to submit the indoor resilient athletic surfacing manufacturer's or distributor's certification attesting that they are an approved installer of the indoor resilient multipurpose surfacing.
- C. Testing:

Tests shall be relative for multi-purpose use with certificates from independent testing resources to be made available upon request. Test results shall be no more than 5 years old and performed according to ASTM and/or EN standard testing procedures.

1.4 DELIVERY, STORAGE AND HANDLING

A. Delivery:

Material shall not be delivered until all related work is in place and finished and/or proper storage facilities and conditions can be provided and guaranteed stable according to FieldTurf USA, Inc. recommendations.

B. Storage:

Store the material in a secure, clean and dry location. Maintain temperature between 55° and 85° Fahrenheit. Store the indoor resilient athletic surfacing on a clean flat surface. Do not stack rolls.

1.5 PROJECT/SITE CONDITIONS

A. It is the responsibility of the general contractor/construction manager to maintain project/site conditions acceptable for the installation of the indoor resilient multipurpose flooring.

B. The area in which the indoor resilient multipurpose surfacing will be installed shall be dry and weather tight. Permanent heat, light and ventilation shall be installed and operable.

C. All other trades shall have completed their work prior to the installation of

the resilient athletic flooring. The general contractor or Construction Manager shall maintain a secure and clean working environment before, during and after the installation. Suspension of other trades' work may be authorized providing their work will not damage the new flooring.

D. Maintain a stable room temperature of at least 65°F for a minimum of one (1) week prior to, during and thereafter installation.

E. An effective low-permeance vapor barrier is placed directly beneath the concrete subfloor. For "on" or "below grade" installations, it is recommended to provide a permanent vapor barrier resistant to long term hydrostatic pressure/moisture exposure. Protrusions should be sealed to prevent moisture migration into the slab. Moisture should not be allowed to

enter the slab after the completed construction.

F. Concrete subfloor surface pH level within the 7 to 9 range dependent upon installation type.

G. Concrete subfloor should be no greater than 1/8" within a 10 ft diameter. This tolerance can be measured in accordance with ASTM E1155. A specified (F_p) of 50 and an (F_L) of 30 should reach this degree of floor flatness and floor level. There is no numerical correlation between F numbers and the deviation from the straight edge, however the above specified numbers should achieve a flat floor with minimal deviation in the slab. Reference ACI 117 and ACI 302.1R. The general contractor should provide a certificate of compliance with the above recommendations.

H. Concrete subfloor must be clean and free of all foreign materials or objects including, but not limited to, curing compounds and sealers.

- I. Fill cracks, grooves, voids, depressions, and other minor imperfections with Ardex (or equal) cement-based patching/leveling compounds. Follow the manufacturer's directions. Moveable joints must be treated utilizing specific transitioning joint devices depending upon the architect's recommendations.

Follow current ASTM F710 guidelines for the preparation of concrete slabs to receive resilient flooring.

- J. Refer to ACI 302.2R "Guidelines for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials" for concrete design and construction.
- K. Concrete slab shall be fortified with continual steel reinforcement. Fiber reinforcement alone shall not be considered adequate fortification.

1.6 WARRANTY

A. Materials:

The indoor resilient athletic surfacing shall be covered by the manufacturer against product defects for 3 years.

B. Installation:

The installation of the indoor resilient multipurpose surfacing shall be covered against poor workmanship and faulty installation by a two (2) year written, limited warranty provided by the contractor performing/overseeing the installation.

1.7 ADDITIONAL MATERIALS

Furnish to the owner additional materials containing a total of at least 3% of each different color or design of the indoor resilient athletic surfacing used on the project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

The basis of the design for the indoor resilient multipurpose surfacing is **Dropzone, Dropzone Speckle, and/or Dropzone Interlocking** as provided by FieldTurf USA, Inc. All other installation accessories and related components must be either made or approved by the indoor resilient athletic surfacing manufacturer. Other products may be approved as equal if deemed qualified and submitted in accordance with the General Conditions. Test reports confirming compliance from an Independent Sports Laboratory must be provided along with samples, technical data, installation, maintenance, and warranty prior to acceptance as an alternative product.

2.2 MATERIALS.

Dropzone, Dropzone Speckle, and/or Dropzone Interlocking 8mm recycled non-laminated rubber flooring.

1. Physical properties of the indoor resilient athletic surfacing shall conform to the following minimums:

	Width	Roll Width 4ft – Tile 2ft x 2ft
	Length	Specify length (min. 15 ft)
	Total Thickness	8 mm
	Weight	1.92 lbs/sq.ft.
Tensile Strength	ASTM D412		200 minimum
Static Load	ASTM F970		1000 p.s.i (modified test)
Coefficient of Friction	ASTM 2047		>.9
Chemical Resistance	ASTM F925		Excellent
Ambient Noise Reduction	ASTM C423		.10
Impact Sound Insulation	ASTM E492		.45 minimum
Thermal Conductivity	ASTM C518		Approximate .406
Sound Transmission	ASTM 413		.45 minimum

PART 3 - EXECUTION

3.1 *EXAMINATION*

- A. It is the responsibility of the general contractor/construction manager to ensure that project/site conditions are acceptable for the installation of the indoor resilient athletic flooring.
- B. Verify that the area in which the indoor resilient athletic surfacing will be installed is dry and weather tight. Verify that permanent heat, light and ventilation is installed and operable.
- C. Verify that all other work that could cause damage, dirt and dust or interrupt the normal pace of the indoor resilient athletic flooring installation is completed or suspended.
- D. Verify that there is a stable room temperature of at least 65°F.
- E. Verify that there are no foreign materials or objects on the subfloor and that the subfloor is clean and ready for installation.
- F. Direct Full Spread Adhering to Concrete Subfloor : moisture content less than 92 % RH when tested per ASTM F2170. Use only manufacturer recommended Multi-Poxy adhesive.
- G. If both tests are performed, use the highest value. Do not average the results of the tests. Report all field test results in writing to the General Contractor, Architect, and End User prior to installation.
- H. Verify that the concrete subfloor surface pH level is within the 7 - 9 range.
- I. Document the results indicating the slab is within manufacturer's tolerances for slab deviation.

3.2 *PREPARATION OF SURFACES*

- A. Sand the entire surface of the concrete slab.
- B. Sweep the concrete slab so as to remove all dirt and dust. If a sweeping compound is to be used it must be a sweeping compound that does not contain oil or other items that may inhibit the adhesive bond.
- C. Slab must be dust free. In the event that dust impairs adhesive bond, priming the slab prior to application of adhesive may be necessary. Follow installation guidelines.

3.3 *OPTIONS FOR MOISTURE MITIGATION*

- A. For projects with moisture conditions higher than the specified tolerances,

TARKOLAY may be used for conditions that do not 98% per ASTM F2170.

Use only approved adhesive as directed by the manufacturer. Tarkolay is available for roll goods only.

3.4 *INSTALLATION*

- A. The installation area shall be closed to all traffic and activity for a period to be set by the indoor resilient athletic surfacing installer. The indoor resilient athletic surfacing installation shall not begin until the installer is familiar with the existing conditions.
- B. All necessary precautions should be taken to minimize noise, smell, dust, the use of hazardous materials and any other items that may inconvenience others.
- C. Install the indoor resilient athletic surfacing in strict accordance with the indoor resilient athletic surfacing manufacturer's written instructions.
- D. Install the indoor resilient athletic surfacing minimizing cross seams. Provide a seam diagram during the submittal process for approval prior to installation.
- E. Install appropriate threshold plates or transition strips where necessary.

3.5 *CLEANING*

- A. Remove all unused materials, tools, and equipment and dispose of any debris properly. Clean the indoor resilient athletic surfacing in accordance with the manufacturer's instructions.

3.6 *PROTECTION*

If required, protect the indoor resilient athletic surfacing from damage using coverings approved by the manufacturer until acceptance of work by the customer or their authorized representative.

3.6 RELATED STANDARDS AND GUIDELINES

- A. ASTM F2170 "Standard Test Method for Determining Relative Humidity In Concrete Floor Slabs Using In-Situ Probes"
- B. ASTM F710 "Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring"
- C. ACI 302.2R-06 "Guideline for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials"

End of Section

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section .

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM F1303-04, Standard Specification for Sheet Vinyl Floor Covering with Backing.
 - .2 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
 - .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
 - .4 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule 1113-04, Architectural Coatings.
 - .2 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 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, 300 mm long base, nosing, feature strips, treads, edge strips.
- .4 Sustainable Design Submittals:
 - .1 LEED Canada-NC Version 1.0 CI Version 1.0 Submittals: in accordance with Section 01 35 21 - LEED Requirements.
- .5 Closeout Submittals:
 - .1 Provide maintenance data for resilient flooring for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.4 SUSTAINABLE REQUIREMENTS

- .1 Materials and products in accordance with Section 01 47 15 - Sustainable Requirements: Construction.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Waste Management and Disposal:
 - .1 Separate waste materials for reuse recycling in accordance 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 Section 01 78 00 - Closeout Submittals.
 - .2 Provide m² 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 Departmental Representative DCC Representative Consultant, upon completion of the work of this section.
 - .6 Store where directed by Departmental Representative DCC Representative Consultant.

Part 2 Products

2.1 MATERIALS

- .1 Resilient Sheet Flooring (RSF-1) :Standard of Acceptance iQ Optima
 - .1 Color from manufacturers standard range.
 - .2 Complies with requirements for ASTM F 1913 Standard Specification for Vinyl Sheet Floor Covering Without Backing.
 - .3 iQ construction: no wax, no finish for life of product.
 - .4 Roll/Sheet Width: 6' 6" (2 m)
 - .5 Wear layer/Overall thickness: .080" (2.0 mm).
 - .6 ASTM D 2047, Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring of 0.6 or greater.
 - .7 ASTM F 970, Standard Test Method for Static Load Limit – 250 PSI.
 - .8 ASTM E 648, Standard Test method for Critical Radiant Flux of 0.45 watts/cm² or greater, Class I
 - .9 Contains 25% pre-consumer recycled content

- .10 100% Recyclable
- .11 NSF-332 Platinum Certified
- .12 Phthalate-free (except for recycled material)
- .2 Resilient Sheet Flooring (RSF-2) :Standard of Acceptance: Acceptable material: Altro Aquarius (measurements and product weights given below are approximate): Slip Resistance .88/D 1.03/W
 - .1 Color from manufacturers standard range.
 - .2 Complies with requirements for ASTM F 1913 Standard Specification for Vinyl Sheet Floor Covering Without Backing.
 - .3 iQ construction: no wax, no finish for life of product.
 - .4 Roll/Sheet Width: 6' 6" (2 m)
 - .5 Wear layer/Overall thickness: .080" (2.0 mm).
 - .6 ASTM D 2047, Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring of 0.6 or greater.
 - .7 ASTM F 970, Standard Test Method for Static Load Limit – 250 PSI.
 - .8 ASTM E 648, Standard Test method for Critical Radiant Flux of 0.45 watts/cm² or greater, Class I
- .3 Primers and adhesives: of types recommended by resilient flooring manufacturer for specific material on applicable substrate, above, on or below grade.
 - .1 Rubber floor adhesives:
 - .2 Cove base adhesives:
- .4 Sub-floor filler and leveller: white premix latex requiring water only to produce cementitious pastes recommended by flooring manufacturer for use with their product.
- .5 Metal edge strips:
 - .1 Aluminum extruded, smooth, polished stainless steel with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.
- .6 External corner protectors: stainless steel, type recommended by flooring manufacturer.
- .7 Edging to floor penetrations: stainless steel , type recommended by flooring manufacturer.
- .8 Sealer and wax: type recommended by resilient flooring material manufacturer for material type and location.

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 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 and Seal concrete slab 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 Run sheets in direction of traffic. Double cut sheet joints and continuously seal heat weld according to manufacturer's printed instructions.
- .5 Heat weld seams of linoleum sheet flooring in accordance with manufacturer's printed instructions.
- .6 As installation progresses, and after installation roll flooring with 45 kg minimum roller to ensure full adhesion.
- .7 Cut flooring around fixed objects.
- .8 Install feature strips and floor markings where indicated. Fit joints tightly.
- .9 Install flooring in pan type floor access covers. Maintain floor pattern.
- .10 Continue flooring over areas which will be under built-in furniture.
- .11 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.
- .12 Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.
- .13 Install metal edge strips at unprotected or exposed edges where flooring terminates.

3.5 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.

3.6 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.

3.7 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.

3.8 PROTECTION

- .1 Protect new floors from time of final set of adhesive until final inspection.
- .2 Prohibit traffic on floor for 48 hours after installation.

END OF SECTION

Part 1 General

1.1 SCOPE

- .1 Provide all seamless epoxy ceramic granular flooring to patch and resurface cell areas to blend in with other areas.

1.2 EXAMINATION

- .1 Examine work upon which work of this section depends. Do not apply the work of the section until any unsatisfactory conditions have been rectified. Commencement will be deemed acceptable of substrate.

1.3 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 – Submittals.

1.4 Handling and Storage

- .1 Store materials in original undamaged condition with manufacturer's labels and seals in tact. Prevent damage to materials during handling and storage.

1.5 Description of Systems

- .1 Epoxy / ceramic granular flooring, shown on room schedule as "S.E" flooring, shall consist of multi-coloured quartz aggregates imbedded in a clear epoxy with clear coat of epoxy:
 - .1 Bond coat-epoxy
 - .2 Matrix-epoxy and ceramic coated granular aggregate.

1.6 Environmental Conditions

- .1 Maintain minimum 55 deg. F air temperature at the installation area for 24 hours prior to, during and after construction.

Part 2 Products

2.1 Materials

- .1 Epoxy / ceramic granular flooring shall have the following physical characteristics:
 - .1 Primer: epoxy coated binder pigmented, non-yellowing.
 - .2 Aggregate: ceramic coated quartz.
 - .3 Matrix: epoxy binder.
 - .4 Grout Coats: 100% solids, clear epoxy, non-yellowing, non- flammable.
 - .5 Finish Coats: epoxy 100% solids, non-ambering, non-flammable.
 - .6 Finish: matte finish complete with integral base.

- .7 Normal thickness: 3mm
- .2 Performance characteristics:
 - .1 Tensile strength: ASTM-638. 1600 psi.
 - .2 Compression Strength: ASTM D695. 9000 psi.
 - .3 Impact Resistance Gardener Impact Tester. 160 in/lb – no cracking, chipping or delamination.
 - .4 Impact Resistance: MIL D 313F Section 4.7.3 Withstands 16 ft/lb no cracking, delamination or chipping.
 - .5 Indentation Resistance: MIL D-3134F Section 4.7.4 Withstands; 2000 lb/sq. in. for 30 minutes without indentation.
 - .6 Resistance to elevated temperature: MIL D313F Section 4.7.5. No slip of flow at required temperatures of 158 deg. F.
 - .7 Taber abrasion resistance: CS17 wheels with 2000 gram load for 1000 cycles.
 - .8 Water absorption: ASTM D-570 (24 hrs. immersion) 0.08%.
 - .9 Bond Strength to concrete: After 7 days water emersion ACI Committee 403, Bulletin 59-43. 333 psi failure in concrete.
 - .10 Moisture Vapour permeability: ASTM E—96. 0.06 perms.
 - .11 Toxicity: U.S. Dept. of Agriculture Research Service Meat Inspection Division. Non toxic.
 - .12 Flammability: ASTM D-635. Self extinguishing by this test. Extent of burning .0 inch.
- .3 Divider Strips:
 - .1 Between epoxy and flooring of other material, extruded heat treated aluminum having a total height of 3 mm. Divider strips shall be secured in place and be absolutely vandal proof and non removable. Provide metal strip at top of base.

2.2 Manufacturer

- .1 Use the same manufactured brands and sources for each for each type of material for the entire project, in order to ensure uniformity of finished and colour.
- .2 Standard of Acceptance:
 - .1 Standard Stone Shield SLT – Color from manufacturers standard colors
 - .2 Approved Equal.

Part 3 Execution

3.1 Application

- .1 Apply flooring in accordance with manufacturer's printed instructions, employing technically trained, approved mechanics, using equipment specifically designed for this purpose.
- .2 Prepare surface of existing substrate in accordance with flooring material manufacturer's suggestions and instructions.

- .3 Patch cracks and other openings in substrate using an epoxy filler.
- .4 Grind down uneven joints, rough areas, projections and foreign matter from surfaces to receive flooring and base.
- .5 Mask adjacent surfaces and apply seamless flooring and 100 mm high integral seamless cove base in accordance with manufacturer's directions.
- .6 Install metal divider strips at junctions of seamless flooring and other floorings, at exposed edges of seamless flooring and at other locations required due to application techniques of the system.
- .7 Install 100 mm seamless cove base with metal screed on concrete block.

END OF DOCUMENT

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C423-07, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
 - .2 CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .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 1113-04, Architectural Coatings.
 - .2 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.
- .6 Underwriter Laboratories of Canada (ULC)
 - .1 CAN/ULC-S702-97, Standard for Thermal Insulation, Mineral Fibre, for Buildings.

1.2 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 sample of each type acoustical unit.

1.3 QUALITY ASSURANCE

- .1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
- .2 Construct one representative mock-up of each type acoustical wall treatment system.
- .3 Construct mock-up 10 m² minimum to indicate method of assembly, installation and fixing.
- .4 Construct mock-up where directed.
- .5 Allow 48 hours for inspection of mock-up by Consultant before proceeding with work.
- .6 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of the finished work.

1.4 ENVIRONMENTAL REQUIREMENTS

- .1 Commence installation after building enclosed and dust generating activities are completed.
- .2 Permit wet work to dry prior to commencement of installation.
- .3 Maintain uniform minimum temperature of 15 degrees C and relative humidity of 20-40% prior to, during and after installation.

1.5 DELIVERY, STORAGE AND HANDLING

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

1.6 MAINTENANCE

- .1 Extra Materials:
 - .1 Provide extra materials of acoustic units and adhesive in accordance with Section 01 78 00 - Closeout Submittals.
 - .2 Provide acoustical units for maintenance use amounting to 2% of gross wall area for each pattern and type required for project.
 - .3 Provide sufficient adhesive to install extra material provided.
 - .4 Extra materials from same production run as installed materials.
 - .5 Identify each package of acoustical units including colour and type, and each container of adhesive.
 - .6 Deliver to Departmental Representative, upon completion of the work of this section.
 - .7 Store where directed by Departmental Representative.

Part 2 Products

2.1 MATERIALS

- .1 Acoustical construction products must:
 - .1 Not require being labelled as poisonous, corrosive, flammable or explosive under Consumer Chemical and Container Regulations of the Hazardous Products Act.
 - .2 Be accompanied by detailed instructions for proper handling and installation so as to minimize health concerns.
 - .3 The manufacturing process must adhere to lifecycle assessment standards as per CANISO 14040
- .2 Demountable acoustic units
 - .1 Acoustic core material: to CAN/CGSB-92.1.
 - .1 Type 1: Fabric faced demountable acoustic units. (Room 103)
 - .1 Acoustic core material; to CAN/CGSB-92.1, impact resistant 6 pcf fibreglass.

- .2 Fabric Finish: Fire resistant 2-ply polyester, colour to be selected by Departmental Representative from manufacturer's standard range.
- .3 Weight: 10oz/lin.yd. min.
- .4 Metal Support Clips: roll formed galvanized steel clip-on strip to acoustical unit supplier's standard allowing non-destructive de-mounting.
- .5 Flame Spread: 25 or less, passing CAN/ULC-S102.
- .6 Noise reduction coefficient (NRC) 1.10
- .7 Sound Absorption Characteristics: Hz 150, 250, 500, 1000,2000, 4000 Sabins 0.31, 0.81, 1.09, 0.99, 1.02, 0.98
- .8 Size as indicated on drawings.
- .9 Metal support clips: roll formed galvanized steel to acoustic unit supplier's standard.
- .2 Type 2: Cementitious wood fibre acoustical units: (Room 134)
 - .1 Acoustic core material: to CAN/CGSB-92.1.
 - .2 Standard Units, 1200 x full length of wall x 38 mm thick and as dimensioned, bevel-butt edge, factory paint finish standard white, NRC designation of 0.85. Standard C-40 mounting.
 - .3 Flame Spread Rating: 25 or less, passing CAN/ULNS102
 - .4 Sound Absorption Characteristics: Hz 150 250 500 1000 2000 4000 Sabins 0.32 0.70 1.09 0.93 0.76 0.94
- .3 Adhesive: type recommended by acoustic unit manufacturer.
- .4 Staples, nails and screws: to CSA B111, non-corrosive finish, type recommended by acoustic unit manufacturer.
- .5 Polyethylene: to CAN/CGSB-51.34, 0.015 mm thick.
- .6 Select paints that provide reduced environmental impacts as described in section 09 91 23 - Interior Painting. Ensure that selected paint materials will not compromise the acoustical properties of wall treatments.

2.2**FABRICATION**

- .1 Demountable acoustic units:
 - .1 Use one piece trim, continuous, with mitred corners and concealed fastenings.
 - .2 Conceal and make magnetic fastenings integral part of trim. Adhesive bonding of magnets is not acceptable.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION

- .1 Ensure substrate surface is straight to tolerance of plus or minus 3 mm over 3000 mm.
- .2 Install Fabric Type 1 acoustic units to clean, dry and firm substrate using mounting clips glued and screwed to the wall at a maximum 600 mm o.c. in accordance with manufacturer's instruction for a Type A mounting. If requested by Departmental Representative, glue full perimeter of panels to wall.
- .3 Install Type 2 acoustic units plumb and aligned. Arrange units as indicated. Cut units to be at least 50 % of unit width.
- .4 Scribe acoustic units to fit adjacent work. Butt joints tight.

3.3 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Keep acoustic installation and all components clean. Remove blemishes immediately.

3.4 PROTECTION

- .1 Use polyethylene to protect finished acoustical wall treatment from damage.
- .2 Remove prior to substantial completion.

END OF SECTION

Part 1 General

1.1 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.

1.2 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 Departmental Representative DCC Representative Consultant .
 - .8 Standard of Acceptance:

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

1.3 PERFORMANCE REQUIREMENTS

- .1 Environmental Performance Requirements:
 - .1 Provide paint products meeting MPI "Environmentally Friendly" E1 E2 E3 ratings based on VOC (EPA Method 24) content levels.
 - .2 Green Performance in accordance with MPI Standard GPS-1.

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 product characteristics, performance criteria, physical size, finish and limitations.
- .3 Upon completion, submit records of products used. List products in relation to finish system and include the following:
 - .1 Product name, type and use.
 - .2 Manufacturer's product number.
 - .3 Colour numbers.
 - .4 MPI Environmentally Friendly classification system rating.
 - .5 Manufacturer's Material Safety Data Sheets (MSDS).
- .4 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit duplicate 200 x 300 mm sample panels of each paint stain clear coating special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards submitted on the following substrate materials:
 - .1 3 mm plate steel for finishes over metal surfaces.
 - .2 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 hardboard siding plywood 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.

1.5 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.

1.6 MAINTENANCE

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

1.7 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 Remove paint materials from storage only in quantities required for same day use.
 - .10 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
 - .11 Fire Safety Requirements:
 - .1 Provide one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.

- .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
 - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.
- .2 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 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, individuals, or organizations for verifiable re-use or re-manufacturing.
 - .8 Close and seal tightly partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

1.8 AMBIENT CONDITIONS

- .1 Heating, Ventilation and Lighting:
 - .1 Ventilate enclosed spaces.

- .2 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.
 - .3 Where required, provide continuous ventilation for seven days after completion of application of paint.
 - .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
 - .5 Perform 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.

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" ratings are acceptable for use on this project.

2.2 COLOURS

- .1 Departmental Representative will provide color schedule after award.
- .2 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.
- .3 Selection of colours will be from manufacturers full range of colours.
- .4 Where specific products are available in restricted range of colours, selection will be based on limited range.
- .5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

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 Departmental Representative'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 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.
 - .2 EXT 2.1B - Alkyd zone/traffic marking finish.
- .2 Structural Steel and Metal Fabrications:
 - .1 EXT 5.1B - Waterborne light industrial insert gloss level coating (over inorganic zinc).
- .3 Steel - High Heat: heat exchangers, breeching, pipes, flues, stacks, etc., with temperature range as noted
 - .1 EXT 5.2A - Heat resistant enamel finish, maximum 205 degrees C
- .4 Galvanized Metal: not chromate passivated
 - .1 EXT 5.3B - Alkyd insert gloss level finish.
- .5 Dimension Lumber: columns, beams, exposed joists, underside of decking, siding, fencing, etc.

- .1 EXT 6.2A - Latex insert gloss level finish (over alkyd primer).
 - .2 EXT 6.2B - Waterborne solid colour stain finish.
 - .3 EXT 6.2C - Alkyd insert gloss level finish.
 - .4 EXT 6.2D - Solid colour stain finish.
 - .5 EXT 6.2E - Varnish gloss finish (over stain).
 - .6 EXT 6.2F - Pigmented fire retardant insert gloss level coating.
 - .7 EXT 6.2G - Clear fire retardant penetrating wood preservative coating.
 - .8 EXT 6.2H - Clear (2 component) polyurethane finish.
 - .9 EXT 6.2J - Pigmented polyurethane finish.
 - .10 EXT 6.2K - Varnish gloss semi-gloss finish.
 - .11 EXT 6.2L - Semi-transparent stain finish.
 - .12 EXT 6.2M - Latex insert gloss level finish (over latex primer).
- .6 Dressed Lumber: doors, door and window frames, casings, battens, smooth facias, etc.
- .1 EXT 6.3A - Latex insert gloss level finish. do not use flat finish on doors.
 - .2 EXT 6.3B - Alkyd insert gloss level finish do not use flat finish on doors.
 - .3 EXT 6.3C - Solid colour stain finish do not use in high contact areas or on doors.
 - .4 EXT 6.3D - Semi-transparent stain finish do not use on doors.
 - .5 EXT 6.3E - Varnish gloss semi-gloss finish (over stain).
 - .6 EXT 6.3F - Varnish gloss semi-gloss finish.
 - .7 EXT 6.3G - Clear (2 component) polyurethane finish.
 - .8 EXT 6.3H - Pigmented polyurethane finish.
 - .9 EXT 6.3J - Waterborne light industrial insert gloss level coating use gloss or semi-gloss finish on doors and frames only.
 - .10 EXT 6.3K - Waterborne solid colour stain finish do not use flat finish on doors and frames.
 - .11 EXT 6.3L - Latex insert gloss level finish (over latex primer) do not use flat finish on doors.

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 work: 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 Departmental Representative .

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 bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
 - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
 - .4 Allow surfaces to drain completely and allow to dry thoroughly. Allow sufficient drying time and test surfaces using electronic moisture meter before commencing work.
 - .5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water based paints.
 - .6 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.
- .4 Clean metal surfaces to be repainted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements. Remove such contaminates from

surfaces, pockets and corners to be repainted by brushing with clean brushes, blowing with clean dry compressed air, or brushing/vacuum cleaning as required.

- .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .6 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

3.4 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 Departmental Representative DCC Representative 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 splatters, 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 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.
- .5 Move and cover exterior furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
- .6 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 air sprayer airless 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 Departmental Representative DCC Representative 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 cutouts 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 independent inspection firm as designated by Consultant and paid for by the cash allowance.
 - .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 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.

1.2 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 journeyman 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 Departmental Representative DCC Representative Consultant .
 - .8 Standard of Acceptance:

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

1.3 PERFORMANCE REQUIREMENTS

- .1 Environmental Performance Requirements:
 - .1 Provide paint products meeting MPI "Environmentally Friendly" E1 E2 E3 ratings based on VOC (EPA Method 24) content levels.
 - .2 Green Performance in accordance with MPI Standard GPS-1.

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 product characteristics, performance criteria, physical size, finish and limitations.
- .3 Upon completion, submit records of products used. List products in relation to finish system and include the following:
 - .1 Product name, type and use.
 - .2 Manufacturer's product number.
 - .3 Colour numbers.
 - .4 MPI Environmentally Friendly classification system rating.
 - .5 Manufacturer's Material Safety Data Sheets (MSDS).
- .4 Provide samples in accordance with Section 01 33 00 - Submittal Procedures,
 - .1 Submit duplicate 200 x 300 mm sample panels of each paint stain clear coating special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards submitted on the following substrate materials:
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 - .5 10 mm cedar hardboard siding plywood 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.

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- .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.

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 - .1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
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 - .2 Labels: to indicate:
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 - .3 Compliance with applicable standard.
 - .4 Colour number in accordance with established colour schedule.
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 - .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 Remove paint materials from storage only in quantities required for same day use.
 - .10 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
 - .11 Fire Safety Requirements:
 - .1 Provide one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.

- .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
 - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.
- .2 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 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, individuals, or organizations for verifiable re-use or re-manufacturing.
 - .8 Close and seal tightly partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

1.8 AMBIENT CONDITIONS

- .1 Heating, Ventilation and Lighting:
 - .1 Ventilate enclosed spaces.

- .2 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.
 - .3 Where required, provide continuous ventilation for seven days after completion of application of paint.
 - .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
 - .5 Perform 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.

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" ratings are acceptable for use on this project.

2.2 COLOURS

- .1 Departmental Representative will provide color schedule after award.
- .2 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.
- .3 Selection of colours will be from manufacturers full range of colours.
- .4 Where specific products are available in restricted range of colours, selection will be based on limited range.
- .5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

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 Departmental Representative'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 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.
 - .2 EXT 2.1B - Alkyd zone/traffic marking finish.
- .2 Structural Steel and Metal Fabrications:
 - .1 EXT 5.1B - Waterborne light industrial insert gloss level coating (over inorganic zinc).
- .3 Steel - High Heat: heat exchangers, breeching, pipes, flues, stacks, etc., with temperature range as noted
 - .1 EXT 5.2A - Heat resistant enamel finish, maximum 205 degrees C
- .4 Galvanized Metal: not chromate passivated
 - .1 EXT 5.3B - Alkyd insert gloss level finish.
- .5 Dimension Lumber: columns, beams, exposed joists, underside of decking, siding, fencing, etc.

- .1 EXT 6.2E - Varnish gloss finish (over stain).
- .2 EXT 6.2K - Varnish gloss semi-gloss finish.
- .3 EXT 6.2L - Semi-transparent stain finish.

- .6 Dressed Lumber: doors, door and window frames, casings, battens, smooth facias, etc.
 - .1 EXT 6.3A - Latex insert gloss level finish. do not use flat finish on doors.
 - .2 EXT 6.3B - Alkyd insert gloss level finish do not use flat finish on doors.
 - .3 EXT 6.3C - Solid colour stain finish do not use in high contact areas or on doors.
 - .4 EXT 6.3D - Semi-transparent stain finish do not use on doors.
 - .5 EXT 6.3E - Varnish gloss semi-gloss finish (over stain).
 - .6 EXT 6.3F - Varnish gloss semi-gloss finish.
 - .7 EXT 6.3G - Clear (2 component) polyurethane finish.
 - .8 EXT 6.3H - Pigmented polyurethane finish.
 - .9 EXT 6.3J - Waterborne light industrial insert gloss level coating use gloss or semi-gloss finish on doors and frames only.
 - .10 EXT 6.3K - Waterborne solid colour stain finish do not use flat finish on doors and frames.
 - .11 EXT 6.3L - Latex insert gloss level finish (over latex primer) do not use flat finish on doors.

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 work: 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 Departmental Representative .

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

3.4 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 Departmental Representative DCC Representative 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 splatters, 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 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.
- .5 Move and cover exterior furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
- .6 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 air sprayer airless 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 Departmental Representative DCC Representative 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 cutouts 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 independent inspection firm as designated by Consultant and paid for by the cash allowance.
 - .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 Includes:
 - .1 Material and installation of site applied paint finishes to new interior surfaces, including site painting of shop primed surfaces.

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 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.
- .3 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.
- .4 The mechanical Rooms and other rooms where a significant amount mechanical and electrical equipment are to be painted prior to the installation of the electrical and mechanical work.

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 stain clear coating special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:
 - .1 3 mm plate steel for finishes over metal surfaces.
 - .2 13 mm 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 hardboard siding 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 stain finish coating. Identify colour and paint type in relation to established colour schedule and finish system.
 - .3 Delivery, storage and protection: comply 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 Type ABC dry chemical fire extinguisher adjacent to storage area.
 - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
 - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.
- .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 Handle and dispose of hazardous materials in accordance with Regional and Municipal, regulations.
 - .4 Ensure emptied containers are sealed and stored safely.
 - .5 Unused paint coating materials must be disposed of at official hazardous material collections site as approved by Consultant.
 - .6 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.
 - .7 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
 - .8 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
 - .9 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).
- .10 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
- .11 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 Ventilate enclosed spaces .
 - .2 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.
 - .3 Provide continuous ventilation for seven days after completion of application of paint.
 - .4 Coordinate use of existing ventilation system with Departmental Representative DCC Representative Consultant and ensure its operation during and after application of paint as required.
 - .5 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.
 - .6 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 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 Materials and resources in accordance with Section 01 47 15 - Sustainable Requirements: Construction.
- .2 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .3 Provide paint materials for paint systems from single manufacturer.
- .4 Only qualified products with E3 "Environmentally Friendly" rating are acceptable for use on this project.
- .5 Conform to latest MPI requirements for interior painting work including preparation and priming.
- .6 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.

- .7 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.
- .8 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes to meet minimum "Environmentally Friendly" E2 rating.

2.2 COLOURS

- .1 Departmental Representative will provide color schedule after contract award
- .2 Colour schedule will be based upon selection of seven base colours and five accent colours. No more than twelve colours will be selected for entire project and no more than five colours will be selected in each area.
- .3 Selection of colours from manufacturers full range of colours.
- .4 Where specific products are available in restricted range of colours, selection based on limited range.
- .5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 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 indicated as noted on Finish Schedule.

2.5 INTERIOR PAINTING SYSTEMS

- .1 Concrete horizontal surfaces: floors and stairs:
 - .1 INT 3.2F - Concrete floor sealer.
- .2 Concrete masonry units: smooth and split face block and brick:
 - .1 INT 4.2D - High performance architectural G5 latex finish.
- .3 Structural steel and metal fabrications: columns, beams, joists:
 - .1 INT 5.1B - Waterborne light industrial G5 coating.
- .4 Galvanized metal: doors, frames, railings, misc. steel, pipes, overhead decking, and ducts.
 - .1 INT 5.3B - Waterborne light industrial G5 coating.
- .5 Dressed lumber: including doors, door and window frames, casings, mouldings:
 - .1 INT 6.3E - Polyurethane varnish G5 finish (over stain).
- .6 Wood paneling and casework: partitions, panels, shelving, millwork:
 - .1 INT 6.4E - Polyurethane varnish G5 finish (over stain).
- .7 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:
 - .1 INT 9.2A - Latex G3 finish (over latex sealer).
- .8 Canvas and cotton coverings.
 - .1 INT 10.1A - Latex G3 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 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 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 spatters, 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 Departmental Representative DCC Representative 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 bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.

- .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
- .4 Allow surfaces to drain completely and allow to dry thoroughly.
- .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
- .6 Use trigger operated spray nozzles for water hoses.
- .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.
- .4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .5 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.
- .6 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.
- .7 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes blowing with clean dry compressed air vacuum cleaning.
- .8 Touch up of shop primers with primer as specified.
- .9 Do not apply paint until prepared surfaces have been accepted Consultant

3.5 APPLICATION

- .1 Method of application to be as approved by Consultant. Apply paint by brush roller air sprayer airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
 - .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
 - .2 Work paint into cracks, crevices and corners.
 - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
 - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
 - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Spray application:

- .1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
- .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
- .3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.
- .4 Brush out immediately all runs and sags.
- .5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.
- .4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.
- .5 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .7 Sand and dust between coats to remove visible defects.
- .8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.
- .9 Finish inside of cupboards and cabinets as specified for outside surfaces.
- .10 Finish closets and alcoves as specified for adjoining rooms.
- .11 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

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 Departmental Representative.
- .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 Departmental Representative and paid for by Section 01 21 00 Allowances.
- .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 Departmental Representative 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 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 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.186-1996, High Performance Glazed Coating System, Interior.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Manufacturer's Instructions: provide to indicate special handling criteria, installation sequence, cleaning procedures.
- .3 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit duplicate 400 x 200mm samples of each colour and finish and decorative effects, coating applied to porous concrete block.
- .4 Closeout Submittals:
 - .1 Provide maintenance data for coatings for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.3 QUALITY ASSURANCE

- .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
- .2 Apply coating of each finish and decorative effect to 10 m² area of surface to be treated.
- .3 Allow 48 hours for inspection of mock-up by Consultant before proceeding with coating work.
- .4 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
 - .1 Deliver and store materials in manner to prevent damage.
 - .2 Ensure materials remain in original wrapping and containers until used.
- .2 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 1 General

1.1 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.186-1996, High Performance Glazed Coating System, Interior.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Manufacturer's Instructions: provide to indicate special handling criteria, installation sequence, cleaning procedures.
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 - .1 Deliver and store materials in manner to prevent damage.
 - .2 Ensure materials remain in original wrapping and containers until used.
- .2 Waste Management and Disposal:
 - .1 Separate waste materials for reuse recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.5 SITE CONDITIONS

- .1 Safety:
 - .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of materials.
 - .2 Ensure no open flame heating devices are used.
 - .3 Discourage occupancy of treated space until volatile materials are no longer being emitted and there is no odour.
 - .4 Provide adequate respiratory protection to exposed individuals.
- .2 Ventilation:
 - .1 Provide ventilation continuously during and after coating application. Run system 24 hours per day during application; provide continuous ventilation for 7days after completion of application.
- .3 Temperature:
 - .1 Do not apply emulsion systems unless uniform minimum 10 degrees C air temperature at installation area for 24 hours prior to and after application.
 - .2 Maintain minimum temperature 10 degrees C within area of installation until final acceptance of building.

Part 2 Products

2.1 MATERIALS - (HG)

- .1 Acceptable materials: Stonhard Stronglaze VSC: Saniglaze
- .2 Two components, 1:1 ratio, 100% solids epoxy (putty) patching mortar.
Acceptable material: Stonhard Stonset PM5.
- .3 Glaze coat: pigmented, semi-gloss finish
- .4 Color to be from manufacturer's standard color set.

2.2 MIXES

- .1 Mix coatings according to manufacturer's instructions.

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 Prepare surfaces in accordance with CAN/CGSB-1.186 and coating material manufacturer's instructions.

- .2 Mask surrounding surfaces to provide neat, clean juncture lines.
- .3 Protect adjacent surfaces and equipment from damage by overspray.

3.3 APPLICATION

- .1
- .2 Apply coating to produce smooth surface, uniform in sheen, colour and finish, free from marks, dirt, particles, runs, crawls, curling, holes, air pockets and other defects and to achieve smoothness index in accordance with CAN/CGSB-1.186. Total dry film thickness to manufacturers recommended thickness
- .3 Apply filler coats to porous surfaces.
- .4 Apply base per manufacturers recommended instructions.
- .5 Apply top glaze coat.

3.4 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
 - .1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.5 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
 - .1 Clean surfaces to coating manufacturer's printed instructions.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Aluminum Association, Inc. (AAI)
 - .1 AAI DAF45-03, Designation System for Aluminum Finishes.
- .2 ASTM International Inc.
 - .1 ASTM A653/A653M-07, Standard Specification for Steel Sheet, Zinc-Coated, (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM B32-04, Standard Specification for Solder Metal.
 - .3 ASTM B456-03, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
- .3 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.81-M90, Air Drying and Baking Alkyd Primer for Vehicles and Equipment.
 - .2 CAN/CGSB-1.88-92, Gloss Alkyd Enamel, Air Drying and Baking.
 - .3 CGSB 31-GP-107Ma-90, Non-Inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.
 - .4 CGSB 41-GP-6M-1983, Sheets, Thermosetting Polyester Plastics, Glass Fibre Reinforced. Reaffirmation of September 1976.
- .5 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .2 CSA W47.2-M1987(R2008), Certification of Companies for Fusion Welding of Aluminum.
 - .3 CSA W59-03, Welded Steel Construction (Metal Arc Welding).
 - .4 CSA W59.2-M1991(R2003), Welded Aluminum Construction.
- .6 Canadian Sheet Steel Building Institute (CSSBI)
 - .1 CSSBI SSF 6-1995, Sheet Steel Facts #6, Metallic Coated Sheet Steel for Structural Building Products-July 1995.
- .7 Green Seal Environmental Standards
 - .1 Standard GS-11-2008, 2nd Edition, Paints and Coatings.

- .2 Standard GS-36-00, Commercial Adhesives.
- .8 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .9 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule #1113-A2007, Architectural Coatings.
 - .2 SCAQMD Rule #1168-A2005, Adhesive and Sealant Applications.
- .10 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - February 2004.
 - .1 MPI #76, Quick Dry Alkyd Metal Primer.
 - .2 MPI #96, Quick Dry Enamel Gloss.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section 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.

1.3 ACTION SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Shop drawings: submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
 - .2 Submit shop drawings and catalogue sheets.
 - .3 Indicate materials, thicknesses, sizes, finishes, colours, construction details, removable and interchangeable components, electrical components specifications and power loads, wiring terminal box locations, lamp centres and overlaps, access panels, mounting methods, schedule of signs.
 - .4 Submit drawn-to-scale details for individually fabricated or incised lettering indicating word and letter spacing.
- .3 Samples:
 - .1 Submit duplicate representative sample of each type sign, sign image and mounting method including, but not limited to: graphics, cast letters, sign box installation method, channel letters, and wall plates fixed mounting installation method.

1.4 INFORMATIONAL SUBMITTALS

- .1 Product Data:

- .1 Submit manufacturer's printed product literature panel signage or components, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.

1.5 CLOSEOUT SUBMITTALS

- .1 Provide operation and maintenance data for illuminated signs for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.6 QUALITY ASSURANCE

- .1 Welding Certification in accordance with CSA W47.2.

1.7 DELIVERY, STORAGE AND HANDLING

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

Part 2 Products

2.1 MATERIALS

- .1 Aluminum extrusions: to designation AA 6063-T5 AA 6006-T5.
- .2 Sheet aluminum: anodizing quality.
- .3 Prefinished sheet aluminum: plain utility sheet with manufacturer applied baked enamel finish.
- .4 Electrical components: CSA approved.
- .5 Welding materials: to CSA W59.
- .6 Solder: to ASTM B32, Type Sn50.
- .7 Self-stick foam tape: 1.6 mm thick, 352.4 kg/m³ density polyurethane open-cell foam tape for sign purposes, with synthetic self-stick adhesive on both sides.
 - .1 Width: to suit sign sizes.
- .8 Bituminous paint: to MPI EXT 5.4D.

2.2 EXTERIOR SIGNAGE

- .1 Wording for exterior signage will be confirmed by Project Manager.
 - .1 Make allowance for 26 letters.
 - .2 Font and letter spacing to be confirmed by Project Manager on shop drawings.
 - .3 Construction and installation:
 - .1 Letters to be 150mm height and manufactured from 4mm thick silver anodized aluminum.
 - .2 Supply with min. two mounting studs welded to each letter.

- .3 Supply with corrosion resistant mounting hardware and secure fastening brackets for attachment to substrate.
- .4 Ensure that full continuity of air-barrier is achieved where mounting hardware or fasteners penetrate air-barrier.

2.3 DOOR SIGNAGE

- .1 Fabricate sign faces of 3mm thick material with clear anodized aluminum finish.
- .2 Sign graphics: apply by engraving.
- .3 Fixed mounting:
 - .1 Prepare wall plates for fixing by concealed tamperproof clips to meet Project Manager's approval.
 - .2 Include back-up plates for fixing to uneven surfaces where required.
- .4 Room numbering signage:
 - .1 Size to be 50mm high x 100mm wide.
 - .2 Final room numbering will be confirmed by Project Manager on shop drawings.

2.4 ILLUMINATED SIGN

- .1 Approved Product: RCMP Approved double faced free standing sign Model RCMP-2B Type 2 as manufactured by Pattison sign group c/w posts and base plates
- .2 Representative's DCC Representative's Consultant's sample.

2.5 PARKING SIGNAGE

- .1 Screen print on steel or aluminum with reflective sheeting finish.
 - .1 Handicapped parking with pictogram only, 450 mm square. Acceptable product: Lab Safety Supply CN-22138.
 - .2 "Visitor Parking" 450 mm x 300 mm horizontal. Acceptable product: Seton TC32.
 - .3 "Staff and Police Vehicles Only" 600 mm square. Acceptable product: Seton TC44.
- .2 U-Channel post: Hot dipped galvanized rolled high tensile steel, length to suit, prepuce with 10 mm holes at 25 mm orc.
- .3 Tamper-proof bolts and nuts: steel zinc plated bolts with cone shaped fluted aluminum nuts.

2.6 WASHROOM PICTOGRAPHS

- .1 Engraved white on blue field with wheelchair symbols. acceptable Product: Frost 960-B, 961-B, 962-B, 963-B, and 966-B, or approved equivalent

2.7 FABRICATION

- .1 Fabricate signs in accordance with details, specifications and shop drawings.

- .2 Build units square, true, accurate to size, free from visual or performance defects.
- .3 Fit and securely join sections to obtain tight, closed joints.
- .4 Allow for thermal movement without distortion of components.
- .5 Exposed fasteners permitted where indicated where approved by Consultant and to be inconspicuous and same color and finish as base material or as noted.
- .6 Polish exposed edges of metal to smooth, slightly convex profile.
- .7 Do steel welding to CSA W59 and aluminum welding to CSA W59.2.
 - .1 Finish exposed welds flush and smooth.
- .8 Apply bituminous paint to aluminum in contact with dissimilar metals, concrete or masonry.
- .9 Manufacturer's nameplates on sign surface permitted in non-visible locations in completed work.

Part 3 Execution

3.1 INSTALLATION

- .1 Manufacturer's Instructions: compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheets.
- .2 Erect and secure signs plumb and level at elevations indicated.
- .3 Comply with sign manufacturer's installation instructions and approved shop drawings.
- .4 Mechanical attachment:
 - .1 To concrete or solid masonry: use lag screws and expansion bolts or screws and fibre plugs, as appropriate for stresses involved.
 - .2 To hollow masonry: use toggle bolts or equivalent.
 - .3 To steel: use bolts with nut and lock washers, self-tapping screws.
 - .1 Do steel welding to CSA W59 and aluminum welding to CSA W59.2.
 - .2 Finish exposed welds flush and smooth.
 - .4 To wood: use screws.
 - .5 Secure into framing members behind stud walls or above ceilings.
 - .6 Mechanical fasteners on exterior: non-staining, non-ferrous type.
 - .7 Fabricate special fasteners as required for installation conditions.
 - .8 Mechanical fasteners and methods of attachment subject to Consultant's approval.
 - .1 Obtain Consultant's approval before fixing to structural steel.
- .5 Adhesive attachment:
 - .1 Use self-stick adhesive foam tape to manufacturer's instructions to fix sign and prevent "rocking".

- .2 Keep tape maximum 1.6 mm from edges.

3.2 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.

3.3 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
 - .1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
 - .2 Leave signs clean.
 - .3 Remove debris from interior of sign boxes.
 - .4 Touch up damaged finishes.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Aluminum Association (AA)
 - .1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for wall and corner guards and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Installation Drawings:
 - .1 Indicate on drawings large scale details, materials, finishes, dimensions, anchorage and assembly.
- .4 Samples:
 - .1 Submit duplicate 300 mm long samples of profiles and colours for corner guards.

1.3 QUALITY ASSURANCE

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

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

Part 2 Products

2.1 MATERIALS

- .1 Metal corner guards: 89 x 89 mm size, 1000 mm long, type 302 polished satin finished stainless steel, with removable protective paper cover, adhesive mounted.
 - .1 Standard of Acceptance: CS Group CO-8 corner guards.

2.2 ACCESSORIES

- .1 Fasteners: self-tapping stainless steel, concealed flush mounting.
- .2 Adhesive: water resistant type as recommended by manufacturer for substrate.

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 wall and corner guards installation in accordance with manufacturer's written instructions.

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 units on solid backing and erect with materials and components straight, tight and in alignment.
- .2 Adhere wall guards at 200 mm maximum on centre straight and level to variation plus or minus 3 mm over 3000 mm straight edge, non-cumulative.

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

3.5 PROTECTION

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

END OF SECTION

Part 1 General

1.1 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-B651-04, Accessible Design for the Built Environment.
 - .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

1.2 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 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors for grab bars.

1.3 CLOSEOUT SUBMITTALS

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

1.4 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 Departmental Representative

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .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 toilet and bathroom accessories from nicks, scratches, and blemishes .
 - .3 Replace defective or damaged materials with new.

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.
- .3 Sustainability Characteristics:
 - .1 Laminate Adhesives:
 - .1 Urea Formaldehyde Free.
- .4 Stainless steel tubing: Type 302, 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 Toilet tissue dispenser: double roll type, surface mounted, chrome plated steel frame, capacity of 500 double ply roll, roll under spring tension for controlled delivery.
 - .1 Acceptable Products:
 - .1 Frost 150
 - .2 Bradly 522
- .2 Paper towel dispenser: for double fold paper towels, stainless steel cabinet, hinged front panel, refill indicator slot, lock and key, surface mounted.
 - .1 Acceptable Products:

- .1 Frost 103-1
 - .2 Bradly 252
- .3 Combination towel dispenser/waste receptacle: recessed wall unit, approximately 355 mm wide, 933 mm high, 155 mm deep. Interior of 0.8 mm galvanized steel, exterior of 0.8 mm stainless steel. Suitable for dispensing folded or roll paper towels. Removable galvanized steel waste receptacle, lockable access door with continuous full height stainless steel hinge.
 - .1 Acceptable Products
 - .1 Frost 400B
 - .2 Bradly 234-35
- .4 Soap dispenser: liquid push-in valve 102 mm spout, self-contained 40 oz. tank, stainless steel piston and valve assembly, tamper proof filler lock, surface mounted, exposed metal components chrome plated.
 - .1 Acceptable Products
 - .1 Frost 708A
 - .2 Bradley 6562
- .5 Soap dispenser: liquid push-in valve 102 mm spout, self-contained 340 mL glass 1.14 L tank, stainless steel piston and valve assembly, tamper proof filler lock, under counter mounted, exposed metal components chrome plated.
 - .1 Acceptable Products
 - .1 Frost 712
 - .2 Bobrick B-8826
- .6 Feminine napkin disposal bin: stainless steel, surface unit including rough-in frame, continuous hinged door, self-closing, embossed with "napkin disposal", removable stainless steel receptacles fitted with spring clip for deodorizer block.
 - .1 Acceptable Products
 - .1 Frost 633-2
 - .2 Bradley 4722-10-15
- .7 Shower curtain: 225 g white duck anti-bacterial fire resistive self-extinguishing vinyl laminated fabric shower curtain. Provide curtain hold-back hook and chain at each curtain.
 - .1 1.5 fullness and to hang within 10mm of floor
 - .2 25mm side seams and 50mm top and bottom hems
 - .3 Top hem reinforced and fitted with brass grommets at maximum 300mm O.C.
 - .4 Standard of Acceptance
 - .1 Hold – back hook and chain: Frost 1144-500
- .8 Shower rods: stainless 25 1.2 mm wall thickness steel tubing of required length with satin chrome finished flanges, 12 shower curtain hooks and curtain hold-back hook and chain. Shower rod material and anchorage to withstand downward pull of 0.9 kN.
 - .1 Standard of Acceptance

- .1 Frost 972
- .2 Bradley 9558
- .9 Towel bar: 25 mm diameter stainless steel tubing, stainless steel end brackets, concealed fasteners, 600 mm long.
 - .1 Frost 1141S
- .10 Grab bars: 30/32 mm wall tubing of stainless steel, 76 mm diameter wall flanges, exposed screw attachment, flanges welded to tubular bar, provided with steel back plates and all accessories. Knurl bar at area of hand grips. Grab bar material and anchorage to withstand downward pull of 2.2 kN.
 - .1 Bar sizes 600mm, 1200mm, 450mm
 - .2 Acceptable Products
 - .1 Frost 1001 series
 - .2 Bradley 837 series
- .11 Robe hook: stainless steel with 75 mm projection.
 - .1 Acceptable Products
 - .1 Frost 1138S
 - .2 Bradley 9114
- .12 Waste receptacle: Type wall mount 50 litre capacity , white enamelled finish, spring loaded door
 - .1 Acceptable Products
 - .1 Frost 30
- .13 Tilt mirror: wall mounted unit, fixed 600mm x 750mm fixed framed mirror, float glass 6mm , stainless steel frame, satin finish welded corners, 15 year anti silvering warranty
 - .1 Acceptable Products
 - .1 Frost 941-2430FT
 - .2 Approved equal.

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 to prevent 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 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instructions for building in anchors and inserts.
- .9 Provide steel anchor plates and components for installation on studding and building framing.

2.4 FINISHES

- .1 Chrome and nickel plating: to ASTM B456, satin polished finish.
- .2 Baked enamel: condition metal by applying one coat of metal conditioner to CGSB 31-GP-107Ma, apply one coat Type 2 primer to CAN/CGSB-1.81 and bake, apply two coats Type 2 enamel to CAN/CGSB-1.88 and bake to hard, durable finish. Sand between final coats. Colour selected from standard range by Departmental Representative DCC Representative Consultant.
- .3 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.

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.
- .5 Install mirrors in accordance with Section 08 80 50 - Glazing.

3.3 ADJUSTING

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

3.4 CLEANING

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

3.5 PROTECTION

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

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .2 National Fire Protection Association (NFPA)
 - .1 NFPA 10-2006, Standard for Portable Fire Extinguishers.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.
- .3 Provide shop drawings.
- .4 Closeout Submittals:
 - .1 Provide operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.3 DELIVERY, STORAGE AND HANDLING

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

- .1 Stored pressure rechargeable type with hose and shut-off nozzle, ULC labelled for A, B and C class protection.
 - .1 Sizes 9 kg or as indicated.

2.2 EXTINGUISHER BRACKETS

- .1 Type recommended by extinguisher manufacturer.

2.3 CABINETS

- .1 Flush surface semi-recessed type as indicated, constructed of 1.6 mm thick steel, 180 degrees opening door of 2.5 mm thick steel with latching device.
- .2 Cabinet to maintain fire resistive rating of construction in which they occur.
- .3 Cabinet door: with metal panel.
- .4 Finish:
 - .1 Tub: prime coated.
 - .2 Door and frame: No.4 satin finish stainless steel.

2.4 IDENTIFICATION

- .1 Identify extinguishers in accordance with recommendations of ANSI/NFPA 10 CAN/ULC-S508.
- .2 Attach tag or label to extinguishers, indicating month and year of installation. Provide space for service dates.

2.5 FIRE SAFETY BLANKETS

- .1 1800 x 1800 mm of silicone coated fibre glass in metal container.

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 or mount extinguishers in cabinets or on brackets as indicated.
- .2 Install fire safety blankets as indicated.

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

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

1.2 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:
 - .1 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 metal lockers from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MANUFACTURED UNITS

- .1 Police Lockers: to CAN/CGSB-44.40, Type 1-Single full-height locker, Class 2 - A bank of two or more lockers, freestanding. Size: 450 mm wide x 610 mm deep x 1829 mm high. Assembly: 16 ga. frames and hinge reinforcement. Top: sloped, 20 ga. Standard of Acceptance Shanahans Police Lockers
- .2 Doors: one leaves, one piece double wall envelope construction, steel thickness - outer skin 20 ga., inner skin 24 ga., hinges 14 ga. Allow for three colours to be selected by Departmental Representative. Sides and back: 24 ga. Door handle: recessed handle steel with bright chromium nickel-plated finish with 10 ga. hasp for padlock.

.3 ACCESSORIES

- .1 19 mm dia. steel hanger rods with chromium finish.
- .2 100 mm steel base.
- .3 Steel end panels.
- .4 Steel trim including corner angles.
- .5 Jamb trim.
- .6 Fillers.
- .7 Number plates.
- .8 Coat hooks.
- .9 Belt hook.
- .10 Note clip.
- .11 Boot Drip Tray: removable 528 mm wide x 558 mm deep x 38 mm high black PVC.
- .12 Pistol Drawer: 20 ga. steel full extension pullout pistol drawer with heavy duty nylon roller tray glide, built-in cylinder cam locks, master keyed with each lock keyed differently.
- .13 Provide duplicate keys for each locker padlock and each pistol drawer.

2.2 Pistol Lockers:

- .1 DSM - Model EDHGF04V flush mount four door unit c/w locks (two required), as manufactured by Space Saver.

2.3 Evidence Lockers:

- .1 Construction to be the same as the Police lockers, size 305mm wide x 610mm deep x 1829mm high 2 tier Type B, and 457mm wide x 610mm deep x 1829mm high, 2 tier type A and 4 tier as indicated on drawings.

2.4 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.

2.5 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 back panels to exposed ends backs of locker banks.
- .6 Install locker numbers.

2.6 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.

2.7 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.

2.8 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 REFERENCES

- .1 The Aluminum Association Inc. (AAI)
 - .1 AAI DAF45-2003, Designation System for Aluminum Finishes - 9th Edition.
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A490M-ae1, Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints Metric.
 - .2 ASTM A653/A653M-06a, Standard Specification for Steel Sheet, Zinc-Coated, (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.81-M90(R1990), Air Drying and Baking Alkyd Primer for Vehicles and Equipment.
 - .2 CAN/CGSB-1.88-92, Gloss Alkyd Enamel, Air Drying and Baking.
 - .3 CGSB 31-GP-107Ma-90, Non-inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.
- .4 Canadian Standards Association (CSA International)
 - .1 CSA-G40.20-04/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W59-03, Welded Steel Construction (Metal Arc Welding).
- .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 - February 2004.
 - .1 MPI # 76, Quick Dry Alkyd Metal Primer.
 - .2 MPI # 96, Q.D. Alkyd Enamel Gloss.

1.2 DESIGN REQUIREMENTS

- .1 Design and construct metal storage shelving to support uniform load of 227 kg per 1200 mm shelf, and 259 kg per shelf, with a maximum deflection of 1/180.
- .2 Design shelving to accommodate vertical adjustment of shelves in 50 mm increments and to permit easy assembly, expansion, dismantling and re-use of shelving component parts.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit shop drawings:

- .1 Indicate shelving layouts, number of bays, number of shelves, number and size of drawers, bins, number of dividers, system of bracing and anchoring devices.

- .3 Samples:

- .1 Submit representative sample bay of specified shelving showing finish colour and including accessories.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:

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

1.5 EXTRA MATERIALS

- .1 Provide maintenance materials, special tools and spare parts in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Provide 6 spare shelves end panels components for maintenance use.
 - .1 Store where directed.
 - .2 Identify each box.
- .3 Provide tools for assembly and disassembly, standard with metal storage shelving manufacturer.

Part 2 Products

2.1 MATERIALS

- .1 Galvanized steel sheet: commercial grade to ASTM A653/A653M with Z275 zinc coating.
- .2 Steel sections and plates: to CSA-G40.20/G40.21, Type 400 W.
- .3 Steel bolts, nuts and washers: to ASTM A490M.
- .4 Welding materials: to CSA W59.
- .5 Shelving:
 - .1 Storage shelving:
 - .1 Depth of shelving : as noted on drawings
 - .2 Length of shelving: as noted on drawings
 - .3 Height of shelving: as noted on drawings
 - .4 Number of shelves per unit: 5

2.2 COMPONENTS

- .1 Uprights:
 - .1 Roll formed steel angles or tees with perforations to accommodate shelves and other components.

- .2 Size and thickness of angles or tees to support specified total load.
- .2 Shelves:
 - .1 Brake formed sheet metal, reinforced to carry specified loads.
 - .2 Punch holes in shelves to accommodate dividers and other components.
- .3 Kickplates: formed sheet metal to close opening between bottom shelf and floor on front and on sides of shelving bay.
- .4 Side panels: 0.6 mm core thickness steel sheet panels to close ends of shelving bays or sections and as partitions between adjacent bays.
- .5 Dividers:
 - .1 Reinforced sheet metal plates for subdividing shelves into bins.
 - .2 Provide for attachment of dividers to shelves immediately above and below dividers.
- .6 Braces:
 - .1 Provide sway braces for open type shelving.
 - .2 Use side sway braces on two exposed sides of each rack and at alternate bays.
 - .3 Use back sway braces on two end sections of each bank and on alternate bays.
- .7 Label holders: attachable to front edge of shelf with provision to hold paper or plastic label.
- .8 Base plates: metal or plastic plates to take uprights and to protect floor surfaces.

2.3 FINISH

- .1 Finish shelving system painted in standard cream-beige colour .
- .2 Condition metal by applying one coat of metal conditioner to CGSB 31-GP-107Ma.
- .3 Apply one coat type 2 primer to CAN/CGSB-1.81 MPI # 76 and bake.
- .4 Apply two coats of type 2 enamel to CAN/CGSB-1.88 MPI # 96 and bake to hard durable finish.
- .5 Manufacturers or brand names on face of units are not acceptable.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION

- .1 Do metal storage shelving work except where specified otherwise.
- .2 Install metal storage shelving in accordance with reviewed layout.

- .3 Brace, secure and anchor shelving units in place.
- .4 Make good baked enamel surfaces damaged during shipment or installation.

3.3 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.

3.4 CLEANING

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

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 The Aluminum Association (AA)
 - .1 AA DAF-45-R2003, Designation System for Aluminum Finishes - 9th Edition.
- .2 ASTM International
 - .1 ASTM A53/A53M-10, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .3 ASTM A480/A480M-10a, Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.
 - .4 ASTM B241/B241M-02, Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.
- .3 Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for flag poles and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Indicate dimensions, finishes, base jointing, anchoring and support systems, cleats, halyard boxes, trucks, finials and base collar for flagpoles.
 - .2 Submit copies of drawings of flagpoles and bases, showing general layout, jointing and complete anchoring and supporting systems.
- .4 Manufacturer's Instructions: submit manufacturer's installation instructions for each type of flagpole.

1.3 QUALITY ASSURANCE

- .1 Provide each flagpole as complete unit produced by single manufacturer, including fittings, accessories, bases and anchorage devices.

1.4 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 Spiral wrap each flagpole with heavy kraft paper, wood strip and steel band, or polyethylene wrap and pack in tubing for shipment.
 - .2 Ship flagpole to installation site in one piece.
 - .3 Deliver flagpole in 2 pieces.
 - .1 When more than one piece is required, provide precision joints with self-aligning internal splicing sleeve arrangement.
- .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 flagpoles from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Aluminum:
 - .1 Aluminum Association alloy AA 6063-T5 seamless extruded aluminum tubing.
 - .2 Fabricated from seamless extruded tubing in accordance with ASTM B241, alloy 6063 T6, having minimum tensile strength not less than 20 MPa and a yield point of 17 MPa. Heat treated and age hardened after fabrication.
- .2 Isolation coating: alkali-resistant bituminous paint or epoxy resin solution.

2.2 DESIGN CRITERIA

- .1 Flagpole, bases and anchorage devices to resist minimum wind velocity of 145 km/h unflagged, 100 km/h flagged.

2.3 FABRICATION

- .1 Fabricate 7600 mm long flagpole as complete unit including base mounting brackets anchorage and fittings.
- .2 Cone tapered flagpole:
 - .1 Seamless, uniform, straight line tapered section above cylindrical butt section.
 - .2 Taper: 25mm per 1700mm of run.
 - .3 Provide internal splicing, self-aligning sleeve of same material as flagpole for snug fitting, watertight field joints.
- .3 Weld in accordance to appropriate CSA Standard, by welders certified by Canadian Welding Bureau. Finish exposed welds flush and smooth.

2.4 ACCESSORIES

- .1 Finial: 150 mm diameter ball, 1.6 mm minimum thick, aluminum to match flagpole finish.
- .2 Truck assembly: stainless steel ballbearing, nonfouling, revolving double truck assembly, finish to match flagpole.
- .3 Cleats: 230 mm size, two per halyard, cast aluminum finish to match flagpole.
- .4 Halyard: internal, two continuous halyards per flagpole; stainless steel Retaining loop and weights for internal halyard, nylon covered.
- .5 Swivel snaps: two per halyard; aluminum with neoprene or vinyl covers.
- .6 Cleat box: one per cleat; cast aluminum finish to match flagpole. Furnish hasp for padlock, hinged cover, and tamperproof screws. Include lockable cleat box.
- .7 Flags: 900mm x 1800mm size, knitted polyester, printed with UV protection
 - .1 Supplied by owner

2.5 FINISHES

- .1 Aluminum:
 - .1 Finish exposed surfaces of aluminum components in accordance with AA DAF-45.
 - .2 Appearance and properties of anodized finishes designated by the Aluminum Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative.

2.6 FIELD FABRICATION

- .1 Fabricate mountings of same metal as flagpoles were exposed and of galvanized steel where encased in concrete.

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 flagpole installation in accordance with manufacturer's written instructions.

3.2 INSTALLATION

- .1 Shop apply isolation coating to metal surfaces of flagpole and base that will be encased in concrete.
- .2 Install flagpoles, base assemblies and fittings to shop drawings and manufacturer's instructions.
- .3 Check and adjust installed fittings for smooth operation of halyards.

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.

3.4 PROTECTION

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

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Clearly Indicate component construction and installation details.

1.2 QUALITY ASSURANCE

- .1 Provide each flagpole as complete unit produced by single manufacturer, including fittings, accessories, bases and anchorage devices.

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

Part 2 Products

2.1 Manufactured Products

- .1 Institutional Wall Mount Seat – Room 138
 - .1 Bobrick Model B-5191
- .2 Storage Bins for Prisoner Effects
 - .1 Norix Model PB300 c/w sliding lid, 15 required
- .3 Gun Discharge Station - 2 required location by consultant during construction
 - .1 Supply and install two Ultimate Firearm Unloading Station, Painted Safety Red, 381MM dia x 1015Mm high 235,000 PSI strength impact plate , 500 Brinell Hardness. Available from Weizel Security
- .4 Boot Scrubber (One required at rear entry)
 - .1 Electrically powered, hand activated boot scrubber c/w water pan
 - .2 Acceptable Product: Unit 125 Boot Boy by Olsen Curling and Manufacturing and supplies. 1-780-425-8646

2.2 CLEANING

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

2.3 PROTECTION

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

Part 3 INSTALLATION

- .1 Lay Drying Mats to shower stall drying areas
- .2 Place boot scrubbers in location designated by Departmental Representative
- .3 Install Prisoner effects storage bins on shelving in room 135
- .4 Install Gun Discharge unit as indicated on drawings

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

- A. Section includes
 - 1. Manually operated Roller Shades
- B. Related work includes the following:
 - 1. Section 06100: Rough Carpentry
 - 2. Section 08520: Aluminum Windows

1.2 REFERENCES

- A. National Fire Protection Association (NFPA) 701
- B. Department of Transportation Motor Vehicle Safety Standard 302 Flammability of Interior Materials
- C. California Administrative Code Title 19
- D. Federal Standard 191 Method 5903 (used by Port Authority of New York and New Jersey for drapery, curtain, and upholstery material)
- E. Boston Fire Department Teat BFD IX-1
- F. New York State Uniform Fire Prevention and Building Code

1.3 SUBMITTALS

- A. Subject under provisions of Section 01330 – Submittal Procedures
- B. Product Data: Manufacturer's data sheets shall be submitted for each product specified, including:
 - 1. Preparation instructions and recommendations
 - 2. Finishes, material descriptions, dimensions of individual components
 - 3. Construction and installation instructions
 - 4. Manufacturers recommendations for maintenance and cleaning
- C. Drawings and Diagrams: Product details, installation details, working and assembly drawings shall be supplied as requested.
- D. Sample: Responsible contracting officer or agent shall supply one sample shade of each type specified in this contract for approval. Supplied units shall be furnished complete with all required components, mounting and associated hardware, instructions and warranty.

1.4 QUALITY ASSURANCE

- A. Supplier: Manufacturer, subsidiary or licensed agent shall be approved to supply the products specified, and to honor any claims against product presented in accordance with warranty.
- B. Installer: Installer or agent shall be qualified to install specified products by prior experience, demonstrated performance and acceptance of requirements of manufacturer, subsidiary, or licensed agent. Installer shall be responsible for an acceptable installation.

C. Uniformity: Provide Manual Roller Shades of only one manufacturer for entire project.

D. Mock up: Provide (1) mock-up shade for each roller shade type/assembly specified.

1.5 DELIVERY, STORAGE AND HANDLING

A. Product shall be delivered to site in manufacturer's original packaging.

B. Product shall be handled and stored to prevent damage to materials, finishes and operating mechanisms.

1.6 JOB CONDITIONS

A. Prior to shade installation, building shall be enclosed.

B. Interior temperature shall be maintained between 60° F. and 90° F. during and after installation; relative humidity shall not exceed 80%. Wet work shall be complete and dry.

1.7 WARRANTY

A. Lifetime Limited Warranty. Fabrics warranted for 5 years. Specific product warranties available from manufacturer or its authorized agent.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

A. Hunter Douglas Contract "RB 500 Dual Manual Roller Shades" or approved equivalent

B. Request for substitutions must be approved by architect minimum of 30 days prior to close of bid.

2.02 MANUAL ROLLER SHADES

A. PRODUCT: **Hunter Douglas Contract "RB 500 Dual Manual Roller Shades"**

B. MATERIALS:

1. FABRICS: Inherently anti-static, flame retardant, fade and stain resistant, light filtering, room darkening, & blackout fabrics providing 0% - 14% openness factors. Fabric weights to range between 6.00 oz/sq.yd. – 20.70 oz/sq.yd., containing fiberglass, PVC, polyester, acrylic, vinyl laminates, cotton, & vinyl coatings. Finish selected by architect from manufacturer's available contract colors.

2. CONTROL SYSTEMS:

A. CLUTCH OPERATED: Engineered heavy duty chain drive pulley operating system consisting of metal clutch housing and locking plug containing minimum 6 ribs and inserted at minimum of 2-1/4" into roller tube. Lift torque enhancement provided by Counter Balance System with integrated spring support module. Utilization of adjustment-free continuous qualified T304 stainless steel ball chain with 110 lbs breaking strength for precise control, smooth operation and ensuring a uniform look. Chain tensioner to be compliant with WCMA safety standard A100.1-2010 and must prevent the clutch system from moving the roller shade through lowering and raising if not

properly installed as specified in ANSI Standard Section 6.5.2. Components will be maintenance free from adjustments or lubrication for trouble-free operation.

B. CRANK OPERATED: Gear box assembly made from die cast aluminum and steel construction with steel crank insert. Permanent (or detachable) steel handle with flexible universal joints for easy turning force.

3. DUAL ROLLER SHADES: Universal mount steel brackets with 2 separate solar and room darkening blackout roller shades operating independently of each other.
4. ROLLER TUBE: Circular-shaped aluminum tube extruded from alloy and temper 6063 T-6. 2" outside diameter extruded tube to have a .063" wall thickness (2.5" outside diameter to have a .079" wall thickness). Heavily reinforced with minimum six internal ribs providing additional tensile strength and allows for secure placement of clutch & end plug.
5. HEAVY DUTY TUBE BEARING PLUG: Die cast metal and reinforced idler assembly containing spring loaded end plug with positive locking wheel allows for up to 7/8" adjustment and provides for a secure installation and removal of shade. Locking tube bearing plug contains minimum 6 ribs and inserted a minimum of 2-3/8" into roller tube.
5. BOTTOM BAR: Extruded aluminum weight in a Sealed Pocket Hem Bar, or RB Bottom Bar for fabrics that are not seamable. Bottom bar is for tracking adjustments and provides uniform look.
6. MOUNTING HARDWARE: Manufacturer's standard heavy duty bracket constructed of hardened 1/8" thick steel to support full weight of shade with bracket & screw hole covers to provide uniform look. Integrated leveling device for enhanced level adjustment of overall shade. Locking mechanism on bracket adapter provides for a secure installation and removal of the shade.
7. FASCIA: L shape removable aluminum extrusion valance that attaches to brackets and conceals roller shade.
8. ROLLER SHADE POCKET: Extruded aluminum alloy U shape housing for recessed mounting in acoustical tile or drywall ceilings. 5.25" (or 9") in diameter with aluminum closure mount.
9. BLOCKOUT SYSTEM: Extruded aluminum side channel with concealed mounting brackets. Bottom bar with nylon wool pile to prevent light leakage.

2.03 FABRICATION

- A. Shade measurements shall be accurate to within $\pm 1/8$ " or as recommended in writing by manufacturer.

2.04 FABRICS

- A. FABRIC: Roller #1: From Manufacturers Standard Range Roller #2: From Manufacturers Standard Range

PART 3 - EXECUTION

3.01 INSPECTION:

- A. SUBCONTRACTOR shall be responsible for inspection on site, approval of mounting surfaces, installation conditions and field measurement for this work.

- B. OTHER INTERACTING TRADES shall receive drawings of shade systems, dimensions, assembly and installation methods from subcontractor upon request.

3.02 INSTALLATION:

- A. INSTALLATION shall comply with manufacturer's specifications, standards and procedures as detailed on contract drawings.
- B. ADEQUATE CLEARANCE shall be provided to permit unencumbered operation of shade and hardware.
- C. CLEAN finish installation of dirt and finger marks. Leave work area clean and free of debris.

3.03 DEMONSTRATION:

- A. Demonstrate operation method and instruct owner's personnel in the proper operation and maintenance of the roller shades.

3.04 SCHEDULE:

- A. EXTERIOR WINDOWS: In Room 100,104, 105, 106 and 107

END OF SECTION 2

Part 1 General

1.1 REFERENCES

- .1 American National Standards Institute (ANSI)
 - .1 ANSI A208.1-09, Particleboard.
- .2 American National Standards Institute (ANSI)/Business and International Furniture Manufacturers Association (BIFMA) International
 - .1 ANSI/BIFMA X5.1-11, American National Standard for Office Furnishings, General Purpose Office Chairs - Tests.
 - .2 ANSI/BIFMA X5.6-10, American National Standard for Office Furnishings - Panel Systems.
 - .3 BIFMACMD-1-09, BIFMA Chair Measuring Device.
- .3 ASTM International
 - .1 ASTM C297/C297M-04(2010), Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions.
- .4 CSA International
 - .1 CSA C22.2 No.9.0-96(R2011), General Requirements for Luminaires.
 - .2 CAN/CSA-C22.2 No.203-M91(R2010), Modular Wiring Systems for Office Furniture.
 - .3 CAN/CSA-Z809-08, Sustainable Forest Management.
- .5 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
- .6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .7 Public Works and Government Services Canada (PWGSC) - Industrial and Commercial Products and Standardization Services Sector - Government Purchase Description (GPD)
 - .1 PWGSC-GPD-6-February 1999, Side Chairs with Metal Frame.
- .8 Sustainable Forestry Initiative (SFI)
 - .1 SFI-2010-2014 Standard.
- .9 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.
- .10 Underwriters' Laboratories Canada (ULC)
 - .1 CAN/ULC-S102-2010, Standard Method of Test for Surfaces Burning Characteristics of Building Materials and Assemblies.
- .11 Underwriters' Laboratories (UL)

- .1 UL 1286-2008(R2011), Standard for Office Furnishings.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for furniture 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 01 35 43 - Environmental Procedures.
- .3 Samples:
 - .1 Submit .

1.3 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for furniture for incorporation into manual.
- .3 Supply part numbers of furniture to allow for replacement of worn or damaged furniture parts.
- .4 Supply instructions detailing procedures for repairing or replacing worn furniture parts.

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

1.5 WARRANTY

- .1 Submit written assurance that replacement parts will be available for minimum of 5 years following discontinuation of product manufacture.
- .2 Ensure warranties provide for repair rather than replacement.

Part 2 Products

2.1 MANUFACTURERS

- .1 TEKNION
- .2 GLOBAL UPHOLSTERY
- .3 HAWORTH, LTD

2.2 MATERIALS

- .1 Wood: visible wood free from open knots .
 - .1 Wood veneers: applied to furniture 0.7 minimum mm thick.
- .2 Certified Wood to: CAN/CSA-Z809 or FSC or SFI.
- .3 Adhesives used to apply plastic laminates capable of achieving tensile strength of 552 kPa minimum when tested to ASTM C297.

2.3 WORKSTATION TYPE 1

- .1 51”H Powered Panel system as per attached drawing including the following:
 - .1 42” x 24” rectangular worksurface
 - .2 42” x 42” corner worksurface
 - .3 54” x 24” rectangular worksurface
 - .4 mobile box/file pedestal
 - .5 42” Shelf
 - .6 Above worksurface double power box, 8 Wire, Isolated Ground, Circuits 1 & 2
 - .7 Communication and data outlets
 - .8 Base feed
 - .9 Conforms to all Teknion Leverage Standards
 - .10 See following Sketch

2.4 WORKSTATION TYPE 2

- .1 51”H Powered Panel system as per attached drawing including the following:
 - .1 42” x 24” rectangular worksurface Qty - 2
 - .2 42” x 42” corner worksurface
 - .3 36” x 24” rectangular worksurface
 - .4 mobile box/file pedestal
 - .5 2 drawer lateral file
 - .6 42” Shelf
 - .7 Above worksurface double power box, 8 Wire, Isolated Ground, Circuits 1 & 2
 - .8 Communication and data outlets
 - .9 Base feed
 - .10 Conforms to all Teknion Leverage Standards

2.5 WORKSTATION TYPE 3

- .1 Modular workstation as per attached drawing including the following:
 - .1 72" x 30" rectangular desk
 - .2 72" x 24" rectangular desk
 - .3 48" x 24" Bridge return
 - .4 36" storage cabinet with laminate doors
 - .5 metal mobile box/box/file pedestal
 - .6 36"metal lateral filing cabinet
 - .7 Conforms to all Teknion R&B Casegoods Standards
 - .8 See following Sketch

2.6 MEETING TABLES

- .1 Type 1
 - .1 96" x 48" Racetrack Table with T-Legs
~ conforms to all Teknion R&B Casegoods Standards
See following Sketch
- .2 Type 2
 - .1 60" x 30" Rectangular Table with T-Legs
~ conforms to all Teknion R&B Casegoods Standards
See Following sketch

2.7 SEATING

- .1 General Purpose Office Seating: to ANSI/BIFMA X5.1 CAN/CGSB-44.232.
 - .1 Type I: tilt seat.
 - .1 Standard of Acceptance: Teknion Model:NPRTNP
 - .2 Features: to CAN/CGSB-44.232.
 - .3 Upholstery: to CAN/CGSB-44.232.
 - .1 Fabric to meet heavy duty rating for abrasion resistance.
 - .4 Backrest: to CAN/CGSB-44.232.
 - .1 Backrest-to-Seat-Angle: adjustable with minimum adjustment of 10 degrees within range of 93 degrees to 113 degrees.
 - .2 Lumbar Support: to CAN/CGSB-44.232.
 - .1 Lumbar support height: adjustable by at least 50 mm within range of 250 mm above seat as measured using BIFMA CMD - 1.
 - .5 Armrests: to CAN/CGSB-44.232.
 - .1 Supply chair with removable armrests.
 - .1 Armrest to be detachable using commonly available tools.

- .2 Armrests to be able to swing under the chair out of the way.
- .6 Column: to CAN/CGSB-44.232.
 - .1 Seat height adjustment: standard seat height.
- .7 Controls: seat height and chair tilt tension adjustable by user of chair while seated, semi-seated or standing when chair in upright position.
 - .1 Controls for other adjustment mechanisms accessible by seated user.
 - .2 Include controls with positive action to operate and position where they cannot be activated inadvertently under normal use of chair.
- .8 Seat: to CAN/CGSB-44.232.
- .9 Seat and Backrest Locks: to CAN/CGSB-44.232.
 - .1 Lockable or stoppable at multiple positions with adjustment ranges.
- .10 Foam cushioning material used in seat and backrest: to CAN/CGSB-44.232.
- .11 Casters: to CAN/CGSB-44.232 for hard surfaces.
- .12 Preparation for delivery: conform to normal commercial practice.

2.8 PANEL SYSTEM

- .1 General: to CAN/CGSB-44.227 ANSI/BIFMA X5.6.
 - .1 Panels: acoustic classes acoustic high performance non acoustic.
 - .2 Finish: to CAN/CGSB-44.227.
 - .3 Standard of Acceptance Teknion: Leverage Panel system
- .2 Materials:
 - .1 Wood: to CAN/CGSB-44.227.
 - .2 Certified Wood to: CAN/CSA-Z809 or FSC or SFI.
 - .3 Particleboard: to ANSI A208.1 grade m² or greater.
- .3 Upholstered sections of any panel: one piece without any sewn or glued seams.
 - .1 Install upholstery fabric with concealed edges to prevent fraying and make them stable to prevent snags or wrinkles. Ensure warp of directional fabrics is applied with squareness tolerance of +/- 6 mm over space of 1 m.
- .4 Welds: to CAN/CGSB-44.227.
- .5 Use hardware in assembling components and connecting panels that allows for repeated assembly, disassembly and reconfiguration.
- .6 Allow clearance between vertically user adjustable surface and any adjacent surface, of 25 mm minimum.
 - .1 Clearance less than 8 mm, is acceptable where clearance is maintained throughout travel of adjusting surface.
 - .2 Articulating keyboard support surfaces are exempt from this requirement.
- .7 Clearance under work surfaces: to CAN/CGSB-44.227.

- .8 Adhesives: for application of plastic laminates to achieve a tensile strength of 449 kPa when tested in accordance with ASTM C297.
- .9 Panels:
 - .1 Panels: stable, stand straight and plumb when interconnected.
 - .1 Height variance of same height panels when interconnected 3 mm maximum.
 - .2 Panels: capable of accommodating industry standard communication modules with one knockout for communication modules on each side of panel.
 - .3 Provide panel tops, panel end trims and corner covers that can be attached to panel without visible connecting devices, unless finish of panel top, ends and corner linking devices are integrated into panel design.
 - .1 System to provide homogenized look and uniform, uninterrupted line of sight.
- .10 Panel finishes: fabric upholstered.
- .11 Flammability: to flame-spread rating and smoke developed classification when tested in accordance with CAN/ULC-S102.
- .12 Load bearing panels: provide mounting system, integral with assembled panel, full height of both sides of panel at each end.
 - .1 Include slotted vertical uprights at 30 mm maximum centres for component attachment.
 - .2 Ensure system has no visual gaps when installed.
- .13 Equip each panel with two glides with a minimum vertical adjustment of 38 mm.
 - .1 Include fastening device to secure glides designed to prevent panels coming loose or detached under normal use conditions of glides.
- .14 Connector system: capable of connecting panels of different heights and at junction connecting combination of 2, 3 or 4 panels at various angles.
 - .1 Include flexible hinge connector system to meet or exceed applicable tests listed in UL 1286.
- .15 Electrical system: to CAN/CSA-C22.2, No.203.
 - .1 Construct electrical system of modular components and capable of providing power only at needed locations, of being rearranged without altering or disassembling panel system.
 - .1 Provide receptacle accessible at work surface height.
 - .2 Provide minimum 8 wire, three-circuit capability to support variety of electronic equipment, where number 10 neutral wire is required.
 - .3 Powered panel:
 - .1 Panel 610 mm size provide with minimum of 1 duplex outlet per side and each powered panel.
 - .2 Panel 760 mm size or greater provide minimum of 2 duplex outlets per side.

- .3 Receptacles: interchangeable anywhere along wiring harness.
- .4 Powered panels with raceways accessible from both sides of panel at desk height:
 - .1 Powered panel 610 mm size provide space for at least 4 single outlets or 2 duplex outlets.
 - .2 Powered panel 760 mm size or greater provide space for 8 single outlets or 4 duplexes.
 - .3 Receptacles: interchangeable anywhere along wiring harness.
 - .4 Raceway access doors: opened and closed tightly without special tools.
- .5 Equip powered and non-powered panels with raceways capable of accommodating at least three 8 wire circuits and minimum of eight 25-pair data and telecommunications cables.
- .6 Raceways to provide sufficient space to allow for bend radius of at least 76 mm for installation of communications cables (especially fibre optics cables) both horizontal and vertical.
- .7 Non-powered raceways: capable of field conversion to powered raceways without requiring disassembly of workstation.
- .8 Raceways to provide for floor, ceiling and end of panel access.
- .9 Vertical wire management system: provide internal external to conceal wires running from raceway base to desk height and above or from desk height raceways to above.
- .10 Energy efficient task lights: T5 or T8 fixtures with electronic dimming ballast.
- .16 Base covers: capable of being opened without use of special tools and closing tightly without gap; complete with knockouts to receive back-to-back electrical outlets as required.
- .17 Provide covers for unused knockouts/access points, that are visible under normal use or installation, to prevent unsightly holes.
- .18 Paint: to MPI .
- .19 Colourization pigments: free from lead, chromium 51, cadmium or their components any toxic metals or their components.

2.9

FABRICATION

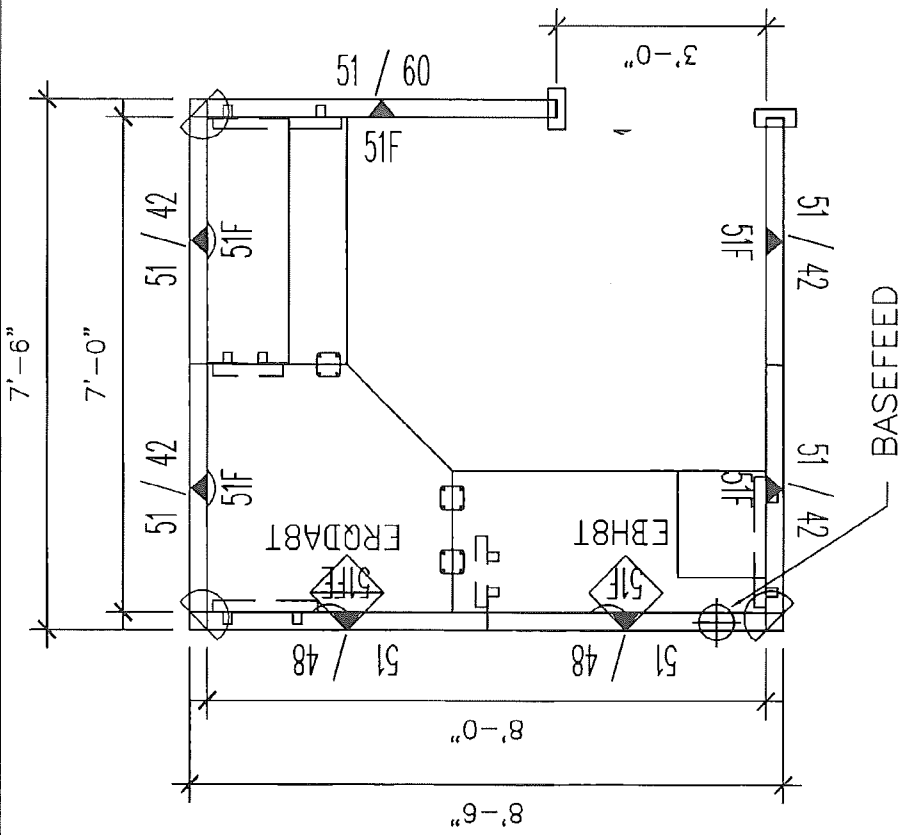
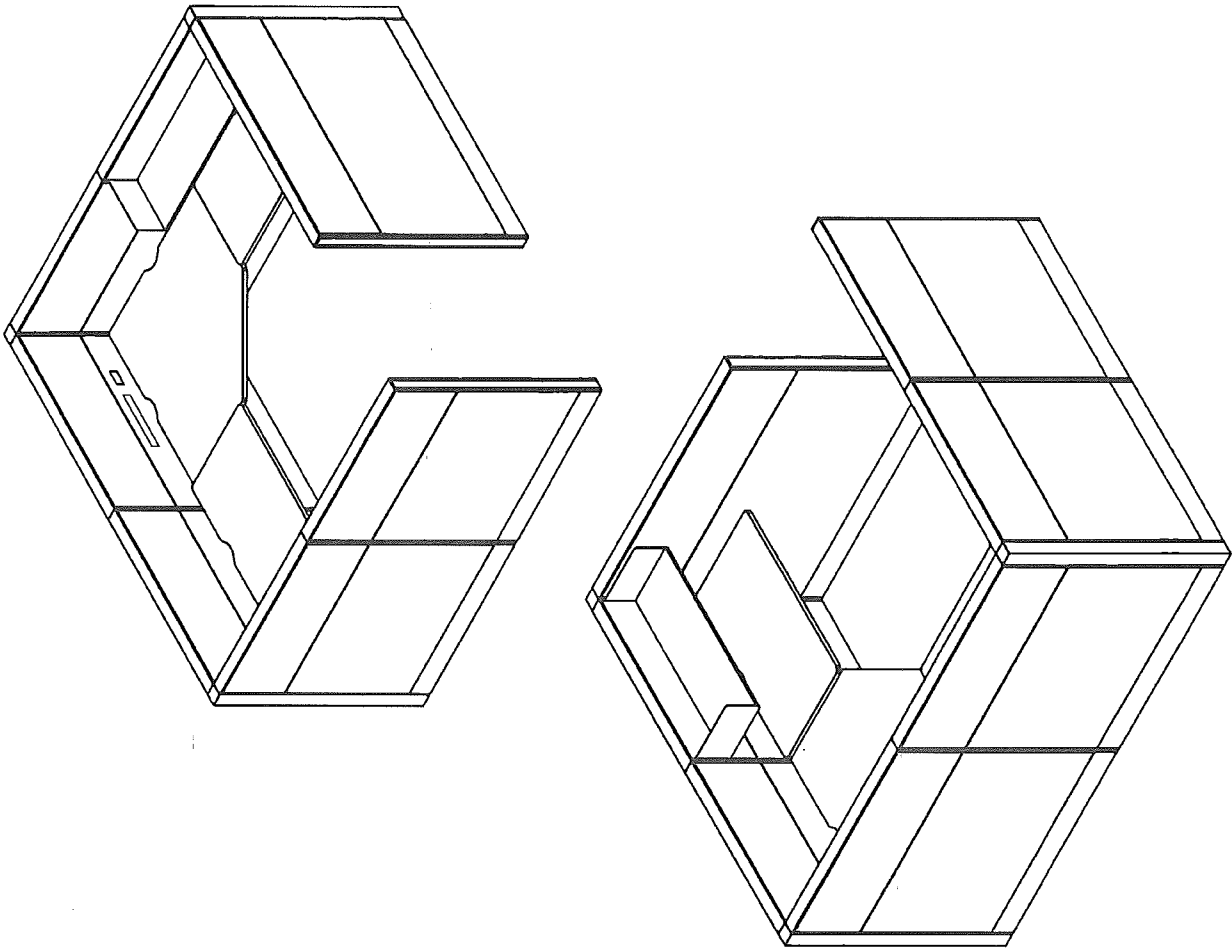
- .1 Manufacture furniture to allow for dismantling and replacing of worn or defective components and recycling options following first use.
 - .1 Fabricate furniture to allow for remanufacturing or refurbishing of furniture following first use.
 - .2 Seal exposed surfaces of particleboard constructed with urea formaldehyde adhesives to contain formaldehyde emissions.
- .2 Chair marking: to CAN/CGSB-44.232.
- .3 Chair labelling: to CAN/CGSB-44.232.

Part 3 Execution

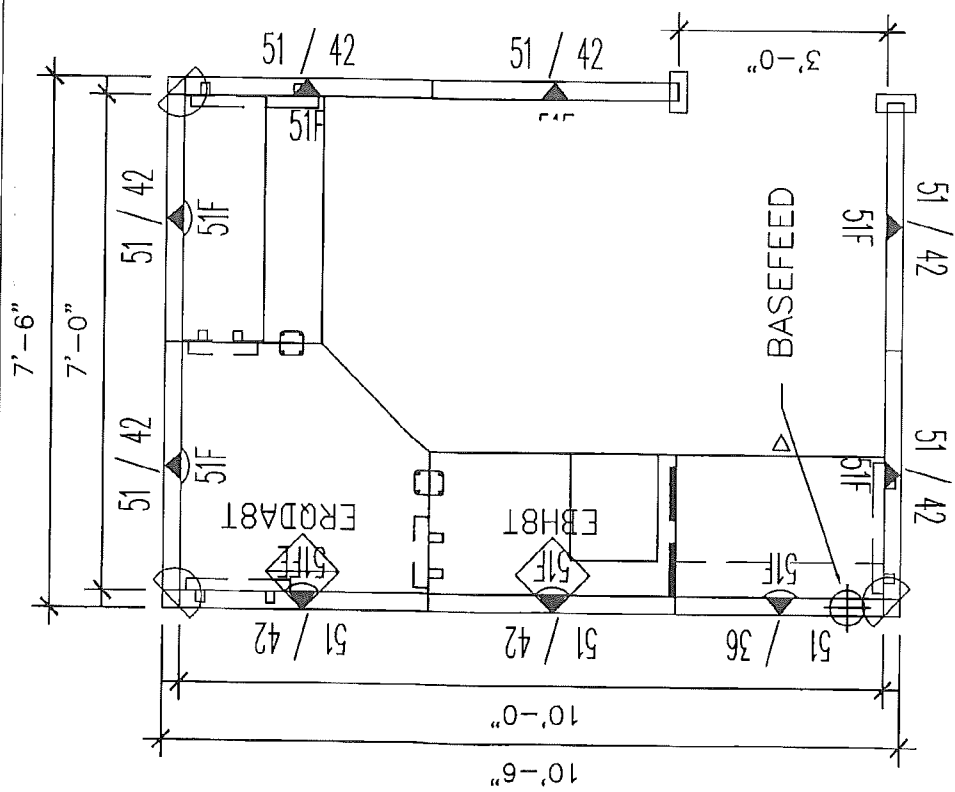
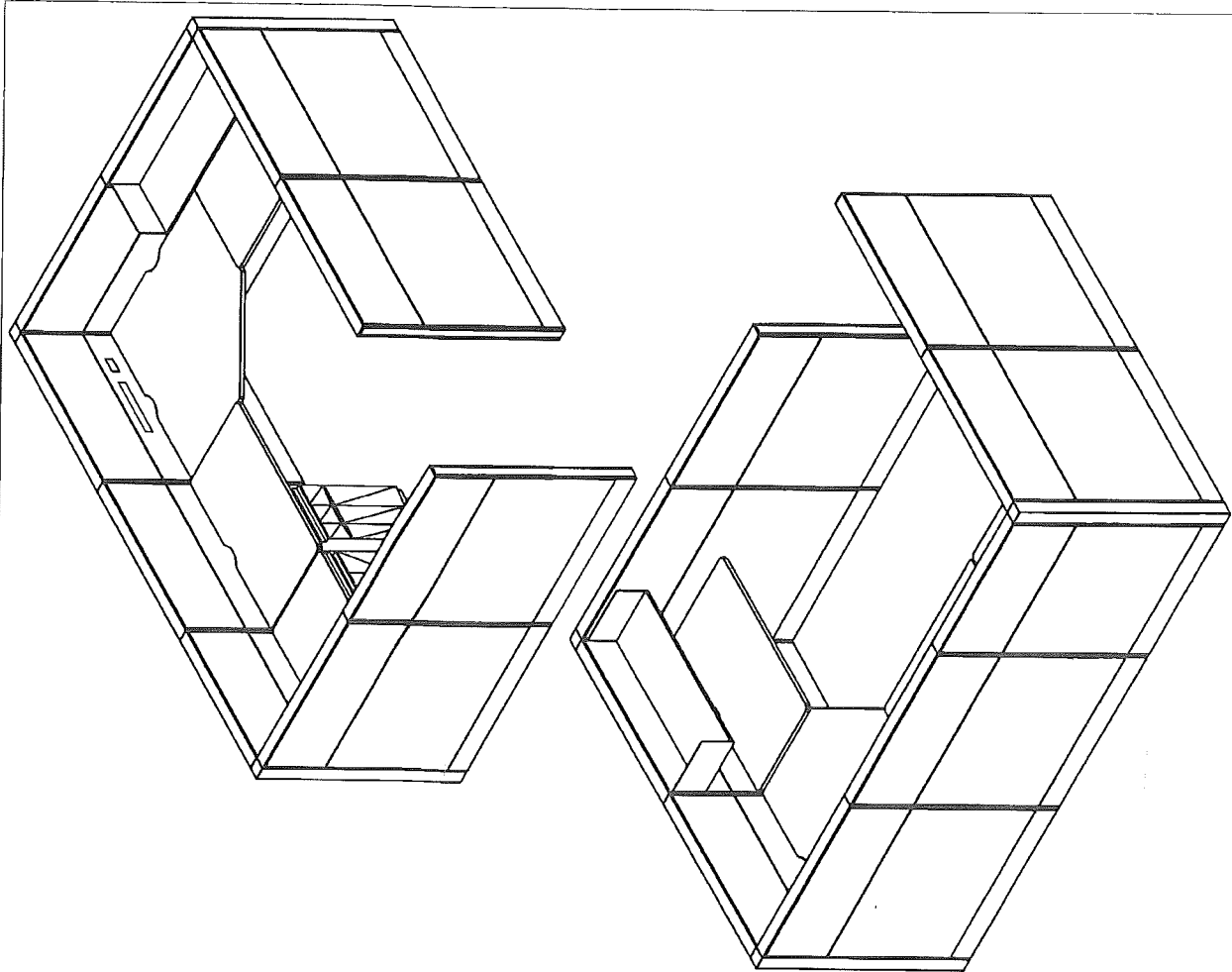
3.1 NOT USED

.1 Not used.

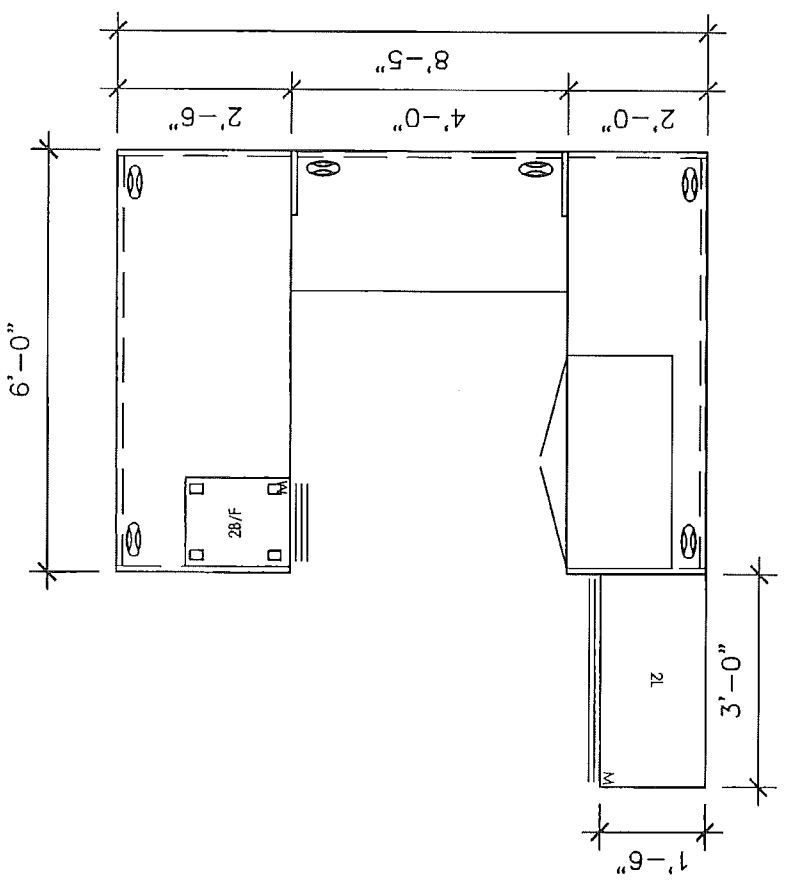
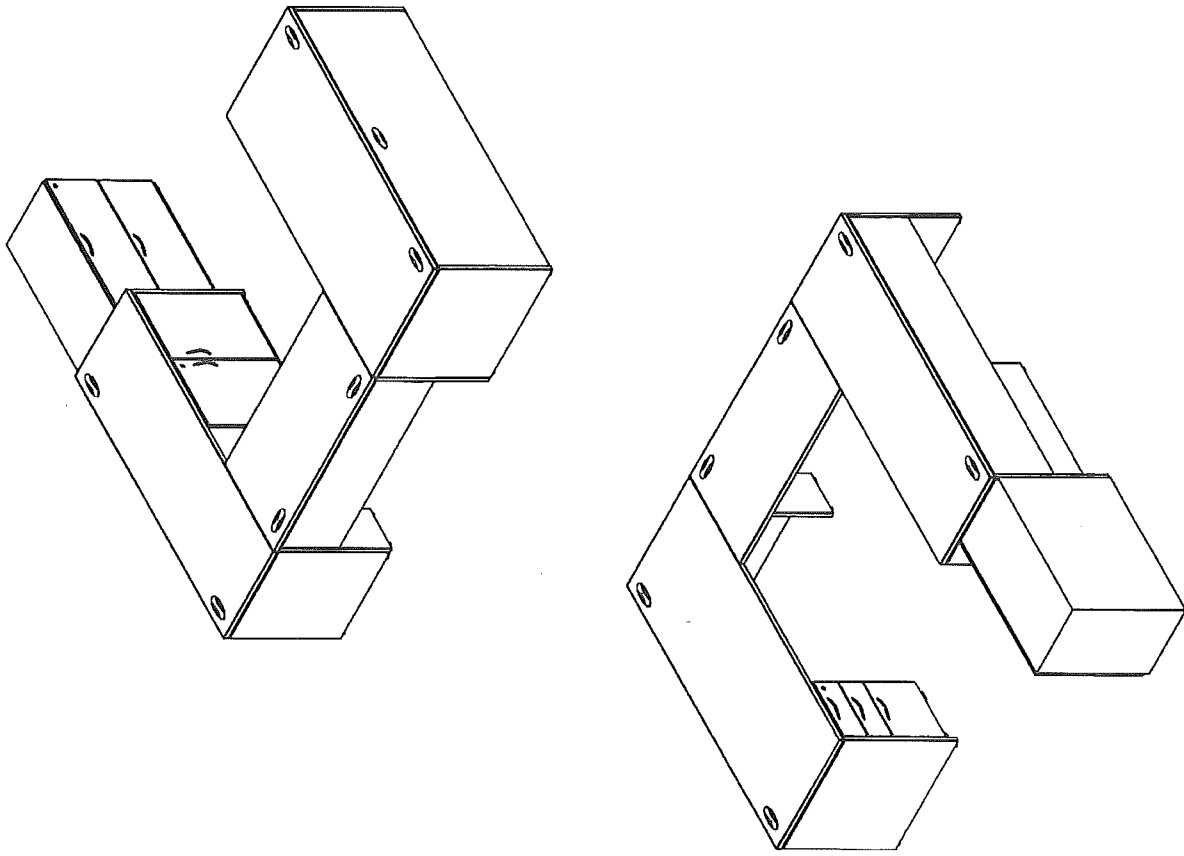
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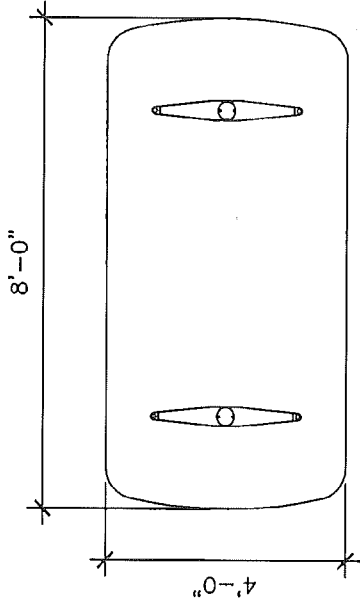
WORKSTATION TYPE # 1



WORKSTATION TYPE #2



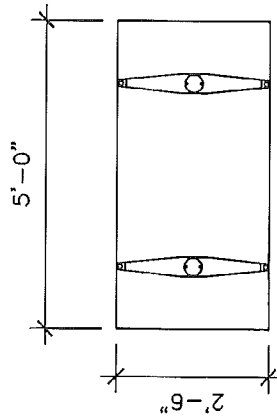
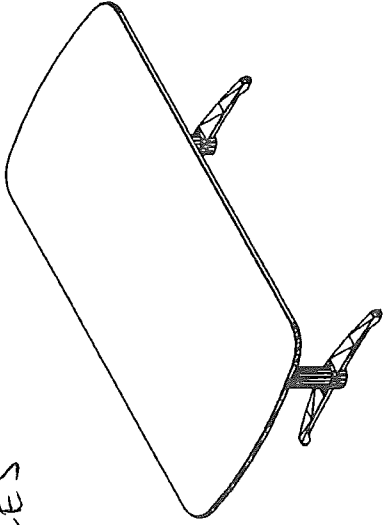
WORKSTATION TYPE # 3



MULTIPURPOSE ROOM

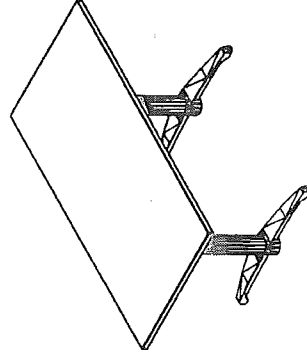
MEETING TABLES

TYPE # 1



INTERVIEW ROOM

TYPE # 2



PROJECT: RCMP ISLAND LAKE

DRAWING NAME:
MULTIPURPOSE ROOM AND INTERVIEW ROOM TABLES

DATE:
5/13/2014

SCALE:
NTS

SALESPERSON:
KRISTIE SAYDACK

DRAWN BY:
VAL SARMIENTO

ATTENTION:

REVISIONS: