Woodvale Pentecostal Church Renovation

205 Greenbank Rd, Nepean, ON

RENOVATION SPECIFICATIONS

ISSUED FOR 70% PROGRESS,
November 12, 2021

HOBIN
ARCHITECTURE

SECTION	TITLE	PAGES
00 01 10	Table of Contents	2 pages
DIVISION 01 - GENERAL REQUIREMENTS		
01 14 00	Work Restrictions	2 pages
01 31 19	Project Meetings	3 pages
01 32 16.07	Construction Progress Schedule – Bar (Gantt) Chart	4 pages
01 33 00	Submittal Procedures	6 pages
01 35 29.06	Health and Safety Requirements	4 pages
01 35 43	Environmental Procedures	4 pages
01 45 00	Quality Control	3 pages
01 47 18	Indoor Air Quality During Construction	7 pages
01 51 00	Temporary Utilities	3 pages
01 52 00	Construction Facilities	4 pages
01 56 00	Temporary Barriers and Enclosures	3 pages
01 61 00	Common Product Requirements	5 pages
01 71 00	Examination and Preparation	2 pages
01 73 00	Execution	3 pages
01 74 11	Cleaning	3 pages
01 74 21	Construction/Demolition Waste Management and Disposal	10 pages
01 77 00	Closeout Procedures	2 pages
01 78 00	Closeout Submittals	9 pages
DIVISION 03 – CONCRETE		
03 10 00	Concrete Forming and Accessories	8 pages
03 20 00	Concrete Reinforcing	5 pages
03 30 00	Cast-in Place Concrete	12 pages
DIVISION 04 - MASONRY		
04 05 00	Common Work Results for Masonry	8 pages
04 05 12	Masonry Mortar and Grout	6 pages
04 05 19	Masonry Anchorage and Reinforcing	7 pages
04 05 23	Masonry Accessories	5 pages
04 22 00	Concrete Unit Masonry	7 pages
DIVISION 05 – METALS		
05 12 23	Structural Steel for Buildings	16 pages
05 21 00	Steel Joist Framing	7 pages
05 31 00	Steel Decking	6 pages
05 50 00	Metal Fabrications	6 pages
DIVISION 06 – WOOD, PLASTICS AND COMPOSITES		
06 10 00	Rough Carpentry	6 pages
06 20 00	Finish Carpentry	9 pages
06 40 00	Architectural Woodwork	13 pages
06 47 00	Plastic Laminates	7 pages

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

07 21 16	Blanket Insulation	3 pages
07 21 29	Spray in Place Foam Insulation	6 pages
07 84 00	Fire Stopping	11 pages
07 92 00	Joint Sealants	9 pages

DIVISION 08 – OPENINGS

08 00 00.01	Door Schedule	2 pages
08 00 00.02	Door Schedule Door Types	1 page
08 00 00.03	Door Schedule Frame Types	1 page
08 00 00.04	Door Schedule Jamb Details	1 page
08 11 00	Metal Doors and Frames	8 pages
08 11 16	Aluminum Doors and Frames	7 pages
08 14 16	Flush Wood Doors	6 pages
08 44 13	Glazed Aluminium Curtain Walls	14 pages
08 50 00	Aluminum Windows	11 pages
08 80 50	Glazing	11 pages

DIVISION 09 - FINISHES

09 00 00	Interior Finish, Material/Colour Legend	4 pages
09 00 00	Room Finish Schedule	2 pages
09 21 16	Gypsum Board Assemblies	11 pages
09 22 16	Non-Structural Metal Framing	4 pages
09 30 13	Ceramic Tiling	10 pages
09 65 19	Resilient Vinyl Tile Flooring	8 pages
09 91 23	Interior Painting	16 pages

DIVISION 10 - SPECIALTIES

10 00 00	Manufactured Specialties	3 pages
10 21 13.13	Metal Toilet Partitions	5 pages

END OF SECTION

PART 1 – GENERAL

1.1 EXISTING SERVICES AND BUILDING

.1 Perform the Work in a manner which will cause the minimum disruption to pedestrian and vehicle traffic and the normal operation of the existing occupied building.

.2 Where unknown services are encountered, immediately advise the Project Manager, the Owner's Representative and the Consultant and confirm findings in writing.

1.2 OWNER'S USE OF PREMISES

.1 The use of and access to the Site by the Contractor and construction personnel is subject to constraints necessitated by the Owner's continuous use of the existing building and site. Coordinate with the Owner regarding work which is to be executed in areas currently occupied, used for pedestrian, vehicular traffic and emergency vehicles.

1.3 CONTRACTOR'S USE OF PREMISES

.1 Manage the use of the premises to facilitate the continuous normal use of the premises by the Owner. Cooperate with the Owner to schedule operations to minimize conflict with the Owner's activities.

.2 Assume full responsibility for the protection of the existing building and property from damage due to the Work. Make good, to the approval of the Consultant and at no cost to the Owner, all such damage.

.3 Do not encumber site with materials or equipment. Ensure no part of Work is subjected to a load which will endanger its safety or will cause permanent deformation.

.4 From time to time, the Contractor may be asked to suspend certain objectionable operations causing interference with the ongoing use of the building. Extend full cooperation and courtesy in such cases.

1.4 EXISTING SERVICES

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

.2 Where the Work involves breaking into or connecting to existing services, carry out the Work at times directed by governing authorities and acceptable to the Owner. Provide the Owner's Representative with a minimum of 7 days notice of pre-scheduled activities affecting utility services within the existing building. The Owner may require that disruption to services be performed during specific hours.

.2 Where Work involves breaking into or connecting to existing services, give Owner's Representative 7 days notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum.

1.9 VEHICULAR AND PEDESTRAIN TRAFFIC

.1 Where Work involves changes to pedestrian or vehicular traffic flow or parking, give Owner's Representative 7 days notice and work with Owner's Representative to provide information that will be used by the Owner to notify Staff, and, Visitors. Keep duration of interruptions minimum.

.2 Where Work involves changes to existing vehicular traffic flow that could impact emergency vehicles the Contractor shall notify in writing to the Ottawa Ambulance, Police and Fire Department of alternate access and traffic flow on the site a minimum of 5 days in advance of the changes being made.

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

1.9 SPECIAL REQUIREMENTS FOR ACCESS TO OCCUPIED AREAS

.1 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations. All access to occupied areas is limited to pre approved or escorted visitation

1.11 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions. Smoking is not permitted on the site, either within the building, or on the property.

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 The Owner's Project Manager shall schedule and administer project meetings throughout the progress of the work on a bi-weekly basis or at the call of Consultant or Contractor.

.2 The Owner's Project Manager shall prepare agenda for meetings.

.3 The Owner's Project Manager shall distribute written notice of each meeting four days in advance of meeting date to Contractor and Consultant.

.4 The Contractor shall provide physical space and make arrangements for meetings, if required.

.5 The General Contractor's Project Manager and Site Superintendent shall attend meetings.

.6 The Owner's Project Manager shall record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.

.7 The Owner's Project Manager shall distribute copies of minutes within three days after meetings and transmit to meeting participants and, affected parties not in attendance and General Contractor and Consultants.

.8 The General Contractor shall distribute minutes of meetings to any Subcontractors in attendance at the meeting.

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

1.2 PRECONSTRUCTION MEETING

.1 Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Senior representatives of Owner, Consultant Team, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.

.3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.

.4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.

.5 Agenda to include:
.1 Appointment of official representative of participants in the Work.
.2 Schedule of Work: in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.
.3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
.4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
.5 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures .
.6 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
.7 Owner provided products.
.8 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
.9 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
.10 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
.11 Monthly progress claims, administrative procedures, photographs, hold backs.
.12 Appointment of inspection and testing agencies or firms.
.13 Insurances, transcript of policies.

1.3 PROGRESS MEETINGS

.1 During course of Work and 4 weeks prior to project completion, schedule progress meetings twice per month or as requested.

.2 Contractor, major Subcontractors involved in Work and Owner Representative and Consultant and Owner are to be in attendance.

.3 Notify parties minimum 5 days prior to meetings.

.4 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 Saturday, inclusive, will provide six (6) 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 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, 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 Consultant within 10 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.3 Submit Project Schedule to 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 Excavation completed within working days of Award of Contract date.
.2 Substructure completed within working days of Award of Contract date.
.3 Superstructure completed within working days of Award of Contract date.
.4 Building closed-in and weatherproofed within working days of Award of Contract date.
.5 Interior finishing and fitting, mechanical, and electrical work completed within working days of Award of Contract date.
.6 Substantial Completion date

1.5 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 Owner and 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 broken down by Division.
.3 Permits.
.4 Mobilization.
.5 Tree Removal.
.6 Excavation.
.7 Backfill.
.8 Building footings.
.9 Slab on grade.
.10 Foundations – Concrete
.11 Steel Structure broken down between floor joists, deck, brace frames per floor.
.12 Concrete.
.1 Second Floor Slab.
.2 Penthouse Floor Slab.
.13 Exterior Metal Studs broken down by floors and wings.
.14 Interior Concrete Block.
.15 Interior Metal Studs broken down by floors and wings.
.16 Drywall broken down by exterior walls by floors and wings and interior walls by floor and wings.
.17 Spray Fireproofing by wing.
.18 Roofing *(include delays for curing and testing related to Quality Control)*
.19 Windows broken down by floors and wings.
.20 Exterior envelope broken down by floors and wings.
.21 Exterior masonry broken down by floors and wings.
.22 Interior Ceilings broken down between gypsum board and ACT broken down by floors and wings.
.23 Plumbing, Fire Protection, HVAC and utilities.
1 for each floor level and wing broken down as per Mechanical Specification
.24 Lighting, Power, Fire Alarm, Systems.
1 for each floor level and wing broken down as per Electrical and Systems Specification
.25 Controls broken down by floors and wings..
.26 Millwork.
1 resident suites broken down by floors and wings.
2 Common areas broken down by floors and wings.
.27 Flooring broken down by floors and wings.
.28 Washroom accessories by floor and wing.
.29 Corner Guards by floor and wing.
.30 Site Services to/from Dan Street.
.31 Site Services to/from Ida Street.
.32 Access Road from Norma Street
.33 Root Protection
.34 Asphalt driveways, parking lots, walkways.
.35 Concrete sidewalks, walkways.
.36 Soft landscape.
.37 Testing and Commissioning.
.38 Supplied equipment long delivery items.
.39 Work being performed by Owners Contractors.

.
40 Municipal Occupancy Date
.41 Total Completion

1.7 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.8 PROJECT MEETINGS

.1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

.2 Adverse weather related delays with their remedial measures will be discussed and negotiated. The baseline schedule shall include allowances for expected weather conditions such as rain, snow, cold and hot days.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section - All Sections.

1.2 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 GC to 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 coordinated 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 coordinated.

.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.

1.3 ELECTRONIC DOCUMENTS

.1 The Consultants may upon request from the General Contractor provide Contract Drawings in the form of electronic documents, for the Work. The supply of the electronic documents to the Contractor is for the convenience of the Contractor in carrying out the work. The Contractor must sign the Consultants standard agreement form for the use of electronic documentation.

.2 The Consultant retains all rights of ownership and copyright of the electronic files.

.3 The Contractor agrees that these drawings are to be used for its own use and that of its Subtrades and only for the management of the Project, and shall not forward, sell, trade or distribute any part of the electronic files to a third party. The Contractor agrees to have the license agreements signed and forwarded to the Consultant prior to distributing the electronic files to any project Subtrades. Furthermore, the User agrees to take steps to protect the electronic files from being used by a third party for any purpose.

.4 The Consultant agrees that the Contractor may use the electronic files as a background for the preparation of shop drawings. Shop drawings must be prepared by the Contractor, Consultant electronic files are issued for background information only. Shop drawings received which are not prepared by the Contractor and are re-submissions of drawings prepared by the Consultant will be rejected and returned with no claim for delays on the part of the affected trade.

.5 The Consultant agrees that the Contractor may use the electronic files in the preparation of as-built drawings.

1.4 SHOP DRAWINGS AND PRODUCT DATA

.1 Refer to CCDC 5B.

.2 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.

.3 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario.

.4 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be

supplied and installed. Indicate cross references to design drawings and specifications.

.5 Allow 10 days for Consultant's review of each submission.

.6 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.

.7 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.

.8 Accompany submissions with transmittal letter, containing:
- .1 Date and submission number
- .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.

.9 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.

.10 After Consultant's review, distribute copies.

.11 Submit 1 print set and an electronic copy of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.

.12 Submit 1 electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product. Provide all documents in PDF format (.pdf)

.13 Submit 1 electronic copy of test reports for requirements requested in specification Sections and as requested by Consultant.
.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
.2 Testing must have been within 3 years of date of contract award for project.
.3 Provide all documents in PDF format (.pdf)

.14 Submit 1 electronic copy of certificates for requirements requested in specification Sections and as requested by Consultant.
.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
.2 Certificates must be dated after award of project contract complete with project name.
.3 Provide all documents in PDF format (.pdf)

.15 Submit 1 electronic copy of manufacturer’s instructions for requirements requested in specification Sections and as requested by Consultant.
.1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
.2 Provide all documents in PDF format (.pdf)

.16 Submit 1 electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Consultant. Provide all documents in PDF format (.pdf)

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

.18 Submit 1 electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Consultant.

.19 Delete information not applicable to project.

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

.21 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, 1 electronic copy will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.22 The review of shop drawings by the Consultants is for sole purpose of ascertaining conformance with general concept.
.1 This review shall not mean that the Consultants approve detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.5 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.

1.6 MOCK-UPS

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

1.7 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic copy of colour digital photography in jpg & tif 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: twice weekly and as directed by Consultant.
.1 Upon completion of: excavation, foundation, framing and services before concealment, of Work, and as directed by Consultant.

1.8 CERTIFICATES AND TRANSCRIPTS

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

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 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS).

.3 Province of Ontario
.1 Occupational Health and Safety Act, R.S.O. 1990 Updated 2011.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
.1 Results of site specific safety hazard assessment.
.2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.

.3 Submit 1 copy of Contractor's authorized representative's work site health and safety inspection reports to Consultant bi-weekly (2 times per month).

.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

.7 Consultant will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 6 days after receipt of plan. Revise plan as appropriate and resubmit plan to Consultant within 10 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 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

.1 Fire Alarm Testing and Evacuation Program implemented by the CLIENT.

1.3 FILING OF NOTICE

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

1.4 SAFETY ASSESSMENT

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

1.5 REGULATORY REQUIREMENTS

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

1.6 PROJECT/SITE CONDITIONS

.1 Work at site will involve contact with:

.1 Materials referenced in the attached Designated Substance Survey.

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 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 Ontario Health and Safety Act, R.S.O.

1.10 UNFORSEEN HAZARDS	.1	When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Consultant verbally and in writing.
1.11 HEALTH AND SAFETY CO-ORDINATOR	.1	Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must: .1 Have site-related working experience specific to activities associated with demolition and asbestos. .2 Have working knowledge of occupational safety and health regulations. .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work. .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
1.12 POSTING OF DOCUMENTS	.1	Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Consultant.
1.13 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.
1.14 BLASTING	.1	Blasting or other use of explosives is not permitted .
1.15 POWDER ACTUATED DEVICES	.1	Use powder actuated devices only after receipt of written permission from Owner.
1.16 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 RELATED REQUIREMENTS

.1 All Sections

1.2 REFERENCES

.1 Definitions:

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

.2 Reference Standards:

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 5B-2010 Construction Management Contract – for Services and Construction.

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

.1 EPA 832/R-92-005-92, Storm Water Management for Construction Activities, Chapter 3.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Prior to commencing construction activities or delivery of materials to site, provide Environmental Protection Plan for review by Consultant.

.3 Ensure Environmental Protection Plan includes comprehensive overview of known or potential environmental issues to be addressed during construction.

.4 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.5 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 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Ensure plan includes measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
.6 Spill Control Plan including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
.7 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
.8 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
.9 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.
.10 Waste Water Management Plan identifying methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
.11 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.
.12 Pesticide treatment plan to be included and updated, as required.

1.4 FIRES

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

1.5 SITE CLEARING AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties as indicated. Refer to landscape drawings and specifications.

.2 Wrap in burlap, 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 or as directed by landscape architect during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

.4 Minimize stripping of topsoil and vegetation.

.5 Restrict tree removal to areas indicated.

1.7 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this Contract.

.2 Control emissions from equipment and plant to local authorities' emission requirements.

.3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area.
.1 Provide temporary enclosures where directed.

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.8 HISTORICAL/ ARCHAEOLOGICAL CONTROL

.1 Protect historical and archaeological resources found on the project site: and identify procedures to be followed if historical or archeological resources not previously known to be onsite or in area are discovered during construction.

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

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 CLEANING

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

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

.3 Ensure storm and sanitary sewers remain free of waste and volatile materials disposal.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS	.1	Section - All Divisions, All Sections
1.2 REFERENCES	.1	Canadian Construction Documents Committee (CCDC) .1 CCDC 5B - 2010, Construction Management Contract – for Services and Construction
1.3 INSPECTION	.1	Refer to CCDC 5B.
1.4 INDEPENDENT INSPECTION AGENCIES	.1	Independent Inspection/Testing Agencies will be engaged by Owner for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Owner.
	.2	Provide equipment required for executing inspection and testing by appointed agencies.
	.3	Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
	.4	If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Consultant at no cost to Owner. Pay costs for retesting and re-inspection.
1.5 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.
1.6 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.
1.7 REJECTED WORK	.1	Refer to CCDC 5B.

.2 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.

1.8 REPORTS

.1 Submit 1 electronic copy of inspection and test reports in PDF format to Consultant.

.2 Provide copies to subcontractor of work being inspected or tested manufacturer or fabricator of material being inspected or tested.

1.9 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

1.10 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 Consultant and as specified in specific Section.

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

.4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.5 Mock-ups may remain as part of Work if approved by Consultant.

1.11 MILL TESTS

.1 Submit mill test certificates as requested or as required of specification Sections.

1.12 EQUIPMENT AND SYSTEMS

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

.2 Refer to Division 22, 23, 25, and 26 for specific sections and for definitive requirements.

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 Implementation of a Construction Indoor Air Quality (IAQ) Management Plan for the duration of the Work.

1.2 REFERENCES

.1 Sheet Metal and Air Conditioning Contractor's National Association (SMACNA).

.1 IAQ Guidelines for Occupied Buildings Under Construction (latest edition).

1.3 SUBMITTALS

.1 Provide requested information in accordance with Section 01 33 00- Submittals.

.1 Prepare and submit, prior to project start-up, 2 copies of the Construction IAQ Management Plan.

.2 Concurrent with each Application for Payment provide the following information:

.1 Weekly inspection reports of IAQ management measures

.2 Photographs of implementation of SMACNA approaches.

1.4 CONSTRUCTION IAQ MANAGEMENT PLAN

.1 The intent of this plan is to prevent construction and future indoor air quality problems that may result from construction affecting the comfort and well being of construction workers and building occupants.

.2 The provision of the Construction Indoor Air Quality Management Plan or IAQ Management Plan is the responsibility of the Contractor.

.3 Provide a fully developed IAQ Management Plan implemented through construction and pre-occupancy of the building including the following activities:

.1 Meet or exceed the recommended Design Approaches in Chapter 3 of the SMACNA IAQ Guidelines for Occupied Buildings under Construction - 1995 and other requirements as detailed in this specification during all construction activities. These design approaches shall be applicable for all buildings regardless of whether it is a new construction or renovation.

.2 No smoking policy: No smoking is permitted on the site.

.3 Protect all stored and installed absorptive materials from moisture or dust, chemical and gas damage.

.4 Construction use of air handling units, heat recovery ventilators, fans or any associated equipment and systems for ventilation, heating, de-humidification, humidification, dust control or any other use is permissible, provided that filters of MERV 8 or better are installed during operation. Use of permanent units and systems is permissible during construction as noted above if authorized by the Contractor, Consultant and Owner. Be responsible for damage to heating system if use is permitted.

.5 Replace all filtration equipment for air handling units, heat recovery ventilators and fans with new filter media as specified within the technical specification sections in Division 23 at the end of construction.

.1 New filtration media to be MERV 13 or better.

.4 Provide the following submittals to the requirements of Section 01 33 00 - Submittal Procedures:

.1 IAQ Management Plan:

.1 Provide a draft documented IAQ Management

plan in writing for review by the Consultant within 10 days of award of contract.

.2 The IAQ Management Plan submission is to include:

.1 Details of each management plan strategy including:

.1 The Design Approaches in Chapter 3 of the SMACNA IAQ Guidelines for Occupied Buildings under Construction - 1995 including:

.1 HVAC Protection

.2 Source Control procedures.

.3 Pathway Interruption.

.4 Housekeeping.

.5 Scheduling.

.6 Reporting.

.2 Samples of reporting documents based SMACNA IAQ Guidelines for Occupied Buildings under Construction - 1995.

.3 Methods for protecting all stored and installed absorptive materials from moisture or dust, chemical and gas damage.

.4 Declaration that air handling units, heat recovery ventilators, fans or any associated equipment and systems used during construction for ventilation, heating, de-humidification, humidification and dust control will use air filtration media of MERV 8 or better.

.5 Schedule for filter replacement as a component of the building startup and Commissioning.

.3 Format: submit 1 pdf copy of reports, complete with index tabs for verification and review by Consultant.

.4 Make changes or additions to the draft IAQ Management Plan within the specified plan requirements to the satisfaction of the Consultant and reissue as final draft.

.5 Distribute the final IAQ Management Plan to all trades working on the site.

.2 Construction Reporting

.1 During the course of construction provide the following reporting to the Consultant for review:

.1 Photographs indicating the general conformance to the IAQ Management Plan.

.2 Completed Planning Checklist for all trades on the project indicating scheduling and the requirements of IAQ procedures with respect to scheduled construction activities for that week.

.3 Inspection sheets completed by the Site Superintendent reviewing that all trades completed the scheduled requirements of the IAQ procedures for that week including any deficiencies and corrective actions taken.

.2 Provide all reporting on a weekly basis unless otherwise approved by the Consultant during periods of low IAQ risk construction or low construction activity.

.5 Provide the following close out submittals to the requirements of Section 01 78 00 - Closeout Submittals:

.1 Provide all IAQ Management Plan submittals including the following:

.1 The final version of the Construction IAQ Management Plan.

.2 Digital copies of all weekly photographs in a USB Format.

.3 All weekly planning checklists.

.4 All weekly inspection sheets.

.5 Format: submit 5 copies of closeout report, each in "D" ring binders, complete with index tabs for verification and review by Consultant. Submit this same binder in a single pdf format.

.6 Provide the following activities specified to meet or exceed the recommended Design Approaches in Chapter 3 of the SMACNA IAQ Guidelines for Occupied Buildings under Construction - 1995 during all construction activities. These design approaches shall be applicable for all buildings regardless of whether it is a new construction or renovation:

.1 HVAC Protection:

.1 Use of air handling units, heat recovery ventilators, fans or any associated equipment and systems for ventilation, heating, de-humidification, humidification, dust control is permissible during Construction, provided that filters of MERV 8 or better are installed during operation. Use of permanent units and systems is permissible during construction as noted above if authorized by the Contractor, Consultant and Owner. Be responsible for damage to heating system if use is permitted.

.2 Seal off all supply, return and exhaust air system openings to prevent the accumulation of dust and debris in the systems at all times unless work is being completed on the immediate area of the system using plastic seals to the approval of the Consultant. This is to include overnight and longer work stoppages. All diffusers, grilles, and displacement ventilators are also to be sealed in plastic.

.3 Keep all operable doors on all air handling units closed at all times unless work is being completed on the immediate area of the system.

.4 Do not store construction or waste materials in Fan and Mechanical Rooms.

.5 Keep all construction areas clean and neat as specified elsewhere in this specification.

.6 Where ducts become contaminated due to inadequate protection these ducts will be cleaned professionally as specified in Division 23.

.2 Source Control:

.1 Use of low VOC products, as specified elsewhere, at all times.

.2 Restrict traffic volume and idling of motor vehicles where emissions could be drawn into the building.

.3 Direct fired construction heaters are not acceptable. Vent all construction heater products of combustion to the outdoors.

.4 Cycle heating equipment off when not being used or needed.

.5 Exhaust all pollution sources to the outside with portable fan systems ensuring exhaust does not re-circulate back into the building.

.6 Keep containers of wet products closed as much as possible. Cover and seal waste materials, which can release odor or dust.

.3 Pathway Interruption:

.1 Prevent dust from migrating to other areas with the use of dust curtains or temporary enclosures where applicable.

.2 Relocate pollutant sources as far away as possible from construction ventilation equipment, stored materials and areas occupied by workers when feasible. Any construction supply and exhaust systems that ventilate both areas where pollutant sources are being used and areas where they are not been used should be shut down or isolated during such activity with supplemental construction ventilation provided as required.

.3 Isolate during construction, areas of work to prevent contamination of clean or occupied areas. Utilize pressure differentials generated by mechanical means to prevent contaminated air from entering clean areas.

.4 Ventilate contaminated air from construction areas directly to the outside during installation of VOC emitting materials.4.

.4 Housekeeping:

.1 Cleaning activities are specified in Section 01 74 11; however provide special emphasis on HVAC equipment and building spaces to remove contaminants from the building prior to operation of any permanent ventilation equipment.

.2 Keep all coils, filters, fans and ductwork clean during installation as specified and clean all prior to performing the Testing, Adjusting and Balancing of the systems.

.3 During construction suppress dust with wetting agents or sweeping compounds. Use efficient and effective dust collecting methods such as a damp cloth, wet mop, vacuums with particulate filters, or wet scrubbers.

.4 Remove accumulations of water inside the building during construction. Protect all porous materials such as insulation and ceiling tile from exposure to moisture.

.5 Scheduling:

.1 Schedule work to ensure dust emitting work does not coincide with installation of absorbent materials (ceiling tiles, gypsum wall board, fabric furnishings, carpet and insulation, for example) that may act as 'sinks' for dust.

.2 Do not schedule any construction activities that would require the use of VOC or dust emitting activities during occupancy without the approval of the Consultant.

.3 Schedule all use of VOC emitting and high odorous materials BEFORE installing absorbent materials (ceiling tiles, gypsum wall board, fabric furnishings, carpet and insulation, for example) that may act as 'sinks' for VOCs, odors and other contaminants.

PART 2 - PRODUCTS

2.1 AIR FILTRATION MEDIA

.1 In accordance with the technical specification sections in Division 23 related to air filtration media.

.2 Air handling equipment operated during the construction phase to be fitted with air filtration media of minimum MERV 8 efficiency.

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS	.1	Division 26
1.2 REFERENCES	.1	U.S. Environmental Protection Agency (EPA) / Office of Water .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.
1.3 ACTION AND INFORMATIONAL SUBMITTALS	.1	Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
	.2	Submit erosion and sedimentation control plan.
1.4 INSTALLATION AND REMOVAL	.1	Provide temporary utilities controls in order to execute work expeditiously.
	.2	Remove from site all such work after use.
1.5 DEWATERING	.1	Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.
1.6 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.
1.7 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 On completion of Work for which permanent heating system is used, replace filters, clean ductwork and all diffusers.

.8 Ensure Date of Substantial Performance and Warranties for heating system do not commence until entire system is in as near original condition as possible and is certified by Consultant.

.9 Pay costs for maintaining temporary heat, when using permanent heating system if available.

.10 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.

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

1.8 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 GC.

.4 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

1.9 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for temporary telephone, fax, and data hook up lines equipment necessary for own use and use of Owner Representative and Consultant.

1.10 FIRE PROTECTION

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

.2 Burning rubbish and construction waste materials is not permitted on site.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.2 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)
.1 CCDC 5B – 2010 Construction Management Contract – for Services and Construction.

.2 Canadian Standards Association (CSA International)
.1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
.2 CSA-0121-M1978(R2003), Douglas Fir Plywood.
.3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
.4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.

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

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

1.4 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.

1.5 SCAFFOLDING

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

.2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms and temporary stairs.

1.6 HOISTING	.1	Provide, operate and maintain hoists, cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.
	.2	Hoists, cranes to be operated by qualified operator.
1.7 ELEVATORS	.1	New permanent elevators not to be used by construction personnel and transporting of materials.
1.8 SITE STORAGE/LOADING	.1	Refer to CCDC 5B.
1.9 CONSTRUCTION PARKING	.1	Parking is not available on site. Arrange parking off site or within the construction area.
	.2	Provide and maintain adequate access to project site.
1.10 SECURITY	.1	Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays if required.
1.11 OFFICES	.1	Space will be allocated on site for a temporary construction office of sufficient size to accommodate site meetings and furnished with drawing laydown table. Maintain in clean condition.
	.2	Provide marked and fully stocked first-aid case in a readily available location.
	.3	Subcontractors to provide their own offices as necessary. Direct location of these offices.
	.4	In an effort to reduce the spread of the Coronavirus, Contractor to provide private washroom facilities for contractor use on site complete with flush or chemical type toilet, lavatory and mirror and maintain supply of paper towels and toilet tissue.
1.12 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.

1.13 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.

1.14 CONSTRUCTION SIGNAGE

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

.2 Indicate on sign, name of Owner, Consultant and Contractor.

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

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

.5 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project.

1.15 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. Keep all local roads used by construction traffic clean and clear of mud, gravel, etc

.

.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 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.9 Dust control: adequate to ensure safe operation at all times.

.10 Provide snow removal during period of Work.

1.16 EXISTING FIRE ROUTE

.1 Existing fire route around existing building is to be accessible in case of emergency at all times.

.2 Provide measures for protection of existing fire route and measures to allow existing route to be extended around new building.

1.17 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

.3 Store materials resulting from demolition activities that are salvageable.

.4 Stack stored new or salvaged material not in construction facilities.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.2 HOARDING

.1 Provide temporary site enclosures with chain link fencing or Modu-Loc fencing 1.8 metres high, as required to restrict access to facility during demolition. Distinguish between all construction zones and occupied areas.

.2 Provide lockable truck entrance gate gates and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.

.3 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

.4 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.

1.3 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 .

1.4 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.

1.5 DUST TIGHT SCREENS AND PARTITIONS

.1 Provide dust tight screens / insulated partitions to localize dust generating activities, and for protection of workers, finished areas of Work occupied and public areas. Screens must be structurally sound and impact resistant.

.2 Maintain and relocate protection until such work is complete.

.3 Screens will be required at all work abutting occupied spaces.

1.6 ACCESS TO SITE

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

1.7 PUBLIC TRAFFIC FLOW

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

1.8 FIRE ROUTES

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

.2 Provide temporary fire routes and signage as required to suit project phasing. Work with Owner to develop temporary fire exit routes.

1.9 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Document adjacent properties with digital photography and advise residents of any works likely to disturb adjacent properties.

.3 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 Confirm with Consultant locations and installation schedule 3 days prior to installation.

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

1.11 WASTE MANAGEMENT AND DISPOSAL

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

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section - All Sections.

1.2 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)
.1 CCDC 5B-2010 Construction Management Contract – for Services and Construction.

.2 Within text of each specifications section, reference may be made to reference standards.

.3 Conform to the latest issue of reference standards, in whole or in part as specifically requested in specifications.

.4 If there is question as to whether products or systems are in conformance with applicable standards, Consultant reserves right to have such products or systems tested to prove or disprove conformance.

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

1.3 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 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.

1.4 AVAILABILITY

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to notify Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Consultant reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.5 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 and masonry 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.

1.6 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 Owner. Unload, handle and store such products.

1.7 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.

1.8 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Consultant if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Consultant reserves right to require dismissal from site, workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Consultant, whose decision is final.

1.9 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.

1.10 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.

1.11 REMEDIAL WORK

.1 Refer to CCDC 5B and Section 01 73 00 - Execution Requirements.

.2 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.

.3 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.12 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.

1.13 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.

1.14 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.

1.15 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.

1.16 EXISTING UTILITIES

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants and pedestrian and vehicular traffic.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)
.1 CCDC 5B – 2010 Construction Management Contract – for Services and Construction.

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

.3 Section 01 14 00 Work Restrictions

1.2 QUALIFICATIONS OF SURVEYOR

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

1.3 SURVEY REFERENCE POINTS

.1 Existing base horizontal and vertical control points are designated on drawings.

.2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.

.3 Make no changes or relocations without prior written notice to Consultant.

.4 Report to Consultant when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

.5 Require surveyor to replace control points in accordance with original survey control.

1.4 EXISTING SERVICES

.1 Before commencing work, establish location and extent of service lines in area of Work and notify Consultant of findings.

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 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

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

1.8 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit name and address of Surveyor to Consultant.

.2 On request of Consultant, submit documentation to verify accuracy of field engineering work.

.3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

1.9 SUBSURFACE CONDITIONS

.1 Promptly notify Consultant in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

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

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 perimeter of and 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.

1.5 WASTE MANAGEMENT AND DISPOSAL

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

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)
.1 CCDC 5B – 2010 Construction Management Contract for Services and Construction.

1.2 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.

.3 Clear snow and ice from access to building, bank/pile snow in designated areas only remove from site.

.4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.5 Provide on-site roll off containers for collection of waste materials and debris.

.6 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

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

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

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

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

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

1.3 FINAL CLEANING

.1 Refer to CCDC 5B.

.2 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.3 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.4 Prior to final review remove surplus products, tools, construction machinery and equipment.

.5 Remove waste products and debris including that caused by Owner or other Contractors.

.6 Remove waste materials from site at regularly scheduled times.

.7 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.8 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

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

.10 Clean lighting reflectors, lenses, and other lighting surfaces.

.11 Vacuum clean and dust building interiors, behind grilles, louvres and screens.

.12 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.

.13 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.14 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.15 Remove dirt and other disfiguration from exterior surfaces.

.16 Clean and sweep roofs, gutters, areaways, and sunken wells.

.17 Sweep and wash clean paved areas.

.18 Clean equipment and fixtures to sanitary condition; clean or

replace filters of mechanical equipment.

.19 Clean roofs, downspouts, and drainage systems.

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

.21 Remove snow and ice from access to building.

1.4 WASTE MANAGEMENT AND DISPOSAL

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

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 WASTE MANAGEMENT GOALS

.1 The minimum Waste Management Goal for the Project shall be compliance with all required Local, Provincial, and Federal waste by-laws, and waste management regulations.

.2 An optimum Waste Management Goal for the Project shall be 75 percent of total Project Waste to be diverted from landfill sites. .1 Provide Consultant documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.
.2 Accomplish maximum control of solid construction waste.
.3 Preserve environment and prevent pollution and environment damage.

1.2 DEFINITIONS

.1 Class III: non-hazardous waste - construction renovation and demolition waste.

.2 Cost/Revenue Analysis Workplan (CRAW): based on information from WRW, and intended as financial tracking tool for determining economic status of waste management practices.

.3 Demolition Waste Audit (DWA): relates to actual waste generated from project.(Schedule C)

.4 Inert Fill: inert waste - exclusively asphalt and concrete.

.5 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation. (Schedule C)

.6 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.

.7 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.

.8 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.

.9 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.

.10 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.

.11 Separate Condition: refers to waste sorted into individual types.

.12 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.

.13 Waste Audit (WA): detailed inventory of materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project. Indicates quantities of reuse, recycling and landfill. Refer to Schedule A.

.14 Waste Management Co-ordinator (WMC) : contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.

.15 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. Refer to Schedule B. WRW is based on information acquired from WA (Schedule B).

1.3 DOCUMENTS

.1 Maintain at job site, one copy of following documents:
.1 Waste Audit.
.2 Waste Reduction Workplan.
.3 Material Source Separation Plan.
.4 Schedules A B C D completed for project.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Prepare and submit following prior to project start-up:
.1 Submit 2 copies of completed Waste Audit (WA): Schedule A.
.2 Submit 2 copies of completed Waste Reduction Workplan (WRW): Schedule B.
.3 Submit 2 copies of completed Demolition Waste Audit

(DWA): Schedule C.
.4 Submit 2 copies of Materials Source Separation Program (MSSP) description. (Schedule D)

.3 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal by project using deconstruction/disassembly material audit form.
.1 Failure to submit could result in hold back of final payment.
.2 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled, co-mingled and separated off-site or disposed of.
.3 For each material reused, sold or recycled from project, include amount in tonnes and the destination.
.4 For each material land filled or incinerated from project, include amount in tonnes of material and identity of landfill, incinerator or transfer station.

1.5 WASTE AUDIT (WA)

.1 Conduct WA prior to project start-up.

.2 Prepare WA: Schedule A.

.3 Record, on WA - Schedule A, extent to which materials or products used consist of recycled or reused materials or products.

1.6 WASTE REDUCTION WORKPLAN (WRW)

.1 Prepare WRW prior to project start-up.

.2 WRW should include but not limited to:
.1 Destination of materials listed.
.2 Deconstruction/disassembly techniques and sequencing.
.3 Schedule for deconstruction/disassembly.
.4 Location.
.5 Security.
.6 Protection.
.7 Clear labelling of storage areas.
.8 Details on materials handling and removal procedures.
.9 Quantities for materials to be salvaged for reuse or recycled and materials sent to landfill.

.3 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.

.4 Describe management of waste.

.5 Identify opportunities for reduction, reuse, and recycling of

materials. Based on information acquired from WA.

.6 Post WRW or summary where workers at site are able to review content.

.7 Set realistic goals for waste reduction, recognize existing barriers and develop strategies to overcome these barriers.

.8 Monitor and report on waste reduction by documenting total volume and cost of actual waste removed from project.

1.7 DEMOLITION WASTE AUDIT (DWA)

.1 Prepare DWA prior to project start-up.

.2 Complete DWA: Schedule C.

.3 Provide inventory of quantities of materials to be salvaged for reuse, recycling, or disposal.

1.8 COST/REVENUE ANALYSIS WORKPLAN (CRAW)

.1 Prepare CRAW: Schedule D.

1.9 MATERIALS SOURCE SEPARATION PROGRAM (MSSP)

.1 Prepare MSSP and have ready for use prior to project start-up.

.2 Implement MSSP for waste generated on project in compliance with approved methods and Provincial Standards.

.3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.

.4 Provide containers to deposit reusable and recyclable materials.

.5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.

.6 Locate separated materials in areas which minimize material damage.

.7 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.

.1 Transport to approved and authorized recycling facility or to users of material for recycling.

1.10 STORAGE, HANDLING AND

.1 Store, materials to be reused, recycled and salvaged.

PROTECTION

.2 Unless specified otherwise, materials for removal become Contractor's property.

.3 Protect, stockpile, store and catalogue salvaged items.

.4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.

.5 Protect structural components not removed for demolition from movement or damage.

.6 Support affected structures. If safety of building is endangered, cease operations and immediately notify Consultant.

.7 Protect surface drainage, mechanical and electrical from damage and blockage.

.8 Separate and store materials produced during dismantling of structures in designated areas.

.9 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
.1 On-site source separation is recommended.
.2 Remove co-mingled materials to off-site processing facility for separation.
.3 Provide waybills for separated materials.

1.11 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 from deconstruction as deconstruction/disassembly Work progresses.

.5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

1.12 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises.

1.13 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.

.2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

.1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.

.2 Clean-up work area as work progresses.

.3 Source separate materials to be reused/recycled into specified sort areas.

3.3 DIVERSION OF MATERIALS

.1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, and consistent with applicable fire regulations.
- .1 Mark containers or stockpile areas.
- .2 Provide instruction on disposal practices.

Or
Send waste materials to off-site sorting agency for separation and diversion / recycling of waste materials

.2 On-site sale of salvaged recovered materials is not permitted.

.3 Demolition Waste:

Material Type	Recommended Diversion	Actual Diversion

	%		%	
Acoustic Tile	50			
Acoustical Insulation	100			
Partitions		100		80
Doors and Frames		100		80
Electrical Equipment		80		
Mechanical Equipment	100			
Metals	100			
Rubble		100		
Wood (uncontaminated)		100		
Other				

.4 Construction Waste:

Material Type	Recommended Diversion %		Actual Diversion %	
Cardboard		100		100
Plastic Packaging	100			
Rubble				
Steel	100			
Wood (uncontaminated)		100		
Other				

3.5 WASTE AUDIT (WA)

.1 Schedule A - Waste Audit (WA):

(1) Material Category	(2) Material Quantity	Unit	(3) Estimated Waste	(4) Total Quantity	Point of Waste (unit)	(5) Generation	(6) % Recycled	(7) % Reused
.1 Wood and Plastics								
Material Descript ion								
Off-cuts								
Warped Pallet Forms								
Plastic Packaging								

Cardboard Packaging

Other

.2 Doors and Windows

Material Description

Painted Frames

Glass

Wood

Metal

Other

3.6 WASTE REDUCTION WORKPLAN (WRW) .1 Schedule B:

(1) Material Category	(2) Person(s) Responsible	(3) Total Quantity of Waste (unit)	(4) Actual Reused Amount (units)	(5)Actual Recycled Amount (unit)	(6) Material (s) Destination
. 1 Wood and Plastics					
Material Description					
Chutes					
Warped Pallet					
Forms					
Plastic Packaging					

Cardboard Packaging

Other

.2 Doors and Windows

Material Description

Painted Frames

Glass

Wood

Metal

Other

3.7 DEMOLITION WASTE AUDIT (DWA)

.1 Schedule C - Demolition Waste Audit (DWA):

(1) Material Description	(2) Quantity Total Volume	Weight	Remarks and Assumption
Wood			
Metal Stud			
Plywood			
Baseboard-Wood			
Door Trim - Wood			
Cabinet			
Doors and			

Windows

Panel
Regular

Slab
Regular

Wood
Laminate

Glazing

3.8 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT

.1 Schedule E - Government Chief Responsibility for the Environment:

Ontario Ministry of Environment and Energy
135 St. Clair Avenue West
Toronto ON M4V 1P5
General Inquiries
416 323-4321 - phone
800-565-4923
416-323-4682 - fax

Environment Canada
Toronto ON
General Inquiries
416-734-4494

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)
.1 CCDC 5B – 2010 Construction Management Contractor – for Services and Construction.

.2 OGCA/OAA Document 100 latest edition.

.3 Section 01 74 11 – Cleaning.

1.2 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 Consultant in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
.2 Request Consultant's inspection.

.2 Consultant's Inspection:
.1 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 and balanced and fully operational.
.4 Certificates required by Boiler Inspection Branch Fire Commissioner Utility companies: submitted.
.5 Operation of systems: demonstrated to Owner's personnel.
.6 Commissioning of mechanical systems: completed in accordance with Commissioning Requirements and 2 and copies of final Commissioning Report submitted to Consultant.

.4 Final Inspection:
.1 When completion tasks are done, request final inspection of Work by Consultant, and Contractor .
.2 When Work incomplete according to Owner and Consultant, complete outstanding items and request re-inspection.

.5 Declaration of Substantial Performance: when Consultant

considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.

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

.7 Final Payment:
.1 When Consultant considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
.2 Refer to CCDC 5B : when Work deemed incomplete by Consultant, complete outstanding items and request re-inspection.

.8 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.3 FINAL CLEANING

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

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

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Pre-warranty Meeting:

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

.1 Verify Project requirements.

.2 Review manufacturer's installation instructions and warranty requirements.

.2 Consultant to establish communication procedures for:

.1 Notifying construction warranty defects.

.2 Determine priorities for type of defects.

.3 Determine reasonable response time.

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

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

1.2 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 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, 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 scanned drawing files in pdf format on a USB key.

.10 Once binder has been reviewed and approved provide electronic copy in pdf format, one file per binder.

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 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 Consultant and Owner one record copy of:
.1 Contract Drawings.

.2 Specifications.
.3 Addenda.
.4 Change Orders and other modifications to Contract.
.5 Reviewed shop drawings, product data, and samples.
.6 Field test records.
.7 Inspection certificates.
.8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction.
.1 Provide files, racks, and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
.1 Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition.
.1 Do not use record documents for construction purposes.

1.6 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Record information on set of black line opaque drawings.

.2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information concurrently with construction progress.
.1 Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
.1 Measured depths of elements of foundation in relation to finish first floor datum.
.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
.4 Field changes of dimension and detail.
.5 Changes made by change orders.
.6 Details not on original Contract Drawings.
.7 References to related shop drawings and modifications.

.5 Specifications: mark each item to record actual construction, including:
.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

.2 Changes made by Addenda and change orders.

.6 Submit original as-built drawings and specification as well as scan as pdf format on USB key.

.7 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections. Submit original hardcopy as well as scan as pdf.

.8 Provide digital photos, as requested, for site records. Submit in jpeg format using file name that includes date in the following format YYMMDD as well as location using Room Name and or grid lines.

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 Design-Builder'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 and to suit commissioning requirements.

.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 location as directed; place and store.
.4 Receive and catalogue items.
.1 Submit inventory listing to Consultant.
.2 Include approved listings in Maintenance Manual.
.5 Obtain receipt for delivered products and submit prior to final payment.

.2 Extra Stock Materials:
.1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
.2 Provide items of same manufacture and quality as items in Work.
.3 Deliver to site location as directed; 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 location as directed; 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 Consultant.

1.12 WARRANTIES AND BONDS

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

.2 Warranty management plan to include required actions and documents to assure that Owner receives warranties to which it is entitled.

.3 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.

.4 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.

.5 Conduct joint 4 month warranty inspection, measured from time of acceptance, by Consultant.

.6 Include information contained in warranty management plan as follows:
.1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.
.2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and commissioned systems such as fire protection, alarm systems, sprinkler systems, .
.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 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.

.7 Respond in timely manner to oral or written notification of required construction warranty repair work.

.8 Written verification to follow oral instructions.
.1 Failure to respond will be cause for the Consultant to proceed with action against Contractor.

1.13 WARRANTY TAGS

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

.2 Attach tags with copper wire and spray with waterproof silicone coating.

.3 Leave date of acceptance until project is accepted for occupancy.

.4 Indicate following information on tag:
.1 Type of product/material.
.2 Model number.
.3 Serial number.
.4 Contract number.
.5 Warranty period.
.6 Inspector's signature.
.7 Construction Contractor.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 Related Requirements

.1 Section 03 30 00: Cast-in-Place Concrete

.2 Section 32 13 13: Concrete Paving

.3 Section 32 16 00: Curbs, Gutters and Sidewalks

1.2 References

.1 Editions of all Referenced Standards to be the ones designated by the applicable Building Code in force at the time of building permit application, as indicated on Structural Drawings. For Standards not referenced by the Building Code, use the latest editions.

.2 CSA Group (CSA):

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

.2 CSA O121, Douglas Fir Plywood

.3 CSA O141, Softwood Lumber

CSA O151, Canadian Softwood Plywood

.4 CSA O153, Poplar Plywood

.5 CSA S269.1, Falsework and Formwork

.3 American Concrete Institute (ACI):

.1 ACI 347, Guide to Formwork for Concrete

.4 ASTM International (ASTM)

.1 ASTM D2240, Standard Test Method for Rubber Property-Durometer Hardness

.2 ASTM D412, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension

.3 ASTM D570, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension

.4 ASTM D624, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension

.5 AST D638, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension

.6 ASTM D746, Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact

1.3 Quality Assurance

.1 Qualifications

.1 Engage a Professional Engineer licensed in the place where the project is located to be responsible for design and site review of all formwork, falsework and re-shoring.

1.4 Unit Prices

.1 Provide unit prices per Section 01 29 00 – Payment procedures.

1.5 Action and Informational Submittals

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

.2 Shop Drawings:

.1 Provide shop drawings for formwork and falsework stamped and signed by the Professional Engineer responsible for their design.

.2 Show on drawings:

.1 Formwork design data: permissible rate of concrete placement and temperature of concrete in forms.

.2 Erection sequence.

.3 Stripping and re-shoring procedure.

.4 Camber.

.5 Locations of all construction and control joints in slabs and walls.

.6 Equipment and procedure details when slip forming and / or flying forms are used.

.7 Shoring of composite steel beams and composite slabs on steel deck.

.8 Shoring of existing construction where required to carry construction loads.

PART 2 - PRODUCTS

2.1 Design Requirements

.1 Design in accordance with CSA S269.1.

.2 Design formwork and falsework supporting Post-Tensioned Concrete to account for the differences in load distribution before and after pre-stressing. Design supports under beams and at flat slab columns for the additional load which will be attracted from tributary slab areas after pre-stressing. Where cast concrete will move relative to the formwork during stressing, design and detail the contact face of the formwork to accommodate the movement.

.3 Design temporary lateral bracing for tall concrete walls as required to keep them stable until the permanent structure which will brace them is completed.

.4 WSP-S accepts no responsibility for structural adequacy of formwork, falsework and re-shoring and will not review its design.

2.2 Materials

.1 Formwork materials: to CSA S269.1.

.1 For concrete without special architectural features, use wood and wood product formwork materials to CSA O121, CSA O141, CSA O151 or CSA O153.

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

.3 Tubular column forms: round, spirally wound laminated fibre forms, internally treated with release material.

.4 Square fibre column forms: tubular column form with fibre board insert locked into place with polystyrene.

.5 Stay forms: expanded hot dip galvanized sheet steel, with min. 20 mm (3/4”) deep V-shaped ribs and perforations suitable to carry through reinforcing steel.

.6 Key-creating stay form: hot dip galvanized prefabricated sheet steel box min. 30 mm (1-1/8”) deep, with removable cover and dimpled back casing carrying pre-installed bent dowels.

.7 Form ties:

.1 Removable or internally disconnecting tie rods with or without spreader tubes, or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm (1”) diameter in concrete surface.

.2 Form ties to be designed to act as ties and spreaders and to have a minimum working strength of 13 kN (3000 pounds).

.3 Snap ties to snap cleanly at least 25 mm (1") from concrete surface without damage to the concrete.

.8 Form liner: high density overlay plywood to CSA O121 or other special materials to achieve the required concrete finish.

.9 Form stripping agent: colourless mineral oil, non-toxic, low VOC, free of kerosene, with viscosity between 15 to 24 mm²/s (70 and 110s Saybolt Universal) at 40°C, flashpoint minimum 150°C, open cup.

.10 Grooves, reglets and chamfers: White pine selected for straightness and accurately dressed to size.

.2 Falsework materials: to CSA S269.1.

.3 Void Form: Cellular cardboard with minimum compressive strength of 62 kPa (9 psi) designed to carry weight of wet concrete and loads associated with placing concrete and also designed to disintegrate and create an air space below the fully hardened concrete.

.4 Frost cushion: expanded polystyrene, non-degradable, minimum compressive strength 27.5 kPa, configured to compensate for frost swelling of underlying soils and designed to carry a maximum load of 24 kPa with 5% deformation.

2.3 Accessories

.1 PVC Waterstops: flexible, extruded, heat weldable, ribbed as follows:

.1 Tensile strength: to ASTM D638, minimum 13 MPa.

.2 Ultimate elongation: to ASTM D638, minimum 350%.

.3 Water absorption: to ASTM D570, 0.15% max.

.4 Tear resistance: to ASTM D624, minimum 50 kN/m.

.5 Low temperature brittleness: to ASTM D746, no failure at -37°C.

.6 Width in construction joints: 100 mm (4”) min.

.7 Width in control joints: 150 mm (4”) min; if surface mounted, with 25 (1”) deep centre key to create reglet.

.8 Width in expansion joints: 225 mm (9”), with 31 mm (1-1/4”) O.D. centre bulb.

.2 Swellable Waterstops

.1 Bentonite Waterstops - composed of 75% sodium bentonite and 25% butyl rubber, rectangular, flexible, min 200% expansion after 21 day aging.

.2 Extrudable waterstops - one part polyurethane, bentonite free, 100% expansion after 7 days.

.3 Co-extruded expending rubber waterstops, comprised of non-bentonite, modified hydrotite and chloroprene rubber forming cellular section, protected by delay action coating. Nominal size 10mm (3/8") thick x 20mm (3/4") wide.

.1 Tensile strength: to ASTM D412, 2.4 MPa min.

.2 Elongation: to ASTM D412, 400% min.

.3 Hardness: to ASTM D2240, 50 +/- 5 per Shore A scale.

.3 Dovetail anchor slots: minimum 0.6 mm thick galvanized steel with insulation filled slots.

.4 Weep hole tubes: plastic.

PART 3 - EXECUTION

3.1 Fabrication and Erection

.1 Confirm to CSA A23.1.

.2 Fabricate and erect falsework in accordance with CSA S269.1.

.3 Do not place shores and mud sills on frozen ground.

.4 Provide site drainage to prevent washout of soil supporting mud sills and shores.

.5 Fabricate and erect formwork in accordance with CSA S269.1 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA A23.1/A23.2.

.6 Make formwork tight and flush faced to prevent the leakage of mortar and the creation of unspecified fins or panel outlines.

.7 Form sides of footings unless Structural Drawings and Geotechnical report allow use of earth forms.

.8 See drawings for any camber required in hardened concrete. Measure cambers relative to member supports.

.9 Obtain WSP-S approval for formed openings, slots and chases not indicated on Structural Drawings.

.10 Provide water stops and keys around temporary openings in basement and retaining walls for shoring rakers or similar purposes.

.11 Do not permit loads from formwork to be transmitted to adjacent existing structure.

.12 Apply a form coating and release agent uniformly to the contact surface of formwork panels before reuse.

.13 Use 25 mm (1") chamfer strips on external corners, unless specified otherwise. Note that chamfers are not necessarily shown on drawings, for drafting simplicity.

.14 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated on Architectural and Structural drawings.

.15 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.

.16 Anchors and inserts not to protrude beyond surfaces designated to receive applied finishes, including painting.

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

.18 Provide vertical dovetail anchor slots at 600 mm (2'-0") on centre where masonry veneer covers face of concrete.

.19 Build top form on sloping concrete where required to prevent concrete from flowing out of the form. Provide vents to allow air and bleed water to escape.

.20 Do not close wall forms before reinforcing steel has been reviewed by WSP-S.

.21 Where removable tie rods are used for form ties, plug and seal tie holes to maintain the fire resistance, gas impermeability, soundproofing and waterproofing of the adjacent concrete.

.22 Provide lateral bracing as required to keep walls stable after formwork removal.

Void form:

.1 Conform to manufacturer's recommendations.

.2 Place on sand leveling bed.

.3 Protect from moisture until concrete is about to be placed.

.4 Protect from excessive construction loads. Overlay with max. 3 mm (1/8") thick fibreboard if required to protect it from damage during construction.

.5 If void form collapses during construction, remove and replace affected area.

.23 Frost cushion:

.1 Store on site on raised platforms protected with lightproof cover.

.2 Place at bottom of form with flat surface facing upward.

.3 Provide plywood overlay as required to distribute stresses from point loads.

3.2 Joints

.1 Refer to Typical Details and Drawings Notes for locations, detailing and maximum spacing requirements of all concrete joints.

.2 Provide construction joints in formed slab and slab on deck.

.3 Provide evenly spaced vertical control joints in walls.

.4 Provide expansion joints where shown on Structural Drawings. Remove all forming and filler material used during construction and provide clear space between structural elements equal to width specified.

.5 Provide construction gaps (closure strips) where shown on Structural Drawings.

.6 Refer to Section 03 30 00 for construction joints, sawcut joints, expansion / contraction joints and isolation joints in slab on grade and concrete toppings (as applicable).

3.3 Waterstops

.1 PVC Waterstops:

.1 Provide PVC waterstops for expansion, construction and control joints in exterior walls, basement walls, retaining walls, tanks walls, slabs supporting earth, and at other locations shown.

.2 Do not use surface mounted waterstops at control joints which will be protected by hot applied waterproofing.

.3 Do not nail surface mounted waterstops against blindsided waterproofing unless approved by the waterproofing supplier.

.4 Use equipment to manufacturer's requirements to field splice waterstops for continuity over the full length of runs.

.5 Use only straight heat-sealed butt joints in the field.

.6 Use factory welded corners and intersections.

.7 Securely tie waterstops to reinforcing bars at 1m (3') maximum centres to keep them in alignment when concrete is placed.

.2 Swellable Waterstops:

.1 Provide swellable waterstops for construction and temporary joints in exterior walls, basement walls, retaining walls, slabs supporting earth and at other locations shown where minimum required distance to concrete edge can be achieved. Do not use for expansion joints.

.2 Bentonite waterstops:

.1 Locate bentonite waterstops 75 mm (3") clear from outside face of concrete to avoid spalling of concrete due to swelling pressure of bentonite.

.2 Butt strips together. Do not overlap.

.3 Adhere to concrete with continuously applied adhesive in conjunction with mechanical fasteners (where required).

.3 Extrudable waterstops:

.1 Locate extrudable waterstops 100 mm (4") clear from outside face of concrete to avoid spalling of concrete due to swelling pressure.

.2 Refer to manufacturer's specifications for application temperature range.

.3 Refer to manufacturers specifications for recommended profile size and number of profiles suitable for particular concrete thickness.

.4 Co-extruded expanding rubber waterstops:

.1 Locate co-extruded rubber waterstops min. 50 mm (2") clear from outside face of concrete to avoid spalling of concrete due to swelling pressure.

.2 Splice waterstops by gluing square / mitered cut ends together, using cyanoacrylate adhesive.

.3 Continuously adhere to concrete with peel and stick adhesie backing or with hydrotite adhesive applied to both the waterstop and the concrete surfaces.

3.4 Concrete Exposed to View

.1 Minimize formwork joints. Locate joints and ties in a uniform pattern with no ties within 300 mm (12") of an edge or joint.

.2 Make panels forming slab soffits and wall / beam faces as large as possible, and arrange symmetrically.

.3 Make form joints in columns level from column to column and consistent with form joints in other parts of the structure. Locate lowest horizontal form joints 2400 mm (8'-0") above finished floor elevation.

.4 Where grooves, reglets or chamfers are shown, locate panel form joints to be hidden behind them.

.5 Provide reglets at all concrete joints.

.6 Seal all joints in formwork and between formwork and concrete.

.7 Place chamfers at member corners unless architectural details show an alternative profile. When beams are supported on columns of the same width, extend chamfer across face of column.

.8 Do not reuse formwork if there is any evidence of surface damage or wear, which could impair the visual quality of the concrete surface.

.9 Reuse forms only on identical sections, using the original tie holes. Clean forms and fill nail holes before reuse.

.10 Use only galvanized nails.

.11 Where removable tie rods are used for form ties, remove tie cones and plug holes with precast concrete plugs bonded to concrete using a pre-approved adhesive.

3.5 Removal and Reshoring

.1 Conform to CSA A23.1 and to ACI 347.

.2 Survey top of formwork and slab elevations before concrete placement, prior and after falsework removal, refer to drawing notes for detailed requirements. Submit survey data for WSP-S record.

.3 Use pullout tests, on-site cured cylinders (kept beside and treated as the concrete in the structure they represent) or maturity tests to determine in-situ strength of concrete prior to removal of falsework. Do not locate pullout inserts on concrete surfaces exposed to view. Retain a testing company to supply, locate and test the inserts in accordance with ASTM C900.

.4 Maintain falsework supporting beams and slabs until concrete has reached at least 75% of its specified strength.

.5 Maintain bracing of walls until the permanent structure which will brace them is completed.

.6 Keep falsework or reshoring in place until concrete reaches the specified design strength, but not less than 28 days. If reshoring is installed to replace falsework, strip and re-shore simultaneously so that no more than 9 m^2 of soffit is left unsupported by either formwork or reshoring at any time.

.7 Install reshores tight to structure above and below so that they do not shorten under load. Do not pre-load or lift the structure above by overtightening.

.8 When a floor is required to support weight of newly placed concrete on the floor above, provide not less than two levels of re-shoring below it (so that the new concrete load is shared by three levels) and maintain until the newly placed concrete above has reached at least 75% of the specified 28 day strength. If the new structure above is thicker than the floors supporting it, more than two levels of reshoring may be required.

.9 Construction joints: maintain falsework supporting beams and slab adjacent to the construction joint until the concrete beyond the joint reaches at least 75% of its specified 28 day strength.

.10 Construction gaps: Do not remove falsework supporting beams and slabs adjacent to construction gaps until the gaps are filled and concrete in gaps has reached at least 75% of its specified 28 day strength.

.11 Post-tensioned concrete: Remove slab and beam side forms prior to stressing. Do not remove falsework supporting beams and slabs until stressing of the area is complete. Re-tightened reshores after stressing.

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

3.6 Field Quality Control

.1 Refer to Section 01 45 00 - Quality Control.

.2 Obtain field review of falsework and reshoring by the Professional Engineer responsible for that work prior to each pour. WSP-S will not field review the formwork, falsework or reshoring.

3.7 Cleaning

.1 Clean in accordance with Section 01 74 00 - Cleaning.

.2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal and 01 35 21 – LEED Requirements.

END OF SECTION 03 10 00

PART 1 - GENERAL

1.1 Related Requirements

.1 Section 04 22 00: Concrete Unit Masonry

.2 Section 32 13 13: Concrete Paving

.3 Section 32 16 00: Curbs, Gutters and Sidewalks

1.2 References

.1 Editions of all Referenced Standards to be the ones designated by the applicable Building Code in force at the time of building permit application, as indicated on Structural Drawings. For Standards not referenced by the Building Code, use the latest editions.

.2 CSA Group (CSA):

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

.2 CSA G30.18, Carbon Steel Bars for Concrete Reinforcement

.3 CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel

.4 CSA W186, Welding of Reinforcing Bars in Reinforced Concrete Construction

.3 Reinforcing Steel Institute of Canada (RSIC):

.1 Reinforcing Steel Manual of Standard Practice

.4 American Concrete Institute (ACI):

.1 ACI SP-66, ACI Detailing Manual

.5 ASTM International Inc.(ASTM):

.1 ASTM A1064/A1064M, Standard Specification for Carbon Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete

.2 ASTM A775/A775M, Standard Specification for Epoxy-Coated Reinforcing Steel

.3 ASTM D3963 / D3963M, Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars

.4 ASTM A1044 / A1044M, Standard Specification for Steel Stud Assemblies for Shear Reinforcement of Concrete

1.3 Quality Assurance

.1 Qualifications:

.1 Welding of reinforcing steel to be performed by welders certified under CSA W186.

.2 Shear stud reinforcing to be fabricated in an ICC ES approved facility.

1.4 Quality Control

.1 Submit in accordance with Section 01 45 00 - Quality Control.

.2 Source Quality Control Submittals:

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

.2 Upon request, inform WSP-S of proposed source of reinforcement material to be supplied.

.3 Upon request, provide WSP-S with a copy of plant certificate by the Concrete Reinforcing Steel Institute for epoxy coating of reinforcement.

.4 Upon request, provide WSP-S with a copy of manufacturer's instructions for patching factory applied epoxy coating.

1.5 Unit Prices

.1 Provide unit prices per Section 01 29 00 – Payment Procedures.

1.6 Action and Informational Submittals

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

.2 Product Data:

.1 Submit manufacturer's data sheets for mechanical rebar splices.

.3 Shop Drawings:

.1 Prepare shop drawings in accordance with RSIC Manual of Standard Practice unless the Contract Documents contain a more stringent requirement. Conform to ACI SP-66 Detailing Manual whenever a detail condition is not covered by any of the above.

.2 Submit plans, elevations, sections and details necessary to fabricate, place and review reinforcement without reference to structural drawings, including masonry wall reinforcement. Draw to scale not smaller than 1:50 (¼" = 1'-0").

.3 Show on drawings:

.1 Sizes, spacings and locations of reinforcement, with identifying labels.

.2 Bar bending details.

.3 Lengths and locations of all lap splices.

.4 Types and locations of mechanical splices.

.5 Placing sequence.

.6 Large scale details at areas of steel concentration (such as column / beam / wall intersections), and around cast-ins.

.7 Bar lists.

.8 Quantities of reinforcement (including all rebar added to accommodate installation).

.9 Sizes, spacings and locations of chairs, spacers and hangers.

.10 Construction joint, control joint and pour gap locations.

.11 Strip dimensions for flat slab and flat plate.

.12 Concrete cover.

.13 Details and layouts of shear stud reinforcing.

.14 Rebar to be site bent.

.4 Do not release for fabrication reinforcing bars whose length may be affected by field conditions, such as the final elevation of footings, until obtaining the required field measurements.

PART 2 - PRODUCTS

2.1 Materials

.1 Reinforcing steel: carbon steel, deformed bars to CSA G30.18, unless indicated otherwise.

.2 Weldable Reinforcing steel: weldable low alloy steel deformed bars to CSA G30.18.

.3 Stainless Reinforcing steel: deformed bars to ASTM A955/A955M.

.4 Cold-drawn annealed steel wire ties: to ASTM A1064/A1064M.

.5 Welded steel wire fabric: to ASTM A1064/A1064M. Provide in flat sheets only.

.6 Epoxy Coating of reinforcement: to ASTM A775/A775M.

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

.8 Mechanical splices: to concentrically align bars and develop specified tensile strength of rebar. Threaded couplers to have plastic internal coupler thread protectors.

.9 Rebar terminators: oversized taper-threaded couplings capable to develop specified tensile strength of rebar; area to be not less than 5 times the rebar area.

.10 Plain round bars: to CSA G40.20/G40.21.

.11 Shear stud reinforcing: per ASTM A1044. Min yield strength for studs – 350 MPa, for rails – 300 MPa.

.12 Expansion cap for dowels at expansion / contraction joints: plastic, tight fitting, with internal pin to locate dowel and create void for expansion.

PART 3 - EXECUTION

3.1 Fabrication

.1 Fabricate reinforcing steel in accordance with CSA A23.1/A23.2 and Reinforcing Steel Manual of Standard Practice.

.2 Fabricate epoxy coated reinforcing steel in accordance with ASTM D3963/D3963M. Provide colour to contrast sharply with reinforcing steel and rust colour.

.3 Stagger mechanical splices 750 mm (2’-6”) unless otherwise noted on drawings.

.4 Weld reinforcement in accordance with CSA W186 where indicated.

.5 Fabricate shear stud reinforcing according to ASTM A1044. Weld studs to rail to develop yield strength of stud.

.6 Ship bundles of bar reinforcement, clearly identified in accordance with bar lists.

.7 Provide standard hooks at ends of all hooked bars.

.8 Where drawings indicate “L” dowels from foundation walls to slabs on grade, supply and install straight bars to be field bent.

.9 Substitute different size bars only if permitted in writing by WSP-S.

3.2 Field Bending

.1 Do not field bend or field weld reinforcement except where indicated or authorized by WSP-S.

.2 When field bending is indicated or authorized, bend without heat, applying slow and steady pressure. Use tools which will limit bend radii to the values given in CSA A23.1.

.3 Where key-creating stay form with pre-installed blind dowels is used, bend the dowels out using special tools approved by the stay form manufacturer.

.4 Replace bars which develop cracks or splits.

3.3 Placing Reinforcement

.1 Place reinforcing steel in accordance with contract documents and CSA A23,1 / A23.2.

.2 Use only the placing drawings reviewed by WSP-S.

.3 Remove all loose scale, dirt, oil or other coatings which would reduce bond.

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

.5 Turn ends of tie wire towards the interior of concrete.

.6 Support bars, chairs and spacers:

.1 Provide sufficient support bars, chairs, carriers and side form spacers as necessary to secure against displacement of reinforcement and maintain concrete cover before and during concrete placement. Support devices contacting surfaces exposed to the exterior to be non-corroding. Bars which are not shown on Structural Drawings and whose only function is supporting other reinforcing in lieu of other supporting devices to be considered accessories.

.2 Use bar supports for beams and slabs.

.3 Use side form spacers for walls and columns.

.4 Use plastic or plastic tipped bar supports and spacer with colour to match concrete for exposed concrete surfaces.

.5 Use plastic bar supports, epoxy coated support bars and plastic-coated tie wire for epoxy coated reinforcement.

.6 Use precast concrete chairs where supports rest on the ground. Where welded wire fabric is used in slabs-on- grade, place precast concrete chairs at 600 mm (2’-0”) on centre each way. Do not attempt to position welded wire fabric by lifting it after concrete is poured.

.7 Do not splice reinforcing at locations other than shown on placing or structural drawings without WSP-S written approval.

.8 Do not cut reinforcement without WSP-S written approval.

.9 Unless otherwise noted on drawings, stagger alternate mechanical couplers 750 mm (2’-6”) apart.

.10 Install end bearing compression splices so that bearing ends are fitted to within 3 degrees of full bearing after splice installed.

.11 Do not field weld reinforcement except where indicated or authorized by WSP-S.

.12 Do not weld epoxy coated reinforcement.

.13 Bend dowels from foundation walls to slab on grade (supplied and installed straight) only after soil compaction against the wall has been completed.

3.4 Field Touch-Up

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

3.5 Cleaning

.1 Clean in accordance with Section 01 74 00 - Cleaning.

.2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal and 01 35 21 – LEED Requirements.

END OF SECTION 03 20 00

PART 1 - GENERAL

1.1 Related Requirements

.1 Section 03 10 00: Concrete Forming and Accessories

.2 Section 03 20 00: Concrete Reinforcing

.3 Section 03 35 00: Concrete Finishing

.4 Section 03 35 46: Concrete Floor Hardening

.5 Section 05 12 23: Structural Steel for Buildings

.6 Section 32 13 13: Concrete Paving

.7 Section 32 16 00: Curbs, Gutters and Sidewalks

1.2 References

.1 Editions of all Referenced Standards to be the ones designated by the applicable Building Code in force at the time of building permit application, as indicated on Structural Drawings. For Standards not referenced by the Building Code, use the latest editions.

.2 CSA Group (CSA):

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

.2 CSA A283, Qualification Code for Concrete Testing Laboratories

.3 CSA A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005)

.3 ASTM International (ASTM):

.1 ASTM C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

.2 ASTM C920 – Standard Specification for Elastomeric Joint Sealants

.3 ASTM D1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

.4 ASTM E1155M Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Number (Metric)

.5 ASTM C1059, Standard Specifications for Latex Agents for Bonding Fresh to Hardened Concrete

.4 Canadian General Standards Board (CGSB):

.1 CGSB-51.34, Vapour Barrier, Polyethylene Sheet for Use in Building Construction

1.3 Quality Assurance

.1 Qualifications:

.1 Concrete supplier to have a valid “Certificate of Ready Mixed Concrete Production Facilities” issued by the relevant Ready Mixed Concrete Association.

.2 Samples:

.1 Include construction joints to be used.

.2 Use the same materials and workmanship as will be employed for the actual Work.

.3 Include a repaired area for each sample.

.4 If a sample does not meet the standard of quality specified for the Work, construct additional samples until the required standard is achieved and accepted.

.5 The accepted samples to be the minimum standard of quality for Work. Do not proceed until the samples are accepted by the Architect.

.2 Steel fibre reinforced slab on grade: Submit samples of steel fibres and construction joint dowels with sleeves.

1.4 Quality Control

.1 Submit in accordance with Section 01 45 00 - Quality Control.

.2 Minimum two weeks prior to starting concrete work, provide valid 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 four weeks prior to starting concrete work, provide proposed quality control procedures on following items:

.1 Hot weather concrete.

.2 Cold weather concrete.

.3 Finishing.

.4 Protection.

1.5 Unit Prices

.1 Provide unit prices per Section 01 29 00 – Payment Procedures.

1.6 Administrative Requirements

.1 Pre-installation Meeting: convene pre-installation meeting one week prior to beginning concrete works. Ensure key personnel to attend.

.2 Batch Logs: keep record of each batch delivered to site.

.3 Concrete Delivery Slips: Keep all concrete delivery slips (“driver’s tickets”) on site until building is completed. Record on delivery slip where concrete was placed, including time and date.

1.7 Action and Informational Submittals

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

.2 Minimum 2 weeks prior to starting concrete work, submit all concrete mix designs, and indicate where each concrete mix is to be used.

.3 Minimum 2 weeks prior to placing concrete, submit drawings showing proposed locations of all construction and control joints (including wall and slab on grade control joints) for WSP-S review and approval.

.4 Provide composite sleeving drawings showing sleeves required by all trades.

.5 Provide composite layout drawings showing all cast in place pipes and conduits.

.6 Minimum submission requirements for each concrete mix design shall include the following:

.1 Minimum specified compressive strength at 28 days (or at the time specified on drawings).

.2 Maximum aggregate size.

.3 Aggregate type (if not normal density).

.4 Concrete density range, wet and dry (if not normal density).

.5 CSA exposure class.

.6 Cement type (if not type GU).

.7 Percentage and type of supplemental cementing materials.

.8 Maximum water/cementitious materials ratio.

.9 Slump at point of discharge.

.10 Assumed method of placement of concrete.

.11 Corrosion inhibitor (name and quantity, if applicable).

.12 Plastic or steel fibres (type, name and quantity, if applicable).

.13 Alkali-aggregate resistance.

.14 Architectural requirements (colour of cement and aggregate, if applicable).

.15 Maximum time from batching to placing concrete (if retarding admixtures are used).

.7 Concrete pours: provide accurate records of all concrete pours marked on a set of Structural Drawings.

.8 Flatness and levelness: when requested, submit measurements of slab tolerances for each concrete pour.

.9 On completion of the works, provide written report to WSP-S certifying that the concrete in place meets performance requirements established in **PART 2 - PRODUCTS**.

PART 2 - PRODUCTS

2.1 Design Criteria

.1 To CSA A23.1/A23.2, Alternative 1 – Performance, and as described under Mixes and on Structural Drawings.

.1 Chose fibre type and dosage to control cracking and to enable slab on grade of specified thickness to safely support loads indicated on Structural Drawings.

.2 Check slabs in centre of panel, at slab edges, at slab corners, at control joints and at construction joints.

.3 Design dowels at construction joints.

2.2 Performance Criteria

.1 Concrete supplier to meet the concrete performance criteria established by WSP-S and to provide verification of compliance.

2.3 Materials

.1 Portland cement: to CSA A3001.

.2 Cementitious hydraulic slag: to CSA A3000.

.3 Fly ash: to CSA A3001, Type CI.

.4 Water: to CSA A23.1.

.5 Aggregates: to CSA A23.1/A23.2. Do not use recycled concrete as aggregate.

.6 Admixtures: not to contain chlorides.

.7 Corrosion-inhibiting admixture: calcium nitrite solution.

.8 Plastic fibre additive: fibrillated polypropylene micro fibres at least 19 mm (3/4”) in length.

.9 Shrinkage compensating grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents to CSA A23.1/A23.2. Minimum compressive strength: 40 MPa at 28 days.

.10 Non premixed dry pack grout: composition of non metallic aggregate and Portland cement with sufficient water for mixture to retain its shape when made into ball by hand and capable of developing compressive strength of 40 MPa at 28 days.

.11 Curing/sealing compound: to CSA A23.1/A23.2 and ASTM C309, Type 1, Class B, water based acrylic, compatible with surface hardener where hardener is used.

.12 Pre-moulded joint fillers: min.12 (1/2”) bituminous impregnated fiber board to ASTM D1751.

.13 Compressible filler: flexible polyethylene closed cell expansion joint filler to ASTM D 4819, type II.

.14 Joint Sealants: to ASTM C920, class 100/50.

.15 Weep hole tubes: plastic.

.16 Evaporation reducer: water based polymer liquid forming continuous monomolecular temporary film on fresh concrete surface.

.17 Penetrating sealer: water based, clear water repellent, at least equivalent to AT&U Type 1b as specified in Alberta Infrastructure and Transportation Publication B388.

.18 Bonding adhesive: synthetic latex per ASTM C1059.

.19 Non- slip nosing inserts for concrete stairs: fine aluminum oxide strips, 6 mm (¼") wide x 10 mm (3/8”) deep.

.20 Rigid insulation: extruded polystyrene boards per ASTM C578, structural grade, compressive strength 40 psi (275 kPa).

.21 Control joint filler: semi-rigid two component epoxy or polyurea with 100% solids, Shore A hardness (per ASTM D2240) min. 85, tensile strength at 7 days (per ASTM D638 or ASTM D412) min 5.0 MPa.

.1 For sawcuts in exterior slabs and in slabs in vehicle accessible areas use only polyurea fillers.

.22 Pre-formed control joint: two piece pre-assembled “T” shaped plastic; detachable top segment, minimum depth of vertical segment equal to ¼ of slab thickness.

.23 Continuous sliding bearing:

.1 Two layers of polyolefin, or two layers of promine covered with rubber top and bottom, approximately 6 mm (1/4") in overall thickness.

.2 Deformation under 13.8 MPa at 22°C not to exceed 10% when tested for 24 hours.

.24 Elastomeric bearing pads:

.1 Virgin natural polyisoprene or virgin polychloroprene (Neoprene) conforming to CSA S6.

.25 Prefabricated Seepage Protection System: polymer core with a geotextile laminated on one side.

.26 Crack Filler: low viscosity epoxy resin.

.27 Bond Breaker: 0.25 mm (10 mil) polyethylene or grade D, 30 minute building paper perforated with 8 mm (5/16") holes at 150 mm (6") centres, each way.

2.4 Concrete Mixes

.1 Use ready-mix concrete. Proportion concrete in accordance with CSA A23.1, Alternative 1 - Performance Method for Specifying Concrete.

.2 Set performance characteristics of concrete in plastic state in coordination with all trades involved.

.3 Meet performance criteria of concrete in hardened state as shown on Structural Drawings and provide verification of compliance.

.4 Do not use admixtures containing chlorides.

.5 supplementary cementing materials (SCM):

.1 Conform to CSA A23.1.

.2 Follow slag and fly ash manufacturers' directions for proportioning and mixing of concrete.

.3 Avoid using SCM in architecturally exposed concrete. If necessary to achieve the required exposure classification, SCM not to affect colour and texture of finished concrete.

.4 Do not use concrete with more than 40% of SCM when ambient temperature is forecast to be below +10ºC at the time of concrete pour and during the seven days after the pour, except for footings, walls and columns.

.5 Reduce W/C ratio to 0.45 where using more than 40% of SCM in concrete for slabs and other horizontal finished surfaces, in order to reduce bleed water and to increase rate or strength gain.

PART 3 - EXECUTION

3.1 Preparation

.1 Provide advanced notice as indicated on drawings to allow WSP-S field review of reinforcing prior to placing of concrete/closing of wall forms.

.2 Obtain WSP-S written approval before placing concrete.

.3 Obtain written approval of each foundation bearing surface by the Geotechnical Consultant before placing concrete.

.4 Remove water and disturbed soil from excavations before placing concrete.

.5 Before placing slab-on-grade, confirm that subgrade and backfill meet specifications and are free of frost and surface water.

.6 Provide bondbreaker under unbonded concrete topping. Attach to base slab, lap min. 150 mm (6”) and seal.

.7 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.

3.2 Installation/Application

.1 Set sleeves, conduits, pipe hangers, weep hole tubes, drains and other inserts and openings as indicated or specified elsewhere.

.2 Refer to Typical Details and Drawing Notes for placing guidelines, maximum size and minimum spacing of sleeves, embedded pipes and conduits.

.3 Check locations and sizes of sleeves and openings shown on Structural Drawings with Architectural, Mechanical and Electrical Drawings. Notify WSP-S of any discrepancies.

.4 Obtain WSP-S approval for any required sleeves and openings which are not shown on Structural Drawings or reviewed sleeving drawings.

.5 Set special inserts for strength testing as required for non destructive method of testing concrete.

.6 Set anchor rods using templates under supervision of appropriate trade prior to placing concrete. Locate each anchor rod group to within 6 mm (1/4”) of required location.

.7 Refer to Section 03 10 00 for construction joint requirements.

3.3 Placing Concrete

.1 Place concrete in accordance with CSA A23.1.

.2 Delivery and place concrete with minimum re-handling.

.3 If concrete is pumped or placed pneumatically, control discharge velocity to prevent separation or scattering of concrete mix ingredients.

.4 Place concrete in a continuous operation without cold joints. If cold joints develop inadvertently, notify WSP-S to obtain instructions for required remedial work.

.5 Where higher strength concrete needs to be puddled in slabs above columns and walls, place adjacent lower strength slab concrete within 30 minutes of pouring the puddled concrete.

.6 Do not overload forms.

.7 Use rubber tipped vibrators for concrete containing epoxy coated reinforcement.

.8 Cast slabs and beams at least two hours after casting the supporting columns and walls.

.9 Cast slabs with a top surface that is level or sloping as required by the Drawings. Allow for cambering where required.

.10 Where steel beams are used, ensure that slab thickness is as specified. Measure from top of steel to control thickness.

.11 Concrete exposed to view:

.1 Exposed surfaces to be dense, even, uniform in colour, texture and distribution of exposed aggregate.

.2 Defects such as honeycombing, voids, loss of fines, visible flow lines, cold joints or excessive bug holes may be cause for rejection at the discretion of the Architect.

.12 Maintain accurate records of all poured concrete including extent, date and location of each pour, concrete mix used, ambient air temperature, test samples taken and falsework removal date and mark on a set of Structural Drawings.

3.4 Finishing Concrete

.1 Finish concrete to CSA A23.1/A23.2.

.2 Cooperate with any trade applying finishes to concrete surfaces and provide surfaces which will ensure adequate bond. Provide chases and reglets where required.

.3 Finishing Flatwork:

.1 See Section 03 35 00 - Concrete Floor Finishing.

.2 Protect concrete during finishing process. Use evaporation reducer during severe drying conditions.

.3 Provide final finish in accordance with proposed use and as follows:

.1 Screeded and bull floated for: mud slabs and footings/pile caps.

.2 Screeded and bull floated with scratch finish for: base slabs which receive mortar setting beds or bonded toppings.

.3 Powered float finish for: roofs (except future floors) and slabs which receive a membrane.

.4 Wood float finish with brooming for: exterior exposed slabs.

.5 Powered steel trowel finish for: interior exposed slabs, slabs which receive resilient flooring, carpet, epoxy-based finishes, thin-set tiles, etc. and future floors. Do not trowel air entrained concrete.

.6 Steel trowel exposed interior concrete floors at least twice. Provide final spin troweling when non-slip finish is required.

.7 Incorporate hardener into the surface of the concrete while concrete is still plastic.

.8 Follow manufacturer’s recommendations for dosage and application procedure.

.9 Where coloured hardeners are required, colour will be selected from available colours by the Architect.

.10 Hold pre-construction meeting with hardener technical representative and finisher to ensure proper application, curing and protection.

.4 Finishing Formed Surfaces:

.1 Completely fill holes left by through-bolts with grout.

.2 Do not patch surfaces until instructed in writing by WSP-S.

.3 Concrete exposed to view:

.1 Provide smooth-form finish.

.2 Rub exposed sharp edges with carborundum to produce 3 mm (1/8") radius edges unless otherwise indicated.

3.5 Concrete Curing and Protection

.1 At a minimum cure and protect concrete in accordance with CSA A23.1

.2 Extend curing and protection period until concrete has reached following strength levels for structural safety:

.1 Framed slabs and beams: 75% of specified 28 day strength.

.2 Columns, walls, piers and footings: 50% of specified 28 day strength

.3 For concrete containing supplementary cementing materials, curing and protection times may need to be extended beyond those outlined by CSA A23.1 to achieve the required structural properties.

.4 Cure slab surfaces immediately after finishing is completed. Unless otherwise noted or required, use a curing compound compatible with applied finishes.

.5 Do not use curing compound on parking garage slabs and where bonded topping is to be applied. Cover slab surfaces with absorptive mat or fabric and keep continuously wet.

.6 Slabs on grade and structural slabs receiving resilient floor or other moisture sensitive finishes:

.1 Apply 24 hours of continuous sprinkling with water. Start immediately after finishing slab.

.2 Cover slab for at least the following 72 hours using plastic sheets with joints taped and free edges covered.

.3 Protect finished and cured slab from surface water (i.e. rain, snow).

.4 Refer to Architectural Specifications for required testing methods prior to placing floor finishes.

.7 Concrete exposed to view:

.1 Protect during construction period from wear, damage, marking, discolouration, staining and becoming coated with concrete leakage.

.2 Unless rejected, repair damage and remove marks and stains to the approval of the Architect.

.8 Do not load concrete until sufficient strength is developed.

3.6 Slabs on Grade

.1 Construction joints and control joints:

.1 Refer to Notes on Structural Drawings for maximum spacing requirements.

.2 Saw cut control joints to depth equal to one quarter of the concrete thickness u/n. Alternatively, for slabs on grade not exposed to view or vehicle traffic, create control joints by inserting pre-assembled “T” shaped plastic joints into fresh concrete; remove top part prior to concrete finishing.

.3 Locate joints on column lines wherever possible and on intermediate lines, which result in approximately square panels, without re-entrant corners.

.4 Do not create “L” shaped panels nor “T” shaped joint intersections.

.5 Protect edges of sawcuts from breakage.

.6 Clean out sawcuts in concrete exposed to view or vehicle traffic and fill with control joint filler after concrete is at least 120 days old.

.7 Sawcut top 25 mm (1") at construction joints in exposed concrete for a width of 5 mm (3/16") and fill with control joint filler after concrete is at least 120 days old. Alternatively, form construction joint with a 5mm (3/16") thick chamfer strip at top. Depth of the strip to be at least equal to ¼ of slab thickness.

.8 Clean out sawcuts in other concrete and fill with a sand-cement paste one month prior to installing floor coverings.

.2 Isolation Joints:

.1 Unless otherwise shown on structural drawings, provide pre-moulded joint filler of the same depth as the thickness of the concrete wherever slabs-on-grade abut foundation walls, columns and piers. Omit if slab is chased or dowelled into structure.

.2 Furnish filler for each joint in single piece for depth and width required for joint.

.3 When more than one piece of filler is required for a joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.

.3 Cracks in Slabs-on-Grade:

.1 Extensive cracking of slabs-on-grade or cracks in excess of 3 mm (1/8") in width may be cause for rejection of slab or portion of slab at the Architect's discretion.

.2 Protect edges of cracks in slabs-on-grade from breakage.

.3 Exposed slab on grade: Unless slab is rejected, repair cracks that are over 0.4 mm (0.016") wide:

.1 Fill cracks with a sand-cement grout after concrete is at least 120 days old.

.2 Seven days later, cut out top 20 mm (3/4") of crack for a width of 5 mm (3/16") and fill with control joint filler.

.4 Architectural slab on grade: Unless slab is rejected, repair cracks that are over 0.2 mm (0.008") wide:

.1 Fill cracks with epoxy after concrete is at least 180 days old.

.2 Take all measures necessary to prevent epoxy on surface of exposed slab.

.3 Have manufacturer's technical representative present during initial repairs.

3.7 Unbonded Concrete Toppings

.1 Place unbonded concrete topping over bondbreaker.

.2 Provide construction, control and isolation joints same as specified for slab on grade.

3.8 Bonded Concrete Toppings

.1 Place bonded topping over hardened concrete base slab in accordance with CSA A23.1.

.2 Not less than 24 hours prior to applying concrete toppings, remove all laitance, dirt, dust, debris, grease, or other substances that would interfere with the bond between the base slab and the topping using one or more of the following methods:

.1 Wet or dry grit sand-blasting.

.2 High-pressure water-blasting.

.3 Mechanical removal by scarifiers, scabblers, or grinding wheels.

.3 Notify WSP-S before placement of each topping.

.4 Bond topping to base slab using an epoxy bonding agent or cement/sand grout procedure.

.5 Provide joints in topping to match locations of those in base slab.

3.9 Penetrating sealer

.1 Concrete to receive penetrating sealer to be at least 28 days old.

.2 Surfaces to be treated with the sealer to be dry and free of dirt and other contaminants.

.3 Completely remove all curing compounds before the sealer application.

.4 Follow manufacturer's recommendations for coverage rate and application procedure.

.5 Do not apply in inclement weather or if ambient air temperature or concrete surface temperature is less than 5ºC or more than 38ºC.

3.10 Grouting Under Base Plates and Bearing Plates

.1 Grout under base plates and bearing plates using procedures in accordance with manufacturer's recommendations.

.2 Provide 100% contact over grouted area.

.3 Grout column base plates and beam bearing plates as soon as steelwork is completed.

.4 Do not add load on steelwork until grouting is completed and grout strength has reached at least 20 MPa.

3.11 Existing Structure

.1 Take precautions to protect the existing structure from damage.

.2 Remove portions of existing concrete structure as required.

.3 Provide temporary shoring and bracing as required.

.4 Retain a Professional Engineer to design the temporary shoring and bracing and to review this work on site.

.5 Obtain approval from WSP-S before coring or cutting existing slabs, beams or walls.

.6 Retain an independent testing company to locate existing reinforcement and conduit in the areas of proposed openings and to mark locations on the surfaces of slabs and walls on which the cores and cuts are to be started using a non destructive method.

.7 Remove toppings prior to locating reinforcement and conduit.

.8 Mark locations and sizes of cores and openings and locations of reinforcement and conduit using indelible markers as follows:

.1 Red for top bars

.2 Green for bottom bars

.3 Black for cores, openings and conduit.

.9 Relocate proposed openings and repeat process at no extra cost to the Contract if proposed locations are not acceptable to WSP-S.

.10 Save the complete length of all cores. Label each core with location taken. Make all cores available for review by WSP-S. Dispose of cores only with approval of WSP-S. See details on structural drawings for sawcutting procedure.

.11 If new reinforcement is required at an opening, install reinforcement before cutting opening or shore up structure until new reinforcement is installed.

.12 Roughening existing surfaces:

.1 Where drawings call for a roughened surface, bush hammer entire surface to a full amplitude of at least 5 mm.

.13 Patching:

.1 Patch existing concrete where necessary to provide required smooth, flat surfaces for reinforcement and for other trades.

3.12 Inspection and Testing:

.1 Compressive Strength Testing:

.1 One test is required for each 100 cubic meters of placed concrete, but not less than one test for each concrete mix placed each day. At least 3 tests are required for each class of concrete used.

.2 A group of three cylinders for each test will be provided, Location of concrete placement will be recorded for each cylinder set. One specimen will be tested at 7 and one at 28 days. The third specimen will be tested at 56 days if the required strength at 28 days is not achieved.

.3 If the final concrete strength is specified at 56, 90 or 120 days, a group of four cylinders will be provided. One specimen will be tested at 7 and one at 28 days, with the third specimen tested at the time the final concrete strength is specified. If the required strength is not achieved at the time specified, the fourth specimen will be tested 28 days later.

.4 One additional cylinder will be provided for each concrete mix during cold weather concreting. The specimens will be cured on site adjacent to and under the same conditions as the work they represent and will be tested prior to form removal.

.5 If standard on site cured cylinders are used to determine concrete strength prior to removal of formwork, they will be kept adjacent to and under the same conditions as the work they represent.

.6 If pull out tests are used to determine concrete strength prior to removal of formwork, the Inspection and Testing Agency will supply, locate and test pull out inserts. The inserts not to be located on surfaces exposed to view.

.7 If maturity tests are used to determine concrete strength prior to removal of formwork, the Inspection and Testing Agency will develop strength-maturity relationship curves, provide and install temperature sensors into fresh concrete and interpret readings in accordance with ASTM 1074,

.2 Slump testing:

.1 A minimum of one standard slump test will be conducted for every compressive strength test taken.

.3 Air Entrainment Testing:

.1 A minimum of one standard test for air content in plastic concrete will be conducted for each 25cubic meters of each air entrained concrete mix.

.2 One standard test per ASTM C457 will be conducted to determine air void spacing factor in hardened concrete for each 100 cubic meters of each air entrained concrete mix.

.4 Permeability Testing:

.1 One chloride ion permeability test will be conducted for each 100 cubic meters of all class C-1, A-1 and C-XL concrete mixes used for floor and roof slabs and for salt water pools.

.5 Mass Concrete Testing:

.1 All concrete slabs (including raft foundation slabs) over 600 mm (2'-0") thick, and all walls over 1000 mm (3'-4") thick are considered mass concrete.

.2 The Agency will record concrete temperature at placing.

.3 The Agency will record concrete temperature and temperature gradient during the 7 day curing period by providing, installing and monitor sufficient number of thermocouples.

.6 Fresh Density Testing:

One standard fresh density test will be performed on site for each 50 cubic meters of semi-low density, low density and high density concrete. Assist the Agency to correlate fresh density with air-dry density prior to the work beginning on site. Reports will include both fresh density and air-dry density.

.7 Bond Strength Testing:

.1 One standard bond test will be provided for each 200 square meters of bonded concrete topping placed over hardened concrete and designed to act compositely with it.

.8 Grout Testing

.1 One standard test per ASTM C1107 will be made each day when concrete grout is installed under base plates.

.2 A group of 6 cubes for each test will be provided. 3 cubes will be tested after 7 days, and 3 after 28 days.

3.13 Cleaning

.1 Clean in accordance with Section 01 74 00 - Cleaning.

.2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal and 01 35 21 – LEED Requirements.

END OF SECTION 03 30 00

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 04 05 12 – Mortar and Masonry Grout.
.2 Section 04 05 19 – Masonry Anchorage and Reinforcing.
.3 Section 04 05 23 – Masonry Accessories.
.4 Section 04 22 00 – Concrete Unit Masonry
.5 Section 05 50 00 – Metal Fabrications.
.6 Section 07 21 13 – Board Insulation
.7 Section 07 27 00 – Air Barriers.
.8 Section 07 92 00 – Joint Sealing.

1.2 REFERENCES

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

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Pre-installation meetings: comply with Section 01 31 19 - Project Meetings. Conduct pre-installation meeting two weeks 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. 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.

1.3 ACTION 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 Samples.
.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
.2 Submit samples.
.2 One type of masonry accessory specified.
.3 One type of masonry reinforcement, tie and connector proposed for use.

.3 Manufacturer's Instructions.
.1 Submit manufacturer's installation instructions.
.2 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, limitations and colours.
.3 Provide two copies of Workplace Hazardous Materials Information System (WHMIS) - Material Safety Data Sheets (MSDS) in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.4 QUALITY ASSURANCE

.1 Test Reports.
.1 Certified test reports showing compliance with specified performance characteristics and physical properties.
.2 Submit laboratory test reports in accordance Section 01 29 83 - Payment Procedures: Testing Laboratory Services.
.3 Submit laboratory test reports certifying compliance of masonry units and mortar ingredients with specification requirements.

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

.3 Qualifications:
.1 Manufacturer: capable of providing field service representation during construction and approving application method.
.2 Installer: experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
.3 Masons: company or person specializing in masonry installations with 5 years documented experience with masonry work similar to this project.
.1 Masons employed on this project must demonstrate ability to reproduce mock-up standards.

.4 Mock-ups:
.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control

.2 Construct mock-up panel of exterior masonry wall construction showing masonry colours and textures, use of reinforcement, ties, through-wall flashing, weep holes, jointing, coursing, mortar and workmanship.

.3 Mock-up used:

.1 To judge workmanship, substrate preparation, operation of equipment and material application.

.4 Construct mock-up where directed by Consultant.

.5 Allow 48 hours for inspection of mock-up by Consultant before proceeding with work.

.6 When accepted by Consultant, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

.7 Start work only upon receipt of written acceptance of mock-up by Consultant.

1.5 DELIVERY, STORAGE, AND HANDLING

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

.2 Deliver materials to job site in dry condition, store and handle material in accordance with manufacturer's instructions.

.3 Storage and Handling Protection.

.1 Keep materials dry until use except where wetting of bricks is specified.

.2 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

1.6 WASTE MANAGEMENT AND DISPOSAL

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

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, pallets, packaging material for recycling in accordance with Waste Management Plan.

.3 Unused metal materials are to be diverted from landfill to a metal recycling facility as approved by Consultant.

.4 Unused or damaged masonry materials must be diverted from landfill to a local facility as approved by Consultant.

1.7 SITE CONDITIONS

.1 Ambient Conditions: assemble and erect components when temperatures are above 4 degrees C.

.2 Weather Requirements: to CSA-A371.

.3 Cold weather requirements.
.1 Supplement Clause 5.15.2 of 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 between 5 degrees C and 50 degrees C and protect site from windchill.

.4 Hot weather requirements.
.1 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.
.2 Keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until masonry work is completed and protected by flashings or other permanent construction.

.5 Spray mortar surface at intervals and keep moist for maximum of three days after installations.

1.8 CLOSEOUT SUBMITTALS

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

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Masonry materials are specified in Related Sections.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 EXAMINATION

.1 Examine conditions, substrates and work to receive 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.

.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, and dimensioned stone.
.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.

.4 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.

3.4 INSTALLATION

.1 Do masonry work in accordance with CSA-A371 except where specified otherwise.

.2 Build masonry plumb, level, and true to line, with vertical joints in alignment, respecting construction tolerances permitted by CSA-A371.

.3 Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

.4 Assume complete responsibility for dimensions, plumbs and levels of this work and constantly check same with graduated

rod.

.5 Carry up walls in uniform manner. Raise no one portion more than 1.2m or less to avoid excessive loads on un-set joints. Ensure no impact to plumbness and alignment of wall as work progresses. Review permitted height with masonry veneer manufacturer and adjust as necessary to suit cure rate for each type of masonry unit.

3.5 CONSTRUCTION

.1 Exposed masonry.

.1 Remove chipped, cracked, and otherwise damaged units, in accordance with CSA A-165, in exposed masonry and replace with undamaged units.

.2 Jointing.

.1 Allow joints to set just enough to remove excess water, then tool with round jointer to provide smooth, joints true to line, compressed, uniformly concave joints where concave joints are indicated. Typical for all exposed locations.

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

.3 Cutting.

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

.2 Make cuts straight, clean, and free from uneven edges.

.4 Building-In.

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

.2 Prevent displacement of built-in items during construction. Check plumb, location and alignment frequently, as work progresses.

.3 Brace door jambs to maintain plumb. Fill spaces between jambs and masonry with mortar.

.5 Support of loads.

.1 Use 21 MPa concrete to Section 03 30 00 - Cast-in-Place Concrete, where concrete fill is used in lieu of solid units.

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

.3 Install building paper below voids to be filled with concrete grout; keep paper 25 mm back from faces of units.

.6 Provision for movement.

.1 Leave 20 mm space below shelf angles.

.2 Leave 15 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.

.7 Loose steel lintels.
.1 Install loose steel lintels. Centre over opening width.

.8 Control joints.
.1 Construct continuous control joints as required for site condition, as indicated, and at maximum spacing of 9M.

.9 Expansion joints.
.1 Build-in continuous expansion joints as indicated

3.6 SITE TOLERANCES

.1 Tolerances in notes to CSA-A371 apply.

3.7 FIELD QUALITY CONTROL

.1 Inspection and testing will be carried out by Testing Laboratory designated by Consultant.

.2 Manufacturer's Services:
.1 Have manufacturer of masonry veneer products supplied under this Section review work involved in handling, installation/application, and protection 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.
.3 Upon completion of work, after cleaning is carried out.
.4 Obtain reports within three days of review and submit immediately to Consultant.

3.8 CLEANING

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

.2 Progress cleaning in accordance with related masonry sections.

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

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

3.9 PROTECTION

.1 Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.

.2 Keep masonry dry using waterproof non-staining coverings. Drape over walls and extend down sufficient to protect walls from wind driven rain until masonry wall is complete and protected by flashings or other permanent construction.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 04 03 07 – Masonry Repointing
.2 Section 04 03 31 – Replacing Brick Masonry.
.3 Section 04 05 00 – Common Work Results for Masonry.
.4 Section 04 05 19 – Masonry Anchorage and Reinforcing.
.5 Section 04 05 23 – Masonry Accessories.
.6 Section 04 22 00 – Concrete Masonry Unit

1.2 REFERENCES

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

.2 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)
.1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

1.3 ACTION SUBMITTALS

.1 Product Data.
.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures and in Section 01 35 29.06 - Health and Safety Requirements. Indicate VOC's mortar, grout, parging, colour additives and admixtures. Expressed as grams per litre (g/L).

.2 Samples.
.1 Sample to be part of mock-up review.

.3 Manufacturer's Instructions.
.1 Submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties and in accordance with Section 04 05 00 - Common Work Results for Masonry supplemented as follows:
.1 Submit laboratory test reports in accordance Section

01 29 83 - Payment Procedures: Testing Laboratory Services.

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

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

.4 Mock-ups:
.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control and requirements of Section 04 05 00 - Common Work Results for Masonry.

1.5 DELIVERY, STORAGE, AND HANDLING

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

1.6 SITE CONDITIONS

.1 Ambient Conditions: maintain materials and surrounding air temperature to:
.1 Minimum 5 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

1.7 WASTE MANAGEMENT AND DISPOSAL

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

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material for recycling in accordance with Waste Management Plan.

PART 2 - PRODUCTS

2.1 MATERIALS

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

.2 Mortar and grout: CSA A179.

.3 Aggregate: supplied by one supplier.
.1 to CAN/CSA A179,
.2 Use aggregate passing 1.18 mm sieve where 6 mm thick joints are indicated.

.4 Cement:
.1 Portland Cement: to CAN/CSA-A3000, HS - High-sulphate-resistant hydraulic cement (Type 50), gray colour.
.2 Masonry Cement: to CAN/CSA-A3002 and CAN/CSA A179, Type N and S.
.3 Mortar Cement: to CAN/CSA-A3002 and CAN/CSA A179, Type N and S.
.4 Packaged Dry Combined Materials for mortar: to CAN/CSA A179, Type N and S, using gray colour cement.

.5 Water: clean and potable.

.6 Lime:
.1 Quick Lime: to CAN/CSA A179, Type N.
.2 Hydrated Lime: to CAN/CSA A179, Type S.

.7 Bonding Agent: epoxy type.

.8 Polymer Latex: organic polymer latex admixture of butadiene-styrene type non-emulsifiable bonding admixture.

.9 Non-Staining mortar: use non-staining masonry cement for cementitious portion of specified mortar type.

.10 Grout: to CSA A179, Table 3.

2.2 MORTAR MIXES

.1 Mortar for exterior masonry above grade:
.1 Loadbearing: type S based on proportion specifications.
.2 Non-Loadbearing: N based on proportion specifications.

.2 Mortar for interior masonry:
.1 Loadbearing: type S based on proportion specifications.
.2 Non-Loadbearing: N based on proportion specifications.

.3 Mortar for foundation walls, manholes, sewers, pavements, walks, patios and other exterior masonry at or below grade:

type M based on proportion specifications.

.4 Following applies regardless of mortar types and uses specified above:
.1 Mortar for grouted reinforced masonry: type S based on proportion specifications.

2.3 MORTAR MIXING

.1 Mix mortar ingredients in accordance with CAN/CSA A179 in quantities needed for immediate use.

.2 Maintain sand uniformly damp immediately before mixing process.

.3 Add admixtures in accordance with manufacturer's instructions. Provide uniformity of mix and colouration.

.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 Re-temper mortar only within two hours of mixing, when water is lost by evaporation.

.8 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 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 CAN/CSA-A23.1 transit mixed.

.2 Mix grout ingredients in quantities needed for immediate use in accordance with CAN/CSA A179 fine 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 proportion specification. Test prior to construction and 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.
.7 Splitting tensile strength.

.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 proportion specification. Test prior to construction and during construction for:

.1 Compressive strength.
.2 Sand/cement ratio.
.3 Water content and water/cement ratio.
.4 Slump.

.3 Inspection and testing will be carried out by Testing Laboratory designated by Consultant.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Request inspection of spaces to be grouted.

3.2 PREPARATION

.1 Apply bonding agent to existing concrete surfaces.

.2 Plug clean-out holes with block masonry units. Brace masonry for wet grout pressure.

3.3 MANUFACTURER'S INSTRUCTIONS

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

3.4 CONSTRUCTION

.1 Do masonry mortar and grout work in accordance with CSA A179 except where specified otherwise.

3.5 MIXING

.1 Clean all mixing boards and mechanical mixing machine between batches.

.2 Mortar must be weaker than the units it is binding.

.3 Contractor to appoint one individual to mix mortar, for duration of project. In the event that this individual must be changed, mortar mixing must cease until the new individual is trained, and mortar mix is tested.

3.6 MORTAR PLACEMENT

.1 Install mortar to requirements of CAN/CSA A179.

.2 Remove excess mortar from grout spaces.

3.7 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 400mm, without consolidating grout by rodding.

.5 Do not displace reinforcement while placing grout.

3.8 FIELD QUALITY CONTROL

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

.2 Manufacturer's Field Services: in accordance with Section 04 05 00 - Common Work Results for Masonry.

.3 Inspection and testing will be carried out by Testing Laboratory designated by Owner.

3.9 CLEANING

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

.2 Remove droppings and splashings using clean sponge and water.

.3 Clean masonry with low pressure clean water and soft natural bristle brush.

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

3.10 PROTECTION OF COMPLETED WORK

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

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 04 05 12 – Mortar and Masonry Grout.
.2 Section 04 05 23 – Masonry Accessories.
.3 Section 04 22 00 – Concrete Unit Masonry.
.5 Section 05 50 00 – Metal Fabrications.
.6 Section 07 21 13 – Board Insulation
.7 Section 07 27 00 – Air Barriers.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International).
.1 CAN/CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
.2 CAN/CSA A179-04, Mortar and Grout for Unit Masonry.
.3 CAN/CSA A370-04, Connectors for Masonry.
.4 CAN/CSA A371-04, Masonry Construction for Buildings.
.5 CAN/CSA G30.18-M92(R2007), Billet-Steel Bars for Concrete Reinforcement.
.6 CSA-S304.1-04, Design of Masonry Structures.
.7 CSA W186-M1990(R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.

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 datasheets illustrating products to be incorporated into project for specified products.
.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's for epoxy coatings and galvanized protective coatings and touch-up products.

.2 Shop Drawings :
.1 Provide drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
.2 Shop drawings consist of bar bending details, lists and placing drawings.
.3 On placing drawings, indicate sizes, spacing, location and quantities of reinforcement and connectors.

.3 Manufacturer's Instructions:
.1 Submit manufacturer's installation instructions.

.4 Samples:
.1 Samples to be part of mock-up sample for review.

1.4 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

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

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Section 04 05 00 - Common Work Results for Masonry.

.4 Mock-ups:
.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control and requirements of Section 04 05 00 - Common Work Results for Masonry supplemented as follows:
.1 Construct mock-ups panel of anchorage installation and reinforcement installation.
.2 Sample panel: using proposed procedures, anchorage material, connectors, reinforcement material, and workmanship.

1.5 FIELD MEASUREMENTS

.1 Make field measurements necessary to ensure proper fit of members.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle masonry anchorage and reinforcing materials in accordance with Section 01 61 00 - Common Product Requirements, supplemented as follows:
.1 Deliver reinforcement and connectors, identified in shop and placement drawings.

1.7 WASTE MANAGEMENT AND

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste

DISPOSAL

Management And Disposal.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material for recycling in accordance with Waste Management Plan.

.3 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Bar reinforcement: to CSA-A371 and CAN/CSA G30.18, Grade 400.

.2 Wire reinforcement: to CSA-A371 and CSA G30.14, truss type, tri-rod for cavity walls, with min. 3.8 mm deformed side rods but heavier rods where required, galvanized without a drip, 50 mm narrower than wall.

.3 Connectors: to CSA-A370 and CSA-S304.

.4 Corrosion protection: to CSA-S304.1, galvanized to CSA-S304.1 and CSA-A370. Hot dip galvanized with min. 0.46 kg. zinc /m2.

.5 At back up metal studs, use Bailey brick tie/connector or Fero Slotted Stud Tie with brick connector connected by sheet metal screws to web of stud; all material to be hot dipped galvanized complete with insulation support clip.

.6 Fasteners to steel studs: sheet metal screws with self-drilling tip round of pan head, min. 10mm longer than material to be fastened min. 4.8mm diameter (#12). Construction Fasteners Inc.'s "Sentri-Coating, Buildex" Climaseal Coating", or 300 Series Stainless Steel. Engineer for large format masonry units.

2.2 FABRICATION

.1 Fabricate reinforcing in accordance with CAN/CSA-A23.1 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Ontario.

.2 Fabricate connectors in accordance with 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 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 INSTALLATIONS

.1 Supply and install masonry connectors and reinforcement in accordance with CSA-A370, CSA-A371, CAN/CSA-A23.1 and CSA-S304.1 unless indicated otherwise.

.2 As part of mock-up assembly obtain Consultant's review of placement of reinforcement and connectors.

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

3.3 HORIZONTAL REINFORCING

.1 Provide horizontal reinforcing in all masonry work in accordance with drawings. Refer to structural drawings.

.2 Install continuous horizontal reinforcing in each wythe of every concrete block wall at vertical spacing intervals 400mm maximum or 200mm where called for. Lap 150mm at each splice.

.3 Utilize "L" and "T" shaped horizontal reinforcement at corners and abutting partitions.

.4 Additionally place reinforcement in the first and second bed joints above and below openings extending 600mm beyond each side of opening.

.5 Place joint reinforcement continuous in first [and second] joint below top of walls.

.6 Lap joint reinforcement ends minimum 150 mm.

.7 Reinforce masonry where thickness is reduced by a column or chase with a length of horizontal reinforcing in the joint of every block course and extending 1.2m beyond each end of the column or chase.

3.4 BONDING AND TYING

.1 Bond walls of two or more wythes using metal connectors in accordance with CSA-S304, CSA-A371 and as indicated and specified.

.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 and manufacturer's instructions.

1 Locate box anchors in cavity walls at max. 400mm o.c. vertically and maximum 600mm o.c. horizontally.

.2 Secure special ties to framing: locate at maximum 400mm o.c. horizontally and max. 600mm o.c. vertically to metal studs.

.3 Additionally reinforce brick to steel stud framing:

.1 At max. 3 brick courses below top of any wall or wall opening.

.2 At max. 5 brick courses above steel lintels and shelf angles.

.4 Connect stack bonded unit joint corners and intersections with strap anchors 400 mm on centre

3.5 EARTHQUAKE

.1 Reinforce masonry elements in accordance with most recent issue of Ontario Building code and National Building Code.

.2 Reinforce masonry elements in accordance with CSA-A371, and as indicated, supplemented as follows:

.1 Loadbearing and lateral load-resisting masonry and

.2 Masonry enclosing elevator shafts and stairways or used as exterior cladding, and

.3 Masonry partitions exceeding 200 kg/m² or 3m in height.

.3 Set dowels in foundations and floor slabs at cores of block to be reinforced.

.4 Install vertical rod reinforcing in cores, sized and spaced as shown on drawings.

.5 Anchor reinforcing to floor of foundation and to structure above.

.6 Anchor masonry to structural beams, columns, and walls at maximum 400mm o.c. vertically and max. 12.m. o.c. horizontally.

.7 Lap reinforcing bars min. 36 bar diameters at splices.

.8 Embed bolts and anchors solidly in mortar or grout to develop maximum resistance to design forces.

.9 Tie intersecting new bearing walls together with reinforcing in every second course.

.10 Provide lateral support and anchorage in accordance with CSA-A371 and as indicated and specified.

.11 Consult drawings for additional reinforcing.

3.6 REINFORCED LINTELS AND BOND BEAMS

.1 Reinforce masonry lintels and bond beams as indicated.

.2 Place and grout reinforcement in accordance with CSA-S304.1, CSA-A371, and CSA-A179.

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

3.7 GROUTING

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

3.8 ANCHORS

.1 Supply and install metal anchors as indicated.

.2 Embed metal anchors solidly in mortar or grout to develop maximum resistance to design forces.

.3 Anchor masonry to structural beams, columns, and walls max. 400mm o.c. vertically and max. 1.2m o.c. horizontally.

.1 Anchor concrete block steel columns and beams with 250mm long x 38mm wide x 3mm thick "L" shaped straps at 400mm o.c. with 200mm leg in block and 50mm leg welded to column or beam.

.2 Anchor new concrete block to existing concrete block with corrugated ties at 400mm o.c.

3.9 LATERAL SUPPORT AND ANCHORAGE	.1	Supply and install lateral support and anchorage in accordance with CSA-S304.1 and as indicated.
3.10 MOVEMENT JOINTS	.1	Reinforcement will not be continuous across movement joints unless otherwise indicated.
	.2	Stop reinforcing 25mm on each side of control joints unless otherwise indicated.
3.11 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.
3.12 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	Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 04 05 00 – Common Work Results for Masonry.
.2 Section 04 05 12 – Mortar and Masonry Grout.
.3 Section 04 05 19 – Masonry Anchorage and Reinforcing.
.4 Section 04 21 13 – Brick Masonry.
.5 Section 04 22 00 – Concrete Unit Masonry.

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).
.1 ASTM D 2240-05, Standard Test Method for Rubber Property - Durometer Hardness.

.2 Canadian Standards Association (CSA International).
.1 CAN/CSA A371-04, Masonry Construction for Buildings.
.2 CAN/CSA-ISO 14021-00(R2204), Environmental Labels and Declarations - Self Declared Environmental Claims (Type II Environmental Labelling).

.3 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)
.1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

1.3 ACTIVE 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 data sheet in accordance with Section 01 33 00 - Submittal Procedures.
.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's for joint fillers and lap adhesives.

.3 Manufacturer's Instructions:
.1 Submit manufacturer's installation instructions.

.4 Shop Drawings:
.1 Provide shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
.1 Provide drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
.2 Provide shop drawings consist of flashing and installation details. Indicate sizes, spacing, location and quantities of fasteners.

.5 Samples:
.1 Provide samples in accordance with Section 01 33 00 - Submittal Procedures, supplemented as follows:.
.1 Materials: two, cured, and coloured samples, illustrating colour and colour range. Include:
.1 Movement joint filler.
.2 Lap adhesive.
.3 Mechanical fasteners.
.4 Reglets.
.5 Brick vents.
.2 Two moisture control material samples, illustrating colour and colour range, size, and shape. Include:
.1 Weep hole vents.
.2 Mortar diverters.
.3 Grout screens.
.3 Two flashing material samples, illustrating colour and colour range, size, shape, and profile. Include as specified:
.1 Sheet metal flashings.
.2 Composite flashings.

.6 Quality Assurance Submittals:
.1 Test reports: submit certified test reports in accordance with Section 04 05 00 - Common Work Results for Masonry.
.2 Certificates: submit in accordance with Section 04 05 00 - Common Work Results for Masonry.
.3 Manufacturer's Instructions: submit in accordance with Section 04 05 00 - Common Work Results for Masonry, supplemented as follows:
.1 Submit installation instructions for fillers, adhesives, reglets, brick vents, weeps, vents, diverters, screens, and flashings.

.7 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

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

.9 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Section 04 05 00 - Common Work Results for Masonry.

1.4 FIELD MEASUREMENTS

.1 Make field measurements necessary to ensure proper fit of members.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle masonry anchorage and reinforcing materials in accordance with Section 01 61 00 - Common Product Requirements, supplemented as follows:
.1 Deliver reinforcement and connectors, identified in shop and placement drawings.

1.6 WASTE MANAGEMENT AND DISPOSAL

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

.2 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material for recycling in accordance with Waste Management Plan.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Control joint filler: purpose-made elastomer 654-4 (85+ or -5)durometer hardness to ASTM D 2240.

.2 Lap adhesive: recommended by masonry flashing manufacturer. Use low VOC products in compliance with the SCAQMD Rule 1168

.3 Nailing inserts: 0.6mm thick purpose made galvanized steel inserts for setting in mortar joints.

.4 Mechanical fasteners: recommended by flashing manufacturer to suit project requirements

2.2 MOISTURE CONTROL

.1 Weep Hole Vents: Purpose made PVC.

.2 Cell vents: polypropylene plastic, honeycomb design.
.1 Size: 9.5 mm x 63.5 mm x 85.7 mm

.3 Colour: brown or black.

.4 Mortar diverters: shaped and sized to suit cavity spaces. "Mortarstop" cavity drainage board manufactured by Polytite Manufacturing Corporation.

.5 Grout Screens: 6 mm square monofilament screen is fabricated form high-strength, non-corrosive polypropylene polymers to isolate flow of grout in designated areas.

2.3 FLASHINGS

.1 Through-wall Flashings: Perm-a-Barrier wall flashing membrane by:
.1 W.R.Grace,
.2 Blueksin AG by Bakor
.3 Sopraseal Stick 1100T by Soprema.
.4 3015TWF by 3M
Complete with adhesive and primer recommended by Manufacturer of flashing. Provide metal support over cavities larger than 50mm of 26GA (0.55 mm) zinc coated steel commercial quality to ASTM A526M with Z275 designated zinc coating.

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 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: MATERIALS

.1 Install continuous control joint fillers in control joints at locations indicated on drawings. Provide control joints at 9m maximum spacing. .

.2 Install vent holes in vertical joints at top of veneer cavity in exterior wythes of cavity wall and masonry veneer wall construction at maximum horizontal spacing of 800mm. Do not place directly below weep holes above.

.3 Install inserts in mortar joints at 400mm centres each way, for attachment of wall strapping. install fasteners to suit application and in accordance with manufacturer's written installation instructions.

.4 Reglets: install reglets at locations indicated on drawings.

.5 Lap adhesive: apply adhesive to flashing lap joints.

3.4 INSTALLATION: MOISTURE CONTROL

.1 Install weep hole vents in vertical joints immediately over flashings, in exterior wythes of cavity wall and masonry veneer wall construction, at maximum horizontal spacing of 600 mm on centre.

.2 Install cavity drainage board within cavity wall directly behind weep holes, immediately over flashings.

.3 Grout screens: install purpose made diverters in cavities where indicated and as directed, size and shape to suit purpose and function.

3.5 INSTALLATION: FLASHINGS

.1 Build in flashings in masonry in accordance with CSA-A371.
.1 Install flashings under exterior masonry bearing on foundation walls, slabs, shelf angles, and steel angles over openings. and at base of cavity wall and where cavity is interrupted by horizontal members or supports and as shown on drawings. Install flashings under weep hole courses and as indicated.

.2 In double wythe masonry walls, veneered walls, and siding clad walls carry flashings from front edge of masonry or siding under outer wythe, then up backing not less than 200mm, bond to backing using manufacturer's recommended adhesive.

.3 Where required and detailed provide metal flashing support to adhere through wall flashing to and span over suspended steel angle vertical framing.

.4 Lap joints 150mm and seal full overlap with adhesive.

.5 Turn up ends of flashings at ends to form end dams at lintels, sills and wall ends to prevent water from travelling horizontally past flashing ends.(i.e. at sills of openings/windows).

.6 Install over horizontal firestops within exterior wall cavities.

3.6 CLEANING

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

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

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management

END OF SECTION

PART 1 - GENERAL

1.1 SCOPE OF WORK

.1 The work of this Section includes all material, labour, equipment, and tools required to compete the work described herein and reflected in the Contract Documents.

.2 Existing concrete masonry units damaged as a result of demolition of portions of concrete block walls described herein and reflected in the Contract Documents, shall be replaced and/or repointed under the scope of this Section.

1.2 RELATED SECTIONS

.1 Section 04 03 07 – Masonry Repointing
.2 Section 04 05 00 – Common Work Results for Masonry
.3 Section 04 05 12 – Mortar and Masonry Grout
.4 Section 04 05 19 – Masonry Anchorage and Reinforcing
.5 Section 04 05 23 – Masonry Accessories
.6 Section 07 84 00 – Fire Stopping

1.3 REFERENCES

.1 Canadian Standards Association (CSA International)
.1 CAN3 A165 SERIES-2004, CSA Standards on Concrete Masonry Units covers: A165.1, A165.2, A165.3.
.2 CAN/CSA A371-04, Masonry Construction for Buildings.
.3 CSA S304.1-04, Design of Masonry Structures.

.4 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)
.1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

.5 Underwriters' Laboratories of Canada (ULC)
.1 CAN/ULC-S101-07, Standard Methods of Fire Endurance Tests of Building Construction and Materials.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
.1 Product Data: provide product data, including manufacturer's printed data sheets and catalog pages illustrating products to be incorporated into project for specified products.

.3 Samples:
.1 Provide unit samples in accordance with Section 04 05 00 - Common Work Results for Masonry. Sample to be part of Project mockup.

.4 Manufacturer's Written Instructions: provide in accordance with Section 04 05 00 - Common Work Results for Masonry.

1.5 QUALITY ASSURANCE SUBMITTALS

.1 Certificates: provide in accordance with Section 04 05 00 - Common Work Results for Masonry.

.2 Test and Evaluation Reports: provide certified test reports in accordance with Section 04 05 00 - Common Work Results for Masonry.

.3 Pre-Installation Meetings: conduct pre-installation meeting in accordance with Section 04 05 00 - Common Work Results for Masonry to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

.4 Mock-ups:
.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control and requirements of Section 04 05 00 - Common Work Results for Masonry.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle concrete unit masonry in accordance with Section 04 05 00 - Common Work Results for Masonry.

1.7 WASTE MANAGEMENT AND DISPOSAL

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

.4 Divert damaged or unused concrete materials from landfill to local facility approved by Consultant.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Standard concrete block units: to CAN3-A165 Series (CAN3-A165.1).
.1 Classification: H / 15 / A / M.
.2 Size: True Imperial sizes to match existing block size

and coursing. Refer to drawings for required thicknesses
.3 Special shapes: where shown on drawings provide bull-nosed units for wall exposed corners and at exposed corners at door frames. Provide purpose-made shapes for lintels and bond beams. Provide additional special shapes as indicated.
.4 Size and coursing of blocks to match existing.

.2 Special fire resistant concrete block units: to CAN3-A165 Series (CAN3-A165.1) as modified below.
.1 Classification: H/15/B/M except as modified by fire resistance requirements specified below.
.2 Fire resistant characteristics: aggregate used in units and equivalent thickness of units to the Supplement to the National Building Code of Canada 1990, Chapter 2 for fire-resistance ratings indicated.
.3 Size: True Imperial sizes to match existing block size and coursing. Refer to drawings for required thicknesses
.4 Special shapes: where shown on drawings provide bull-nosed units for wall exposed corners and at door frames. Provide purpose-made shapes for lintels and bond beams and provide additional shapes as indicated.

2.2 REINFORCEMENT .1 Reinforcement in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing .

2.3 CONNECTORS .1 Connectors in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.

2.4 FLASHING .1 Flashing: in accordance with Section 04 05 23 - Masonry Accessories.

2.5 MORTAR MIXES .1 Mortar and mortar mixes in accordance with Section 04 05 12 - Masonry Mortar and Grout.

2.6 GROUT MIXES .1 Grout and grout mixes in accordance with Section 04 05 12 - Masonry Mortar and Grout.

2.7 CLEANING COMPOUNDS .1 Use low VOC products [in compliance with SCAQMD Rule 1168.

.2 Compatible with substrate and acceptable to masonry manufacturer for use on products.

.3 Cleaning compounds compatible with concrete unit masonry and in accordance with manufacturer's written recommendations and instructions.

2.8 TOLERANCES

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

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

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verify surfaces and conditions are ready to accept work of this Section.

.2 Commencing installation means acceptance of existing substrates.

3.2 PREPARATION

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

3.3 INSTALLATION

.1 Concrete block units.
.1 Bond: running.
.2 Coursing height: 213 mm for one block and one joint.
.3 Jointing: concave where exposed or where paint or other finish coating is specified. Flush joints where PVC Hygenic wall panel finishes.

.2 Install blocks with bullnose corners at all exterior corners of walls except where walls are completely finished with covering material of gypsum board, wood paneling, ceramic tile, or other finished material (excluding paint and coatings).

.3 Concrete block lintels.
.1 Install special units to form corners, returns, offsets, reveals and indents without cut ends being exposed and without losing bond or module.
.2 Install reinforced concrete block lintels over openings in masonry where steel or reinforced concrete lintels are not indicated.
.3 End bearing: not less than 200 mm and as indicated on drawings.
.4 Refer to structural drawings for general requirements

3.4 REINFORCEMENT

.1 Install reinforcing in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.

3.5 CONNECTORS

.1 Install connectors in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.

3.6 FLASHING

.1 Install flashings: in accordance with Section 04 05 23 - Masonry Accessories.

3.7 MORTAR PLACEMENT

.1 Place mortar in accordance with Section 04 05 12 - Masonry Mortar and Grout.

3.8 GROUT PLACEMENT

.1 Place grout in accordance with Section 04 05 12 - Masonry Mortar and Grout.

3.9 CONSTRUCTION

.1 Cull out masonry units, in accordance with CAN/CSA A165 and reviewed range of colour samples, with chips, cracks, broken corners, excessive colour and texture variation.

.2 Build in miscellaneous items such as bearing plates, steel angles, bolts, anchors, inserts, sleeves and conduits.

.3 Construct masonry walls using running bond unless otherwise noted.

.4 Build around frames previously set and braced. Fill behind hollow frames within masonry walls with mortar or grout and embed anchors.

.5 Fit masonry closely against electrical and plumbing outlets so collars, plates and covers overlap and conceal cuts.

.6 Install movement joints and keep free of mortar where indicated.

.7 Hollow Units: spread mortar setting bed from outside edge of face shells. Gauge amount of mortar on top and end of unit to create full joints, equivalent to shell thickness. Avoid excess mortar.

.8 Solid Units: apply mortar over entire vertical and horizontal surfaces. Avoid bridging of airspace between brick veneer and backup wall with mortar.

.9 Ensure compacted head joints. Use full or face-shell joint as indicated.

.10 Tamp units firmly into place.

.11 Do not adjust masonry units after mortar has set. Where resetting of masonry is required, remove, clean and reset units in new mortar.

.12 Tool exposed joints concave [weathered/raked for interior work]; strike concealed joints flush.

.13 After mortar has achieved initial set up, tool joints.

.14 Do not interrupt bond below or above openings.

3.10 FIELD QUALITY CONTROL

.1 Site Tests, Inspection: in accordance with Section 04 05 00 - Common Work Results for Masonry.

.2 Manufacturer's Field Services: in accordance with Section 04 05 00 - Common Work Results for Masonry.

3.11 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning, supplemented as follows.

.2 Allow mortar droppings on masonry to partially dry then remove by means of trowel, followed by rubbing lightly with small piece of block and finally by brushing.

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

3.12 PROTECTION

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

END OF SECTION

PART 1 - GENERAL

1.1 Related Requirements

.1 Section 03 30 00: Cast in Place Concrete

.2 Section 05 21 00: Steel Joists

.3 Section 05 31 00: Steel Decking

.4 Section 05 50 00: Metal Fabrications

.5 Section 07 81 00: Applied Fireproofing

.6 Section 09 91 00: Painting

.7 Section 13 34 19: Metal Building Systems

1.2 References

.1 Editions of all Referenced Standards to be the ones designated by the applicable Building Code in force at the time of building permit application, as indicated on Structural Drawings. For Standards not referenced by the Building Code, use the latest editions.

.2 CSA Group (CSA):

.1 CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel

.2 CSA S16, Limit States Design of Steel Structures

.3 CSA S136, North American Specifications for the Design of Cold Formed Steel Structural Members

.4 CSA W47.1, Certification of Companies for Fusion Welding of Steel

.5 CSA W48, Filler Metals and Allied Materials for Metal Arc Welding

.6 CSA W55, Certification of Companies for Resistance Welding of Steel and Aluminum

.7 CSA W59, Welded Steel Construction (Metal Arc Welding)

.8 CSA W186, Welding of Reinforcing Bars in Reinforced Concrete Construction

.3 ASTM International (ASTM):

.1 ASTM A123/A123M, Standard Specification for Zinc (Hot Dip Galvanized) coating on Iron and Steel Products

.2 ASTM F3125/F3125M, Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.

.3 ASTM A500, Standard Specification for Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

.4 ASTM A53/A53M, Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc-Coated, Welded and Seamless

.5 ASTM A1085/A1085M, Standard Specification for Cold Formed Welded Carbon Steel Hollow Structural Sections (HSS)

.6 ASTM A992, Standard Specifications for Structural Steel Shapes

.7 ASTM B695, Standard Specification for Coating of Zinc Mechanically Deposited on Iron and Steel

.8 ASTM F2329/F2329M, Standard Specification for Zinc Coating, Hot-Dip, requirements for Application to Carbon and Alloy Steel Bolts, Screws, washers, Nuts and Special threaded Fasteners.

.9 ASTM F1136/F1136M, Standard Specification for Zinc/Aluminum Corrosion Protective Coating for fasteners

.10 ASTM F1554, Standard Specification for Anchor Bolts, Steel 36, 55 and 105 ksi Yield Strength

.11 ASTM D7803. Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Streel Product and Hardware Surfaces for Painting.

.4 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturers Association (CPMA):

.1 CISC Handbook of Steel Construction

.2 CISC/CPMA Standard 1-73a, A Quick-drying One-coat Paint for Use on Structural Steel

.3 CISC/CPMA Standard 2-75, Quick-drying Primer for Use on Structural Steel

.4 CISC Code of Standard Practice, Appendix I, Architecturally Exposed Structural Steel (AESS)

.5 The Society for Protective Coatings (SSPC) and National Association of Corrosion Engineers (NACE) International:

.1 SSPC-SP 1, Solvent Cleaning

.2 NACE No. 3 / SSPC-SP 6, Commercial Blast Cleaning

.3 NACE No.4 / SSPC-SP 7, Brush Off Blast Cleaning

.4 NACE No.2 / SSPC-SP 10, Near White Blast Cleaning

.5 SSPC Technology Guide No.14 –Guide for the Repair of Imperfections in Galvanized, Organic or Inorganic Zinc-Coated Steel Using Organic Zinc Rich Coating.

.6 SSPC Paint Specification No. 20 – Zinc Rich Coating, Type I – Inorganic and Type II - Organic

1.3 Quality Assurance

.1 Qualifications:

.1 Structural steel fabricator and erector to be certified by the Canadian Welding Bureau under the requirements of CSA W47.1, Division 1 or 2 for fusion welding and/or CSA W55.3, Division 1 or 2 for resistance welding of structural steel components, and to have CWB approved procedure for welding rebar (Grade 400W) to structural steel in accordance with CSA W186.

.2 Welders to be appropriately qualified, working under direction of a qualified welding supervisor.

.3 Engage a Professional Engineer licensed in the place where the project is located to be responsible for design, detailing and site review of all connections related to structural steel work.

.4 The Professional Engineer designing connections to hold a Certificate of Authorization, and to carry a minimum of $1,000,000.00 in liability insurance (per occurrence).

1.4 Quality Control

.1 Submit in accordance with Section 01 45 00 – Quality Control.

.2 Source Quality Control Submittals:

.1 Provide all submittals 4 weeks prior to starting fabrication of structural steel.

.2 Mill test reports:

.1 Mill test reports to include ladle analysis and physical test results, and to show chemical and physical properties and other details of steel to be incorporated in project.

.2 The reports to be correlated to the materials or products to which they pertain.

.3 Tolerances:

.1 Conform to the fabrication and erection tolerances of CAN/CSA S16.

.2 Comply with more stringent tolerances if specified elsewhere to suit interfacing materials or AESS members

1.5 Unit Prices

.1 Provide unit prices per Section 01 29 00 – Payment Procedures.

1.6 Action and Informational Submittals

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

.2 Shop Drawings:

.1 Provide fabrication and erection documents stamped and signed by the Professional Engineer responsible for steel connections.

.2 Before submitting shop drawings, provide a letter signed and sealed by that Engineer stating that the Engineer has been engaged to undertake the responsibility for the above. Also submit a copy of that Engineer's Certificate of Authorization and proof of liability insurance.

.3 If additional information is required from WSP-S, allow a minimum of five working days for WSP-S to review and respond to the request for information.

.4 It is advisable to submit erection diagrams for review before preparing shop details. Copies of plans and section details developed by WSP-S will not be accepted as erection diagrams.

.3 Erection documents:

.1 Submit erection drawings indicating details and information necessary for assembly and erection purposes, including:

.1 Erection procedure

.1 Description of erection methods.

.2 Sequence of erection.

.3 Temporary bracings.

.2 Erection diagrams

.1 Member sizes (in addition to member marks).

.2 Size and finish of field bolts.

.3 Connections where threads must be excluded from shear plane.

.4 Sliding bearing assemblies.

.5 Members which are considered AESS and their category.

.6 Type and finish of bolts in AESS connections.

.7 Side where bolt heads should be placed in AESS connections.

.3 Field work details

.1 Details of all field welded connections.

.2 Weld grinding, finish and profile in AESS field connections.

.2 Provide setting drawings showing dimensions and details for placing steel assemblies which are set in concrete.

.4 Fabrication documents:

.1 Submit shop details showing designed assemblies, member sizes, components and connections. Show on drawings:

.1 Material specifications.

.2 Surface preparation.

.3 Shop painting / galvanizing.

.4 Section splices.

.5 Types of shop and field connections.

.6 Net weld lengths.

.7 Size and finish of shop bolts.

.8 Precautions which will be taken to exclude threads from shear planes of bearing type bolted connections (where applicable).

.9 Protected zones.

.10 Vent holes required for galvanizing process.

.11 Camber.

.12 Architectural clearance lines and finishes where connections could encroach other works.

.13 Beam and column web holes required for services and reinforcing around them.

.2 Indicate members which are considered AESS, and their category. Refer to AESS Category Matrix as shown in Table 1 of the CISC Code of Standard Practice, Appendix I.

.1 For AESS bolted connections, indicate bolt type, finish and which side of the connection bolt heads should be placed.

.2 For AESS welded connections, show grinding, profile and weld finish.

.3 Show details by which steel assemblies, which are set in concrete, are to be connected to the formwork.

.4 Substitution of alternative sections will only be allowed provided the new members have equal or greater capacity and stiffness and their dimensions are approved by WSP-S.

.5 When requested, submit sketches and design calculations stamped and signed by the Professional Engineer responsible for connection design.

.6 Provide technical specifications for all sliding bearing assemblies.

.7 On completion of erection, submit a letter signed and sealed by the Professional Engineer responsible for structural steel connections certifying that the work has been completed in accordance with all contract documents.

PART 2 - PRODUCTS

2.1 Design and Detailing Requirements

.1 Design details and connections in accordance with requirements of CSA S16 and CSA S136 to resist forces and to allow for movements indicated. Consider load effects due to fabrication, erection and handling.

.2 Connection design to include consideration of all pass-through forces, including tension, compression, moment and shear. Provide local reinforcement at connection or joint as required.

.3 Follow conceptual connection details if shown on structural drawings. Do not change without WSP-S written approval. If welds are defined on drawings, the sizes shown are minimum requirements which might need to be increased to suit connection design.

.4 Increase specified section thickness at no extra cost if required for fabrication (bending) or galvanizing. Alternatively, build up curved sections from plates.

.5 Assume that bolt threads are intercepted by shear plane, unless special measures are indicated on shop drawings to exclude threads from shear plane.

.6 Beams:

.1 Select beam end connections from CISC "Handbook of Steel Construction" when connection for shear only (standard connection) is required.

.2 Typical beam to spandrel beam and beam to column connections to be two sided or end plate connections.

.3 Select or design beam end connections for factored shear indicated on plans.

.4 When shears are not indicated, select or design non composite beam end connections to resist reaction due to maximum uniformly distributed load capacity of the beam in bending, assuming the flange in compression is fully braced.

.5 When shears are not indicated, select or design composite beam end connections to resist one and a half times the reaction due to maximum uniformly distributed load capacity of the non composite beam section in bending.

.6 Except within moment frames, where axial forces occur in beams framing to opposite sides of a supporting member, design connections for a pass-through force equal to the smaller of the two axial forces. If beam sizes differ, assume the axial force is centred in the smaller beam.

.7 Where axial forces occur in beams within moment frames, connect both ends of beams to columns for the axial force shown.

.8 Where no axial force is shown for beam to column connection, design to resist horizontal tension / compression equivalent to 2% of the factored axial force in column, in addition to all other loads.

.9 Seated beam connections to have top clip angles. Connect to supports as required for lateral bracing.

.10 End bearing connections of inclined members to have horizontal bearing plane at supported member.

.11 Extend beams bearing on walls for the full length of bearing plates unless indicated otherwise on drawings.

.12 For beams continuous over supports and for beams supporting columns, posts or hangers, provide min. 6 mm (1/4”) stiffener plates at each side of web at supports / points of concentrated load, unless thicker stiffeners are required by connection design or different details are shown on drawings.

.13 Provide all spandrel beams and all floor beams not fully braced by floor construction with top and bottom flange connections for torsional restraint.

.14 Where studs for composite action are connected to composite beams indirectly (i.e. through a plate attached to beam top flange), connect plate to beam to transfer the full shear capacity of all studs.

.7 Columns:

.1 In addition to all other loads, connect columns to base plates to transfer horizontal load equal to 2% of the column vertical load.

.2 In addition to all other loads, connect columns to base plates to transfer tensile load equal to the capacity of all anchor bolts,

.3 Provide seat angles for joist support at sides of columns continuous through floor.

.4 Provide connection for tie joist bottom chord at all columns supporting joists; coordinate with joist supplier.

.5 Unless otherwise noted on drawings, provide 102 x 102 x 9.5 seat angles attached to sides of columns to support masonry lintels adjacent to columns. Length of seat to equal width of lintel minus 25 mm (1").

.6 Provide connection for masonry wall steel lintels adjacent to columns.

.7 Provide diagonal or cantilevered angles at sides of columns where required to support deck or slab.

.8 Provide cap plates at tops of columns where required for support of deck, slab, joists, beams or roof anchors.

.9 Where columns are built in and stabilized by masonry walls, provide anchors to masonry walls per typical details.

.10 Where beams frame into sides of columns forming moment frames, provide min. 6 mm (1/4”) stiffener plates at each side of column web in continuation of beam flanges, unless thicker stiffeners are required by connection design or different details are shown on drawings.

.8 Bracings:

.1 Shape and size gusset plates to accommodate required finishes and clearances; refer to Architectural and Mechanical drawings.

.2 Detail plate and rod bracing connections to be adjustable and to be able to be prestressed to approximately 15 MPa.

.3 Design gusset plates and bracing connections for members which are parts of seismic force resisting system to allow ductile rotation and to satisfy requirements of CSA S16. Design gusset plates for other compression members for the force equivalent to twice the specified compression member force, or provide stiffeners to prevent gusset plate buckling.

.4 For tension / compression “X” braces, design and detail connection between the intersecting members so that out of plane stiffness within the connection is same as or larger than the out of plane stiffness of the bracing member itself, thus maintaining the full length of the bracing members effectively continuous.

.9 Moment connections:

.1 Provide moment connections at splices to maintain continuity of cranked beams. Provide header plates or stiffener plates to resist unbalanced flange forces at splices.

.2 Where moment connections are called for but values are not indicated, design for moment capacity of the smaller member in the connection.

.3 Install web and flange stiffener plates at moment connections as required by connection design and detail but in every case when indicated on the drawings. If the shear generated in column web exceeds its shear capacity, reinforce the web.

.10 Pretensioned connections - pretension high-strength bolts used in:

.1 All elements resisting crane loads.

.2 All elements resisting seismic loads.

.3 Elements directly supporting machinery which produces impact or cyclic loads.

.4 Connections where bolts are subject to tensile loads.

.5 Connections using oversized or slotted holes unless finger-tight bolts are required to accommodate movement.

.6 Slip critical connections.

.11 Holes:

.1 Where holes for services are required through webs of beams or columns, coordinate size and location with Architectural, Mechanical and Electrical drawings, and show on fabrication drawings. Reinforce in accordance with Typical Detail. Alternatively, design reinforcing in accordance with the procedure set forth in the CISC Handbook of Steel Construction, and provide calculations for WSP-S review.

.2 Provide holes in beam flanges or weld threaded studs as required for attachment of wood nailers.

.3 Provide 10mm drain holes in all HSS members located outside air / vapour barrier. Locate so that any water inside HSS will drain away when HSS is in its final position.

.4 Provide vent holes in all galvanized HSS members as required for galvanizing process.

.5 Provide 12 mm (1/2”) dia. holes in HSS columns to be filled with concrete. Locate at opposing column faces 150 mm (6”) from each end.

.6 Provide 19 mm (3/4”) dia. vent holes at centerline of all cast in plates supporting columns.

.7 Provide 50 mm (2”) dia, grouting holes in column bearing plates larger than 600 mm x 600 mm (24”x24”).

.12 Built-up members:

.1 Connect together double beams and double channels at not more than 1200 mm (4 ft) centres unless the members are welded toe to toe.

.2 Connect together axially loaded built-up members in accordance with the requirements of CSA S16. In addition, interconnect compression members for trusses and bracing at least at the one-third points.

.3 Connect cover plates of built-up members to develop the capacity of the built-up member.

.13 Provide all wall supporting members (shelf angles, hangers, stubs, back braces, etc.) which are attached to floor beams with adjustable connections capable to compensate for the deflection of the floor beams due to self weight of concrete. Anticipate beam deflection to be equivalent to the camber shown, or 20 mm (whichever is more). Alternatively, fabricate based on actual deflected shape of the beams as measured after concrete is poured.

.14 Provide slotted holes long enough to allow for movements indicated on drawings plus construction tolerance, see Typical Detail for bolts' positions in slots. Bolts are to be finger-tight with burred threads to allow for movement during the life of structure without bolts loosening.

.15 Do not oversize anchor rod holes for site tolerances. Use hole sizes suggested in the CISC Handbook of Steel Construction.

.16 Design and proportion welded and bolted connections at crane girders and at columns supporting them in accordance with the fatigue requirements of CSA S16 to be able to sustain 2,000,000 cycles of load.

.17 Connect new steel members to existing concrete using drilled concrete anchors, refer to Post Installed Anchors and Dowels notes on drawings. Do not field weld at connections with adhesive anchors.

.18 Provide closure plates for all exterior tubular members and for all interior tubular members which will be exposed in the finished construction.

.19 Design sliding bearing assemblies to accommodate forces and movements shown on drawings.

2.2 Materials

.1 Structural steel:

.1 Rolled shapes: to ASTM A992.

.2 Hollow structural sections: to ASTM A500, ASTM A1085 or CSA G40.21, refer to drawings.

.3 Structural pipe: to ASTM A53.

.2 Anchor rods: CSA G40.21, or ASTM F1554, refer to drawings.

.3 Bolts, nuts and washers: to ASTM F3125.

.4 Load indicating washers: to ASTM F959.

.5 Maximum percentage of boron in all structural steel elements and fasteners not to exceed 0.0008%.

.6 Weldable reinforcing steel: to CSA G30.18, deformed bars.

.7 Grating: Galvanized safety grating. Minimum thickness of material 2 mm (0.079"). Banded ends. Bolted connections. Capacity 4.8 kPa (100 psf) unless noted otherwise on drawings. Maximum deflection 1/180th of span.

.8 Checker plate: to CSA G40.21, Grade 300W. Plate with rolled-in embossments to provide non-slip surface.

.9 Welding materials: to CSA W48 and CSA W59, certified by Canadian Welding Bureau. For members in seismic force resisting system, refer to additional brittleness requirements in CSA S16.

.10 Shop paint: to CISC/CPMA 1-73a.

.11 Shop paint primer: to CISC/CPMA 2-75, solvent reducible alkyd, red oxide, compatible with specified topcoat.

.12 Zinc-rich coating: to SSPC Paint Specification No.20, compatible with top coat (where specified).

.13 Hot dip galvanizing of structural steel members: to ASTM A123/A123M, minimum zinc coating of 600 g/m².

.14 Coating of fasteners: to ASTM F2329 (hot dip galvanizing), ASTM B695 (mechanical galvanizing) or ASTM F1136 (Zn/Al coating). All fastening elements (bolts, nuts, washers) to be coated using the same process and to be obtained from a single supplier. Nuts to have visible dye lubricant.

.15 Epoxy coating: pre-mixed, 2 components, high-solids (volume of solids 87 ±3%), self-priming.

.16 Headed studs: to CSA W59, Type B, min. Fy=350 MPa

.17 Joint filler for exposed steelwork: Epoxy resin.

.18 Sliding bearing assembly: Galvanized top steel plate with a type 304 stainless steel highly polished lower surface and bottom elastomeric pad with a polytetrafluoroethylene (Teflon) upper surface, wrapped in water tight polyethylene wrapping. Static and kinetic coefficients of friction not to exceed 5% under working stress. Assembly to have a working stress capacity of min. MPa on the lower pad. Elastomeric bottom pad to allow a 2% rotation of upper plate and still maintain a substantially uniform bearing pressure between plate and pad. Alternative sliding bearing assembly may be proposed for review by WSP-S.

.19 Elastomeric bearing pad: Virgin natural polyisoprene or virgin polychloroprene (Neoprene) conforming to CSA S6.

.20 Galvanizing vent hole plug: Grade 6061 Aluminum circular plug.

2.3 Fabrication

.1 Fabricate structural steel in accordance with CSA S16 and with reviewed shop drawings.

.2 Weld in accordance with CSA W59 and CSA W186.

.3 Continuously seal hollow members located outside air / vapour barrier by intermittent welds and plastic filler unless continuous welds are indicated on drawings.

.4 Position beams having permissible mill camber so that the camber is up.

.5 Install stud anchors for cast in plates and similar elements in shop with end welds in accordance with the recommendations of the stud manufacturer. Lengths of studs given on drawings are the lengths after welding. Replace studs that crack in the weld or shank.

.6 Do not shop weld shear studs to composite beams supporting slab on deck which do not run in the direction of deck span.

.7 HSS members which require galvanizing to either be per CSA G40.21, grade 350W, Class H, or to be stress relieved prior to galvanizing.

.8 Mill column bearing plates as required to provide full contact bearing and develop column bearing strength.

.9 Prepare contact surfaces of slip critical connections as required by CSA S16.

.10 Complete welded shop connections prior to galvanizing.

.11 Plug vent holes in all galvanized members.

.12 Mark materials in accordance with CSA G40.20/G40.21. Do not use die stamping. When steel is to be left unpainted, place marking at locations not visible from exterior.

.13 Match marking: shop mark bearing assemblies and splices for fit and match.

.14 Where shop inspection is required, do not ship material to the site before it has been inspected.

.15 Fabricate in stages complex members for which steel inspection is impossible or difficult once completed, and arrange for the Inspection and Testing Agency to do intermediate shop inspections.

.16 Fabricate AESS with tolerances and surface quality consistent with AESS category.

2.4 Shop Painting

.1 Clean all members to SSPC-SP 1 – Solvent Cleaning. Remove loose mill scale, rust, oil, dirt and foreign matter using any suitable method.

.2 In addition for members to be galvanized or to receive shop primer paint: Clean steel to SSPC-SP 7 Brush-Off Blast Cleaning.

.3 In addition for members receiving intumescent coating: Clean steel to SSPC-SP 6 Commercial Blast Cleaning

.4 In addition for members receiving zinc-rich coating: Clean steel to SSPC-SP 10 Near White Blast Cleaning.

.5 Apply one coat of shop paint CISC/CPMA 1-73a to steelwork in the shop with the exception of:

.1 Members to receive spray fireproofing.

.2 Members to receive a finish coat of paint on site for which a CISC/CPMA 2-75 shop primer is required.

.3 Members to receive intumescent coating for which a compatible shop primer is required.

.4 Members to receive zinc-rich coating.

.5 Galvanized members.

.6 Shear connectors and top flanges of composite beams with field welded shear connectors.

.7 Surfaces encased in or in contact with cast-in-place concrete including top flanges of beams supporting slabs.

.8 Surfaces and edges to be field welded for a distance of 50 mm (2") from joints.

.9 Faying surfaces of slip-critical connections.

.6 If members to receive sprayed fireproofing are shop painted, only paints tested to ASTM E736 and approved by spray fireproofing supplier may be used. Any other paint must be removed to bear steel prior to application of spray applied fireproofing.

.7 Apply one coat of compatible primer paint (CISC/CPMA 2-75) in the shop to steelwork to receive a finish coat of paint on site.

.8 Apply one coat of compatible primer paint in the shop for steel to receive intumescent coating on site, see section 07 81 00 Applied Fireproofing.

.9 If more than one type of paint is specified, each paint to be visually identifiable after application.

.10 Apply galvanizing coating in the shop to all structural steel located beyond the vapour barrier, including:

.1 Shelf angles and hangers in exterior walls.

.2 Spandrel angles to which precast panels are attached.

.3 Lintels in exterior walls.

.4 Exposed exterior steel members.

.5 Exposed anchor rods.

.6 Other steel noted on drawings.

.11 If galvanized steel is to be painted, use only non passivated galvanizing process (without chromate coating).

.1 Clean galvanized members to be painted in accordance to ASTM D7803.

.12 Apply paint under cover, on dry surfaces when surface and air temperatures are above 5ºC.

.13 Maintain dry condition and 5ºC minimum temperature until paint is thoroughly dry.

.14 Touch up paint on bolts, nuts, sharp edges and corners to remove sags, drips and runs before prime coat is dry.

PART 3 - EXECUTION

3.1 General

.1 Structural steel work: in accordance with CSA S16.

.2 Welding: in accordance with CSA W59 and CSA W186.

3.2 Connection to Existing Work

.1 Verify dimensions and condition of existing works prior to start of fabrication. Report discrepancies, modify connection details if required and submit to WSP-S for review. Determine any potential interference with existing services and report problem areas to WSP-S for direction before commencing work.

.2 Take precautions to protect existing works from damage. Provide temporary shoring as required. Repair damage to adjacent materials caused by structural steel installation.

.3 When welding to elements cast in concrete, do not overheat the embedded elements. Implement control measures and appropriate welding procedures which will prevent thermal expansion of the embedded elements which could damage to the adjacent concrete.

3.3 Erection

.1 Erect structural steel in accordance with CSA S16 and reviewed erection drawings.

.2 Do not field cut or alter any members without WSP-S approval.

.3 Make adequate provision for all loads acting on the structure during erection. Provide erection bracing to keep the structure stable, plumb and in true alignment during construction. Bracing members or connections shown on Structural Drawings are those required for the completed structure, and may not be sufficient for erection purposes. For load bearing masonry construction, maintain bracing until completion of masonry work and floor / roof decks which together provide permanent bracing. Do not remove erection bracings without written approval from the Engineer who designed it.

.4 Steel framing to be plumb at temperature of 20°C. If erection is carried out at temperatures greatly differing from 20°C, make adequate provisions; some members may need to be erected out of plumb in order to become plumb when the temperature stabilizes at 20°C.

.5 Set column base plates to the elevation required for grouting using steel shims or leveling screws attached to sides of base plates. Do not fasten leveling nuts to anchor rods. Alternatively, for base plates equal or smaller than 350 mm x 350 mm (14” x 14”), leveling plates set with grout and level to within 1.5 mm (1/16") across the plate can be used. Do not erect columns upon plates exceeding this tolerance. Lift base plates for inspection when directed.

.6 Grout under column base plates and beam bearing plates as soon as steelwork is completed. Do not add load on steelwork until grouting is completed and grout strength has reached at least 20 MPa.

.7 Do not make permanent connections until structure has been properly aligned.

.8 Where slotted connections are shown on structural drawings, finger tighten bolts to a snug fit and burr threads to prevent nuts from working loose.

.9 Prestress plate and rod bracing connections to approximately 15 MPa. Adjust connections as required for the prestress to be effective when building ambient temperature has stabilized.

.10 Weld beams to bearing plates unless otherwise noted on drawings.

.11 Adjust and finalize connections at wall supporting elements affected by floor beam deflections after concrete is poured.

.12 Provide dissimilar metal separators at connections between aluminum members and structural steel.

.13 Report ill-fitting connections to WSP-S before taking corrective measures.

.14 When welding after galvanizing is in place, grind away galvanizing at areas to be welded.

.15 Do not weld in an ambient temperature below -18ºC. Preheat material adjacent to welding areas when ambient temperature is between -18ºC and 0ºC.

.16 Do not weld or otherwise attach any structural or non structural elements to protected zones unless noted specifically on structural drawings. Failure to comply will result in full replacement of the affected members.

3.4 Field Painting

.1 Paint in accordance with Section 09 91 00 - Painting.

.2 Touch up damaged surfaces with the same paint as the shop coat.

.3 Repair any galvanized or zinc rich painted surfaces which have been damaged or field welded in accordance with SSPC Technology Guide No.14.

.4 Clean and prepare surfaces of bolts, which will receive a finished coat of paint in the same manner as the connected steelwork.

3.5 Inspection and Testing:

.1 An Inspection and Testing Agency (certified to CSA W178.1 & 2) will be appointed to carry inspection and testing of all structural steel.

.2 Do not commence fabrication until details of inspection have been worked out with the Agency.

.3 Assist the Inspection and Testing Agency in its work. Notify as to the Work Schedule and provide safe access to the work area as required.

.4 Provide Inspection and Testing Agency with a copy of reviewed shop drawings.

.5 The Inspection Agency will submit reports to WSP-S, Contractor and Municipal Authorities covering the Work inspected and provide details of errors or deficiencies observed. The Reports will make reference to the reviewed shop drawings used for inspection, including the date on the review stamp. Work will be inspected in shop and when erected. Store fabricated members in shop so that they are accessible for inspection.

.6 Welding inspection:

.1 Welding inspection will be conducted in shop and in field.

.2 The Inspector will check welders' CWB qualification.

.3 The Inspector will review welding procedures for conformance with CWB requirements, manufacturers' requirements and standard practice.

.4 The inspector will visually check all welds at plate girders, all butt welds (including cranks and splices), all welds in moment connections, all welds at crane columns and crane girders, all welds of roof anchors to the base structure, 50% of welds in hanger connections and 20% of all other welds for:

.1 Size, length and profile.

.2 Joint preparation, including cleaning and removal of any paint.

.3 Fit up and alignment.

.4 Slag removal.

.5 Distortion.

.6 Porosity.

.7 Cracks.

.5 Non destructive testing will be conducted on the following connections:

.1 All shop and field welded splices.

.2 All welds on crane columns and girders.

.3 A representative 10% of all other welded connections.

.6 Test results will be evaluated in accordance with CSA W59.

.7 Shop inspection will include:

.1 Confirming that all materials meet specifications.

.2 Reviewing mill test reports for conformance with specified material grades.

.3 Checking that mill test reports, boron test reports (if applicable) and producer's certificates are properly correlated to materials and products supplied for the project and that legible markings were made on the material and products by the producers in accordance with the applicable standards. Where this is not possible, WSP-S may request sample testing to be carried out as described below.

.4 Checking fabricator's qualification under the requirement of CSA W47.

.5 Sampling fabrication procedures for general conformity with Contract requirements.

.6 Reviewing cambering procedure for compliance with CSA W59 requirements.

.7 Checking surface preparation for members to be painted.

.8 Checking shop painting and galvanizing.

.9 General checking:

.1 Dimensions and cross sections in relation to specified member sizes.

.2 Allowable mill sweep and camber.

.3 Locations of all holes, cuts and fittings.

.4 Reinforcement of openings.

.5 Milling of ends for bearing.

.6 Base plate orientation.

.7 Items to be cast in concrete.

.8 Fabrication tolerances.

.9 Splicing (where indicated on drawings).

.10 Cambering.

.11 Compliance with AESS requirements.

.10 Sample testing: When requested, test coupons will be taken and tested in accordance with CSA G40.20 to establish identification. Cut samples from member locations selected by WSP-S and provide to the Inspection and Testing Agency. Make good the locations if requested, at no extra cost, by adding new plates and welds acceptable to WSP-S. The Agency will have the samples tested for mechanical properties and for chemical composition and will classify the steel as to specification.

.8 Field inspection:

.1 Arrange for the Inspector to start field inspection as soon as each section of the Work is completed, plumbed, bolts tightened and field welding finished.

.2 The Inspector will sample erection procedures for general conformity with Contract requirements.

.3 The Inspector will check general fit-up and tolerances and report any apparent distortions and misalignments.

.4 Minimum 10% of columns and 10% of beams will be checked by instruments for plumbness, alignment and elevation.

.5 Field inspection will include:

.1 Checking individual frame members for twisting, sweep and local damage.

.2 Checking levelness of leveling plates.

.3 Inspection of grouting under base plates and bearing plates.

.4 Checking column bearings on cast in plates.

.5 Checking bearings on steel and masonry.

.6 Inspection of sliding bearings.

.7 Inspection of bolting, shear studs and post installed anchors as described below.

.8 Checking installation of permanent bracings and nominal tension in finished building (where specified).

.9 Checking truss permanent bridging and end connections.

.10 Checking that column connections are adjusted to keep the columns plumb after supported structure has deflected due to dead loads applied to floor and roof deck.

.11 Checking that all adjustable connections at wall supporting members have been finalized after concrete is poured.

.12 Inspection of approved field cutting and reinforcing around openings.

.13 Inspection of field painting.

.14 Inspection of field touch-up.

.6 Bolting inspection:

.1 The Inspector will visually check all bolts in bearing connections. Where erection drawings indicate bolts with threads excluded from the shear plane, the Inspector will remove nuts from 1% of all bearing bolts and check that thread is excluded from the shear planes.

.2 The Inspector will check that surfaces in slip- critical connections are free from paint and other deleterious substances.

.3 The Inspector will torque check at least one bolt in each of the connections indicated to be pre-tensioned.

.7 Shear stud inspection:

.1 The Inspector will visually check all stud shear connectors on composite steel beams.

.2 At least one stud in every 150 and all studs which do not have a complete end weld, which are repaired by welding or which show less than the normal reduction in height due to welding will be bent 15 degrees from their axis towards the nearest support, as specified in CSA-W59.

.3 Bent studs that show no sign of failure will be accepted and shall remain in the bent position. Studs that crack in weld, base metal or shank will be rejected. Studs with end welds covering less than 85% of the perimeter will be rejected even if they pass the bend test.

.8 Post installed anchor inspection:

.1 The Inspector will sample check drilled concrete and masonry anchors.

.2 The Inspector will provide full time inspection during installation of post installed adhesive anchors subject to sustained tension loads.

.3 The Inspector will randomly select and pull test 5% of all types and sizes of post installed anchors installed on a weekly basis, but not less than one anchor of each type, size and orientation. Pull test to twice the allowable tensile load, or 1.5 times the factored resistance of the anchor given by the manufacturer. Chose anchor locations where proximity to concrete edge does not affect anchor capacity, or use reduced anchor loads per manufacturer's recommendation. Submit reports to WSP-S within one week of testing. Reports to indicate each anchor location, test load and mode of failure, if applicable. Notify WSP-S immediately if any anchor fails the pull test.

3.6 Cleaning

.1 Clean in accordance with Section 01 74 00 - Cleaning.

.2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal and 01 35 21 – LEED Requirements].

END OF SECTION 05 12 23

PART 1 - GENERAL

1.1 Related Requirements

.1 Section 03 30 00: Cast in Place Concrete

.2 Section 05 12 23: Structural Steel for Buildings

.3 Section 05 31 00: Steel Decking

.4 Section 05 50 00: Metal Fabrications

.5 Section 07 81 00: Applied Fireproofing

.6 Section 09 91 00: Painting

.7 Section 13 34 19: Metal Building Systems

1.2 References

.1 Editions of all Referenced Standards to be the ones designated by the applicable Building Code in force at the time of building permit application, as indicated on Structural Drawings. For Standards not referenced by the Building Code, use the latest editions.

.2 CSA Group (CSA):

.1 CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel

.2 CSA S16, Limit States Design of Steel Structures

.3 CSA S136, North American Specifications for the Design of Cold Formed Steel Structural Members

.4 CSA W47.1, Certification of Companies for Fusion Welding of Steel

.5 CSA W48, Filler Metals and Allied Materials for Metal Arc Welding

.6 CSA W55, Certification of Companies for Resistance Welding of Steel and Aluminum

.7 CSA W59, Welded Steel Construction (Metal Arc Welding)

.8 CSA W186, Welding of Reinforcing Bars in Reinforced Concrete Construction

.3 ASTM International (ASTM):

.1 ASTM A123/A123M, Standard Specification for Zinc (Hot Dip Galvanized) coating on Iron and Steel Products

.2 ASTM F3125/F3125M, Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPA) Minimum Tensile Strength, Inch and Metric dimensions

.3 ASTM D7803. Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Streel Product and Hardware Surfaces for Painting.

.4 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturers Association (CPMA):

.1 CISC Handbook of Steel Construction

.2 CISC/CPMA Standard 1-73a, A Quick-drying One-coat Paint for Use on Structural Steel

.3 CISC/CPMA Standard 2-75, Quick-drying Primer for Use on Structural Steel

.4 CISC Code of Standard Practice, Appendix I, Architecturally Exposed Structural Steel (AESS)

.5 The Society for Protective Coatings (SSPC) and National Association of Corrosion Engineers (NACE) International:

.1 SSPC-SP 1, Solvent Cleaning

.2 NACE No. 3 / SSPC SP-6, Commercial Blast Cleaning

.3 NACE No.4 / SSPC SP-7, Brush Off Blast Cleaning

.4 NACE No.2 / SSPC SP-10, Near White Blast Cleaning

.5 Quality SSPC Paint System Guide No.14 – Guide for Repair of Imperfections in Galvanized or Inorganic Zinc Coated Steel Using Organic Zinc Rich Coating

.6 SSPC Technology Guide No.14 – Guide for the Repair of Imperfections in Galvanized, Organic or Inorganic Zinc-Coated Steel Using Organic Zinc Rich Coating

.7 SSPC Paint Specification No. 20 – Zinc Rich Coating, Type I – Inorganic and Type II - Organic

1.3 Quality Assurance

.1 Qualifications:

.1 Steel joist fabricator to be a member of the Canadian Institute of Steel Construction and to have at least five years of experience.

.2 Steel joist fabricator and erector to be certified by the Canadian Welding Bureau under the requirements of CSA W47.1, Division 1 or 2 for fusion welding and/or CSA W55.3, Division 1 or 2 for resistance welding of structural steel components and to have CWB approved procedure for welding rebar (Grade 400W) to structural steel in accordance with CSA W186 (if applicable).

.3 Welders to be appropriately qualified, working under direction of a qualified welding supervisor.

.4 Engage a Professional Engineer licensed in the place where the project is located to be responsible for design, detailing and site review of all steel joists.

.5 The Professional Engineer designing joists to hold a Certificate of Authorization, and to carry a minimum of $1,000,000.00 in liability insurance.

1.4 Quality Control

.1 Submit in accordance with Section 01 45 00 – Quality Control

.2 Source Quality Control Submittals:

.1 Submit mill test reports 4 weeks prior to fabrication of steel joists.

.1 Mill test reports to show chemical and physical properties and other details of steel to be used for steel joists.

.2 The reports to be correlated to the materials or products to which they pertain.

.3 Tolerances

.1 Conform to the fabrication and erection tolerances of CAN/CSA S16.

.2 Comply with more stringent tolerances if specified elsewhere to suit interfacing materials or AESS members.

1.5 Unit Prices

.1 Provide unit prices per Section 01 29 00 – Payment Procedures.

1.6 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 the Professional Engineer responsible for steel joist design.

.2 Submit a copy of that Engineer's Certificate of Authorization and proof of liability insurance.

.3 Show on drawings:

.1 Material specifications.

.2 Joist geometry.

.3 Joist spacing.

.4 Joist camber.

.5 Member sizes.

.6 Joint details.

.7 Net weld lengths.

.8 Section splices.

.9 Bearing and anchorage details.

.10 Surface preparation.

.11 Shop painting / galvanizing.

.12 Bridging, including anchorage details at ends of bridging lines.

.13 Joists which are considered AESS, and their category; Refer to AESS Category Matrix as shown in Table 1 of the CISC Code of Standard Practice, Appendix I.

.14 Temporary bracings.

.4 On completion of erection, submit a letter signed and sealed by the Professional Engineer responsible for steel joists certifying that the work has been completed in accordance with all contract documents.

PART 2 - PRODUCTS

2.1 Design and Detailing Requirements

.1 Design joists in accordance with requirements of CSA S16 and CSA S136. Consider load effects due to fabrication, erection and handling.

.2 Submit calculations for strength and deflection. Show design loads, member forces and utilizations.

.3 Arrange joists and bridging to accommodate recessed fixtures and ductwork. Refer to Mechanical and Electrical Drawings.

.4 Arrange members to form a statically determinate truss. Chose web and chord members to have an axis of symmetry in the plane of the web. Line up web members along joist runs sufficiently to permit mechanical services.

.5 Minimum thickness of material: flats and hot rolled sections 2.5 mm (0.10"); rods 10 mm (0.39") diameter; cold formed sections 2mm (0.079"); members supporting steel deck 3.15 mm (0.125").

.6 Where joists support 76 mm (3”) deep composite steel deck, total width of top chord elements that actually support the deck to be 140 mm (5- 5/8”) minimum.

.7 Design joists to carry loads indicated on Structural Drawings, including uplifts, point loads and axial loads; see Steel Joists General Notes for additional design loads. The loads shown on drawings are working loads unless otherwise noted.

.8 Unless otherwise noted, total load deflection not to exceed 1/240th of the span and live load deflection not to exceed 1/360th of the span.

.9 Unless otherwise shown on drawings, if a joist is adjacent to a wall or a column which provide next line of support to the deck carried by the joist and are located within the middle half of the joist span, stiffen the joist so that the total load deflection does not exceed d/50, where “d” is the distance between the joist and the adjacent wall / column. In addition, design subsequent joists so that differential total load deflection between any two adjacent joists does not exceed joist spacing / 50. Maximum camber for these joists not to exceed total load deflection.

.10 Provide the minimum required moment of inertia for floor joists where shown on Structural Drawings.

.11 Design joists and bridging to meet requirements of any Fire Rated Assembly Design specified for the Project. Increase capacity as required for load restricted ULC / UL assemblies.

.12 Apply unbalanced live loads and concentrated loads in accordance with CSA S16.

.13 Design joist chords for additional axial forces from horizontal bracings connected to them. Connect joists to all supporting members by welding or bolting.

.14 Centre reaction point of joist framing from one side only over centroid of supporting beam. Where necessary, increase shoe depths as required for the first diagonal to clear the supporting structure. Coordinate the required supporting steel elevation with steel trade.

.15 Make all joist shoes with solid webs.

.16 Design joist shoe connections to supporting members to be able to resist uplift and to transfer axial force into joist top chord equal to 10% of the joist reaction (but not less than 25 kN).

.17 Design joist shoes for rollover forces where shown on structural drawings.

.18 At columns where floor slab does not exist at the column side opposite to the joist connection point (such as at perimeter columns), design joist shoe connection to resist axial force not less than 2% of the column axial load at that level.

.19 Provide top and bottom chord extensions where required. Provide tie joists at all columns as required for erection stability.

.20 Where supporting girders run over tops of steel columns, design and connect tie joist bottom chord for axial load of +/- 25 kN (in addition to the primary chord loads).

.21 Where bearing plate sizes are not noted on drawings, design bearing plates for a maximum factored bearing pressure of 1.9 MPa on masonry and 11.0 MPa on cast in place concrete.

.22 Design end plates and post installed anchors for connection of bridging to concrete and masonry walls.

.23 Unless noted otherwise, camber floor joists for dead load deflection, excluding any partition allowance.

.24 Unless noted otherwise, camber roof joists in accordance to CSA S16.

.25 Provide holes to receive 16 mm (0.625") bolts for securing of any wood framing and blocking. Space at 600 mm (2'-0") centres. Substitute 16 mm (0.625") threaded studs with nuts in locations where appearance is a factor.

2.2 Materials

.1 Steel joists: to CSA S16 and CSA S136.

.2 Structural steel: to CSA G40.20/G40.21.

.3 Welding materials: to CSA W48 and CSA W59, certified by Canadian Welding Bureau.

.4 Bolts, nuts and washers: to ASTM F3125.

.5 Anchor rods: CSA G40.21 or ASTM F1554, refer to drawings.

.6 Shop paint: to CISC/CPMA 1-73a.

.7 Shop paint primer: to CISC/CPMA 2-75, solvent reducible alkyd, red oxide, compatible with specified topcoat.

.8 Zinc-rich coating: to SSPC Paint Specification No.20, compatible with top coat (where specified).

.9 Hot dip galvanizing: to ASTM A123/A123M, minimum zinc coating of 600 g/m².

.10 Headed studs: to CSA W59, Type B, Fy=350 MPa.

.11 Joint filler for exposed steelwork: Epoxy resin.

2.3 Fabrication

.1 Fabricate steel joists in accordance with CSA S16, CSA S136 and with reviewed shop drawings.

.2 Weld in accordance with CSA W59 and CSA W186.

.3 Stagger chord member splices. Do not ship joists to the site before being inspected.

2.4 Shop Painting

.1 Clean all joists to SSPC-SP 1. Remove loose mill scale, rust, oil, dirt and foreign matter.

.2 In addition for joists to be galvanized or to receive shop primer paint: Clean steel to SSPC-SP 7 Brush-Off Blast Cleaning.

.3 In addition for members receiving zinc-rich coating: Clean steel to SSPC-SP 10 Near White Blast Cleaning.

.4 Apply one coat of shop paint CISC/CPMA 1-73a to joists in the shop with the exception of:

.1 Members to receive spray fireproofing.

.2 Members to receive a finish coat of paint on site for which a CISC/CPMA 2-75 shop primer is required.

.3 Members to receive zinc-rich coating.

.4 Galvanized members.

.5 Top chords of composite joists with field welded shear connectors.

.6 Surfaces encased in or in contact with cast-in-place concrete including top chords of joists supporting slabs.

.5 If joists to receive sprayed fireproofing are shop painted, only paints tested to ASTM E736 and approved by spray fireproofing supplier may be used. Any other paint must be removed to bear steel prior to application of spray applied fireproofing.

.6 Apply galvanizing in the shop to:

.1 Exposed exterior steel joists.

.2 Other joists noted on drawings.

.7 If galvanized steel is to be painted, use only non passivated galvanizing process (without chromate coating).

.1 Clean galvanized members to be painted in accordance to ASTM D7803.

.8 Apply paint under cover, on dry surfaces when surface and air temperatures are above 5 degrees C.

.9 Maintain dry condition and 5 degrees C minimum temperature until paint is thoroughly dry.

.10 Touch up paint on bolts, nuts, sharp edges and corners to remove sags, drips and runs before prime coat is dry.

PART 3 - EXECUTION

3.1 General

.1 Structural steel work: in accordance with CSA S16.

.2 Welding: in accordance with CSA W59 and CSA W186.

3.2 Examination

.1 Verify conditions of substrates previously installed under other Sections or Contracts are acceptable for steel joist framing installation:

.1 Visually inspect substrate.

.2 Inform WSP-S of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.3 Connection to Existing Work

.1 Verify dimensions and condition of existing work. Report discrepancies and potential problem areas to WSP-S for direction before commencing fabrication.

.2 Take precautions to protect existing works from damage. Repair damage to adjacent materials caused by steel joist installation.

3.4 Erection

.1 Erect steel joists in accordance with CSA S16 and reviewed shop drawings.

.2 Do not field cut or alter any members without the WSP-S approval.

.3 Make adequate provision for all loads acting on the structure during erection. Provide erection bracing to keep the structure stable, plumb and in true alignment during construction. Complete installation of bridging and anchorages before placing construction loads on joists. For load bearing masonry construction, maintain bracing until completion of masonry work and floor / roof decks which together provide permanent bracing. Do not remove erection bracings without written approval from the Engineer who designed it.

.4 Where bottom cord bridging is terminated by connection to steel beam, bring it up and connect to beam top flange.

.5 Do not make permanent connections until structure has been properly aligned.

.6 Report ill-fitting connections to the WSP-S before taking corrective measures.

.7 When welding after galvanizing is in place, grind away galvanizing at areas to be welded.

.8 Do not weld in an ambient temperature below -18°C. Preheat material adjacent to welding areas when ambient temperature is between -18°C and 0°C.

.9 Protect installed products from damage during construction.

.10 AESS joists: erect using softened slings or other methods such that they are not damaged. Provide padding as required to protect while rigging and aligning.

3.5 Field Painting

.1 Paint in accordance with Section 09 91 00 Painting

.2 Touch up damaged surfaces with the same paint as the shop primer.

.3 Repair any galvanized or zinc rich painted surfaces which have been damaged or field welded in accordance with SSPC Technology Guide No.14.

3.6 Inspection and Testing

.1 An Inspection and Testing Agency (certified to CSA W178.1 & 2) will be appointed to carry inspection and testing of all steel joists.

.2 Refer to Section 05 12 23 for inspection and testing requirements.

3.7 Cleaning

.1 Clean in accordance with Section 01 74 00 - Cleaning.

.2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal and 01 35 21 – LEED Requirements.

END OF SECTION 05 21 00

PART 1 - GENERAL

1.1 Related Requirements

.1 Section 03 20 00: Concrete Reinforcing

.2 Section 03 30 00: Cast in Place Concrete

.3 Section 05 12 23: Structural Steel for Buildings

.4 Section 05 21 00: Steel Joists

.5 Section 05 50 00: Metal Fabrications

.6 Section 09 91 00: Painting

.7 Section 13 34 19: Metal Building Systems

1.2 References

.1 Editions of all Referenced Standards to be the ones designated by the applicable Building Code in force at the time of building permit application, as indicated on Structural Drawings. For Standards not referenced by the Building Code, use the latest editions.

.2 CSA Group (CSA):

.1 CSA S136, North American Specification for the Design of Cold Formed Steel Structural Members

.2 CSA W47.1, Certification of Companies for Fusion Welding of Steel

.3 CSA W55, Certification of Companies for Resistance Welding of Steel and Aluminum

.4 CSA W59, Welded Steel Construction, (Metal Arc Welding)

.3 ASTM International (ASTM):

.1 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

.2 ASTM A792/A792M, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process

.4 Canadian Sheet Steel Building Institute (CSSBI):

.1 CSSBI 10M, Standard for Steel Roof Deck

.2 CSSBI 12M, Standard for Composite Steel Deck

.5 Factory Mutual Insurance Company:

.1 FM Global Property Loss Prevention Data Sheet 1-29, Roof Deck Securement and Above Deck Roof Components

1.3 Quality Assurance

.1 Qualifications

.1 Deck supplier and erector to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel and/or CSA W55.3 Division 1 or 2 for resistance welding.

.2 Welders to be CWB approved for deck welding.

.3 Engage a Professional Engineer licensed in the place where the project is located to be responsible for design, detailing and site review of all decking.

.4 The Professional Engineer designing steel decking to hold a Certificate of Authorization, and to carry a minimum of $1,000,000.00 in liability insurance.

1.4 Unit Prices

.1 Provide unit prices per Section 01 29 00 – Payment Procedures.

1.5 Action and Informational Submittals

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

.2 Product Data:

.1 Submit manufacturer's data sheets for each deck type.

.2 When requested, provide data to substantiate deck load capacity, including diaphragm shear capacity.

.3 Shop Drawings:

.1 Provide drawings stamped and signed by a Professional Engineer responsible for design of steel decking. Drawings to include diaphragm connection design.

.2 Submit a copy of the Engineer’s Certificate of Authorization and proof of liability insurance.

.3 Show on drawings:

.1 Material grade.

.2 Deck layout.

.3 Deck profile and base steel thickness.

.4 Type of deck metallic coating. Indicate deck which is to be painted on site.

.5 Gravity and uplift loads, diaphragm shear and deflection requirements for which the deck is designed.

.6 Type and spacing of connections to supports and between sheets.

.7 Projections and openings.

.8 Reinforcement details and accessories.

.9 Layout, size, type and welding requirements for welded stud shear connectors.

.10 Temporary shoring required for floor deck.

PART 2 - PRODUCTS

2.1 Design and Detailing Requirements

.1 Design loads, deck depths and core nominal thicknesses are shown on Structural Drawings. Chose deck profile, design connections and detail in accordance with CSA S136, CSSBI 10M and CSSBI 12M and to satisfy requirements of any Fire Rated Assembly Design specified for the Project.

.2 If increased wind uplift loads applicable at roof edges and corners are not specifically noted on Structural Drawings, increase the minimum design wind uplift shown (which is applicable in the zones away from roof edges) in accordance with the User’s Guide to NBC – Structural Commentaries (Part 4 of Division B).

.3 Design roof deck for indicated diaphragm action, including anchorage and side laps, in accordance with CSSBI “Design of Steel Deck Diaphragms” and Hilti Product Technical Guide (for Powder Actuated Fasteners)..

.4 Unless otherwise noted on drawings, floor deck to carry weight of wet concrete and appropriate construction load allowance without shoring.

.5 Deflection limitations for floor and roof deck:

.1 1/360 of span under specified live load.

.2 1/240 of span under total load.

.6 Make deck sheets continuous over 3 spans wherever possible. Combine triple span and double span sheets to suite multi span deck layouts. Use single span sheets only where single span condition is shown on drawings.

.7 Design reinforcement for roof deck openings up to 450 mm (18”) wide across flutes.

2.2 Materials

.1 Prefinished deck: with underlying zinc protection of Z275. Colour selected by the Architect from manufacturer’s standard list.

.2 Acoustic deck: with web perforations reducing capacity of the deck without perforation by maximum 5%.

.3 Decks to be painted on site: zinc-iron alloy coated decks suitable for finish painting.

.4 Fasteners for galvanized deck and prefinished deck: stainless steel, hex head, self-tapping screws with EPDM bonded washers.

.5 Fasteners for deck to wood supports: galvanized screws with flat seal washers.

.6 Powder-actuated fasteners: Hilti Decking Fastening System.

.7 Acoustic insulation: fibrous glass, 17.5 kg/m³ (1.1 lb/ft^3) minimum density, profiled to suit deck flutes.

.8 Cover plates, closures, pour stops, edge strips, flashings and deck reinforcing: steel sheet with minimum base steel thickness of 0.91 mm. Metallic coating same as deck material.

.9 Headed studs: to CSA W59, Type B, min. Fy=350 MPa.

2.3 Types of Decking

.1 Roof deck: with interlocking or overlapping side joints. Centre to centre rib spacing to be:

.1 150 mm (6") for 38 mm (1.5") deep deck.

.2 150 mm (6") or 200 mm (8") for 76 mm (3") deep deck.

.2 Where roof deck fasteners and fastening pattern are specified on drawings, use deck with flute spacing and side lap type which can accommodate the specified fasteners.

.3 In addition for acoustic roof deck: provide perforations on vertical face of flutes, to achieve noise reduction coefficient of 0.7 minimum.

.4 Composite floor deck: embossed fluted profile, interlocking or overlapping side laps. Centre to centre rib spacing to be:

.1 150 mm (6") for 38 mm (1.5") deep deck.

.2 300 mm (12") for 76 (3") and 51 mm (2”) deep deck.

.5 In addition for composite floor deck over composite steel beams with shear studs, minimum average width of concrete ribs to be:

.1 50 mm (2”) for 38 deep steel deck.

.2 100 mm (4”) for 38 mm (1.5") deep inverted steel deck.

.3 150 mm (6”) for 76 mm (3") and 51 mm (2”) deep steel deck.

.6 Use only decks with overlapping side joints where side lap connections need to be screwed or where multiple deck layers are specified.

2.4 Fabrication

.1 Conform to CSA S136 and CSA W59.

.2 Fabricate sections from steel sheets by rolling. Form integral ribs which will bear on supports and form interlocking male and female side laps.

PART 3 - EXECUTION

3.1 General

.1 Structural steel work: in accordance with CSA S136, CSSBI 10M and CSSBI 12M.

.2 Welding: in accordance with CSA W59, except where specified otherwise.

3.2 Examination

.1 Verification of Conditions: verify that conditions of substrates previously installed under other Sections or Contracts are acceptable for steel decking installation.

.1 Visually inspect substrate.

.2 Inform WSP-S of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.3 Erection

.1 Erect steel deck in accordance with CSA S136, CSSBI 10M, CSSBI 12M, and reviewed shop drawings.

.2 Do not overload structure during erection. Place deck bundles near columns.

.3 Align deck end to end for accurate fit with corresponding sections. Sections to be parallel, even and straight.

.4 Locate deck rib directly over perimeter steel beams spanning parallel to deck and at same elevation as underside of deck.

.5 Lap over supports. Minimum lap 50 mm (2"), maximum lap 100 mm (4").

.6 For exposed deck end laps, do not extend lower deck sheet past the face of the supports.

.7 Exercise particular care in erection of exposed deck. Sections which are dented, damaged or perforated by welding will be rejected.

.8 Where composite beams (with shear studs) run in the direction of deck span, split deck and trim with closures as required to allow min. 25 mm (1”) clear between studs and closure(s) / deck webs.

.9 Where composite beams (with shear studs) do not run in the direction of deck span, weld studs through deck. Do not cut deck to accommodate pre-welded studs.

.10 Connections

.1 Connect deck to all supporting beams and perimeter beams. Interconnect sheets at side laps.

.2 Predrill holes for screws connecting deck to timber beams. Screws shall tap metal and extend into wood, clamping deck to wood.

.3 Fasten stud shear connectors to composite beams by welding to beams (through deck where necessary) with a full 360 degrees weld capable of developing 120% of the shear values listed in CAN/CSA S16. Fastening procedure to conform to the recommendations of the stud manufacturer. Test the first two studs installed each day in accordance with CSA W59. Maintain record of the studs tested. Replace studs rejected by Inspection and Testing Agency.

.11 Immediately after deck is permanently secured in place, touch up metallic coated top surface with compatible primer where burned by welding.

.12 Prior to concrete placement, steel deck to be free of soil, debris, standing water, lose mil scale and other foreign matter.

.13 Apply spray paint to deck immediately above the protected zones which are indicated on structural steel members by contrasting shop paint. Do not attach studs nor powder actuated fasteners to these zones. Only acceptable deck fasteners within the protected zones are 19 mm (3/4") puddle welds. If any other fasteners are used, the affected structural steel members will have to be removed and replaced.

.14 Closures and Accessories

.1 Provide all required edge stiffeners, closures, reinforcing sheet steel and flashing.

.2 Reinforce edge of free spanning deck with channel shaped edge strip.

.3 Provide pour stops for concrete slabs over deck. Fasten to deck.

.4 Provide flashing at columns and points of discontinuity to prevent leakage when concrete is placed over deck.

.15 Openings

.1 Structural Drawings do not show all openings required. Refer also to Architectural, Mechanical and Electrical drawings.

.2 Cut all opening required by other trades. Carry deck through floor openings which are not framed with structural steel and cut only after concrete reaches 75% of the specified design strength.

.3 Reinforce roof deck openings up to 450 mm (18") across flutes. Maximum size of unreinforced openings not to exceed 150 mm (6").

.16 Protect existing works. Repair damage to adjacent materials caused by steel decking installation.

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

.18 Temporary shoring, if required, not to be removed until concrete attains 75% of its specified 28 day compression strength.

3.4 Inspection and Testing

.1 An Inspection and Testing Agency (certified to CSA W178.1 & 2) will be appointed to carry out inspection and testing of steel decks and check conformance with Contract documents and reviewed shop drawings.

.2 Assist the Inspection and Testing Agency in its work. Notify as to the Work Schedule and provide safe access to the work area as required.

.3 Provide Inspection and Testing Agency with a copy of reviewed shop drawings.

.4 The Inspection Agency will submit reports to WSP-S, Contractor and Municipal Authorities covering the Work inspected and provide details of errors or deficiencies observed. The Reports will make reference to the reviewed shop drawings used for inspection, including the date on the review stamp.

.5 Work will be inspected when erected.

.6 Inspection will include:

.1 Checking that mill test reports are properly correlated to materials.

.2 Confirming that all materials meet specifications.

.3 Checking welders' CWB qualification.

.4 Checking deck types, gauge and coating thicknesses.

.5 Checking welding, fastening, side laps and button punching.

.6 Checking deck reinforcement at holes cut in deck.

.7 Checking installation of sheet metal strips and edge reinforcing.

.8 Checking deck bearing lengths at supporting members.

.9 Checking appearance of exposed steel deck.

.10 Checking and testing field welded stud shear connectors as follows:

.1 The Inspector will visually check all stud shear connectors on composite steel beams.

.2 At least one stud in every 150 and all studs which do not have a complete end weld, which are repaired by welding or which show less than the normal reduction in height due to welding will be bent 15 degrees from their axis towards the nearest support, as specified in CSA-W59.

.3 Bent studs that show no sign of failure will be accepted and shall remain in the bent position. Studs that crack in weld, base metal or shank will be rejected.

.4 Studs with end welds covering less than 85% of the perimeter will be rejected even if they pass the bend test.

3.5 Cleaning

.1 Clean in accordance with Section 01 74 00 - Cleaning.

.2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal and 01 35 21 – LEED Requirements.

END OF SECTION 05 31 00

PART 1 - GENERAL

1.1 SCOPE OF WORK

.1 The work of this section includes all material, labour, equipment and tools required to complete the work described herein and reflected in the Contract Documents. Refer to Architectural and Structural Drawings.

1.2 RELATED SECTIONS

.1 Section 04 05 00 - Common Work Results for Masonry.
.2 Section 04 05 19 - Masonry Anchorage and Reinforcing.
.3 Section 05 12 00 - Structural Steel.
.4 Section 09 91 23 - Interior Painting.

1.3 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)
.1 ASTM A 53/A 53M-02, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
.2 ASTM A 307-02, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.
.2 CAN/CGSB-1.181-92, Ready-Mixed, Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA International)
.1 CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel.
.2 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
.3 CAN/CSA-S16.1-01, Limit States Design of Steel Structures.
.4 CSA W48-01, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
.5 CSA W59-1989(R2001),Welded Steel Construction (Metal Arc Welding) (Imperial Version).

.4 The Environmental Choice Program
.1 CCD-047a-98, Paints, Surface Coatings.
.2 CCD-048-98, Surface Coatings - Recycled Water-borne.

1.4 SUBMITTALS

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

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
.1 For finishes, coatings, primers and paints.

.2 Shop Drawings
.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
.2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
.3 Each shop drawing submitted shall bear the stamp and signature of a qualified Professional Engineer registered in the Province of Ontario.

.3 Submit Contractor's Engineer certificate/ written report, within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL. Certificate/report shall be stamped and signed by qualified professional engineer registered in the province of Ontario.

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.

.3 Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

.4 Site Meetings: as part of Contractor's Services as 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.

1.6 DELIVERY, STORAGE, AND HANDLING

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

.2 Storage and Protection:
.1 Cover exposed stainless steel surfaces with pressure

sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.
.2 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials 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.

.4 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 300W.

.2 Welding materials: to CSA W59.

.3 Welding electrodes: to CSA W48 Series.

.4 Bolts and anchor bolts: to ASTM A 307.

.5 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 FABRICATION

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

.2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.

.3 Where possible, fit and shop assemble work, ready for erection.

.4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 FINISHES

.1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to CAN/CSA-G164.

.2 Shop coat primer: to CAN/CGSB-1.40.

.3 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

2.4 ISOLATION COATING

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

2.5 SHOP PAINTING

.1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.

.2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 degrees C.

.3 Clean surfaces to be field welded; do not paint.

2.6 ANGLE LINTELS

.1 Steel angles: galvanized, sizes indicated for openings. Provide 200 mm minimum bearing at ends per structural drawings. Angle lintels to be provided at all openings through masonry to accommodate, ductwork, recessed mechanical and electrical pieces of equipment and where detailed. See structural drawings.

.2 Weld or bolt back-to-back angles to profiles as indicated.

.3 Finish: galvanized.

.4 Refer to structural drawings for size and details of angle lintels, hangers and corner lintels and suspended lintels.

2.7 SADDLE PLATE CONNECTION AT LAMINATED ROOF BEAM

.1 See Structural general notes for requirements, provide as required by CSA-A371.

.2 Finish: Shop primed with painted finish.

PART 3 - EXECUTION

3.1 ERECTION

.1 Do welding work in accordance with CSA W59 unless specified otherwise.

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

.3 Provide suitable means of anchorage acceptable to Consultant such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

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

.5 Provide components for building by other sections in accordance with shop drawings and schedule.

.6 Make field connections with bolts to CAN/CSA-S16.1, or weld.

.7 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

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

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

3.2 INSTALLATION

.1 Install all items listed under Part 2 of this Section and as indicated on drawings as per the reviewed shop drawings.

3.3 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

.1 Obtain written report from Contractor's Engineer 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 Contractor's Engineer 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.

3.4 CLEANING

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

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

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 05 41 00 - Structural Metal Stud Framing
.2 Section 06 20 00 - Finish Carpentry
.3 Section 08 00 00 – Door Schedule
.4 Section 08 11 00 - Metal Doors and Frames
.5 Section 08 14 16 - Flush Wood Doors
.6 Section 08 44 13 - Glazed Aluminum Curtainwall
.7 Section 08 50 00 - Aluminum Windows
.8 Section 08 71 00 - Door Hardware
.9 Section 09 22 16 - Non-Structural Metal Framing

1.2 REFERENCES

.1 American National Standards Institute (ANSI)
.1 ANSI/NPA A208.1-1999, Particleboard, Mat Formed Wood.

.2 American Society for Testing and Materials International (ASTM)
.1 ASTM A 653/A 653M-06, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealled) by the Hot-Dip Process.
.2 ASTM D 1761-88(2000), Standard Test Methods for Mechanical Fasteners in Wood.

.3 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-11.3-M87, Hardboard.

.4 Canadian Standards Association (CSA International)
.1 CAN/CSA-A247-M86, Insulating Fiberboard.
.2 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
.3 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
.4 CSA O112 Series-M1977(R2006), CSA Standards for Wood Adhesives.
.5 CSA O121-M1978(R2003), Douglas Fir Plywood.
.6 CSA O141-05, Softwood Lumber.
.7 CSA O151-04, Canadian Softwood Plywood.
.8 CSA O153-M1980(R2003), Poplar Plywood. .
.9 CSA O437 Series-93(R2006), Standards on OSB and Waferboard.

.5 National Lumber Grades Authority (NLGA)
.1 Standard Grading Rules for Canadian Lumber 2005.

.6 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)

.1 SCAQMD Rule 1113-04, Architectural Coatings.

.2 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

1.3 SUBMITTALS

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

1.4 QUALITY ASSURANCE

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

.2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

1.5 DELIVERY, STORAGE, AND HANDLING

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

PART 2 - PRODUCTS

2.1 FRAMING AND STRUCTURAL MATERIALS

.1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% (S-dry) or less in accordance with the following standards:
.1 CSA 0141,
.2 NLGA Standard Grading Rules for Canadian Lumber.

.2 Glued end-jointed (finger-jointed), are not acceptable for use on this project without written approval from the consultant.

.3 Composite wood products and laminate adhesive to contain no added ureaformadelhyde.

.4 Furring, blocking, nailing strips, grounds, rough bucks cants, curbs, fascia backing and sleepers:
.1 S2S is acceptable.
.2 Board size: “Standard” or better grade.
.3 Dimension sizes: “Standard” light framing or better grade.
.4 Post and timbers sizes: “Standard” or better grade.

2.2 PANEL MATERIALS

.1 Composite wood products and laminate adhesive to contain no added ureaformadelhyde.

.2 Plywood, OSB and wood based composite panels: to

CAN/CSA-O325.0.

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

.

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

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

.6 Interior mat-formed wood particleboard: to ANSI 208.1.

.7 Mat-formed structural panelboards (OSB wafer): to CAN3-O437.0.

2.3 ACCESSORIES

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

.2 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.

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

.4 Sealants: in accordance with Section 07 92 10 – Joint Sealants
.1 Maximum allowable VOC limit 250 g/L. All sealants shall comply with SCAQMD 1168 requirements.

.5 General Purpose Adhesive: to CSA 0112 Series. Maximum allowable VOC limit 70 g/L. All adhesives shall comply with SCAQMD 1168 requirements. All aersol adhesives to comply with Green Seal Standard for Commercial adhesives.

2.4 FASTENER FINISHES

.1 Galvanizing: to CAN/CSA-G164 ASTM A 653, use galvanized fasteners for exterior work pressure-preservative treated lumber.

.2 Stainless steel: use stainless steel where indicated.

2.6 WOOD PRESERVATIVE

.1 SCAQMD Rule #1113 - Architectural Coatings.

.2 Maximum allowable VOC limit 350 g/L.

2.7 FIRE RETARDENT

.1 Pressure impregnation fire retardent material (FRT): Wood and plywood where specified or indicated and where required by

TREATMENT

authorities having jurisdiction.

.2 Vacuum pressure impregnate wood with fire retardent treatment in accordance with CAN/CSA-080, C20 for lumber and C27 for plywood. Acceptable products: “Dricon” fire retardent chemicals for wood which is concealed in final work.

.3 Provide flame spread rating of 25 or less. Provide ULC or WHI label for treated lumber and plywood as received from the pressure treatment plant. Including identification colour dye in the fire retardent chemicals for wood which is concealed in the final work.

.4 Pressure treat materials before final milling and kiln dry after treatment to the specified moisture content.

.5 Do not expose pressure treated materials to dampness between time of treatment and time that finish is applied. Remove surface salt deposits before finishing.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Store wood products.

3.2 INSTALLATION

.1 Comply with requirements of OBC 2006, Part 3 and Part 9 supplemented by following paragraphs.

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

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

.4 Install spanning members with "crown-edge" up.

.5 Select exposed framing for appearance. Install lumber and panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.

.6 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, fascia, soffit, sliding door tracks, electrical equipment mounting boards, wall mounted door hardware (wall stops) and other work as required. Typical backing shall be sheet metal as specified under Section 09 22 16. Apply wood blocking where indicated on drawings.

.7 Install furring to support elements 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.

.8 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work. Refer to drawing details for requirements.

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

.10 Install plywood backing sheets to washrooms for water closets as indicated and as noted below to provide solid backing for grab bars.
.1 Provide blocking at water closet to accommodate grab bars installed as per O.B.C. 3.8.3.8.(3)(a) and (c) and as detailed.

.11 Install plywood backing sheets and wood stud blocking to flip up grab bars.
.1 Refer to Series 8 drawings for locations.

3.3 ERECTION

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

.2 Countersink bolts where necessary to provide clearance for other work.

3.4 SCHEDULES

.1 Electrical equipment mounting boards:
.1 Plywood, DFP or CSP grade, square edge 19 mm thick, fire treated pressure impregnated fire retardant material for all electrical and security equipment mounting boards.

.2 Frame window and door rough openings using exterior grade plywood mounted to bent steel angle supports specified in Section 05 41 00 Structural Metal Stud Framing.

.3 Supply and installation of wood blocking to support plywood window opening surrounds to replace the bent steel angle supports specified in Section 05 41 00.

.3 Wood blocking for interior elements identified under 3.2.6 and 3.2.12.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 The work of this Section includes all labour, materials, tools and equipment as required for a complete project related to the supply and installation of carpentry and woodworking elements.
.

1.2 RELATED REQUIREMENTS

.1 Section 05 41 00 – Structural Metal Stud Framing
.2 Section 06 10 00 – Rough Carpentry
.3 Section 06 40 00 – Architectural Woodwork
.4 Section 08 00 00 – Door Schedule
.5 Section 08 11 00 – Metal Doors and Frames
.6 Section 08 14 16 – Flush Wood Doors
.8 Section 09 00 00 – Room Finish Schedule
.9 Section 09 91 23 – Interior Painting

1.3 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.
.4 ANSI Z124-6-5.2 1997 Stain Resistance.

.2 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
.1 Architectural Woodwork Quality Standards, 8th edition, version 1.0 2009.

.3 ASTM International
.1 ASTM E 1333-10, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.
.2 ASTM D 2832-92(R2011), Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
.3 ASTM D 2369-10e1, Standard Test Method for Volatile Content of Coatings.
.4 ASTM D 5116-10, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
.5 ASTM G21 Fungal Resistance, Method A, B no growth.

.4 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-11.3-M87, Hardboard.
.2 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.

.6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS).

.7 National Hardwood Lumber Association (NHLA)
.1 Rules for the Measurement and Inspection of Hardwood and Cypress 2011.

.8 National Lumber Grades Authority (NLGA)
.1 Standard Grading Rules for Canadian Lumber 2010.

.9 National Electrical Manufacturers Association (NEMA)
.1 ANSI/NEMA LD-3-05, High Pressure Decorative Laminates (HPDL).

.10 ISSDA-2 Classification and Standards Publication of Solid Surfacing Material.

.11 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.

.12 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
.1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

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 plywood, particleboard, OSB, MDF and include product characteristics, performance criteria, physical size, finish and limitations.
.2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements

01 35 43 - Environmental Procedures.

.3 Shop Drawings:
.1 Indicate details of construction, profiles, jointing, fastening, location of exposed fasteners, and other related details.
.2 Indicate materials, thicknesses, finishes and hardware.
.3 Indicate mechanical and electrical service routes, service outlets, cutout locations, and sizes.
.4 Include erection drawings, plans, elevations, section, and details as applicable.
.5 Include site measurements.

.4 Samples:
.1 Submit for review and acceptance..
.2 Submit duplicate 300 x 300 mm samples of:
.1 Each type of wood to receive a stained or natural finish.
.2 Each colour, pattern, gloss, and texture of plastic laminate, in manufacturer's standard tag size.
.3 Laminated plastic joints, edging, cutouts and postformed profiles.

.5 Certifications: submit certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical properties.

.6 Low-Emitting Materials:
.1 Submit listing of adhesives and sealants used in building, showing compliance with VOC and chemical component limits or restrictions requirements.
.2 Submit listing of composite wood products used in building, stating that they contain no added urea-formaldehyde resins, and laminate adhesives used in building, stating that they contain no urea-formaldehyde.

.7 Provide maintenance data for laminate work for incorporation into manual specified in Section 01 78 00 – Closeout Submittals.

1.5 QUALITY ASSURANCE

.1 Lumber by grade stamp of agency certified by Canadian Lumber Standards Accreditation Board (CLSAB).

.2 Plywood, particleboard, OSB and wood based composite panels to CSA and ANSI standards.

.3 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.

1.6 DELIVERY, STORAGE AND HANDLING

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

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

.1 Protect millwork against dampness and damage during and after delivery.

.2 Store millwork in ventilated areas, protected from extreme changes of temperature or humidity.

.3 Storage and Handling Requirements:

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

.2 Deliver, store, and handle finish carpentry in accordance with the AWMAC Quality Standards. Control the temperature and humidity in accordance with AWMAC recommendations, before, during and after finish carpentry delivery, and also during storage and installation.

.3 Store and protect wood products from nicks, scratches, and blemishes.

.4 Cover finished plastic laminate work with heavy kraft paper or put in cartons during shipment. Protect installed surfaces by approved means. Do not remove until immediately before final inspection.

.5 Replace defective or damaged materials with new.

.4 Develop Construction Waste Management Plan and Waste Reduction Workplan related to Work of this Section.

.5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.7 WARRANTY

.1 Warrant the work of this Section in accordance with GC12.3 but for the time periods specified following.

.2 Contractor's Warranty: Warrant that the work of this section will not warp or delaminate for a period of two (2) years from the date of Substantial Completion of the contract. Make all necessary repairs and replacements at no cost to the owner.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Softwood Lumber: To CAN/CSA 0141 and National Lumber Grades Authority requirements, with maximum moisture content on 7% for interior work, 12% for exterior work, yard lumber selected for paint finish, pine species, to AWMAC custom grade, "C" select or better (Paragraph 112C). Finger-jointed material unacceptable.

.2 Hardwood: To National Hardwood Lumber Association (NHLA) requirements, moisture content of maximum 7% for interior.
.1 Oak: To AWMAC custom grade.

.3 Hardwood plywood: To CSA 0115-1982 Oak, rotary cut, Type II bond, formaldehyde free. Good two sides where exposed to view both sides. 19mm unless otherwise called for. Plywood resin to contain no added urea-formaldehyde.

.4 Douglas Fir or Poplar Plywood: To CSA 0121, good two sides, select sheathing, formaldehyde free, 19mm thick unless otherwise called for. Plywood resin to contain no added urea-formaldehyde.

.5 Russian (Baltic) Birch Plywood: To CSA 0121, good two sides Grade B/BB, rotary cut veneer, multi-core, select sheathing, formaldehyde free, 18mm thick unless otherwise called for. Plywood resin to contain no added urea-formaldehyde.

.6 Laminated Plastic for Flatwork: To CAN3-A172-M79 Grade GP Type HD 1.5mm thick; for use inside cabinets and drawers. Backing sheet; min. 0.5mm thick, sanded surface, of same manufacturer as facing sheets.

.7 Laminated Plastic for Post Formed Work: To CAN3-A172-M79. Grade PF, Type S, 1.25mm thick, otherwise as for flatwork.

.8 Laminated Plastic Adhesive: As recommended by plastic laminate manufacturer, water based.

.9 Hardboard: To CAN/CGSB – 11.3-M87, tempered, 6mm, perforated.

.10 Core Hardwood Plywood: Provide PureBond® process domestic veneer core hardwood plywood as manufactured by Columbia Forest Products (http://www.columbiaforestproducts.com/Products.aspx/VeneerCore).

.11 Particleboard Core Hardwood Plywood: Provide phenolic particleboard core hardwood plywood assembled with PureBond® formaldehyde-free technology by Columbia Forest Products http://www.columbiaforestproducts.com/Products.aspx/VeneerCore) or Vesta by Flakeboard, www.flakeboard.com

.12 Medium Density Fiberboard (MDF) Core Hardwood Plywood: Provide phenolic or MDI bonded MDF-core hardwood plywood assembled with PureBond® formaldehyde-free technology by Columbia Forest Products (http://www.columbiaforestproducts.com/Products.aspx/VeneerCore) or Superior MDF by Flakeboard, www.flakeboard.com

.13 Multi-Layered Core Hardwood Plywood: Provide specialty all hardwood European style (Europly PLUS™) high-ply-count birch veneer core blank with a phenolic-bonded platform to assure a no-added urea-formaldehyde panel, with face and back veneers laminated with PureBond® formaldehyde-free technology, as manufactured by Columbia Forest Products (http://www.columbiaforestproducts.com/Products.aspx/VeneerCore).

.14 Combi-Core Hardwood Plywood: Provide panels constructed of veneer core inner plies with phenolic-bonded MDF crossbands; panel shall offer similar strength and stability to veneer core but shall have the void-free surface quality of PBC or MDF; panel shall provide excellent substrate for thin-sliced woods and rotary woods with face and back veneers laminated with PureBond® formaldehyde-free technology; Classic Core™ as manufactured by Columbia Forest Products (http://www.columbiaforestproducts.com/Products.aspx/VeneerCore).

.15 Rough Re-Sawn Red Cedar: Boards mounted to HSS columns at main entrance and porch elements as detailed.

2.2 PLASTIC LAMINATE

.1 Laminated plastic for flatwork: to NEMA LD 3.

.1 Type: General purpose.

.2 Grade: HGS.
.3 Size: 1.27 mm thick.
.4 Colour: as per Finish Schedule.
.5 Pattern: solid or printed pattern.
.6 Finish: furniture or textured.

.2 Laminated plastic for postforming work: to NEMA LD 3.
.1 Type: Postforming.
.2 Grade: HGP.
.3 Size: 1.016 mm thick.
.4 Colour: as per Finish Schedule.
.5 Pattern: solid or printed pattern.
.6 Finish: furniture.

.3 Laminated plastic for backing sheet: to NEMA LD 3.
.1 Type: Backer.
.2 Grade: BKH.
.3 Size: not less then 0.5 mm thick or same thickness as face laminate.
.4 Colour: same colour as face laminate.

.4 Softwood or hardwood plywood core to CSA0151, solid two sides to be used at countertops with sinks, and window sills.

.5 Core: meeting CAN3.0.188.1-M78 Grade R DH, sanded faces, of thickness indicated.
.1 Particleboard core for countertops without sinks.

.6 Laminated plastic adhesive: urea resin adhesive to CSA O112.5, contact adhesive to CAN/CGSB-71.20, resorcinol resin adhesive to CSA O112.7or polyvinyl adhesive to CSA O112.4

.7 Sealer: water resistant sealer or glue acceptable to laminate manufacturer.

.8 Sealant: Section 07900/ Sealants.

.9 Draw bolts and splines: as recommended by fabricator

2.3 ACCESSORIES

.1 Nails and staples: to CSA B111; galvanized to ASTM A 123/A 123M for exterior work, interior humid areas and for treated lumber; plain finish elsewhere.

.2 Wood screws: steel, type and size to suit application.

.3 Splines: metal.

.4 Adhesive and Sealants: in accordance with Section 07 92 00 - Joint Sealants.
.1 Provide adhesives, sealants, and sealant primers with

VOC quantities lower than stated in SCAQMD Rule #1168, current edition.

.2 Provide primers, paints, sealers, coatings and wood finishes with VOC quantities lower than limits stated in Green Seal's Standards GS-3 and GS-11 and SCAQMD Rule #1113, current editions

2.4 BARN DOOR FRAMES AND PANELS

.1 Refer to door schedule details for barn door details.

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. 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 Fastening:

.1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.

.2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.

.3 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round smooth cut hole and plug with wood plug to match material being secured.

.4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.

.2 Interior frames:

.1 Set frames with plumb sides and level heads and secure.

.3 Shelving:
.1 Install shelving on ledgers.

3.4 FINISH CARPENTRY SCHEDULE

.1 **Café Ceiling Slats**: 38 x 89mm dressed pine boards, donated by church congregation to be installed under this contract. Refer to drawing A2.05 for layout. Slats to be clear stained and seismically mounted to existing fire rated ceiling under this Contract. Submit seismic connection details, prepared by P. Eng. licensed to practice in Ontario for Consultant review.

.2 **Fellowship Hall Barn Doors:**
.1 Grade: Custom.
.2 Frames to be solid maple species, free of knots and imperfections.
.3 Construction:
.1 Profile: as per details.

.3 **Fireplace surround:**
.1 Grade: Custom
.2 Surround panels to be Russian Birch Plywood species, Grade B/BB, free of knots and imperfections.
.3 Construction:
.1 Profile: as per details.

3.6 CLEANING

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

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

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.7 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 SECTION INCLUDES

.1 .1 The work of this section includes the provision of all labour, material, equipment and services required to fabricate and install all shop fabricated finished cabinetwork and millwork items, as indicated on the drawings and specified herein and as required for a complete project.

.2 The work of this section includes the provisions of all labour, material, equipment, and services required to finish shop fabricated finished cabinetwork and millwork as specified in Section 06 47 00 Plastic Laminate and Section 09 91 23 Painting.

.3 The work includes, but is not necessarily limited to the following:

.1 Laminated plastic faced cabinetwork and millwork.

.2 Hardwood veneer faced cabinetwork and millwork.

.3 Flat countertops, faced with laminated plastic.

.4 Supply and installation of cabinet hardware specified in Section 08 71 50.

1.2 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry
.2 Section 06 20 00 – Finish Carpentry
.3 Section 09 00 00 – Interior Finish, Material/Colour Legend
.4 Section 09 00 00 – Room Finish Schedule
.5 Section 09 22 16 – Non-Structural Metal Framing
.6 Section 09 91 23 – Interior Painting

1.3 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.

.4 ANSI Z124-6-5.2 1997 Stain Resistance

.2 ASTM International

.1 ASTM E 1333-10, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.

.2 ASTM D 2832-92(R2011), Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.

.3 ASTM D 5116-10, 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-11.3-M87, Hardboard
.2 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.

.6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS).

.7 National Electrical Manufacturers Association (NEMA)
.1 ANSI/NEMA LD-3-[05], High-Pressure Decorative Laminates (HPDL).

.8 National Hardwood Lumber Association (NHLA)
.1 Rules for the Measurement and Inspection of Hardwood and Cypress [2011].

.9 National Lumber Grades Authority (NLGA)
.1 Standard Grading Rules for Canadian Lumber [2010].

.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 ISSDA-2 Classification and Standards Publication of Solid Surfacing Material.

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 architectural woodwork and include product characteristics, performance criteria, physical size, finish and limitations.
.2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.

.3 Shop Drawings:
.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
.2 Indicate details of construction, profiles, jointing, fastening and other related details.
.1 Scales: profiles full size, details half full size.
.3 Indicate materials, thicknesses, finishes and hardware.
.4 Indicate locations of service outlets in casework, typical and special installation conditions, and connections, attachments, anchorage and location of exposed fastenings.

.4 Certifications: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

1.5 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 to CSA and ANSI standards.

1.6 DELIVERY, STORAGE AND HANDLING

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

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
.1 Protect millwork against dampness and damage during and after delivery.
.2 Store millwork in ventilated areas, protected from extreme changes of temperature or humidity.

.3 Storage and Handling Requirements:
.1 Store materials off ground, indoors, in dry location, and in accordance with manufacturer's recommendations in clean,

dry, well-ventilated area.

.2 Store and protect architectural woodwork from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

.4 Develop Construction Waste Management Plan related to Work of this Section.

.5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

1.7 WARRANTY

.1 Warrant the work of this Section in accordance with GC12.3 but for the time periods specified following.

.2 Contractor's Warranty: Warrant that the work of this section will not warp or delaminate for a period of two (2) years from the date of Substantial Completion of the contract. Make all necessary repairs and replacements at no cost to the owner.

1.8 MOCK-UP

.1 Construct mock-ups in accordance with Section 01 33 00 - Shop Drawings, Product Data, Samples and Mock-ups.

.2 Shop prepare one upper Café cabinet unit, complete with hardware and shop applied finishes, and install on project at designated location.

.3 Allow 24 hours for inspection of mock-up by Owner/Client and Consultant before proceeding with this work.

.4 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Softwood Lumber: To CAN/CSA 0141 and National Lumber Grades Authority requirements, with maximum moisture content on 7% for interior work, 12% for exterior work, yard

lumber selected for paint finish, pine species, to AWMAC custom grade, “C” select or better (Paragraph 112C). Finger-jointed material unacceptable.

.2 Machine stress-rated lumber is acceptable for all purposes.

.3 Hardwood: To National Hardwood Lumber Association (NHLA) requirements, moisture content of maximum 7% for interior.
.1 Oak: To AWMAC custom grade.

.4 Hardwood plywood: To CSA 0115-1982 Oak, rotary cut, Type II bond, formaldehyde free. Good two sides where exposed to view both sides. 19mm unless otherwise called for. Plywood resin to contain no added urea-formaldehyde.

.5 Douglas Fir or Poplar Plywood: To CSA 0121, good two sides, select sheathing, formaldehyde free, 19mm thick unless otherwise called for. Plywood resin to contain no added urea-formaldehyde.

.6 Russian (Baltic) Birch Plywood: To CSA 0121, good two sides Grade B/BB, rotary cut veneer, multi-core, select sheathing, formaldehyde free, 18mm thick unless otherwise called for. Plywood resin to contain no added urea-formaldehyde.

.7 Laminated Plastic for Flatwork: To CAN3-A172-M79 Grade GP Type HD 1.5mm thick; suede finish colours; pattern as indicated. Backing sheet; min. 0.5mm thick, sanded surface, of same manufacturer as facing sheets.

.8 Laminated Plastic for Post Formed Work: To CAN3-A172-M79. Grade PF, Type S, 1.25mm thick, otherwise as for flatwork.

.9 Laminated Plastic Adhesive: As recommended by plastic laminate manufacturer, water based.

.10 Hardboard: To CAN/CGSB – 11.3-M87, tempered, 6mm, perforated.

.11 Core Hardwood Plywood: Provide PureBond® process domestic veneer core hardwood plywood as manufactured by Columbia Forest Products (http://www.columbiaforestproducts.com/Products.aspx/VeneerCore).

.12 Particleboard Core Hardwood Plywood: Provide phenolic particleboard core hardwood plywood assembled with PureBond® formaldehyde-free technology by Columbia Forest

Products http://www.columbiaforestproducts.com/Products.aspx/VeneerCore) or Vesta by Flakeboard, www.flakeboard.com

.13 Medium Density Fiberboard (MDF) Core Hardwood Plywood: Provide phenolic or MDI bonded MDF-core hardwood plywood assembled with PureBond® formaldehyde-free technology by Columbia Forest Products

(http://www.columbiaforestproducts.com/Products.aspx/VeneerCore) or Superior MDF by Flakeboard, www.flakeboard.com

.14 Multi-Layered Core Hardwood Plywood: Provide specialty all hardwood European style (Europly PLUS™) high-ply-count birch veneer core blank with a phenolic-bonded platform to assure a no-added urea-formaldehyde panel, with face and back veneers laminated with PureBond® formaldehyde-free technology, as manufactured by Columbia Forest Products (http://www.columbiaforestproducts.com/Products.aspx/VeneerCore).

.15 Combi-Core Hardwood Plywood: Provide panels constructed of veneer core inner plies with phenolic-bonded MDF crossbands; panel shall offer similar strength and stability to veneer core but shall have the void-free surface quality of PBC or MDF; panel shall provide excellent substrate for thin-sliced woods and rotary woods with face and back veneers laminated with PureBond® formaldehyde-free technology; Classic Core™ as manufactured by Columbia Forest Products (http://www.columbiaforestproducts.com/Products.aspx/VeneerCore).

.16 Nails and staples: to CSA B111.

.17 Wood screws: stainless steel and steel, type and size to suit application.

.18 Splines: wood or metal.

.19 Sealant: in accordance with Section 07 92 00 - Joint Sealants.
.1 Sealants: VOC limit 250 g/L maximum to SCAQMD Rule 1168.

.20 Solid Surfacing materials as indicated in Section 09 00 00 Interior Finish, Material/Colour Legend:
.1 Cast, non-porous, filled polymer, not coated, laminated of composite construction with through-body colours meeting ANSI Z124.3 or ANSI Z124.6. Superficial

damage to a depth of .25mm shall be repairable by sanding and/or polishing

.2 Eased edge treatment. See details for edge profiles.

.3 Colour: Refer to Section 09 00 00 Interior Finish, Material/Colour Legend.

.21 Quartz Surface: Materials as indicated in Section 09 00 00 Interior Finish, Material/Colour Legend:

.1 Caesarstone Quartz slab, 20mm thick, 43-48kg/m², polished surface

.2 Pencil Round Mitred edge treatment. See details for Edge profiles.

.3 Colour: Refer to Section 09 00 00 Interior Finish, Material/Colour Legend.

2.2 MANUFACTURED UNITS

.1 Casework.

.1 Fabricate caseworks to AWMAC custom quality grade.

.2 Furring, blocking, nailing strips, grounds, and rough bucks and sleepers.

.1 S2S is acceptable.

.2 Board sizes: Standard or better grade.

.3 Dimension sizes: Standard light framing or better grade.

.3 Framing birch species, NHLA select grade.

.4 Case Bodies: (ends, gables, divisions and bottoms).

.1 Russian (Baltic) plywood:

.1 Thickness: 18 mm.

.2 Number of plies: 13.

.3 Finish: as per Section 09 00 00 Interior Finish, Material/Colour Legend.

.4 Back veneer to be white plastic laminate within the cabinets or exposed plywood, stained finish, where there are no doors and

where finish would be exposed. Bottom of cabinet to be white plastic laminate or to exposed plywood, stained finish, where there are no doors and where finish would be exposed.

.5 Core: veneer.
.6 Bond: Type II.
.7 Sanding: touch sanding.
.8 Grain direction longitudinal.

5 Backs:
.1 Hardwood plywood:
.1 Thickness: 6 mm.
.2 Number of plies: 4.
.3 Face veneer: white plastic laminate.
.4 Backs: to match face where exposed.
.5 Core: veneer.
.6 Bond: Type II.
.7 Sanding: touch sanding.
.8 Grain direction vertical.
.9 Hanging Strips - Provide cabinet backs with suitable hanging strips.

.6 Doors:
.1 Fabricate doors to AWMAC premium grade supplemented as follows:
.2 Russian (Baltic) Birch Plywood
.1 Thickness: 18mm.
.2 Number of plies: 13
.3 Finish: as per Section 09 00 00 Interior Finish Material/Colour Legend

.7 Shelves:
.1 Russian (Baltic) Birch plywood:
.1 Thickness: 18 mm.
.2 Number of plies: 13.
.3 Stained finish as per Section 09 00 00 Interior Finish, Material/Colour Legend, for open shelving where exposed. White plastic laminate finish for insides of cabinets and or open

shelving
where cabinets are noted as plastic laminate finish on finish schedule.

.2 Edge banding: provide 10 mm thick solid matching wood strip on plywood edges 18 mm or thicker, exposed in final assembly for fixed shelves and front and rear on adjustable shelves. Strips same width as plywood.
Provide self edge plastic laminate on front face of fixed shelves and on all four edges on adjustable shelves with plastic laminate finishes. .

.3 Drawers:

.1 Fabricate drawers to AWMAC premium grade supplemented as follows:

.2 Sides and Backs.
Hardwood plywood:
.1 Thickness: 12 mm.
.2 Number of plies: 7.
.3 Face veneer : White plastic laminate.
.4 Back veneer: White plastic laminate.
.5 Core: veneer.
.6 Bond: Type II.
.7 Sanding: touch sanding.
.8 Grain direction longitudinal.
.9 Edge: provide plastic laminate at all edges.

.3 Bottoms.
Hardwood plywood:
.1 Thickness: 6 mm.
.2 Number of plies: 3.
.3 Face veneer: White plastic laminate.
.4 Back veneer: White plastic laminate.
.5 Core: veneer.
.6 Bond: Type II.
.7 Sanding: touch sanding.
.8 Grain direction longitudinal.

.4 Fronts.
Russian (Baltic) Birch plywood:

.1 Thickness: 18 mm.
.2 Number of plies:13.
.3 Stained finish as per Section 09 00 00 Interior Finish, Material/Colour Legend, for open shelving where exposed. White plastic laminate finish for insides of drawers.
.4 Back veneer: white plastic laminate with plastic laminate edges.
.5 Core: veneer.
.6 Bond: Type II.
.7 Sanding: touch sanding.
.8 Grain direction vertical.

2.3 CABINET HARDWARE

.1 Use only manufacturer's product for all similar items.

.2 Supply all necessary 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 Use fastener compatible with material through which they pass.

.5 Hinges:
.1 Cabinet doors: Concealed self-closing type B01601 finish to 626.

.2 Bar countertop: Richelieu #23032890, 23.5".

.6 Cabinet door & drawer pulls: Top (or bottom) mounted, Häfele No. 124.02.911 handle, 40mm wide x 42mm deep, matt aluminum finish. Installed on bottom edge of all upper cabinet doors and top edge of all lower cabinet doors and drawers.

.7 Elbow latch: Type B03023 similar to Type 2, zinc 604.

.9 Roller catches Type B03091 finish to 626.

.10 Shelf rests at adjustable shelving unless noted otherwise, Richelieu CP2289180. Shelf rest installed in pre-drilled holes at 30mm spacing.

.11 Drawer slides: Type B05051-KV #1429 x LTS heavy duty, full extension, side mounted.

.12 Drawer and door locks to be Cam Lock type to suit application. Locks to be similar to E07261. Key to be removable in locked and unlocked positions. Cylinders to be keyed as noted in 2.6.15 – Keying. Finish 626.

.13 Door bumpers: Richelieu #MP30311, 9.5mm dia., stick-on bumpers.

.14 Keying:

.1 Cabinet locks to be keyed alike by room master-keyed and grandmaster-keyed as directed. Submit keying schedule for approval.

.2 Provide keys in duplicate for every lock in the contract.

.3 Provide three master keys for each MK or GMK group.

.4 Refer to drawings for those cabinet doors and drawers within millwork to be lockable.

2.4 FABRICATION

.1 Set nails and countersink screws apply stained 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, 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.

.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 to interior of cabinetry.

2.5 FINISHING

.1 Factory finish all cabinetwork prior to delivery to site.

.2 Appearance of finish of stained finish to be visibly free of flow lines, streaks, sags, blisters and other surface imperfections.

.3 Provide temporary protection to factory finished cabinetwork during shipment. Ensure that method of protection does not damage finish.

.4 Touch up marked or abraded finish to Consultants approval. Units which are damaged beyond acceptance standard shall be replaced at no extra cost to the owner.

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. . Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

.1 Do architectural woodwork to Quality Standards of AWMAC.

.2 Install prefinished millwork at locations shown on drawings.
.1 Position accurately, level, plumb straight.

.3 Fasten and anchor millwork securely.
.1 Supply and install heavy duty fixture attachments for wall mounted cabinets.

.4 Use draw bolts in countertop joints.

.5 Scribe and cut as required to fit abutting walls and to fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.

.6 At junction of plastic laminate counter back splash and adjacent wall finish, apply small bead of sealant in accordance with Section 07 92 00 - Joint Sealants.

.7 Fit hardware accurately and securely in accordance with manufacturer's written instructions.

3.3 CLEANING

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
.1 Clean millwork and cabinet work inside cupboards and drawers, and outside surfaces.
.2 Remove excess glue from surfaces.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

.1 Protect millwork and cabinet work from damage until final inspection.

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

.3 Repair damage to adjacent materials caused by architectural woodwork installation.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 The work of this section includes the provision of all labour,material, equipment and services required to replace the existing plastic laminate countertops with new plastic laminate.

1.2 RELATED SECTIONS

.1	Section 01 33 00	Submittal Procedures
.2	Section 01 45 00	Quality Control
.3	Section 01 47 18	Indoor Air Quality Requirements
.4	Section 01 61 00	Common Product Requirements
.5	Section 01 74 21	Construction / Demolition Waste Management and Disposal
.6	Section 01 78 00	Close Out Submittals
.7	Section 06 10 00	Rough Carpentry
.8	Section 06 20 00	Finish Carpentry
.9	Section 06 40 00	Architectural Woodwork
.10	Section 07 92 00	Joint Sealing
.11	Section 09 00 00	Interior Finish, Material / Colour Legend
.12	Section 09 00 01	Room Finish Schedule

1.3 REFERENCES

.1 American National Standards Institute (ANSI)
.1 ANSI A208.2-02, Medium Density Fibreboard (MDF) for Interior Applications.

.2 American Society for Testing and Materials International, (ASTM)
.1 ASTM D 2832-[92(R2005)], Standard Guide for Determining Volative and Non-Volatile Content of Paint and Related Coatings.
.2 ASTM D 5116-97, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.

.3 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-71.20-M88, Adhesive, Contact,

Brushable.

.4 Canadian Standards Association (CSA International)
.1 CSA 0112-Series {M1977 (R2006)], Standards for Wood Adhesives.
.2 CSA O112.5-1.1-Series-M-1977(R2001), Urea Resin Adhesives for Wood (Room- and High-Temperature Curing).
.3 CSA O112.7-1.1-Series M-1977(R2001), Resorcinol and Phenol-Resorcinol Resin Adhesives for Wood (Room- and Intermediate-Temperature Curing).
.4 CSA 0121-[08], Douglas Fir Plywood.
.5 CSA 0141-[05], Softwood Lumber.
.6 CSA 0151-[09], Canadian Softwood Plywood.
.7 CSA 0153-[M1980 (R2008)], Poplar Plywood.

.5 Environmental Choice Program (EPC)
.1 CCD-044-95, Adhesives.
.2 CCD-045-95, Sealants and Caulking Compounds.
.3 CCD-048-95, Surface Coatings Recycled Water-borne.
.4 CCD-047a-98, Paints - Surface Coatings.
.5 CCD-048b-98, Stains - Surface Coatings.
.6 CCD-048c-98, Varnishes - Surface Coatings.

.6 National Electrical Manufacturers Association (NEMA)
.1 NEMA LD3-2000, High Pressure Decorative Laminates

.7 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI).

.8 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards.
.1 SCAQMD Rule 1168-[A2005], Adhesives and Applications.

.9 Green Seal Environmental Standards (GS).
.1 GS-36-[00], Commercial Adhesives.

1.4_SUBMITTALS

.1 Product Data:
.1 Submit manufacturer's printed product literature, specifications and data sheets in accordance with Section 01 33 00 – Submittal Procedures.
.2 Submit two copies of WHMIS MSDS – Material Safety Data Sheets in accordance with Section 01 33 00 – Submittal Procedures, Indicate VOC limits for

adhesives, solvents and cleaners.

.2 Samples:
- .1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit duplicate samples of joints, edging, cutouts and postformed profiles.

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

.4 Submit MSDS for all adhesives and sealants applied on site indicating VOC content.

.5 Submit product documentation for all adhesives and composite wood products, confirming that they contain no added urea-formaldehyde.

1.5 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for laminate work for incorporation into manual specified in Section 01 78 00 – Closeout Submittals.

1.6 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.

1.7 STORAGE AND PROTECTION

.1 Deliver, handle, store and protect material of this Section in accordance with Section 01 61 00 – Common Product Requirements.

.2 Maintain relative humidity between 25% and 60% at 22°C during storage and installation.

1.8 WASTE MANAGEMENT AND DISPOSAL

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

.2 Divert wood cut-offs from landfill by disposal into on-site wood

recycling bin

.3 Divert reusable materials for reuse at nearest used building materials facility or similar type facility.

.4 Divert unused caulking, sealants, surface coatings and adhesive materials from landfill through disposal at an appropriate facility,

1.9 WARRANTY

.1 Warrant the work of this Section in accordance with GC12.3 but for the time periods specified following.

.2 Contractor's Warranty: Warrant that the work of this section will not warp or delaminate for a period of two (2) years from the date of Substantial Completion of the contract. Make all necessary repairs and replacements at no cost to the owner.

PART 2 - PRODUCTS

2.1 PRODUCT REQUIREMENTS .1 Provide adhesives, sealants, and sealant primers with VOC quantities lower than stated in SCAQMD Rule #1168, current edition.

.2 Provide primers, paints, sealers, coatings and wood finishes with VOC quantities lower than limits stated in Green Seal's Standards GS-3 and GS-11 and SCAQMD Rule #1113, current editions.

2.2 MATERIALS .1 Laminated plastic for flatwork: to NEMA LD 3.
- .1 Type: General purpose.
- .2 Grade: HGS.
- .3 Size: 1.27 mm thick.
- .4 Colour: as per Finish Schedule.
- .5 Pattern: solid or printed pattern.
- .6 Finish: furniture or textured.
- .7 Refer to Section 06 40 00 for core material.

.2 Laminated plastic for postforming work: to NEMA LD 3.
- .1 Type: Postforming.
- .2 Grade: HGP.
- .3 Size: 1.016 mm thick.
- .4 Colour: as per Finish Schedule.
- .5 Pattern: solid or printed pattern.
- .6 Finish: furniture.
- .7 Refer to Section 06 40 00 for core material.

.3 Softwood or hardwood plywood core to CSA0151, solid two sides to be used at countertops with sinks, and window sills.

.4 Core: meeting CAN3.0.188.1-M78 Grade R DH, sanded faces, of thickness indicated.
.1 Particleboard core for countertops without sinks.

.5 Laminated plastic adhesive: urea resin adhesive to CSA O112.5, contact adhesive to CAN/CGSB-71.20, resorcinol resin adhesive to CSA O112.7or polyvinyl adhesive to CSA O112.4

.6 Sealer: water resistant sealer or glue acceptable to laminate manufacturer.

.7 Sealant: Section 07900/ Sealants.

.8 Draw bolts and splines: as recommended by fabricator.

2.3 COUNTERTOP PROFILES

.1 To match existing.

2.4 FABRICATION

.1 Comply with NEMA LD 3, 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 facing 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 mm. Keep joints 600 mm from sink cut-outs.

.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 laminate work.

.8 Apply laminate to cover underside of countertop edge to match countertop.

PART 3 – EXECUTION

3.1 MANUFACTURERS INSTRUCTION

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

3.2 INSTALLATION

.1 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 oc, 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 counter back splash and adjacent wall finish, apply small bead of sealant.

.6 Site apply laminated material to units as indicated. Adhere laminated material over entire surface. Make corners with hairline joints. Use full sized laminate sheets. Make joints only where approved.

.7 For site application, offset joints in laminate facing from joints in core.

3.3_PROTECTION

.1 Cover finished laminated surfaces with heavy kraft paper or put in cartons during shipment. Protect installed laminated surfaces by approved means. Do not remove until immediately before final inspection.

3.4 CLEANING

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

.2 Perform care and cleaning with NEMA LD 3, Annex B.

.3 Remove traces of primer, caulking, epoxy and filler materials; clean doors and frames .

3.5 SCHEDULE

.1 Laminate to Consultant's selection as noted in Section 09 00 00 Interior Finish, Material/Colour Legend.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 The work of this Section includes but is not limited to the all material, equipment, tools, and labour required for the supply and installation of blanket insulation to provide thermal and acoustic protection and separation where noted in wall types.

.2 Acoustic insulation to interior wall assemblies as indicated on the drawings. Construct all assemblies in accordance with the requirements of the labeling agency. When in doubt seek direction from the Consultant.

.3 Where specified in construction assembly insulation shall be installed, carefully fitted to avoid gaps and voids across the full width of the assembly.

.4 All interior partitions enclosing vertical plumbing drainage piping shall be insulated within the stud spaces containing piping.

.5 At all washrooms within resident suites, provide and install insulation within all enclosing partitions.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures
.2 Section 07 27 00 - Air Barriers
.3 Section 07 84 00 - Fire Stopping
.4 Section 09 21 16 - Gypsum Board Assemblies
.5 Section 09 22 16 - Non-structural Metal Framing
.6 Division 15 - Insulation for Mechanical Work

1.3 REFERENCES

.1 American Society for Testing and Materials International (ASTM)
.1 ASTM C 553-02, Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.

.2 Canadian Standards Association (CSA International)
.1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.3 Underwriters Laboratories of Canada (ULC)
.1 CAN/ULC-S604-M1991, Type A Chimneys.
.2 CAN/ULC-S702-1997, Standard for Mineral Fibre Insulation.

1.4 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 Provide information on recycled contents of materials as per Section 01 61 00 – Product Requirements

.4 Submit information on locations of manufacture and extraction of materials as per Section 01 61 00 – Product Requirements

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.

.3 Convene pre-installation meeting one week prior to beginning on-site installations.
.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.

1.6 WASTE MANAGEMENT AND DISPOSAL

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

.2 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.

PART 2 - PRODUCTS

2.1 INSULATION

.1 Acoustic Insulation
.1 Batt and blanket mineral fibre ASTM C665

CAN/ULCS702
.2 Type: 1.
.3 Thickness: as indicated
.4 Non Combustible in accordance with CAN/ULC S114 and ASTM E136
.5 Flame spread less than 25, smoke development 50
.6 Width purpose made for fitting between studs.
.7 Acceptable Products:
.1 Ottawa Fibre Industries - Golden Glow Acoustic Insulation
.2 CGC Thermafibre SAFB
.3 Certainteed Certasound or CertaPro AcoustaTherm Batts
.4 Roxul AFB
.5 Owens Corning Quietzone

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSULATION INSTALLATION

.1 Install insulation to maintain continuity acoustic protection to building elements and spaces and to ASTM C 1320.

.2 Install insulation within framing members tightly fit but not compressed.

.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 and CAN/CGA-B149.1 and CAN/CGA-B149.2 Type B and L vents.

.6 Do not enclose insulation until it has been inspected and approved by Consultant.

.7 Pack gaps at top of masonry partitions, except for rated fire separations, with glass fibre insulation for full thickness of wall. Install foam insulation on each side of wall as detailed on

drawings.

3.3 CLEANING

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

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Materials and requirements for application of spray foam insulation:
- .1 Applied behind and within new curtainwall cavities, and perimeter of new window openings. Refer to wall sections and plan details.
- .2 Applied within exterior HSS structural members. Division 5 to provide drill holes for access within hollow sections to permit cavity to be completely filled.

1.2 RELATED SECTIONS

.1 Section 07 21 13 - Board Insulation
.2 Section 07 27 00 - Air Barriers
.3 Section 08 11 00 - Metal Doors and Frames
.4 Section 08 11 16 - Aluminum Doors and Frames
.5 Section 08 44 13 - Glazed Aluminum Curtain Walls
.6 Section 08 50 00 - Aluminum Windows

1.3 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 Underwriters' Laboratories of Canada (ULC)
- .1 CAN/ULC-S101-04, Fire Endurance Tests of Building Construction and Materials.
- .2 CAN/ULC-S102-10, 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.
- .5 CAN/ULC S770-09 - Standard Test Method for Determination of Long-term Thermal Resistance of Closed-Cell Thermal Insulating Foams.
- .6 CAN/ULC S774-03 - Standard Laboratory Guide for the Determination of Volatile Organic Compound Emissions from Polyurethane Foam.
- .7 Canadian Construction Materials Centre (CCMC) Evaluation Reports

.8 Canadian Construction Materials Centre (CCMC) Technical Guide, Air Barrier Systems for Exterior Walls of Low-Rise Buildings

.5 .1 ASTM C411-05 - Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.
.2 ASTM C518-10 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
.3 ASTM C1338-08 - Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings.
.4 ASTM D1621-10 - Standard Test Method for Compressive Properties Of Rigid Cellular Plastics.
.5 ASTM D1622-08 - Standard Test Method for Apparent Density of Rigid Cellular Plastics.
.6 ASTM D1623-09 - Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics (Type C sample).
.7 ASTM D2126-09 - Standard Test Method for Response of Rigid Cellular Plastics toThermal and Humid Aging.
.8 ASTM D2369-10, Standard Test Method for Volatile Content of Coatings.
.9 ASTM D2842-06 - Standard Test Method for Water Absorption of Rigid Cellular Plastics.
.10 ASTM D6226 - Standard Test Method for Open Cell Content of Rigid Cellular Plastics.
.11 ASTM E96/E96M-10 - Standard Test Methods for Water Vapor Transmission of Materials.

1.4 SUBMITTALS

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

.2 Product Data:
.1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
.2 Submit two copies WHMIS MSDS - Material Safety Data Sheets.

.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.
.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.

.4 Provide information on recycled contents of materials as per Section 01 61 00 – Product Requirements

1.5 QUALITY ASSURANCE

.1 Applicators to conform to CUFCA Quality Assurance Program.

.2 Qualifications:
.1 Installer: person specializing in sprayed insulation installations with 5 years documented experience approved by manufacturer.
.2 Manufacturer: company with minimum 5 years experience in producing of material used for work required for this project, with sufficient production capacity to produce and deliver required units without causing delay in work.

.3 Mock-up:
.1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
.2 Construct mock-up of typical wall application and application around window and door openings.
.3 Mock-up may be part of finished work.
.4 Allow 24 hours for inspection of mock-up by Consultant before proceeding with sprayed insulation work.

.4 Convene pre-installation meeting one week prior to beginning on-site installations.
.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.

.5 Health and Safety Requirements: worker protection:
.1 Protect workers as recommended by CAN/ULC-S705.2 and manufacturer's recommendations:
.2 Workers must wear protective clothing when applying foam insulation.
.3 Workers must not eat, drink or smoke while applying foam insulation.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Packing, shipping, handling and unloading:
.1 Deliver, store and handle materials in accordance w.th 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 and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.7 SITE CONDITIONS

.1 Ventilate area in accordance with Section 01 51 00 - Temporary Utilities.

.2 Ventilate area to receive insulation by introducing fresh air and exhausting air continuously during and 24 hour after application to maintain non-toxic, unpolluted, safe working conditions.

.3 Provide temporary enclosures to prevent spray and noxious vapours from contaminating air beyond application area.

.4 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of insulation materials.

.5 Apply insulation only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Insulation: spray polyurethane to CAN/ULC-S705.1-01 including amendment 1&2.
.1 Closed cell, medium density, spray-applied rigid polyurethane foam insulation and air barrier system.
.2 Long Term Thermal resistance: Min. 1.95 RS1/50mm (R11.07)
.3 Flame Spread Rating: <500, tested in conformance with CAN/ULC S102/S127
.4 Perm rating: to ASTM E-96, 37-55ng/Pa.s.m2/ 50mm
.5 Acceptable products:
.1 BASF Walltite ECO v.2 (CCMC 13530-L)
.2 Polarfoam PF-7300-0 Soya (CCMC 13244-L)
.3 Icynene Proseal (CCMC 13683-L)
.4 Accella Foamsulate ECO (CCMC 13583-R)

.2 Primers: in accordance with manufacturer's recommendations for surface conditions. Maximum VOC limit as per Section 01 61 00 Product Requirements

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 compliance with the spray polyurethane Foam Alliance and manufacturer's printed instructions.

.2 Use primer where recommended by manufacturer.

.3 Apply spray foam insulation directly to the interior faces of all exterior poured concrete curbs and upstands, to the underside for floor slabs at exterior soffit locations, around exhaust duct plenum boxes penetrating exterior walls and where indicated on the drawings.

.4 Apply after installation of anchorage ties and supports, and galvanized "Z" girt framing for anchorage of cladding systems.

.5 Apply in maximum 50mm thickness per pass. On initial application thickness of first pass shall be no more than 25mm. Allow application of spray foam to cure and cool prior to application of additional layers of insulation as per manufacturer's recommendations to achieve total thickness to meet thermal values specified.

.6 Apply sprayed foam insulation in total thickness to achieve a minimum R value of 20 on wall areas and 30 on soffit areas unless indicated otherwise.

.7 Apply spray foam insulation around supply and exhaust ductwork penetrations through exterior walls. The work of this section is to seal and thermally protect the connection of ductwork to the exterior wall. Apply insulation after ductwork and duct insulation is in place.

.8 Apply spray foam insulation to back of window panel/spandrel panel assemblies where indicated on drawings at junctions with concrete roof and floor slabs.

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 at stages listed.

.1 After delivery and storage of products and when prepatory work and mock-up is completed but before general installation begins.

.2 Twice during progress of Work at 25% and 60% complete.

.3 Upon completion of work, after cleaning is carried out.

.4 Provide written report for each site review.

3.4 CLEANING

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

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 The work of this Section includes all material, equipment, tools, and labour required to supply and install fire stopping materials to maintain noted fire separations.

.2 Fire stopping of mechanical and electrical service penetrations are the responsibility of the mechanical and electrical trades. Mechanical , plumbing, fire protection, and electrical shall each be responsible for fire stopping their service penetrations. Refer to mechanical and electrical specifications for additional requirements.

1.2 RELATED SECTIONS

.1 Section 04 22 00 - Concrete Masonry Units
.2 Section 07 21 13 - Board Insulation
.3 Section 07 21 16 - Blanket Insulation
.4 Section 07 92 00 - Joint Sealants
.5 Section 08 44 13 - Glazed Aluminum Curtain Walls
.6 Section 09 21 16 - Gypsum Board Assemblies
.7 Section 09 22 16 - Non-structural Metal Framing
.8 Division 22
.9 Division 23
.10 Division 26
.11 Division 27

1.3 REFERENCES

.1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS).

.2 Test Requirements: CAN/ULC-S115-11, "Standard Method of Fire Tests of Through Penetration Fire Stops".

.3 Underwriters Laboratories of Canada (ULC) of Scarborough runs CAN/ULC-S115-11 under their designation of ULC-S115-11 and publishes the results in their "FIRE RESISTANCE RATINGS DIRECTORY" that is updated annually.

.4 Underwriters Laboratories (UL) of Northbrook, IL runs ASTM E-814 under their designation of UL 1479 and publishes the results in their "FIRE RESISTANCE DIRECTORY" that is updated annually. UL tests that meet the requirements of ULC-S115-M are given a cUL listing and are published by UL in their “Products Certified for Canada (cUL) Directory. Omega Point Laboratories runs ASTM E-814 and publishes the results annually in their “Omega Point Laboratories Directory”

.5 Test Requirements: UL 2079, “Tests for Fire Resistance of Building Joint Systems”. These test requirements provide more guidelines for testing moving joints than that given in CAN4-S115-M. UL tests that meet the requirements of ULC-S115-M are given a cUL listing and are published by UL in their “Products Certified for Canada (cUL) Directory

.6 Inspection Requirements: ASTM E 2174, “Standard Practice for On-site Inspection of Installed Fire Stops.”

.7 Test Requirements: ASTM E 2307, “Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus”

.8 International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments

.9 CAN/ULC-S102-M, Standard Test Method for Surface Burning Characteristics of Building Materials.

.10 ASTM D6904, “Standard Practice for Resistance to Wind Driven Rain for Exterior Coatings Applied on Masonry”

.11 ASTM C 679, “Standard Test Method for Tack-Free Time of Elastomeric Sealants”

.12 All major building codes: NBC, OBC

.13 NFPA 101 - Life Safety Code

.14 Canadian Electrical Code

1.4 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.Fire stop material also refers to assemblies intended to close off openings and gaps in the floor slabs and between wall assemblies and the edges of floor slabs to maintain fire separations between floor levels.

.2 Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.

.3 Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on site fire stop system.

.4 Tightly Fitted; (ref: NBC Part 3.1.9.1.1 and 9.10.9.6.1): penetrating items that are cast in place in buildings of noncombustible construction or have "0" annular space in buildings of combustible construction.
.1 Words "tightly fitted" should ensure that integrity of fire separation is such that it prevents passage of smoke and hot gases to unexposed side of fire separation.

1.5 SUBMITTALS

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

.2 Product Data:
.1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets.

.3 Shop Drawings:
.1 Submit shop drawings to show location, proposed material, reinforcement, anchorage, fastenings and method of installation.
.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.
.2 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties.
.3 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
.4 Manufacturer's Instructions: submit manufacturer's

installation instructions and special handling criteria, installation sequence, cleaning procedures.

.5 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.

.6 Manufacturer's engineering judgment identification number and drawing details when no ULC or cUL system is available for an application. Engineered judgment must include both project name and contractor's name who will install firestop system as described in drawing. All EJ assemblies must be inspected on site during and after installation and an engineer's stamped letter provided confirming compliance of installed firestopping complies with submitted EJ.

1.6 QUALITY ASSURANCE

.1 Qualifications:

.1 Installer: company specializing in fire stopping installations with 5 years documented experience approved by manufacturer. Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having the necessary training to install manufacture's products per specified requirements.

.2 A manufacturer's direct representative (not distributor or agent) to be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.

.3 The work is to be installed by a contractor with at least one of the following qualifications:
FM 4991 Approved Contractor
UL Approved Contractor
Product Manufacturer's Accredited Fire Stop Specialty Contractor

.2 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section, with contractor's representative and Consultant 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 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.

.4 Firestop System installation must meet requirements of CAN/ULC-S115-11 or UL 2079 tested assemblies that provide a fire rating as shown in Section 2.03 Clauses 18, 19 & 20 below.

.5 Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

.6 For those firestop applications that exist for which no ULC or cUL tested system is available through a manufacturer, a manufacturer's engineering judgment derived from similar ULC or cUL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgment drawings must follow requirements set forth by the International Firestop Council

1.7 DELIVERY, STORAGE AND HANDLING

.1 Packing, shipping, handling and unloading:

.1 Deliver, store and handle materials in accordance w.th 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 or cUL markings.

.2 Storage and Protection:

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

.2 Replace defective, damaged or expired materials with new.

.3 Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.

.3 Waste Management and Disposal:

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

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

.1 Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.

.2 Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.

.3 Firestopping Materials are either “cast-in-place” (integral with concrete placement) or “post installed.” Provide cast-in-place firestop devices prior to concrete placement.

.4 Provide a round fire-rated cable management device whenever cables penetrate fire rated walls, where frequent cable changes and additions may occur. The fire-rated cable management device shall consist of a corrugated steel tube with zinc coating, contain and inner plastic housing, intumescent material rings, and inner fabric smoke seal membrane. The length of the sleeve shall be 315mm. The fire-rated cable management device shall contain integrated intumescent firestop wrap strip materials sufficient to maintain the hourly rating of the barrier being penetrated. The fire-rated cable management device shall contain a smoke seal fabric membrane or intumescent firestop plugs sufficient to achieve the L-Rating requirements of the barrier type. Install device per the manufacturer’s published installation instructions.

.5 Penetrations in Fire Resistance Rated Walls: Provide firestopping with ratings determined in accordance with CAN/ULC-S115-11

.1 F-Rating: Not less than the fire-resistance rating of the wall construction being penetrated.

.6 Penetrations in Horizontal Assemblies: Provide firestopping with ratings determined in accordance with CAN/ULC-S115-11.

.1 F-Rating: Minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.

.2 T-Rating: when penetrant is located outside of a wall cavity, minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.

.7 Penetrations in Smoke Barriers: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.

.1 L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at both ambient and elevated temperatures.

.8 Mold Resistance: Provide penetration firestopping with mold and mildew resistance rating of 0 as determined by ASTM G21.

.9 Rain and water resistance: provide perimeter joint sealant tested in accordance with ASTM D 6904 with less than 1 hour tack free time as tested in accordance with ASTM C 679.

.10 Fire-resistance rating of installed fire stopping assembly in accordance with NBC and OBC.

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

.12 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.

.13 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.

.14 Sealants for vertical joints: non-sagging.

2.2 MATERIALS

.1 Subject to compliance with through penetration firestop systems and joint systems listed in the U.L.C Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory

.2 Use only firestop products that have been ULC or cUL tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.

.3 For penetrations through a Fire Separation wall provide a firestop system with a "F" Rating as determined by ULC or cUL as indicated below:

Fire Resistance Rating of Separation	Required ULC or cUL "F" Rating of Firestopping Assembly
30 minutes	20 minutes
45 minutes	45 minutes
1 hour	45 minutes
1.5 hours	1 hour
2 hours	1.5 hours
3 hours	2 hours
4 hours	3 hours

For combustible pipe penetrations through a Fire Separation provide a firestop system with a "F" Rating as determined by ULC or cUL which is equal to the fire resistance rating of the construction being penetrated.

.4 For penetrations through a Fire Wall or horizontal Fire Separation provide a firestop system with a "FT" Rating as determined by ULC or cUL which is equal to the fire resistance rating of the construction being penetrated.

.5 Provide a firestop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction joint assembly.

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 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials.
.1 Ensure that substrates and surfaces are clean, dry and frost free.

.2 Prepare surfaces in contact with fire stopping materials and

smoke seals to manufacturer's instructions.

.3 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.

.4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.3 INSTALLATION

.1 Install fire stopping and smoke seal material and components in accordance with manufacturer's certified tested system listing.

.2 Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration and construction joint materials.

.1 Seal all holes or voids made by penetrations to ensure an air and water resistant seal.

.2 Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of ULC or cUL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.

.3 Protect materials from damage on surfaces subjected to traffic.

.3 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.

.4 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

.5 Tool or trowel exposed surfaces to neat finish.

.6 Remove excess compound promptly as work progresses and upon completion.

.7 Regulatory Requirements: Install firestop materials in accordance with ULC Fire Resistance Directory or UL Products Certified for Canada (cUL) Directory or Omega Point Laboratories Directory.

3.4 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 Mechanical pipe insulation: certified fire stop system component.
.1 Ensure pipe insulation installation precedes fire stopping.

3.5 FIELD QUALITY CONTROL

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

.2 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.

3.6 CLEANING

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

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

.3 Remove temporary dams after initial set of fire stopping and smoke seal materials.

3.7 SCHEDULE

.1 Fire stop and smoke seal at:
.1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
.2 Edge of floor slabs at curtain wall and window wall assemblies by-passing edge of floor slab.
.3 Top of fire-resistance rated masonry and gypsum board partitions.
.4 Intersection of fire-resistance rated masonry and gypsum board partitions.
.5 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.
.6 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
.7 Openings and sleeves installed for future use through fire separations.

.8 Around mechanical and electrical assemblies penetrating fire separations.
.9 Rigid ducts: greater than 129 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 SECTION INCLUDES

.1 The work of this Section includes all, materials, tools and equipment, and labour required to supply and install joint sealants for the project as indicated on the drawings and noted below.

.2 Requirements for Joint Sealants to complete other various Sections containing sealant or caulking specifications.

1.2 RELATED SECTIONS

.1 Section 04 05 00 - Common Work Results for Masonry
.2 Section 07 27 00 - Air Barriers
.3 Section 07 62 00 - Sheet Metal Flashing and Trim
.4 Section 08 11 00 - Metal Doors and Frames
.5 Section 08 11 16 - Aluminum Doors and Frames
.6 Section 08 44 13 - Glazed Aluminum Curtain Walls
.7 Section 08 50 00 - Windows
.8 Section 08 80 50 - Glazing
.9 Section 09 21 16 - Gypsum Board Assemblies
.10 Section 09 22 16 - Non-structural Metal Framing

1.3 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)
.1 ASTM C 919-02, Standard Practice for Use of Sealants in Acoustical Applications.

.2 Canadian General Standards Board (CGSB)
.1 CGSB 19-GP-5M-1984, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
.2 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
.3 CGSB 19-GP-14M-1984, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
.4 CAN/CGSB-19.17-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).

1.4 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.

.7 Submit MSDS with VOC contents as per 01 61 00 for approval

1.5 QUALITY ASSURANCE/MOCK-UP

.1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.

.2 Construct mock-up to show location, size, shape and depth of joint s complete with back-up material, primer, caulking and sealant.

.3 Mock-up will be used:
.1 To judge workmanship, substrate preparation, operation of equipment and material application.

.4 Locate where directed.

.5 Allow 24 hours for inspection of mock-up by Consultant before proceeding with sealant work.

.6 When accepted, mock-up will demonstrate minimum standard of quality required for this Work. Approved mock-up may remain as part of finished Work.

1.6 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 WASTE MANAGEMENT AND DISPOSAL

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

.2 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.

.4 Place materials defined as hazardous or toxic in designated containers.

.5 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.6 Unused sealant material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.7 Divert unused joint sealing material from landfill to official hazardous material collections site approved by Consultant.

.8 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling.

.9 Fold up metal banding, flatten, and place in designated area for recycling.

1.8 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.

1.9 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada.

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

.3 Ventilate area of work by use of approved portable supply and exhaust fans.

1.10 WARRANTY

.1 Contractor hereby warrants that joint sealants will stay in place and remain leakproof in accordance with General Conditions (GC), but for five years from the date of substantial performance of the contract. Make all necessary repairs and replacements within 48 hours of receipt of written notification.

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 VOC limit for joint sealants as per 01 61 00.
- .1 Substrate metal to metal sealant 30g/l
- .2 Substrate plastic foam sealant 50g/l
- .3 Substrate porous material sealant 50g/l
- .4 Substrate wood sealant 30g/l
- .5 Substrate fibreglass sealant 80g/l
- .6 Architectural sealant 250g/l
- .7 other 420g/l

.5 VOC limit for sealant primers as per 01 61 00.
- .1 Architectural nonporous 250g/l
- .2 Architectural porous 775g/l
- .3 other 750g/l

.6 All sealants and primers shall comply with SCAQMD 1168, aerosol adhesives to comply with Green Seal Standard for Commercial adhesives.

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Type 1: Urethanes Two Part.
- .1 Non-Sag to CAN/CGSB-19.24, Type 2, Class B, colour selected by consultant from full product range.
- .2 Acceptable material:Tremco Dymeric 240

.2 Type 2: Urethanes One Part.
- .1 Self-Leveling to CAN/CGSB-19.13, MG-2-25-B-N, colour selected by consultant from full product range
- .2 Acceptable material : Tremco Dymonic

.3 Type 3: Silicones One Part.
- .1 To CAN/CGSB-19.13, Type MCG-2-25-A-L.
- .2 Acceptable material: Spectrum 2 by Tremco

.4 Type 4: Silicone Resistant One Part Mildew resistant:
- .1 Acceptable material:Tremsil 200 by Tremco

.5 Type 5: Acrylic Latex One Part.
- .1 To CAN/CGSB-19.17.
- .2 Acceptable material:Tremflex 834 by Tremco

.6 Type 6: Acoustical Sealant.
- .1 To ASTM C 919.
- .2 Acceptable material: Acoustical Sealant by Tremco

.7 Type 7: Urethanes One or Two Part
- .1 Multi or single component, self levelling or slope grade polyurethane sealant to ASTM C 920, Type M, Grade P, Class 25, Use T,M,A and O
- .2 Acceptable material: THC 900 or THC901 hybrid or

Vulkem 45 by Tremco

.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 SEALANT SELECTION

.1 Use Sealant Type 1 or Type 3 at all locations except where another type is specified including: exterior joint work, bedding for windows, perimeter of all aluminum and steel entrance frames and windows including around base of all frames, below perimeter edge of door thresholds, perimeter of all louvers and exhaust caps, balcony floor slabs and poured concrete curbs.

.2 Use Sealant Type 1 or Type 3 at Expansion and control joints in exterior surfaces of poured-in-place concrete walls, and at exterior side of cold joint at balcony concrete curbs.

.3 Use Sealant Type1 or Type 3 at Expansion and control joints in exterior surfaces of precast panels.

.4 Use Sealant Type 1 or Type 3 at Control and expansion joints in exterior surfaces of unit masonry walls.

.5 Use Sealant Type 3 at glass to glass, glass to metal and metal to metal joints, including coping joints and coping-to facade joints:

.6 Use Sealant Type 7 at exterior joints in horizontal wearing surfaces, and penetrations through floors.

.7 Use Sealant type 2 or Type 3 at all interior perimeters of exterior openings as detailed on drawings. Use at interior joints between windows, door frames and screen frames and adjacent wall assemblies.

.8 Use Sealant Type 2 or Type 3 at all control and expansion joints

on the interior of exterior poured-in place concrete walls.

.9 Use Sealant Type 2 or Type 3 at control and expansion joints on the interior of exterior surfaces of unit masonry walls.

.10 Use Sealant Type 7 at Interior control and expansion joints in floor surfaces, sawcuts and perimeter joints in floor slabs..

.11 Use Sealant Type 2 or Type 3 at perimeters of interior frames and penetrations through interior walls.

.12 Use Sealant Type 2 or Type 3 at interior masonry vertical control joints (block-to-block, block-to-concrete, and intersecting masonry walls).

.13 Use Sealant Type 6 at joints at tops of non-load bearing, non-rated masonry walls at the underside of poured concrete.

.14 Use Sealant type 4 at perimeter of bath fixtures (e.g. sinks, tubs, urinals, stools, water closets, basins, access doors, vanities, and countertops).

.15 Use Sealant Type 5 at exposed interior control joints in drywall.

.16 Use Sealant Type 6 at Perimeter of all acoustically rated partitions and around penetrations through acoustically rated partitions.

2.4 JOINT CLEANER

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

.2 Primer: as recommended by manufacturer.

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 TESTING

.1 Perform an adhesive test of proposed joint sealant for all exterior applications to confirm surface prep, priming and sealant performance to manufacturer's specifications. Submit written test results to Consultant pior to proceed- ing with project work.

3.4 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.5 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.6 MIXING

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

3.7 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 primer to joints prior to caulking application.

.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

Door No	Room Name	Frame Type	Throat Dim	Finish	Details	Door Type	Width	Height	Finish	Glass	Label Min.	Hardware Heading	Remarks
Level 1													
101.1 Existing	New Vestibule 101	Exist.	_	Brown		ALD-1	2x998	2135	PT				Remove existing single door & sidelight, replace with new double door, c/w power operator and barrier free hardware
102.1	New Children's Lobby 102	AL-1	_	Brown	D6	ALD-1	2x965	2135	Brown	GL-3	_		Power door operators. Frame & door colour to match existing.
103.1	New Children's Ed. Age 3 Teaching Area 103	PSF-5	118	PT	D2	HMD-4	2x965	2135	PT	GL-1	_		
103.2	New Children's Ed. Age 3 Teaching Area 103	PSF-1	118	PT	D2	HMD-2	965	2135	PT	GL-1	_		
103A.1	New WR 103A	PSF-1	118	PT	D2	HMD-1	815	2135	PT	_	_		
103B.1	New WR 103B	PSF-1	118	PT	D2	HMD-1	815	2135	PT	_	_		
103C.1	New Children's Ed. Age 3 Activity Area 103C	PSF-4	118	PT	D2	HMD-2	965	2135	PT	GL-1	_		
103.D1	New Storage 103D	PSF-1	118	PT	D1	HMD-1	965	2135	PT	_	_		
104.1	New Janitor 104	PSF-1	156	PT	D3	HMD-1	965	2135	PT	_	45min.		

Door No	Room Name	Frame Type	Throat Dim	Finish	Details	Door Type	Width	Height	Finish	Glass	Label Min.	Hardware Heading	Remarks
107.1	New Janitor 107	PSF-1	156	PT	D3	HMD-1	965	2135	PT	_	45min.		
111.1	New Universal WR 111	PSF-1	+/-194 (SITE DIM.)	PT	D5	HMD-1	965	2135	PT				Remove existing door & frame from opening. Replace with new door, frame and barrier free hardware c/w power operator
112.1	New Universal WR 112	PSF-1	+/-194 (SITE DIM.)	PT	D5	HMD-1	965	2135	PT				Remove existing door & frame from opening. Replace with new door, frame and barrier free hardware c/w power operator
113A.1	New Stor 113A	PSF-1	+/-143 (SITE DIM.)	PT	D5	HMD-1	762	2135	PT	_	45min.		
114.1	New Common Office 114	PSF-3	118	PT	D1	HMD-2	965	2135	PT	GL-1	_		Complete with sidelite and frame
114.2 Existing	New Common Office 114	Exist.	_	PT	_	Exist.	2x914	2135	PT	_	_		Existing steel doors and Frame. Provide new hardware
115.1	New Office 115	PSF-3	118	PT	D1	HMD-2	965	2135	PT	GL-1	_		Complete with sidelite and steel frame
118.1	New Children's Rm Sp. Needs 118	PSF-3	118	PT	D1	HMD-2	965	2135	PT	GL-1	_		Complete with sidelite and steel frame

Door No	Room Name	Frame Type	Throat Dim	Finish	Details	Door Type	Width	Height	Finish	Glass	Label Min.	Hardware Heading	Remarks
118A.1	New WR 118A	PSF-1	118	PT	D2	HMD-1	965	2135	PT	–	–		
118B.1 Existing	New WR 118B	Exist.	–	PT	–	Exist.	914	2135	PT	–	–		Existing door and Frame. Provide new lockset
119.1	New Volunteer Lounge 119	PSF-2	178	PT	D1 sim.	HMD-4	2x965	2135	PT	GL-1	–		Complete with separate sidelites and frames
120.1	New Children's Ed. Ages 8-10 120	PSF-2	300	PT	D8	HMD-4	2x965	2135	PT	GL-1	–		
120.2 Existing	New Children's Ed. Ages 8-10 120	Exist.	–	PT	–	Exist.	2x914	2135	PT	–	–		Relocate existing door to this location. Replace hardware
120.3	New Children's Ed. Ages 8-10 120	PSF-1	300	PT	D8	HMD-1	711	2135	PT	–	–		
120A.1	New WR 120A	PSF-1	118	PT	D2	HMD-1	815	2135	PT	–	–		
121.1 Existing	New Children's Ed. Ages 5-7 121	Exist.	–	PT	–	Exist.	2x914	2135	PT	–	–		Remove existing door and frame from opening, rotate 180° and reinstall
121.2	New Children's Ed. Ages 5-7	PSF-1	190	PT	D4	HMD-2	965	2135	PT	GL-1	–		
121A.1 Existing	New WR 121A	Exist.	–	PT	–	Exist.	813	2135	PT	–	–		Existing door & frame. Provide new lockset

Door No	Room Name	Frame Type	Throat Dim	Finish	Details	Door Type	Width	Height	Finish	Glass	Label Min.	Hardware Heading	Remarks
121B.1	New Storage 121B	PSF-1	118	PT	D1	HMD-1	965	2135	PT	–	–		
L02A.1	New WR L02A	PSF-1	118	PT	D2	HMD-1	815	2135	PT	–	–		
L02B.1	New Storage L02B	PSF-1	118	PT	D1	HMD-1	965	2135	PT	–	–		
L22.1	Existing Storage L22	PSF-1	+/-143 (SITE DIM.)	PT	D5	HMD-1	965	2135	PT	–	–		
L29.1	Existing Elev. Mach. Rm. L29	PSF-1	190	PT	D4	HMD-1	965	2135	PT	–	45min.		
Level 2													
212.1	Exist. Corridor 212	PSF-1	118	PT	D2	HMD-2	965	2135	PT	GL-1	–		
212.2	Exist. Corridor 212	PSF-1	118	PT	D2	HMD-2	965	2135	PT	GL-1	–		
212A.1	New Corridor 212A	PSF-1	118	PT	D2	HMD-1	815	2135	PT	–	–		
213.1	Exist. Jan. 213	PSF-1	124	PT	D7	HMD-1	965	2135	PT	–	45min.		Remove existing door and frame. Provide new door, frame & hardware in new location

Door No	Room Name	Frame Type	Throat Dim	Finish	Details	Door Type	Width	Height	Finish	Glass	Label Min.	Hardware Heading	Remarks
215.1	New Reception 215	PSF-1	118	PT	D7	HMD-2	965	2135	PT	GL-1			
215.2	New Reception (Closet) 215	PSF-1	118	PT	D1	HMD-3	2x609	2135	PT	_			
215A.1	New Sound Room 215.A	PSF-1	118	PT	D2/D7	HMD-1	965	2135	PT	_			
215B.1	New Graphics Room 215.B	PSF-1	118	PT	D2/D7	HMD-1	965	2135	PT	_			
216.1	New Library 216	PSF-1	118	PT	D7	HMD-2	965	2135	PT	GL-1			
216.2	New Library 216	PSF-1	229	PT	D2/D7	HMD-2	965	2135	PT	GL-1			
217.1	New Room 4 217	PSF-1	118	PT	D2	HMD-2	965	2135	PT	GL-1			
217A.1	New Room 1 217A	PSF-1	118	PT	D7	HMD-2	965	2135	PT	GL-1			
217B.1	New Room 2 217B	PSF-1	118	PT	D2	HMD-2	965	2135	PT	GL-1			
217C.1	New Room 3 217C	PSF-1	118	PT	D2	HMD-2	965	2135	PT	GL-1			

Door No	Room Name	Frame Type	Throat Dim	Finish	Details	Door Type	Width	Height	Finish	Glass	Label Min.	Hardware Heading	Remarks
220.1	Exist. Stor. 220	PSF-1	118	PT	D7	HMD-1	965	2135	PT	_			

Door No	Room Name	Frame Type	Throat Dim	Finish	Details	Door Type	Width	Height	Finish	Glass	Label Min.	Hardware Heading	Remarks

NOTE: Contractor to verify throat dimensions of existing walls or new walls being installed flush to existing walls prior to submitting shop drawings.

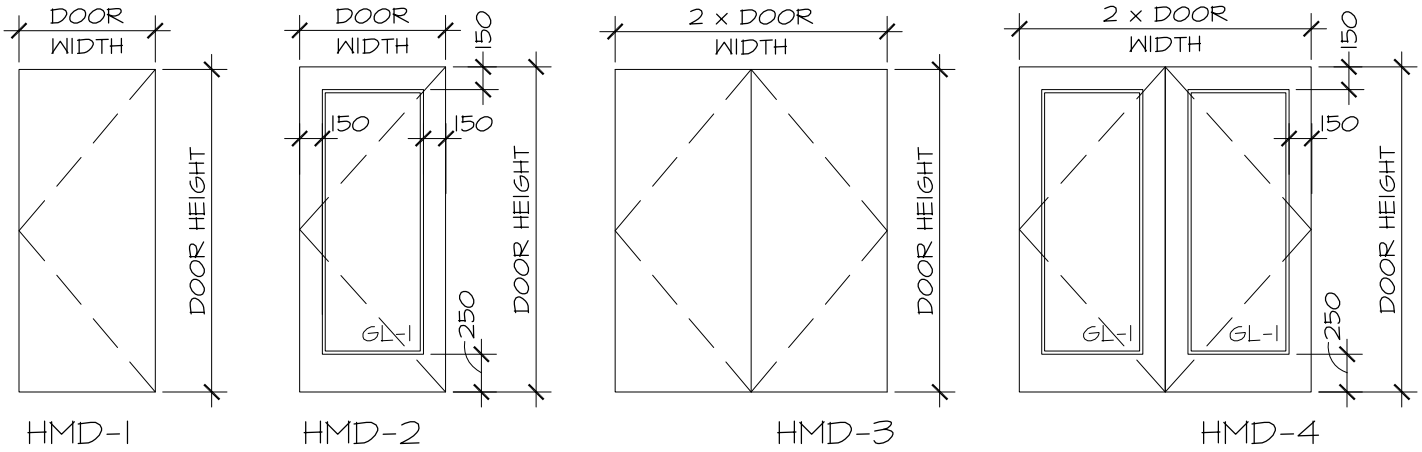
See Specification Sections 08 00 00.02 - Door Types, 08 00 00.03 - 08 00 00.04 Frame Types, 08 00 00.05 - Jamb Details for door & frame designations and jamb details.

LEGEND:

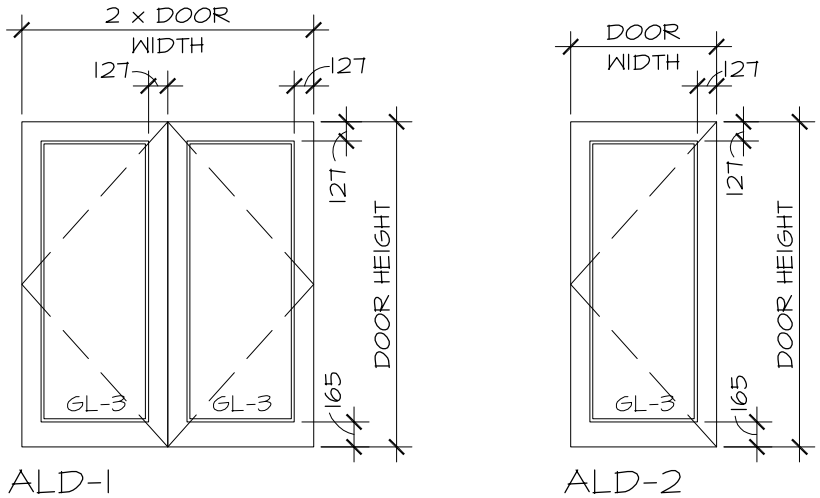
PT: Paint Finish - Refer to Specification Section 09 00 00 - Interior Finish, Material/Colour Legend
WS: Wood Stain - Refer to Specification Section 09 00 00 - Interior Finish, Material/Colour Legend
GL_: Glass Type - Refer to Specification Section 08 80 50 - Glazing
GL-1 Safety Glass - Tempered
GL-2 Wired Glass
GL-3 Insulated Glass

Existing Door, frame and Hardware. See notes for revisions to door and/or frame &hardware

METAL DOOR TYPES



ALUMINUM DOOR TYPES



NOTE: REFER TO DOOR SCHEDULE FOR GLASS TYPE LOCATIONS & SPECIFICATIONS FOR GLAZING TYPES

HOBIN ARCHITECTURE

Hobin Architecture Incorporated
63 Pamilla Street T: 613-238-7200
Ottawa, ON K1S 3K7 F: 613-235-2005
hobinarc.com E: mail@hobinarc.com

PROJECT / LOCATION:
WOODVALE PENTECOSTAL CHURCH RENOVATION
205 Greenbank Rd, Nepean, ON K2H 8K9

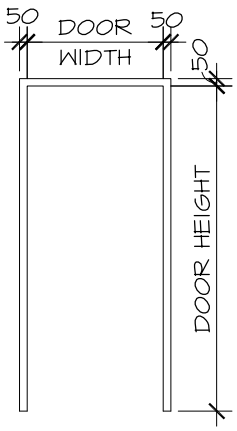
DRAWING NAME:
DOOR TYPES

Issued For 70% Progress

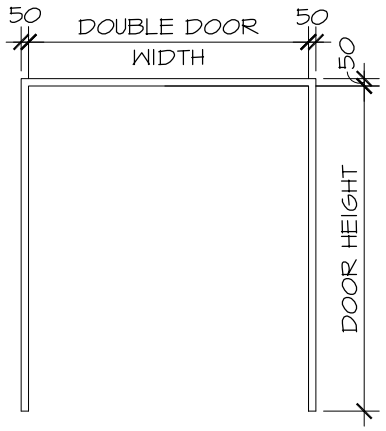
DATE:	DRAWN BY:	SCALE:
Nov 12, 2021	JG	N.T.S.

PROJECT NO.:	ASK NO.
1939	08 00 00.02

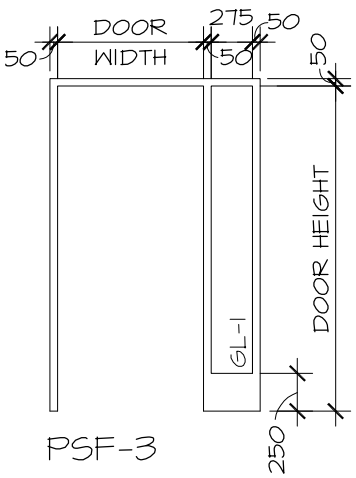
PRESS STEEL FRAME TYPES



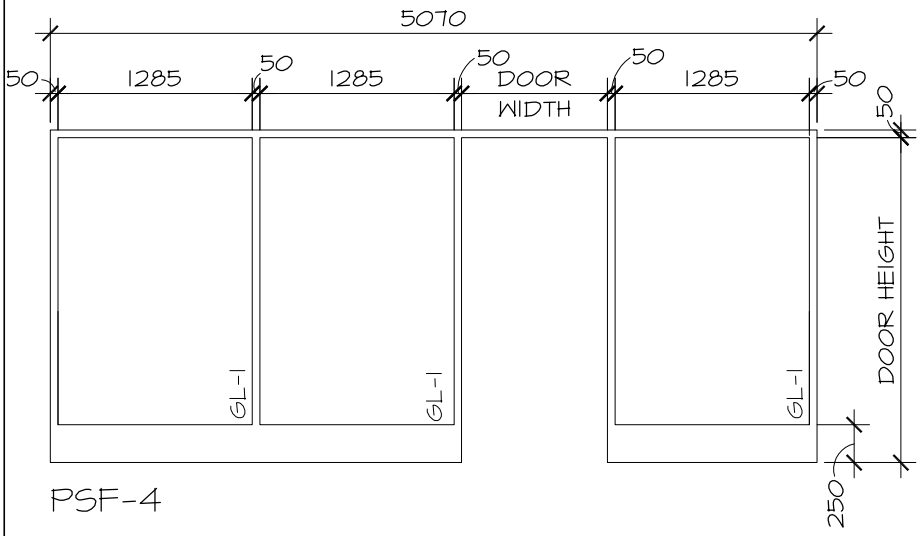
PSF-1



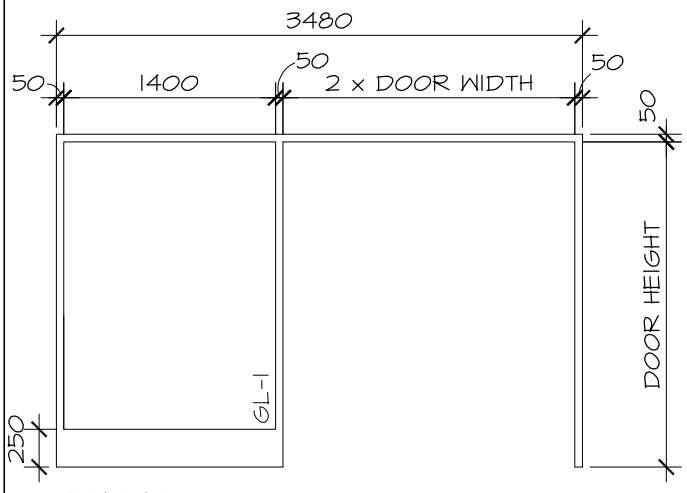
PSF-2



PSF-3



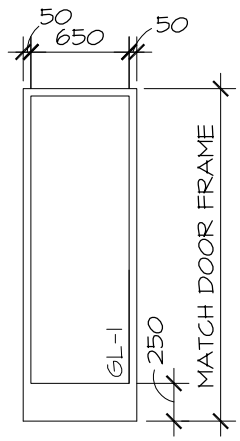
PSF-4



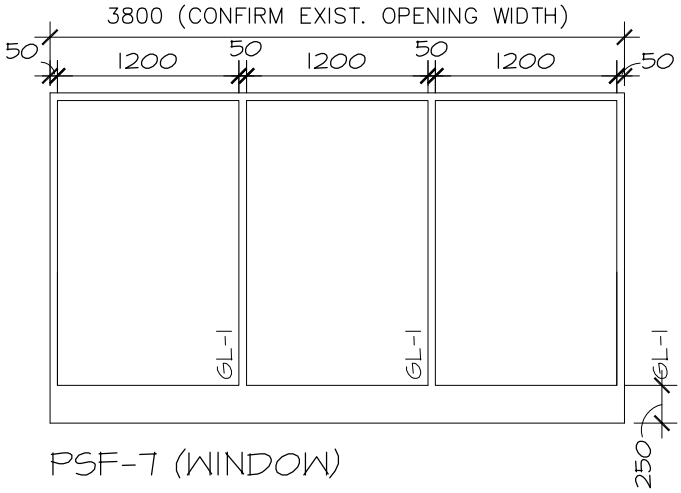
PSF-5

HOBIN ARCHITECTURE	PROJECT / LOCATION: WOODVALE PENTECOSTAL CHURCH RENOVATION 205 Greenbank Rd, Nepean, ON K2H 8K9	DRAWING NAME: DOOR FRAME TYPES	DATE: Nov 12, 2021	DRAWN BY: JG	SCALE: N.T.S.
	Hobin Architecture Incorporated 63 Pamilla Street T: 613-238-7200 Ottawa, ON K1S 3K7 F: 613-235-2005 hobinarc.com E: mail@hobinarc.com	Issued For 70% Progress	PROJECT NO.: 1939	ASK NO. 08 00 00.03	

PRESS STEEL FRAME TYPES CONT'D

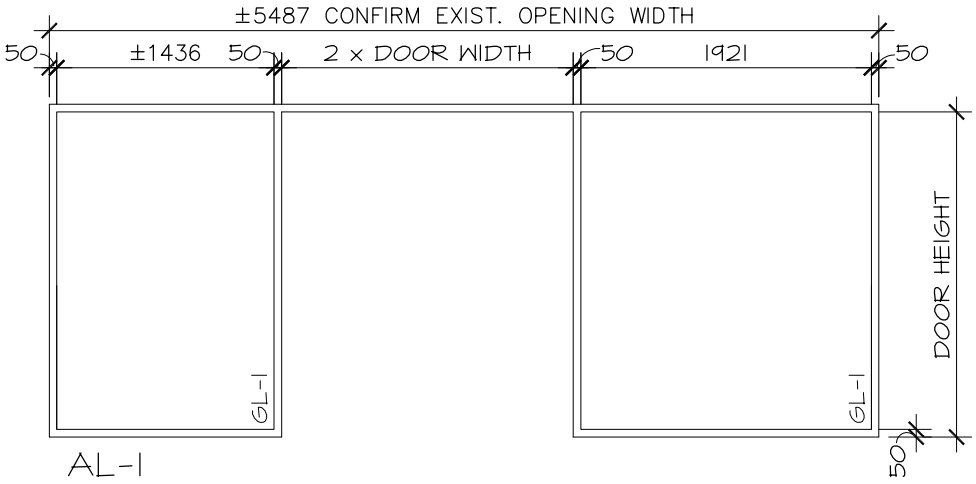


PSF-6 (WINDOW)



PSF-7 (WINDOW)

ALUMINUM FRAME TYPE



AL-1

HOBIN ARCHITECTURE

PROJECT / LOCATION:
WOODVALE PENTECOSTAL CHURCH RENOVATION
205 Greenbank Rd, Nepean, ON K2H 8K9

Hobin Architecture Incorporated
63 Pamilla Street T: 613-238-7200
Ottawa, ON K1S 3K7 F: 613-235-2005
hobinarc.com E: mail@hobinarc.com

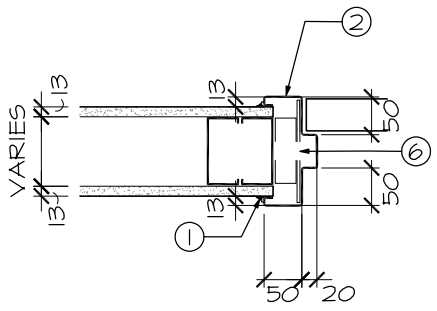
DRAWING NAME: DOOR FRAME TYPES

Issued for 70% Progress

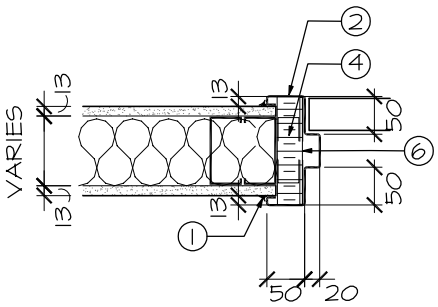
DATE:	DRAWN BY:	SCALE:
Nov 12, 2021	JG	N.T.S.

PROJECT NO.:	ASK NO.
1939	08 00 00.04

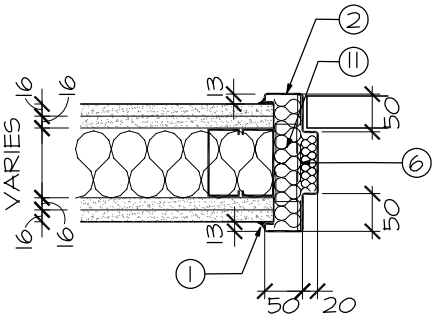
JAMB DETAILS



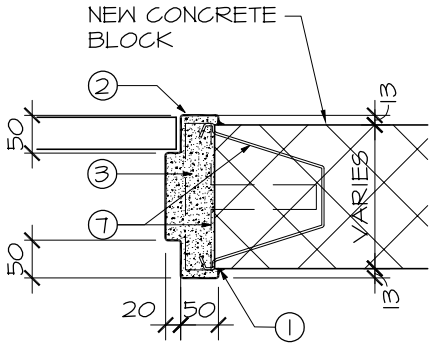
DETAIL D1



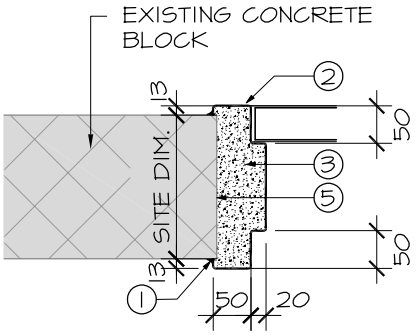
DETAIL D2



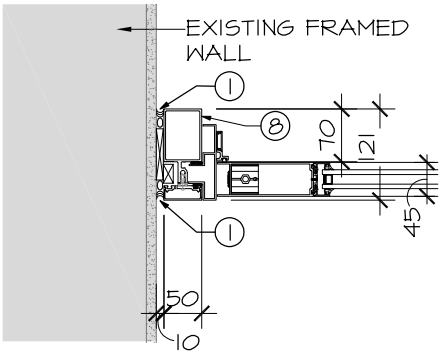
DETAIL D3



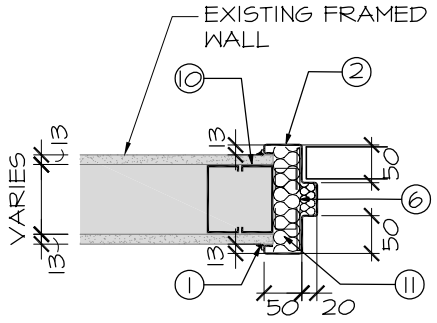
DETAIL D4



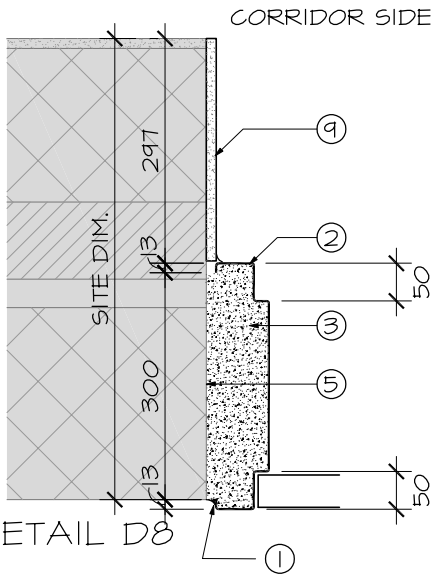
DETAIL D5



DETAIL D6



DETAIL D7



DETAIL D8

LEGEND

1. CAULKING BOTH SIDES OF FRAME TO WALL SURFACE
2. PRESSED STEEL DOOR FRAME TO PROFILE INDICATED
3. FILL DOOR FRAME SOLID WITH GROUT
4. FILL DOOR FRAME SOLID WITH SEMI-RIGID INSULATION
5. MASONRY TUBE & SCREW ANCHOR (AT EXIST. MASONRY WALL LOCATIONS)
6. METAL STUD STRAP ANCHOR
7. MASONRY WIRE ANCHOR OR STRAP ANCHOR (AT NEW MASONRY WALL LOCATIONS)
8. PRE-FINISHED ALUMINUM DOOR FRAME TO PROFILE INDICATED
9. NEW DRYWALL RETURN TO OPENING JAMB AND HEAD
10. NEW STEEL STUD FRAME SUPPORT FOR NEW DOOR
11. FILL FRAME WITH BATT INSULATION IN INSULATED AND FIRE RATED WALLS

HOBIN ARCHITECTURE

PROJECT / LOCATION:
WOODVALE PENTECOSTAL CHURCH RENOVATION
205 Greenbank Rd, Nepean, ON K2H 8K9

Hobin Architecture Incorporated
63 Pamilla Street T: 613-238-7200
Ottawa, ON K1S 3K7 F: 613-235-2005
hobinarc.com E: mail@hobinarc.com

DRAWING NAME: JAMB DETAILS

Issued For 70% Progress

DATE:	DRAWN BY:	SCALE:
Nov 12, 2021	JG	N.T.S.

PROJECT NO.:	ASK NO.
1939	08 00 00.05

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 04 05 00 - Common Work Results for Masonry
.2 Section 06 10 00 – Rough Carpentry
.3 Section 07 92 00 - Joint Sealants
.3 Section 08 14 16 - Flush Wood Doors
.4 Section 08 71 00 - Door Hardware
.5 Section 08 80 50 - Glazing
.6 Section 09 22 16 - Non-Structural Metal Framing
.7 Section 09 91 13 - Exterior Painting
.8 Section 09 91 23 - Interior Painting

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)
.1 ASTM A 653/A 653M-06a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
.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 80-99, Standard for Fire Doors and Fire Windows.
.2 NFPA 252-03, Standard Methods of Fire Tests of Door Assemblies.

.6 Underwriters' Laboratories of Canada (ULC)
.1 CAN/ULC-S701-01, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
.2 CAN/ULC-S704-03, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
.3 CAN4-S104-M80, Standard Method for Fire Tests of Door Assemblies.

.4 CAN4-S105-M85, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

.7 ANSI/SDI A250.8, SDI 111A, and SDI 112.

1.3 SYSTEM DESCRIPTION

.1 Design Requirements:
.1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35 degrees C to 35 degrees C.
.2 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 E 152 or NFPA 252 and listed by nationally recognized agency having factory inspection services.

1.4 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 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
.2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed louvred, arrangement of hardware and fire rating and finishes.
.3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and reinforcing fire rating finishes.
.4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
.5 Submit test and engineering data, and installation instructions.

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 and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Hot dipped galvanized steel sheet: to ASTM A 653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.
.1 Recycled Content: 30 % post-consumer content, 0 % pre-consumer content.

.2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A 653M, ZF75.
.1 Recycled Content: 30 % post-consumer content, 0 % pre-consumer content.

2.2 DOOR CORE MATERIALS

.1 Stiffened: face sheets, insulated core.
.1 Recycled Content: 15 % post-consumer content, 0 % pre-consumer content.
.2 Fibreglass: to CAN/ULC-S702, semi-rigid Type 1 density 24 kg/m³.
.3 Polyurethane: to CAN/ULC-S704 rigid, modified poly/isocyanurate, closed cell board. Density 32 kg/m³.

.2 Honeycomb construction: Structural small cell 24.5mm maximum kraft paper ‘ honeycomb’. Weight: 36.3 kg per ream minimum. Density 16.5 kg/m3 minimum sanded to required thickness.

2.3 ADHESIVES

.1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.

.2 Polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.

.3 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.4 PRIMER

.1 Touch-up prime CAN/CGSB-1.181.
.1 Maximum VOC limit 50 g/L to GC-03.

2.5 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.
.1 Maximum VOC emission level 50 g/L to GS-11.

2.6 ACCESSORIES

.1 Door silencers: single stud rubber/neoprene type.

.2 Exterior top and bottom caps: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.

.3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.

.4 Door bottom seal: Refer to Hardware Schedule.

.5 Metallic paste filler: to manufacturer's standard.

.6 Fire labels: metal riveted.

.7 Sealant: Refer to Section 07 92 00.
.1 Maximum VOC limit 250 g/L.

.8 Glazing: Refer to Door Schedule and Section 08 80 50

.9 Make provisions for glazing as indicated and provide necessary glazing stops.
.1 Provide removable stainless steel glazing beads for use with glazing tapes and compounds and secured with countersunk stainless steel screws.
.2 Design exterior glazing stops to be tamperproof.

2.7 FRAMES
FABRICATION GENERAL

.1 Fabricate frames in accordance with CSDMA specifications.

.2 Fabricate frames to profiles and maximum face sizes as indicated.

.3 Exterior frames: 1.6 mm welded type construction.

.4 Interior frames: 1.6 mm welded type construction.

.5 Blank, reinforce, drill and tap frames for mortised, templated hardware, and 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.

.12 Spreader Bar: Removable at sill.

2.8 FRAME ANCHORAGE

.1 Provide appropriate anchorage to floor and wall construction without distortion or stress.

.2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.

.3 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.

.4 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm on centre maximum.

2.9 FRAMES: WELDED TYPE

.1 Welding in accordance with CSA W59.

.2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.

.3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.

.4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.

.5 Securely attach floor anchors to inside of each jamb profile.

.6 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.

2.10 DOOR FABRICATION GENERAL

.1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.

.2 Interior and Exterior doors: Insulated hollow steel stiffened construction.
- .1 Exterior polyurethane insulation
- .2 Interior fibreglass insulation

.3 Fabricate doors with longitudinal edges locked seam fill with metallic paste filler and sand to a uniform smooth finish.

.4 Blank, reinforce, drill doors and tap for mortised, templated hardware and 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 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 E 152 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.

.10 Ensure door sizes are fabricated so bottoms clear floor finish but do not exceed ULC Standards. Coordinate with finished floor materials listed in Division 09 and Room Finish Schedule.

2.11 HOLLOW STEEL CONSTRUCTION

.1 Form face sheets for exterior doors from 1.6 mm (16ga) sheet steel.

.2 Form face sheets for interior doors from 1.6 mm (16ga) sheet steel.

.3 Reinforce exterior doors with vertical stiffeners, securely welded to face sheets at 150 mm on centre maximum.

.4 Fill voids between stiffeners of exterior doors with polyurethane core.

.5 Fill voids between stiffeners of interior doors with fibreglass core.

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. Frame installation tolerances to comply with Canadian Steel Door manufacturer’s Association Standard as indicated on Drawings 08 11 00-1, 2, 3 & 4 included as part of this section.

.2 Secure anchorages and connections to adjacent construction.

.3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.

.4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.

.5 Caulk perimeter of frames between frame and adjacent material.

.6 Maintain continuity of air barrier and vapour retarder.

3.4 DOOR INSTALLATION

.1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 - Door Hardware.

.2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.

.1 Hinge side: 3.3 mm.
.2 Latchside and head: 3.3 mm.
.3 Finished floor, and thresholds: 19 mm.

Door clearance tolerances to comply with Canadian Steel Door manufacturer’s Association Standard as indicated on Drawings

08 11 00-1, 2, 3 & 4 included as part of this section.

.3 Adjust operable parts for correct function.

.4 Install louvers where indicated.

3.5 FINISH REPAIRS

.1 Touch up with primer finishes damaged during installation.

.2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

3.6 GLAZING

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

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 05 50 00 - Metal Fabrications.
.2 Section 06 10 00 - Rough Carpentry.
.3 Section 07 27 00 - Air Barriers
.4 Section 07 92 00 - Joint Sealing.
.5 Section 08 44 13 - Glazed Aluminum Curtain Wall
.6 Section 08 50 00 - Windows
.7 Section 08 71 00 - Door Hardware - General.
.8 Section 08 80 50 - Glazing
.9 Division 26 - Electrical – connections for security systems and sensors, outlet boxes, conduit boxes and fittings

1.2 REFERENCES

.1 Aluminum Association (AA).
.1 DAF 45-03, Designation System for Aluminum Finishes.

.2 American Architectural Manufacturers Association (AAMA).
.1 AAMA 609/610-09, Cleaning and Maintenance of Architectural Anodized Aluminum.

.3 American Society for Testing and Materials International, (ASTM).
.1 ASTM E 330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

.4 Canadian General Standards Board (CGSB).
.1 CGSB 1.40-97, Primer, Structural Steel, Oil Alkyd Type.
.2 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
.3 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.

.5 Canadian Standards Association (CSA International).
.1 CAN/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.

1.3 SYSTEM DESCRIPTION

.1 Design Criteria.
.1 Design frames and doors in exterior walls to:
.1 Accommodate expansion and contraction within service temperature range of -35 to 75 degrees C.
.2 Limit deflection of mullions to maximum 1/175th of clear span when tested to ASTM E 330 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 Design door system to provide average thermal resistance of:
.1 Door system (excluding vision glass areas): RSI of 3.8.

.4 Provide continuous air barrier and vapour retarder through door system. Primarily in line with inside pane of glass and heel bead of glazing compound.

1.4 SUBMITTALS

.1 Product Data:
.1 Submit manufacturer's printed product literature, specifications and data sheets in accordance with Section 01 33 00 - Submittal Procedures.
.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's for caulking materials during application and curing.

1.5 SHOP DRAWINGS

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

.2 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 hardware and required clearances.

.3 Submit catalogue details for each type of door and frame illustrating profiles, dimensions and methods of assembly.

1.6 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for cleaning and maintenance of aluminum finishes for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.7 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 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.8 DELIVERY, STORAGE, AND HANDLING

.1 Storage and Protection:
.1 Apply temporary protective coating to finished surfaces. Remove coating after erection. Do not use coatings that will become hard to remove or leave residue.
.2 Leave protective covering in place until final cleaning of building.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials 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 Dispose of corrugated cardboard, polystyrene, plastic packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

.4 Divert used metal cut-offs from landfill by disposal into the on-site metals recycling bin.

1.10 WARRANTY

.1 The warranty period stated in General Conditions and relevant supplementary conditions is with respect to this section of work extended from one (1) year to three (3) years. Provide a written guarantee.

.2 Warrant that aluminium finishes will not develop excessive fading, non-uniformity of colour and will not crack, peel, delaminate or otherwise corrode and that hardware fastening points will not wear excessively allowing hardware to work loose.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Aluminum extrusions: Aluminum Association alloy AA 6063-T5 or T6 anodizing quality.

.2 Sheet aluminum: Aluminum Association alloy AA 1100 - H14 or AA 5005 - H32 or H34 anodizing quality.

.3 Steel reinforcement: to CAN/CSA-G40.20/G40.21, grade 300 W.

.4 Fasteners: 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, surface mounted with drip cap, closed ends.

.8 Isolation coating: alkali resistant bituminous paint.

.9 Glazing materials: as per Section 08 80 50.

.10 Sealants: as per Section 07 92 00 colour selected by Consultant.

.11 Plastic shims: Glazelock Shims, High impact polystyrene horseshoe shaped purpose made glazing shims. (wood shims are NOT PERMITTED on this project.)

.12 Aluminum cladding: Provide sample of corner closure pieces, caps, transom panels, louvers etc. for review and approval.

2.2 ALUMINUM SWING DOORS

.1 Construct doors of porthole extrusions with minimum wall thickness of 2.4 mm.

.2 Door stiles nominal 127 mm wide plus or minus 6 mm.

.3 Top rail nominal 127 mm wide plus or minus 6 mm.

.4 Bottom rail nominal 165 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 Provide thermally broken doors for exterior.

.8 Hardware: as per Hardware Schedule.

.9 Door swing: See Drawings.

.10 Acceptable Manufacturers:
- .1 Kawneer
- .3 Alumico
- .4 Prevost
- .5 Alumicor

2.3 EXTERIOR ALUMINUM FRAMES

.1 Exterior framing to be Curtainwall Framing as per Section 08 44 13

2.4 ALUMINUM FINISHES

.1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.

.2 Exterior surface finish to be anodized aluminum **Dark Bronze**, Architectural Class I (.7mils), AA-M10C21A44 / AA-M45C22A44.

.3 Interior surface finish to be anodized aluminum **Dark Bronze**, Architectural Class I (.7mils), AA-M10C21A44 / AA-M45C22A44.

.4 Exterior of exposed infill panel, trim surfaces and sill flashings: to match adjacent finish.

2.5 STEEL FINISHES

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

2.6 FABRICATION

.1 Doors and framing to be by same manufacturer.

.2 Fabricate doors and frames to profiles and maximum face sizes as shown. 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 - General.

.7 Isolate aluminum from direct contact with dissimilar metals, concrete and masonry.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION

.1 Set frames plumb, square, level at correct elevation in alignment with adjacent work.

.2 Anchor securely.

.3 Install doors and hardware in accordance with hardware templates and manufacturer's instructions.

.4 Adjust operable parts for correct function.

.5 Make allowances for deflection of structure to ensure that structural loads are not transmitted to frames.

3.3 GLAZING

.1 Glaze aluminum doors and frames in accordance with Section 08 80 50 - Glazing.

3.4 CAULKING

.1 Seal joints to provide weather tight seal at outside and air, vapour seal at inside.

.2 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.

3.5 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 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.
.3 Upon completion of Work, after cleaning is carried out.

.4 Obtain reports within three days of review and submit.

3.6 CLEANING

.1 Perform cleaning of aluminum components in accordance with AAMA 609.1 - Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminum.

.2 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.

.3 Clean aluminum with damp rag and approved non-abrasive cleaner.

.4 Remove traces of primer, caulking, epoxy and filler materials; clean doors and frames.

.5 Clean glass and glazing materials with approved non-abrasive cleaner.

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

3.7 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 SECTION INCLUDES

.1 The work of this Section includes but is not limited to all materials, labour, equipment and tools required to supply and install complete glazed aluminum curtain wall systems as indicated and detailed on the Contract documents.

.2 Curtain wall assembly of aluminum extrusions, glass and glazing, glass spandrel panels, aluminum spandrel panels within curtain wall framing, associated wall aluminum trims, air vapour barrier seals to building membrane, and attachments to building structure.

.3 Weather sealing of glazing systems specified under this Section. Work includes air vapour barrier membrane supply and installation at perimeter of curtain wall, spray foam insulation at perimeter of curtain wall assemblies, perimeter caulking at the interior face of all curtain wall assemblies.

.4 Curtain wall assemblies supply and installation includes galvanized steel air-vapour barrier pans, insulation, spandrel glass and spandrel aluminum panels, and sealants.

.5 Exterior and interior aluminum sills, trims and panels c/w end dam flashings and underlayment membrane.

.6 Work to be performed by this Contract specified in other Sections includes all labour, materials, equipment and tools required to provide a complete project for the following scope of work as indicated on the Contract Documents.

.1 Aluminum doors.
.2 Aluminum windows
.3 Glazing

1.2 RELATED SECTIONS

.1 Section 07 21 29 – Spray Foam Insulation
.2 Section 07 27 00 - Air Barriers.
.3 Section 07 84 00 - Firestopping: Firestopping between floor edge and curtain wall system.
.4 Section 07 92 00 - Joint Sealants: System perimeter sealant and back-up materials.
.5 Section 08 11 16 - Aluminum Doors and Frames: Entrance doors, frames, and glazed lights.
.6 Section 08 50 00 – Aluminum Windows
.7 Section 08 80 50 - Glazing.
.8 Section 09 91 23 - Interior Painting: Field painting of interior surface of infill panel and surfaces.

1.3 REFERENCES

.1 Aluminum Association Designation System For Aluminum Finishes (AA)-1997.
.1 DAF 45 2003(R2009), Designation System For Aluminum Finishes.

.2 American Architectural Manufacturers Association (AAMA).
.1 AAMA CW-DG-1-96, Aluminum Curtain Wall Design Guide Manual.
.2 AAMA CW-10-04, Care and Handling of Architectural Aluminum From Shop to Site.
.3 AAMA CW-11-85, Design Wind Loads for Buildings and Boundary Layer Wind Tunnel Testing.
.4 AAMA T1R-A1-04, Sound Control for Fenestration Products.
.5 AAMA 501-05, Methods of Test for Exterior Walls.
.6 AAMA 611-98, Voluntary Specifications for Anodized Finishes Architectural Aluminum.
.7 AAMA 612-02, Voluntary Specifications, Performance Requirements, and Test Procedures for Combined Coatings of Anode Oxide and Transparent Organic Coatings on Architectural Aluminum.
.8 AAMA 2603-02, Voluntary Specification Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
.9 AAMA 2604-05, Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.

.3 American Society for Testing and Materials International, (ASTM).
.1 ASTM A 36/A 36M-08, Specification for Carbon Structural Steel.
.2 ASTM A 123/A 123M-09, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
.3 ASTM A 167-99(2009), Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
.4 ASTM A 653/A 653M-09a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
.5 ASTM B 209-07, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
.6 ASTM B 221-08, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
.7 ASTM E 283-91-04, Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
.8 ASTM E 330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain

Walls, by Uniform Static Air Pressure Difference.
.9 ASTM E 331-00(R2009), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.
.10 ASTM E 413-04, Classification for Rating Sound Insulation.
.11 ASTM E 1105-00(2008), Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.

.4 Canadian General Standards Board (CGSB).
.1 CAN/CGSB 1.108-M89, Bituminous Solvent Type Paint.
.2 CAN/CGSB-12.20-[M89], Structural Design of Glass for Buildings.

.5 Canadian Standards Association (CSA International).
.1 CSA-G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels.
.2 CSA-S136-07, North American Specification for the Design of Cold-Formed Steel Structural Members.
.3 CAN3-S157/S157.1-05, Strength Design in Aluminum.
.4 CSA W59.2-M1991(R2008), Welded Aluminum Construction.
.5 CSA-A440-00/A440.1-00(R2005), A440-00, Windows / Special Publication A440.1-00, User Selection Guide to CSA Standard A440-00, Windows.

.6 Environmental Choice Program (ECP).
.1 CCD-45-95(R2005), Sealants and Caulking Compounds.
.2 CCD-47-98(R2005), Surface Coatings.
.3 CCD-48-98(R2006), Recycled Water-Borne Surface Coatings.

.7 Society for Protective Coatings (SSPC).
.1 SSPC - Paint 20 Zinc Rich Coating.
.2 SSPC - Paint 25 Alkyd, Zinc Oxide Linseed Oil and Primer for Use Over Hand Cleaned Steel Type 1 and Type 2.

1.4 SYSTEM DESCRIPTION

.1 Aluminum curtain wall system includes thermally broken tubular aluminum sections with self supporting framing, shop fabricated, factory prefinished horizontal and vertical pressure plates and caps, vision glass, insulated glass spandrel infill, related flashings, trims and anchorage and attachment devices.

.2 Assembled system to permit re-glazing of individual glass (and

infill panel) units from exterior without requiring removal of structural mullion sections.

1.5 PERFORMANCE REQUIREMENTS

.1 Design and size components to withstand dead and live loads caused by pressure and suction of wind, acting normal to plane of system as calculated in accordance with NBC to a design pressure of 1.0 kPa as measured in accordance with AAMA CW 11 and ASTM E 330.

.2 Design and size components to withstand seismic loads and sway displacement as calculated in accordance with OBC.

.3 Limit mullion deflection to L/175; with full recovery of glazing materials.

.4 Size glass units and glass dimensions to limits established in CAN/CGSB-12.20.

.5 Provide system to accommodate, without damage to components or deterioration of seals:

.1 Movement within system.
.2 Movement between system and perimeter framing components.
.3 Dynamic loading and release of loads.
.4 Deflection of structural support framing.
.5 Shortening of building concrete structural columns.
.6 Creep of concrete structural members.
.7 A mid-span slab edge deflection of 15mm.

.6 Thermal performance of Glazed Aluminum Curtain Wall USI value of 2.38 W/(sq.m K). The manufacturers shall submit WINDOW and THERM analysis for the actual curtain wall system proposed (i.e. not just standard ASTM test sizes).

.7 Limit air infiltration through assembly to 0.0003 m^3 /s/m^2 of wall area, measured at a reference differential pressure across assembly of 75 Pa as measured in accordance with AAMA 501 and ASTM E 283.

.8 Vapour seal with interior atmospheric pressure of 25 mm sp, 22 degrees C, 40% RH: No failure.

.9 Water leakage: none, when measured in accordance with AAMA 501 and ASTM E 331.

.10 System to provide for expansion and contraction within system components caused by a cycling temperature range of 95 degrees C over a 12 hour period without causing detrimental affect to system components.

.11 Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network. "Rain Screen" curtain wall design.

.12 Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound. Position thermal insulation on exterior surface of air barrier and vapour retarder.

.13 Ensure no vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system occur.

.14 Design all fixed curtain wall framing that extend to less than 1m from the floor to withstand the lateral design loads for balcony guards in Part 4 of the Ontario Building Code. Curtain wall shall be designed to comply with Article 4.1.5.14 of the O.B.C.

1.6 PRODUCT DATA

.1 Submit WHMIS MSDS - Material Safety Data Sheets for all sealants and primers/paints applied on site indicating VOC limits.

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

.3 Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details and water flow diagrams.

1.7 SHOP DRAWINGS

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

.2 Indicate system dimensions, framed opening requirements and tolerances, adjacent construction, anchor details anticipated deflection under load, affected related Work, weep drainage network, expansion and contraction joint location and details, and field welding required.

.3 Clearly indicate materials and large scale details for head, jamb and sill, profiles of components, elevations of unit, anchorage details, location of isolation coating, description of related components and exposed finished and fasteners.

.4 Indicate connections of curtainwall to structural components of

building. Connections to be designed and shop drawings to be stamped by a professional engineer in the Province of Ontario.

.5 Prior to substantial completion, the engineer who stamped the shop drawings shall submit a stamped letter confirming that the curtainwall has been installed as per the approved shop drawings.

1.8 SAMPLES

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

.2 Submit two samples 300 x 300 mm in size illustrating prefinished aluminum surface, finish, colour, texture, specified glass units, insulated infill panels, glazing materials illustrating edge and corner.

1.9 DESIGN DATA

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

.2 Provide framing member structural and physical characteristics, calculations, dimensional limitations, special installation requirements.

1.10 TEST REPORTS

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

.2 Submit substantiating engineering data, test results of previous tests by independent laboratory which purport to meet performance criteria, and supportive data.

.3 Submit test reports from approved independent testing agency certifying compliance with specification requirements for CSA A440.

- .1 Air tightness
- .2 Water tightness
- .3 Wind load resistance
- .4 Condensation resistance
- .5 Forced entry
- .6 Insect screens
- .7 Glazing

1.11 MOCK-UP

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

.2 Provide one typical curtain wall unit mock-up including all

framing vision glass light, and insulated infill panel. Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.

.3 Locate where directed.

.4 Allow 24 hours for inspection of mock-up by Consultant before proceeding with work.

.5 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

1.12 PRE-INSTALLATION MEETING

.1 Convene two weeks before starting work of this section.

1.13 DELIVERY, STORAGE, AND HANDLING

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

.2 Handle work of this section in accordance with AAMA CW-10.

.3 Protect prefinished aluminum surfaces with wrapping . Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.14 ENVIRONMENTAL REQUIREMENTS

.1 Do not install sealants when ambient and surface temperature is less than 5 degrees C.

.2 Maintain this minimum temperature during and after installation of sealants.

1.15 SEQUENCING

.1 Coordinate work of this section with installation of fire stopping, air barrier placement and flashing placement.

1.16 WARRANTY

.1 Provide warranty in accordance with General Conditions (GC) GC12.3 but for a period of five (5) years.

.2 Warranty shall specifically guarantee against leakage, defects and malfunction under normal usage. Warrant against defects in material and labour of the work of this Section. Warrant that the glazed aluminum curtain wall system will remain structurally sound, free from distortion and deformation under load and and

that glazing splines and sealants will be free from deterioration from sunlight, weather and oxidation.

1.17 WASTE MANAGEMENT AND DISPOSAL

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

.2 Dispose of corrugated cardboard polystyrene plastic packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

1.18 POST INSTALLATION CERTIFICATION

.1 After installation, submit written certification, signed by the structural engineer responsible for the design indicated on the shop drawings, that all items have been installed in accordance with the stamped shop drawings.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Materials and resources in accordance with CSA A440.

.2 Extruded aluminum: ASTM B 221 Aluminum Association Alloy AA6063-T5

.3 Sheet aluminum: ASTM B 209 break formed aluminum sheet interior 2mm thick and exterior 3mm thick.

.4 Sheet steel: CSA-S136M ASTM A 653/A 653M; galvanized in accordance with CAN/CSA G164.

.5 Steel sections: CSA-G40.20/G40.21M Grade 300W; shaped to suit mullion sections.

.6 Anchors: 3-way adjustable hot-dip galvanized cast iron.

.7 Fasteners: stainless steel or cadmium plated, corrosion resistant steel of adequate strength for the purpose.

.8 Bituminous paint: CAN/CGSB 1.108, Type 1, without thinner.

.9 Glazing:
.1 Refer to Section 08 80 50.

.10 Fire Safety Materials - See Section 07 84 00 - Firestopping.

.11 Sealant: as per Section 07 92 00

.12 Backpans: 24ga., galvanized steel.

.13 Insulation: Mineral fiber block and board insulation to ASTM C612, Type IVB, thickness minimum 75mm thick, RSI 0.74/25.4 mm c/w insulation clips and self locking washers.

.14 Air Vapour Barrier Perimeter Seal: in accordance with Section 07 27 00.

.15 Heavy duty black aluminum insect screens complete with aluminum frames for all operable windows.

.16 Spray Foam Insulation: CF 812 by Hilti

2.2 COMPONENTS

.1 Mullion profile:

.1 Vertical members: 63 x 101 mm nominal dimension back section tubes.

.2 Horizontal members: 63 x 101 mm nominal dimension back section tubes.

.3 Thermally broken with interior tubular section insulated from exterior pressure plate.

.4 Matching stops and pressure plate of sufficient size and strength to provide adequate bite on glass and infill panels. 19mm on horizontal and vertical mullions typical for all location except as noted below and indicated on drawings.

.5 Drainage holes, deflector plates and internal flashings to accommodate internal weep drainage system.

.6 Internal mullion baffles to eliminate "stack effect" air movement within internal spaces. Spray foam where indicated.

.7 Acceptable manufactuers

- .1 Kawneer
- .2 Alumico
- .3 Prevost
- .4 Alumicor
- .5 Oldcastle
- .6 Lessard

All manufacturers must confirm proposed systems comply with project specifications and System Classification performance requirements listed under 1.5 of this section.

.2 Reinforced mullion: internal reinforcement of shaped steel structural section as required to meet load requirements.

.3 Infill panel: internally reinforced, glazing edge sealed unsealed

permitting internal air movement to glazing space, outside air barrier line , structurally sufficient to support wall panel
.1 Outer face: SP1 or 3mm aluminum panels as indicated.
.2 Core: Mineral wool fibre insulation, RSI of 0.74/25.4mm, total RSI value of 2.59, Roxul CurtainRock
.3 Inner face: galvanized steel formed pan.

.4 Flashings: 2 mm thick aluminum, finish to match curtain wall mullion sections where exposed, secured with concealed fastening method.

.5 Air barrier: specified in Section 07 27 00 - Air Barriers.

2.3 FABRICATION

.1 Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

.2 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof

.3 Prepare components to receive anchor devices. Install anchors.

.4 Arrange fasteners and attachments to ensure concealment from view.

.5 Prepare system components to receive exterior doors, specified in Section 08 11 16 and hardware specified in Section 08 71 00.

.6 Reinforce framing members for external imposed loads to suit spans and window layout as indicated.

.7 Visible manufacturer's identification labels not permitted.

2.4 FABRICATION: INFILL PANELS

.1 Fabricate infill panels with metal covered edge seals around perimeter of panel assembly, enabling installation and minor movement of perimeter seal.

.2 Reinforce interior surface of exterior panel sheet from deflection caused by wind and suction loads.

.3 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

.4 Place insulation within panel, adhered to exterior face of interior panel sheet over entire area of sheet with impale fasteners.

.5 Ventilate and pressure equalize the air space outside the exterior surface of the insulation, to the exterior.

.6 Arrange fasteners and attachments to ensure concealment from view.

2.5 FINISHES

.1 Finish coatings: conform to AA designations.

.2 Exposed aluminum surfaces for all curtain wall framing to be :

.1 Exterior surface finish to be anodized aluminum **Dark Bronze**, Architectural Class I (.7mils), AA-M10C21A44 / AA-M45C22A44.

.2 Interior surface finish to be anodized aluminum **Dark Bronze**, Architectural Class I (.7mils), AA-M10C21A44 / AA-M45C22A44.

.3 Exterior of exposed infill panel and trim surfaces: to match specified curtainwall frame finish.

.4 Shop and touch-up primer for steel components: SSPC 25 Paint red oxide.

.5 Touch-up primer for galvanized steel surfaces: SSPC 20 Paint zinc rich.

.6 Concealed steel items: galvanized in accordance with CAN/CSA-G164M ASTM A 123 to 600 gm/m².

.7 Apply two coats of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

2.6 SOURCE QUALITY CONTROL

.1 Perform work in accordance with AAMA GSM-1 AAMA CW-I-9. Maintain one copy on site.

.2 Manufacturer qualifications: company specializing in manufacturing the products specified in this section with minimum 5 years documented experience.

.3 Installer qualifications: company specializing in performing the work of this section with minimum 5 years documented experience approved by manufacturer.

.4 Design structural support framing components to CAN3 S157 under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the Province

of Ontario.

.5 Perform welding Work in accordance with CSA W59.2.

2.7 SYSTEM CLASSIFICATION

.1 To CSA A440 classifications as follows:
- .1 Air tightness: A3
- .2 Water tightness: B7
- .3 Wind load resistance: C5
- .4 Condensation Resistance Temperature Index: 168.
- .5 Forced Entry: F2
- .6 Insect Screens: S2
- .7 Thermal performance of Glazed Aluminum Curtain Wall USI value of 2.38 W/(sq.m. K). The manufacturers shall submit WINDOW and THERM analysis for the actual curtain wall system proposed (ie. Not just standard ASTM test sizes).

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verify dimensions, tolerances, and method of attachment with other work.

.2 Verify wall openings and adjoining air barrier and air vapour materials are ready to receive work of this section.

3.2 INSTALLATION

.1 Install curtain wall system in accordance with manufacturer's instructions.

.2 Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

.3 Provide alignment attachments and shims to permanently fasten system to building structure. Clean weld surfaces; apply protective primer to field welds and adjacent surfaces.

.4 Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and align with adjacent work.

.5 Provide thermal isolation where components penetrate or disrupt building insulation.

.6 Install sill flashings complete with under sill membrane specified in Section 07 27 00 and end dams to sills.

.7 Coordinate installation of fire stop insulation, specified in Section 08 84 00, at each floor slab edge.

.8 Install operating sash in accordance with manufacturer's instructions.

.9 Install glass and infill panels in accordance with Section 08 80 50 - Glazing, to glazing method required to achieve performance criteria exterior method of glazing. Place sealant on the up-slope side of the pressure plate cover caps; finish the surface with a slope to encourage drainage over the cap Cover caps to conceal screws and provide continuous sightline.

.10 Install perimeter sealant to method required to achieve performance criteria. Sealant, backing materials, and installation criteria in accordance with Section 07 92 00 - Joint Sealant.

3.3 SITE TOLERANCES

.1 Maximum variation from plumb: 1.5 mm/m non-cumulative or 12 mm/30 m, whichever is less.

.2 Maximum misalignment of two adjoining members abutting in plane: 0.8 mm.

.3 Maximum sealant space between curtain wall and adjacent construction: 13 mm.

3.4 PERIMETER SEALING

.1 Provide and install continuous strip of air barrier membrane as per Section 07 27 00 to all perimeter frames. Provide sufficient material to allow minimum 150mm lap onto wall membrane.

.2 Air barrier membrane to be sealed into glazing spline of perimeter frames and securely adhered.

.3 All perimeter frames shall have shim space sealed with spray applied polyurethane insulation. Install in multiple passes to ensure application full depth of shim space.

3.5 MANUFACTURER'S FIELD SERVICES

.1 Curtain wall product manufacturers to provide field surveillance of installation of their Products.

.2 Monitor and report installation procedures, unacceptable conditions and submit reports at inspections performed at 25%, 60% and 100% stages of installation.

3.6 CLEANING

.1 Remove protective material from prefinished aluminum surfaces.

.2 Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

.3 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

3.7 PROTECTION

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

.2 Repair damage to adjacent materials caused by installations of this Section.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 The work of this Section includes all labour, materials, equipment and tools required to provide a complete project for the following scope of work as indicated on the Contract Documents:

.1 All exterior punched window framing.

.2 All exterior and interior glazing, including sealed thermal units, spandrel glass, interior door and window glazing.

.3 Weather sealing of glazing systems specified in this Section. Work includes air vapour barrier membrane supply and installation at perimeter of window assemblies, spray foam insulation at perimeter of window assemblies, perimeter caulking at the interior face of all window assemblies.

.4 Exterior aluminum and glass spandrel panels.

.5 Exterior and interior aluminum sills, trims and panels.

.6 Window operators complete with all hardware including integral restrictors and screens. Awning as indicated.

2. Work to be performed by this Contract specified in other Sections includes all labour, materials, equipment and tools required to provide a complete project for the following scope of work as indicated on the Contract Documents.

.1 Aluminum doors c/w thresholds, and hardware as indicated.

.2 Curtain wall framing.

.3 Glazing.

1.2 RELATED SECTIONS

.1 Section 07 92 00 - Joint Sealing: caulking of joints between frames and other building components.
.2 Section 07 27 00 - Air barriers - Performance
.3 Section 08 11 16 - Aluminum Doors and Frames
.4 Section 08 44 13 - Glazed Aluminum Curtain Walls
.5 Section 08 80 50 - Glazing

1.3 REFERENCES

.1 Aluminum Association (AA),

.1 AA DAF 45-[03(R2009)], Designation System for Aluminum Finishes.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.40-97, Anticorrosive Structural Steel Alkyd Primer.

.2 CAN/CGSB-79.1-M91, Insect Screens.

.3 Canadian Standards Association (CSA) International
.1 CSA-A440-00/A440.1-00(R2005), A440-00, Windows / Special Publication A440.1-00, User Selection Guide to CSA Standard A440-00, Windows.
.2 CAN/CSA-Z91-02(R2008), Health and Safety Code for Suspended Equipment Operations.

1.4 QUALIFICATIONS

.1 The work of this section shall be designed, fabricated and erected by a company with at least five years experience with projects of similar size and nature and with adequate plant equipment and skilled tradesman.

1.5 DESIGN CRITERIA

.1 Windows: Conform to CSA-A440-00 including Appendix A.
.1 Accommodate thermal movement of component materials within service temperature range of -35 to +75 degrees Celsius without causing buckling, failure of joint seals, undue stress on fasteners, or other detrimental effects.

.2 Design connection details to accommodate movement in window system, and to accommodate movement between window system and building structure, caused by structural movements, without permanent distortion, damage, racking, breakage of seals, or water penetrations.

.3 Provide for positive drainage of condensation occurring within wall construction and water entering at joints, to exterior face of wall in accordance with NRC "Rain Screen Principles" including:
.1 Provide pressure equalized cavity efficiently sealed to effectively deter penetration of water into the system.
.2 Make adequate provision to drain to the exterior any water or water vapour infiltration, exfiltration and to maintain the pressure equalized cavity.
.3 Provide adequate gasket and other seals for efficient control of air and vapour infiltration, exfiltration and maintenance of the pressure equalized cavity.

.4 Design members to withstand dead load, earthquake and other live loads as calculated in accordance with Ontario Building Code to max. allowable deflection of 1/200 of clear span of 20mm, whichever is the lesser. Minimum acceptable wind load; 1.00 kPa.

.5 Limit deflection of any member, in direction parallel to wall plane, when member carries its full design load, not to exceed 75% of design clearance dimension between that member and panel, glass or any part immediately below it.

.6 Limit air infiltration and exfiltration to maximum 0.18 litres/sec. per m2 of glazing when tested to ASTM E283, at 75Pa pressure differential.

.7 Exclude water penetration when tested to ASTM E331, at 0.72Pa pressure differential.

.8 Provide thermal break for calculated temperature differential of 100 degrees Celsius when tested to CGSB 63-GP-12M.

.9 Condensation: Nil at -25 degrees Celsius externally and +20 degrees Celsius internally with R.H. of 25% and nil before any of the exposed area of insulated glass reaches the dew point.

.10 Conform to CSA-A440-00 except as otherwise called for.

.11 Design all fixed windows that extend to less than 1m from the floor to withstand the lateral design loads for balcony guards in Part 4 of the Ontario Building Code. Windows shall be designed to comply with Article 4.1.5.14 of the O.B.C.

1.6 SHOP DRAWINGS

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

.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.

.3 Show waterproofing and condensation control methods.

.4 Indicate connections of windows to structural components of building. Connections to be designed and shop drawings to be stamped by a professional engineer in the Province of Ontario.

.5 Prior to substantial completion, the engineer who stamped the shop drawings shall submit a stamped letter confirming that the window systems have been installed as per the approved shop drawings.

1.7 SAMPLES

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

.2 Submit one representative model of each specified finish.

1.8 TEST REPORTS

.1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications, for:
- .1 Windows classifications .
- .2 anodized finish,.
- .3 Insect screens.
- .4 Air tightness.
- .5 Water tightness.
- .6 Wind load resistance.
- .7 Condensation resistance.
- .8 Thermal performance.
- .9 Sash strength and stiffness – Operable Awning Projecting
- .10 Ease of operation – windows with operable lights
- .11 Mullion deflection - combination and composite windows.

1.9 CLOSEOUT SUBMITTALS

.1 Provide operation and maintenance data for windows for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials 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 for recycling in accordance with Waste Management Plan.

.4 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.

.5 Divert unused or damaged wood materials from landfill to recycling reuse composting facility approved by Consultant.

.6 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.7 Divert unused caulking material from landfill to official hazardous material collections site approved by Engineer Consultant.

.8 Plastic caulking tubes are not recyclable and must not be diverted for recycling with other plastic materials.

1.11 POST INSTALLATION CERTIFICATION

.1 After installation, submit written certification, signed by the structural engineer responsible for the design indicated on the shop drawings, that all items have been installed in accordance with the stamped shop drawings.

1.12 DELIVERY AND STORAGE

.1 Deliver material factory formed and ready for installation

.2 Handle, deliver, and store material in a manner so as to prevent soiling, marring of finished surfaces, twisting, denting and all other damages.

.3 Ship material with shop applied protection over finished surfaces and corners padded.

.4 Store at the site under cover and set above ground.

1.13 WARRANTY

.1 The warranty period stated in General conditions, Warranty and relevant Supplementary Conditions, is with respect to this section of work, extended from one year to three years.

.2 Warranty shall specifically guarantee against leakage, defects, and malfunction under normal usage. Warrant against defects in the material and labour of the work of this section and warrant that the work will remain structurally sound free from distortion and deformation under load and that glazing splines and sealant will be free from deterioration from sunlight, weather and oxidation.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Materials: to CSA-A440/A440.1 supplemented as follows:

.2 All windows by same manufacturer.

.3 Glass: as per Section 08 80 50

.4 Screens to CAN/CGSB-79.1.
- .1 Heavy duty black aluminum mesh or vinyl mesh
- .2 Insect screening mesh: count 18 x 14.
- .3 Fasteners: tamper proof.
- .4 Screen frames: aluminum or vinyl colour to match window frames.
- .5 Mount screen frames for interior replacement.
- .6 Provide screens for all operable windows.

.5 Exterior metal sills: brake formed aluminum sheet metal of type and size as detailed; minimum 1.5 mm thick, complete with joint

covers, jamb drip deflectors, chairs, anchors anchoring devices and end dams, and underlayment membrane of thru-wall flashing.

.6 Isolation coating: alkali resistant bituminous paint.

.7 Steel attachments and reinforcements: to CAN3G 40.21-M87, grade 300W.

.8 Bolts, screws and fasteners: Stainless steel, or cadmium plated corrosion-resistant steel of adequate strength for the purpose.

.9 Thermal Isolators: High Preformance thermal break of glass - reinforced nylon 6/6, polyamide nylon 6/6

.10 Exterior and Interior Aluminum Trim Panels: Extruded aluminum or break formed aluminum sheet metal to profiles and sizes indicated, min. 2mm thick.

.11 Sealing Compound: Multi-component, polysulphide, chemical curing, high modulus, to CAN2-19.24-M90, Type 2, Movement Class 25, Class A, glazing.

.12 Peripheral Sealants: In accordance with Section 07900. Colours as selected by Consultant.

.13 Bedding Compound: To CGSB 19-GP-14-M76.

.14 Zinc Rich Primer: To CGSB 1-GP-181M.

.15 Backpan: 26ga. galvanized metal.

.16 Insulation: Stonewool semi-rigid insulation to CAN/CGSB-S1.10-92, Type 2, Class 4, thickness 75mm min., insulation clips with self locking washers. RSI 0.74/25mm thickness.

.17 Air vapour barrier perimeter seal: in accordance with Section 07 27 00.

.18 Foam Insulation around Windows and Doors:
.1 CF 812 by Hilti

2.2 WINDOWS

.1 Framing: Extruded Aluminum, Aluminum Association Alloy AA6063-T5. Casement and awning operators.
.1 Acceptable manufactuers
.1 Kawneer
.2 Alumico

.3 Prevost
.4 Alumicor
.5 Oldcastle
.6 Lessard

All manufacturers must confirm proposed systems comply with project specifications and System Classification performance requirements listed under 1.5 of this section.

2.3 WINDOW TYPE AND CLASSIFICATION

.1 Types:
.1 Projected: top projected with double glazing insulating glass (awning operators).
.2 Fixed: with double glazing insulating glass.

.2 Classification rating: to CSA-A440/A440.1.
.1 Air tightness: A3.
.2 Water tightness: B7.
.3 Wind load resistance: C5.
.4 Condensation resistance: Temperature Index, I60
.5 Forced Entry: F2.
.6 Insect Screens: S2.
.7 Thermal performance: u value of 1.8 (maximum).

2.4 FABRICATION

.1 Fabricate in accordance with CSA-A440/A440.1 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 shop coat primer to CAN/CGSB-1.40 380 g/m² zinc coating to CAN/CSA-G164.

2.5 ALUMINUM FINISHES

.1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.

.2 Exposed aluminum surfaces for all curtain wall framing to be :
.1 Exterior surface finish to be anodized aluminum **Dark Bronze**, Architectural Class I (.7mils), AA-M10C21A44

/

AA-M45C22A44.

.2 Interior surface finish to be anodized aluminum **Dark Bronze**, Architectural Class I (.7mils), AA-M10C21A44 /
AA-M45C22A44.

.3 Exterior of exposed infill panel and trim surfaces: to match adjacent window finish.

2.6 ISOLATION COATING

.1 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 CSA-A440/A440.1. Refer to Section 08 80 50

2.8 HARDWARE

.1 Hardware: sash locks and aluminum handles to match interior finish and to provide security and permit easy operation of units.

.2 Provide limiters on all operators to restrict the vent from opening more than 100mm.

2.9 AIR BARRIER AND VAPOUR RETARDER

.1 Equip window frames with site installed air barrier and vapour retarder material for sealing to building air barrier and vapour retarder 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 and vapour retarder from interior.
.3 Spray foam to fill shim space void at perimeter of windows.
.4 Caulking to interior perimeter of window frames to seal between window frame and air vapour barrier membrane.

PART 3 - EXECUTION

3.1 WINDOW INSTALLATION

.1 Install in accordance with CSA-A440/A440.1.

.2 Arrange components to prevent abrupt variation in colour.

.3 Set aluminum work plumb, square, level, free from warp, twist, and superimposed loads. Use only plastic horseshoe shims, no wood shims are permitted on this project.

.4 Secure work adequately and accurately to structure in required position, in manner not restricting thermal or wind movement. Final anchor settings after alignment.

.5 Anchor component parts to transmit loads and other stresses to anchorage system and hence to structure.

.6 Field measure and cut to fit aluminum flashings and miscellaneous trim. Pack voids with semi-rigid insulation and perimeter sim spaces with urethane foam insulation.

3.2 GLAZING

.1 Glaze in accordance with Section 08 80 50.

3.3 INSULATION

.1 Comply with Section 07 21 13.

.2 Adhere insulation into place in metal pans and secure. Impale on welded galvanized pins and retain with integral galvanized discs.

3.4 PERIMETER OF WINDOWS

.1 Fill perimeter voids of windows, doors, and other exterior wall and roof penetrations and interruptions and as indicated on the drawings with foam in place insulation.

.2 Ensure surfaces are free of dust, oil, grease, frost, loose debris. Provide temporary bracing required to prevent bowing of adjacent frames. Mask adjacent exposed surfaces against damage.

.3 Provide adequate ventilation and protective apparel. Min. application temperature 5°C.

.4 Fill gaps, cracks, holes with foam. Make allowance for expansion of foam. Install foam into gaps and shim space in layered application to ensure full depth of joint is sealed. Allow each layer to cure before next layer is applied. Cut back excess foam after curing. Tool foam only when tack free.

3.5 SILL INSTALLATION

.1 Install through wall flashing membrane as per Section 07 27 00 below metal sills from window sill frame out and over edge of veneer cladding.

.2 Install metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Use one piece lengths at each location.

.3 Secure sills in place with anchoring devices located at ends 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.

.6 Install end dam flashings at ends of sills as detailed c/w return flange under sill.

3.6 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 Sealing. Conceal sealant within window units except where exposed use is permitted by Consultant.

.3 Apply spray foam insulation to fill voids around windows. Apply in multiple passes to ensure complete cavity is filled solid.

3.7 PROTECTION

.1 During construction protect framing and glass against damage from plaster, mortar and other causes.

.2 Protect pre-finished aluminum surfaces with protective coatings or wrappings until the installation of glazing commences. Ensure that method of protection does not damage finish.

3.8 CLEANING

.1 Remove as work progresses, corrosive, hardening, or foreign matter or droppings resulting from the work.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 07 92 00 - Joint Sealers.
.2 Section 08 00 00 - Door Schedule
.3 Section 08 11 16 - Aluminum Doors and Frames
.4 Section 08 44 13 - Glazed Aluminum Curtain Walls
.5 Section 08 50 00 - Windows

1.2 REFERENCES

.1 American National Standards Institute (ANSI).
.1 ANSI/ASTM E330-02, Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

.2 American Society for Testing and Materials International, (ASTM).
.1 ASTM C 542-05, Specification for Lock-Strip Gaskets.
.2 ASTM D 2240-05, Test Method for Rubber Property - Durometer Hardness.
.3 ASTM E 84-10, Test Method for Surface Burning Characteristics of Building Materials.
.4 ASTM E 330-02, 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 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, (Amendment) Insulating Glass Units.
.7 CAN/CGSB-12.9-M91, Spandrel Glass.
.8 CAN/CGSB-12.10-M76, Glass, Light and Heat Reflecting.
.9 CAN/CGSB-12.11-M90, Wired Safety Glass.
.10 CAN/CGSB-12.12-M90, Plastic Safety Glazing Sheets.

.4 Canadian Standards Association (CSA International).
.1 CSA A440.2-98, Energy Performance Evaluation of Windows and Sliding Glass Doors.
.2 CSA Certification Program for Windows and Doors 2000.

.5 Environmental Choice Program (ECP).
.1 CCD-045-95(R2005), Sealants and Caulking.

.6 Glass Association of North American (GANA)
.1 GANA Glazing Manual - 2008.
.2 GANA Laminated Glazing Reference Manual - 2009.

.7 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
.1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

1.3 SYSTEM DESCRIPTION

.1 Performance Requirements:
.1 Provide 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 acting normal to plane of glass to meet requirements of Ontario Building Code and as measured in accordance with ANSI/ASTM E330.
.3 Limit glass deflection to 1/200 flexural limit of glass with full recovery of glazing materials.
.4 Design all fixed glazed panels within dwelling units that extend to less than 1m from the floor to withstand the lateral design loads for balcony guards in Part 4 of the Ontario Building Code. Windows shall be designed to comply with Article 4.1.5.14 of the O.B.C.

.2 Conform to applicable criteria in Sections 08 44 13 Glazed Aluminum Curtain wall and 08 50 00 Aluminum Windows, and Section 05 52 16 Guardrails at porch.

.3 Use only galvanized materials whose compatibility with insulating units has been confirmed in writing by insulating unit management.

1.4 SUBMITTALS

.1 Product Data:
.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
.1 For glazing materials during application and curing.
.3 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.

.2 Shop Drawings:

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
.2 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.

.3 Samples:
.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
.2 Submit duplicate 300 mm x 300 mm size samples of each type of glass.

.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.

.6 Manufacturer's Instructions:
.1 Submit manufacturer's installation instructions.

.7 Closeout Submittals:
.1 Provide maintenance data including cleaning instructions for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
.1 Provide testing of glass under provisions of Section 01 45 00 - Quality Control.
.2 Provide shop inspection and testing for glass.

.2 Certificates: 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.
.2 Construct mock-up to including glass glazing, and perimeter air barrier and vapour retarder seal.
.3 Mock-up will be used:
.1 To judge workmanship, substrate preparation, operation of equipment and material application.
.4 Locate where directed where indicated.
.5 Allow 24 hours for inspection of mock-up before proceeding with work.
.6 When accepted, mock-up will demonstrate minimum

standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.6 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:
.1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Store and protect 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 SITE CONDITIONS

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

1.8 WASTE MANAGEMENT AND DISPOSAL

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

.2 Divert metal cut-offs from landfill by disposal into on-site Metal recycling bin.

.3 Divert uninstalled materials for reuse at nearest used building materials facility or similar type facility.

.4 Divert unused caulking and sealant materials from landfill through disposal at special wastes depot.

.5 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.

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

.7 Dispose of corrugated cardboard, polystyrene, plastic, packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

1.9 WARRANTY

.1 Provide manufacturer's warranty for sealed glazed units and spandrel glass in accordance with General Conditions (GC) GC12.3 but for five (5) years.

.2 Warrant sealed units against failure of perimeter seals of enclosed spaces and deposits on inner face of glass.

.3 Warrant spandrel glass panel coating will not delaminate or deteriorate in colour or finish.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Float glass: to CAN/CGSB-12.3, Glazing quality, of thickness indicated.

.2 Safety glass :to CAN/CGSB-12.1, transparent, 6 mm thick.
- .1 **Type GL-1** - Tempered.
- .2 Class B-Float.
- .3 Category 1
- .4 Edge treatment: flat ground

.3 Wired Glass: to CAN/CGSB-12.1, transparent, 6 mm thick.
- .1 **Type GL-2** - Wired
- .2 Type 1-Polished both sides (transparent).
- .3 Wire mesh styles 3-Square.

4 Silvered mirror glass **GL-4** : thickness to suit size of panel, 5mm minimum thickness.

Safety glass : to CAN/CGSB-12.11, transparent, 6 mm thick.
- .1 **Type GL-5** - laminated.
- .2 Class B-float.
- .3 Category 1 11.
- .4 Edge treatment seamed.

2.2 MATERIALS: SEALED INSULATING GLASS

.1 Insulating glass units to CAN/CGSB-12.8, double unit, 25 mm overall thickness. (**GL-3**).
- .1 Glass: to CAN/CGSB-12.3 outer glass, PPG Solarban 67 Low-E(2), inner glass 6mm clear tempered.
- .2 Glass thickness: 6 mm each light.
- .3 Inter-cavity space thickness: 12.5 mm with low conductivity spacers thermal edge space black.
- .4 Glass coating: surface number 2, low "E".
- .5 Inert gas fill: argon.
- .6 Performance:
  - .1 Visible transmittance: 54%
  - .2 Ext. reflectance: 19%
  - .3 Interior reflectance: 16%
  - .4 Winter U Value: 0.24
  - .5 Solar heat gain coefficient: 0.29
  - .6 Light to solar gain: 1.86

2.3 MATERIALS

.1 Sealant:multi-component, chemical curing to CAN 2-19.24, Type 2 Class A, compatible with sealed units.

2.4 ACCESSORIES

.1 Setting blocks: Neoprene, EPDM, Silicone, 80-90 Shore A durometer hardness to ASTM D 2240, ,minimum 100 mm x width of glazing rabbet space minus 1.5 mm x height to suit glazing method, glass light weight and area.

.2 Spacer shims: Neoprene Silicone, 50-60 Shore A durometer hardness to ASTM D 2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.

.3 Glazing tape:
.1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D 2240; coiled on release paper , black colour.

.4 ,Glazing splines: resilient polyvinyl chloride or silicone, extruded shape to suit glazing channel retaining slot, colour as selected by Consultant.

.5 Glazing clips: manufacturer's standard type.

.6 Lock-strip gaskets: to ASTM C 542.

.7 Mirror attachment accessories:
.1 Stainless steel clips.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 EXAMINATION

.1 Verify that openings for glazing are correctly sized and within tolerance.

.2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

3.3 PREPARATION

.1 Clean contact surfaces with solvent and wipe dry.

.2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.

.3 Prime surfaces scheduled to receive sealant.

3.4 INSTALLATION: EXTERIOR WET/DRY METHOD (PREFORMED TAPE AND SEALANT)

.1 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods.

.2 Cut glazing tape to length and set against permanent stops, 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.

.3 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.

.4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners. Ensure support of both planes of glass. Do not block drainage cavities.

.5 Rest glazing on setting blocks and push against tape and heel head of sealant with sufficient pressure to attain full contact at perimeter of light or glass unit.

.6 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line. Place glazing tape on glazing light or unit with tape flush with 16 mm below sight line.

.7 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.

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

.9 Install pressure plates with gaskets or glazing tape as required. Ensure proper alignment of weep holes for drainage at base of glass unit. Ensure proper compression of gaskets or glazing tape. Seal ends of abutting pressure plates.

.10 Install snap caps. Ensure proper alignment of weep holes for drainage from underside of cap.

3.5 INSTALLATION: EXTERIOR - WET METHOD (SEALANT AND SEALANT)

.1 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods.

.2 Place setting blocks at 1/4 points and with edge block maximum 150 mm from corners. Ensure support of both planes of glass. Do not block drainage cavities.

.3 Install removable stops with glazing centred in space by inserting spacer shims both sides at 600 mm intervals, 6 mm below sight line.

.4 Fill gaps between glazing and stops with sealant to depth of bite on glazing, maximum 9 mm below sight line to ensure full contact with glazing and continue air and vapour seal.

.5 Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.6 INSTALLATION: INTERIOR - DRY METHOD (TAPE AND TAPE)

.1 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods

.2 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.

.3 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.

.4 Rest glazing on setting blocks and push against tape for full contact at perimeter of light or unit.

.5 Place glazing tape on free perimeter of glazing in same manner described.

.6 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

.7 Knife trim protruding tape.

3.7 INSTALLATION: INTERIOR WET/DRY METHOD (TAPE AND SEALANT)

.1 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods

.2 Cut glazing tape to length and install against permanent stops, projecting 1.6 mm above sight line.

.3 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.

.4 Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of light or unit.

.5 Install removable stops, with spacer shims inserted between glazing and applied stops at 600 mm intervals, 6 mm below sight line.

.6 Fill gaps between light and applied stop with sealant to depth equal to bite on glazing, to uniform and level line.

.7 Trim protruding tape edge.

3.8 INSTALLATION: INTERIOR - WET METHOD COMPOUND AND COMPOUND

.1 Install glazing resting on setting blocks. Install applied stop and centre light by use of spacer shims at 600 mm centres, 6 mm below sight line.

.2 Locate and secure glazing light using spring wire clips glazers' clips.

.3 Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

3.9 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.

3.10 CLEANING

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

.2 Remove traces of primer, caulking.

.3 Remove glazing materials from finish surfaces.

.4 Remove labels after work is complete.

.5 Clean glass and mirrors using approved non-abrasive cleaner in accordance with manufacture's instructions.

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

3.11 PROTECTION OF FINISHED WORK

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

.2 After installation, mark each light with an "X" by using removable plastic tape or paste.
.1 Do not mark heat absorbing or reflective glass units.

.3 Repair damage to adjacent materials caused by glazing installation.

END OF SECTION

1.0 ROOM FINISH SCHEDULE INDEX

Room Finish Schedule 09 00 50

2.0 GENERAL NOTES

.1 Ceiling heights given Above Finished Floor (AFF) unless noted otherwise.
.2 All steel brackets and covers to be painted.
.3 Closets to have same finish as room in which they occur.
.4 All exposed piping, ductwork, conduit and equipment inside and outside of mechanical and electrical service rooms to be painted.
.5 All gas piping (exposed and concealed) to be painted.
.6 All surfaces visible through ceiling openings to be painted out.
.7 All wood millwork such as handrails, wood ceiling panels are to be pre-finished by Section 06 40 00. All site applied finish carpentry to be stained unless otherwise noted. Refer to Section 09 91 23 for finishing formulas.
.8 Paint all exposed steel supports, framing and connectors of millwork to match adjacent finish unless otherwise noted.
.9 All mounting boards and backing furring/studs for electrical equipment to be painted with two coats of fire retardant paint.
.10 Paint fire extinguisher cabinets to match adjacent wall colour unless stainless steel.
.11 All discrepancies between documents and drawings are to be reported to the Consultants.

3.0 MATERIAL CODES

MISCELLANEOUS

TBA	To be advised by Consultant at time of material submittals

WALLS

CB	Concrete Block – see Section 04 22 00
GYP BD	Gypsum Board – see Section 09 21 16
PT	Paint finish – see Section 09 91 23
CT	Ceramic Tile – See Section 09 30 13

CEILINGS

GYP BD	Gypsum Board – see Section 09 21 16
PT_	Paint Finish – see Section 09 91 23
ACT_	Acoustical Ceiling Tile– see Section 09 51 13 & 09 53 00
G_	Suspended Grid for Ceiling Tile - see Section 09 51 13 & 09 53 00

MILLWORK

WS_	Wood Stained – see Section 06 20 00 and Section 06 40 00
WPLY_	Wood Species – see Section 06 20 00 and Section 06 40 00
SS_	Through Solid Surface Material – see Section 06 20 00
PL _	Plastic Laminate - see Section 06 47 00
QT_	Quartz countertop – see Section 06 40 00

FLOORING

CT_	Porcelain or Ceramic Tile – see Section 09 30 13
LVT_	Luxury Vinyl Tile – see Section 09 65 19
PT_	Paint finish – see Section 09 91 23

BASE

RUB_	Resilient Base and Transitions – see Section 09 65 50

DOORS see Division 8

4.0 INTERIOR FINISHES LEGEND:

END OF SECTION

Room No	Room Name	Floor		Base		Walls				Door			Ceiling		Millwork				Remarks
		Field	Acc-ent	Mat.'l	Ht. (mm)	Material / Colour				Number	Door Colour	Frame Colour	Mat.'l	Fin.	Window Sill	Horizontal Counter	Upper Cabinet	Lower Cabinet	
						North	East	South	West										
LEVEL 1 GROUND																			
101	NEW VESTIBULE					PT-	PT-	PT-	PT-	101.1 Exist.	PT-	PT-	GYP BD	PT-					
102	NEW CHILDREN'S LOBBY					PT-	PT-	PT-	PT-	102.1	PT-	PT-	G-1/ACT-1						
103	NEW CHILDREN'S ED. AGE 3 TEACHING AREA					PT-	PT-	PT-	PT-	103.1	PT-	PT-	G-1/ACT-1			PL-1	PL-2	PL-2	
						PT-	PT-	PT-	PT-	103.2	PT-	PT-							
103A	NEW WASHROOM					PT-	PT-	PT-	PT-	103A.1	PT-	PT-	G-1/ACT-1			PL-1	PL-2	PL-2	
103B	NEW WASHROOM					PT-	PT-	PT-	PT-	103B.1	PT-	PT-	G-1/ACT-1			PL-1	PL-2	PL-2	
103C	NEW CHILDREN'S ED. AGE 3 ACTIVITY AREA					PT-	PT-	PT-	PT-	103C.1	PT-	PT-	G-1/ACT-1			PL-1	PL-2	PL-2	
103D	NEW STORAGE					PT-	PT-	PT-	PT-	103D.1	PT-	PT-	G-1/ACT-1						
104	NEW JANITOR					PT-	PT-	PT-	PT-	104.1	PT-	PT-	GYP. BD. (W11 HOR.)	PT-					
105	NEW STAIR					PT-	PT-	PT-	PT-		PT-	PT-	GYP BD	PT-					
106	EXISTING CORRIDOR					PT-	PT-	PT-	PT-		PT-	PT-	G-1/ACT-1						
107	NEW JANITOR					PT-	PT-	PT-	PT-	107.1	PT-	PT-	GYP. BD. (W11 HOR.)	PT-					
110	EXISTING CORRIDOR					PT-	PT-	PT-	PT-		PT-	PT-	G-1/ACT-1						
111	NEW UNIVERSAL WASHROOM					PT-	PT-	PT-	PT-	111.1	PT-	PT-	G-1/ACT-1			PL-1	PL-2	PL-2	
112	NEW UNIVERSAL WASHROOM					PT-	PT-	PT-	PT-	112.1	PT-	PT-	G-1/ACT-1			PL-1	PL-2	PL-2	
113	NEW OFFICE					PT-	PT-	PT-	PT-	113.1	PT-	PT-	G-1/ACT-1						
113A	NEW STORAGE					PT-	PT-	PT-	PT-	113A.1	PT-	PT-	GYP. BD. (W11 HOR.)	PT-					
114	NEW COMMON OFFICE					PT-	PT-	PT-	PT-	114.1	PT-	PT-	G-1/ACT-1			PL-1	PL-2	PL-2	
							PT-	PT-	PT-	114.2 Exist.	PT-	PT-							
115	NEW OFFICE					PT-	PT-	PT-	PT-	115.1	PT-	PT-	G-1/ACT-1						
116	NEW CORRIDOR					PT-	PT-	PT-	PT-		PT-	PT-	G-1/ACT-1						

Room No	Room Name	Floor		Base		Walls				Door			Ceiling		Millwork				Remarks
		Field	Acc-ent	Mat.'l	Ht. (mm)	Material / Colour				Number	Door Colour	Frame Colour	Mat.'l	Fin.	Window Sill	Horizontal Counter	Upper Cabinet	Lower Cabinet	
						North	East	South	West										
118	NEW CHILDREN'S RM. SPECIAL NEEDS					PT-	PT-	PT-	PT-	118.1	PT-	PT-	G-1/ACT-1						
118A	NEW WASHROOM					PT-	PT-	PT-	PT-	118A.1	PT-	PT-	G-1/ACT-1			PL-1	PL-2	PL-2	
118B	NEW WASHROOM					PT-	PT-	PT-	PT-	118B.1 Exist.	PT-	PT-	G-1/ACT-1			PL-1	PL-2	PL-2	
119	NEW VOLUNTEER LOUNGE					PT-	PT-	PT-	PT-	119.1	PT-	PT-	EXIST.						
120	NEW CHILDREN'S ED. AGES 8-10					PT-	PT-	PT-	PT-	120.1	PT-	PT-	EXIST. ACT	PT-					EXIST. CEILING TILE TO REMAIN TO BE PAINTED BLACK
						PT-	PT-	PT-	PT-	120.2	PT-	PT-							
						PT-	PT-	PT-	PT-	120.3	PT-	PT-							
120A	NEW WASHROOM					PT-	PT-	PT-	PT-	120A.1	PT-	PT-	G-1/ACT-1			PL-1	PL-2	PL-2	
120B	NEW TECH					PT-	PT-	PT-	PT-		PT-	PT-							
121	NEW CHILDREN'S ED. AGES 5-7					PT-	PT-	PT-	PT-	121.1	PT-	PT-	EXIST. ACT	PT-					EXIST. CEILING TILE TO REMAIN TO BE PAINTED BLACK
121A	NEW WASHROOM					PT-	PT-	PT-	PT-	121A.1 Exist.	PT-	PT-	G-1/ACT-1			PL-1	PL-2	PL-2	
121B	NEW STORAGE					PT-	PT-	PT-	PT-	121B.1	PT-	PT-	G-1/ACT-1						
121C	NEW TECH					PT-	PT-	PT-	PT-		PT-	PT-							
L01	EXISTING CHILDREN'S ED. AGE 4					PT-	PT-	PT-	PT-		PT-	PT-	EXIST.			PL-1	PL-2	PL-2	
L02	EXISTING PLAYROOM					PT-	PT-	PT-	PT-		PT-	PT-	EXIST/ G-1/ACT-1			PL-1	PL-2	PL-2	
L02A	NEW WASHROOM					PT-	PT-	PT-	PT-	L02A.1	PT-	PT-	G-1/ACT-1			PL-1	PL-2	PL-2	
L02B	NEW STORAGE					PT-	PT-	PT-	PT-	L02B.1	PT-	PT-	GYP BD	PT-					
L22	EXISTING STORAGE					PT-	PT-	PT-	PT-	L22.1	PT-	PT-	EXIST.						
L23	EXISTING CORRIDOR					PT-	PT-	PT-	PT-		PT-	PT-	G-1/ACT-1						
L24	EXISTING RAMP					PT-	PT-	PT-	PT-		PT-	PT-	EXIST/ G-1/ACT-1						
L25	EXISTING CORRIDOR					PT-	PT-	PT-	PT-		PT-	PT-	EXIST.						
L29	EXISTING ELEVATOR MACH. RM					PT-	PT-	PT-	PT-	L29.1	PT-	PT-	EXIST.						
L30	EXISTING CORRIDOR					PT-	PT-	PT-	PT-		PT-	PT-	G-1/ACT-1						

Room No	Room Name	Floor		Base		Walls				Door			Ceiling		Millwork				Remarks
		Field	Acc-ent	Mat.'l	Ht. (mm)	Material / Colour				Number	Door Colour	Frame Colour	Mat.'l	Fin.	Window Sill	Horizontal Counter	Upper Cabinet	Lower Cabinet	
						North	East	South	West										
LEVEL 2																			
212	EXISTING CORRIDOR					PT-	PT-	PT-	PT-	212.1	PT-	PT-	G-1/ACT-1						
						PT-	PT-	PT-	PT-	212.2	PT-	PT-							
						PT-	PT-	PT-	PT-	212.3	PT-	PT-							
212A	NEW CORRIDOR					PT-	PT-	PT-	PT-	212A.1	PT-	PT-	G-1/ACT-1 / GYP. BD.						
213	EXISTING JANITOR					PT-	PT-	PT-	PT-	213.1	PT-	PT-	EXIST.						
214	EXISTING REMOTE A/V ROOM					PT-	PT-	PT-	PT-	214.1	PT-	PT-	EXIST/ G-1/ACT-1						
215	NEW RECEPTION					PT-	PT-	PT-	PT-	215.1	PT-	PT-	G-1/ACT-1/ GYP. BD.						
						PT-	PT-	PT-	PT-	215.2	PT-	PT-							
215A	NEW SOUND ROOM					PT-	PT-	PT-	PT-	215A.1			G-1/ACT-1						
215B	NEW GRAPHICS ROOM					PT-	PT-	PT-	PT-	215B.1			G-1/ACT-1						
216	NEW LIBRARY					PT-	PT-	PT-	PT-	216.1			EXIST.						
						PT-	PT-	PT-		216.2									
217	NEW ROOM 4					PT-	PT-	PT-	PT-	217.1			G-1/ACT-1						
217A	NEW ROOM 1					PT-	PT-	PT-	PT-	217A.1			G-1/ACT-1						

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 The work of this Section includes all labour, materials, equipment, and tools required to complete the following list of work as identified on the Contract Documents.
- .1 New gypsum board assemblies over existing exterior concrete block walls.
- .2 Interior gypsum board wall assemblies.
- .3 Interior gypsum board ceiling assemblies.
- .4 Interior shaft wall assemblies.
- .5 Acoustic caulking to gypsum board assemblies.
- .6 Rated gypsum board interior and perimeter column enclosures.
- .7 Installation of access panels and doors supplied by Division 21, 22, 23, 25, and 26.

.2 Work by the same contractor specified in other sections includes all labour, materials, equipment, and tools required to complete the following list of work as identified on the Contract Documents.
- .1 Sheet metal or plywood blocking within stud wall framing for anchoring of millwork, cabinets, overhead barn door track.
- .2 Wood blocking at all exterior window and door frames.
- .3 Non-load bearing steel stud wall framing as indicated on drawings. (Interior walls)
- .4 Steel stud furring channel assemblies.
- .5 Acoustic batt insulation within wall and ceiling assemblies.

1.2 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry
.2 Section 07 21 16 - Blanket Insulation
.3 Section 07 21 29 = Spray Foam Insulation
.4 Section 07 26 00 – Vapour Barriers
.5 Section 07 27 00 – Air Barriers
.6 Section 08 11 00 – Metal Doors and Frames
.7 Section 08 11 16 – Aluminum Doors and Frames
.8 Section 08 44 13 – Glazed Aluminum Curtain Walls.
.9 Section 08 50 00 – Aluminum Windows
.10 Section 09 22 16 - Non-structural Metal Framing

1.3 REFERENCES

.1 Aluminum Association
- .1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.

.2 American Society for Testing and Materials International, (ASTM)
- .1 ASTM C 475-03(R2009), Specification for Joint

Compound and Joint Tape for Finishing Gypsum Board.
.2 ASTM C 840-08, Standard Specification for Application and Finishing of Gypsum Board.
.3 ASTM C 954-07, 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.
.4 ASTM C 1002-07, Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
.5 ASTM C 1047-09, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
.6 ASTM C 1280-99, Specification for Application of Gypsum Sheathing Board.
.7 ASTM C 1177 / C 1177M-08, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
.8 ASTM C 1178/C 1178M-08, Standard Specification for Glass Mat Water-Resistant Gypsum Backing Board.
.9 ASTM C 1396/C 1396M-09a, Standard Specification for Gypsum Wallboard.

.3 Association of the Wall and Ceilings Industries International (AWCI)
.1 AWCI Levels of Gypsum Board Finish-[97].

.4 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
.2 CAN/CGSB-71.25-M88, Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.

.5 Underwriters' Laboratories of Canada (ULC)
.1 CAN/ULC-S102-07, Standard Method of Test of Surface Burning Characteristics of Building Materials and Assemblies.

.6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
.1 SCAQMD Rule 1113-A2007, Architectural Coatings.
.2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

.7 Gypsum Association:
.1 GA-216, Application and Finishing of Gypsum Panel Products
.2 GA 214 Recommended Levels of Gypsum board Finish

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 gypsum board assemblies and include product characteristics, performance criteria, physical size, finish and limitations.

1.5 DELIVERY, STORAGE AND HANDLING

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

.2 Deliver materials in original packages, containers or bundles bearing manufacturers brand name and identification.

.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 of strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

.6 Replace defective or damaged materials with new

1.6 SITE ENVIRONMENTAL REQUIREMENTS

.1 Maintain temperature minimum 10 degrees C, maximum 21 degrees C for 48 hours prior to and during application of gypsum boards and joint treatment, and for at least 48 hours after completion of joint treatment.

.2 Apply board and joint treatment to dry, frost free surfaces.

.3 Ventilation: Ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

1.7 MOCK-UP

.1 Prepare a mockup of typical gypsum board wall finish to interior frame of exterior windows for review. Reviewed work shall become standard of acceptance for balance of work.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials 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 for recycling in accordance with Waste Management Plan.

.4 Divert unused gypsum from landfill to gypsum recycling facility for disposal approved by Consultant.

.5 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.6 Divert unused wood materials from landfill to recycling composting facility approved by Consultant.

.7 Divert unused paint and caulking material from landfill to official hazardous material collections site approved by Consultant.

.8 Do not dispose of unused paint and caulking materials into sewer systems, into lakes, streams, onto ground or in other locations where it will pose health or environmental hazard.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Gypsum board materials must comply with Canadian Recognized tested assemblies for fire resistance and acoustic performance noted. Supplier of materials must provide confirmation that products and total assemblies meet performance requirements.

.2 Materials shall be from regional sources where possible, within 800 km by truck or 2400 km shipped by rail or water.

.3 Standard board: to ASTM C 1396/C 1396M,CAN/CSA – A82.27 regular, 12.7mm and 15.9 mm thick, and Type X 1200 mm wide x maximum practical length, ends square cut, edges bevelled, 4% post consumer recycled content, 94% post industrial recycled content, and 100% recycled face paper. **Where noted on drawings, provide impact-resistant**

gypsum board to 3050mm (10') A.F.F.
.1 CGC Sheetrock TGD
.2 Certainteed Gypsum board

.4 Mould & Mildew resistant board:
.1 Identified price as an alternative to .4 above.
.2 Complete system as per manufacturer's specifications.
.3 Thickness: 12.7mm and 15.9mm
.4 Regular and Type X
.5 Acceptable Materials:
.1 CGC Sheetrock Mold Tough
.2 Certainteed M2Tech Water-Mould resistant

.5 Exterior glass mat gypsum substrate sheathing: to ASTM C 1177/C 1177M, 12.7 & 15.9mm thick, 1200 mm wide x maximum practical length. Type X where indicated.
.1 Acceptable Materials:
.1 CGC Securock Glass Mat sheathing
.2 Certainteed Glasroc
.3 Georgia Pacific Dens Glass Gold

.6 Ceramic Tile Backer Board:
.1 12.7 mm thick
.2 For all areas to receive ceramic tile finish.
.3 Acceptable Materials:
.1 CGC Fibrerock Aqua-tough Tile Backerboard
.2 Certainteed Diamondback GlasRoc Tile Backer
.3 CGC Durock Cement Board
.4 Unifex Permabase
.5 Georgia-Pacific Dens Shield Tile Backer

.7 Metal furring runners, hangers, tie wires, inserts, anchors: to CSA A82.30, galvanized.

.8 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.

.9 Resilient drywall furring: 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.

.10 Nails: to ASTM C 514.

.11 Steel drill screws: to ASTM C 1002.

.12 Laminating compound: as recommended by manufacturer, asbestos-free.

.13 Casing beads, corner beads, control joints and edge trim: to

ASTM C 1047, zinc-coated by electrolytic process, 0.5 mm base thickness, perforated flanges, one piece length per location.

.14 Sealants: in accordance with Section 07 92 00 - Joint Sealing.

.15 Acoustic sealant: Tremco Acoustic Sealant or equal, Refer to Section 07 92 00

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

.17 Insulating strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 12 mm wide, with self sticking permanent adhesive on one face, lengths as required.

.18 Joint compound: to ASTM C 475, asbestos-free.

.19 Neoprene two sided tape gaskets: white neoprene gasket at window frame junctions.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 ERECTION

.1 Do application and finishing of gypsum board in accordance with ASTM C 840 except where specified otherwise.

.2 Do application of gypsum sheathing in accordance with ASTM C 1280.

.3 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C 840 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,and other access locations including valves, access doors and fire dampers.

.7 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.

.8 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.

.9 Install wall furring for gypsum board wall finishes in accordance with ASTM C 840, except where specified otherwise.

.10 Furr openings and around built-in equipment, cabinets, access panels, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.

.11 Furr duct shafts, beams, columns, pipes and exposed services where indicated.

.12 Erect drywall resilient furring transversely across studs and joists, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screw.

.13 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed.

3.3 APPLICATION

.1 Do not apply gypsum board until bucks, anchors, blocking, sound attenuation, electrical and mechanical work are approved.

.2 Apply single and double layer gypsum board to wood and metal furring or framing using screw fasteners for first layer, screw fasteners for second layer. Maximum spacing of screws 300 mm on centre.

.1 Single-Layer Application:

.1 Apply gypsum board on ceilings prior to application of walls in accordance with ASTM C 840.

.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 and double layer gypsum board to concrete block surfaces, where indicated.
.1 Comply with gypsum board manufacturer's recommendations.

.4 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. Refer to acoustic notes on drawings related to additional requirements.

.5 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.

.6 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.

.7 Install gypsum board with face side out.

.8 Do not install damaged or damp boards.

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

.10 Install tile backer board to all walls specified to receive ceramic tile finish.

.11 At all exterior window frame jambs and heads, return gypsum board into window frame. Apply two sided white neoprene tape to back of window frame to act as separator between gypsum board and window frame. Finish gypsum board with exposed white “J” moulding exposing edge of white neoprene tape.
Or
Nova Trim adjustable and removable J protection trim model 8131
Construct mock-up for review and approval prior to proceeding with general work.

3.4 INSTALLATION

.1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm on centre.

.2 Install casing beads around perimeter of suspended ceilings.

.3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.

.4 Install insulating strips continuously at edges of gypsum board and casing beads abutting window and exterior door frames, to provide thermal break. Use 2mm thick black foam tape, leaving tape edge exposed as a break between window and door frames and gypsum board casing bead.

.5 Construct control joints of preformed units set in gypsum board facing and supported independently on both sides of joint.

.6 Provide continuous polyethylene dust barrier behind and across control joints.

.7 Locate control joints where indicated at changes in substrate construction at approximate 10 m spacing on long corridor runs at approximate 15 m spacing on ceilings.

.8 Install control joints straight and true.

.9 Construct expansion joints as detailed, at building expansion and construction joints. Provide continuous dust barrier.

.10 Install expansion joint straight and true.

.11 Splice corners and intersections together and secure to each member with 3 screws.

.12 Install access doors to electrical and mechanical fixtures specified in respective sections.
.1 Rigidly secure frames to furring or framing systems.

.13 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.

.14 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with Association of the Wall and Ceiling Industries (AWCI) International Recommended Specification on Levels of Gypsum Board Finish:

.1 Level 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. Locations: plenum areas above ceilings.

.2 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. Locations: panels to be covered with ceramic tile or Puraguard finish.

.3 Level 3: 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. Locations which are to receive coving plaster finish.

.4 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. Locations: standard for all locations not exposed to severe natural lighting conditions (natural light washing across wall face).

.15 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.

.16 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.

.17 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

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

.19 Mix joint compound slightly thinner than for joint taping.

.20 Apply thin coat to entire surface using trowel or drywall broadknife to fill surface texture differences, variations or tool marks.

.21 Allow skim coat to dry completely.

.22 Remove ridges by light sanding or wiping with damp cloth.

.23 Provide protection that ensures gypsum drywall work will remain without damage or deterioration at time of substantial completion.

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.

.2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.6 PROTECTION

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

.2 Repair damage to adjacent materials caused by gypsum board assemblies installation.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 06 10 00 – Rough Carpentry
.2 Section 07 92 00 - Joint Sealants.
.3 Section 09 21 16 - Gypsum Board Assemblies.

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).
.1 ASTM C 645-00, Specification for Nonstructural Steel Framing Members.
.2 ASTM C 754-00, Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

.2 Canadian General Standards Board (CGSB).
.1 CAN/CGSB-1.40-97, Primer, Structural Steel, Oil Alkyd Type.

.3 Environmental Choice Program (ECP).
.1 CCD-047a -98, Paints - Surface Coatings.
.2 CCD-048-98, Surface Coatings - Recycled Water-borne.

1.3 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

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

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials 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.

.4 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.5 Divert unused gypsum materials from landfill to recycling facility approved by Consultant.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Non-load bearing channel stud framing: to ASTM C 645, stud size as indicated on drawings, roll formed from 0.53 mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 460 mm centres.

.2 Floor and ceiling tracks: to ASTM C 645, in widths to suit stud sizes, 32 mm flange height.

.3 Use 0.91mm thick steel sheet for studs at walls which are to have grab bars and towel bars installed.

.4 Metal channel stiffener: size to suit wall stud, framing,1.4 mm thick cold rolled steel, coated with rust inhibitive coating.

.5 Acoustical sealant: to ASTM C919.

.6 Insulating strip: rubberized, moisture resistant 6 mm thick foam strip, full width of track, with self sticking adhesive on one face, lengths as required.

.7 Steel Backing Sheets: 1.083mm (18 GA) galvanized sheet steel.

PART 3 - EXECUTION

3.1 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 600 mm on centre and not more than 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.

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

.5 Attach studs to bottom 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. 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. Secure track to studs at each end, in accordance with manufacturer's instructions. 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. Refer also to other clauses of this Section for backing and blocking requirements.

.13 Install steel studs or furring channel between studs for attaching electrical and other boxes.

.14 Extend partitions to underside of structure except where noted otherwise on drawings.

.15 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use 50 mm leg ceiling tracks.

.16 Install two continuous beads of acoustical sealant or insulating

strip under studs and tracks around perimeter of sound control partitions. Refer to acoustic notes on drawings for acoustic requirements.

.17 Install continuous 200mm wide horizontal strips of galvanized sheet steel screw fastened to studs at locations required to provide anchorage backing for cabinets and wall mounted elements. Screw heads to be flush with backing strips as not to effect finish drywall surface plumpness. Items for which metal backing is to be installed included but not limited to millwork, cabinets, wall mounted door hardware (wall stops), washroom accessories, and grab bars.

.18 Install heavy gauge studs (1.146mm thick) with wide flange (41mm) at all locations where cement board or specialty board is to be installed which require increased sub-framing support / anchorage.

.19 Install framing above ceiling and provide solid wood blocking within track to support toilet partitions.

3.2 CLEANING

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

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures
.2 Section 01 45 00 - Quality Control
.3 Section 01 47 18 - Indoor Air Quality during Construction
.4 Section 01 61 00 - Common Product Requirements
.5 Section 01 74 11 - Cleaning
.6 Section 01 74 21 -Construction/Demolition Waste Management and Disposal
.7 Section 01 78 00 – Close out Submittals
.8 Section 07 92 00 – Joint Sealant
.9 Section 09 00 00 – Interior Finish Material / Colour Legend
.10 Section 09 00 01 – Room Finish Schedule
.11 Section 09 21 16 - Gypsum Board Assemblies
.12 Division 22 – Plumbing, Specialties and Trim

1.2 REFERENCES

.1 American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI)
.1 ANSI A108.1-99, Specification for the Installation of Ceramic Tile (Includes ANSI A108.1A-C, 108.4-.13, A118.1-.10, ANSI A136.1).
.2 CTI A118.3-92, Specification for Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive (included in ANSI A108.1).
.3 CTI A118.4-92, Specification for Latex Cement Mortar (included in ANSI A108.1).
.4 CTI A118.6-92, Specification for Ceramic Tile Grouts (included in ANSI A108.1).

.2 American Society for Testing and Materials International (ASTM)
.1 ASTM C144-04, Specification for Aggregate for Masonry Mortar
.2 ASTM C 207-06, Specification for Hydrated Lime for Masonry Purposes.
.3 ASTM C 847-06, Specification for Metal Lath.
.4 ASTM C 979-05, Specification for Pigments for Integrally Coloured Concrete.

.3 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
.2 CGSB 71-GP-22M-78(AMEND.), Adhesive, Organic, for Installation of Ceramic Wall Tile.
.3 CAN/CGSB-75.1-M88, Tile, Ceramic.
.4 CAN/CGSB-25.20-95, Surface Sealer for Floors.

.4 Canadian Standards Association (CSA International)
.1 CAN/CSA-A3000-03(R2006), Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.5 South Coast Air Quality Management District (SCAQMD), California State
.1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

.6 Terrazzo Tile and Marble Association of Canada (TTMAC)
.1 Tile Specification Guide 09 30 00 2006/2007, Tile Installation Manual.
.2 Tile Maintenance Guide 2000.

1.3 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.
.1 Include manufacturer's information on:
- .1 Ceramic tile, marked to show each type, size, and shape required.
- .2 Chemical resistant mortar and grout (Epoxy).
- .3 Cementitious backer unit.
- .4 Dry-set cement mortar and grout.
- .5 Divider strip.
- .6 Elastomeric membrane and bond coat.
- .7 Reinforcing tape.
- .8 Levelling compound.
- .9 Latex cement mortar and grout.
- .10 Commercial cement grout.
- .11 Organic adhesive.
- .12 Slip resistant tile.
- .13 Waterproofing isolation membrane.
- .14 Fasteners.
- .15 Primers

.3 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
.1 Base tile: submit duplicate, 300 x 300 mm sample panels of each colour, texture, size, and pattern of tile.
.2 Floor tile: submit duplicate, 300 x 300 mm sample panels of each colour, texture, size, and pattern of tile.
.3 Trim shapes, cap and cove including cap and base pieces at internal and external corners of vertical surfaces, each type, colour, and size.
.4 Adhere tile samples to 11 mm thick plywood and grout joints to represent project installation.

1.4 QUALITY ASSURANCE

.1 Quality Assurance Submittals:
.1 Manufacturer's Instructions: manufacturer's installation instructions.
.2 Manufacturer's Field Reports: manufacturer's field reports specified.

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

1.6 AMBIENT CONDITIONS

.1 Maintain air temperature and structural base temperature at ceramic tile installation area above 12 degrees C for 48 hours before, during, and 48 hours after, installation.

.2 Do not install tiles at temperatures less than 12 degrees C or above 38 degrees C.

.3 Do not apply epoxy mortar and grouts at temperatures below 15 degrees C or above 25 degrees C.

1.7 MAINTENANCE

.1 Extra Materials:
.1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
.2 Provide minimum 2% of each type and colour of tile required for project for maintenance use. Store where directed.
.3 Maintenance material same production run as installed material.

PART 2 - PRODUCTS

2.1 FLOOR TILE

.1 Porcelain tile: to CAN/CGSB-75.1

.2 Refer to Section 09 00 00 Interior Finish Material / Colour Legend for product Manufacturer, Distributor, Designation, Size, and Colour. Top of ceramic tile to be flush with adjacent vinyl tile and existing carpeting.

2.2 WALL TILE

.1 Ceramic tile: to CAN/CGSB-75.1

.2 Refer to Section 09 00 00 Interior Finish Material / Colour

Legend for product Manufacturer, Distributor, Designation, Size, and Colour.

2.3 BASE TILE

.1 Base: coved; type, size, colour and texture to match adjacent flooring material.

.2 Other Bases:
.1 Refer to Section 09 00 00 – Interior Finish Material / Colour Legend, 09 00 01 Room Finish Schedule and Architectural Drawings for product Manufacturer, Distributer, Designation, Size, Colour and Location.

2.4 TRIM SHAPES

.1 Conform to applicable requirements of adjoining floor and wall tile.

.2 Use "Schluter" type trim shapes sizes conforming to size of adjoining field wall tile, including existing spaces, unless specified otherwise. Use trims for transitions between floor types, inside corners, outside corners and edges.

.3 Use trim at top of ceramic tile base where it abuts painted gypsum board or painted concrete block: Schluter Schiene E.

.4 Trim at side of ceramic tile where it abuts painted gypsum board concrete block: Schluter Schiene E.

.6 Trim at floor transition between Porcelain Floor Tile CT and Vinyl Tile, Vinyl Composite Tile or Resilient Sheet Floor: Schluter Reno-V- AEVT 100 B20-10mm-AE Finish. Trim to be installed prior to installation of Vinyl Tile, Vinyl Composite Tile or Resilient Sheet Floor.

.7 Trim at floor transition between Ceramic Tile and Carpet: Schluter Reno-U – AEU 100-10mm.

.8 Trim at control joints in ceramic tile flooring: Schluter Dilex-AKSN-125-G Grey.

2.5 MORTAR AND ADHESIVE MATERIALS

.1 Cement: to CSA-A5, type 10.

.2 Sand: to ASTM C 144, passing 16 mesh.

.3 Hydrated lime: to ASTM C 207, Type N NA S SA.

.4 Latex additive: formulated for use in cement mortar and thin set bond coat.

.5 Water: potable and free of minerals and chemicals which are detrimental to mortar and grout mixes.

.6 Adhesives:.
.1 Maximum VOC limit 65 g/L to SCAQMD Rule 1168.

.7 Levelling coat: Flextile 5900 Flex Flo plus or Flextile dry pack mortar mix for sloped/ deeper fill areas (or approved equal).

.8 Tile on concrete block: use Flextile dry pack mortar mix (or approved equal).to level block surface.

.9 Mortar bed for Floors: 1 part Portland cement, 4 parts sand, 1 part water, adjust water volume depending on water content sand, (latex additive may be included)

.10 Medium bed Mortar: to ANSI A118.4 Flextile 56 SR (or approved equal).

.11 Mortar at glass tiles: Flextile 51 White mix with Flextile 44 Latex additive (or approved equal).

.12 Measure mortar ingredients by volume, mix all mortars to manufactures written instructions.

.13 Mortar: colour selected by Consultant from full colour range.

2.6 BOND COAT

.1 Dry set cement mortar: to ANSI A118.4 and A118.11 Flextile 56 SR.

2.7 GROUT

.1 Colouring Pigments:
.1 Pure mineral pigments, limeproof and nonfading, complying with ASTM C 979.
.2 Colouring pigments to be added to grout by manufacturer.
.3 Job coloured grout are not acceptable.

.2 Commercial Cement Grout: to CTI A118.6.

.3 Polymer Modified Cement Grout: to ANSI A118.6 &7, high early strength, polymer-modified, stain resistant, sanded mix for floors, unsanded mix for walls and floors with polished tiles commercial tile grout.
.1 Floors Flextile 600 Polymer Modified Sanded grout
.2 Walls Flextile 500 Polymer Modified Unsanded grout
.3 Grout preparation as per manufacturer's written instruction.
.4 Alternative for walls and floors (fast curing): Flextile 1600

RSG or approved equal

2.8 ACCESSORIES

.1 Reinforcing mesh: 50 x 50 x 1.6 x 1.6 mm galvanized steel wire mesh, welded fabric design, in flat sheets.

.2 Divider strips:
.1 Zinc : 2mm x depth, complete with anchors, both sides spaced at 150 mm on centre.

.3 Underlayment membrane: Flextile Flexmat or approved equal- all tiled floor areas.

.4 Metal lath: to ASTM C 847 galvanized finish, 10 mm rib at 2.17 kg/mý.

.5 Transition Strips: purpose made metal extrusion; anodized aluminum type. Schluter or approved equal.

.6 Reducer Strips: purpose made metal extrusion; stainless steel anodized aluminum type; maximum slope of 1:2. Schluter or approved equal.

.7 Prefabricated Movement Joints: purpose made, having a Shore A Hardness not less than 60 and elasticity of plus or minus 40 percent when used in accordance to TTMAC Detail 301EJ.

.8 Sealant: in accordance with Section 07 92 00 - Joint Sealants.
.1 Sealants: maximum VOC limit 250 g/L to SCAQMD Rule 1168.

.9 Floor sealer and protective coating: to CAN/CGSB-25.20, Type to tile and grout manufacturers recommendations.

2.9 MIXES

.1 Cement:

.2 Dry set mortar: mix to manufacturer's instructions.

.3 Mix bond and leveling coats, and grout to manufacturer's instructions.

.4 Adjust water volumes to suit water content of sand.

2.10 PATCHING AND LEVELLING COMPOUND

.1 Portland cement base, acrylic polymer compound, manufactured specifically for resurfacing and leveling concrete floors. Products containing gypsum are not acceptable.

.2 Have not less than the following physical properties:
.1 Compressive strength - 25 MPa.

.2 Tensile strength - 7 MPa.
.3 Flexural strength - 7 MPa.
.4 Density - 1.9.

.3 Capable of being applied in layers up to 50 mm thick, being brought to feather edge, and being trowelled to smooth finish. Standard of Acceptance**:** Flextile 5900 Flex Flo plus or Flextile dry pack mortar mix for sloped/ deeper fill areas or approved equal

.4 Primer: Type as recommended by levelling underlayment manufacturer to suit substrate

.5 Ready for use in 48 hours after application.

2.11 CLEANING COMPOUNDS

.1 Specifically designed for cleaning masonry and concrete and which will not prevent bond of subsequent tile setting materials including patching and leveling compounds and elastomeric waterproofing membrane and coat.

.2 Materials containing acid or caustic material are not acceptable.

PART 3 - EXECUTION

3.1 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 Examine the work upon which this Section depends and report defects to the Consultant

.2 The Manufacturer’s Representative of the Substrate Prep Work and the Manufacturer’s Representative of the finish material shall review and comment in writing to the Construction Manager and Architect on the condition of the substrate. The Manufacturers shall recommend in writing that the substrate is acceptable for installation of the ceramic tile prior to its installation.

.3 Remove coatings, sealers, curing compounds and other materials which may be determined to bond of fillers, leveling coat, membrane or mortar bed.

.4 Apply leveling compound as required to provide level and plumb floor surfaces to receive membrane and ceramic tile, and to provide slope to drains. Substrate surface to be

smooth, true within 6mm in 3000mm.

.5 Apply levelling compound as required to provide level, plumb and straight wall surfaces to receive ceramic tile and waterproofing/ceramic tile wall finish. Substrate surface to be smooth, true within 3mm in 3000mm.

.6 Ensure that backings are structurally sound, level and plumb within the required tolerances.

.7 Tolerance of substrate shall be suitable for particular setting bed used.

.8 Where adhesive bond coat is used, ensure that surface variations do not exceed plus/minus 2 mm and 1 mm in any 3000 mm.

.9 Ensure that access doors are set to provide a flush installation of the tile.

3.3 WORKMANSHIP

.1 Do tile work in accordance with TTMAC Tile Installation Manual 2006/2007, "Ceramic Tile", except where specified otherwise.

.2 Apply tile or backing coats to clean and sound surfaces.

.3 Fit tile around corners, fitments, fixtures, drains and other built-in objects. Maintain uniform joint appearance. Cut edges smooth and even. Do not split tiles.

.4 Maximum surface tolerance 1:800.

.5 Make joints between tile uniform and approximately 3.0 mm wide, plumb, straight, true, even and flush with adjacent tile. Ensure sheet layout not visible after installation. Align patterns.

.6 Lay out tiles so perimeter tiles are minimum 1/2 size.

.7 Sound tiles after setting and replace hollow-sounding units to obtain full bond.

.8 Make internal angles square, external angles rounded . Use appropriate "Schluter" type trims as noted and as indicated.

.9 Install divider strips at junction of tile flooring and dissimilar materials.

.10 Clean installed tile surfaces after installation and grouting cured.

.11 Sort and arrange tiles to ensure no apparent variation in colour

or texture between panels.

.12 Allow minimum 24 hours after installation of tiles before grouting.

.13 Joints to be watertight without voids or cracks.

.14 Clean installed tile surfaces after installation and grouting cured.

.15 Make control joints at max. 6M in each direction. Make joint width same as tile joints. Clean of mortar and grout. See flooring layout for locations. Provide control joints around perimeter of large areas, around columns, in locations where area changes direction and where tile abuts other hard material. Place control joints directly over subfloor expansion/control joints.

.16 Remove as work progresses all excess foreign matter which would set up or become difficult to remove from finished surfaces.

.17 Install Schluter trims using pieces as long as practically possible.

3.4 SETTING TILES

.1 Install tile and bases on substrate in accordance with TTMAC details

.2 Install trims as per manufacturer’s instructions and recommendations.

.3 Trowel mortar into substrate and comb with notched edge.

.4 Back butter tiles greater than 200 x 200mm.

.5 Set tiles firmly with rubber mallet.

.6 Make joints between tile uniform, plumb, straight, true, even and flush with adjacent tile. Ensure sheet layout not visible after installation. Align patterns.

.7 Allow minimum 24 hrs after installation of tiles, before grouting.

.8 Protect finished work from traffic and damage.

3.5 FLOOR SEALER AND PROTECTIVE COATING

.1 Apply in accordance with manufacturer's 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.

3.8 SCHEDULE

.1 Refer to Section 09 00 00 Interior Finish Material / Colour Legend and Section 09 00 00.1 Suite Finish /ColourSchedule for all materials and colours.

.2 Refer to Section 09 00 01 Room Finish Schedule and drawings for locations of ceramic tile installations.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

.1 The work of this Section includes the supply and installation of Luxury Vinyl Tile (LVT) flooring as noted in the Room Finish Schedule.

1.2 RELATED SECTIONS

.1	Submittal Procedures	Section 01 33 00
.2	Indoor Air Quality Requirements	Section 01 81 19
.4	Interior Finish, Colour Schedule	Section 09 00 00
.5	Room Finish Colour Schedule	Section 09 00 50

1.3 REFERENCES

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

- .1 ASTM D2047, Standard Test for Floor Slip Resistance.
- .2 ASTM E648/NFPA 253, Standard Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
- .3 ASTM E662, Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- .4 ASTM F970, Standard Test for Static Load Limit.
- .5 ASTM F2170, Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

.2 Resilient Floor Covering Institute

- .1 RFCI Standard Slab Moisture Test Method (Calcium Chloride Method) as a supplementary test method to ASTM F2170.

.3 Underwriters Laboratories of Canada (ULC)

- .1 CAN/ULC-S102.2, Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies

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

- .1 Material Safety Data Sheets (MSDS).

.5 DIN 51130 Slip Resistance Test

.6 ACI 302.2R-06 Guide for Concrete Slabs that receive Moisture Sensitive Flooring Materials.

.7 RFCI Recommended Work Practices for Removal of Resilient Floor Covering.

1.4 SUBMITTALS

.1 Product Data: Submit manufacturer's current printed product literature, specifications, installation instructions, and field reports in accordance with Section 01 33 00 - Submittal Procedures.

.2 Samples: Submit for approval the colours, finishes and material for the various items of work specified herein. Submit in accordance with Section 01 33 00 – Submittal Procedures.

.3 Shop Drawings: Submit shop drawings for review in accordance with Section 01 33 00 – Submittal Procedures.

.4 Maintenance Data and Operating Instructions: Provide copies of maintenance and operating instructions in accordance with Section 01 77 00 – Closeout Submittals.

1.5 HANDLING & STORAGE

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

.1 Store the flooring inside, sheltered from extreme hot or cold temperatures. Place the material on a smooth level floor or where there is a uniform solid support in a clean, dry well-ventilated area. The storage temperature must be maintained between 18dC and 24dC. Protect adhesive from freezing and extreme heat.
.2 All flooring material and adhesive shall be present at the jobsite for at least 48 hours at a temperature between 20dC and 22dC.

.2 Waste Management and Disposal:
.1 Separate waste materials for reuse and recycling.
.2 Avoid using landfill waste disposal procedures when recycling facilities are available.
.3 Keep all discarded packaging away from children.

.3 Protect all material during transit and on the site from damage and from the elements.

.4 Do not remove units from crates and protective packing until ready for installation.

.5 Handle the units with care to prevent damage and use protective pads and covering to prevent soiling and marring of the finish.

1.6 ENVIRONMENTAL REQTS

.1 Temperature Requirements: If storage temperature is below 65F (18C) or the floor temperature is below 50F (18C), the flooring product must be moved to a warmer place and allowed to reach this temperature before unrolling or installation. For further information, refer to current manunfacturer's Installation Practices and Quick Facts.

.2 Maintain air temperature and structural base temperature at flooring installation area between 68F (20C) and 80F (26C) for 48 hours before, during and 24 hours after installation.

1.7 MAINTENANCE

.1 Extra Materials:

.1 Provide maintenance materials of resilient tile flooring, base and adhesive in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide 5% of each colour, pattern and type flooring material required for this project for maintenance use.

.3 Extra materials from same production run as installed materials.

.4 Identify each container of floor tile and each container of adhesive.

.5 Deliver to Consultant, upon completion of the work of this section.

.6 Store where directed by Consultant.

1.8 QUALITY ASSURANCE

.1 Installer Qualifications: Experienced in performing the work of this section and who is specialized in the installation of work similar to that required for this project.

.1 Training: Installer who has attended an Altro flooring installation training clinic who has successfully installed Altro luxury vinyl tile previously.

.2 Awarded flooring contractor must be able to provide recent Altro references with contacts.

.2 Mock-ups: Install at project site a job mock-up using acceptable products and manufacturer approved installation methods, including concrete substrate testing. Obtain Owner's and Consultant's acceptance of finish colour texture and pattern and workmanship standards.

.1 Mock-up Size: Room 107H.
.2 Maintenance: Maintain mock-up during construction for workmanship comparison.
.3 Incorporation: Mock-up may be incorporated into final construction upon Owner's approval.

.3 Pre-installation Meeting: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, manufacturer's warranty requirements, and installer qualifications.

.4 Bond Test: Install multiple bond tests using 3'x3' sections of material adhered with the appropriate adhesive to verify quality of adhesion. Remove half of each piece after 24 hours, then the other half after 48 hours. To help assess resistance to indentation, place end user equipment onto a sample for 72 hours. Document all results.

1.9 WARRANTY

.1 Project Warranty: Refer to CCDC 2 for project warranty provisions.

.2 Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official in accordance with Section 01 78 00 Closeout Submittals. Manufacturer's warranty is in addition to and not a limitation of other rights that the Owner may have under the Contract Conditions.

.3 Warranty period on material shall be extended from one year to twenty years.

.4 Warranty shall specifically guarantee against defects and wear, of pattern, colour and delamination.

.5 Warranty period on labour shall be extended from one year to two years.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Refer to Interior Finishes Colour Legend 09 00 50 for colour and plank sizes. Material is 3mm gauge with a 20 mil wear layer.

.2 Adhesives:
.1 Tarkett 959 Vinyl and Plank Adhesive – solvent-free acrylic-based.

.3 Primer and Patch: 2 part latex-type filler requiring no water as recommended by flooring manufacturer for use with their product. Feather floor areas as required to ensure flush transition height between floor finishes as noted on drawings. Allow for two coats. Standard of Acceptance: HB Fuller TA 320 Perfect Finish.

.4 Floor patch and leveller TEC Primer TA560 and TEC Levelling TA323 where vinyl flooring is being applied where substrate requires a self levelling material.

.5 Metal edge strips: Schluter aluminum extruded, smooth, mill finish with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

.6 Transition strips: Schluter stainless steel or aluminum profiles as noted to provide smooth transition between different floor finishes.

.7 Sealer: to CAN/CGSB-25.20, Type 2-water based or type recommended by flooring manufacturer.
.1 Sealant: Sealant: maximum VOC limit 50 g/L to SCAQMD Rule 1168.

PART 3 – EXECUTION

3.1 WORKMANSHIP

.1 Install flooring, base and transitions in accordance with manufacturer's instructions.

.2 Finished installation shall present a uniform appearance , free from conspicuous joints, uneveness, colour contrast and other faults. Joints shall be firm and even. Entire surface of tile shall be fully adhered to substrate.

3.2 EXAMINATION

.1 Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog, installation instructions found at www.altrofloors.com.

.2 Site Verification of Conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.

3.3 SURFACE CONDITIONS

.1 Examine subfloors prior to installation to determine that

surfaces are smooth and free from cracks, holes, ridges, and other defects that might prevent adhesive bond or impair durability or appearance of the finished flooring material.

.2 Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, and hardening compounds; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mold or mildew.

.3 Do not remove residual or other adhesive with chemical adhesive removal products.

.4 Report conditions contrary to contract requirements which would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.

.5 Failure to call attention to defects or imperfections will be construed as acceptance and approval of the subfloor. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.

.6 Vinyl flooring shall be installed over subfloors conforming to ASTM F710 for concrete and other monolithic floors.

.7 Moisture Testing: Perform calcium chloride moisture test every 800 square feet of area. Advise Flooring Material's Technical Representative, Consultant and Project Manager of results.

.8 Underlayment and Patching Compounds: Use only gray colored Portland cement based underlayments; patching compounds are used for filling cracks, holes and leveling. White gypsum materials are not acceptable.

.9 Perform a bond test for each type of material. Mockup shall incorporate underlayment, adhesive and tile on the concrete slab to determine compatibility of the system. This shall be performed in advance of the flooring being installed. Photographs of each step taken shall be forwarded to the Manufacturer's representative for review and issuance of a report prior to proceeding with the full installation.

3.4 PREPARATION OF FLOORS

.1 Substrate to be free from oil, grease, dust, loose, concrete sealer, floor finishes or curing compound. Surface protrusions shall be removed by sanding, scraping or chipping. After sanding, remove all dust by vacuuming.

.2 Apply Floor Patch and Leveller smooth finish as per manufacturer's written recommendations.

3.5 PREPARATION OF ALL SUBSTRATES PRIOR TO INSTALLATION OF FINISH FLOORING

.1 Vacuum or broom-clean surfaces to be covered immediately before the application of flooring. Make subfloor free from dust, dirt, grease, adhesive, wax and all foreign materials.

If the previous adhesive leaves a residue after scraping, it must be encapsulated with portland cement.

.2 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.

3.6 TILE APPLICATION

.1 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturer's instructions. Do not spread more adhesive than can be covered by flooring before initial set takes place.

.2 Lay flooring with joints parallel to building lines to produce symmetrical tile pattern. Border tiles minimum half tile width.

.3 See Floor Finish Plans for joint pattern.

.4 As installation progresses and after installation, roll flooring in 2 directions with 45 kg minimum roller to ensure full adhesion, all in accordance with manufacturer's written instructions.

.5 Cut tile to fit neatly around fixed objects.

.6 Install feature strips and floor markings where indicated. Fit joints tightly.

.7 Terminate flooring at centerline of door in openings where adjacent floor finish or colour is dissimilar.

.8 Refer to Section 09 30 13 for trim where flooring abuts ceramic tile.

3.7 CLEANING

.1 Remove excess adhesive from floor without damage.

.2 Remove temporary coverings and protection of adjacent work areas.

- .1 Repair or replace damaged installed products.
- .2 Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.

.3 Current recommended maintenance procedures can be found on Manufacturers Documentation.

3.8 PROTECTION OF FINISHED WORK

.1 Sweep or vacuum all construction debris and dust first, then clean the flooring using manufacturer's recommended products and procedures.

.2 Cover and protect finished installation from damage from other trades using a non-staining, temporary floor protection system, such as reusable textured plastic sheeting.

.3 Never use tapes on the surface on the finish flooring, Sharpies, pens, crayons or construction markers on either the finish flooring or the substrate.

.4 No traffic for 24 hours after installation, unless approved by Altro technical.

.5 No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.

.6 Wait 72 hours after installation before performing initial cleaning. Start a regular maintenance program after the initial cleaning as recommended by manufacturer

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.
.2 Sustainable requirements for construction and verification:

.2 Related Sections:
.1 Section 01 33 00 – Submittal Procedures
.2 Section 01 35 29 - Health and Safety Requirements.
.3 Section 01 45 00 - Quality Control
.4 Section 01 47 18 - Indoor Air Quality during Construction
.5 Section 01 61 00 - Common Product Requirements
.6 Section 01 74 11 - Cleaning
.7 Section 01 74 21 -Construction/Demolition Waste Management and Disposal
.8 Section 01 78 00 – Close out Submittals
.9 Section 06 20 00 – Finished Carpentry
.10 Section 06 40 00 – Architectural Woodwork
.11 Section 07 92 00 – Joint Sealant
.12 Section 08 00 00 – Door Schedule
.13 Section 08 11 00 – Metal Doors and Frames
.14 Section 09 00 00 – Interior Finish Material / Colour Legend
.15 Section 09 00 01 – Room Finish Schedule
.16 Section 09 21 16 – Gyspum Board Assemblies
.17 Section 09 30 13 - Ceramic Tile

1.2 REFERENCES

.1 Department of Justice Canada (Jus)
.1 Canadian Environmental Protection Act (CEPA), 1999, c. 33

.2 Environmental Protection Agency (EPA)
.1 EPA Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 - 1995, (for Surface Coatings).

.3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS).

.4 Master Painters Institute (MPI)
.1 MPI Architectural Painting Specifications Manual, 2004.

.5 National Fire Code of Canada - 1995

.6 Society for Protective Coatings (SSPC)
.1 SSPC Painting Manual, Volume Two, 8th Edition, Systems and Specifications Manual.

.7 Transport Canada (TC)
.1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34 .

1.3 QUALITY ASSURANCE

.1 Qualifications:
.1 Contractor: minimum of five years proven satisfactory experience. Provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
.2 Journeymen: qualified journeymen who have "Tradesman Qualification Certificate of Proficiency" engaged in painting work.
.3 Apprentices: working under direct supervision of qualified trades person in accordance with trade regulations.

.2 Mock-Ups:
.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
.1 Provide mm mock-up. Prepare and paint designated surface, area, room or item (in each colour scheme) to specified requirements, with specified paint or coating showing selected colours, gloss/sheen, textures.
.2 Mock-up will be used:
.1 To judge workmanship, substrate preparation, operation of equipment and material application and workmanship to MPI Architectural Painting Specification Manual standards.
.3 Locate where directed
.4 Allow 24 hours for inspection of mock-up before proceeding with work.
.5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

.3 Pre-Installation Meeting:
.1 Convene pre-installation meeting two weeks prior to beginning work of this Section and on-site installations
.1 Verify project requirements.
.2 Review installation and substrate conditions.
.3 Coordination with other building subtrades.

.4 Review manufacturer's installation instructions and warranty requirements.

.4 Health and Safety:
.1 Do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.

1.4 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 maple 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.
.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 and 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.

1.5 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 with Consultant requirements for delivery and storage of extra materials.

1.6 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 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 and recycling in accordance with Section01 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.
.4 Separate for reuse and recycling and place in designated containers Steel Metal Plastic waste.
.5 Place materials defined as hazardous or toxic in designated containers.
.6 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal, regulations.
.7 Ensure emptied containers are sealed and stored safely.
.8 Unused paint coating materials must be disposed of at official hazardous material collections site.
.9 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.

.10 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
.11 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
.12 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground follow these procedures:
.1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
.2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
.3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
.4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.
.5 Empty paint cans are to be dry prior to disposal or recycling (where available).
.13 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
.14 Set aside and protect surplus and uncontaminated finish materials:. Deliver to or arrange collection by, or organizations for verifiable re-use or re-manufacturing.

1.7 SITE CONDITIONS

.1 Heating, Ventilation and Lighting:
.1 Provide heating facilities to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
.2 Provide continuous ventilation for seven days after completion of application of paint.
.3 Provide 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.
.4 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 product manufacturer, perform no painting when:
.1 Ambient air and substrate temperatures are

below 10 degrees C.
.2 Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.
.3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
.4 The relative humidity is under 85 % or when the dew point is more than 3 degrees C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 degrees C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
.5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
.6 Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand 'normal' adverse environmental factors.

.2 Perform painting work when maximum moisture content of the substrate is below:
.1 Allow new concrete and masonry to cure minimum of 28 days.
.2 15 % for wood.
.3 12 % for plaster and gypsum board.

.3 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".

.4 Test concrete, masonry and plaster surfaces for alkalinity as required.

.3 Surface and Environmental Conditions:
.1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
.2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
.3 Apply paint when previous coat of paint is dry or adequately cured.

.4 Additional interior application requirements:
.1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.

.2 Provide paint materials for paint systems from single manufacturer.

.3 Only qualified products with E2 E3 "Environmentally Friendly" rating are acceptable for use on this project.

.4 Conform to latest MPI requirements for interior painting work including preparation and priming.

.5 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.

.6 Linseed oil, shellac, and turpentine: highest quality product from approved manufacturer listed in MPI Architectural Painting Specification Manual, compatible with other coating materials as required.

.7 Provide paint products meeting MPI "Environmentally Friendly", E2 & E3 ratings based on VOC (EPA Method 24) content levels.

2.2 COLOURS

.1 Colour Schedule:
- .1 Refer to Interior Finish Material / Colour Legend 09 00 00
- .2 Refer to Room Finish Schedule 09 00 00.

.2 Selection of colours from manufacturer's full range of colours.

.3 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 MIXING AND TINTING

.1 Perform colour tinting operations prior to delivery of paint to site.

.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.

2.5 INTERIOR PAINTING SYSTEMS

.1 Asphalt surfaces: zone/traffic marking of interior drive and parking areas:
.1 INT 2.1A - Latex zone/traffic marking finish.

.2 Concrete vertical surfaces: including horizontal soffits:
.1 INT 3.1E - Latex G4 Premium Grade
.2 INT 3.1G - Waterborne epoxy (tile-like) finish for smooth

concrete, Premium Grade to be applied in garbage rooms.

.3 Concrete horizontal surfaces: floors and stairs:
.1 INT 3.2B - Alkyd floor enamel low gloss finish for painted concrete floors. Premium grade.
.2 INT 3.2G - Concrete floor sealer for floors indicated to receive finish sealer.
.3 INT 3.2L - Waterborne epoxy floor finish for floors indicated to receive "EPX" finish premium grade.

.4 Concrete masonry units: smooth and split face block and brick:
.1 INT 4.2D - High performance architectural latex G4 Premium grade finish.
.2 INT 4.2K - Waterborne light industrial G5 premium grade to be applied in garbage rooms

.5 Structural steel and metal fabrications: columns, beams, joists:
.1 INT 5.1E Alkyd - G5 premium finish.

.6 Galvanized metal: doors, frames, railings, misc. steel, pipes, overhead decking, and ducts.
.1 INT 5.3B - Waterborne light industrial G5 premium coating.

.7 Dressed lumber: including doors, door and window frames, casings, mouldings:
.1 INT 6.3A - High performance architectural latex G5 premium grade finish for painted wood.
.2 INT 6.3S - Clear fire retardant finish (ULC rated), for fire treated wood.
.3 INT 6.3Z - Clear (2 component) polyurethane finish. Premium grade.

.8 Wood paneling and casework: partitions, panels, shelving, millwork:
.1 INT 6.4J - Polyurethane varnish G4 premium finish.
.2 INT 6.4Y - Clear lacquer G4 premium grade finish.

.9 Spray textured surfaces: ceilings:
.1 INT 9.1B - Latex G2 premium grade finish (over alkyd sealer).

.10 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:
.1 INT 9.2B - High performance architectural latex G2 - all ceilings/bulkheads, G3 within suites, G4 in "public" areas, walls premium grade finish.

.11 Canvas and cotton coverings.

.1 INT 10.1A - Latex G4 premium grade finish.

.12 Bituminous coated surfaces: cast iron pipe, concrete, etc.:
.1 INT 10.2A - Latex G4 premium grade finish.

2.6 SOURCE QUALITY CONTROL

.1 Perform following tests on each batch of consolidated post-consumer material before surface coating is reformulated and canned. Testing by laboratory or facility which has been accredited by Standards Council of Canada.
.1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.
.2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.
.3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 GENERAL

.1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.3 EXAMINATION

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Consultant damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.

.2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

.3 Maximum moisture content as follows:
.1 Stucco, plaster and gypsum board: 12 %.
.2 Concrete: 12 %.
.3 Clay and Concrete Block/Brick: 12 %.
.4 Wood: 15 %.

3.4 PREPARATION

.1 Protection:
.1 Protect existing building surfaces and adjacent structures from paint 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.

.2 Surface Preparation:
.1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.
.2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
.3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of Consultant.

.3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
.1 Remove dust, dirt, and other surface debris by wiping with dry, clean cloths.
.2 Wash surfaces with a biodegradable detergent and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
.3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
.4 Allow surfaces to drain completely and allow to dry thoroughly.
.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 or vacuum cleaning.

.8 Touch up of shop primers with primer as specified.

.9 Do not apply paint until prepared surfaces have been accepted by Paint Manufacturer's Representative

3.5 APPLICATION

.1 Method of application to be as approved by Consultant. Apply paint by brush,roller and 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/ELECTRIC 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: do not 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 disconnect switches for fire alarm system and exit light systems in red enamel.

.9 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.

.10 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 PAINT COLOURS

Paint Colours and Locations:

.1 The work of this section includes painting all exposed wall and ceiling surfaces in all areas of the building unless specifically noted otherwise.
Colours: Refer to Finish Schedule Color Legend & Interiors Package

3.8 FIELD QUALITY CONTROL

.1 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 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.

.2 Advise Consultant when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.

.3 Cooperate with inspection firm and provide access to areas of work.

.4 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Consultant.

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 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry
.2 Section 06 20 00 - Finish Carpentry
.3 Section 06 40 00 - Architectural Woodwork
.4 Division 26 - Electrical

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)
.1 ASTM A 53/A 53M-02, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
.2 ASTM A 307-02, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.
.2 CAN/CGSB-1.181-92, Ready-Mixed, Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA International)
.1 CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel.
.2 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
.3 CAN/CSA-S16.1-01, Limit States Design of Steel Structures.
.4 CSA W48-01, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
.5 CSA W59-1989(R2001),Welded Steel Construction (Metal Arc Welding) (Imperial Version).

.4 The Environmental Choice Program
.1 CCD-047a-98, Paints, Surface Coatings.
.2 CCD-048-98, Surface Coatings - Recycled Water-borne.

1.3 SUBMITTALS

.1 Product Data:
.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
.1 For finishes, coatings, primers and paints.

.2 Shop Drawings
.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
.2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
.3 Each shop drawing submitted shall bear the stamp and signature of a qualified Professional Engineer registered in the Province of Ontario.

.3 Submit Contractor's Engineer certificate/ written report, within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL. Certificate/report shall be stamped and signed by qualified professional engineer registered in the province of Ontario.

1.4 QUALITY ASSURANCE

.1 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

.4 Site Meetings: as part of Contractor's Services as 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 DELIVERY, STORAGE, AND HANDLING

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

.2 Storage and Protection:
.1 Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.
.2 Leave protective covering in place until final cleaning of

building. Provide instructions for removal of protective covering.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials 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.

.4 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

PART 2 - PRODUCTS

2.1 MATERIALS .1

.2

.3

.4

PART 3 - EXECUTION

3.1 INSTALLATION .1 Install all items listed under Part 2 of this Section and as indicated on drawings as per the reviewed shop drawings and manufacturer's written instructions.

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

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Supply and install of accessories as specific in this Section.

1.2 RELATED SECTIONS

.1 Section 01 74 21- Construction Waste Management and Disposal
.2 Section 01 78 00 – Closeout Procedures
.3 Section 06 10 00 – Rough Carpentry
.4 Section 09 21 16 – Gypsum Board Assemblies
.5 Section 09 22 16 – Non-structural metal Framing
.6 Section 09 30 13 – Ceramic Tiling
.7 Section 10 28 10 – Toilet & Bath Accessories

1.3 REFERENCES

.1 ASTM International
.1 ASTM A167-90 Specification for Stainless and Heat-Resisting Chromium-Nicket Steel Plate, Sheet, and Strip.
.2 ASTM A526M-90 Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality

.2 Canadian General Standards Board (CGSB)
.1 CAN/CSA-B651-M90 Barrier-Free Design

1.4 SUBMITTALS

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

.2 Shop Drawings:
.1 Indicate fabrication details, plans, elevations, hardware, and installation details.

.3 Product Data:
.1 Submit (2) copies of product sheets and/or catalogue cuts, of all products listed in the shop drawings.

.4 Samples:
.1 Submit (2) copies of colour sample on actual substrate (metal) for consultant review and approval prior to commencing work.

1.5 SCOPE

.1 Supply complete toilet partition package with all required parts, accessories and filler panels to suit existing partition configuration in Men’s WR 107 & Women’s WR 109.

1.6 DELIVERY, STORAGE AND HANDLING

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

.2 Protect finished metal surfaces during shipment and installation. Do not remove until immediately prior to final inspection.

.3 Toilet Partitions must be delivered to the job site in the manufacturer's original packages and marked to correspond with the approved shop drawings.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials.

.2 Collect and separate for disposal paper, plastic, corrugated cardboard packaging material in appropriate on-site bins for recycling.

.3 Unused sealant and adhesive material must be disposed of at an official hazardous material collection site.

.4 Fold up metal banding, flatten and place in designated area for recycling.

.5 Do not dispose of unused sealant and adhesive material in sewer system, into streams, lakes, onto ground or in any other location where it will pose health or environmental hazard.

1.8 WARRANTY

.1 Written Guarantee:

.1 The toilet partition manufacturer shall guarantee all toilet partitions by written certification, for a period of (3) years from date of receipt by customer, against any defects in design, materials and workmanship.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Metal Toilet Partitions:

.1 Headrail Braced toilet partitions to match existing layouts. Site confirm dimensions.

.2 Manufacturer: Acceptable manufacturer's shall be Hadrian Manufacturing Inc.

2.2 COMPONENTS AND FABRICATION

.1 Construction: Doors, panels and pilasters shall be constructed of two sheets of panel flatness zinc-coated steel, Galvanneal ASTM A653 GR33, laminated under pressure to a honeycomb core for sound deadening and rigidity. Formed edges to be welded together and inter-locked under tension with a

roll-formed oval crown locking bar, mitred, welded and ground smooth at the corners. Honeycomb to have a maximum 25mm (1") cell size.

.2 Doors: Shall be 25mm (1") thick with cover sheets not less than 22-gauge (0.8mm).

.3 Panels: Shall be 25mm (1") thick with cover sheets not less than 22-gauge (0.8mm).

.4 Pilasters: Shall be 32mm (1.25") thick with cover sheets not less than 20-gauge (0.9mm). Pilaster tops shall be reinforced with a 20-gauge channel to create extra strength and twist-free rigidity along with minimizing damage by handling and/or shipping.

.5 Headrail: Shall be 25mm (1") by 41mm (1.625") extruded anodized aluminum with double-ridge anti-grip design. Wall thickness to be 1.5mm (0.060") and shall be securely attached to wall and pilasters with manufacturer's fittings in such a way as to make a strong and rigid installation. All joints in headrails shall be made at pilaster.

.6 Hardware and Fittings: All panel and pilaster brackets and all door hardware shall be chrome plated zinc die castings. Fasteners are zinc plated 12 x 1-3/4" and 12 x 5/8" TR-27 6-lobe security screws. Doors shall be equipped with a gravity type hinge mounted on the lower pilaster hinge bracket. Door hinges shall be fully concealed within the thickness of the door and adjustable to permit the door to come to rest at any position when not latched. Each door to be fitted with a combined coat hook and bumper and a concealed latch, with face mortised flush with edge strip of door. Barrier-free doors shall include thumbturn lever to activate latch without fingertip grip application. Both standard and barrier-free latches shall have a turn slot designed to allow emergency access from exterior. The combined stop and keeper shall have a 19mm (0.75") diameter bumper locked in place. Threaded upper hinge pin shall have a metal core and self-lubricating nylon sleeve to ensure smooth, quiet operation. Pilaster shoes shall be a welded one-piece design made from polished stainless steel. Two-piece shoes that can disassemble when kicked are unacceptable.

2.3 FINISH

.1 All sheet metal to be thoroughly cleaned, phosphate and finished with a high performance powder coating, electrostatically applied and oven cured to provide a uniform, smooth protective finish.

.2 Colour: As selected by interior designer

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Site Preparation:
.1 The contractor must examine all site conditions that would prevent the proper application and installation of toilet partitions. Any defects must be immediately identified and corrected, prior to the installation of the toilet partitions.

3.2 INSTALLATION

.1 Mounting Locations:
.1 All toilet partitions must be mounted according Manufacturers standard locations and those specified on the drawings.
.2 All wall-mounted screens to be mounted as specified on drawings.

3.3 FIELD QUALITY CONTROL

.1 Inspection:
.1 After installation has been completed, provide for a site inspection of all toilet partitions to determine that all items have been supplied and installed as per the enclosed details. Also, check the operation and adjustment of all toilet partitions. Any discrepancies, or malfunctioning product, must be reported to the consultant immediately.

3.4 ADJUSTMENT AND CLEANING

.1 Final Preparation:
.1 At final completion, toilet partitions shall be left clean and free from disfigurement. Make all final adjustments. Where toilet partitions are found defective, repair or replace or otherwise correct as directed.

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

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

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21-Construction/ Demolition Waste Management and Disposal.
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PROTECTION

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

.2 Repair damage to adjacent materials caused by toilet partitions and wall-mounted screens installation.

3.6 SCHEDULE

.1 Schedule

.1 Provide toilet partitions as specified in all above sections and as per the drawings.

END OF SECTION