PROJECT SPECIFICATIONS

PROJECT

FORT MALDEN – SERVICE BUILDING ADDITION
100 LAIRD AVE,
AMHERSTBURG, ONTARIO

OWNER

PARKS CANADA AGENCY
Southwestern Ontario Field Unit

Issued for Tender: November 23, 2016

END OF SECTION

PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises the interior alterations and an addition to the service building located at 100 Laird Ave, Amherstburg, ON. This project is essential for all existing exterior features to remain. Consequently, standards for visual aesthetics of final product shall be of a quality standard. Contract limits shall be strictly adhered to and Contractor is to take special care to minimize damage and disruption and protect existing features. The Departmental Representative is to be notified immediately if any historic or natural resources are located during construction.

1.2 CONTRACT METHOD

.1

1.3 WORK SEQUENCE

.1 Construct Work in stages to accommodate Parks Canada Agency (PCA) to continued use of premises during construction.

.2 Co-ordinate Progress Schedule and co-ordinate with Owner Occupancy during construction.

.3 Maintain fire access/control.

1.4 CONTRACTOR USE OF PREMISES

.1 Limit use of premises for Work,and for access, to allow:
- .1 PCA occupancy.
- .2 Partial owner occupancy.
- .3 Public usage.

.2 Co-ordinate use of premises under direction of Departmental Representative or designate.

.3 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

.4 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.

.5 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Consultant.

.6 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.5 PCA OCCUPANCY

.1 PCA will occupy premises during entire construction period for execution of normal operations.

.2 Co-operate with PCA in scheduling operations to minimize conflict and to facilitate PCA usage.

1.6 PCA FURNISHED ITEMS

.1 PCA Responsibilities:

.1 Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions, and certificates to Contractor.

.2 Deliver supplier's bill of materials to Contractor.

.2 Contractor Responsibilities:

.1 Designate submittals and delivery date for each product in progress schedule.

.2 Review shop drawings, product data, samples, and other submittals. Submit to Departmental representative notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.

.3 Receive and unload products at site.

.4 Inspect deliveries jointly with Pca; record shortages, and damaged or defective items.

.5 Handle products at site, including uncrating and storage.

.6 Protect products from damage, and from exposure to elements.

.7 Assemble, install, connect, adjust, and finish products.

.8 Provide installation inspections required by public authorities.

.9 Repair or replace items damaged by Contractor or subcontractor on site (under his control).

1.7 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

.1 Execute work with least possible interference or disturbance to building operations and occupants, public and normal use of premises.

1.8 EXISTING SERVICES

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

.2 Where Work involves breaking into or connecting to existing services, give PCA 48 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to site operations.

.3 Provide alternative routes for pedestrian and vehicular traffic.

1.8 EXISTING SERVICES (Cont'd)

.4 Establish location and extent of service lines in area of work before starting Work. Notify Departmental representative of findings.

.5 Submit schedule to and obtain approval from Departmental representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.

.6 Provide temporary services when directed by Departmental representative to maintain critical building and tenant systems.

.7 Where unknown services are encountered, immediately advise Departmental representative and confirm findings in writing.

.8 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

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

1.9 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each document as follows:

- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Reviewed Shop Drawings.
- .5 List of Outstanding Shop Drawings.
- .6 Change Orders.
- .7 Other Modifications to Contract.
- .8 Field Test Reports.
- .9 Copy of Approved Work Schedule.
- .10 Health and Safety Plan and Other Safety Related Documents.
- .11 Other documents as specified.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 ACCESS AND EGRESS

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

1.2 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative or designate to facilitate work as stated.

.2 Maintain existing services to building and provide for personnel and vehicle access.

.3 Where security is reduced by work provide temporary means to maintain security.

.4 Departmental Representative or designate will assign sanitary facilities for use by Contractor's personnel. Keep facilities clean.

.5 Closures: protect work temporarily until permanent enclosures are completed.

1.3 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

.1 Execute work with least possible interference or disturbance to site and other building operations occupants, public and normal use of premises. Arrange with Departmental Representative or designate to facilitate execution of work.

1.4 EXISTING SERVICES

.1 Notify, Departmental Representative or designate and utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, give Departmental Representative or designate 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.

.3 Provide for personnel and vehicular traffic.

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

1.5 SPECIAL REQUIREMENTS

.1 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.2 Keep within limits of work and avenues of ingress and egress.

1.6 BUILDING SMOKING ENVIRONMENT

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

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 ADMINISTRATIVE

.1 Schedule and administer project meetings throughout the progress of the work and at the call of Departmental Representative.

.2 Prepare agenda for meetings.

.3 Distribute written notice of each meeting four days in advance of meeting date to Departmental Representative

.4 Provide physical space and make arrangements for meetings.

.5 Preside at meetings.

.6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.

.7 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants and,affected parties not in attendance.

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

1.2 PRECONSTRUCTION MEETING

.1 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 Departmental Representative, 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 submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.

.3 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.

1.2 PRECONSTRUCTION MEETING (Cont'd)

.5 (Cont'd)

.4 Delivery schedule of specified equipment

.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 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 2 weeks prior to project completion, schedule progress meetings every two weeks.

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

.3 Notify parties minimum 7 days prior to meetings.

.4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 3 days after meeting.

.5 Agenda to include the following:

.1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

.3 Field observations, problems, conflicts.

.4 Problems which impede construction schedule.

.5 Review of off-site fabrication delivery schedules.

.6 Corrective measures and procedures to regain projected schedule.

.7 Revision to construction schedule.

.8 Progress schedule, during succeeding work period.

.9 Review submittal schedules: expedite as required.

.10 Maintenance of quality standards.

.11 Review proposed changes for affect on construction schedule and on completion date.

.12 Other business.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 ADMINISTRATIVE

.1 Submit to Departmental Representative or designate 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 completed and approval in writing is issued from Departmental Representative.

.3 Present shop drawings, product data, samples and mock-ups in Metric units.

.4 Where items or information is not produced in IM imperial units converted values are acceptable.

.5 Review submittals prior to submission to Departmental Representative or designate. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Departmental Representative or designate, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent Work are co-ordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative or designates review.

.10 Keep one approved copy of each submission on site.

.11 Submit number of hard copies specified for each type and format of submittal and also submit in electronic format as pdf files. Forward pdf files on CD or through email.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

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

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow 7 working days for Departmental Representative or designates review of each submission.

.5 Adjustments made on shop drawings by Departmental Representative or designate are not intended to change Contract Amount. If adjustments affect value of Work, state such in writing to Departmental Representative or designate prior to proceeding with Work.

.6 Make changes in shop drawings as Departmental Representative or designate may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative or designate in writing of revisions other than those requested.

.7 Accompany submissions with transmittal letter, in duplicate, containing:
- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.8 Submissions shall 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.

1.2 SHOP DRAWINGS AND PRODUCT DATA (Cont'd)

.8 (Cont'd)

.5 (Cont'd)

.3 Setting or erection details.
.4 Capacities.
.5 Performance characteristics.
.6 Standards.
.7 Operating weight.
.8 Wiring diagrams.
.9 Single line and schematic diagrams.
.10 Relationship to adjacent work.

.9 After Departmental Representative or designate's review and approval, distribute copies.

.10 Submit three hard copies and one electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative or designate may reasonably request.

.11 Submit three hard copies and one electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative or designate where shop drawings will not be prepared due to standardized manufacture of product.

.12 Submit three hard copies and one electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative or designate.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.2 Testing must have been within 3 years of date of contract award for project.

.13 Submit three hard copies and one electronic copy of certificates for requirements requested in specification Sections and as requested by Departmental Representative or designate.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract complete with project name.

.14 Submit three hard copies and one electronic copy of manufacturers instructions for requirements requested in specification Sections and as requested by Departmental Representative or desingate.

.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.

1.2 SHOP DRAWINGS AND PRODUCT DATA (Cont'd)

.15 Submit three hard copies and one electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative or designate.

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

.17 Submit three hard copies and one electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative or designate.

.18 Delete information not applicable to project.

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

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

.21 The review of shop drawings by Parks Canada Agency (PCA) / Asset Management and Project Delivery (AMPD) is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that PCA/AMPD approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.3 SAMPLES

.1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to Departmental Representative or designates business address.

.3 Notify Departmental Representative or designate 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.

1.3 SAMPLES (Cont'd)

.5 Adjustments made on samples by Departmental Representative or designate are not intended to change Contract Amount. If adjustments affect value of Work, state such in writing to Departmental Representative or designate prior to proceeding with Work.

.6 Make changes in samples which Departmental Representative or designate may require, consistent with Contract Documents.

.7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.4 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic copy of colour digital photography in jpg format, fine resolution monthly with progress statement and as directed by Departmental Representative or deisgnate.

.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 Departmental Representative or designate.

.4 Frequency of photographic documentation: weekly monthly as directed by Departmental Representative.
.1 Upon completion of: framing and services before concealment, of Work, and as directed by Departmental Representative or designate.

1.5 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Safety and Insurance Board Experience Report.

.2 Submit transcription of insurance immediately after award of Contract.

1.6 FEES, PERMITS AND CERTIFICATES

.1 Provide authorities having jurisdiction with information requested.

.2 Pay fees and obtain certificates and permits required.

.3 Furnish certificates and permits.

.4 Submit acceptable certificate stating that suspended ceiling systems provide adequate support for electrical fixtures, as required by current bulletin of Electrical Inspection Department of Ontario Hydro.

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 Standards Association (CSA): Canada
.1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.

.2 National Building Code 2010 (NBC):
.1 NBC 2010, Division B, Part 8 Safety Measures at Construction and Demolition Sites.

.3 National Fire Code 2010 (NFC):
.1 NFC 2010, Division B, Part 5 Hazardous Processes and Operations, subsection 5.6.1.3 Fire Safety Plan.

.4 Province of Ontario:
.1 Occupational Health and Safety Act Revised Statutes of Ontario 1990, Chapter O.1 as amended, and Regulations for Construction Projects, O. Reg. 213/91 as amended.
.2 O. Reg. 490/09, Designated Substances.
.3 Workplace Safety and Insurance Act, 1997.
.4 Municipal statutes and authorities.

.5 Treasury Board of Canada Secretariat (TBS):
.1 Treasury Board, Fire Protection Standard April 1, 2010 www.tbs-sct.gc.ca/pol/doc-eng.aspx ?id=17316&section=text.

.6 Fire Commissioner of Canada (FCC):
.1 FC-301 Standard for Construction Operations, June 1982.
.2 FC-302 Standard for Welding and Cutting, June 1982.

Human Resources and Social Development C
Labour Program
Fire Protection Engineering Services
4900 Yonge Street North York
Ontario 2N8 6A8

and copies may be obtained from:

Human Resources and Social Development C
Labour Program
Fire Protection Engineering Services
Ottawa, Ontario K1A 0J2

1.2 SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00.

1.2 SUBMITTALS (Cont'd)

.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 operations found in work plan.

.3 Measures and controls to be implemented to address identified safety hazards and risks.

.4 Provide a Fire Safety Plan, specific to the work location, in accordance with NBC, Division B, Article 8.1.1.3 prior to commencement of work. The plan shall be coordinated with, and integrated into, the existing Building, and Evacuation Plan in place at the site. Departmental Representative or designate will provide Building, Facility, Tenant's Emergency Procedures and Evacuation Plan. Deliver two copies of the Fire Safety Plan to the Departmental Representative not later than 14 days before commencing work.

.5 Contractor's and Sub-contractors' Safety Communication Plan.

.6 Contingency and Emergency Response Plan addressing standard operating procedures specific to the project site to be implemented during emergency situations. Coordinate plan with existing Building, Facility, Tenant's Emergency Response requirements and procedures provided by Departmental Representative or designate.

.3 Departmental Representative or designates 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.

.4 Submit names of personnel and alternates responsible for site safety and health.

.5 Submit records of Contractor's Health and Safety meetings when requested.

.6 Submit copies of orders, directions or reports issued by health and safety inspectors of the authorities having jurisdiction.

.7 Submit copies of incident and accident reports.

.8 Submit Material Safety Data Sheets (MSDS).

.9 Submit Workplace Safety and Insurance Board (WSIB)- Experience Rating Report.

1.3 FILING OF NOTICE

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

1.4 WORK PERMIT	.1	Obtain building permits related to project prior to commencement of Work.
1.5 SAFETY ASSESSMENT	.1	Perform site specific safety hazard assessment related to project.
1.6 MEETINGS	.1	Schedule and administer Health and Safety meeting with Departmental Representative or designate prior to commencement of Work.
1.7 REGULATORY REQUIREMENTS	.1	Comply with the Acts and regulations of the Province of Ontario.
	.2	Comply with specified standards and regulations to ensure safe operations at site.
1.8 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	Departmental Representative or designate may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns either accepting or requesting improvements.
	.3	Relief from or substitution for any portion or provision of minimum Health and Safety standards specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative or designate in writing.
1.9 COMPLIANCE REQUIREMENTS	.1	Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990 Chapter 0.1, as amended.
1.10 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.

1.10 RESPONSIBILITY (Cont'd)

.3 Where applicable the Contractor shall be designated "Constructor", as defined by Occupational Health and Safety Act for the Province of Ontario.

1.11 UNFORSEEN HAZARDS

.1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, immediately stop work and advise Departmental Representative or designate verbally and in writing.

.2 Follow procedures in place for Employees Right to Refuse Work as specified in the Occupational Health and Safety Act for the Province of Ontario.

1.12 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 abatement of lead and asbestos containing materials.

.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.

1.13 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 of Ontario, and in consultation with Departmental Representative.

.1 Contractor's Safety Policy.

.2 Constructor's Name.

.3 Notice of Project.

.4 Name, trade, and employer of Health and Safety Representative or Joint Health and Safety Committee members (if applicable).

.5 Ministry of Labour Orders and reports.

.6 Occupational Health and Safety Act and Regulations for Construction Projects for Province of Ontario.

.7 Address and phone number of nearest Ministry of Labour office.

.8 Material Safety Data Sheets.

.9 Written Emeregency Response Plan.

.10 Site Specific Safety Plan.

.11 Valid certificate of first aider on duty.

.12 WSIB "In Case of Injury At Work" poster.

.13 Location of toilet and cleanup facilities.

1.14 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative or designate.

.2 Provide Departmental Representativeor designate with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Departmental Representative or designate may stop Work if non-compliance of health and safety regulations is not corrected.

1.15 WORK STOPPAGE

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

.2 Assign responsibility and obligation toHealth and Safety Coordinator to stop or start Work when, at Health and Safety Coordinator's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative or designate may also stop Work for health and safety considerations.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Definitions:

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

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

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

.2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 43 - Environmental Procedures.

.3 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative.

.4 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.

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

.6 Include in Environmental Protection Plan:

.1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.

.2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.

.3 Names and qualifications of persons responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

1.2 ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)

.6 (Cont'd)

.5 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations and EPA 832/R-92-005, Chapter 3.

.6 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.

.7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.

.1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.

.8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.

.1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.

.9 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.

.12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.13 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.

.14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.

.15 Pesticide treatment plan to be included and updated, as required.

1.3 FIRES

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

1.4 SITE AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties as indicated.

.2 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m minimum.

.3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.

.1 Avoid unnecessary traffic, dumping and storage of materials over root zones.

.4 Minimize stripping of topsoil and vegetation.

1.5 POLLUTION CONTROL

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

.2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.

.3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.

.1 Provide temporary enclosures where directed by Departmental Representative.

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

1.6 NOTIFICATION

.1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.

.2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.

.1 Take action only after receipt of written approval by Departmental Representative.

.3 Departmental Representativewill issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 CLEANING

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

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

.2 Bury rubbish and waste materials on site where directed after receipt of written approval from Departmental Representative.

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

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

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES AND CODES

.1 Perform Work in accordance with National Building Code of Canada (NBC) 2010, National Fire Code of Canada (NFC) 2010 and Ontario Building Code (OBC) 2012, including all amendments up to bid closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:
- .1 Contract documents.
- .2 Specified standards, codes and referenced documents.

.3 Standards and guidelines for 'Conservation of Historic Places in Canada' Second Edition

1.2 HAZARDOUS MATERIAL DISCOVERY

.1 Stop work immediately and notify Departmental Representative or designate if materials which may contain designated substances or PCB's are discovered in course of work.

1.3 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions.

1.4 IAQ - INDOOR AIR QUALITY

.1 Comply with CSA-Z204-94(R1999), Guideline for Managing Indoor Air Quality in Office Buildings.

1.5 ACCESSIBLE DESIGN

.1 Comply with CAN/CSA-B651-04(R2010), Accessible Design for the Built Environment, unless specified otherwise. In any case of conflict or discrepancy between the building codes and CAN/CSA-B651, the requirements of CAN/CSA-B651 shall apply.

1.6 STATISTICAL INFORMATION

.1 Provide statistical information to Departmental Representative:
- .1 Within ten working days after March 31 and September 30 occurring between commencement of work and final completion
- .2 Within ten working days after final completion.

.2 Include in statistical information:
- .1 Statement of total person days of labour used on site in performance of contract, including labour provided under sub-contracts.

1.6 STATISTICAL INFORMATION (Cont'd)

.2 (Cont'd)

.2 Estimate of total value in dollars of material delivered to site and installed, including material provided and installed under sub-contracts.

.3 This information is required by Government of Canada solely to provide statistics that will aid in assessing socio-economic benefits of this project.

1.7 TAXES

.1 Pay applicable Federal, Provincial and Municipal taxes.

1.8 EXAMINATION

.1 Examine existing conditions and determine conditions affecting work.

.2 Conduct concrete floor moisture testing using Calcium Chloride moisture tests.

.1 Submit test results to Departmental Representative for approval prior to installing any flooring. Conduct one test per 100 m^2 of area being covered.

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 General

.1 Departmental Representative or designate will engage as required, independent inspection/testing agencies for purpose of quality assurance only, that is, verify contractor control process for construction materials, workmanship, environmental protection, waste disposal, etc. quality control. Employment of inspection/testing agencies does not relax responsibility to perform work in accordance with contract documents.

1.2 SECTION INCLUDES

.1 Inspection and testing, administrative and enforcement requirements.

.2 Tests and mix designs.

.3 Mill tests.

.4 Equipment and system adjust and balance.

1.3 INSPECTION

.1 Allow Departmental Representative or designate access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative or designate instructions, or law of Place of Work.

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

.4 Departmental Representative or designate may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

1.4 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.4 ACCESS TO WORK (Cont'd)

.2 Co-operate to provide reasonable facilities for such access.

1.5 PROCEDURES

.1 Notify appropriate agency and Departmental Representative or designate 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 an orderly sequence so as not to cause delay 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.

1.6 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative or designate as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of Departmental Representative or designate it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative may deduct from Contract Amount difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Departmental Representative or designate.

1.7 REPORTS

.1 Submit 4 copies of inspection and test reports to Departmental Representative.

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

1.8 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as may be requested.

.2 The cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work shall be appraised by Departmental Representative or designate and may be authorized as recoverable.

1.8 TESTS AND MIX DESIGNS (Cont'd)	.2	The cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work shall be appraised by Departmental Representative or designate and may be authorized as recoverable.
1.9 MILL TESTS	.1	Submit mill test certificates as required of specification Sections.
1.10 EQUIPMENT AND SYSTEMS	.1	Submit testing, adjusting and balancing reports for mechanical, electrical and building equipment systems.

PART 2 - PRODUCTS

2.1 NOT USED	.1	Not Used.

PART 3 - EXECUTION

3.1 NOT USED	.1	Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Temporary utilities.

1.2 RELATED SECTIONS

.1 Section 01 52 00 - Construction Facilities.

.2 Sectin 01 56 00 - Temporary Barriers and Enclosures.

1.3 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

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 WATER SUPPLY

.1 Provide continuous supply of potable water for construction use.

.2 Arrange for connection with appropriate utility company and pay all costs for installation, maintenance and removal.

.3 Pay for utility charges at prevailing rates.

1.6 TEMPORARY HEATING AND VENTILATION

.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

.2 Construction heaters used inside building must be vented to outside or be non-flame 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°C in areas where construction is in progress.

1.6 TEMPORARY HEATING AND VENTILATION (Cont'd)

.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, may 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.

.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 Departmental Representative or designate.

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

.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.

1.7 TEMPORARY POWER AND LIGHT

.1 Provide and pay for temporary power during construction for temporary lighting and operating of power tools.

.2 Arrange for connection with appropriate utility company. Pay all costs for installation, maintenance and removal.

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

1.7 TEMPORARY POWER AND LIGHT (Cont'd)

.4 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Departmental Representative or designate provided that guarantees are not affected. Make good damage to electrical system caused by use under this Contract. Replace lamps which have been used for more than 3 months.

1.8 FIRE PROTECTION

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

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

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Construction aids.

.2 Office and sheds.

.3 Parking.

.4 Project identification.

1.2 REFERENCE

.1 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.189-2000, Exterior Alkyd Primer for Wood.
- .2 CAN/CGSB-1.59-97, Alkyd Exterior Gloss Enamel.

.2 Canadian Standards Association (CSA International)
- .1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2 CAN/CSA-Z321-96(R2006), Signs and Symbols for the Occupational Environment, withdrawn but still available from CSA, CCOHS and Techstreet.

.3 Standards and guidelines for 'Conservation of Historic Places in Canada' 2nd Edition

1.3 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

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 SITE STORAGE/LOADING

.1 Confine work and operations of employees to areas defined by Contract Documents. Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

1.6 CONSTRUCTION PARKING

.1 Parking will be permitted on site provided it does not disrupt performance of Work or Site Operations.

.2 Provide and maintain adequate access to project site.

.3 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.

.4 Clean construction runways and taxi areas where used by Contractor's equipment.

1.7 SECURITY

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

1.8 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in a 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 a manner to cause least interference with work activities.

1.9 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.10 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.

.2 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

1.10 PROTECTION AND MAINTENANCE OF TRAFFIC (Cont'd)

.3 Protect travelling public from damage to person and property.

.4 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

.5 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.6 Construct access and haul roads necessary.

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

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

.9 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.

1.11 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.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Barriers.

.2 Environmental Controls.

.3 Traffic Controls.

.4 Fire Routes.

1.2 RELATED SECTIONS

.1 Section 01 51 00 - Temporary Utilities.

.2 Section 01 52 00 - Construction Facilities.

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB):
- .1 CAN/CGSB-1.189-2000, Exterior Alkyd Primer for Wood.
- .2 CAN/CGSB-1.59-97, Alkyd Exterior Gloss Enamel.

.2 Canadian Standards Association (CSA):
- .1 CSA-O121-08, Douglas Fir Plywood.

1.4 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.5 HOARDING

.1 Erect temporary site enclosure using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2. m o.c. Provide one lockable truck gate. Maintain fence in good repair.

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

1.6 DUST TIGHT SCREENS

.1 Provide dust tight screens partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.

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

1.7 ACCESS TO SITE

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

1.8 PUBLIC TRAFFIC FLOW

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

1.9 FIRE ROUTES

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

1.10 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

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

.2 Be responsible for damage incurred.

1.11 PROTECTION OF BUILDING FINISHES

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with Departmental Representative or designate locations and installation schedule 3 days prior to installation.

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

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Product quality, availability, storage, handling, protection, and transportation.

.2 Manufacturer's instructions.

.3 Quality of Work, coordination and fastenings.

.4 Existing facilities.

1.2 RELATED SECTIONS

.1 Section 01 45 00 - Quality Control.

1.3 REFERENCES

.1 Within text of specifications, reference may be made to reference standards.

.2 Conform to these standards, in whole or in part as specifically requested in specifications.

.3 If there is question as to whether any product or system is in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.

.4 The cost for such testing will be born by Owner in event of conformance with Contract Documents or by Contractor in event of non-conformance.

.5 Conform to latest date of issue of referenced standards in effect on date of submission of Bids, except where specific date or issue is specifically noted.

1.4 QUALITY

.1 Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of Products provided.

.2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

1.4 QUALITY (Cont'd)

.3 Should any dispute arise as to quality or fitness of products, decision rests strictly with Departmental Representative or designate based upon requirements of Contract Documents.

.4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.5 AVAILABILITY

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of products are foreseeable, notify Departmental Representative or designate 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 Departmental Representative or desigante at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative or designate reserves right to substitute more readily available products of similar character, at no increase in Contract Amount or Contract Time.

1.6 METRIC SIZED MATERIALS

.1 The Contractor is required to provide products in the sizes called for in the Contract Documents except where a valid claim can be made that a particular product is not available on the Canadian market.

.2 Claims for exemptions from use of metric sized products shall be in writing and fully substantiated with supportive documentation. Promptly submit application to Departmental Representative or designate for consideration and ruling. Non- imperail sized products may not be used unless Contractor's application has been approved in writing by the Departmental Representative or designate.

.3 Difficulties caused by the Contractor's lack of planning and effort to obtain modular sized products which are available on the Canadian market will not be considered sufficient reasons for claiming that they cannot be provided.

.4 Claims for additional costs due to provision of specified modular metric sized products will not be considered.

1.7 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.

1.7 STORAGE, HANDLING AND PROTECTION (Cont'd)

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative or designate.

.9 Touch-up damaged factory finished surfaces to Departmental Representative or designates satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.8 TRANSPORTATION

.1 Pay costs of transportation of products required in performance of Work.

1.9 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 Departmental Representative or designate in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative or designate may establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative or designate to require removal and re-installation at no increase in Contract Amount or Contract Time.

1.10 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 Departmental Representative or designate if required Work is such as to make it impractical to produce required results.

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

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

1.11 CO-ORDINATION

.1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.12 CONCEALMENT

.1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation, inform Departmental Representative or designate if there is interference. Install as directed by Departmental Representative.

1.13 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.

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

1.14 LOCATION OF FIXTURES

.1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.

.2 Inform Departmental Representative or designate of conflicting installation. Install as directed.

1.15 FASTENINGS

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

1.15 FASTENINGS (Cont'd)

.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.

1.16 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.

1.17 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of any part of building. Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated without written approval of Departmental Representative.

1.18 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.

.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 2-94, Stipulated Price Contract.

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

1.2 EXISTING SERVICES

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

.2 Remove abandoned service lines within 2m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.

1.3 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 Departmental Representative 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 Departmental Representative.

1.4 RECORDS

.1 Maintain a complete, accurate log of control and survey work as it progresses.

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

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00.

.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 PCA 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 PCA 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.

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 to complete Work.

.2 Fit several parts together, to integrate with other Work.

1.4 EXECUTION (Cont'd)

.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 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.

.8 Restore work with new products in accordance with requirements of Contract Documents.

.9 Submit proposed materials, finishes and installation method for patching to Departmental Representative for approval, prior to patching.

.10 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

.11 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.12 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material full thickness of the construction element.

.13 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Progressive cleaning.

.2 Final cleaning.

1.2 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by PCA or other Contractors.

.2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative or designate. Do not burn waste materials on site.

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

.4 Provide on-site containers for collection of waste materials and debris.

.5 Remove waste material and debris from site at end of each working day.

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

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

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

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

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

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

1.3 FINAL CLEANING (Cont'd)

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

.4 Remove waste products and debris other than that caused by PCA or other Contractors.

.5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative or designate. Do not burn waste materials on site.

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

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

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

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

.10 HEPA vacuum clean and dust building interiors, behind grilles, louvres and screens.

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

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

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

.14 Remove dirt and other disfiguration from exterior surfaces.

.15 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment.

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

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

1 GENERAL

1.01 WASTE MANAGEMENT GOALS

.1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss PCA's waste management goal and Contractor's proposed Waste Reduction Workplan for Construction, Renovation and /or Demolition (CRD) waste to be project generated.

.2 PCA's waste management goal: to divert a minimum 75 percent of total Project Waste from landfill sites. Prior to project completion provide Departmental Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.

.3 Specific material target percentages for reuse and/or recycling:
- .1 Ceilings and walls: %.
- .2 Metals:%.
- .3 Mechanical - HVAC: 100%.
- .4 Mechanical - plumbing piping: 100%.
- .5 Mechanical - fixtures: 100%.
- .6 Mechanical - other: 100%.
- .7 Wood 100:%.
- .8 Finish carpentry and millwork: 100%.
- .9 Electrical - wiring/conduits/boxes: 100%.
- .10 Electrical - lighting:100%.
- .11 Electrical - other:100%.
- .12 Packaging:100%.

.4 Target percentage goals are achievable for waste diversion. Contractor to review and confirm Departmental Representative's Waste Audit acceptable values.

.5 Minimize amount of non-hazardous solid waste generated by project and accomplish maximum source reduction, reuse and recycling of solid waste produced by CRD activities.

.6 Protect environment and prevent environmental pollution damage.

1.02 REFERENCES

.1 Definitions:
- .1 Approved/Authorized recycling facility: waste recycler approved by applicable provincial authority or other users of material for recycling approved by the Departmental Representative.
- .2 Class III: non-hazardous waste - construction renovation and demolition waste.
- .3 Construction, Renovation and/or Demolition (CRD) Waste: Class III solid, non-hazardous waste materials generated during construction, demolition, and/or renovation activities
- .4 Cost/Revenue Analysis Workplan (CRAW): based on information from Waste Reduction Workplan, and intended as financial tracking tool for determining economic status of waste management practices (Schedule E).
- .5 Inert Fill: inert waste - exclusively asphalt and concrete.
- .6 Waste Source Separation Program (WSSP): implementation and co-ordination of ongoing activities to ensure designated waste materials will be sorted into pre-defined categories and sent for recycling and reuse, maximizing diversion and potential to reduce disposal costs.
- .7 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.

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

.9 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.

.10 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.

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

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

.13 Source Separation: act of keeping different types of waste materials separate beginning from the point they became waste.

.14 Waste Audit (WA): detailed inventory of estimated quantities of waste materials that will be generated during construction, demolition, deconstruction and/or renovation. Involves quantifying by volume/weight amounts of materials and wastes that will be reused, recycled or landfilled. Refer to Schedule A.

.15 Waste Diversion Report: detailed report of final results, quantifying cumulative weights and percentages of waste materials reused, recycled and landfilled over course of project. Measures success against Waste Reduction Workplan (WRW) goals and identifies lessons learned.

.16 Waste Management Co-ordinator (WMC) : contractor representative responsible for supervising waste management activities as well as co-ordinating required submittal and reporting requirements.

.17 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials generated by project. Specifies diversion goals, implementation and reporting procedures, anticipated results and responsibilities. Waste Reduction Workplan (Schedule B) information acquired from Waste Audit.

.2 Reference Standards:

.1 Ontario Ministry of Environment

.1 Ontario 3 R's Regulations (regulation 102/94) for waste management programs applicable to construction and demolition projects greater than 2,000 mý.

.2 Ontario Environmental Protection Act (EPA)

.1 Regulation 102/94, Waste Audits and Waste Reduction Workplans.

.2 Regulation 103/94, Source Separation Programs.

.3 Canadian Construction Association (CCA)

.1 CCA 81-2001: A Best Practices Guide to Solid Waste Reduction.

.4 Public Works and Government Services Canada (PWGSC)

.1 2002 National Construction, Renovation and Demolition Non-Hazardous Solid Waste Management Protocol.

.2 CRD Waste Management Market Research Report (available from PWGSC's Environmental Services).

.3 Sustainable Development Strategy 2007-2009: Target 2.1 Environmentally Sustainable Use of Natural Resources.

.1 Real Property projects over $1 million and in communities where industrial recycling is supported, implementation of CRD waste management practices will be completed, with waste materials being reused or recycled.

.2 Contractually ensure resources used in construction or maintenance are consumed and recovered in a sustainable manner.

1.03 DOCUMENTS

.1 Post and maintain in visible and accessible area at job site, one copy of following documents:
- .1 Waste Reduction Workplan (Schedule B).
- .2 Waste Source Separation Program.
- .3 Schedules A B completed for project.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Prepare and submit following prior to project start-up: Reduction .1 1 copy and 1 electronic copy of completed Waste Workplan (WRW): Schedule B.
- .1 1 copy and 1 electronic copy of Cost/Revenue Analysis Workplan (CRAW): Schedule E.
- .2 1 copy and 1 electronic copy of Waste Source Separation Program (WSSP).

.3 Prepare and submit on monthly basis, throughout project or at intervals agreed to by Departmental Representative the following:
- .1 Receipts, scale tickets, waybills, and/or waste disposal receipts that show quantities and types of materials reused, recycled, or disposed of.
- .2 Updated Waste Materials Tracking form (Schedule D).
- .3 Written monthly summary report detailing cumulative amounts of waste materials reused, recycled and landfilled, and brief status of ongoing waste management activities.

.4 Submit prior to final payment the following:
- .1 Waste Diversion Report, indicating final quantities in tonnes by material types salvaged for reuse, recycling or disposal in landfill and recycling centres, re-use depots, landfills and other waste processors that received waste materials (See Schedule C).
- .2 Provide receipts, scale tickets, waybills, waste disposal receipts that confirm quantities and types of materials reused, recycled or disposed of and destination.

1.05 WASTE REDUCTION WORKPLAN (WRW)

.1 Prepare and submit WRW (Schedule B) at least 10 days prior to project start-up.

.2 WRW identifies strategies to optimize diversion through reduction, reuse, and recycling of materials and comply with applicable regulations, based on information acquired from WA.

.3 WRW should include but not limited to:
- .1 Applicable regulations.
- .2 Specific goals for waste reduction, identify existing barriers and develop strategies to overcome them.
- .3 Destination of materials identified.
- .4 Deconstruction/disassembly techniques and schedules.
- .5 Methods to collect, separate, and reduce generated wastes.
- .6 Location of waste bins on-site.
- .7 Security of on-site stock piles and waste bins.
- .8 Protection of personnel, sub-contractors.
- .9 Clear labelling of storage areas.
- .10 Training plan for contractor and sub-contractors.
- .11 Methods to track and report results reliably (Schedule D).
- .12 Details on materials handling and removal procedures.
- .13 Recycler and reclaimer requirements.
- .14 Quantities of materials to be salvaged for reuse or recycled and materials sent to landfill.
- .15 Requirements for monitoring on-site wastes management activities.

.4 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority,

followed by Reuse, then Recycle.

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

.6 Monitor and report on waste reduction by documenting total volume (in tonnes) and cost of actual waste removed from project (Schedule D).

1.06 WASTE SOURCE SEPARATION PROGRAM (WSSP)

.1 As part of Waste Reduction Workplan, prepare WSSP prior to project start-up.

.2 WSSP will detail methodology and planned on-site activities for separation of reusable and recyclable materials from waste intended for landfill.

.3 Provide list and drawings of locations that will be made available for sorting, collection, handling and storage of anticipated quantities of reusable and recyclable materials.

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

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

.6 Provide training for contractor sub-contractors and workers in handling and separation of materials for reuse and/or recycling.

.7 Locate separated materials in areas which minimizes material damage.

.8 Clearly and securely label containers to identify types/conditions of materials accepted and assist contractor sub-contractors and workers in separating materials accordingly.

.9 Monitor on-site waste management activities by conducting periodic site inspections to verify: state of signage, contamination levels, bin locations and condition, personnel participation, use of waste tracking forms and collection of waybills, receipts and invoices.

.10 On-site sale of salvaged materials is not permitted unless authorized in writing by Departmental Representative and provided that site safety regulations and security requirements are adhered to.

1.07 USE OF SITE AND FACILITIES

.1 Execute Work with minimal interference and disturbance to normal use of premises.

.2 Maintain security measures established by facility provide temporary security measures approved by Departmental Representative.

1.08 WASTE PROCESSING SITES

.1 Contractor is responsible to research and locate waste diversion resources and service providers. Salvaged materials are to be transported off site to approved and/or authorized recycling facilities or to users of material for recycling.

1.09 QUALITY ASSURANCE

.1 After award of Contract, a mandatory site examination will be held for this Project for Contractor and/or sub-contractors responsible for construction, renovation demolition/deconstruction waste management.

.1 Date, time and location will be arranged by Departmental Representative .

.2 Waste Management Meeting: Waste Management Co-ordinator is to provide an update on status of waste diversion and management activities at each meeting. Written monthly Waste Diversion Report summary to be provided by Waste Management Coordinator (refer to the Waste Diversion Report form in Schedule C and Waste Materials Tracking form in Schedule D).

1.10 STORAGE, HANDLIN AND PROTECTION

G .1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.

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

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

.4 Protect structural components not removed and salvaged materials from movement or damage.

.5 Support affected structures. If safety of building is endangered, cease operations and immediately notify Departmental Representative.

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

.7 Provide on-site facilities and containers for collection and storage of reusable and recyclable materials.

.8 Separate and store materials produced during project in designated areas.

.9 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.

.1 On-site source separation is recommended.
.2 Remove co-mingled materials to off site processing facility for separation.
.3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.
.4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

1.11 DISPOSAL OF WAST

ES .1 Do not bury rubbish or waste materials.

.2 Do not dispose of waste volatile materials mineral spirits oil paint thinner into waterways, storm, or sanitary sewers.

.3 Keep records of construction waste including:

.1 Number and size of bins.
.2 Waste type of each bin.
.3 Total tonnage generated.
.4 Tonnage reused or recycled.
.5 Reused or recycled waste destination.

.4 Remove materials on-site as Work progresses.

1.12 SCHEDULING

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

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 APPLICATION

.1 Do Work in compliance with WRW and WSSP.

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

3.02 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.
- .2 Source separate materials to be reused/recycled into specified sort areas.

3.03 DIVERSION OF MATERIALS

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

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

3.04 WASTE DIVERSION REPORT

.1 At completion of Project, prepare written Waste Diversion Report indicating quantities of materials reused, recycled or disposed of as well as the following:
- .1 Identify final diversion results and measure success against goals from Waste Reduction Workplan.
- .2 Compare final quantities/percentages diverted with initial projections in Waste Audit and Waste Reduction Workplan and explain variances.
  - .1 Supporting documentation.
  - .2 Waybills and tracking forms.
  - .3 Description of issues, resolutions and lessons learned.

3.05 WASTE REDUCTION WORKPLAN (WRW)

.1 Schedule B

	Material of Waste Category	Persons Responsible	Total Quantities	Projected Amount	Actual Recycled	Materials Desitination
Wood and Plastic (Material Description)						
Chutes						
Warped Pallets						
Forms						
Plastic Packaging						
Cardboard Packaging						
Doors & Windows (Material Description)						
Painted Frames						
Glass						
Wood						
Metal						
Other						

3.06 COST/REVENUE ANALYSIS WORKPLAN (CRAW)

.1 Schedule E - Cost/Revenue Analysis Workplan (CRAW)

	Material Description	Total Quantity (unit)	Volume (Cumulative)	Weight (Cumulative)	Disposal Cost/Credit $(+/-)	Category Sub Total $(+/-)	Cost (-) / Revenue (+)
Wood							
Wood Studs							
Plywood							
Baseboard -							

Wood							
Door Trim - Wood							
Cabinet Doors & windows panels							
Regular slab							
Regular wood							
laminate							
Bi-fold closet							
Glazing							

CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT

.1 Schedule G - Government Chief Responsibility for the Environment: Inquires

Ontario Ministry of Environment and Energy,
416-323-4321 or 416-323-4682 or 800-565-4923
135 St. Clair Avenue West
Toronto ON M4V 1P5
Environment Canada
Toronto ON 416-734-4494

3.08 SCHEDULES

.1 Following Schedules are attached to this Specification:

.1 Waste Audit - Schedule A.
.2 Waste Reduction Workplan Form - Schedule B.
.3 Waste Diversion Report Form - Schedule C.
.4 Waste Materials Tracking Form - Schedule D.
.5 Cost/Revenue Analysis Workplan - Schedule E.

END OF SECTION

PART 1 - GENERAL

1.1 INSPECTION AND DECLARATION

.1 Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Departmental Representative or designate in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.

.2 Request Departmental Representative or designates Inspection.

.2 Departmental Representative or designates Inspection: Departmental Representative or designate and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.

.3 Completion: submit written certificate that following have been performed:

.1 Work has been completed and inspected for compliance with Contract Documents.

.2 Defects have been corrected and deficiencies have been completed.

.3 Equipment and systems have been tested, adjusted and balanced and are fully operational.

.4 Operation of systems have been demonstrated to PCA operation and maintenances personnel.

.5 Work is complete and ready for final inspection.

.4 Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative or designate and Contractor. If Work is deemed incomplete by Departmental Representative or designate, complete outstanding items and request reinspection.

1.2 CLEANING

.1 In accordance with Section 01 74 11.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 As-built, samples, and specifications.

.2 Equipment and systems.

.3 Product data, materials and finishes, and related information.

.4 Operation and maintenance data.

.5 Spare parts, special tools and maintenance materials.

.6 Warranties and bonds.

.7 Final site survey.

1.2 RELATED

.1 Section 01 79 00 - Demonstration and Training.

1.3 SUBMISSION

.1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.2 Revise content of documents as required prior to final submittal.

.3 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative or designate, five final copies of maintenance manuals and commissioning documentation in English.

.4 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.

.5 If requested, furnish evidence as to type, source and quality of products provided.

.6 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.7 Pay costs of transportation.

1.4 FORMAT

.1 Organize data in the form of an instructional manual.

1.4 FORMAT (Cont'd)

.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. 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. Bind in with text; fold larger drawings to size of text pages.

1.5 CONTENTS - EACH VOLUME

.1 Table of Contents: provide title of project;
.1 date of submission; names,
.2 addresses, and telephone numbers of 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 clearly 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. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00.

.6 Training: Refer to Section 01 79 00.

1.6 AS-BUILTS AND SAMPLES

.1 In addition to requirements in General Conditions, maintain at the site for PCA one record copy of:
.1 Contract Drawings.

1.6 AS-BUILTS AND SAMPLES (Cont'd)

.1 (Cont'd)
- .2 Specifications.
- .3 Amendments.
- .4 Change Orders and other modifications to the 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. 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. Label each document "PROJECT RECORD" in neat, large, printed letters.

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

.5 Keep record documents and samples available for inspection by Departmental Representative or designate.

.6 Turn one set, paper copy and electronic copy, of AS-BUILT drawings and specifications over to Departmental Representative or designate on completion of work.

.7 If project is completed without significant deviations from Contract drawings and specifications submit to Departmental Representative or designate one set of drawings and specifications marked "AS-BUILT".

1.7 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Departmental Representative or designate.

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

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

.4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:

.1 Measured depths of elements of foundation in relation to finish first floor datum.

.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

.4 Field changes of dimension and detail.

1.7 RECORDING ACTUAL SITE CONDITIONS (Cont'd)

.4 (Cont'd)

.5 Changes made by change orders.

.6 Details not on original Contract Drawings.

.7 References to related shop drawings and modifications.

.5 Specifications: legibly mark each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

.2 Changes made by Amendments and change orders.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.8 EQUIPMENT AND SYSTEMS

.1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.

1.8 EQUIPMENT AND SYSTEMS (Cont'd)

.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 and mechanical 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. 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 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 all items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.11 MAINTENANCE MATERIALS

.1 Provide maintenance and extra materials, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to site, location as directed; place and store.

1.11 MAINTENANCE MATERIALS (Cont'd)

.4 Receive and catalogue all items. Submit inventory listing to Departmental Representative or designate. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.12 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 all items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.

1.13 STORAGE, HANDLING AND PROTECTION

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.

.2 Store in original and undamaged condition with manufacturer's seal and labels intact.

.3 Store components subject to damage from weather in weatherproof enclosures.

.4 Store paints and freezable materials in a heated and ventilated room.

.5 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative or designate.

1.14 WARRANTIES AND BONDS

.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 the applicable item of work.

.4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Certificate of Completion is determined.

1.14 WARRANTIES AND BONDS (Cont'd)

.5 Verify that documents are in proper form, contain full information, and are notarized.

.6 Co-execute submittals when required.

.7 Retain warranties and bonds until time specified for submittal.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Procedures for demonstration and instruction of equipment and systems to Owner's O&M personnel.

.2 O&M personnel includes property facility manager, building operators, maintenenace staff, security staff and technical specialists, as applicable.

1.2 RELATED SECTIONS

.1 Mechanical - General Requirements.

1.3 DESCRIPTION

.1 Demonstrate scheduled operation and maintenance of equipment and systems to Departmental Representative or designates personnel two weeks prior to date of substantial performance.

.2 Departmental Representative or designate will provide list of personnel to receive instructions, and will coordinate their attendance at agreed-upon times.

1.4 QUALITY CONTROL

.1 When specified in individual Sections, require manufacturer to provide authorized representative to demonstrate operation of equipment and systems, instruct PCA's personnel, and provide written report that demonstration and instructions have been completed.

.2 Submit training schedule of time and date for demonstration and training of each item of equipment and each system in accordance with the training plan four weeks prior to designated dates, for Departmental Representative or designates approval.

.3 Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.

.4 Report shall give time and date of each demonstration and training, with list of persons present.

1.5 CONDITIONS FOR DEMONSTRATIONS

.1 Equipment has been inspected and put into operation.

.2 Testing, adjusting, and balancing has been performed in accordance with Section 23 00 00 and equipment and systems are fully operational.

1.5 CONDITIONS FOR DEMONSTRATIONS (Cont'd)

.3 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

1.6 PREPARATION

.1 Verify that conditions for demonstration and instructions comply with requirements.

.2 Verify that designated O&M personnel are present.

1.7 DEMONSTRATION AND INSTRUCTIONS

.1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment at scheduled times, at the designated location.

.2 Instruct personnel in all phases of operation and maintenance using operation and maintenance manuals as the basis of instruction.

.3 Review contents of manual in detail to explain all aspects of operation and maintenance.

.4 Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instructions.

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 AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21.

.2 Removed asphalt shall be taken to a recycling facility.

PART 2 - PRODUCTS

2.1 EQUIPMENT

.1 Use cold milling, planning, cutting, or grinding equipment with automatic grade controls capable of operating from stringline, and capable of removing part of pavement surface to depths or grades indicated in the Contract Drawings.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Prior to beginning removal operation, inspect and verify with Departmental Representative or Designate areas, depths and lines of asphalt pavement to be removed. Sawcut extent of asphalt to be removed. Sawcut and prepare step connection where indicated and as per detailed drawings.

3.2 PROTECTION

.1 Protect existing pavement not designated for removal. Protect lights, bollards, concrete pads, buildings and any other structures designated to remain. In event of damage, immediately replace or make repairs to approval of Departmental Representative or Designate at no additional cost.

3.3 REMOVAL

.1 Remove existing asphalt pavement to lines and grades as indicated in the Contract Drawings.

.2 Prevent contamination of removed asphalt pavement by topsoil, underlying gravel or other materials.

.3 Provide for suppression of dust generated by removal process.

3.4 SWEEPING

.1 Sweep step connection surfaces clean of debris resulting from removal operations using rotary power brooms and hand brooming as required.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

.1 Section Includes.
- .1 Methods and procedures for demolishing, salvaging, recycling and removing items designated to be removed in whole or in part.

1.2 REFERENCES

.1 Canadian Council of Ministers of the Environment (CCME).
- .1 CCME PN1326-2009, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products.

.2 Department of Justice Canada (Jus).
- .1 Canadian Environmental Assessment Act (CEAA), 1995, c. 37.
- .2 Canadian Environmental Protection Act, 1999 (CEPA), c. 33.

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

.4 Transport Canada (TC).
- .1 Transportation of Dangerous Goods Act, 1992 (TDGA), c. 34.

.5 Standards and Guidelines for 'Conservation of Historic Places in Canada' 2nd Edition

1.3 DEFINITIONS

.1 Demolition: rapid destruction of building following removal of hazardous materials.

.2 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or well being or environment if handled improperly.

1.4 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00.

.2 Coordinate submittal requirements and provide submittals required.

.3 Product Data: submit WHMIS MSDS - Material Safety Data Sheets.

.4 Shop drawings.

1.4 SUBMITTALS (Cont'd)

.4 (Cont'd)

.1 Submit for approval drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning, where required by authorities having jurisdiction.

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

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

1.5 QUALITY CONTROL

.1 Regulatory Requirements: ensure Work is performed in compliance with CEPA, CEAA, TDGA, and applicable Provincial regulations.

.2 Site Meetings.

.1 Convene pre-installation meeting one week prior to beginning on-site installations:

.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.

.2 Arrange for site visit with Departmental Representative or designate to examine existing site conditions adjacent to demolition work, prior to start of Work.

.3 Health and Safety.

.1 Do construction occupational health and safety in accordance with Section 01 35 29.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Storage and Protection.

.1 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Departmental Representative or designate and at no cost to Departmental Representative or designate.

.2 Remove and store materials to be salvaged, in manner to prevent damage.

.3 Store and protect in accordance with requirements for maximum preservation of material.

.4 Handle salvaged materials as new materials.

1.7 SITE CONDITIONS

.1 Site Environmental Requirements.

1.7 SITE CONDITIONS (Cont'd)

.1 (Cont'd)

.1 Ensure that selective demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.

.2 Do not dispose of waste of volatile materials including but not limited to, mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.

.1 Ensure proper disposal procedures are maintained throughout the project.

.3 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers or onto adjacent properties.

.4 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities.

.5 Protect trees, plants and foliage on site and adjacent properties.

.2 Existing Conditions.

.1 Remove contaminated or hazardous materials as defined by authorities having jurisdiction from site, prior to start of demolition Work, and dispose of at disposal facilities in safe manner in accordance with TDGA and other applicable regulatory requirements.

.2 List of hazardous materials:

.1 Refer to Designated Substances and Hazardous materials survey report.

1.8 SCHEDULING

.1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.

.1 Notify Departmental Representative or desingate in writing when unforeseen delays occur.

PART 2 - PRODUCTS

2.1 EQUIPMENT

.1 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Inspect site with Departmental Representative or designate and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.

.2 Locate and protect utilities. Preserve active utilities traversing project in operating condition.

3.1 PREPARATION (Cont'd)

.3 Notify and obtain approval of utility companies before starting demolition.

.4 Disconnect and Cap Designated Mechanical Services as per drawings.
.1 Natural Gas Supply Lines: remove in accordance with gas company requirements and as per drawings.
.2 Sewer and Water Lines: remove as per drawings and securely plug to form watertight seal.

3.2 REMOVAL OF HAZARDOUS WASTES

.1 Remove contaminated or dangerous materials defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.

3.3 REMOVAL OPERATIONS

.1 Remove items as indicated.

.2 Do not disturb items designated to remain in place.

.3 Disposal of Material.
.1 Dispose of materials not designated for salvage or reuse on site at authorized facilities approved.

3.4 STOCKPILING

.1 Label stockpiles, indicating material type and quantity.

.2 Designate appropriate security resources/measures to prevent vandalism, damage and theft.

.3 Locate stockpiled materials convenient for use in new construction to eliminate double handling wherever possible.

.4 Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.

3.5 REMOVAL FROM SITE

.1 Remove stockpiled material as directed by Departmental Representative or desingate, when it interferes with operations of project.

.2 Remove stockpiles of like materials by alternate disposal option once collection of materials is complete.

.3 Transport material designated for alternate disposal using approved haulers in accordance with applicable regulations.

3.5 REMOVAL FROM SITE (Cont'd)

.4 Dispose of materials not designated for alternate disposal in accordance with applicable regulations..

3.6 RESTORATION

.1 Restore areas and existing works outside areas of demolition to conditions that existed prior to beginning of Work and match condition of adjacent, undisturbed areas.

.2 Use soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

3.7 CLEANING

.1 Remove debris, trim surfaces and leave work site clean, upon completion of Work.

.2 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

3.8 General Notes

.1 The building will remain occupied during all demolition and construction. Provide temporary dustproof partitions to maintain an airtight seal separating all areas of work from occupied areas. Ensure that occupied areas of the building remain free from any dust or other debris as well as noise, prior to and during demolition and construction, assume. Full responsibility for the protection of existing equipment and/or materials from damage due to construction and/or demolition operations. do not transport demolished materials through occupied areas other than those denoted. All noisy work is to be done on evenings and weekends. Contractor to clean all areas of work prior to turnover of space back to the client and on a daily basis.

.2 Unless noted otherwise, all removed and demolition materials are to be removed from site and disposed of in an approved manner. Coordinate with Project Manager or desingate exact locations of dumpster(s) and storage of re-used equipment and/or materials, prior to placement.

.3 Where existing grounds and buildings are affected by work of contract (including, but not limited to supply and removal of dumpsters, vehicular traffic, etc.), reinstate grade and sod c/w 4" topsoil and sod and clean and reinstate all existing surfaces of building to match existing. Protect asphalt at all times during construction and demolition. Rectify any and all damage to asphalt at no cost to owner.

3.8 General Notes (Cont'd)

.4 All salvageable materials and/or equipment, furnishings, etc from demolition operations to remain property of owner as denoted on drawings. Co-ordinate with Departmental Representive or designate items to be removed off site and items to be re-used, relocated and where they are to be temporarily stored. (Refer to note no.2)

.5 Where smoke detectors, heat detectors, exit lights, emergency battery back up lighting and other fire alarm components are to remain or removed and reinstalled, contractor to make provisions to ensure all components are protected from damage that may occur during the construction phase (i.e. dust control, etc.) and that they are fully functional before turn over to the PCA for use during normal working hours, and recommissioned at end of project

.6 Demolition types and existing conditions indicated on the drawings are approximate only, intended as a general indication of site conditions. Site verify and assume responsibility for all existing conditions prior to starting work.

END OF SECTION

PART 1 - GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Submit erosion and sedimentation control drawing/plan.

1.2 QUALITY ASSURANC

E.1 Selective demolition work shall be performed by workers familiar with the materials affected. Perform in a manner to neither damage nor endanger any portion of the Work.

1.3 SITE CONDITIONS

.1 Existing conditions:

.1 Take precautions to protect environment. Refer to specification section 01 35 29.

.2 Proceed with work following directions of this specification, all referenced materials and the contract drawings.

.2 Protection:

.1 Prevent movement, or damage of adjacent construction. Provide bracing as required. Repair damage caused by demolition as directed by Departmental Representative or Designate.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Inspect site and verify extent and location of items designated for removal, disposal, recycling, salvage and items to remain.

.2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.

.3 Notify and obtain approval of utility companies, as required before starting demolition.

3.1 EXAMINATION (Cont'd)

.4 Disconnect, cap, plug or divert, as required, existing utilities within the property where they interfere with the execution of the work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or plugged services on the site and indicate location (horizontal and vertical) on the record drawings. Support, shore up and maintain pipes and conduits encountered.

.5 Immediately notify Departmental Representative and utility company concerned in case of damage to any utility or service, designated to remain in place.

.6 Immediately notify the Departmental Representative should uncharted utility or service be encountered, and await instruction in writing regarding remedial action.

3.2 PROTECTION

.1 Prevent movement, settlement, or damage to adjacent structures, utilities, landscaping features, and parts of building to remain in place. Provide bracing and shoring required.

.2 Keep noise, dust, and inconvenience to occupants to minimum.

3.3 PREPARATION

.1 Temporary Erosion and Sedimentation Control:

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties, walkways and waterways according to requirements of authorities having jurisdiction.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during demolition.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal after completion of demolition work.

3.4 SELECTIVE DEMOLITION WORK

.1 Remove items for disposal and salvage as indicated on drawings.

.1 Do not damage or deface existing construction, equipment or finishes indicated to remain or items indicated for salvage.

.2 Dispose of rubble, debris, and removed materials off site. Dispose of materials in accordance with authority having jurisdiction.

.3 Refer to section 01 14 00 for further requirements of work.

3.5 CLEANING

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

.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.

.3 Refer to removals drawings and specifications for items to be salvaged for reuse.

.4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Concrete Reinforcement: Section 03 20 00

.2 Cast-In-Place Concrete: Section 03 30 00

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

- .1 CSA-A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2 CAN/CSA-086-14, Engineering Design in Wood.
- .3 CSA 0121-08(R2013), Douglas Fir Plywood.
- .4 CSA 0151-09 (R2014), Canadian Softwood Plywood.
- .5 CSA 0153-13, Poplar Plywood.
- .6 CAN/CSA-0325-16, Construction Sheathing.
- .7 CSA 0437 Series-93(R2011), Standards for OSB and Waferboard.
- .8 CAN/CSA-S269.3-M92(R2013), Concrete Formwork, National Standard of Canada.

.2 Council of Forest Industries of British Columbia (COFI).

- .1 COFI Exterior Plywood for Concrete Formwork.

.3 Underwriters' Laboratories of Canada (ULC)

- .1 CAN/ULC-S701-5, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.3 FALSEWORK AND FORMWORK DESIGN

.1 Design, construct and dismantle falsework and formwork in accordance with the requirements of Chapter 11 of CSA A23.1, CSA S269.1 "Falsework for Construction Purposes" and CSA-269.3, "Concrete Formwork" unless more stringent tolerances are specified below.

.2 All temporary structural supports for concrete formwork to be designed by a Professional Engineer Registered in the Province of Ontario.

.3 Supply details drawings of temporary structural supports, bearing the seal of the designer, a Registered Engineer in the Province of Ontario.

1.4 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00.

.2 Indicate method and schedule of construction, materials, arrangement of joints, ties, shores, liners, and locations of temporary embedded parts.

.3 Each shop drawing submitted to bear the stamp and signature of qualified Professional Engineer registered in the Province of Ontario.

1.5 INSPECTION

.1 In scheduling work, allow 72 hours after placement of reinforcing steel for inspection of forms, reinforcement, inserts, chairs, ties and other devices. In walls and deep beams, one side of form to be left open until reinforcement and formwork have been inspected and approved.

PART 2 - PRODUCTS

2.1 FORMWORK MATERIALS

.1 Lumber, plywood and other formwork and falsework, materials to comply with requirements to CSA S269.1, Table 1. Materials to bear grade marks, or to be accompanied by certificates, test reports or other proof of conformity. Steel forms to be fabricated from a minimum of 16 ga. sheet. They are to be tight fitting and stiffened to support the imposed forces without deflection detrimental to the appearance of the finished concrete surface.

.2 Plywood for architectural or exposed concrete to be new factory resin coated medium density overlaid Douglas Fir plywood, 19mm thick, to CSA 0121 base material with 7 ply COFIFORM GRADE finish. Coated side to be in contact with concrete. Plywood for concealed concrete may be re-used Douglas Fir Plywood with all holes patched. All edges of plywood to be supported.

.3 Form release agent: chemically active release agents containing components that react with free lime in concrete to provide water insoluable soaps, preventing set of film of concrete in contact with form. Standard of acceptance: Formshield by Euclio Chemical.

.4 Form stripping agent: colourless mineral oil, free of

kerosene, with a viscosity between 70 and 110s Saybolt Universal or 15 to 24mmý/s at 40°, flashpoint minimum 150°C, open cup.

.6 Sealant: Tremco Dymeric Joint Sealer.

.7 Chamfer Strips: Use 20mm triangular mill fabricated pine bevelled strips on corners of exposed beams, columns, curbs, equipment bases, etc.

.8 Plastic Anchor Bolt Sleeves: Dayton/Richmond D-1-S Anchor Bolt Sleeves. Size to suit anchor bolt diameter and embedment depth.

2.2 FORM TIES

.1 Unexposed concrete surfaces-snapties, coil ties or she-bolts to suit application. They are to be free of devices leaving holes larger than 25mm dia. in concrete surface.

PART 3 - EXECUTION

3.1 FABRICATION AND ERECTION

.1 Verify lines, levels and centers before proceeding with formwork and ensure dimensions agree with drawings.

.2 Earth forms shall not be used.

.3 Fabricate and erect falsework in accordance with CSA S269.1 and COFI Exterior Plywood for Concrete Formwork.

.4 All interior faces and exterior faces of tanks not to be backfilled, shall be formed with new high density overlaid plywood.

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

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

.7 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1. and as noted following:

.1 Variation from plumb: plumbness of columns and walls shall be within 1:400, but not more than 15mm.

.2 Variation of cross-section of girders, beams and columns and for the thickness of walls

and slabs other than slabs on grade to be: 0-300mm ± 8mm 301-1000 ±12mm 1001 and greater ±20mm

.3 Average slope of floors, beams and other horizontal units shall be within 1:400 but not more than 20mm for the total length of the structure.

.4 Variation of the linear building lines form established position in plan for all elements to be: 0-6000 ± 6mm 6001 and greater ±12mm

.8 Align form joints and make watertight. Keep form joints to minimum.

.9 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.10 Construct forms for architectural concrete, and place ties as indicated and/or as directed. Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.

.11 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting. Accurately locate and secure all items to be cast-in-place. No such forming of slots, recesses, openings, etc. shall be done unless shown on drawings.

.12 Camber:

.1 Camber all formwork to compensate for anticipated deflections in formwork prior to hardening of concrete. Positive means of adjustment (wedges or jacks) or shores and struts to be provided and all settlement taken up during concrete placing operation.

.2 Camber, where indicated on drawings refers to camber required to compensate for deflection of structure anticipated by design, not that required to compensate for settlement or deflection of falsework as noted .1.

.3 Maintain beam depth or slab thickness measured form cambered thickness.

.13 Provide temporary cleanout and inspection openings at the base of wall and forms at max. 5000mm centers. Openings shall be located such that flushing water will drain from the form. Close temporary

openings with tight fitting panels, flush with the inside form face prior to concrete placement. Joints to be neat and tight such that joints will not be apparent on exposed concrete surfaces.

.14 Clean formwork in accordance with CAN/CSA-A23.1, before placing concrete.

3.2 QUALITY CONTROL .1 Inspect all components of the formwork to ensure conformity with design and shop drawings. The Engineer responsible for the design shall perform inspection of the work and submit written observations and certification. Inform Engineer when formwork is complete and cleaned.

3.3 PREPARATION OF FORM_ SERVICES .1 All surfaces of forms and embedded materials shall be cleaned of all foreign materials, grout or mortar. Flush form with water or air and ensure all water and debris exit formwork through clean-outs. Remove ice and snow from within forms. No de-icing salts will be permitted.

.2 Coat inside form faces with form release agent prior to installing reinforcing steel, cast-in items, etc.

3.4 REMOVAL OF FORMWORK .1 Comply with the requirements of CSA 23.1.

.2 Leave formwork in place for following minimum periods of time after placing concrete.

.1 3 days for sides of slabs, footings and sides of beams.

.2 7 days for walls & columns.

.3 These minimum limits are based upon the cumulative number of hours or days which the air temperature around the concrete under consideration is above 10°C. The limits also apply only if curing conditions outlined in Section 03 30 00 are met.

.3 Remove slab formwork when concrete has reached 75% of its design strength or minimum period noted above, whichever comes later. Ensure slab is not loaded beyond its reduced capacity until design strength is reached.

.4 Provide all necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required. The strength of concrete in walls subjected to superimposed loads and in all

slabs shall be based upon the results of the two job cured cylinders. Curing conditions of the cylinders shall match that of the wall, slab, etc. under consideration.

.5 Space reshoring in each principal direction at not more than 3000mm apart.

.6 Re-use formwork subject to requirements of CAN/CSA-A23.1 and this specification.

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

.1 Cast-In-Place Concrete: Section 03 05 10

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

- .1 ASTM A 143/A143M-07 (R2014), Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
- .2 ASTM A 775/A775M-16, Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
- .3 ASTM A1064/A1064M-16B, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

.2 Canadian Standards Association (CSA International)

- .1 CSA-A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2 CSA-A23.3-14, Design of Concrete Structures.
- .3 CAN/CSA-G30.18-09 (R2014), Billet-Steel Bars for Concrete Reinforcement, A National Standard of Canada.
- .4 CSA-G40.20/G40.21-13 General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .5 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles, A National Standard of Canada.
- .6 CSA W186-M1990(R2012), Welding of Reinforcing Bars in Reinforcing Concrete Construction.

.3 Reinforcing Steel Institute of Canada (RSIC)

- .1 RSIC, Reinforcing Steel Manual of Standard Practice (latest edition).

1.3 SOURCE QUALITYCONTROL

.1 Upon request inform Consultant of proposed source of material to be supplied.

.2 Upon request provide Consultant with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, prior to commencing reinforcing work.

1.4 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00.

.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 mechanical splices, with identifying code marks to permit correct placement without reference to structural drawings. Indicate sizes, spacing and location of chairs, spacers and hangers. Do drawings in accordance with Reinforcing Steel Manual of Standard Practice - by Reinforcing Steel Institute of Ontario.

.4 Detail lap lengths and bar development lengths to CAN/CSA-A23.3, unless otherwise indicated. Provide type B tension lap splices unless otherwise indicated.

.5 All shop drawings to be to a scale not less than 1:50.

.6 Provide elevation drawings of all walls, cross referenced to plan drawings. Provide drawings for each differing section of steel arrangement. Do not indicate various areas on one detail.

.7 Bar lists to correspond to each detail on drawing; namely each wall, slab, etc. to be separately listed.

.8 Detail to requirements of ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" and with RSIC Manual of Standard Practice.

.9 In no case will reproduction of the Contract Documents be acceptable as shop drawings.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver and store reinforcing steel, formwork materials, concrete accessories, etc. so as to prevent damage or, deterioration prior to use.

.2 Store reinforcing steel off the ground, free of mud, foreign matter or any other bond reducing agent.

.3 All reinforcing steel and mesh shall be new. Substantially free of mill scale, rust, dirt, grease, or other agent that could reduce the strength of bond.

.4 Before placement, reinforcing steel and mesh shall be thoroughly cleaned if required and maintained in this state until concrete is placed.

1.6 SUBSTITUTES

.1 Substitution of different size bars permitted only upon written approval of Consultant.

1.7 QUALIFICATIONS OF WORKERS

.1 At all times there shall be at least one person present during the installation of the reinforcing steel who shall direct the work and who is thoroughly familiar with materials being installed and understands the best methods for their installation.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Reinforcing steel: billet steel, grade 400, deformed bars to CSA G30.18, unless indicated otherwise.

.2 Reinforcing steel: weldable low alloy steel deformed bars to CAN/CSA-G30.18.

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

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

.5 Chairs, bolsters, bar supports, spacers: to CAN/CSA-A23.1/A23.2.

.6 Mechanical splices: subject to approval of Consultant.

.7 Plain round bars: to CAN-CSA-G40.20/G40.21.

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

2.2 FABRICATION

.1 Fabricate reinforcing in accordance with CAN/CSA-A23.1/A23.2, and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada. All details shall be done in accordance with the standard details shown on contract documents.

.2 Obtain Consultant's approval for locations of

reinforcement splices other than shown on placing drawings.

.3 Upon approval of Consultant, weld reinforcement in accordance with CSA W186.

.4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists. Ship epoxy coated bars in accordance with ASTM A775A/A775M.

PART 3 - EXECUTION

3.1 FIELD BENDING

.1 Do not field bend reinforcement except where indicated or authorized by Engineer.

.2 When field bending is authorized, bend without heat, applying a slow and steady pressure.

.3 Replace bars which develop cracks or splits.

.4 All bending details to be as per the requirements of Section 03 20 00 Part 2 Clause 2.2.1.

3.2 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on reviewed placing drawings and in accordance with CAN/CSA-A23.1/A23.2. Use only approved supports and chairs of strong durable non-corrosive materials which fasten or tie securely to the reinforcing steel. Secure reinforcement against displacement within allowed tolerances in accordance with RSIC Manual of Steel Practice.

.2 Use plain round bars as slip dowels in concrete. Paint portion of dowel intended to move within hardened concrete with one coat of lead or asphalt paint. When paint is dry, apply a thick even film of mineral lubricating grease. Protect coated portions of bars with covering during transportation and handling.

.3 Prior to placing concrete, obtain Engineer's approval of reinforcing material and placement.

.4 If concreting is interrupted for any considerable period of time. The exposed steel shall be protected with satisfactory covering. Prior to concreting, the reinforcing steel is to be reinspected and modified or cleaned as required by Engineer.

3.3 SPLICES

.1 No splices in bars or mesh will be permitted except as detailed on the Contract Drawings or on approved placing drawings. For beams and slabs, locate splices away from points of maximum stress in the steel.

.2 Reinforcing steel bars shall have Class 'B' splices unless otherwise indicated on Contract Drawings.

.3 Lap splices shall not be used for bars larger than 35M.

.4 Adjacent splices shall be staggered at least 1500mm center to center of splices unless shown otherwise on the Drawings.

.5 Welded splices shall be used only where shown on the Drawings or where specially permitted.

.6 Splices in reinforcement bars shall be coordinated with slab and wall pouring sequencing and construction joint location.

3.4 SPACING OF REINFORCEMENT

.1 The clear distance between parallel bars in a layer and between layers shall not be less than 1.4 times the diameter of the bars, 1.4 times the maximum size of the coarse aggregate, nor 30mm.

.2 Bars shall be bundled only when shown on the Contract Drawings.

3.5 DISCREPANCIES

.1 In the event of discrepancies, immediately notify the Consultant.

.2 Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.6 CONCRETE COVER

.1 Reinforcing steel shall, where not otherwise shown on the structural drawings, be protected by the clear cover of concrete over the reinforcement as follows:

Location	Min. Cover
Reinforcement in concrete deposited against and permanently exposed to earth.....	75mm
Reinforcement in concrete placed against forms and exposed to the weather, water,	

or in contact with the ground after removal of forms..... 50mm

Reinforcement in slabs or walls, not exposed to weather, water or ground.. 25mm

.2 Maintain the aforementioned clear covers to within ±5mm.

3.7 APPROVAL

.1 Do not place concrete until the reinforcing has been inspected and approved by the Consultant.

3.8 FIELD TOUCH-UP

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

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

.1 Concrete Forms and Accessories: Section 03 10 00

.2 Concrete Reinforcement: Section 03 20 00

.3 Concrete Floor Finishes: Section 03 35 00

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

- .1 ASTM C 260-10a (2016), Standards Specification for Air-Entraining Admixtures for Concrete.
- .2 ASTM C 309-11, Standards Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- .3 ASTM C330/C330M-14, Standard Specification for Lightweight Aggregates for Structural Concrete.
- .4 ASTM C 494/C494M-16, Standard Specification for Chemical Admixtures for Concrete.
- .5 ASTM C 1017/C1017M-11 (C2015), Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
- .6 ASTM D 412-15A, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
- .7 ASTM D 624-00 (R2012), Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.
- .8 ASTM D 1751-04 (R2013), Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- .9 ASTM D 1752-04 (R2013), Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

.2 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-37.2-M88, Emulsified

Asphalt, Mineral Colloid-Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.

.2 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.3 Canadian Standards Association (CSA International)

.1 CSA-A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA A283-06(R2016), Qualification Code for Concrete Testing Laboratories.

.3 CAN/CSA-A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.3 SAMPLES

.1 Submit samples in accordance with Section 01 33 00.

1.4 SUBMITTALS

.1 If requested, submit certificates in accordance with Section 01 33 00.

.2 Concrete pours: submit accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in PART 3 - FIELD QUALITY CONTROL.

.3 Minimum 4 weeks prior to starting concrete work submit to Consultant manufacturer's test data and certification by qualified independent inspection and testing laboratory that following materials will meet specified requirements:

.1 Portland cement.
.2 Blended hydraulic cement.
.3 Supplementary cementing materials.
.4 Grout.
.5 Admixtures.
.6 Aggregates.
.7 Water.
.8 Joint filler.

.4 Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CAN/CSA-A23.1/A23.2.

.5 Provide certification that plant, equipment, and materials to be used in concrete comply mix design

is adjusted to prevent alkali aggregate reactivity problems.

1.5 CONSTRUCTION QUALITY CONTROL

.1 Submit proposed quality control procedures for Consultant's approval for the following:
- .1 Hot and cold weather concreting.
- .2 Curing.
- .3 Uniform finishes.

.2 Concrete hauling time: maximum allowable time for concrete to be delivered to site of work and discharged not to exceed 120 minutes after batching.

1.6 QUALIFICATIONS OF WORKERS

.1 At all times there shall be at least one person present during concrete placement who shall direct the work and who is familiar with the materials being placed and understands the best methods for their placement.

1.7 TESTS

.1 A testing Company will be appointed by the Consultant to carry out concrete testing.

.2 Testing Company will be paid by Owner. Supply all necessary cooperation. Deliver test cylinders to testing company offices at no charge to Owner.

.3 Field control tests will be carried out in accordance with CAN/CSA-A23.1/A23.2 to ensure that concrete quality is as specified. These will be the minimum amount of testing.

.4 Testing will be carried out in accordance with Division 1 and with following frequency.
- .1 One test will be conducted for each individual placing operation which exceeds 23 cubic metres or at least one test for each 100 cubic metres of concrete placed per day of operation. At least one test for each class of concrete used on project will be conducted.
- .2 One "test" consists of a slump test, an air content test (for air entrained concrete) and strength tests on three lab cured cylinders.
- .3 Two additional site cured cylinders will be cast and tested when temperature outside at time of concrete placement is below 5 deg.C.
- .4 Slump tests for pumped concrete will be taken at the discharge end of the pump hose and at the delivery to the

drawings due to unsuitable soil conditions, contact Engineer. Only changes instructed by Engineer and recommended by Geotechnical Consultant will be accepted.

1.11 SAMPLES

.1 Provide all concrete required for field control tests.

.2 If requested, submit the following items for approval, at least 2 weeks before placing any concrete:

.1 rebar chairs, bolsters
.2 aggregates (coarse and fine)
.3 reinforcing steel
.4 premoulded joint fillers
.5 anchors
.6 caulking materials
.7 admixtures

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Portland cement: to CAN/CSA-A3001, Type GU unless noted.

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

.3 Aggregates: to CAN-CSA-A23.1/A23.2. Coarse aggregates to be normal density.

.4 Air entraining admixture: to ASTM C260.

.5 Chemical admixtures: to ASTM C494 and ASTM C1017. Consultant to approve accelerating or set retarding admixtures during cold and hot weather placing.

.6 Shrinkage compensating grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents. CPD Non Shrink Grout, Sika Grout 212 or Inpakt grout.

.7 Tie Hole Grout: non-metallic, non-staining, non-toxic grout, CPD Fastcrete used with a latex adhesive CPD Latex Concrete Adhesive (concentrate).

.8 Premoulded joint fillers: Bituminous impregnated fiber board: to ASTM D1751.

.9 Vapour retarder: 2 layers of 6 mil. polyethelene.

.10 Ribbed waterstops: 150 mm wide extruded PVC Arctic Grade, 150 wide with centrebulb (Type 4 Durajoint), with shop welded corner and intersection pieces with legs not less than 500mm long:

.1 Tensile strength: to ASTM D412, Die "C" method, minimum 11.4 MPa.

.2 Elongation: to ASTM D412, Die "C" method, minimum 275%.

.3 Tear resistance: to ASTM D624, Die "B" method, minimum 48 kN/m.

.11 Construction joint sealant: Sikaflex 2C-NS EZ Mix sealant.

.12 Concrete topping: Sikacrete-08 SCC by Sika Canada.

2.2 CONCRETE

.1 Cement to be Type GU (general use) to CAN/CSA-A3001, Portland Cement unless noted.

.2 Water to be potable quality in accordance with CAN/CSA-A23.1/A23.2.

.3 Coarse and fine aggregates to meet the requirements of "Normal Density Fine Aggregate, and Normal Density Coarse Aggregate" of CAN/CSA-A23.1/A23.2.

.4 Comply with requirements of CAN/CSA A23.1 for mix design as determined by tests.

.5 Pump mix designs shall not be modified from normal concrete mix designs by the changing cement or quantities of coarse and fine aggregate. Specifically fine aggregate contents shall not be increased, nor coarse aggregate contents reduced to accommodate pumping.

.6 Submit a mix design certifying materials including admixtures, which will be used in concrete.

.7 Unless otherwise specified or noted on the drawings, all concrete shall contain an air entraining agent and water reducing agent.

.8 Concrete mix design to be designed to meet these minimum requirements. No concrete shall be placed prior to the approval of the design mixes by

the Consultant.

Location and/or Members	Compressive Strength	Slump	Entrained Air Location (%)	Class of Exposure	Type
Interior Slab on Grade	25 MPA	75 ± 25	Not Required	N	10
Reinforced Foundation Curbs	30 MPa	75 ± 25	4 – 7%	F-2	10
All Exterior Concrete Including Sidewalks and Slabs	32 MPa	75 ± 25	5 – 8%	C-2	10

.9 Admixtures other than water reducing agents and air entrainers are not permitted unless discussed with and approved in writing by Consultant. Follow guidelines listed in ASTM C 494 and ASTM C1017. Calcium chloride not to be added to concrete.

.10 All admixtures must be compatible with each other.

.11 Max. slump values in the table shown in .1 are as follows: With Structural Slabs, Structural Walls & Interior Slabs on grade provide a concrete mix design to give a slump of 38mm. Add super plasticizer as required to produce a 75mm ±25 slump concrete.

2.3 ANCHORS

.1 Concrete Anchors: Hilti Products by Hilti Canada. Expansion anchors to be Hilti KWIK-BOLT-3. Adhesive anchors in concrete to be Hilti HIT HY200. Use Hilti HIT-Z rods for all dowels. Use stainless steel components where noted.

2.4 CONSTRUCTION JOINT GROUT

.1 Grout to be of the same proportions and materials as concrete but without coarse aggregate and with 150 mm maximum slump.

PART 3 - EXECUTION

3.1 GENERAL

.1 Do Cast-In-Place concrete work in accordance with CSA-A23.1/A23.2.

.2 No water or admixtures to be added on site.

3.2 COLD WEATHER REQIREMENTS

.1 Carry out cold weather concreting in accordance with the requirements of Chapter 7 of CSA A23.1/A23.2.

.2 When the air temperature is at or below 4 deg.C or

there is a likelihood of it falling to that limit within 24 hours of placing, employ suitable means to maintain temperature of all concrete surfaces between 10 deg.C and 21 deg.C for at least 5 days after placing. Provide sufficient thermometers, placed in accordance with Consultant's instructions, to monitor temperatures. Remove or replace any portion of concrete allowed to freeze prior to reaching a compressive strength of at least 16 MPa.

.3 Do not use calcium chloride or other chemicals to prevent freezing unless authorized in writing by Consultant.

.4 Repair any concrete damaged by frost, carbonation or flash setting as directed by the Consultant at no cost to Owner.

.5 Contractor shall not use direct fired heaters that will introduce combustion gases within heated enclosures.

3.3 HOT WEATHER REQUIREMENTS

.1 Carry out hot weather concreting in accordance with requirements of Chapter 7 of CSA A23.1/A23.2.

.2 When Air temperature is at or above 27 deg.C during the placing period, employ suitable approved means to maintain temperature of the concrete as low as practicable and in any case not more than 27 deg.C.

.3 When the air temperature is above 27 deg.C use water spray, wet sand or burlap and not curing compounds for initial curing.

.4 When conditions are likely to cause plastic shrinkage cracking, in the opinion of the Consultant (low relative humidity with rate of evaporation exceeding 0.7 kg of water per square meter per hour), use an approved moisture retention film and/or other suitable means to prevent plastic shrinkage cracking in flatwork.

3.4 FINISHING

.1 Non-exposed Concrete Finish:

.1 A "rough form finish" as defined by CSA A23.1/A23.2 will be acceptable for surfaces not exposed to view in finished structure.

.2 Exposed Concrete Finish:

.1 Utilize only new sheets of plywood coated with release agent and cone-type ties for forms or containing concrete which will be exposed.

.2 A "smooth-form finish" as defined by CSA A23.1/A23.2 will be required for all surfaces

exposed to view in finished structure.

.3 Utilize factory coated plywood, (caulked sheet edges), cone type coil ties with setback plugs, chamfered corners and symmetrical joint arrangement for all exposed walls, beams and columns. Coordinate joint layout and form construction with Consultant and construct one sample panel if requested to illustrate joint layout, materials and accessories proposed.

.3 Slab surfaces to be hard, smooth, dense trowelled surface free of blemishes.

.4 As soon as forms are removed, the surfaces shall be thoroughly washed with clean water under pressure. All fins, projections and offsets smoothed off. Tie projections to be removed to a minimum of 25mm below surface.

3.5 PLACING

.1 Place concrete in accordance with Chapter 7 of CSA A23.1.

.2 Notify Consultant before concrete is placed, so that he may, according to his discretion, inspect work to ensure that it is carried out in accordance with requirements of drawings and specifications, and specifically that all forms are right, true to line and correct as to location, shape and size, properly treated and free and clean of all deleterious materials and that reinforcement is properly set, secured and thoroughly clean.

.3 Do not place concrete until the approval of Consultant has been obtained. Ensure that method of placing has been adequately thought out so that no delays are encountered. Ensure adequate access for trucks, walkways, cranes, buggies, water and vibrators. Conduit boxes, sleeves, anchor bolts, chutes and all other items are to be in readiness prior to request for approval to proceed. Ensure that once work has started, it can proceed continuously until completed.

.4 Pumping of concrete will be permitted only after approval of equipment and mix. Concrete pumps utilized for placement of concrete in slabs or forms to meet the following minimum requirements.

.1 Pump shall have size, capacity and mechanism to pump "normal concrete" without necessity of redesigning mix to accommodate pumping.

.2 Pump shall be capable of producing concrete at the discharge end with the specified air entrainment and the specified slump, while concrete supplied to the pump shall have a slump no more than 20 mm greater than the specified slump.

.5 Vibrate all concrete thoroughly. Use internal type vibrators wherever practicable. Keep a spare vibrator on site during all concrete placing operations. Take care not to over-vibrate, which would result in segregation or the formation of excess surface water. Take particular care to ensure the property deposit of concrete in and around corners, joints, inserts and at interfaces with concrete previously poured.

.6 Utilize an "elephant trunk" for placement of concrete wherever the free drop exceeds 1500 mm.

.7 Additional placing requirements for concrete floor slabs are given under section on "Floor Finishing".

.8 Unless otherwise approved, concrete shall be placed in a single operation to the full thickness of slabs, beams, etc. and shall be placed in horizontal layers, not exceeding 600mm in walls, columns and similar members. In walls the first batches in each lift shall be placed at each end of the segment and then placing shall progress towards the center. Concrete shall be placed as rapid as practicable to ensure bonding of the successive layers. No temporary joint shall be allowed to become "cold" before adjacent concrete is placed. The maximum allowable time interval between lifts shall be 45 minutes.

.9 Place slabs in a checkerboard pattern with larger dimensions of any slab not exceeding 10m.

.10 Place walls so that straight runs do not exceed 15m and vertical construction joints are not closer than 2m to a wall corner, wall intersection, a column or beam supported by the wall, or an opening in the wall greater than 600mm in width, or above a construction joint in a slab supporting the wall.

.11 Allow a minimum of 4 days between placing new concrete against recently placed concrete in walls and slabs.

.12 Protect previous Work from concreting operations.

3.6 INSERTS

.1 Set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere. Sleeves and openings greater than 100 x 100 not indicated on structural or civil drawings must be approved by Consultant.

.2 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of all modifications from Consultant before placing of concrete.

.3 Check locations and sizes of sleeves and openings shown on structural and civil drawings with architectural, mechanical, process and electrical drawings. Any openings greater than 100 mm diameter must be sleeves cast in concrete walls.

.4 Anchor bolts:

.1 Set anchor bolts to templates under supervision of appropriate trade prior to placing concrete.

.6 Provide drawings for each wall indicating size and location of opening. Coordinate with all divisions.

3.7 JOINT FILLERS

.1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Consultant. When more than one piece is required for a joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.

.2 Locate and form isolation, construction, expansion joints as indicated. Install joint filler.

.3 Use 12mm thick joint filler to separate horizontal placements from vertical surfaces and extend joint filler from bottom of slabs to within 12mm of finished slab surface unless indicated otherwise.

3.8 CURING

.1 Cure all concrete in accordance with the requirements of Chapter 7 of CSA A23.1/A23.2 unless noted otherwise.

.2 Curing methods and materials to be to approval of Consultant and ensure that concrete will be protected from damage and prevented from drying out or undergoing successive wet/dry cycles. Continue

curing until 7 days, or fractions thereof, with temperature, above 10 deg.C. Prevent rapid drying at end of curing period.

.3 Cure concrete slabs by placing 6 mil. polyethylene over concrete slab immediately after final trowelling. Leave in place for 7 days. Seal at all edges.

3.9 PATCHING

.1 Neatly sawcut perpendicular to surface to a minimum depth of 25mm. Remove all defective concrete down to sound concrete to Consultant's satisfaction. Dampen area +150mm all around just before patching. Patch with expanding grout and latex bonding agent and in accordance with Chapter 7 of CAN/CSA A23.1 to match adjacent surfaces. Cure patch.

.2 Patch all cone tie holes with an approved non-metallic, non-shrink mortar except in exposed architectural concrete.

3.10 GROUTING

.1 Do all grouting around pipes, under equipment bases, under base plates, etc. as indicated in accordance with the manufacturer's instructions, with an approved non-metallic, non-shrink mortar. (Shrink compensative grout).

.2 In water retaining structures and below grade, use an approved expanding non-metallic grout for grouting around pipes. etc., passing through wall, etc.

3.11 SLABS-ON-GRADE

.1 Prior to placing vapour barrier, verify that granular base below dampproof membrane has been compacted and tested as required and that it is acceptable to the Consultant.

.2 Provide vapour retarder on prepared granular base. Lap all joints in membrane 150mm minimum. Seal at all edges.

.3 Unless otherwise indicated divide interior slabs-on-grade into panels not exceeding 13 sq. m in area or 3.6m in length by means of keyed construction joints or sawcut control joints as detailed. Take special care in placing wire fabric and sawcutting joints to avoid damage to mesh when cutting joints. Fill all saw cut joints with an approved control joint sealant.

.4 Place reinforcement at mid-height of concrete slabs by utilizing concrete brick chairs placed at a 600 x 600 mm grid. Chairs to be placed on subgrade prior to placement of concrete and reinforcement to be

hooked up onto chairs immediately ahead of concrete placement operation.

.5 Form keyed or dowelled construction joints at any location where casting of slab must be interrupted.

3.12 EXTERIOR SLABS

.1 Broom finish all exterior slabs. Seal with 2 coats acrylic sealer.

.2 On exterior slabs on grade provide control joint pattern at 1200 mm on center each way unless otherwise detailed and install 13 mm premoulded joint filler every second joint.

3.13 EQUIPMENT BASES, INERTIA SLABS AND PITS

.1 Carefully examine the Architectural, Process, Mechanical and Electrical drawings and specifications for requirements. Cooperate with the forces of sub-contractors. This work is not fully detailed on Structural drawings. For exact size and location of bases and inertia slabs consult shop drawings.

.2 Layout of all concrete bases, curbs, pits, etc. for mechanical, process and electrical work to be responsibility of Mechanical, Process and Electrical Sub-Contractors.

.3 Unless otherwise indicated, bases shall rest on the concrete floor slab. Scarify floor slab to make a good bond or key between the bases and floor slab.

.4 Provide all reinforcing for bases, curbs, pits, etc. Set all anchor bolts, sleeves and other miscellaneous metal items which are required to be embedded or attached to concrete. Anchor bolts, sleeves and other miscellaneous metal items, including setting templates for same, shall be supplied by contractors requiring same. Reinforcing for bases shall be 15M @ 400 mm plus 1-15M perimeter bar unless specified elsewhere. Dowel around perimeter into base floor slab with 15M @ 400 unless specified elsewhere.

.5 Finish exposed parts of the bases and curbs with cement mortar. Fill voids, trowel smooth, level edges and corners to provide a neat appearance to the Consultant's approval. Harden exposed faces of curbs and bases in accordance with the requirements of this Section.

.6 Provide grouting approximately 25 mm thick between equipment base plates and concrete. The space between base plates and concrete shall be completely

filled with grout. Grout shall consist of non-shrinking type and be premixed. Clean surface of concrete and wet same prior to grouting. Do not remove levelling wedges before grout attains its final set. Fill voids left by removal of wedges with grout and finish exposed surface of grout to make neat appearance.

3.14 WATERTIGHTNESS TESTING

.1 Test all containment structures under the supervision of the Consultant upon completion of work in order to determine their degree of watertightness. Permissible leakage from these structures when tested shall not exceed the value specified in .1.

.2 Use only potable water for testing, unless otherwise approved by Consultant.

.3 Fill all tanks retaining liquids to their maximum level for an absorption period of 24 hours. Top up and check over the next 48 hours for watertightness taking readings at 24 and 48 hours. Permissible leakage shall not cause a drop in water level greater than 6 mm during the 24 hour period. Any leakage in excess of the above quantity, or any flowing water is visible, shall be repaired and tanks retested at the Contractor's expense, until the tests are satisfactory in every respect.

.4 Containment lined with waterproof membranes or otherwise waterproofed shall not be permitted to show any leakage or dampness.

.5 Take appropriate measures, approved by the Consultant, to produce a watertight structure and repeat tests until a satisfactory result is obtained.

3.15 TEMPORARY BRACING

.1 Bracing will be required on any wall or floors that are to be backfilled or constructed on prior to concrete obtaining its design strength. If structural support members are not in place, appropriate bracing will be done. All bracing and shoring is to be designed by a Professional Consultant registered in the Province of Ontario. This will be done to the satisfaction of the Consultant.

PART 1 - GENERAL

1.1 RELATED WORK

.1 Cast-In-Place Concrete: Section 03 10 00

1.2 REFERENCES

.1 Do concrete floor finishing work in accordance with CAN/CSA-A23.1 except where specified otherwise.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Concrete materials to Section 03 10 00 - Cast-in-Place Concrete.

.2 Non-metallic floor hardener: BASF MasterTop 100 or comparable product by CPD or Sika.

.3 Curing compound: type compatible with sealer.

.4 Floor sealer: BASF MasterKure CC 300SB or comparable product by CPO or Sika.

.5 Contractor to ensure that hardener, curing compound and sealer are compatible.

.6 Saw control joint filler: MasterSeal NPI Sealant by BASF or comparable product by CPO or Sika.

PART 3 - EXECUTION

3.1 FLOOR FINISH

.1 Steel trowel finish concrete in accordance with CAN/CSA-A23.1/A23.2 classification "flat".

.2 Do not sprinkle dry cement or dry cement and sand mixture over concrete surfaces.

.3 Apply floor hardener aggregate as per manufacturer's instructions. Cure to manufacturers recommendations.

.4 Cure concrete in accordance with Section 03 10 00.

.5 Apply floor sealer in accordance with manufacturer's directions.

.6 All areas not called for sealer and hardener or areas which are to receive an applied finish, are to be cured by ponding, continuous sprinkling or by the use of absorptive mats and fabrics kept continuously wet.

.7 Where floor drains occur, floors to be level around walls and have a minimum 5mm per metre uniform pitch to drains, unless indicated otherwise.

.8 Insert 8mmØ closed cell foam backer rod into 6.4mm wide joint. Fill all sawcut control joints with joint sealant. Prime surfaces with primer according to manufacturer's instructions.

PART 1 - GENERAL

1.1 RELATED WORK

.1 Shop-Fabricated Wood Trusses: Section 06 17 53.

1.2 REFERENCES

.1 CSA International:

.1 CSA 080-15 - Series Consolidated.

.2 CSA 0141-05 (R2014) – Softwood Lumber.

.3 CSA 0151-09 (R2014) – Canadian Softwood Plywood.

.4 CSA B111-74 (R2003) – Wire Nails, Spiles and Staples.

.5 CSA-0325-16 – Construction Sheathing.

.2 ASTM International:

.1 ASTM A123/A123M-15.

1.3 SOURCE QUALITY

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

.2 Plywood identification: by grade mark in accordance with applicable CSA standards.

1.4 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

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

.2 Store and protect wood from nicks, scratches and blemishes.

.3 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 LUMBER MATERIAL

.1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:

.1 CSA 0141.

.2 NLGA Standard Grading Rules for Canadian Lumber, 2000 edition.

.2 Framing and board lumber: in accordance with OBC 2012 Subsection 9.3.2, except as follows:

.1 Structural and light framing: SPF species, NLGA No.1/No.2 grade, kiln dried to 15% moisture content or less.

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

.1 S2S is acceptable for strapping.

.2 Board sizes: "Standard" or better grade.

.3 Dimension sizes: "Standard" light framing or better grade.

2.2 PANEL STANDARDS

.1 Panel standards: type, grade and thickness as indicated, in accordance with following standards:

.1 Canadian softwood plywood (CSP): to CSA 0151, standard construction.

.2 Electrical backboards: 19mm fire retardent pressure treated plywood.

2.3 FASTENERS

.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 Galvanizing: to ASTM A123, use galvanized fasteners for exterior work, interior highly humid areas and pressure-preservative treated lumber.

2.4 WOOD PRESERVATIVE .1 Pressure preservative treat indicated materials to CSA 080 using CCA preservative.

PART 3 - EXECUTION

3.1 ERECTION OF FRAMING MEMBERS

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

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

.3 Install spanning members with "crown-edge" up.

3.2 FURRING AND BLOCKING .1 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding and other work as required.

.2 Install furring to support siding applied vertically where there is no blocking and where sheathing is not suitable for direct nailing.

.3 Align and plumb faces of furring and blocking to tolerance of 1:600.

3.3 NAILING STRIPS, GROUNDS AND ROUGH BUCKS .1 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.

3.4 CANTS, CURBS, FASCIA BACKING .1 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized steel fasteners.

3.5 FASTENERS .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 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

3.6 ELECTRICAL EQUIPMENT BACKBOARD	.1	Provide backboards for mounting electrical equipment as indicated. Use 19 mm thick fire retardant pressure treated plywood such as Drycon.
3.7 SHIMMING OF CONTINUOUS WOOD PLATES	.1	Provide wood shims, cut tapered to suit conditions, between continuous wood plates and precast concrete roof double tees. This is to account for difference in elevations between adjacent double tee members. Wood to be full width and same type & grade as continuous wood plates.

PART 1 - GENERAL

1.1 Section Includes

.1 Standing and running trim.

.2 Interior and exterior frames.

1.2 Related Sections

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 09 91 23 - Painting.

1.3 References

.1 American National Standards Institute (ANSI)
- .1 ANSI A208.1-99, Particleboard.
- .2 ANSI A208.2-94, Medium Density Fibreboard (MDF).

.2 American Society for Testing and Materials (ASTM)
- .1 ASTM E 1333-96, Test Method for Determining Formaldehyde Concentrations in Air and Emissions Rates from Wood Products Using a Large Chamber.

.3 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-11.3-M87, Hardboard.

.4 Canadian Standards Association (CSA)
- .1 CAN/CSA-A247-M86(R1996), Insulating Fibreboard.
- .2 CSA B111-74(R1998), Wire Nails, Spikes and Staples.
- .3 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .4 CSA O115-M82(R2001), Hardwood and Decorative Plywood.
- .5 CSA O121-M78(R1998), Douglas Fir Plywood.
- .6 CAN/CSA O141-91(R1999), Softwood Lumber.
- .7 CSA O151-M78 (R1998), Canadian Softwood Plywood.
- .8 CSA O153-M80 (R1998), Poplar Plywood.
- .9 CSA Z760-94, Life Cycle Assessment.

.5 International Organization for Standardization (ISO)
- .1 ISO 14040-97, Environmental Management-Life Cycle Assessment - Principles and Framework.
- .2 ISO 14041-98, Environmental Management-Life Cycle Assessment - Goal and Scope Definition and Inventory Analysis.

.6 National Hardwood Lumber Association (NHLA)
- .1 Rules for the Measurement and Inspection of Hardwood and Cypress January 1996.

1.3 References (Cont'd)

.7 National Lumber Grades Authority (NLGA)
- .1 Standard Grading Rules for Canadian Lumber 2000.

.8 Underwriters Laboratories of Canada (ULC)
- .1 CAN4-S104-80(R1985), Fire Tests of Door Assemblies.
- .2 CAN4-S105-85(R1992), Fire Door Frames, meeting the Performance Required by CAN4-S104.

1.4 Shop Drawings

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

.2 Indicate details of construction, profiles, jointing, fastening and other related details.

.3 Indicate materials, thicknesses, finishes and hardware.

1.5 Samples

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

.2 Submit duplicate samples: sample size 4" x 4".

1.6 Delivery, Storage, and Handling

.1 Protect materials against dampness during and after delivery.

.2 Store materials in ventilated areas, protected from extreme changes of temperature or humidity.

PART 2 - PRODUCTS

2.1 Lumber Material

.1 Softwood lumber: unless specified otherwise, S4S, moisture content 19% or less in accordance with following standards:
- .1 CAN/CSA-O141.
- .2 NLGA Standard Grading Rules for Canadian Lumber.
- .3 AWMAC premium grade, moisture content as specified.

.2 Machine stress-rated lumber is acceptable.

.3 Hardwood lumber: moisture content 7 % or less in accordance with following standards:
- .1 National Hardwood Lumber Association (NHLA).
- .2 AWMAC premium grade, moisture content as specified.

2.1 Lumber Material (Cont'd)

.4 Manufacturing process must adhere to Lifecycle Assessment (LCA) Standards as per CSA Z760 LCA Standards.

2.2 Panel Material

.1 Laminated plastic for flatwork: to CAN3-A172-M79, Grade G.P., Type 1b, 1.6 mm thick; based on standard colour range with furniture finish.

.2 Laminated plastic for postforming work: to CAN3-A172-M79, Grade PF, Type 2a, 1.25 mm thick, based on standard colour range with furniture finish. Where indicated, provide acid resistant (laboratory grade) as noted above.

.3 Laminated plastic backing sheet: supplied by same manufacturer as facing sheet; not less than same thickness and colour as face laminate.

.4 Edge strips: PVC in matching colour to laminate.

.5 Melamine finish: melamine resin impregnated facing fused to backing board, based on standard colour range.

.6 Particleboard core: sanded faces, of thickness indicated.

.7 Laminated plastic adhesive: urea resin adhesive to CSA 0112.5-M1977.

.8 Sealer: water resistant sealer or glue acceptable to laminate manufacturer.

.9 Draw bolts and splines: as recommended by fabricator.

2.3 Accessories

.1 Nails and staples: to CSA B111; galvanized to CAN/CSA-G164 for exterior work, interior humid areas and for treated lumber; stainless steel finish elsewhere.

.2 Wood screws: stainless steel, type and size to suit application.

.3 Splines: wood.

.4 Adhesive: recommended by manufacturer.

.5 Use least toxic sealants, adhesives, sealers, and finishes necessary to comply with requirements of this section.

.6 DupoiSpun-bonded polyolefin weather barrier system. Tyvek Homewrap by

PART 3 - EXECUTION

3.1 Installation

.1 Do finish carpentry to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.

.2 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets, or other projecting, intersecting or penetrating objects.

.3 Form joints to conceal shrinkage.

3.2 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 cleanly 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 Standing and running trim.

.1 Butt and cope internal joints of baseboards to make snug, tight, joint. Cut right angle joints of casing and base with mitred joints.

.2 Fit backs of baseboards and casing snugly to wall surfaces to eliminate cracks at junction of base and casing with walls.

.3 Make joints in baseboard, where necessary using a 45° scarf type joint.

.4 Install door and window trim in single lengths without splicing.

.3 Panelling.

.1 Secure panelling and perimeter trim using adhesive recommended for purpose by manufacturer. Fill nail holes caused by temporary fixing with filler matching wood in colour.

.2 Secure panelling and perimeter trim using concealed fasteners.

.3 Secure panelling and perimeter trim using counter sunk screws plugged with matching wood plugs.

.4 Handrails, wall rails and bumper rails.

.1 Make joints hair line, dowelled and glued.

.2 Install brackets at ends and at posts.

.3 Secure using counter sunk screws plugged with matching wood plugs.

3.2 Construction (Cont'd)

.5 Hardware.

.1 Pulls: D-type, 8mm dia, 33mm projection, 89mm centres, brushed chrome finish.

.2 Cupboard hinges: fully concealed 107? modular opening, self closing, Blum #74M-155.

.3 Regular drawer glides: ball bearing, full extension 45 kg load, Accuride 3832 with length to suit.

.4 Pilaster strips: (KV255 fully recessed slotted, nickel plated steel with 4 shelf clips to match per shelf.

3.3 Shop Fabrication

.1 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.

.2 Fabricate caseworks to AWMAC flush overlay construction custom grade.

.3 Cabinet doors to be 19 mm thick, flush style, AWMAC custom grade.

.4 Where open cases or shelving occurs, shelving, dividers interior faces of ends and backs and any other visible surface shall be considered as "exposed" surfaces unless noted otherwise.

.5 Unless otherwise indicated construct caseworks using materials as follows:

.1 Gables and end panels: 19 mm thick laminate on hardwood plywood core as indicated.

.2 Doors: 3/4" thick laminate on particleboard core, as indicated.

.3 Counters and vanities: plastic laminate on 3/4" thick hardwood plywood except where lab grade laminate is noted.

.4 Shelves: 3/4" thick plastic laminate on particle boards core as indicated on the drawings.

.5 Backs: 1/2" thick melamine finish particleboard core.

.6 Drawers: 3/4" thick facing with 1/2" thick sides and backs. Provide laminate on particleboard core. Drawer bottom to be 1/4" hardboard with melamine finish.

.7 Shop install and adjust cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.

.1 Shelving to cabinetwork to be adjustable unless otherwise noted.

.2 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.

.6 Laminate Work:

.1 Comply with CAN3-A172-M79, Appendix 'A'.

.2 Ensure adjacent parts of continuous laminate work match in colour and pattern.

3.3 Shop Fabrication (Cont'd)

.6 (Cont'd)

.3 Veneer laminated plastic to core material in accordance with adhesive manufacturer's instructions. ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 2400 mm. Keep joints 24" from sink cutouts.

.4 Form shaped profiles and bends as indicated, using postforming grade laminate to laminate manufacturer's instructions.

.1 Where laminate edges are permitted, use straight colour through laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.

.2 Apply laminate backing sheet to reverse side of core of plastic laminate work.

.5 Fabricate vanities, closet shelves, shelving and other similar items to AWMAC custom grade.

.6 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

.1 Section Includes:

- .1 Material and installation for prefabricated wood trusses.

.2 Related Sections:

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 35 30 - Health and Safety Requirements.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

- .1 CSA O80 Series-15, Wood Preservation.
- .2 CAN/CSA-O86-14, Engineering Design in Wood.
- .3 CAN/CSA-O141-05 (R2014), Softwood Lumber.
- .4 CSA 5347-14, Method of Test for Evaluation of Truss Plates Used in Lumber Joints.
- .5 CSA W47.1-09 (R2014), Certification of Companies for Fusion Welding of Steel.

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

- .1 Material Safety Data Sheets (MSDS).

.3 National Lumber Grades Authority (NLGA)

- .1 NLGA-14, Standard Grading Rules for Canadian Lumber.

.4 Truss Plate Institute of Canada (TPIC)

- .1 TPIC - 14, Truss Design Procedures and Specifications for Light Metal Plate Connected Wood Trusses (Limit States Design).

1.3 DESIGN REQUIREMENTS

.1 Design light metal plate connected wood trusses in accordance with TPIC truss design procedures for wood truss chords and webs in accordance with engineering properties in CAN/CSA-O86.

.2 Design light metal plate connected wood trusses in accordance with TPIC truss design procedures for truss joint designs to test engineering properties in accordance with CSA S347 and listed in CCMC Registry of Product Evaluations.

.3 Design trusses, bracing and bridging in accordance with CAN/CSA-O86.1 for loads indicated and minimum uniform and minimum concentrated loadings stipulated in NBC commentary.

.4 Limit live load deflection to 1/360th of span where gypsum board ceilings are hung directly from trusses.

.5 Limit live load deflections to 1/240th of span unless otherwise specified or indicated.
Provide camber for trusses as indicated.

1.4 QUALITY ASSURANCE

.1 Qualifications:

.1 Fabricator for trusses to show evidence of quality control program such as provided by regional wood truss associations, or equivalent.

.2 Fabricator for welded steel connections to be certified in accordance with CSA W47.1.

.2 Pre-Installation Meeting:

.1 Convene pre-installation meeting one week prior to beginning work of this Section.

.1 Verify project requirements.

.2 Review installation conditions.

.3 Co-ordination with other building subtrades.

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

1.5 SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - Submittal Procedures.

.3 Shop Drawings:

.1 Each shop drawing submission showing connection details to be signed and stamped by professional engineer registered or licensed in province of Ontario, Canada.

.2 Indicate special structural application and specification as according to local authorities having jurisdiction.

.3 Indicate TPIC Truss Design Procedure and CSA O86 Engineering Design in Wood and specific CCMC Product Registry number of the russ plates.

.4 Indicate species, sizes, and stress grades of lumber used as truss members. Show pitch, span, camber, configuration and spacing of trusses. Indicate connector types, thicknesses, sizes, locations and design value. Show bearing details. Indicate design load for members.

.5 Submit stress diagram or print-out of computer design indicating design load for truss members. Indicate allowable load and stress increase.

.6 Indicate arrangement of webs or other members to accommodate ducts and other specialties.

.7 Show location of lateral bracing for compression members.

.4 Test reports: submit certified test reports for prefabricated wood trusses from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.

.5 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.6 Instructions: submit manufacturer's installation instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Lumber: SPF, No. 2 grade, softwood, with maximum moisture content of 19% at time of fabrication and to following standards:

- .1 CAN/CSA-O141.
- .2 NLGA (National Lumber Grading Association), Standard Grading Rules for Canadian Lumber.

.2 Fastenings: to CAN/CSA-O86.

.3 Preservative: None.

.4 Fire retardant: None.

2.2 FABRICATION

.1 Fabricate wood trusses in accordance with reviewed shop drawings.

.2 Provide for design camber and roof slopes when positioning truss members.

.3 Connect members using metal connector plates.

2.3 SOURCE QUALITY CONTROL

.1 Identify lumber by grade stamp of an agency certified by Canadian Lumber Standards Administration Board.

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 datasheet.

3.2 ERECTION

.1 Erect wood trusses in accordance with reviewed shop drawings.

.2 Handling, installation, erection, bracing and lifting in accordance with manufacturer's instructions.

.3 Make adequate provisions for handling and erection stresses.

.4 Exercise care to prevent out-of-plane bending of trusses.

.5 Install temporary horizontal and cross bracing to hold trusses plumb and in safe condition until permanent bracing and decking are installed.

.6 Install permanent bracing in accordance with reviewed shop drawings, prior to application of loads to trusses.

.7 Do not cut or remove any truss material without approval of Engineer.

.8 Remove chemical and other surface deposits on treated wood, in preparation for applied finishes.

3.3 CLEANING

.1 Remove surplus materials, excess materials, rubbish, tools and equipment on completion of installation.

PART 1 - GENERAL

1.1 RELATED WORK	.1	Section 07 21 16 - Batt Insulation.
	.2	Division 21 & 233 - Insulation for Mechanical Work.
1.2 REFERENCES	.1	ASTM E96-80 Test Methods for Water Vapour Transmission of Materials.
	.2	CAN/CGSB-51.20-M87 Thermal Insulation, Polystyrene, Boards and Pipe Covering.
	.3	CGSB 71-GP-24M-77 Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.

PART 2 - PRODUCTS

2.1 INSULATION	.1	Cavity wall insulation: 600 mm high x 2400 mm long extruded polystyrene, Poly ISO Styrofoam SM, insulation or approved alternate, 75mm thick, to fit snugly between veneer anchors.
	.2	Below grade insulation: Extruded polystyrene, Dow Styrofoam SM or Celfort equivalent, minimum 75 mm. Provide high density HI-40 board where noted.
	.3	Above grade perimeter insulation: Dow Styrofoam, thickness noted on the drawings.
2.2 ADHESIVE	.1	General purpose type as recommended by insulation manufacturer and compatible with air/vapour seal membrane where applicable.
2.3 MECHANICAL FASTENERS (BELOW GRADE)	.1	Hilti IDP-6/8 anchoring system for perimeter insulation. Install at 610mm o.c. horizontal and 900mm o.c. vertically
2.4 WEDGE BLOCKS	.1	PVC or plastic wedge blocks, to hold insulation tight against substrate.

PART 3 - EXECUTION

3.1 WORKMANSHIP

.1 Install insulation after building substrate materials are dry and after air/vapour seal membrane is inspected.

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

.3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.

.4 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.

.5 Do not enclose insulation until it has been reviewed by Engineer.

3.2 PERIMETER INSULATION

.1 Install on exterior face of perimeter foundation with mechanical fasteners and adhesive for below and/or above grade applications.

.2 Install in strict accordance with manufacturer's printed instructions.

.3 Ensure that boards are not dislodged when back filling.

3.3 ENTRANCE SLAB INSULATION

.1 Provide high density rigid insulation directly under poured concrete entrance slabs as indicated.

END OF SECTION

PART 1 - GENERAL

1.1 References

.1 CSA A101-M1983 Thermal Insulation, Mineral Fibre, for Buildings.

PART 2 - PRODUCTS

2.1 Insulation

.1 Batt and blanket mineral fibre: to CSA A101, Type 1, R value as noted.

.2 Vapour barrier: 0.15 mm polyethylene film to CAN/CGSB 51.34-M (OBC 9.25.3.5 (1)). Tape or sealant for sealing as recommended by film manufacturer.

PART 3 - EXECUTION

3.1 Insulation Installation

.1 Install insulation to maintain continuity of thermal or acoustical protection to building elements and spaces.

.2 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.

.3 Fill gaps and voids as indicated on the drawings.

.4 At vertical applications and where required provide wire mesh to retain batts in place.

.5 Provide polyethylene vapour barrier where noted on the drawings and to warm side of batt insulation provided.

.6 Seal vapour barrier to sheet membrane air/vapour barrier where the two membranes

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

.1 All conditions of the contract and Division 1, General Requirements apply to this section.

.2 All work shall meet the requirements of the 2006 Ontario Building Code, and the Canadian Roofing Contractors Association (C.R.C.A.), including all amendments up to project date.

1.2 COORDINATION

.1 Co-ordinate work under this section with work of related sections.

1.3 RELATED WORK SPECIFIEDELSEWHERE

.1 Selective Demolition and Removal: Section 02 41 00

.2 Rough Carpentry: Section 06 10 00

.3 Sheet Metal Flashings & Trim: Section 07 62 00

.4 Sealants: Section 07 92 00

1.4 SCOPE OF WORK

.1 Supply all labour materials and equipment required to perform the selective demolition, removal and disposal work specified in the Summary of Work, to the full extent of Drawings and Specifications.

1.5 SAMPLE

.1 Submit to the Consultant for review full-size sample of the specified asphalt shingles.

1.6 JOB CONDITIONS

.1 Before commencing work each day, ensure that all surfaces to receive primer or underlayment are clean, smooth, solid and dry.

.2 Temperatures during application shall not be less than the minimum recommended by the material manufacturer. Work shall not be carried out during inclement weather conditions.

.3 Use only dry materials and apply only during weather that will not introduce moisture into roofing system.

1.7 PROTECTION

.1 Provide all necessary protection measures to protect surrounding surfaces from damage caused by roofing operations.

1.8 WARRANTY

.1 Provide Canadian Roofing Contractors' Association (CRCA) Standard Form of Warranty, complete with a copy of the CRCA's Preventative Maintenance Manual or similar written warranty acceptable to the Owner Representative and the Consultant. The warranty shall be for a period of two (2) years from date of Substantial Performance as certified by the Consultant.

.2 Provide a written warranty stating that the asphalt shingle roofing and flashings will remain leakproof and free of all material and workmanship deficiencies including without being limited to the following: failure to stay in place, undue expansion, lifting, curling, cupping, loss of finish and deformation, for a period of two years from date of Certificate for Substantial Performance. The warranty shall include all required materials and their application, at no additional cost to the Owner.

.3 Provide any applicable material and material / labour warranties offered by the material manufacturers.

.4 Repair leaks into building or roofing assembly within 24 hours of notification.

.5 Inspect roof 30 days before expiry of warranty and correct defects within 15 days of inspection. Provide a written report to the owner identifying the results of the inspection and corrective measures.

.6 Carry out repair work required under the warranty in accordance with the recommendation of the Consultant.

1.9 DELIVERY AND

.1 Deliver and store materials to manufacturer's instructions.

.2 Do not store materials on roof in a manner which may overload the structure.

.3 Store materials under cover on elevated platforms, protected from weather and construction activities.

.4 Deliver and store materials in original packages with labels intact.

.5 Remove and replace damaged, wet or broken materials.

.6 Stand Rolls on end, and protect edges.

.7 Store materials away from open flame or ignition sources.

1.9 DELIVERY AND (Cont'd)

.8 Do not transport any materials through the building.

1.10 REFERENCES

.1 CAN/CGSB 37.4-M89, Fibrated Cutback Asphalt Lap Cement for Asphalt Roofing.

.2 CAN//CGSB 37.5-M89, Cutback Asphalt Plastic Cement.

.3 CSA/A123.1-1979-M, Asphalt Shingles Surfaced with Mineral Granules.

.4 CSAA123.3-1979-M, Asphalt or Tar Saturated Roofing Felt.

.5 CAN3-A123.51-M85, Asphalt Shingle Application on Roof Slopes 1:3 and Steeper.

PART 2 - PRODUCTS

2.1 MANUFACTURER

.1 All components of roofing system, including roof membrane, membrane flashings, rigid insulation, coverboard, and vapour retarder shall be as supplied by one manufacturer / supplier and shall be compatible with all adjacent components.

2.2 MATERIALS

.1 Asphalt Shingles: Cambridge asphalt shingle as manufactured by IKO industries Inc in colour to match existing (from their standard colour range).

.2 Membrane underlayment (Eave Protection): Composite peel and stick membrane comprised of rubberized or modified asphalt and polyethylene such as "Ice & Water Shield" as manufactured by W. R. Grace & Co. of Canada Ltd., "Blueskin SA" as manufactured by Bakor Inc., or an approved equivalent Membrane underlayment to be as manufactured or supplied by selected shingle manufacturer.

.3 Deck Underlayment: synthetic underlayment such as "DeckArmour" as manufactured by GAF Corporation or an approved equivalent deck underlayment to be as manufactured or supplied by selected shingle manufacturer.

.4 Plastic cement: to CAN/CGSB 37.5-M89.

2.2 MATERIALS (Cont'd)

.5 Roofing nails: Hot-dipped galvanized steel nails to CSA B111-1974. Minimum 3 mm diameter with shanks resistant to pull-out, a flat head of 9.5 mm minimum diameter and of sufficient length to penetrate into wood decking by a minimum of 19 mm.

.6 Sheet metal drip edge flashings: in accordance with Section 07 62 00.

2.3 ROOFING

.1 Ridge Vent: "Cobra Snow Country Advanced" exhaust vent for roof ridge as manufactured by GAF Corporation or an approved equivalent equal.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Examine site conditions and surfaces to ensure that they are in satisfactory condition for the commencement of the work of this section.Paragraph

.2 Examine work of other trades for defects and discrepancies and report them to the Owner's Representative in writing. Do not proceed with work until surfaces are satisfactory.

.3 Examine all surfaces to receive roofing.

.4 Deck surface shall be firm and dry, without ridges, warps or voids, and shall be properly fastened to the supporting structure.

.5 All penetrations except plumbing vents and masonry chimneys shall be curbed. All penetrations over 200 mm wide shall have upslope splitters or curbs set diagonally to the slope.

.6 On existing decks, loose nails shall be removed and deck shall be renailed where required.

3.2 PRESENATION

.1 EXAMINE CONDITION OF EXISTING WOOD DECKING AND REPORT TO THE Consultant in writing all structurally unsound or Deteriorated wood decking. Do not permanently cover or replace the structurally unsound or deteriorated wood decking until it is reviewed by the Consultant. Allow Consultant 24 hours to review.

3.3 MEMBRANE UNDERLAYMENT

.1 Install membrane underlayment as per Manufacturer's printed instructions at the following locations:

3.3 MEMBRANE UNDERLAYMENT (Cont'd)

.1 (Cont'd)

.1 Provide membrane underlayment at eaves to provide eave protection. Extend the membrane underlayment a minimum distance of 1800 mm from the roof eave line or to a line 300 mm inside the inner face of the exterior wall whichever is greater.

.2 Provide membrane underlayment below sheet metal drip edge flashings along eaves.

.3 Provide membrane underlayment below sheet metal valley flashings.

.4 Provide membrane underlayment at vent pipe and metal chimney sleeve flashing locations.

.5 Provide membrane underlayment below sheet metal flashing locations.

.2 Ensure all surface areas are free from frost, dust, grease, oil or loose materials.

.3 Proceed only when weather is favourable. Should installation be undertaken at temperature below 4 oC, consult manufacturer regarding special procedures.

PART 1 - GENERAL

1.1 WORK INCLUDED

.1 Removal of existing vinyl cladding and metal flashing. Install new vinyl siding including all accessories, building wrap and flashing in all front, rear and end elevations.

.2 Remove deteriorated sheathing boards. Sheathing that appears to be in sound condition is to remain. Cost to replace deteriorated sheathing will be based on the unit price submitted at tender.

1.2 STANDARDS AND DESIGN

.1 Cladding system in accordance with:

- .1 CAN/CGSB-93.2-M91
- .2 CAN/CGSB-93.5-92
- .3 CAN/CGSB-41.24-95
- .4 AAMA 1402-86

.2 Install cladding to accommodate thermal movement caused by an ambient temperature range of -20°C to 35°C, without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects to the cladding.

.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".

PART 2 - PRODUCTS

2.1 VINYL CLADDING

.1 Polyvinyl Chloride (PVC) solid aluminum siding, nominal thickness to be 0.042". Price to include all accessories including corner posts, undersill, inside corners, drip caps, etc. Siding to be Board and Batten vinyl siding - by GenTek, or approved alternate. Colour to be selected from manufacturer's full colour range.

2.2 FLASHING AND TRIM

.1 Flashings and trim are to be as per the drawings. Where the drawings do not apply, follow manufacturer's standard details. Colour to match siding colour.

2.3 BUILDING WRAP

.1 Spun-bonded polyolefin weather barrier system. Tyvek Homewrap by Dupont Inc and compatible air barrier tape or approved substitution.

PART 3 - EXECUTION

3.1 BUILDING WRAP

.1 Install building wrap following manufacturer's written instructions over entire wall surface.

.2 Install building wrap lapped a minimum of 150 mm at vertical joints and a minimum of 100 mm at horizontal joints and over through-wall flashing. Ensure upper sheet is always lapped over lower sheet. Tape all horizontal and vertical joints.

3.2 VINYL CLADDING

.1 Install all flashings to allow for proper securement of siding, positive drainage of water, to hide exposed siding edges including but not limited to starter flashings, drip flashings, corner flashings, edgings, J-channels, and window flashings as shown on drawings.

.2 Install vinyl cladding in accordance with manufacturer's standard installation procedures, providing proper laps and detailing to ensure a weather tight face. Ensure cladding work is plum and even.

.3 Install finishing flashing and trim to match existing trim.

.4 Provide cladding and all accessories in longest practicable lengths to minimize field lapping of joints.

3.3 TOUCH-UP AND CLEANING

.1 Clean siding to remove stains, dirt and debris.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK

.1 Section 06 10 10 - Rough Carpentry.

.2 Section 01 33 00 - Submittals.

1.2 REFERENCES

.1 ASTM A526M-85 Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.

1.3 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittals.

.2 Submit duplicate 50 x 50 mm samples of each type of sheet metal material, colour and finish.

1.4 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures which indicate arrangements of sheets and joints, types and locations of fasteners and special shapes and relationship of panels to structural frame.

PART 2 - PRODUCTS

2.1 SHEET METAL MATERIALS

.1 Prefinished sheet metal: 0.70mm (24 gauge) thickness, galvanized steel prefinished with Colorite HMP coating system, color to match Stone Grey - QC 6071.

.2 Fascia, flashings & trim, gutters & down spouts: to be same material and colour.

2.2 ACCESSORIES

.1 Isolation coating: alkali resistant bituminous paint.

.2 Underlay for metal flashing: dry sheathing to CAN/CGSB-51.32.

.3 Sealants: Tremco Dymeric 240 or approved alternate.

.4 Cleats: of same material, and temper as sheet metal, minimum 50 mm wide. Thickness 1.6 mm.

2.2 ACCESSORIES (Cont'd)

.5 Fasteners: of same colour as sheet metal, to CSA B111, screwed fasteners of length and thickness suitable for metal flashing application.

.6 Washers: of same material as sheet metal, 1 mm thick with rubber packings.

.7 Touch-up paint: as recommended by metal flashing and trim manufacturer.

2.3 FABRICATION

.1 Fabricate sheet metal, fascia, soffit, gutters and down spouts and fastenings as indicated and as detailed on reviewed shop drawings and in accordance with manufacturer's printed details. Where details differ with printed instructions refer to Engineer for clarification and provide details as directed.

.2 Provide all required, fascias, flashings, gutters and down spouts, closures, clips, sealants, etc. for a complete installation. Flashings noted on architectural drawings are to be deemed as minimum requirements. Provide any additional item necessary to obtain weather seal.

.3 Provide complete weather seal between roofing and flashings.

.4 Form flashing pieces in 2400 mm maximum lengths. Make allowance for expansion at joints.

.5 Hem exposed edges on underside 12 mm. Miter and seal corners with sealant.

.6 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.7 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

.8 Provide continuous bead of sealant along all standing seam joints.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Do sheet metal and fascia in strict accordance with manufacturer's printed instructions and reviewed shop drawings.

.2 Use concealed fastenings except where approved by Engineer before installation.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Materials, preparation and application for caulking and sealants.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 45 00 - Quality Control.

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.

.3 Department of Justice Canada (Jus)
.1 Canadian Environmental Protection Act, 1999 (CEPA).

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

.5 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.

1.4 SUBMITTALS (Cont'd)

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

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

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

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

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

1.5 DELIVERY, STORAGE, AND HANDLING

.1 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.

1.6 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.

1.7 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.

1.7 ENVIRONMENTAL REQUIREMENTS (Cont'd)

.3 Ventilate area of work by use of approved portable supply and exhaust fans.

PART 2 - PRODUCTS

2.1 SEALANT MATERIALS

.1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

.2 When low toxicity caulks are not possible, confine usage to areas which offgas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize offgas time.

.3 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Silicones One Part.
- .1 To CAN/CGSB-19.13.
- .2 Mildew resistant.

.2 Acrylics One Part.
- .1 To CGSB 19-GP-5M.

2.3 SEALANT LOCATIONS

.1 Perimeters of exterior openings where frames meet exterior facade of building (i.e. brick, block, precast masonry).

.2 Expansion and control joints in exterior surfaces of poured-in-place concrete walls.

.3 Seal interior perimeters of exterior openings as detailed on drawings.

.4 Interior control and expansion joints in floor surfaces.

.5 Perimeters of interior frames.

.6 Interior masonry vertical control joints (block-to-block, block-to-concrete, and intersecting masonry walls).

.7 Joints at tops of non-load bearing masonry walls at the underside of poured concrete.

.8 Perimeter of bath fixtures (e.g. sinks, tubs, urinals, stools, waterclosets, basins, vanities).

2.3 SEALANT LOCATIONS (Cont'd)

.9 Exposed interior control joints in drywall.

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 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 MIXING

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

3.6 APPLICATION

.1 Sealant.

.1 Apply sealant in accordance with manufacturer's written instructions.

.2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.3 Apply sealant in continuous beads.

.4 Apply sealant using gun with proper size nozzle.

.5 Use sufficient pressure to fill voids and joints solid.

.6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.7 Tool exposed surfaces before skinning begins to give slightly concave shape.

.8 Remove excess compound promptly as work progresses and upon completion.

.2 Curing.

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until proper curing has taken place.

.3 Cleanup.

.1 Clean adjacent surfaces immediately and leave Work neat and clean.

.2 Remove excess and droppings, using recommended cleaners as work progresses.

.3 Remove masking tape after initial set of sealant.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work	.1	Wood Blocking: Section 06 10 10
	.2	Caulking of joints between frames and other building components: Section 07 92 10
	.3	Supply of finish hardware Section 08 71 10
	.4	Glazing: Section 08 80 50
	.5	Interior Painting: Section 09 91 23
1.2 References	.1	ASTM A525-86 Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
	.2	ASTM A526M-85 Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.
	.3	CAN4 S104M-M80 Fire Tests of Door Assemblies.
	.4	CAN4 S105M-M85 Fire Door Frames.
	.5	CAN/CGSB 181.1 Coating, Zinc-Rich, Organic, Ready Mixed.
	.6	Canadian Steel Door and Frame Manufacturers' Association, (CSDFMA) Canadian Manufacturing Specifications for Steel Door and Frames, 1982.
	.7	NFPA 80-1986 Fire Doors and Windows.
1.3 Requirements of Regulatory Agencies	.1	Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4 S104M-80 revised 1985 and CAN4 S105M-1985 for ratings specified or indicated.
	.2	Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.
1.4 Shop Drawings	.1	Submit shop drawings in accordance with Section 01 33 00.

1.4 Shop Drawings (Cont'd)

.2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, glazed openings, arrangement of hardware and fire rating.

.3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and finishes.

PART 2 - PRODUCTS

2.1 Materials

.1 Galvanized steel sheet: lock-forming quality to ASTM A527, Coating Designation mill phosphatized.

.2 Doors: 1.12mm base material thickness

.3 Door Core:
.1 Honeycomb: structural core consisting of kraft paper having 20mm cell size to thickness indicated.
.2 Hollow Steel: Vertically stiffened with steel ribs and all voids filled with semi-rigid fibrous insulation minimum density 48 kg/m³

.4 Frames: Steel frames to exterior and interior openings 1.520 mm base thickness.

.5 Provide other door and frame components in accordance with CSDFMA requirements.

.6 Primer for galvanized steel sheet: CAN/CGSB 181.1.

.7 Foam-in-place insulation spray polyurethane to CGSB 51-GP-23M Class 1.

.8 Fire Labels: Metal riveted.

2.2 Fabrication

.1 Fabricate frames as detailed, to Canadian Steel Door and Frame Manufacturers' Association, (CSDFMA) Canadian Manufacturing Specifications for Steel Doors and Frames, 1982; except where specified otherwise. Reinforce door and frames to suit hardware requirements specified Section 08 71 10 - Finish Hardware.

.2 Blank, reinforce, drill and tap doors and frames for mortised hardware. Reinforce doors and frames for surface mounted hardware.

.3 Apply, at factory, touch up primer to doors and frames manufactured from galvanized steel where coating has been removed during fabrication.

2.3 Doors

.1 Fabricate doors will longitudunal edges mechanically interlocked and spot welded.

.2 Fabricate doors with top and bottom channels flush and filled solid, extending full width of door and welded to both faces.

.3 Provide fire labelled doors for openings requiring fire protection rating as scheduled. Test such products in accordance with CAN4-S104 and list by nationally recognized agency having factory inspection services.

2.4 Frames

.1 Cut mitres and joints accurately and weld continuously on inside of frame profile.

.2 Grind welded corners and joints to flat plane, fill with metallic paste filler and sand to uniform smooth finish.

.3 Provide adjustable jamb anchors for fixing at floor and walls.

.4 Install 3 bumpers on strike jamb for each single door and 2 bumpers at head for pairs of doors. Provide 2-89x89x16 mm radius hinges per interior apartment door.

.5 Fabricate thermally broken frames for exterior doors using steel core, separating exterior portion of frame from interior portion with polyvinyl chloride thermal breaks.

.6 Make provision for glazing as indicated and provide necessary glazing stops.

PART 3 - EXECUTION

3.1 Installation General

.1 Install in accordance with National Fire Codes, Volume 4, produced by National Fire Protection Association (NFPA) 80.

3.2 Door Installation

.1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 10 - Finish Hardware.

.2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.

.1 Hinge side: 1.0 mm.

.2 Latchside and head: 1.5 mm.

.3 Finished floor, top of carpet, noncombustible sill and thresholds: 13 mm.

3.2 Door Installation (Cont'd)	.3	Adjust operable parts for correct function.
3.3 Frame Installation	.1	Set frames plumb, square, level and at correct elevation.
	.2	Secure anchorages and connections to adjacent construction.
	.3	Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.
	.4	Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
	.5	Where noted provide foam in place insulation to seal at head and jambs. Do not distort frames out of line.
3.4 Finish Repairs	.1	Touch up with primer, galvanized finish damaged during installation.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

.1 The opening will be equipped with Wayne-Dalton 800C Series rolling doors or approved equivalent.

1.2 RELATED WORK

.1 Opening preparation, miscellaneous or structural metal work, access panels, finish or field painting, field electrical wiring, wire conduit, fuses and disconnect switches are in Scope of Work of other divisions or trades.

1.3 REFERENCE STANDARDS

.1 ANSI/DASMA 203 - American National Standards
.1 Institute Specifications for non-rated fire rolling doors published by Door & Access System Manufacturers Associated International.

.2 ASTM A123 - Zinc (hot dipped galvanized) coatings on iron and steel products

.3 ASTM A229 - Steel wire, oil-tempered for mechanical springs.

.4 ASTM A-653-94 - Steel sheet, zinc-coated galvanized by the hot dipped process, commercial quality.

.5 ASTM E330 - Structural performance of exterior windows, curtain walls, and doors by uniform static air pressure difference.

.6 ASTM E413-87 - Sound transmission class acoustical performance value = 22

1.4 QUALITY ASSURANCE

.1 Rolling door and all accessories and components required for complete and secure installations shall be manufactured as a system from one manufacturer.

1.5 SYSTEMS DESCRIPTIONS

.1 Rolling door type: Model 800C

.2 Mounting wood jambs

.3 Operation: chain hoist

1.5 SYSTEMS DESCRIPTIONS (Cont'd)

.4 Material: galvanized steel with polyester finish paint

1.6 SUBMITTALS

.1 Shop Drawings: clearly indicate the following:
- .1 Design and installation details to withstand standard windload.
- .2 All details required for complete operation and installation.
- .3 Hardware locations.
- .4 Type of metal and finish for door sections.
- .5 Finish for micellaneous components and accessories.

.2 Product Data: indicating manufacturers's product data, and installation instructions.

1.7 DELIVERY, HANDLING, STORAGE

.1 Deliver products in manufacturer's original containers, dry, undamaged, seals and labels in tact.

.2 Store and protect products in accordance with manufacturer's recommendations.

1.8 WARRANTY

.1 Standard manufacturer's one year warranty against defects in material and workmanship.

PART 2 - PRODUCTS

2.1 MANUFACTURER

.1 Wayne-Dalton" Thermotite 800C Series or approved alternative.

.2 Wayne-Dalton of Canada - Windsor: 13425 Desro Drive RR #1 Tucumseh,ON, N8N 2L9 (519) 735-7790

2.2 CURTAIN

.1 Curtain will be composed of interlocking #14 flat slats 22 gauge galvanized steel slats with 22 gauge back slats, roll-formed per ASTM standards. The area between the #14 exterior slat and the back slat will be filled by polyurethane insulation, R-value of 6.7 (U=0.15). Curtain designed to withstand a 20 PSF windload. Ends of alternate/continuous slats will be fitted with metal endlocks/windlocks.

2.2 CURTAIN (Cont'd)	.2	Bottom Bar will consists of two equal steel stainless angles 3mm (0.121") minimum thickness to stiffen curtain with astragal. Provide slide bolts on the bottom bar operable from coil side.
2.3 GUIDES	.1	Guides will be roll-formed steel channel bolted to angle or structural grade, three angel assembly of steel stainless steel for a slot of sufficient depth to retain curtains in guides to achieve 20 PSF windload standard. Guides may be provided with integral windlock bars and removable bottom bar stops.
2.4 BRACKETS	.1	Brackets will be of 4.7mm (3/16") minimum thick steel plates, with permanently sealed ball bearings. Designed to enclose ends of coil and provide support for counterbalance pipe at each end.
2.5 COUNTERBALANCE	.1	Curtain to be coiled on a pipe of sufficient size to carry door load with defection not to exceed 0.84mm (0.033") per foot of door span and to be correctly balanced by helical springs, oil tempered torsion type. Cast iron barrel plugs will be used to anchor springs to tension shaft and pipe.
2.6 HOOD	.1	Hood will be minimum 24-gauge galvanized sheet metal, flanged at top for attachment to header and flanged at bottom to provide longitudinal stiffness. Hood will enclose curtain coil and counterbalance mechanism. A flexible hood baffle is included.
2.7 FINISH	.1	Shop coat of rust inhibitive primer on non-galvanized surfaces and operating mechanisms. Guides and bracket plates will be coated with a flat black prime paint. Curtain colour will be beige available as 22 gauge.
2.8 OPERATION	.1	Door will be operated by means of chain hoist with gear drive reduction.
2.9 WEATHERSTRIPPING	.1	Doors will include bottom astragal, surface guide weatherstrip, and internal hood baffle weatherstrip. Optional lintel brush weatherstrip available.

2.10 LOCKING

.1 Chain-hoist door to have chain keepers suitable for padlocks by others.

2.11 WINDLOAD

.1 Windload - minimum 20 psf per SASMA 102-2003 and as required by local codes.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 General

.1 Install doors in accordance with manufacturer's instructions and standards. Installation shall be by an authorized Wayne-Dalton representative.

.2 Verify that existing conditions are ready to receive rolling door work.

.3 Beginning of rolling door work means acceptance of existing conditions.

.2 Install door complete with necessary hardware, jamb and head mold strips, anchors, insertsm hangers, and equipment supports in accordance with final shop drawings, manufacturer's instructions, and as specified herin.

.3 Fit, align, and adjust rolling door assemblies level and plumb for smooth operation.

.4 Upon completion of final installation, lubricate, test, and adjust doors to operate easily, free from warp, twist or distortion and fitting for entire perimeter.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Vinyl Sliding windows.

1.2 RELATED REQUIREMENTS

.1 Section 07 92 10 - Joint Sealants: Sealants.

1.3 REFERENCE STANDARD

.1 ASTM International (ASTM):

.1 ASTM C 1036 - Standard Specification of Flat Glass.

.2 ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass.

.3 ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

.4 ASTM F 558 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.

.2 Screen Manufacturers Association (SMA):

.1 SMA 1201 - Specification for Insect Screens for Windows, Sliding Doors and Swinging Doors.

.3 Window and Door Manufacturers Association (WDMA):

.1 AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights.

1.4 SUBMITTALS

.1 Comply with Section 01 33 00 - Submittal Procedures.

.2 Product Data: Submit manufacturer's product data, including installation instructions.

.3 Shop Drawings: Submit manufacturer's shop drawings, indicating dimensions, construction, component connections and locations, anchorage methods and locations, hardware locations, and installation details.

.4 Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.

.5 Cleaning and Maintenance Instructions: Submit manufacturer's cleaning and maintenance instructions.

1.4 SUBMITTALS (Cont'd)

.6 Warranty Documentation: Submit manufacturer's standard warranty.

1.5 QUALITY

.1 Installer's Qualifications:
.1 Installer regularly engaged, for past 5 years, in installation of vinyl windows of similar type to that specified.
.2 Employ persons trained for installation of vinyl sliding windows.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Delivery:
.1 Deliver windows to site undamaged in manufacturer's or sales branch original, unopened containers and packaging, with labels clearly identifying manufacturer and product name.
.2 Include installation instructions.

.2 Storage and Handling:
.1 Store and handle windows in accordance with manufacturers's instructions.
.2 Store windows off ground and under cover.
.3 Provide full support under framework when storing, handling, and installing windows.
.4 Allow sufficient spacing between windows during storage for ventilation.
.5 Do not life windows by head member only.
.6 Protect windows from weather, direct sunlight, and construction activities.
.7 Protect windows and finish during handling and installation to prevent damage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

.1 Ostaco Windows and Doors, 248 Bowes road, Concord, Ontario. (905) 660-5021

.2 Approved alternative

2.2 PERFORMANCE REQUIREMENTS

.1 Standard Performance:
.1 Meets or exceeds AAMA/WDMA/CSA 101/I.S.2/A440 Ratings: LC-PG25 to LC-PG40, WDMA Hallmark Certified.
.2 Unit assembly shall withstand both positive and negative uniform static air pressure difference without damage when tested according to ASTM E 330.

2.2 PERFORMANCE REQUIREMENTS (Cont'd)

.1 (Cont'd)
- .3 Air Infiltration, 1 .57 psf wind pressure: 0.30 cfm/ft2 of frame.
- .4 Design Pressure: 25 to 40 psf.
- .5 Water Penetration Resistance: 3.76 to 6.06 psf.

.2 Forced Entry Resistance, ASTM F 588, Minimum Security Grade: 10.

.3 Maximum Operating Force:
- .1 Initiate Motion: 50 lbs.
- .2 Maintain Motion: 35 lbs.

.4 Meets U.S ENERGY STAR guidelines.

2.3 VINYL SLIDING WINDOWS

.1 Vinyl Sliding Windows: Coreplus LOE180

.2 Frame:
- .1 Interior and Exterior Frame Surfaces: Extruded, rigid, polyvinyl chloride (PVC).
- .2 Overall Frame Depth: 4-1/2 inches.
- .3 Frame Members: Mitered and heat fused to provide fully welded corner assembly with "SmoothSeam" virtually invisible corner welds.
- .4 Sill: Fitted with weeps.
- .5 Frame Type:
  - .1 Site verify exact wall depth and frame required. .

.3 Sash:
- .1 Sash Members:
  - .1 Extruded, rigid, PVC with {with foam insulation).
  - .2 Mitered and heat fused to provide fully welded corner assembly with "SmoothSeam" virtually invisible corner welds.
- .2 Integral extruded sash lift.
- .3 Contains sealed insulating glass.
- .4 Wet glazed with polyurethane-reactive hotmelt.

.4 Glazing:
- .1 Dual-Pane Insulating Glass:
  - .1 Total Thickness: 1 inch.
  - .2 Advanced Low-E coated, with argon.

.5 Weatherstripping:
- .1 Sash: Weatherstripped around sash perimeter with fin-type, pile weatherstripping.

2.4 TOLERANCES

.1 A. Windows shall accommodate the following opening tolerances:
- .1 2.7 Horizontal Dime nons Between High and Low Points: Plus 2/4.8 inch, minus 0 i ch

2.4 TOLERANCES (Cont'd)

.1 (Cont'd)
.2 Width Dimensions: Plus 1/4 inch, minus 0 inch.
.3 Building Columns or Masonry Openings: Plus or minus 1/4 inch from plumb.

2.5 FINISH

.1 Exposed PVC Surfaces: Smooth, glossy, and uniform in appearance.

.2 Frame Colors:
.1 White: Integral color extruded throughout profiles.

.3 Flashing/Sealant Tape: Pella "SmartFlash"
.1 Aluminum-foil-baed butyl window and door flashing tape.
.2 Maximum Total Thickness: 0.013 inch.
.3 UV resistant.
.4 Verify sealant compatibility with sealant manufacturer.

.4 Interior Insulating g-Foam Sealant: Low-expansion, low-pressure polyurethane insulating window and door foam sealant

.5 Exterior Perimeter Sealant: "Window and Door Installation Sealant" or equivalent high quality, multi-purpose sealant as specified in the joints sealant section.

.6 Jamb Extensions: Factory-applied, primed-wood jamb extensions. Site verify exact wall depth.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Examine rough opening to receive vinyl sliding windows.
.1 Verify rough opening is plumb, level, square, and of proper dimensions.
.2 Verify a minimum of 1-1/2 inches of solid wood blocking is installed around perimeter of rough opening.

.2 Notify Architect conditions that would adversely affect installation or subsequent use.

.3 Do not proceed with installation until satisfactory conditions are corrected.

3.2 INSTALLATION

.1 Install vinyl sliding windows in accordance with manufacturer's instructions.

.2 Install windows plumb, level, square, and without distortion.

3.2 INSTALLATION (Cont'd)

.3 Maintain alignment with adjacent work.

.4 Install windows to be weathertight.

.5 Install windows to be freely operating.

.6 Verify proper operation of operating hardware.

.7 Seal windows to exterior wall cladding with sealant and related backing materials at perimeter of assembly.

.8 Place interior seal around window perimeter to maintain continuity of building thermal and air barrier using insulating-foam sealant.

.9 Leave windows closed and locked.

3.3 CLEANING

.1 Clean vinyl sliding windows in accordance with manufacturer's instructions.

.2 Do not use harsh cleaning materials or methods that could damage finish, vinyl, or glass.

.3 Remove labels and visible markings.

.4 Keep window tracks clear of dirt and debris.

.5 Keep weep holes open and clear of obstructions.

3.4 PROTECTION

.1 Protect installed vinyl sliding windows to ensure that, except for normal weathering, windows will be without damage or deterioration at time of substantial completion.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 61 00 - Common Product Requirements.

.2 Section 01 77 00 - Closeout Submittals.

1.2 REFERENCES

.1 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA).
.1 CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction): standard hardware location dimensions.

.2 Canadian General Standards Board (CGSB).
.1 CAN/CGSB-69.18-M90/ANSI/BHMA A156.1-1981, Butts and Hinges.
.2 CAN/CGSB-69.19-93/ANSI/BHMA A156.3-1984, Exit Devices.
.3 CAN/CGSB-69.20-M90/ANSI/BHMA A156.4-1986, Door Controls (Closers).
.4 CAN/CGSB-69.21-M90/ANSI/BHMA A156.5-1984, Auxiliary Locks and Associated Products.
.5 CAN/CGSB-69.22-M90/ANSI/BHMA A156.6-1986, Architectural Door Trim.
.6 CAN/CGSB-69.24-M90/ANSI/BHMA A156.8-1982, Door Controls - Overhead Holders.
.7 CAN/CGSB-69.29-93/ANSI/BHMA A156.13-1987, Mortise Locks and Latches.
.8 CAN/CGSB-69.32-M90/ANSI/BHMA A156.16-1981, Auxiliary Hardware.
.9 CAN/CGSB-69.34-93/ANSI/BHMA A156.18-1987, Materials and Finishes.

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 Hardware List:
.1 Submit contract hardware list in accordance with Section 01 33 00 - Submittal Procedures.
.2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.

.3 Manufacturer's Instructions:
.1 Submit manufacturer's installation instructions.

.4 Closeout Submittals

1.3 SUBMITTALS (Cont'd)

.4 (Cont'd)

.1 Provide operation and maintenance data for door closers, locksets, door holders electrified hardware and fire exit hardware for incorporation into manual specified in Section 01 77 00 - Closeout Submittals.

1.4 QUALITY CONTROL

.1 Regulatory Requirements:

.1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.

.2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

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

.4 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

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 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

.2 Storage and Protection:

.1 Store finishing hardware in locked, clean and dry area.

1.6 MAINTENANCE

.1 Extra Materials:

.1 Provide maintenance materials in accordance with Section 01 77 00 - Closeout Submittals.

.2 Supply two sets of wrenches for door closers, locksets and fire exit hardware.

PART 2 - PRODUCTS

2.1 HARDWARE ITEMS

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

2.2 DOOR HARDWARE

.1 Locks and latches:
.1 Mortise locks and latches: to ANSI A156.2 series 4000, grade 1, designed for function and keyed as stated in Hardware Schedule.
.2 Lever handles: NDSeries by Schlage - Sparta design.
.3 Roses: round.
.4 Normal strikes: box type, lip projection not beyond jamb.
.5 Cylinders: key into keying system to fit Schlage keying system.
.6 Finished to 626.

.2 Butts and hinges:
.1 Butts and hinges: to CAN/CGSB-69.18, designated by letter A and numeral identifiers, followed by size and finish, listed in Hardware Schedule.

.3 Door Closers and Accessories:
.1 Door controls (closers): to CAN/CGSB-69.20, designated by letter C and numeral identifiers listed in Hardware Schedule, size in accordance with CAN/CGSB-69.20, table A1, finished to 689.

.4 Architectural door trim: to CAN/CGSB-69.22, designated by letter J and numeral identifiers listed in Hardware Schedule as listed below, finished to .
.1 Door protection plates: kick plate type, 200 mm x width of door, 1.27 mm thick stainless steel finished to 630.

2.3 FASTENINGS

.1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.

.2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.3 Exposed fastening devices to match finish of hardware.

.4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.

.5 Use fasteners compatible with material through which they pass.

2.4 KEYING

.1 Doors, as directed to existing keying system. Prepare detailed keying schedule in conjunction with Consultant.

.2 Provide keys in duplicate for every lock in this Contract.

.3 Stamp keying code numbers on keys and cylinders.

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.

.2 Furnish metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.

.3 Furnish manufacturers' instructions for proper installation of each hardware component.

3.2 INSTALLATION

.1 Install hardware to standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.

.2 Where door stop contacts door pulls, mount stop to strike bottom of pull.

.3 Use only manufacturer's supplied fasteners. Failure to comply may void manufacturer's warranties and applicable licensed labels. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

3.3 ADJUSTING

.1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.

.2 Lubricate hardware, operating equipment and other moving parts.

.3 Adjust door hardware to provide tight fit at contact points with frames.

3.4 CLEANING

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

.2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacture's instructions.

.3 Remove protective material from hardware items where present.

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

3.5 SCHEDULE

.1 Door 101a, 108b, 114,
- .1 3 hinges: A8112, 114 x 101 mm, 626.
- .2 Passage Set: Function F109 626
- .3 Door Stop
- .4 Kick Plate 626
- .5 Closer

.2 Door 102a, 103, 104, 105, 107, 110, 112, 113
- .1 3 hinges: A8112, 114 x 101 mm, 626.
- .2 Storage Set: Function F84 626
- .3 Door Stop
- .4 Kick plate 626

.3 Door 111, 108a
- .1 3 Hinges: A8812, 114 x101 mm, 626
- .2 Kick Plate 626
- .3 Dummage Set: 626

END OF SECTION

PART 1 - GENERAL

1.1 References

.1 CAN/CGSB-19.13-M87 Sealing Compound, One Component, Elastomeric, Chemical Curing.

.2 CAN/CGSB-19.18-M87 Sealing Compound, One-Component, Silicone Base, Solvent Curing.

.3 CAN/CGSB-19.24-M80 Sealing Compound, Multi-Component, Chemical Curing.

.4 CAN/CGSB-12.1-M79 Glass, Safety, Tempered or Laminated.

.5 CAN/CGSB-12.11-M76 Glass, Wired, Safety.

PART 2 - PRODUCTS

2.1 Glass Materials

.1 Storm Window Glass: Tempered safety glass to CAN2-12.1, tempered float plate, 6mm thick, unless noted otherwise.

.2 Existing Wood Window Glass Replacement: Glass to CAN2-12.3-91 Clear float Glass. Thickness to match existing.

2.2 Glazing and Sealing Compound Materials

.1 Sealant compound: one component, silicone base, solvent curing to CAN/CGSB-19.18, colour black.

.2 Glazing tape: shimmed preformed butyl tape, 10-15 durometer hardness, paper release, black colour, 3mm thick x 9mm wide.

.3 Setting blocks: neoprene, Shore "A" durometer hardness 70 to 90, 100 mm long x 6 mm high x width to suit glass thickness.

.4 Primer-sealers and cleaners: to glass manufacturer's standard.

PART 3 - EXECUTION

3.1 Workmanship

.1 Remove protective coatings and clean contact surfaces with solvent and wipe dry.

.2 Apply primer-sealer to contact surfaces.

3.1 Workmanship (Cont'd)

.3 Place setting blocks as per manufacturer's instructions.

.4 Cut glazing tape to length and install against permanent stop, project 1.5mm above sightline.

.5 Place glazing tape on free perimeter of glass in same manner described above.

.6 Install glass, rest on setting blocks, ensure full contact and adhesion at perimeter.

.7 Install removable stops, without displacing tape or sealant.

.8 Apply sealant to uniform and level line, flush with sightline and tooled or wiped with solvent to smooth appearance.

.9 Do not cut or abrade tempered glass.

3.2 Finishing

.1 Immediately remove sealant and compound droppings from finished surfaces. Remove labels after work is completed.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 ASTM International

.1 ASTM C473-10, Standard Test Methods for Physical Testing of Gypsum Panel Products.

.2 ASTM C475-02(2007)/C475M-02(2007), Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

.3 ASTM C514-04(2009)e1, Standard Specification for Nails for the Application of Gypsum Board.

.4 ASTM C840-11, Standard Specification for Application and Finishing of Gypsum Board.

.5 ASTM C954-11, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.

.6 ASTM C1002-07, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

.7 ASTM C1047-10a, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

.8 ASTM C1280-11, Standard Specification for Application of Gypsum Sheathing.

.9 ASTM C1396/C1396M-11, Standard Specification for Gypsum Board.

.10 ASTM D2394-05(2011), Standard Test Methods for Simulated Service Testing of Wood and Wood-Base Finish Flooring.

.2 Association of the Wall and Ceilings Industries International (AWCI)

.1 AWCI Levels of Gypsum Board Finish-97.

.3 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.

.4 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S102-10, Standard Method of Test of Surface Burning Characteristics of Building Materials and Assemblies.

.5 American National Standards Institute (ANSI)

.1 ANSI A118.9-1992, Test Methods and Specifications for Cementitious Backer Units.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for gypsum board assemblies and include product characteristics, performance criteria, physical size, finish and limitations.

1.3 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

.1 Store gypsum board assemblies materials level indoors 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 Replace defective or damaged materials with new.

1.4 AMBIENT CONDITIONS

.1 Maintain temperature 10 degrees C minimum, 21 degrees C maximum for 48 hours prior to and during application of gypsum boards and joint treatment, and for 48 hours minimum after completion of joint treatment.

.2 Apply board and joint treatment to dry, frost free surfaces.

.3 Ventilation: ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Standard board: to ASTM C1396/C1396M, regular, 13 mm thick, 1200 mm wide x maximum practical length, ends square cut, edges square.

.2 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.

2.1 MATERIALS (Cont'd)

.3 Resilient drywall furring: 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.

.4 Steel drill screws: to ASTM C1002.

.5 Stud adhesive: to CAN/CGSB-71.25.

.6 Laminating compound: as recommended by manufacturer, asbestos-free.

.7 Sealants: in accordance with Section 07 92 10.

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

.9 Joint tape: to ASTM C475/C475M.
.1 Paper tape for standard gypsum board.

2.2 FINISHES

.1 Texture finish: asbestos-free standard white texture coating and primer-sealer, recommended by gypsum board manufacturer.
.1 Primer: VOC limit 50 g/L maximum to GS-11.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 ERECTION

.1 Do application and finishing of gypsum board to ASTM C840 except where specified otherwise.

.2 Do application of gypsum sheathing to ASTM C1280.

.3 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.

3.2 ERECTION (Cont'd)

.4 Install work level to tolerance of 1:1200.

.5 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, and grilles.

.6 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.

.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 to ASTM C840, 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.

3.3 APPLICATION

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

.2 Apply single layer gypsum board to metal furring or framing using screw fasteners . Maximum spacing of screws 300 mm on centre.

.1 Single-Layer Application:

.1 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints.

.3 Apply single layer gypsum board to concrete block surfaces, where indicated, using laminating adhesive.

.1 Comply with gypsum board manufacturer's recommendations.

.2 Brace or fasten gypsum board until fastening adhesive has set.

.3 Mechanically fasten gypsum board at top and bottom of each sheet.

.4 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.

.5 Install gypsum board with face side out.

.6 Do not install damaged or damp boards.

3.3 APPLICATION (Cont'd)

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

3.4 INSTALLATION

.1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm on centre.

.2 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.

.3 Splice corners and intersections together and secure to each member with 3 screws.

.4 Install access doors to electrical and mechanical fixtures specified in respective sections.

.1 Rigidly secure frames to furring or framing systems.

.5 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.

.6 Gypsum Board Finish: finish gypsum board walls to following levels in accordance with AWCI Levels of Gypsum Board Finish:

.1 Levels of finish:

.1 Level 5: embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; apply a thin skim coat of joint compound to entire surface; surfaces smooth and free of tool marks and ridges.

.7 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.

.8 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.

.9 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

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

.11 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.

3.4 INSTALLATION (Cont'd)

.12 Mix joint compound slightly thinner than for joint taping.

.13 Apply thin coat to entire surface using trowel or drywall broad knife to fill surface texture differences, variations or tool marks.

.14 Allow skim coat to dry completely.

.15 Remove ridges by light sanding or wiping with damp cloth.

3.5 CLEANING

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

.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.

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 01 33 00 - Submittal Procedures.

1.2 References

.1 American Society for Testing and Materials (ASTM International)
.1 ASTM F 1303-99, Specification for Sheet Vinyl Floor Covering with Backing.

.2 Canadian Standards Association (CSA International)
.1 CAN/CSA-ISO 14040-97, Environmental Management - Life Cycle Assessment - Principles and Framework (Adopted ISO 14040:1997, first edition).

1.3 Samples

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

.2 Submit duplicate 300 x 300 mm sample pieces of sheet material and 300 mm long base.

1.4 Closeout Submittals

.1 Provide maintenance data for resilient flooring for incorporation into manual specified in Section 01 77 00 - Closeout Submittals.

1.5 Extra Materials

.1 Provide extra materials of resilient sheet flooring and adhesives in accordance with Section 01 77 00 - Closeout Submittals.

.2 Provide 50 ft^2 of each colour, pattern and type flooring material required for project for maintenance use.

.3 Extra materials to be in one piece and from same production run as installed materials.

.4 Clearly identify each roll of sheet flooring and each container of adhesive.

.5 Deliver to Consultant, upon completion of the work of this section.

.6 Store where directed by Consultant.

1.6 Environmental Requirements

.1 Maintain air temperature and structural base temperature at flooring installation area above 20° for 48 hours before, during and 48 hours after installation.

PART 2 - PRODUCTS

2.1 Materials

.1 Sheet vinyl with backing TYPE 1 : to ASTM F 1913, commercial.
- .1 Type I - PVC binder content 90%.
- .2 Grade: 1.
- .3 Backing: A-fibrous (Non-asbestos formulated)
- .4 Pattern: smooth.
- .5 Colour: selected by Consultant from manufacturers full range of products.
- .6 Thickness: 2 mm.
- .7 Acceptable material: Johnsonite: Melodia

.2 Resilient base: continuous, top set, complete with premoulded end stops and external corners:
- .1 Type: vinyl.
- .2 Style: cove.
- .3 Thickness: 2.03 mm.
- .4 Height: 101.6 mm.
- .5 Lengths: cut lengths minimum 2400 mm.
- .6 Colour: selected by Consultant.

.3 Primers and adhesives: of types recommended by resilient flooring manufacturer for specific material on applicable substrate, above, on or below grade.

.4 Sub-floor shimming: 13mm plywood on wood blocking supports to a maximum spacing of 400mm in either direction. Block supports to be at a maximum height of 65mm. Provide wood transition strip to bridge new plywood edge to existing sub-floor. Shimming to be in areas denoted in finish schedule.

.4 Sub-floor filler and leveller: white premix latex requiring water only to produce cementitious paste as recommended by flooring manufacturer for use with their product.

.5 Metal edge strips:
- .1 Aluminum extruded, smooth, polished stainless steel with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

.6 External corner protectors: stainless steel, type recommended by flooring manufacturer.

2.1 Materials (Cont'd)

.7 Edging to floor penetrations: stainless steel, type recommended by flooring manufacturer.

.8 Sealer and wax: type recommended by resilient flooring material manufacturer for material type and location.

PART 3 - EXECUTION

3.1 Site Verification of Conditions

.1 Ensure concrete floors are clean and dry by using test methods recommended by flooring manufacturer.

3.2 Preparation

.1 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

.2 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.

.3 Remove or treat old adhesives to prevent residual, old flooring adhesives from bleeding through to new flooring and/or interfering with the bonding of new adhesives.

.4 Seal concrete slab to resilient flooring manufacturer's printed instructions.

3.3 Application: Flooring

.1 Provide a high ventilation rate, with maximum outside air, during installation, and for 48 hours after installation. If possible, vent directly to the outside. Do not let contaminated air recirculate through a district or whole building air distribution system. Maintain extra ventilation for at least one month following building occupation.

.2 To minimize emissions from adhesives, use water-based, solvent-free styrene-butadiene-rubber adhesive for linoleum. Butadiene exposure may cause eye and nose irritation, headaches, dizziness, and vomiting.

.3 Apply low VOC adhesive uniformly using recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.

.4 Lay flooring with seams parallel to building lines to produce a minimum number of seams. Border widths minimum 1/3 width of full material.

.5 Run sheets in direction of traffic. Double cut sheet joints and heat weld according to manufacturer's printed instructions.

3.3 Application: Flooring (Cont'd)

.6 Heat weld seams of linoleum sheet flooring in accordance with manufacturer's printed instructions.

.7 As installation progresses, and after installation roll flooring with 45 kg minimum roller to ensure full adhesion.

.8 Cut flooring neatly around fixed objects.

.9 Install feature strips and floor markings where indicated. Fit joints tightly.

.10 Install flooring in pan type floor access covers. Maintain floor pattern.

.11 Continue flooring over areas which will be under built-in furniture.

.12 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.

.13 Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.

.14 Install metal edge strips at unprotected or exposed edges where flooring terminates.

3.4 Application: Base

.1 Lay out base to keep number of joints at minimum.

.2 Clean substrate and prime with one coat of adhesive.

.3 Apply adhesive to back of base.

.4 Set base against wall and floor surfaces tightly by using 3 kg hand roller.

.5 Install straight and level to variation of 1:1000.

.6 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.

.7 Cope internal corners. Use premoulded corner units for right angle external corners. Use formed straight base material for external corners of other angles.

.8 Use toeless type base where floor finish will be carpet, coved type elsewhere.

.9 Install toeless type base before installation of carpet on floors.

.10 Heat weld base in accordance with manufacturer's printed instructions.

3.5 Cleaning

.1 Remove excess adhesive from floor, base and wall surfaces without damage.

.2 Clean, seal and wax floor and base surface to flooring manufacturer's printed instructions.

3.6 Protection

.1 Protect new floors from time of final set of adhesive until final waxing.

.2 Prohibit traffic on floor for 24 hours after installation.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1 Resilient Sheet Flooring: Section 09 65 16

1.2 Samples

.1 Submit samples in accordance with Section 01 33 00.

.2 Submit duplicate square pieces of each type carpet specified, 600 x 600 mm.

1.3 Shop Drawings

.1 Submit shop drawings in accordance with Section 01 33 00.

.2 Indicate locations and lengths of seams and cross joints for carpeted areas, nap, open edges and other details required by Consultant to clarify work.

1.4 Maintenance Data

.1 Provide maintenance data for carpet maintenance for incorporation - Maintenance Manual.

1.5 Maintenance Materials

.1 Deliver 160ft^2 of each type, pattern and colour of carpet required for this project for maintenance use in unopened boxes. Identify each roll. Store where directed.

.2 Maintenance materials to be full size piece of same production run as installed materials.

PART 2 - PRODUCTS

2.1 Materials

.1 Carpets required to have flame spread rating or smoke developed classification to be tested in accordance with CAN4 S102.2-M80 for floor surface covering and be certified by ULC.

.2 Carpet:

.1 Carpet Type 1: Performance level to match 28oz. solution dyed nylon, level loop, Interface Flor - Shepherd 6094. Exact product to be finalized after award . Provide the following guarantee: 10 year - extra heavy Commercial Wear 10 year - no zipper 10 year - anti-shock

2.1 Materials (Cont'd)

.2 (Cont'd)

.2 Separate Price - Carpet Type 2: rolled carpet: Shaw, style name Capitol III, style number 54280.. Exact product, if selected to be finalized after award.

.3 Adhesive: non-release type, recommended by carpet manufacturer for direct glue down installation, low odour, low VOC, free of volatile hydrocarbons such as toluene and mineral spirits.

.4 Concrete floor sealer: to CGSB 25-GP-20M type 1. Ensure compatability with carpet adhesive.

.5 Reducing strips: vinyl reducing strips to extend under carpet and taper down to match adjacent finish, Roberts or approved alternate.

.6 Seaming tape: of types as recommended by carpet manufacturer for purpose intended.

PART 3 - EXECUTION

3.1 Workmanship

.1 Install carpet using glue down method in accordance with CGSB 4-GP-156 and manufacturer's printed instructions.

.2 Install carpeting after finishing work is completed.

.3 Finish installation to present smooth wearing surface free from conspicuous seams, burring and other faults.

.4 Use material from same dye lot and ensure colour, pattern and texture match within any one area.

.5 Use reducing strips at exposed carpet edges and centre under doors in door openings.

3.2 Preparation

.1 Prepare floor surfaces in accordance with CGSB 4-GP-156 and manufacturer's printed instructions.

.2 Ensure toeless type resilient base is installed before proceeding with carpeting.

3.3 Carpet Installation

.1 Install carpet in accordance with reviewed shop drawings. Maintain constant pile direction.

3.3 Carpet Installation (Cont'd)

.2 Pre-condition, stretch and install carpet following manufacturer's printed instructions. Fit neatly around architectural, mechanical, electrical and telephone outlets, and furniture fitments, around perimeter of rooms into recesses, and around projections.

.3 Seal edges of cut-outs with binding method.

.4 Install carpet in pan type floor access covers. Maintain pattern and direction of nap.

3.4 Protection of Finished Work

.1 Vacuum carpets clean. Protect traffic areas of carpeted floors with carpet protection. Tape edges and joints to prevent shifting.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Environmental Protection Agency (EPA)
- .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).

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

.3 The Master Painters Institute (MPI)
- .1 Architectural Painting Specification Manual - February 2004.
- .2 Standard GPS-1-05, MPI Green Performance Standard for Painting and Coatings.

.4 National Fire Code of Canada.

.5 Society for Protective Coatings (SSPC)
- .1 Systems and Specifications, SSPC Painting Manual 2005.

1.2 QUALITY CONTROL

.1 Qualifications:
- .1 Contractor: to have a minimum offive years proven satisfactory experience. When requested, provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
- .2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work
- .3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.
- .4 Conform to latest MPI requirements for exterior painting work including preparation and priming.
- .5 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
- .6 paint materials such as linseed oil, shellac, and turpentine to be highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and to be compatible with other coating materials as required.
- .7 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Departmental Representative or designate.
- .8 Standard of Acceptance:
  - .1 Walls: No defects visible from a distance of 1000 mm at 90 degrees to surface.

1.5 ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)

.4 (Cont'd)

.2 When approved, samples shall become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.

.3 Submit full range of available colours where colour availability is restricted.

1.6 QUALITY CONTROL

.1 Provide mock-up in accordance with Section 01 45 00 - Quality Control.

.2 When requested by Departmental Representative or designate or Paint Inspection Agency, prepare and paint designated surface, area, room or item to requirements specified herein, with specified paint or coating showing selected colours, number of coats, gloss/sheen, textures and workmanship to MPI Painting Specification Manual standards for review and approval. When approved, surface, area, room and/or items shall become acceptable standard of finish quality and workmanship for similar on-site work.

1.7 MAINTENANCE

.1 Extra Materials:

.1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Submit one, four litre can of each type and colour. Identify colour and paint type in relation to established colour schedule and finish system.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 Common Product Requirements, supplemented as follows:.

.1 Deliver and store materials in original containers, sealed, with labels intact.

.2 Labels: to indicate:

- .1 Manufacturer's name and address.
- .2 Type of paint or coating.
- .3 Compliance with applicable standard.
- .4 Colour number in accordance with established colour schedule.

.3 Remove damaged, opened and rejected materials from site.

.4 Provide and maintain dry, temperature controlled, secure storage.

.5 Observe manufacturer's recommendations for storage and handling.

.6 Store materials and supplies away from heat generating devices.

.7 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.

1.8 DELIVERY, STORAGE AND HANDLING (Cont'd)

.1 (Cont'd)

.8 Store temperature sensitive products above minimum temperature as recommended by manufacturer.

.9 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Departmental Representative or designate. After completion of operations, return areas to clean condition to approval of Departmental Representative.

.10 Remove paint materials from storage only in quantities required for same day use.

.11 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

.12 Fire Safety Requirements:

.1 Provide one 9 kg Type ABC fire extinguisher adjacent to storage area.

.2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.9 AMBIENT CONDITIONS

.1 Heating, Ventilation and Lighting:

.1 Ventilate enclosed spaces.

.2 Do not perform painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.

.3 Where required, provide continuous ventilation for seven days after completion of application of paint.

.4 Co-ordinate use of existing ventilation system with General Contractor and ensure its operation during and after application of paint as required.

.5 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.

.6 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities to be provided by General Contractor.

.2 Temperature, Humidity and Substrate Moisture Content Levels:

.1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and, applied product manufacturer, perform no painting work when:

.1 Ambient air and substrate temperatures are below 10 degrees C.

1.9 AMBIENT CONDITIONS (Cont'd)

.2 (Cont'd)

.1 (Cont'd)

.2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperatures.

.3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.

.4 Relative humidity is above 85 % or when dew point is less than 3 degrees C variance between air/surface temperature.

.5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.

.2 Perform no painting work when maximum moisture content of substrate exceeds:

.1 12% for concrete and masonry (clay and concrete brick/block).

.2 15% for wood.

.3 12% for plaster and gypsum board.

.3 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".

.4 Test concrete, masonry and plaster surfaces for alkalinity as required.

.3 Surface and Environmental Conditions:

.1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.

.2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits noted herein.

.3 Apply paint when previous coat of paint is dry or adequately cured.

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

.5 Do not apply paint when:

.1 Temperature is expected to drop below 10 degrees C before paint has thoroughly cured.

.2 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's limits.

.3 Surface to be painted is wet, damp or frosted.

.6 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.

.7 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.

.8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.

1.9 AMBIENT CONDITIONS (Cont'd)

.3 (Cont'd)

.9 Paint occupied facilities in accordance with approved schedule only. Schedule operations to approval of Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Paint materials listed in latest edition of MPI Approved Products List (APL) are acceptable for use on this project.

.2 Paint materials for paint systems: to be products of single manufacturer.

.3 Only qualified products with E2 E3 "Environmentally Friendly" ratings are acceptable for use on this project.

.4 Use only MPI listed L rated materials.

.5 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids, to be as follows:

.1 Be water-based.

.2 Be manufactured without compounds which contribute to ozone depletion in upper atmosphere.

.6 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).

.7 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavelant chromium or their compounds.

.8 Water-borne surface coatings and recycled water-borne surface coatings must have flash point of 61.0 degrees C or greater.

.9 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:

.1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.

.2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.

2.1 MATERIALS (Cont'd)

.10 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes must meet a minimum "Environmentally Friendly" E2 rating.

.11 Recycled water-borne surface coatings must contain 50 % post-consumer material by volume.

.12 Recycled water-borne surface coatings must not contain:
.1 Lead in excess of 600.0 ppm weight/weight total solids.
.2 Mercury in excess of 50.0ppm weight/weight total product.
.3 Cadmium in excess of 1.0ppm weight/weight total product.
.4 Hexavelant chromium in excess of 3.0 ppm weight/weight total product.
.5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.

.13 The following must be performed on each batch of consolidated post-consumer material before surface coating is reformulated and canned. These tests must be performed at a laboratory or facility which has been accredited by the Standards Council of Canada.
.1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.
.2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.
.3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

2.2 COLOURS

.1 Departmental Representative or designate will provide Colour Schedule after Contract award

.2 Colour schedule will be based upon selection of two base colours and two accent colours. No more than four colours will be selected for entire project and no more than two colours will be selected in each area.

.3 Selection of colours will be from manufacturers full range of colours.

.4 Where specific products are available in restricted range of colours, selection will be based on limited range.

.5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 MIXING AND TINTING

.1 Perform colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials is allowed only with Departmental Representative or designates written permission.

2.3 MIXING AND TINTING (Cont'd)

.2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.

.3 Add thinner to paint manufacturer's recommendations. Do not use kerosene or organic solvents to thin water-based paints.

.4 Thin paint for spraying according in accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Departmental Representative or designate.

.5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.4 GLOSS/SHEEN RATINGS

.1 Paint gloss: defined as sheen rating of applied paint, in accordance with following values:

Gloss Level Category/	Units @ 60 Degrees/	Units @ 85 Degrees/
G1 - matte finish	0 to 5	max. 10
G2 - velvet finish	0 to 10	10 to 35
G3 - eggshell finish	10 to 25	10 to 35
G4 - satin finish	20 to 35	min. 35
G5 - semi-gloss finish	35 to 70	
G6 - gloss finish	70 to 85	
G7 - high gloss finish	> 85	

.2 Gloss level ratings of painted surfaces as specified and as noted on Finish Schedule .

2.5 EXTERIOR PAINTIN SYSTEMS

.1 Dimension Lumber: columns, beams, exposed joists, underside of decking, siding, fencing, etc.

.1 EXT 6.2M - Latex G2 finish (over latex primer).

.2 Dressed Lumber: doors, door and window frames, casings, battens, smooth facias, etc.

2.5 EXTERIOR PAINTIN SYSTEMS (Cont'd)

.2 (Cont'd)

.1 EXT 6.3L - Latex G2 finish (over latex primer) do not use flat finish on doors.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 EXAMINATION

.1 Exterior repainting work: inspected by MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor to notify Paint Inspection Agency minimum of one week prior to commencement of work and provide copy of project repainting specification and Finish Schedule.

.2 Exterior surfaces requiring repainting: inspected by both painting contractor and Paint Inspection Agency who will notify Departmental Representative in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.

.3 Where assessed degree of surface degradation of DSD-1 to DSD-3 before preparation of surfaces for repainting is revealed to be DSD-4 after preparation, repair or replacement of such unforeseen defects discovered are to be corrected, as mutually agreed, before repainting is started.

.4 Where "special" repainting or recoating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer to provide as part of work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to PCA

3.3 PREPARATION

.1 Perform preparation and operations for exterior painting in accordance with MPI Maintenance Repainting Manual except where specified otherwise.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

.3 Clean and prepare exterior surfaces to be repainted in accordance with MPI Maintenance Repainting Manual requirements. Refer to the MPI Manual in regard to specific requirements and as follows:

3.3 PREPARATION (Cont'd)

.3 (Cont'd)

.1 Remove dust, dirt, and surface debris by vacuuming,wiping with dry, clean cloths or compressed air.

.2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.

.3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.

.4 Allow surfaces to drain completely and allow to dry thoroughly. Allow sufficient drying time and test surfaces using electronic moisture meter before commencing work.

.5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water based paints.

.6 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.

.4 Clean metal surfaces to be repainted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements. Remove such contaminates from surfaces, pockets and corners to be repainted by brushing with clean brushes, blowing with clean dry compressed air, or brushing/vacuum cleaning as required.

.5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.

.6 Do not apply paint until prepared surfaces have been accepted by Departmental Representative or designate.

.7 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

3.4 EXISTING CONDITIONS

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Departmental Representative or designate damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.

.2 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings to Departmental Representative. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

.3 Maximum moisture content as follows:

3.4 EXISTING CONDITIONS (Cont'd)

.3 (Cont'd)
- .1 Stucco: 12%.
- .2 Concrete: 12%.
- .3 Clay and Concrete Block/Brick: 12%.
- .4 Wood: 15%.

3.5 PROTECTION

.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by Departmental Representative or designate.

.2 Protect items that are permanently attached such as Fire Labels on doors and frames.

.3 Protect factory finished products and equipment.

.4 Protect passing pedestrians, building occupants and general public in and about building.

.5 Remove light fixtures, surface hardware on doors, and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations.Store items and re-install after painting is completed.

.6 Move and cover exterior furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.

.7 As painting operations progress, place "WET PAINT" signs in pedestrian and vehicle traffic areas to approval of Departmental Representative or designate.

3.6 APPLICATION

.1 Method of application to be as approved by Departmental Representative Apply paint by brush roller air sprayer airless spryer. Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush and Roller Application:
- .1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.
- .2 Work paint into cracks, crevices and corners.
- .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
- .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces shall be free of roller tracking and heavy stipple unless approved by Departmental Representative .
- .5 Remove runs, sags and brush marks from finished work and repaint.

3.6 APPLICATION (Cont'd)

.3 Spray Application:

.1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.

.2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.

.3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.

.4 Brush out immediately runs and sags.

.5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.

.4 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized by Departmental Representative or designate.

.5 Apply coats of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.7 Sand and dust between coats to remove visible defects.

.8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as projecting ledges.

.9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.7 CLEANING

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

.1 Remove paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.

3.8 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.

3.8 RESTORATION (Cont'd)

.4 Protect freshly completed surfaces from paint droppings and dust to approval of Departmental Representative or designate. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Departmental Representative or designate.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Architectural Painting Specifications Manual, Master Painters Institute (MPI), 2010.

.2 Systems and Specifications Manual, SSPC Painting Manual, Volume Two, Society for Protective Coatings (SSPC).

.3 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings) of the Environmental Protection Agency (EPA).

.4 National Fire Code of Canada 2010 (NFC).

1.2 QUALITY CONTROL

.1 Contractor shall have a minimum of five years proven satisfactory experience. When requested, provide a list of last three comparable jobs including, job name and location, specifying authority, and project manager.

.2 Qualified journeymen who have a "Tradesman Qualification Certificate of Proficiency" shall be engaged in painting work. Apprentices may be employed provided they work under the direct supervision of a qualified journeyman in accordance with trade regulations.

.3 Conform to latest MPI requirements for interior painting work including preparation and priming.

.4 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) shall be in accordance with MPI Painting Specification Manual "Approved Product" listing and shall be from a single manufacturer for each system used.

.5 Other paint materials such as linseed oil, shellac, turpentine, etc. shall be the highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and shall be compatible with other coating materials as required.

.6 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Departmental Representative.

.7 Standard of Acceptance:

.1 Walls: No defects visible from a distance of 1000 mm at 90° to surface.

.2 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

1.3 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

.1 Provide paint products meeting MPI "Environmentally Friendly" E2 ratings based on VOC (EPA Method 24) content levels.

.2 Where indoor air quality (odour) is a problem, use only MPI listed materials having a minimum E2 rating.

1.4 INSPECTION REQUIREMENTS

.1 Interior painting and decorating work shall be inspected by a Paint Inspection Agency (inspector) acceptable to the specifying authority and local Painting Contractor's Association. Painting contractor shall notify Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of project painting specification, plans and elevation drawings (including pertinent details) as well as a Finish Schedule.

.2 Interior surfaces requiring painting shall be inspected by Paint Inspection Agency who shall notify Departmental Representative or designate and General Contractor in writing of defects or problems, prior to commencing painting work, or after prime coat shows defects in substrate.

.3 Where "special" painting, coating or decorating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer shall provide as part of this work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to PCA.

1.5 SCHEDULING OF WORK

.1 Submit work schedule for various stages of painting to Departmental Representative for approval. Submit schedule minimum of 48 hours in advance of proposed operations.

.2 Obtain written authorization from Consultant for any changes in work schedule.

.3 Schedule painting operations to prevent disruption of occupants in and about the building.

1.6 SUBMITTALS

.1 Submit product data and manufacturer's installation/application instructions for each paint and coating product to be used in accordance with Section 01 33 00.

.2 Submit WHMIS MSDS.- Material Safety Data Sheets in accordance with Section 01 11 00.

.3 Upon completion, submit records of products used. List products in relation to finish system and include the following:

1.6 SUBMITTALS (Cont'd)

.3 (Cont'd)
- .1 Product name, type and use.
- .2 Manufacturer's product number.
- .3 Colour numbers.
- .4 MPI Environmentally Friendly classification system rating.
- .5 Manufacturer's Material Safety Data Sheets (MSDS).

1.7 SAMPLES

.1 Submit full range colour sample chips in accordance with Section 01 33 00. Indicate where colour availability is restricted.

.2 Submit duplicate 200 x 300 mm sample panels of each paint and special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards submitted on the following substrate materials:
- .1 3 mm plate steel for finishes over metal surfaces.
- .2 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
- .3 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.

.3 When approved, sample panels shall become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.

1.8 QUALITY CONTROL

.1 When requested by Departmental Representative or designate , prepare and paint designated surface, area, room or item (in each colour scheme) to requirements specified herein, with specified paint or coating showing selected colours, gloss/sheen, textures and workmanship to MPI Painting Specification Manual standards for review and approval. When approved, surface, area, room and/or items shall become acceptable standard of finish quality and workmanship for similar on-site work.

1.9 DELIVERY, HANDLING AND STORAGE

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

.2 Labels shall clearly indicate:
- .1 Manufacturer's name and address.
- .2 Type of paint or coating.
- .3 Compliance with applicable standard.
- .4 Colour number in accordance with established colour schedule.

.3 Remove damaged, opened and rejected materials from site.

.4 Provide and maintain dry, temperature controlled, secure storage.

.5 Observe manufacturer's recommendations for storage and handling.

1.9 DELIVERY, HANDLING AND STORAGE (Cont'd)

.6 Store materials and supplies away from heat generating devices.

.7 Store materials and equipment in a well ventilated area with temperature range 7°C to 30°C.

.8 Store temperature sensitive products above minimum temperature as recommended by manufacturer.

.9 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Consultant. After completion of operations, return areas to clean condition to approval of Departmental Representative or designate.

.10 Remove paint materials from storage only in quantities required for same day use.

.11 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

.12 Fire Safety Requirements:

.1 Provide one Type ABC fire extinguisher adjacent to storage area.

.2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.10 SITE REQUIREMENTS

.1 Heating, Ventilation and Lighting:

.1 Ventilate enclosed spaces.

.2 Perform no painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10°C for 24 hours before, during and after paint application until paint has cured sufficiently.

.3 Where required, provide continuous ventilation for seven days after completion of application of paint.

.4 Coordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.

.5 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.

.6 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities shall be provided by General Contractor.

.2 Temperature, Humidity and Substrate Moisture Content Levels:

1.10 SITE REQUIREMENTS (Cont'd)

.2 (Cont'd)

.1 Unless specifically pre-approved by the specifying body, Paint Inspection Agency and the applied product manufacturer, perform no painting work when:

.1 Ambient air and substrate temperatures are below 10°C.

.2 Substrate temperature is over 32°C unless paint is specifically formulated for application at high temperatures.

.3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.

.4 The relative humidity is above 85% or when the dew point is less than 3°C variance between the air/surface temperature.

.5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.

.2 Perform no painting work when the maximum moisture content of the substrate exceeds:

.1 12% for concrete and masonry (clay and concrete brick/block).

.2 12% for plaster and gypsum board.

.3 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".

.4 Test concrete, masonry and plaster surfaces for alkalinity as required.

.3 Surface and Environmental Conditions:

.1 Apply paint finish only 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 only to adequately prepared surfaces and to surfaces within moisture limits noted herein.

.3 Apply paint only when previous coat of paint is dry or adequately cured.

.4 Additional Interior Application Requirements:

.1 Apply paint finishes only when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

.2 Apply paint in occupied facilities during silent hours only. Schedule operations to approval of Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.

2.1 MATERIALS (Cont'd)

.2 Paint materials for paint systems shall be products of a single manufacturer.

.3 Only qualified products with E2 or E3 "Environmentally Friendly" rating are acceptable for use on this project.

.4 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids, shall:

.1 be water-based.

.2 be non-flammable.

.3 be manufactured without compounds which contribute to ozone depletion in the upper atmosphere.

.4 be manufactured without compounds which contribute to smog in the lower atmosphere.

.5 do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.

.5 Water-borne surface coatings must be manufactured and transported in a manner that steps of process, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).

.6 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavelant chromium or their compounds.

.7 Water-borne surface coatings and recycled water-borne surface coatings must have a flash point of 61.0°C or greater.

.8 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:

.1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 1] mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.

.2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.

.9 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes must meet a minimum "Environmentally Friendly" E2 rating.

.10 The following must be performed on each batch of consolidated post-consumer material before surface coating is reformulated and canned. These tests must be performed at a laboratory or facility which has been accredited by the Standards Council of Canada.

.1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.

2.1 MATERIALS (Cont'd)

.10 (Cont'd)

.2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.

.3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

2.2 COLOURS

.1 Submit proposed Colour Schedule to Departmental Representative or designate for approval.

.2 Colour schedule will be based upon the selection of two base colours and two accent colours. No more than four colours will be selected for the entire project and no more than three colours will be selected in each area.

.3 Selection of colours will be from manufacturers full range of colours.

.4 Where specific products are available in a restricted range of colours, selection will be based on the limited range.

.5 Second coat in a three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 MIXING AND TINTING

.1 Perform colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials is allowed only with Departmental Representative or designates written permission.

.2 Paste, powder or catalyzed paint mixes shall be mixed in strict accordance with manufacturer's written instructions.

.3 Where thinner is used, addition shall not exceed paint manufacturer's recommendations. Do not use kerosene or any such organic solvents to thin water-based paints.

.4 Thin paint for spraying according in strict accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Departmental Representative or designate.

.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 shall be defined as the sheen rating of applied paint, in accordance with the following values:

2.4 GLOSS/SHEEN RATINGS (Cont'd)

Level Category	Units @ 60°	Units @ 85°
G1 - matte finish	0 to 5	max. 10
G2 - velvet finish	0 to 10	10 to 35
G3 - eggshell finish	10 to 25	10 to 35
G4 - satin finish	20 to 35	min. 35
G5 - semi-gloss finish	35 to 70	
G6 - gloss finish	70 to 85	
G7 - high finish	> 85	

.2 Gloss level ratings of painted surfaces shall be as specified herein.

2.5 INTERIOR PAINTING SYSTEMS

.1 Galvanized Metal: doors, frames, railings, misc. steel, pipes, ducts, etc.
.1 INT 5.3A Latex G6 finish.

.2 Plaster and Gypsum Board: gypsum wallboard, drywall, "sheet rock type material", etc., and textured finishes
.1 INT 9.2A Latex G5 finish (over latex sealer) for walls.

.3 Refer to drawings for exact location: P1 denotes field colur #1 P2 denotes accent colour #1

PART 3 - EXECUTION

3.1 GENERAL

.1 Perform preparation and operations for interior painting in accordance with MPI Painting Specifications Manual except where specified otherwise.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.2 EXISTING CONDITIONS

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Departmental Representative damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.

.2 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings to Departmental Representative. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

3.2 EXISTING CONDITIONS (Cont'd)

.3 Maximum moisture content as follows:
- .1 Stucco, Plaster and Gypsum Board: 12%.
- .2 Concrete: 12%.
- .3 Clay and Concrete Block/Brick: 12%.

3.3 PROTECTION

.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by Departmental Representative.

.2 Protect items that are permanently attached such as Fire Labels on doors and frames.

.3 Protect factory finished products and equipment.

.4 Protect passing pedestrians, building occupants and general public in and about the building.

.5 Removal of electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings shall be done prior to undertaking any painting operations by General Contractor. Items shall be securely stored and re-installed after painting is completed by General Contractor.

.6 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.

.7 As painting operations progress, place "WET PAINT" signs in occupied areas to approval of Departmental Representative.

3.4 CLEANING AND PREPARATION

.1 Clean and prepare surfaces in accordance with MPI Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:

.1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths or compressed air.

.2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.

.3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.

.4 Allow surfaces to drain completely and allow to dry thoroughly.

.5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.

.6 Use trigger operated spray nozzles for water hoses.

3.4 CLEANING AND PREPARATION (Cont'd)

.1 (Cont'd)

.7 Many water-based paints cannot be removed with water once dried. However, minimize the use of kerosene or any such organic solvents to clean up water-based paints.

.2 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.

.3 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.

.4 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.

.5 Touch up of shop primers with primer as specified in applicable section. Major touch-up including cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas, shall be by supplier of fabricated material.

.6 Do not apply paint until prepared surfaces have been accepted by Departmental Representative or designate.

3.5 APPLICATION

.1 Apply paint by brush or roller. Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush and Roller Application:

.1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.

.2 Work paint into cracks, crevices and corners.

.3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.

.4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces shall be free of roller tracking and heavy stipple unless approved by Departmental Representative.

.5 Remove runs, sags and brush marks from finished work and repaint.

.3 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access and only when specifically authorized by Engineer.

3.5 APPLICATION (Cont'd)

.4 Apply coats of paint as a continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.6 Sand and dust between coats to remove visible defects.

.7 Finish 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.

.8 Finish inside of cupboards and cabinets as specified for outside surfaces.

.9 Finish closets and alcoves as specified for adjoining rooms.

.10 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.6 MECHANICAL/ ELECTRICAL EQUIPMENT

.1 Unless otherwise specified, paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.

.2 Boiler room, mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.

.3 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.

.4 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.

.5 Do not paint over nameplates.

.6 Keep sprinkler heads free of paint.

.7 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.

.8 Paint fire protection piping red.

.9 Paint disconnect switches for fire alarm system and exit light systems in red enamel.

.10 Paint natural gas piping yellow.

3.6 MECHANICAL/ ELECTRICAL EQUIPMENT (Cont'd)

.11 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

.12 Do not paint interior transformers and substation equipment.

3.7 FIELD QUALITY CONTROL

.1 Field inspection of painting operations to be carried out be independent inspection firm as designated by Departmental Representative or designate.

.2 Advise Departmental Representative or designate when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.

.3 Co-operate with inspection firm and provide access to areas of work.

3.8 RESTORATION

.1 Clean and re-install all 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 Departmental Representative. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Departmental Representative or designate.

END OF SECTION

PART 1 - GENERAL

1.1 Related Sections

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 08 80 50 - Glazing.

1.2 References

.1 American Society for Testing and Materials (ASTM)

.1 ASTM A 167-99, Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 ASTM B 456-95, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

.3 ASTM A 653/A653M-99, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.4 ASTM A 924/A924M-99, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.81-M90, Air Drying and Baking Alkyd Primer for Vehicles and Equipment.

.2 CAN/CGSB-1.88-92, Gloss Alkyd Enamel, Air Drying and Baking.

.3 CAN/CGSB-12.5-M86, Mirrors, Silvered.

.4 CGSB 31-GP-107Ma-90, Non-inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.

.3 Canadian Standards Association (CSA)

.1 CAN/CSA-B651-95, Barrier-Free Design.

.2 CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.

1.3 Shop Drawings

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

.2 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame.

1.4 Samples

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

.2 Samples to be returned for inclusion into work.

1.5 Closeout Submittals

.1 Provide maintenance data for toilet and bath accessories for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.6 Waste Management and Disposal

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

.2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

1.7 Extra Materials

.1 Provide special tools required for accessing, assembly/disassembly or removal for toilet and bath accessories in accordance with requirements specified in Section 01 78 00 - Closeout Submittals.

.2 Deliver special tools to Consultant.

PART 2 - PRODUCTS

2.1 Materials

.1 Sheet steel: to ASTM A 653/A653M with ZF001 designation zinc coating.

.2 Stainless steel sheet metal: to ASTM A 167, Type 302, with brushed finish.

.3 Stainless steel tubing: Type302, commercial grade, seamless welded, 1.2 mm wall thickness.

.4 Fasteners: concealed screws and bolts hot dip galvanized, exposed fasteners to match face of unit. Expansion shields fibre, lead or rubber as recommended by accessory manufacturer for component and its intended use.

2.2 Components

.1 Toilet tissue dispenser: double roll type, surface mounted, chrome plated steel frame, capacity of 500 double ply roll, roll under spring tension for controlled delivery.

.1 Acceptable material: B-7686 by Bobrick or equivalent.

.2 Paper towel dispenser: single roll paper towels, stainless steel cabinet, hinged front panel, lock and key, surface mounted.

.1 Acceptable material: B-2621 by Bobrick or equivalent.

2.2 Components (Cont'd)

.3 Soap dispenser: liquid push-in valve 102 mm spout, self contained 340 mL translucent polyethylene, stainless steel piston and valve assembly, tamper proof filler lock, surface mounted, exposed metal components chrome plated.
.1 Acceptable material: B-155 by Bobrick or equivalent.

.4 Feminine napkin disposal bin: stainless steel, surface unit, continuous hinged door, self closing, embossed with "napkin disposal" removable stainless steel receptacles fitted with spring clip for deodorizer block.
.1 Acceptable material:B-270 by Bobrick or equivalent.

.5 Grab bars: 38 mm dia x 1.6 mm wall tubing of stainless steel, 76 mm diameter wall flanges, concealed screw attachment, flanges welded to tubular bar, provided with steel back plates and all accessories. Knurl bar at area of hand grips. Grab bar material and anchorage to withstand downward pull of 2.2 kN.
.1 Acceptable material: B-6806 by Bobrick or equivalent.

.6 Shelf & hook: stainless steel with 75 mm projection.
.1 Acceptable material:B-239x34 by Bobrick or equivalent.

.7 Waste receptacle: B-2250 by Bobrick or equivalent.

.8 Tilt mirror: wall mounted unit, fixed framed mirror 6 mm to CAN/CGSB-12.5, stainless steel frame.
.1 Acceptable material:B-293 1836.

2.3 Fabrication

.1 Weld and grind joints of fabricated components flush and smooth. Use mechanical fasteners only where approved.

.2 Wherever possible form exposed surfaces from one sheet of stock, free of joints.

.3 Brake form sheet metal work with 1.5 mm radius bends.

.4 Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.

.5 Back paint components where contact is made with building finishes to prevent electrolysis.

.6 Hot dip galvanize concealed ferrous metal anchors and fastening devices to CSA G164.

.7 Shop assemble components and package complete with anchors and fittings.

2.3 Fabrication (Cont'd)

.8 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instructions for building in anchors and inserts.

.9 Provide steel anchor plates and components for installation on studding and building framing.

2.4 Finishes

.1 Chrome and nickel plating: to ASTM B 456, satin finish.

.2 Baked enamel: condition metal by applying one coat of metal conditioner to CGSB 31-GP-107Ma, apply one coat Type 2 primer to CAN/CGSB-1.81 and bake, apply two coats Type 2 enamel to CAN/CGSB-1.88 and bake to hard, durable finish. Sand between final coats. Colour selected from standard range by Consultant.

.3 Manufacturer's or brand names on face of units not acceptable.

PART 3 - EXECUTION

3.1 Installation

.1 Install and secure accessories rigidly in place as follows:
.1 Stud walls: install steel back-plate to stud prior to plaster or drywall finish. Provide plate with threaded studs or plugs.
.2 Hollow masonry units or existing plaster/drywall: use toggle bolts drilled into cell/wall cavity.
.3 Solid masonry, marble, stone or concrete: use bolt with lead expansion sleeve set into drilled hole.
.4 Toilet/shower compartments: use male/female through bolts.

.2 Install grab bars on built-in anchors provided by bar manufacturer.

.3 Use tamper proof screws/bolts for fasteners.

.4 Fill units with necessary supplies shortly before final acceptance of building.

3.2 Schedule

.1 Locate accessories as follows. Exact locations determined by Consultant.

.2 Toilet tissue dispenser: one in each toilet compartment mounting height 760 mm F.F.F.

.3 Paper towel dispenser: one in each washroom. Maximum height of dispenser and operable part from floor 1200 mm.

3.2 Schedule (Cont'd)

.4 Soap dispenser: one at each wash basin.

.5 Feminine napkin disposal bin: one in each female toilet compartment mounting height 1200mm F.F.F.

.6 Grab bar: two in each handicapped toilet compartment. Height of grab bar from floor 750 mm. Side grab bar: maximum distance from rear wall 300 mm, minimum distance passed front edge of toilet 450 mm.

.7 Shelf & Robe hook: one in each room mounting height 1400 mm F.F.F.

.8 Waste receptacle: one for washroom.

.9 Tilt mirror: one at each accessible wash basin, height of bottom edge of mirror from floor 1000 mm.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Ontario Provincial Standard Specification (OPSS)

.1 OPSS.PROV 1010 November 2013, Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

.2 OPSS.PROV 1004 November 2012, Aggregates Miscellaneous.

1.2 SAMPLES

.1 Allow continual sampling by Departmental Representative or Designate during production.

.2 Provide Departmental Representative or Designate with access to source and processed material for sampling.

.3 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Granular 'A' to OPSS.PROV 1010

.2 Granular 'B' Type 1 to OPSS.PROV 1010.

.3 19mm clear stone to OPSS.PROV 1004.

.4 Rip Rap to OPSS.PROV 1004.

.5 Sand to OPSS.PROV 1010.

2.2 SOURCE QUALITY CONTROL

.1 If, in opinion of Departmental Representative or Designate, materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.

.2 Advise Departmental Representative or Designate 4 weeks in advance of proposed change of material source.

.3 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 31 23 33 - Excavating, Trenching, and Backfilling.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM D698-12e1, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m^3).

1.3 EXISTING CONDITIONS

.1 Known underground and surface utility lines and buried objects are as indicated on site plan.

1.4 PROTECTION

.1 Protect and/or transplant existing fences, trees, landscaping, natural features, bench marks, buildings, pavement, surface or underground utility lines which are to remain and as directed by Departmental Representative or Designate. If damaged, restore to original or better condition unless directed otherwise.

.2 Maintain access roads to prevent accumulation of construction related debris on roads.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Fill material: In accordance with Section 31 23 33.

PART 3 - EXECUTION

3.1 STRIPPING OF TOPSOIL

.1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected as determined by Departmental Representative or Designate.

.1 Commence topsoil stripping of areas as indicated in the Contract Drawings or as required for Performance of Work after area has been cleared of brush weeds and grasses and removed from site.

.2 Strip topsoil to depths as indicated in the Contract Drawings. Rototill weeds and grasses and retain as topsoil on site. Avoid mixing topsoil with subsoil.

3.1 STRIPPING OF TOP (Cont'd)

.3 Stockpile in locations as directed by Departmental Representative or Designate. Stockpile height not to exceed 2.0 m.

.4 Dispose of unused topsoil off site.

3.2 GRADING

.1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.

.2 Rough grade to following depths below finish grades:
- .1 100 mm for grassed areas.
- .2 As per contract drawings.

.3 Grade swales and ditches to depth as indicated in the Contract Drawings.

.4 Prior to placing fill over existing ground, scarify surface to depth of 150 mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

.5 Compact filled and disturbed areas to maximum dry density to ASTM D698, as follows:
- .1 85% under landscaped areas.
- .2 95% under paved and walk areas.

.6 Do not disturb soil within branch spread of trees or shrubs to remain.

3.3 FIELD QUALITY CONTROL

.1 Third Party inspection and testing of field and laboratory tests for control of moisture, density, aggregare gradation, and compaction of materials shall be retained and provided. Contractor to submit Materials Testing Program to the Departmental Representative or Designate for review and Approval.

3.4 SURPLUS MATERIAL

.1 Remove surplus material and material unsuitable for fill, grading or landscaping off site or as directed by Departmental Representative or Designate.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 02 41 99 - Demolition.

.2 Section 31 22 13 - Granular Base.

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM C117-13, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C136/C136M-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM D422-63(2014), Standard Test Method for Particle-Size Analysis of Soils.

.4 ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ^{3}) (600 kN-m/m ^{3}).

.5 ASTM D4318-10e1, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.2 Canadian Standards Association (CSA International)

.1 CAN/CSA A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.1 CAN/CSA A3001-13, Cementitious Materials for Use in Concrete.

.2 CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.3 Ontario Provincial Standard Specifications (OPSS)/Ontario Ministry of Transportation

.1 OPSS.PROV 1004, November 2012, Ontario Provincial Standard Specification, Material Specification for Aggregates - Miscellaneous.

.2 OPSS.PROV 1010, November 2013, Ontario Provincial Standard Specification, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

1.3 DEFINITIONS

.1 Unclassified excavation: excavation of deposits of whatever character encountered in Work.

.2 Topsoil:

.1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

.2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.

1.3 DEFINITIONS (Cont'd)

.3 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

.4 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.

.5 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.

.6 Unsuitable materials:
.1 Weak, chemically unstable, and compressible materials.
.2 Frost susceptible materials:
.1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136: Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.
.2 Coarse grained soils containing more than 20% by mass passing 0.075 mm sieve.

.7 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.4 SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00.

.2 Quality Control: in accordance with Section 01 45 00:
.1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.
.2 Submit for review by Departmental Representative or Designate proposed dewatering and heave prevention methods as described in PART 3 of this Section.
.3 Submit to Departmental Representative or Designate written notice when bottom of excavation is reached.
.4 Submit to Departmental Representative or Designate testing inspection results and report as described in Section 01 45 00.

.3 Preconstruction Submittals:
.1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.
.2 Submit records of underground utility locates, indicating: location plan of existing utilities as found in fields.

.4 Samples:
.1 Submit samples in accordance with Section 01 33 00.
.2 Inform Departmental Representative or Designate at least 2 weeks prior to beginning Work, of proposed source of fill materials.

1.5 QUALITY ASSURANCE

.1 Where Engineer is employee of Contractor, submit proof that Work by the Engineer is included in the Contractor's insurance coverage.

.1 Submit design and supporting data at least 2 weeks prior to beginning Work.

.2 Design and supporting data submitted to bear stamp and signature of qualified professional Engineer registered or licensed in Province of Ontario, Canada.

.3 Keep design and supporting data on site.

.4 Engage services of qualified Professional Engineer who is registered or licensed in Province of Ontario, Canada in which Work is to be carried out to design and inspect shoring, bracing and underpinning required for Work.

.5 Do not use soil material until written report of soil test results are reviewed by Departmental Representative or Designate.

.6 Health and Safety Requirements:

.1 Do construction occupational health and safety in accordance with Section 01 35 29.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21.

1.7 EXISTING CONDITIONS.1 Examine the Geotechnical Report appended to this specification.

.1 Buried services:

.1 Before commencing work verify and establish location of buried services on and adjacent to site.

.2 Coordinate with appropriate authority for relocation of buried services.

.3 Remove obsolete buried services as indicated in the Contract Drawings.

.4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.5 Confirm locations of buried utilities by careful test excavations and soil hydrovac methods as appropriate.

.6 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered and as indicated on the Contract Drawings.

.7 Record location of maintained, re-routed and abandoned underground lines.

.8 Confirm locations of recent excavations adjacent to area of excavation.

.2 Existing buildings and surface features:

1.7 EXISTING CONDITI (Cont'd)

.2 (Cont'd)

.1 Conduct, with Departmental Representative or Designate, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, pavement, survey bench marks and monuments which may be affected by Work.

.2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative or Designate.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Approved Trench Backfill: selected material from trench excavation or other sources, approved by Departmental Representative or Desigate for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse, other deleterious materials.

.2 Granular material: to OPSS.PROV 1010 for:

.1 Granular A, maximum size 19.0 mm.

.2 Granular B, Type I, maximum size 26.5 mm.

.3 Sand: clean, washed, minimum 100% passing 4.75 mm sieve, maximum 5% passing 0.075 mm sieve to OPSS.PROV 1004.05.04.

.4 Drainage material: 19 mm crushed stone or 19 to 63 mm clean gravel to OPSS.PROV 1004.05.07.

.5 Unshrinkable fill: proportioned and mixed to provide:

.1 Maximum compressive strength of 0.4 MPa at 28 days.

.2 Maximum cement content of 25 kg/m ^{3} with 40% by volume fly ash replacement: to CAN/CSA-A3001, Type GU.

.3 Minimum strength of 0.07 MPa at 24 h.

.4 Concrete aggregates: to CAN/CSA-A23.1/A23.2.

.5 Cement: Type GU.

.6 Slump: 160 to 200 mm.

PART 3 - EXECUTION

3.1 SITE PREPARATION

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

.2 Cut pavement and sidewalks neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.2 PREPARATION/ PROTECTION

.1 Protect existing features in accordance with Section 01 56 00 and applicable local regulations.

.2 Keep excavations clean, free of standing water, and loose soil.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative or Designate approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.5 Protect buried services that are required to remain undisturbed.

3.3 STRIPPING OF TOP SOIL.1 In accordance with Section 31 22 13.

3.4 STOCKPILING

.1 Stripped topsoil shall be stockpiled on-site for re-use at a location approved by CSC.

.2 Excluding stripped topsoil and material used in trenching backfill, no excavated material shall be stockpiled on the site. All excavated material shall be removed and disposed of off-site.

3.5 DEWATERING AND HEAVE PREVENTION

.1 Keep excavations free of water while Work is in progress.

.2 Provide for Departmental Representative's review details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.

.3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.

.1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.

.4 Protect open excavations against flooding and damage due to surface run-off.

.5 Dispose of water in accordance with Section 01 35 43 to approved collection runoff areas and in manner not detrimental to public and private property, or portion of Work completed or under construction.

.1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

3.6 EXCAVATION

.1 Advise Departmental Representative or Designate at least 7 days in advance of excavation operations.

.2 Excavate to lines, grades, elevations and dimensions as indicated.

.3 Remove concrete, masonry, paving, walks, demolished foundations and rubble, and other obstructions encountered during excavation in accordance with Section 02 41 99.

.4 Excavation must not interfere with bearing capacity of adjacent foundations.

.5 For trench excavation, unless otherwise authorized by Departmental Representative or Designate in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open at end of day's operation.

.6 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Departmental Representative or Designate.

.7 Restrict vehicle operations directly adjacent to open trenches.

.8 Dispose of surplus and unsuitable excavated material off site.

.9 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.10 Notify Departmental Representative or Designate when bottom of excavation is reached.

.11 Obtain Departmental Representative or Designate approval of completed excavation.

.12 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative or Designate.

.13 Correct unauthorized over-excavation as follows:
.1 Fill under bearing surfaces and footings with unshrinkable fill.
.2 Fill under other areas with Granular B, Type 1 fill compacted to not less than 95% of corrected Standard Proctor Maximum Dry Density.

.14 Hand trim, make firm and remove loose material and debris from excavations.
.1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.
.2 Clean out rock seams and fill with concrete mortar or grout to approval of Departmental Representative or Designate.

3.7 BEDDING AND SURROUND OF UNDERGROUND SERVICES

.1 Place and compact granular material for bedding and surround of underground services as indicated in the Contract Drawings.

.2 Place bedding and surround material in an unfrozen condition.

3.8 BACKFILLING

.1 Do not proceed with backfilling operations until completion of following:

.1 Departmental Representative or Designate has inspected and approved installations.

.2 Departmental Representative or Designate has inspected and approved of construction below finish grade.

.3 Inspection, testing, approval, and recording location of underground utilities.

.4 Removal of concrete formwork.

.5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.

.2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.3 Do not use backfill material which is frozen or contains ice, snow or debris.

.4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer to not less than 95% of corrected standard proctor maximum dry density.

.5 Backfilling around installations:

.1 Place bedding and surround material as specified elsewhere.

.2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.

.3 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 0.2 m.

.4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:

.1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Departmental Representative or:

.2 If approved by Departmental Representative or Designate, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Departmental Representative or Designate.

.6 Place unshrinkable fill in areas as indicated.

.7 Consolidate and level unshrinkable fill with internal vibrators.

.8 Install drainage filter system in backfill as indicated in the Contract Drawings.

3.9 RESTORATION

.1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 21, trim slopes, and correct defects as directed by Departmental Representative or Designate.

.2 Replace topsoil as specified and as indicated in the Contract Drawings.

.3 Reinstate lawns to elevation which existed before excavation or as indicated in the Contract Drawings.

.4 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation or as indicated in the Contract Drawings.

.5 Clean and reinstate areas affected by Work as specified or directed by Departmental Representative or Designate.

.6 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.

.7 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Ontario Provincial Standard Specifications (OPSS)/Ontario Ministry of Transportation

.1 OPSS.PROV 1010, November 2013, Ontario Provincial Standard Specification, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Materials

.2 American Society for Testing and Materials International (ASTM)

.1 ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3).

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Granular A to OPSS.PROV 1010.

PART 3 - EXECUTION

3.1 PLACING

.1 Place on a clean surface, properly shaped and compacted and free from snow or ice.

.2 Place material in layers not exceeding 150 mm when compacted.

.3 Spread each layer uniformly using approved grading equipment and methods to depths ad grades indicated in the Contract Drawings.

3.2 COMPACTING

.1 Compact each layer to minimum 100% Standard Proctor Maximum Dry Density.

.2 Add water as required to maintain material at or near optimum moisture content while compacting.

3.3 FINISHING

.1 Finish compacted surface to within 12 mm of established grade as indicated by a 3 m straightedge placed in any direction

.2 Correct irregularities greater than 12 mm by loosening the surface and adding or removing material until surface is within specified tolerance.

3.4 FIELD QUALITY CONTROL

.1 Third Party inspection and testing of field and laboratory tests for control of moisture, density, aggregate gradation, and compaction of materials shall be retained and provided. Contractor to submit a Materials Testing Program to the Departmental Representative or Designate for review and approval.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Ontario Provincial Standard Specifications (OPSS)/Ontario Ministry of Transportation

.1 OPSS.PROV 1010, November 2013, Ontario Provincial Standard Specification, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Materials

.2 American Society for Testing and Materials International (ASTM)

.1 ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3).

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Granular B Type I: to OPSS.PROV 1010. Maximum size Granular B Type I, 75.0 mm.

PART 3 - EXECUTION

3.1 PLACING

.1 Place on a clean surface, properly shaped and compacted and free from snow or ice.

.2 Place material in layers not exceeding 225 mm when compacted.

.3 Spread each layer uniformly using approved grading equipment and methods.

3.2 COMPACTING

.1 Compact each layer to minimum 100% Standard Proctor Maximum Dry Density.

.2 Add water as required to maintain material at or near optimum moisture content while compacting.

3.3 FINISHING

.1 Finish compacted surface to within 12 mm of established grade as indicated by a 3 m straightedge placed in any direction.

3.3 FINISHING (Cont'd)

.2 Correct irregularities greater than 12 mm by loosening the surface and adding or removing material until surface is within specified tolerance.

3.4 FIELD QUALITY CO

TROL.1 Third Party inspection and testing of field and laboratory tests for control of moisture, density, aggrregate gradation, and compaction of materials shall be retained and provided. Contractor to submit Materials Testing Program to the Departmental Representative or Desigante for review and approval.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.5-M91, Low Flash Petroleum Spirits Thinner.

.2 CAN/CGSB-1.74-2001, Alkyd Traffic Paint.

.3 Ontario Provincial Standard Specification (OPSS)

.1 OPSS 310, November 2010, Construction Specification for Hot Mix Asphalt.

.2 OPSS 1103, November 2013, Material Specification for Emulsified Asphalt.

.3 OPSS 1150, November 2010, Material Specification for Hot Mixed Asphalt.

.4 OPSS 1712, February 1991, Material Specification for Organic Solvent Based Traffic Paint.

1.2 SUBMITTALS

.1 Submit to Department Representative or Designate, the asphalt mix design at least 2 weeks before paving work.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Prime coat: SS-1 to OPSS 1103.

.2 Tack coat: SS-1 to OPSS 1103.

.3 Asphalt concrete: to OPSS 1150.

.4 Traffic paint: Alkyd yellow (505-308) and white (513-301) to CAN/CGSB-1.74 and OPSS 1712.

.5 Paint thinner: to CAN/CGSB-1.5.

PART 3 - EXECUTION

3.1 LIMITATIONS

.1 Implementation and completion of all pavement and pavement markings shall be done on weekends only.

.2 Contractor to provide 72 hours notices prior to closing parking areas off on weekends for paving and pavement marking operations.

3.2 PAVEMENT CONSTRUCTION

.1 Traffic markings shall not be applied earlier than 14 days after application of asphaltic concrete surface course on all phases that have been complted.

.2 Pavement thickness as per Contract Drawings.

.3 Application of tack coat: OPSS 1103. Apply only on clean and dry surface. Paint contact surfaces of curbs, manholes and like structures with thin, uniform coat of asphalt tack coat material.

.4 Construction of asphalt concrete: to OPSS 310.

3.3 TRAFFIC MARKINGS

.1 Traffic markings shall not be applied earlier than 14 days after application of asphaltic concrete surface course has been completed on the entire site.

.2 Paint stop lines, centre lines and other pavement markings in accordance with manufacturers recommendations and as indicated on the Contract Drawings.

.3 Review layout with Department Representative prior to application.

.4 Pavement surface to be dry, free from ponded water, frost, ice, dust, oil, grease and other foreign materials.

.5 Air temperature to be above 10°C, wind speed less than 60 km/h and no rain in forecast within next 4 hours.

.6 Paint lines to be of uniform colour and density with sharp edges.

.7 Remove incorrect markings as directed by Department Representative.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 31 22 13 - Rough Grading.

.2 Section 32 11 20 - Granular Base.

.3 Section 32 11 24 - Granular Sub-base.

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)
.1 ASTM C117-13, Standard Test Method for Materials Finer than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
.2 ASTM C136/136M-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
.3 ASTM D698-12e2, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600 kN-m/m^3).

.2 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-3.3-2014, Kerosene, Amend. No. 1, National Standard of Canada.
.2 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.3 Canadian Standards Association (CSA International)
.1 CSA-A23.1-14/A23.2-14, Concrete materials and methods of concrete construction/Test methods and standard practices for concrete.

.4 Ontario Provincial Standard Specification (OPSS)
.1 OPSS.PROV 1010 November 2013, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

1.3 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00.

.2 Product Data: submit WHMIS MSDS.

.3 If materials have been tested by accredited testing laboratory testing laboratory approved by Departmental Representative or Designate within previous 2 months and have passed tests equal to requirements of this specification, submit test certificates from testing laboratory showing suitability of materials for this project.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Waste Management and Disposal:
.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Concrete mixes and materials: in accordance with Section 03 30 00.

.2 Joint filler, Curing Compound: in accordance with Section 03 30 00.

.3 Granular base: Granular A to OPSS.PROV 1010.

.4 Non-staining mineral type form release agent: chemically active release agents containing compounds that react with free lime to provide water-soluble soap.

.5 Kerosene: to CAN/CGSB-3.3.

.6 Detectable warning plate shall be uncoated cast iron materail with natural "rust" finish in accordance wit the AODA Act.

PART 3 - EXECUTION

3.1 GRADE PREPARATIO

N.1 Do grade preparation work in accordance with Section 31 22 13.

3.2 GRANULAR BASE

.1 Obtain Departmental Representative's approval of subgrade before placing granular base.

.2 Place 150mm thick granular base to lines, widths, and depths as indicated.

.3 Compact granular base layers to at least 95% of Standard Proctor Maximum Dry Density.

3.3 CONCRETE

.1 Obtain Departmental Representative or Designate's approval of granular base prior to placing concrete.

.2 Do concrete work in accordance with Section 03 30 00.

.3 Immediately after floating, give sidewalk surface uniform broom finish to produce regular corrugations not exceeding 2 mm deep, by drawing broom in direction normal to centre line.

.4 Provide edging as indicated with 10 mm radius edging tool.

3.3 CONCRETE (Cont'd)

.5 Slip-form pavers equipped with string line system for line and grade control may be used if quality of work acceptable to Departmental Representative or Designate can be demonstrated. Hand finish surfaces when directed by Departmental Representative or Designate.

3.4 TOLERANCES

.1 Finish surfaces to within 3 mm in 3 m as measured with 3 m straightedge placed on surface.

3.5 EXPANSION AND CONTRACTION JOINTS

.1 Install tooled transverse contraction joints after floating, when concrete is stiff, but still plastic, at intervals of 1.5 m.

.2 Install expansion joints at intervals of 6 m.

.3 When sidewalk is adjacent to curb, make joints of curb, gutters and sidewalk coincide.

3.6 ISOLATION JOINTS

.1 Install isolation joints around manholes and catch basins and along length adjacent to concrete curbs, catch basins, buildings, or permanent structure.

.2 Seal isolation joints with sealant approved by Departmental Representative or Designate.

3.7 CURING

.1 Cure concrete by adding moisture continuously in accordance with CAN/CSA-A23.1/A23.2 to exposed finished surfaces for at least 1 day after placing, or sealing moisture in by curing compound as directed by Departmental Representative or Designate.

.2 Where burlap is used for moist curing, place two prewetted layers on concrete surface and keep continuously wet during curing period.

.3 Apply curing compound evenly to form continuous film, in accordance with manufacturer's requirements.

3.8 BACKFILL

.1 Allow concrete to cure for 7 days prior to backfilling.

.2 Backfill to designated elevations with material as directed by Departmental Representative or Designate.

.1 Compact and shape to required contours as indicated.

3.9 CLEANING

.1 Proceed in accordance with Section 01 74 11.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Agriculture and Agri-Food Canada
- .1 The Canadian System of Soil Classification, Third Edition, 1998.

.2 Canadian Council of Ministers of the Environment (CCME)
- .1 PN 1340-2005, Guidelines for Compost Quality.

1.2 DEFINITIONS

.1 Compost:
- .1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.

.2 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test.

.3 Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth, and contain no toxic or growth inhibiting contaminates.

.4 Composed bio-solids to: CCME Guidelines for Compost Quality.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21.

PART 2 - PRODUCTS

2.1 TOPSOIL

.1 Topsoil for seeded areas and planting beds: mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.
- .1 Soil texture based on The Canadian System of Soil Classification, to consist of 20 to 70% sand, minimum 7% clay, and contain 2 to 10% organic matter by weight.
- .2 Contain no toxic elements or growth inhibiting material.
- .3 Finished surface free from:
  - .1 Debris and stones over 50 mm diameter.
  - .2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
- .4 Consistence: friable when moist.

2.2 SOD

.1 Number One Turf Grass Nursery Sod: sod that has been especially sown and cultivated in nursery fields as turf grass crop.

.1 Turf Grass Nursery Sod types:

.1 Number One Kentucky Bluegrass Sod: Nursery Sod grown solely from seed of cultivars of Kentucky Bluegrass, containing not less than 50% Kentucky Bluegrass cultivars.

.2 Number One Kentucky Bluegrass Sod - Fescue Sod: Nursery Sod grown solely from seed mixture of cultivars of Kentucky Bluegrass and Chewing Fescue or Creeping Red Fescue, containing not less than 40% Kentucky Bluegrass cultivars and 30% Chewing Fescue or Creeping Red Fescue cultivars.

.3 Number One Named Cultivars: Nursery Sod grown from certified seed.

.2 Turf Grass Nursery Sod quality:

.1 Not more than 2 broadleaf weeds or 10 other weeds per 40 square metres.

.2 Density of sod sufficient so that no soil is visible from height of 1500 mm when mown to height of 50 mm.

.3 Mowing height limit: 35 to 65 mm.

.4 Soil portion of sod: 6 to 15 mm in thickness.

2.3 SOIL AMENDMENTS

.1 Fertilizer

.1 Fertility: major soil nutrients present in the following amounts:

.2 Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil.

.3 Phosphorus (P): 40 to 50 micrograms of phosphate per gram of topsoil.

.4 Potassium (K): 75 to 110 micrograms of potassium per gram of topsoil.

.5 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.

.6 Ph value: 6.5 to 8.0.

.2 Sand: washed coarse silica sand, medium to course textured.

.3 Organic matter: compost in accordance with CCME PN1340, unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.

.4 Use composts meeting Category B requirements for land fill reclamation and large scale industrial applications.

.5 Limestone:

.1 Ground agricultural limestone.

.6 Fertilizer: industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

2.4 SOURCE QUALITY CONTROL

.1 Advise Departmental Representative or Designate of sources of topsoil to be utilized with sufficient lead time for testing.

.2 Obtain approval from Departmental Representative or Designate of sod at source.

.3 When proposed source of sod is approved, use no other source without written authorization from Departmental Representative or Designate.

PART 3 - EXECUTION

3.1 TEMPORARY EROSIO AND SEDIMENTATION CONTROL

N.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control drawings and as instructed by Departmental Representative or Designate.

.1 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.2 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 STRIPPING OF TO AND SOD

SOIL

.1 Begin topsoil stripping of areas after area has been cleared of brush and removed from site.

.2 When stripping topsoil, avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.

.3 Stockpile in locations as directed by Departmental Representative or Designate.

.1 Stockpile height not to exceed 2 m.

.4 Dispose of unused topsoil off site.

.5 Protect stockpiles from contamination and compaction.

3.3 PREPARATION OF EXISTING GRADE

.1 Verify that grades are correct.

.1 If discrepancies occur, notify Departmental Representative or Designate and do not commence work until instructed by Departmental Representative or Designate.

3.3 PREPARATION OF EXISTING GRADE (Cont'd)

.1 (Cont'd)

.2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.

.3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.

.1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.

.2 Remove debris which protrudes more than 75 mm above surface.

.3 Dispose of removed material off site.

.4 Cultivate entire area which is to receive topsoil to minimum depth of 100 m.

.1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.4 PLACING AND SPREADING OF TOPSOIL

.1 Place topsoil after Departmental Representative or Designate has accepted subgrade.

.2 Spread topsoil in uniform layers not exceeding 100 mm.

.3 For sodded areas keep topsoil 15 mm below finished grade.

.4 Manually spread topsoil soil around trees, shrubs and obstacles.

3.5 SOD PLACEMENT

.1 Lay sod within 24 hours of being lifted if air temperature exceeds 20 degrees C.

.2 Lay sod sections in rows, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.

.3 Roll sod as directed by Departmental Representative or Designate. Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

3.6 FINISH GRADING

.1 Grade to eliminate rough spots and low areas and ensure positive drainage.

.1 Prepare loose friable bed by means of cultivation and subsequent raking.

.2 Consolidate topsoil to required bulk density using equipment approved by Departmental Representative or Designate.

.1 Leave surfaces smooth, uniform and firm against deep footprinting.

3.7 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following operations from time of installation until acceptance.

.2 Water at frequency required to maintain optimum soil er sodded areas in sufficient quantities and moisture condition to depth of 60 mm.

.3 Cut grass to 50 mm when or prior to it reaching height of 75 mm. Remove clippings which will smother grassed areas as directed by Departmental Representative or Designate.

3.8 ACCEPTANCE

.1 Departmental Representative or Designate will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

.2 Turf Grass Nursery Sod areas will be accepted by Departmental Representative or Designate provided that:

.1 Sodded areas are properly established.

.2 Sod is free of bare and dead spots.

.3 No surface soil is visible from height of 1500 mm when grass has been cut to height of 50 m.

.4 Sodded areas have been cut minimum 2 times prior to acceptance.

.3 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.

3.9 SURPLUS MATERIAL

.1 Dispose of excess materials at a location identified by the facility.

3.10 CLEANING

.1 Proceed in accordance with Section 01 74 21.

.2 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 installation for constructing new outfall structures, precast maintenance holes.

1.2 RELATED SECTIONS

.1 Section 31 23 33 - Excavating, Trenching and Backfilling.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM International)

.1 ASTM A48/A48M-03(2012), Standard Specification for Gray Iron Castings.

.2 ASTM C139-14, Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes (Metric).

.3 ASTM C478M-15a, Standard Specification for Precast Reinforced Concrete Manhole Sections.

.4 ASTM C618-08a(2015), Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

.5 ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

.2 Canadian Standards Association (CSA International)

.1 CAN/CSA-A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.2 CSA-A23.1-14/A23.2-14, Concrete materials and methods of concrete construction/Test methods and standard practices for concrete.

.3 CSA-A165 Series-04(R2014), CSA Standards on Concrete Masonry Units.

.4 CAN/CSA-G30.18-09(R2014), Carbon steel bars for concrete reinforcement.

.3 Ontario Provincial Standard Specification (OPSS)

.1 OPSS 405, November 2008, Construction Specification for Pipe Subdrains.

.2 OPSS 407, November 2015, Construction Specification for Maintenance Hole, Catch Basin, Ditch Inlet and Valve Chamber Installation Cibs.

.3 OPSS 701, November 2009, Construction Specification for Watermain Installation in Open Cut.

.4 OPSS 705, November 2014, Construction Specification for Flexible Delineator Posts.

.5 OPSS.PROV 1010, November 2013, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

.4 Ontario Provincial Standard Drawings (OPSD)

.1 OPSD 405.010, November 2013, Maintenance Hole Steps.

1.4 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00.

.2 Submit manufacturer's test data and certification at least 2 weeks prior to beginning Work. Include manufacturer's drawings, information and shop drawings where pertinent.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Cast-in-place concrete:
.1 In accordance with Section 03 30 00.

.2 Precast maintenance hole units: to OPSS 701.010.

.3 Precast catch basin units: to OPSS 705.010.

.4 Joints: to be made watertight using rubber rings, bituminous compound, epoxy resin cement or cement mortar.

.5 Ladder rungs: to OPSD 405.010.

.6 Frames, gratings, covers as indicated on the Contract Drawings.

.7 Granular bedding and backfill: in accordance with OPSS.PROV 1010.
.1 150 mm Granular 'A' compact to minimum 98% Standard Proctor Maximum Dry Density.

PART 3 - EXECUTION

3.1 EXCAVATION AND BACKFILL

.1 Excavate and backfill in accordance with Section 31 23 33 and as indicated in the Contract Drawings.

.2 Obtain approval of Departmental Representative or Designate before installing maintenance holes or catch basins.

3.2 CONCRETE WORK

.1 Do concrete work in accordance with Section 03 30 00.

3.3 INSTALLATION

.1 Construct units in accordance with details indicated, plumb and true to alignment and grade.

.2 Complete units as pipe laying progresses. Maximum of three units behind point of pipe laying will be allowed.

.3 Dewater excavation to approval of Departmental Representative or Designate and remove soft and foreign material before placing concrete base.

.4 Cast bottom slabs directly on undisturbed ground.

.5 Set precast concrete base on 150 mm minimum of granular bedding compacted to minimum 98% Standard Proctor Maximum Dry Density.

.6 Precast units:

.1 Set bottom section of precast unit in bed of cement mortar and bond to concrete slab or base. Make each successive joint watertight with Departmental Representative or Designate approved rubber ring gaskets, bituminous compound, cement mortar, epoxy resin cement, or combination thereof.

.2 Clean surplus mortar and joint compounds from interior surface of unit as work progresses.

.3 Plug lifting holes with precast concrete plugs set in cement mortar or mastic compound.

.7 For sewers:

.1 Place stub outlets and bulkheads at elevations and in positions indicated and as per Section 33 31 13.

.2 Bench to provide a smooth U-shaped channel. Side height of channel to be 0.75 times full diameter of sewer. Slope adjacent floor at 1 in 20. Curve channels smoothly. Slope invert to establish sewer grade.

.8 Compact granular backfill to minimum 98% Standard Proctor Maximum Dry Density.

.9 Place unshrinkable backfill in accordance with Section 31 23 33 as required.

.10 Set frame and cover to required elevation on no more than four courses of brick. Make brick joints and join brick to frame with cement mortar. Parge and make smooth and watertight.

.11 Place frame and cover on top section to elevation as indicated. If adjustment required use concrete ring.

.12 Clean units of debris and foreign materials. Remove fins and sharp projections. Prevent debris from entering system.

.13 Install safety platforms in maintenance holes having depth of 5 m or greater, as indicated.

3.3 INSTALLATION (Cont'd)

.14 Remove existing gratings, frames and I beams and store for re-use at locations designated by Departmental Representative or Designate.

.15 Sectional units:

.1 Raise or lower straight walled sectional units by adding or removing precast sections as required.

.2 Raise or lower tapered units by removing cone section, adding, removing, or substituting riser sections to obtain required elevation, then replace cone section. When amount of raise is less than 600 mm use standard maintenance hole brick, moduloc or grade rings.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Materials and installation for storm sewers, subdrains, and culverts.

1.2 RELATED SECTIONS

.1 Section 31 23 33 - Excavating, Trenching and Backfilling.

1.3 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)
.1 ASTM D3034-15, Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

.2 Canadian Standards Association (CSA International)
.1 CSA B1800-15, Plastic Non-pressure Pipe Compendium - B1800 Series (Consists of B181.1, B181.2, B181.3, B181.5, B182.1, B182.2, B182.4, B182.6, B182.8, B182.11 and B182.13).
.1 CSA B182.1(2012), Plastic Drain and Sewer Pipe and Pipe Fittings.
.2 CSA B182.2 (2012), PVC Sewer Pipe and Fittings (PSM Type).
.3 CSA B182.11 (2012), Recommended Practice for the Installation of Thermoplastic Drain, Storm, and Sewer Pipe and Fittings.

.3 Department of Justice Canada (Jus)
.1 Canadian Environmental Protection Act, 1999 (CEPA).

.4 Transport Canada (TC)
.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

.5 Ontario Provincial Standard Specification (OPSS)
.1 OPSS.PROV 101o, November 2013, Ontario Provincial Standard Specification, Material Specification for Aggregates - Granular A, B, M and Select Subgrade Material.

1.4 SUBMITTALS

.1 Submit shop drawings in accordance with Section 01 33 00.

.2 Inform Departmental Representative or Designate at least 2 weeks prior to beginning Work, of proposed source of bedding materials and provide access for sampling.

.3 Submit manufacturer's test data and certification at least 2 weeks prior to beginning Work.

.4 Certification to be marked on pipe.

1.4 SUBMITTALS (Cont'd)

.5 Submit to Departmental Representative or Designate one (1) copy of manufacturer's installation instructions.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21.

1.6 SCHEDULING

.1 Schedule Work to minimize interruptions to existing services and to maintain existing flow during construction.

.2 Submit schedule of expected interruptions for approval and adhere to approved schedule.

PART 2 PRODUCTS

2.1 PLASTIC PIPE

.1 Type PSM Polyvinyl Chloride (PVC): to CSA-B182.2.
- .1 Standard Dimensional Ratio (SDR): 35.
- .2 Locked-in Separate gasket and integral bell
- .3 Nominal lengths: 6 m.

2.2 PIPE BEDDING AND SURROUND MATERIAL

.1 Granular material: to OPSS.PROV 1010 for:
- .1 Granular A, maximuOm size 19.0 mm.
- .2 Granular B, Type I, maximum size 26.5 mm.

2.3 BACKFILL MATERIA

L.1 As indicated in the Contract Drawings and in accordance with Section 31 23 33.

PART 3 EXECUTION

3.1 PREPARATION

.1 Clean pipes and fittings of debris and water before installation, and remove defective materials from site to approval of Departmental Representative or Designate.

3.2 TRENCHING

.1 Do trenching Work in accordance with Section 31 23 33.

3.2 TRENCHING (Cont'd)

.2 Trench alignment and depth to approval of Departmental Representative or Designate prior to placing bedding material and pipe.

3.3 GRANULAR BEDDING

.1 Place bedding in unfrozen condition.

.2 Place granular bedding material in uniform layers not exceeding 150 mm compacted thickness to depth as indicated.

.3 Shape bed true to grade and to provide continuous, uniform bearing surface for pipe. Do not use blocks when bedding pipes.

.4 Shape transverse depressions as required to suit joints.

.5 Compact each layer full width of bed to at least 98% Standard Proctor Maximum Dry Density.

.6 Fill excavation below bottom of specified bedding adjacent to maintenance holes or catch basins with compacted bedding material.

3.4 INSTALLATION

.1 Lay and join pipe in accordance with manufacturer's recommendations and to approval of Departmental Representative or Designate.

.2 Handle pipe using methods approved by Departmental Representative or Designate.

.1 Do not use chains or cables passed through rigid pipe bore so that weight of pipe bears upon pipe ends.

.3 Lay pipes on prepared bed, true to line and grade with pipe inverts smooth and free of sags or high points.

.1 Ensure barrel of each pipe is in contact with shaped bed throughout its full length.

.4 Begin laying at outlet and proceed in upstream direction with socket ends of pipe facing upgrade.

.5 Do not exceed maximum joint deflection recommended by pipe manufacturer.

.6 Do not allow water to flow through pipes during construction except as may be permitted by Departmental Representative or Designate.

.7 When any stoppage of Work occurs, restrain pipes as directed by Departmental Representative or Designate, to prevent "creep" during down time.

.8 Plug lifting holes with Departmental Representative or Designate approved prefabricated plugs, set in shrinkage compensating grout.

3.4 INSTALLATION (Cont'd)

.9 Cut pipes as required for special inserts, fittings or closure pieces, as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.

.10 Make watertight connections to maintenance holes and headwalls.
.1 Use shrinkage compensating grout when suitable gaskets are not available.

.11 Use prefabricated saddles or approved field connections for connecting pipes to existing sewer pipes.
.1 Joint to be structurally sound and watertight.

3.5 PIPE SURROUND

.1 Place surround material in unfrozen condition.

.2 Upon completion of pipe laying, and after Departmental Representative or Designate has inspected pipe joints, surround and cover pipes as indicated.
.1 Leave joints and fittings exposed until field testing is completed.

.3 Hand place surround material in uniform layers not exceeding 150 mm compacted thickness as indicated.
.1 Do not dump material within 2 m of pipe.

.4 Place layers uniformly and simultaneously on each side of pipe.

.5 Compact each layer from pipe invert to mid height of pipe to at least 98% Standard Proctor Maximum Dry Density.

.6 Compact each layer from mid height of pipe to underside of backfill to at least 98% Standard Proctor Maximum Dry Density.

.7 When field test results are acceptable to Departmental Representative, place surround material at pipe joints.

3.6 BACKFILL

.1 Place backfill material in unfrozen condition.

.2 Place backfill material, above pipe surround, in uniform layers not exceeding 200 mm compacted thickness to at least 90% Standard Proctor Maximum Dry Density up to grades as indicated.

.3 Place unshrinkable backfill in accordance with Section 31 23 33.

3.7 FIELD TESTING

.1 Repair or replace pipe, pipe joint or bedding found defective.

3.7 FIELD TESTING (Cont'd)

.2 When directed by Departmental Representative or Designate, draw tapered wooden plug with diameter of 50 mm less than nominal pipe diameter through sewer to ensure that pipe is free of obstruction.

.3 Remove foreign material from sewers and related appurtenances by flushing with water.

.4 Provide CCTV of all storm utility drains installed under this contract.

END OF SECTION