

1 GENERAL

1.1 FEES, PERMITS, AND CERTIFICATES

- .1 Pay all fees and obtain all permits, unless otherwise noted. Provide authorities with plans and information for acceptance certificates. Provide inspection certificates as evidence that work conforms to requirements of Authority having jurisdiction.
- .2 Obtain facility work permits from property management on a regular basis as work progresses.

1.2 CONSTRUCTION PROGRESS SCHEDULE

- .1 Submit to Departmental Representative within 10 working days of Award of Contract bar chart construction schedule for work, indicating anticipated progress stages within Construction Time. When the Departmental Representative has reviewed schedule, take necessary measures to complete work within scheduled time. Do not change schedule without notifying Departmental Representative.
- .2 Schedule and execute work with least possible interference or disturbance to the normal use of premises and site.
- .3 Submit schedule updates weekly and, when requested by the Departmental Representative, due to changing project conditions. Provide a narrative explanation of necessary changes and schedule revisions at each update.
- .4 Carry out work during "regular hours", Monday to Friday from 06:00 to 18:00 hours and on Saturdays, Sundays and statutory holidays.
- .5 Carry out noise and odour generating work, and work in occupied areas on Saturdays, Sundays, and statutory holidays.
- .6 Give the Departmental Representative 5 working days-notice for work to be carried out during "off hours" and on Saturdays, Sundays, and statutory holidays.

1.3 REGULATORY REQUIREMENTS

- .1 References and Codes:
 - .1 Materials shall be new, and work shall conform to the minimum applicable standards of the "References" indicated in the specification sections, the National Building Code of Canada 2015 (NBC) and all applicable Provincial and Municipal codes. In the case of conflict or discrepancy the most stringent requirement shall apply.
- .2 Building Smoking Environment:

Smoking is not permitted on the building site, or in the building. Obey smoking restrictions on the campus at all times.

1.4 SUBMITTAL PROCEDURES

- .1 Submit promptly to Departmental Representative submittals listed for review, in orderly sequence to not cause delay in work.

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- .2 Do not proceed with work affected by submittals until review is complete.
- .3 Immediately after award of Contract, submit Workers' Compensation Board status.
- .4 Shop Drawings:
 - .1 Submit one (1) electronic copy of shop drawings: bearing stamp and signature of qualified Professional Engineer registered or licensed in Province of Ontario.
 - .2 The review is for the sole purpose of ascertaining conformance with the general design concept, and does not mean approval of the design details inherent in the shop drawings, responsibility for which shall remain with the Contractor. Such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of his responsibility for meeting all requirements of the Contract Documents.
- .5 Product Data:
 - .1 Submit one (1) electronic copy of product data: manufacturers' catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.
 - .2 Cross reference product data information to applicable portions on Contract Documents.
- .6 Samples:
 - .1 Submit samples: examples of materials, equipment, quality, finishes and workmanship.
 - .2 Where colour, pattern or texture is criterion, submit full range of samples.
 - .3 Reviewed and accepted samples will become standard of material and workmanship, against which installed work will be verified.

1.5 FIRE SAFETY REQUIREMENTS

- .1 Comply with both the National Building Code of Canada 2015 and the National Fire Code of Canada 2015 for safety of persons in buildings in the event of a fire and the protection of buildings from the effects of fire, as follows:
 - .1 The National Building Code (NBC): for fire safety and fire protection features that are required to be incorporated in a building during construction.
 - .2 The National Fire Code (NFC):
 - .1 The on-going maintenance and use of the fire safety and fire protection features incorporated in buildings.
 - .2 The conduct of activities that might cause fire hazards in and around buildings.
 - .3 Limitations on hazardous contents in and around buildings.
 - .4 The establishment of fire safety plans.
 - .5 Fire safety at construction and demolition sites.
- .2 Welding and cutting:
 - .1 Before welding, soldering, grinding and/or cutting work, obtain a permit as directed by the Departmental Representative. Store flammable liquids in approved CSA containers.
 - .2 At least one week prior to commencing cutting, welding or soldering procedure, provide to Departmental Representative:
 - .1 Notice of intent, indicating devices affected, time and duration of isolation or bypass.
 - .2 Completed welding permit as defined in NFC.
 - .3 Return welding permit to Departmental Representative immediately upon completion of procedures for which permit was issued.

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- .3 "Fire Watchers" as described in NFC shall be assigned when welding or cutting operations are carried out in areas where combustible materials within 15m may be ignited by conduction or radiation.
- .3 Where work requires interruption or cause activation of fire alarms or fire suppression, extinguishing or protection systems:
 - .1 Provide "Watchman Service" as described in NFC; In general, watchman service is defined as an individual conversant with "Fire Emergency Procedures", performing fire picket duty within an unprotected and unoccupied (no workers) area once per hour.
 - .2 Retain services of manufacturer for fire protection systems on daily basis or as approved by Departmental Representative, to isolate and protect all devices relating to:
 - .1 modification of fire alarms, fire suppression, extinguishing or protection systems; and/or
 - .2 cutting, welding, soldering or other construction activities that might activate fire protection systems
 - .3 Immediately upon completion of work, restore fire protection systems to normal operation and verify that all devices are fully operational.
 - .4 Inform fire alarm system monitoring agency and local Fire Department immediately prior to isolation and immediately upon restoration of normal operation.

1.6 FIELD QUALITY CONTROL

- .1 Carry out Work using qualified licensed workers or apprentices in accordance with Provincial Act respecting manpower vocational training and qualification.
- .2 Permit employees registered in Provincial apprenticeship program to perform specific tasks only if under direct supervision of qualified licensed workers.
- .3 Determine permitted activities and tasks by apprentices, based on level of training attended and demonstration of ability to perform specific duties.

1.7 HAZARDOUS MATERIALS

- .1 Hazardous Materials: product, substance, or organism that may cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.
- .2 Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and the provision of Material Safety Data Sheets (MSDS).
- .3 Hazardous Material Discovery:
 - .1 Stop work immediately when material resembling spray or trowel-applied asbestos, Polychlorinated Biphenyl (PCB), mould or other designated substance or hazardous substance is encountered during demolition work.
 - .1 Take preventative measure and promptly notify Departmental Representative.
 - .2 Do not proceed until written instructions have been received from Departmental Representative.
 - .2 Comply with the requirements of the Workplace Hazardous Materials Information System and Workplace Hazardous Materials Information System 2015 (WHMIS/WHMIS 2015) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and the provision of Material Safety Data Sheets and Safety Data

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Sheets (MSDS/SDS).

1.8 TEMPORARY UTILITIES

- .1 Existing services required for work, excluding power required for space temporary heating, may be used by the Contractor without charge. Ensure capacity is adequate prior to imposing additional loads. Connect and disconnect at own expense and responsibility.
- .2 Notify the Departmental Representative and utility companies of intended interruption of services and obtain requisite permission.
- .3 Give the Departmental Representative 5 working days-notice related to each necessary interruption that affects the building or adjacent campus facilities and services of any mechanical or electrical service throughout the course of the work. Keep duration of these interruptions to a minimum. Carry out all interruptions that affect the building and adjacent campus facilities and services after normal working hours of the occupants, preferably on weekends.

1.9 EXECUTION

- .1 Cut, Patch and Make Good:
 - .1 Cut existing surfaces as required to accommodate new work.
 - .2 Remove all items so shown or specified.
 - .3 Patch and make good surfaces cut, damaged or disturbed, to Departmental Representative's approval. Match existing material, colour, finish and texture.
- .2 Firestop and smoke seal systems: in accordance with CAN-ULC S115-11 - Standard Method of Fire Test of Firestop Systems. Install around pipe, ductwork, cables, and other objects penetrating fire separations to provide fire resistance not less than the fire resistance rating of surrounding floor, ceiling, and wall assembly.
- .3 Sleeves, Hangers and Inserts: co-ordinate setting and packing of sleeves and supply and installation of hangers and inserts. Obtain Departmental Representative's approval before cutting into structure.
- .4 Unless otherwise specified, materials for removal become the Contractor's property and shall be taken from site.
- .5 Carry out snow and ice removals from the roof, staging area, scaffold access, and entirety of construction zone. Dispose of removed snow/ice off site. Reinstatement to new condition any damages to building, equipment, or landscaped areas due to snow removal activities.

1.10 CONSTRUCTION FACILITIES

- .1 Access and Egress:
 - .1 No access to or through the building will be provided. The contractor shall provide independent secure dedicated access via scaffolding and stairs on north side of building exterior to provide access. Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps and/or ladders, and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

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- .2 At all times, maintain safe occupant access, egress and internal circulation for the building. Provide overhead scaffold protection at all access and egress locations.
- .2 Site Storage:
 - .1 Store materials on site at the north side of the building within the limits of construction. Storage areas shall be equipped and maintained by the Contractor. Stockpile only materials on existing roof that will be used that day. Spread out stored materials, do not mass materials in one area.
 - .2 Stockpiling of material outside of staging area is not permitted.
 - .3 Locate construction and storage trailers within the limits of construction. Do not unreasonably encumber site with materials or equipment.
 - .4 Move stored products or equipment that interfere with operations of Departmental Representative or other contractors.
 - .5 Obtain and pay for use of additional storage or work areas needed for operations.
 - .6 Existing Thoroughfare parking lots to remain operational at all times.
- .3 Sanitary facilities:
 - .1 Provide temporary sanitary facilities for work force in accordance with governing regulations and ordinances (minimum one male and one female temporary toilet) on site within the limits of construction to approval of the Departmental Representative. Maintain supply of paper towels and toilet tissue. Maintain facilities to approval of Departmental Representative. Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition. Relocate sanitary facilities to suit progression of work.
 - .2 Sanitary facilities are to be located out of harm's way and protected from construction vehicles and activities. Provide Departmental Representative with proposed location of sanitary facilities for approval. Relocate as directed by Departmental Representative.
- .4 Limited Contractor parking will be made available in the adjacent parking lot. A maximum of ten (10) parking spots will be assigned for contractor use.
- .5 Signage:
 - .1 Provide common-use signs related to traffic control, information, instruction, use of equipment, public safety devices, etcetera, in both official languages or by the use of commonly understood graphic symbols and to approval of the Departmental Representative.
 - .2 No advertising will be permitted on this project.
 - .3 Maintain approved signs and notices in good condition for duration of project and dispose of offsite, on completion of project or earlier, as directed by Departmental Representative.
- .6 Landscaping and turf disturbed by vehicular traffic, trailers, storage and staging shall be reinstated to new condition with sod and plant materials maintained for a period of not less than one year following the substantial completion.
 - .1 Clean adjacent roadways where affected by Contractor's equipment.

1.11 TEMPORARY SCAFFOLDS AND WORK PLATFORMS

- .1 Design, install, and inspect temporary scaffolds and work platforms required for work in accordance with relevant municipal, provincial and other regulations. Temporary scaffolds and stairs shall provide the only site access and shall be installed on the north side of the building.

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- .2 Design, erect and maintain temporary site enclosures and covered pedestrian walkways and provide protection, complete with signs and electrical lighting as required by the Departmental Representative.
- .3 Design, erect and maintain temporary enclosure over skylights to facilitate glazing replacement. Enclosure to maintain temperatures of minimum 10 degrees C where construction is in progress. Refer to clause 1.15 Temporary Heating And Ventilation.
- .4 Provide engineered design drawings, signed and sealed by qualified Professional Engineer licensed in the province of Ontario, for temporary shoring, scaffolds and work platforms and hoists.
- .5 Additions or modifications to scaffolding must be approved by the Professional Engineer in writing.
- .6 Proposed location for access scaffold and work platforms must not block egress/access routes, and allow sufficient space to accept delivery of material and equipment.
- .7 Scaffolds and work platforms must not interfere with daily operations of MacDonald-Cartier Data Centre or adjacent buildings.

1.12 HOISTING

- .1 Provide, operate and maintain hoists and cranes as required for moving of workers, materials and equipment.
- .2 Hoists and cranes to be operated by qualified operator.
- .3 Proposed location for hoists must not block egress/access routes, and allow sufficient space to accept delivery of material and equipment.
- .4 Hoists and cranes must not interfere with daily operations of MacDonald-Cartier Data Centre or adjacent buildings. Coordinate with Departmental Representative. Maximum height of any piece of equipment will be limited to 20 m above grade. If equipment any higher than that is required, the Departmental Representative is to be advised with minimum 72 hours advance notice. Equipment which exceeds 20m must be brightly painted and be identified with red obstruction lights. The boom must be lowered at sundown and when not in use.

1.13 TEMPORARY BARRIERS AND ENCLOSURES

- .1 Maintain existing services to building and provide for personnel and vehicle access. Access to, and operation of, adjacent loading dock area and parking structure to be unaffected by construction activities.
- .2 Hoarding:
 - .1 Provide temporary construction fencing for entire perimeter of staging/storage area and complete exterior construction zone, including scaffold access, using stack fencing system. Relocate fencing as work progresses to the approval of the Departmental Representative. Reinstate site upon removal of temporary construction fencing.
 - .2 Roadway adjacent area of work must be kept clear of debris and allow free movement of vehicles at all times.

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- .3 Dust Control:
 - .1 Provide dust tight screens or 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.
 - .3 Do not fasten into existing surfaces to remain. At completion of work remove enclosures, clean, and reinstate all surfaces to the approval of the Departmental Representative.
 - .4 Site to be kept clean at all times due to the proximity of the airport runway. Submit pollution control plan to ensure that dust, debris, materials, and trash do not become airborne and travel off-site to the adjacent airfield.
- .4 Guard Rails and Barricades:
 - .1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stairwells, and at roof perimeter.
- .5 Protection:
 - .1 Protect work against damage until take-over.
 - .2 Protect adjacent work against the spread of dust and dirt beyond the work areas.
 - .3 Protect operatives and other users of site from all hazards. All material, waste, and debris to be secured against becoming airborne at all times.
 - .4 Protect adjacent landscaping, roadways, parking areas and pathways. Reinstate and damage to existing areas (inside and outside building) caused by the work to the approval of the Departmental Representative.
- .6 Work Zone Locations and Identifications
 - .1 Be responsible and assume the role of "Constructor" as described in the Ontario Occupational Health & Safety Act and Regulations for Construction Projects.
 - .2 Install proper site separation and identification in order to maintain "Time and Space" at all times throughout the life of the project. When Building Operations staff requires access to equipment in order to operate the building, proper coordination and communication must exist between all parties involved.

1.14 COST BREAKDOWN

- .1 Before submitting first progress claim, submit breakdown of Contract Amount in detail as directed by Departmental Representative and aggregating the Contract Amount. After approval by Departmental Representative cost breakdown will be used as the basis of progress payments.
- .2 On acceptance of cost breakdown and approved construction schedule submit estimated monthly cash flow for the duration of the work.

1.15 TEMPORARY HEATING AND VENTILATION

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- .2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
 - .1 Facilitate progress and protect Work against dampness and cold.

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- .2 Prevent moisture condensation on surfaces.
- .3 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
- .4 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 Maintain temperatures of minimum 10 degrees C where construction is in progress.
- .5 Ventilating:
 - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
 - .4 Ventilate storage spaces containing hazardous or volatile materials.
 - .5 Ventilate temporary sanitary facilities.
 - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .6 Permanent heating system of building not to be used unless written permission is provided from Departmental Representative. Be responsible for damage to heating system if use is permitted. Pay costs for maintaining temporary heat when using permanent heating system.
- .7 Pay costs for maintaining temporary heat.
- .8 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.
- .9 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.16 CLEANING

- .1 Clean up as work progresses. At the end of each work period, and more often if ordered by the Departmental Representative, remove debris from site, neatly stack material for use, and clean up generally.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways. Conduct additional street cleaning to approval by Departmental Representative.
- .3 Upon completion remove temporary protection and surplus materials. Make good defects noted at this stage.
- .4 Clean areas under contract to a condition equal to what previously existed and to approval of

Departmental Representative.

1.17 PRECEDENCE

- .1 For Federal Government projects, Division 01 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

2 PRODUCTS

2.1 NOT USED

- .1 Not used.

3 EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 – GENERAL

1.1 REFERENCES

1. Federal Legislation

1. *Canada Labour Code, Part II, section 124 and 125. Canada Occupational Health and Safety Regulations, as amended*
2. *PSPC Asbestos Management Standard*
3. *Transportation of Dangerous Goods Act, 1992 (TDGA)*
4. *Canada Consumer Product Safety Act*
 1. *Surface Coating Materials Regulations SOR/2016-193.*
5. *Canadian Environmental Protection Act, 1999 (CEPA)*
 1. *PCB Regulations (SOR/2008-273)*
 2. *Federal Halocarbon Regulations, 2003 (SOR/2003-289)*

2. Provincial Legislation

1. *Ontario Occupational Health and Safety Act, R.S.O. 1990.*
 1. *Ontario Regulation 490/09 – Designated Substances (O.Reg. 490/09), as amended.*
 2. *Ontario Regulation 278/05 – Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations, (O.Reg. 278/05), as amended.*
 3. *Ontario Regulation 833 - Control of Exposure to Biological or Chemical Agents, as amended*
 4. *Ontario Regulation 213/91 for Construction Projects (O.Reg. 213/91), as amended.*
2. *Ontario Environmental Protection Act, R.R.O. 1990,*
 1. *Ontario Regulation 347/90, General – Waste Management (O.Reg. 347/90), as amended*
 2. *Ontario Regulation 463/10, Ozone Depleting Substances and Other Halocarbons (O.Reg. 463/10).*
3. *Ontario Dangerous Goods Transportation Act*
3. *Canadian General Standards Board (CGSB).*
4. *Canadian Standards Association (CSA International). CAN/CSA-Z94.4-18 - Respiratory Protection*
5. *Underwriters' Laboratories of Canada (ULC).*

1.2 DEFINITIONS

Asbestos-Containing Materials (ACMs): means material that contains 0.5 per cent or more asbestos by dry weight as per Ontario Regulation 278/05, as amended.

Friable Material: material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.

Time-weighted average exposure limit (TWael): the time-weighted average airborne concentration of a biological or chemical agent to which a worker may be exposed in a work day or work week as outlined in *Ontario Regulation 833 - Control of Exposure to Biological or Chemical Agents, as amended*.

1.3 DESIGNATED SUBSTANCES

Confirm with the Departmental Representative that no additional designated substances have been brought to the project area prior to beginning work.

Additional designated substances and hazardous materials may exist outside the accessible survey area but are beyond the scope of this project.

Should any additional material, suspected to be a designated substance, be encountered within the project area, any disturbance of such material must be stopped, precautionary measures taken, and the Departmental Representative must be notified immediately. Do not proceed until written instructions have been received.

1. ACRYLONITRILE: Not Identified
2. ARSENIC: Not Identified
3. ASBESTOS: Not Identified

Based on the analytical bulk sample results listed above and results from historical assessments, the following building materials do not contain regulated amounts of asbestos:

- Chalky white caulking sampled from the perimeter handrails and electrical plugs along the perimeter wall;
- Black remnant tar sampled from the rooftop air vent units;
- Thick rigid white caulking sampled from exhaust fan #3;
- Black caulking sampled from the lower windows of the skylight;
- Off-White caulking sampled from the upper windows of the skylight;
- Grey caulking patch job sampled from the lower windows of the skylight;
- Gummy white caulking sampled from the underside of the perimeter railing;
- Thick off-white caulking sampled from the metal stilts holding up the shed that houses the conduit units;
- Rigid black caulking sampled from the conduit cooler units;
- Hard cementitious patches sampled from the conduit coolers and observed as debris on the ground below the coolers;
- Clear silicone caulking observed on multiple rooftop units; and

- Roofing layers sampled at three (3) locations across the rooftop.
4. BENZENE: Not identified
 5. COKE OVEN EMISSIONS: Not identified
 6. ETHYLENE OXIDE: Not Identified
 7. ISOCYANATES: Not Identified
 8. LEAD: **Identified**

Based on the analytical results, the following paints contain concentrations of lead greater than the Federal Canada Consumer Product Safety Act's limit of 90 ppm:

- Light grey paint on the rooftop vent units observed throughout the rooftop contains 376 ppm lead.

Based on the analytical results, the following materials contain concentrations of lead less than the Federal Canada Consumer Product Safety Act's limit of 90 ppm:

- Yellow paint on railing within the conduit unit shed contains 27 ppm lead; and
- Light grey paint sampled from the conduit cooler units contains <20 ppm lead.

Lead is also assumed to be present in the following materials:

- Grey paint applied to the perimeter handrail and metal sheeting; and
- Red paint applied to the beams associated with the skylight. This material was inaccessible due to height restrictions.

9. MERCURY: Not Identified

10. SILICA: **Identified**

Free crystalline silica is assumed to be present in the following materials:

- Cementitious parging materials, and
- Roofing Layers.

11. VINYL CHLORIDE MONOMER: Not Identified

12. POLYCHLORINATED BIPHENYLS (PCBs): Not Identified

13. MOULD: Not Identified

14. HALOCARBONS: **Identified**

In general, halocarbons are assumed to be present in:

- Rooftop air conditioning unit.

15. OTHER HAZARDOUS MATERIALS: Not Identified

1.4 RECOMMENDATIONS

1. LEAD

1. Follow recommendations provided in the Ontario Ministry of Labour (MoL) Guideline entitled "Guideline: Lead on Construction Projects". This guideline classifies all lead disturbances as Type 1, Type 2a, Type 2b, Type 3a or Type 3b work, and assigns different levels of respiratory protection and work procedures for each classification.
2. Work procedures and personal protective equipment must be used to ensure that workers are not exposed to airborne lead levels that exceed the TWAEEL of 0.05 milligram per cubic metre (mg/m^3) prescribed by O.Reg. 490/09, as amended, and O.Reg. 833, as amended.
3. The use of mechanically-powered tools or torches on lead-containing materials increases the concentration of airborne lead dust or fumes requiring more stringent respiratory protection and controlled work procedures.
4. Even at low concentrations, there may be a potential for exposure to high concentrations of lead depending on the activities performed that disturb the lead-containing materials (e.g. by aggressive means such as sandblasting, grinding, etc.). At low lead concentrations, a risk assessment should be completed to assess the potential for exposure to airborne lead, in order to determine the need to follow precautionary measures.
5. Disposal of construction waste containing lead must be done in accordance with O.Reg. 347/90 – General Waste Management, as amended, under the Ontario Environmental Protection Act, the Ontario Dangerous Goods Transportation Act, and the federal Transportation of Dangerous Goods Act. The classification of the waste is dependent upon the result(s) of leachate test(s). The waste can be classified as "hazardous, "non-hazardous" or "registerable solid waste" depending on the results of the leachate test.

2. SILICA

1. Comply with Ontario Regulations O.Reg. 490/09 when performing works that may disturb silica-containing materials. The regulation provides requirements for allowable exposure levels.
2. Silica dust can be generated through such processes as blasting, grinding, crushing, and sandblasting silica-containing material. Since silica is present in select materials within the project area, appropriate respiratory protection and ventilation must be donned during the demolition and modifications of these structures.
3. Follow recommendations provided in the MoL Guideline entitled "Guideline: Silica on Construction Projects". This document classifies all silica disturbances as Type 1, Type 2 or Type 3 work, and assigns different levels of respiratory protection and work procedures for each classification. These work procedures should be followed when performing work involving the disturbance of silica-containing materials.

3. HALOCARBONS

1. The handling, transport and disposal of halocarbons is governed by the following:
 - Federal Halocarbon Regulations (FHR), 2003,
 - Ozone-depleting Substances and Halocarbon Alternatives Regulations, 2016,
 - Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems, 2015, and
 - Provincial Transport of Dangerous Substances Regulation and Federal Transport of Dangerous Goods Act.
2. When suspected halocarbon-containing equipment is taken out of service, the halocarbons must be captured and reclaimed by a certified service technician using methods and containers that are designed to contain the halocarbon. The service technician must provide written acknowledgement of the requirements of the FHR. Appropriate records of service technician certification and records of equipment decommissioning must be provided and maintained in accordance with requirements of the FHR.

END OF SECTION

HEALTH AND SAFETY REQUIREMENTS**1 GENERAL****1.1 REFERENCE STANDARDS**

- .1 Province of Ontario
 - .1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990, c.O.1, as amended and O. Reg. 213/91 as amended - Updated 2016
- .2 Canadian Standards Association International (CSA)
 - .1 CSA Z462-15, Workplace Electrical Safety.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 00 10 General Instructions.
- .2 Submit site-specific Health and Safety Plan: Within 7 days prior to commencement of Work. Health and Safety Plan must include but not limited to:
 - .1 Results of site-specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan, including confined space hazard assessment.
 - .3 Other as requested by Health and Safety.
- .3 Submit one copy of Constructor's authorized representative's work site health and safety inspection reports to Departmental Representative and authority having jurisdiction (MOL).
- .4 Submit copies of reports or directions issued by Federal, Provincial health and safety inspectors.
- .5 The Constructor shall immediately advise the Departmental Representative of any visit to the site by Federal and Provincial authorities, or health and safety inspectors, and submit copies of reported or directions issued by such authorities within 24 hours after the visit to the Departmental Representative.
 - .1 The Constructor shall immediately advise the Departmental Representative of any incident, accident injury, near-miss, fire, explosion or chemical spill occurring at the work site, and submit copies of incident and accident reports within 24 hours after the event to the Departmental Representative.
- .6 Submit WHMIS / WHMIS 2015 MSDS / SDS - Material Safety Data Sheets and safety data sheet.
- .7 Departmental Representative will review Constructor's site-specific Health and Safety Plan and provide comments to Constructor within 7 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 3 days after receipt of comments from Departmental Representative.
- .8 Departmental Representative's review of Constructor's final Health and Safety plan should not be construed as approval and does not reduce the Constructor's overall responsibility for construction Health and Safety.
- .9 Departmental Representative will provide details of on-site Contingency and Emergency

HEALTH AND SAFETY REQUIREMENTS

Response Plan. Address all standard operating procedures to be implemented during emergency situations as approved by Departmental Representative.

- .10 Constructor to follow appropriate health and safety protocols for all work within areas that are designated as a Confined Space. Submit site specific work plan for review by Departmental Representative.

1.3 FILING OF NOTICE

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

1.4 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard and risk assessment specific to this project and update for duration of project as new work tasks are implemented.

1.5 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 specific hazards, risks, and mitigation measures.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and must request re-submission with correction of deficiencies or concerns.

1.6 RESPONSIBILITY

- .1 Contractor will be responsible and assume the role Constructor as described in the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
- .3 Appoint a supervisor who is an employee of the Constructor to be present and available at all times for the duration of the project.

1.7 COMPLIANCE REQUIREMENTS

- .1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990, c. 0.1 and Ontario Regulations for Construction Projects, O. Reg. 213/91.

1.8 UNFORESEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province of Ontario having jurisdiction and advise Departmental Representative verbally and in writing.

HEALTH AND SAFETY REQUIREMENTS**1.9 HEALTH AND SAFETY CO-ORDINATOR**

- .1 Employ the Site Supervisor as the 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 work.
 - .2 Have working knowledge of occupational safety and health regulations.
 - .3 Be responsible for completing Constructor'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 Constructor's Health and Safety Plan.
 - .5 Be on site during execution of Work.

1.10 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 Ontario having jurisdiction, and in consultation with Departmental Representative.

1.11 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.

1.12 POWDER ACTUATED DEVICES

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

1.13 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 to Health 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 may also stop Work for health and safety considerations.

2 PRODUCTS**2.1 NOT USED**

- .1 Not used.

3 EXECUTION

HEALTH AND SAFETY REQUIREMENTS

3.1 NOT USED

.1 Not used.

END OF SECTION

1 GENERAL

1.1 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative, unless indicated otherwise.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and reinspection.

1.2 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.

1.3 PROCEDURES

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

1.4 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 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 it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

1.5 REPORTS

QUALITY CONTROL

- .1 Submit electronic copy of inspection and test reports to Departmental Representative.
- .2 Provide copy to subcontractor of work being inspected or tested, or manufacturer or fabricator of material being inspected or tested.

1.6 TESTS AND MIX DESIGNS

- .1 Furnish test results and mix designs as requested.

1.7 MOCK-UPS

- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.
- .2 Construct in locations acceptable to Departmental Representative and as specified in specific Section.
- .3 Prepare mock-ups for Departmental Representative review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

1.8 MILL TESTS

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

1.9 EQUIPMENT AND SYSTEMS

- .1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.
- .2 Refer to appropriate specification sections for definitive requirements.

2 PRODUCTS**2.1 NOT USED**

- .1 Not Used.

3 EXECUTION**3.1 NOT USED**

- .1 Not Used.

END OF SECTION

COMMON PRODUCT REQUIREMENTS**1 GENERAL****1.1 REFERENCE STANDARDS**

- .1 Within text of each specifications section, reference may be made to reference standards.
- .2 Conform to these reference standards, in whole or in part as specifically requested in specifications.

1.2 QUALITY

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 Acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
- .3 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .4 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.3 STORAGE, HANDLING AND PROTECTION

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials, lumber and moisture sensitive materials 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.
- .9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

COMMON PRODUCT REQUIREMENTS**1.4 TRANSPORTATION**

- .1 Pay costs of transportation of products required in performance of Work.
- .2 Unload, handle and store products supplied by Departmental Representative.

1.5 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 in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.

1.6 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 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 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, whose decision is final.

1.7 CO-ORDINATION

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

1.8 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 if there is interference. Install as directed by Departmental Representative.

1.9 REMEDIAL WORK

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

1.10 LOCATION OF FIXTURES

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

COMMON PRODUCT REQUIREMENTS

- .2 Inform Departmental Representative of conflicting installation. Install as directed.

1.11 FASTENINGS

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

1.12 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.

1.13 PROTECTION OF WORK IN PROGRESS

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

1.14 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, to occupants of adjacent buildings and to pedestrian and vehicular traffic.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

2 PRODUCTS**2.1 NOT USED**

- .1 Not Used.

COMMON PRODUCT REQUIREMENTS

3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.1 WASTE MANAGEMENT GOALS

- .1 Departmental Representative's waste management goal: to divert a minimum 85 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. 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.
- .2 Protect environment and prevent environmental pollution damage.

1.2 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.

WASTE MANAGEMENT AND DISPOSAL

- .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.

1.3 DOCUMENTS

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

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 00 10 – General Instructions.
- .2 Waste management to be carried as a line item in the Cost Breakdown, and to be billed against as work progresses. Detailed submittals will be required as back-up.
- .3 Prepare and submit following prior to project start-up:
 - .1 1 electronic copy of completed Waste Audit (WA)
 - .2 1 electronic copy of completed Waste Reduction Workplan (WRW)
 - .3 1 electronic copy of Cost/Revenue Analysis Workplan (CRAW)
 - .4 1 electronic copy of Waste Source Separation Program (WSSP).
- .4 Submit prior to final payment the following:
 - .1 Waste Diversion Report, indicating final quantities in tones 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.
 - .2 Provide receipts, scale tickets, waybills, waste disposal receipts that confirm quantities and types of materials reused, recycled or disposed of and destination.

1.5 WASTE AUDIT (WA)

WASTE MANAGEMENT AND DISPOSAL

- .1 Contractor to prepare WA 20 working days after contract award.
- .2 WA provides detailed inventory, estimated quantities and types of waste materials that will be generated as well as their potential to be reused and/or recycled and project's waste diversion goals and objectives.
- .3 After award of contract, contractor to review WA and confirm that anticipated quantities of waste generated are accurate and goals achievable.
- .4 If after review, contractor determines that indicated quantities or opportunities in WA are not accurate or achievable, contractor to provide written details of discrepancies and revised quantities for areas of concern. Contractor to meet with Departmental Representative to review and justify revisions.
- .5 Post on-site WA where contractor and sub-contractors are able to review content.

1.6 WASTE REDUCTION WORKPLAN (WRW)

- .1 Prepare and submit WRW 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.
 - .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.

1.7 COST/REVENUE ANALYSIS WORKPLAN (CRAW)

- .1 Prepare CRAW and include the following:

WASTE MANAGEMENT AND DISPOSAL

- .1 Cost of current waste management practices.
- .2 Implementation cost of waste diversion program.
- .3 Savings and benefits resulting from waste diversion program.

1.8 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 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 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.

1.9 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.

1.10 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.

1.11 QUALITY ASSURANCE

- .1 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.

1.12 STORAGE, HANDLING AND PROTECTION

- .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 Protect, stockpile, store and catalogue salvaged items.
- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .5 Protect structural components not removed and salvaged materials from movement or damage.
- .6 Support affected structures. If safety of building is endangered, cease operations and immediately notify Departmental Representative.
- .7 Protect surface drainage, mechanical and electrical from damage and blockage.
- .8 Provide on-site facilities and containers for collection and storage of reusable and recyclable materials.
- .9 Separate and store materials produced during project in designated areas.
- .10 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.

1.13 DISPOSAL OF WASTES

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

1.14 SCHEDULING

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

2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

3 EXECUTION

3.1 APPLICATION

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

3.2 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 00 10 – General Instructions.
 - .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 00 10 – General Instructions.
- .3 Waste Management: separate waste materials for reuse and recycling.
 - .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.

3.3 DIVERSION OF MATERIALS

- .1 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 materials is not permitted.

3.4 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.

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3.5 WASTE AUDIT (WA)

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

3.6 WASTE REDUCTION WORKPLAN (WRW)

.1	Schedule B	(1)	(2)	(3)	(4)	(5)	(6)
		Material Category	Person(s) Responsible	Total Quantity of Waste	Actual Reused Amount (units) Projected	Actual Recycled Amount (units) Projected	Material Destination
		Wood and Plastics					
		Off-cuts					
		Warped					
		Pallet					
		Forms					
		Plastic Packaging					
		Cardboard					
		Packaging					
		Other					

WASTE MANAGEMENT AND DISPOSAL3.7 COST/REVENUE ANALYSIS WORKPLAN (CRAW)

.1

Schedule E - Cost/Revenue Analysis Workplan (CRAW)						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Material Description	Total Quantity (unit)	Volume (cum)	Weight (cum)	Disposal Cost/Credit <u>\$(+/-)</u>	Category Sub-Total <u>\$(+/-)</u>	Cost \$(-) / Revenue \$(+)
Wood Stud						
Plywood						
Glass						
Other						

3.8 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT

.1	Schedule G - Government Chief Responsibility for the Environment:			
	Province	Address	General Inquires	Fax
	Ontario Ministry of	135 St. Clair Avenue	416-323-4321	416-323-4682
	Environment and Energy	West	800-565-4923	
		Toronto ON M4V 1P5		
	Environment Canada	Toronto ON	416-734-4494	

END OF SECTION

CLOSEOUT SUBMITTALS**1 GENERAL****1.1 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 00 10 – General Instructions.
- .2 Two (2) weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, two (2) draft copies of operating and maintenance manuals in English.
- .3 Make revisions to operating and maintenance manuals as per comments provided by Departmental Representative. Submit 4 final copies of operating and maintenance manuals in English and French, and one electronic copy each in English and in French.
- .4 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
- .5 Provide evidence, if requested, for type, source and quality of products supplied.

1.2 FORMAT

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings.
 - .1 Identify contents of each binder on spine.
- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by systems, under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab.
 - .1 Bind in with text; fold larger drawings to size of text pages.

1.3 CONTENTS - PROJECT RECORD DOCUMENTS

- .1 Table of Contents for Each Volume: provide title of project;
 - .1 Date of submission; names.
 - .2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
 - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:

CLOSEOUT SUBMITTALS

- .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data.
 - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.
- .6 Training: refer to appropriate Specification Sections.

1.4 AS -BUILT DOCUMENTS AND SAMPLES

- .1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction.
 - .1 Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.

1.5 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .2 Record information concurrently with construction progress.
 - .1 Do not conceal Work until required information is recorded.
- .3 Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - .1 Measured depths of elements of foundation in relation to finish first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

CLOSEOUT SUBMITTALS

- .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
- .4 Field changes of dimension and detail.
- .5 Changes made by change orders.
- .6 Details not on original Contract Drawings.
- .7 Referenced Standards to related shop drawings and modifications.
- .4 Specifications: mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .5 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, and other documentation required by individual specifications sections.
- .6 Provide digital photos, if requested, for site records.

1.6 EQUIPMENT AND SYSTEMS

- .1 For each item of equipment and each system include description of unit or system, and component parts.
 - .1 Give function, normal operation characteristics and limiting conditions.
 - .2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
- .3 Include installed colour coded wiring diagrams.
- .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.
 - .1 Include regulation, control, stopping, shut-down, and emergency instructions.
 - .2 Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .6 Provide servicing and lubrication schedule, and list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.
- .8 Include sequence of operation by controls manufacturer.
- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .10 Provide installed control diagrams by controls manufacturer.
- .11 Provide Contractor's co-ordination drawings, with installed colour coded piping diagrams.

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- .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .14 Include test and balancing reports as specified in Section 01 45 00 - Quality Control.
- .15 Additional requirements: as specified in individual specification sections.

1.7 MATERIALS AND FINISHES

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

1.8 MAINTENANCE MATERIALS

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

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- .1 Submit inventory listing to Departmental Representative.
- .2 Include approved listings in Maintenance Manual.

1.9 DELIVERY, STORAGE AND HANDLING

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

1.10 WARRANTIES

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Departmental Representative approval.
- .3 Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.
- .4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
- .5 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
 - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
 - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
 - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
 - .4 Verify that documents are in proper form, contain full information, and are notarized.
 - .5 Co-execute submittals when required.
 - .6 Retain warranties and bonds until time specified for submittal.
- .6 Include information contained in warranty management plan as follows:
 - .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.
 - .2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and commissioned systems such as fire protection, alarm systems, sprinkler systems, and lightning protection systems.
 - .3 Provide list for each warranted equipment, item, feature of construction or system indicating:
 - .1 Name of item.

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- .2 Model and serial numbers.
 - .3 Location where installed.
 - .4 Name and phone numbers of manufacturers or suppliers.
 - .5 Names, addresses and telephone numbers of sources of spare parts.
 - .6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
 - .7 Cross-reference to warranty certificates as applicable.
 - .8 Starting point and duration of warranty period.
 - .9 Summary of maintenance procedures required to continue warranty in force.
 - .10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
 - .11 Organization, names and phone numbers of persons to call for warranty service.
 - .12 Typical response time and repair time expected for various warranted equipment.
 - .4 Procedure and status of tagging of equipment covered by extended warranties.
 - .5 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.
- .7 Respond in timely manner to oral or written notification of required construction warranty repair work.

1.11 WARRANTY TAGS

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

2 PRODUCTS**2.1 NOT USED**

- .1 Not Used.

3 EXECUTION**3.1 NOT USED**

- .1 Not Used.

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END OF SECTION