

STRUCTURE DEMOLITION**1 GENERAL****1.01 REFERENCES**

- .1 Definitions:
 - .1 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, include but not limited to: poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or materials that endanger human health or environment if handled improperly.
- .2 Reference Standards:
 - .1 CSA International
 - .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures
- .3 Canadian Environmental Protection Act (CEPA), 1999, c. 33
 - .1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations
 - .2 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations
- .4 U.S. Environmental Protection Agency (EPA)
 - .1 EPA CFR 86.098-10, Emission standards for 1998 and later model year Otto-cycle heavy-duty engines and vehicles
 - .2 EPA CFR 86.098-11, Emission standards for 1998 and later model year diesel heavy-duty engines and vehicles

1.02 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Submit for review and approval demolition drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning.
 - .2 Submit demolition drawings stamped and signed by professional engineer registered or licensed in the province of Ontario, Canada.
 - .3 Construction Waste Management:
 - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 80% of construction wastes were diverted from landfill.

STRUCTURE DEMOLITION**1.03 QUALITY ASSURANCE**

- .1 Regulatory Requirements: Ensure Work is performed in compliance with CEPA, and applicable Provincial/Territorial and Municipal regulations.

1.04 SITE CONDITIONS

- .1 Environmental protection:
 - .1 Ensure Work is done in accordance with Section 01 35 43 - Environmental Procedures.
 - .2 Ensure Work does not adversely affect adjacent groundwater and wildlife, or contribute to excess air and noise pollution.
 - .3 Fires and burning of waste or materials is not permitted on site.
 - .4 Do not dispose of waste or volatile materials including but not limited to: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into storm or sanitary sewers.
 - .1 Ensure proper disposal procedures are maintained throughout project.
 - .5 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.
 - .6 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with authorities having jurisdiction as directed by Departmental Representative.
 - .7 Protect trees, plants and foliage on site and adjacent properties where indicated.
 - .8 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.
 - .9 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.

1.05 EXISTING CONDITIONS

- .1 If material resembling spray or trowel applied asbestos or other designated substance listed as hazardous be encountered in course of demolition, stop work, take preventative measures, and notify the Departmental Representative immediately. Proceed only after receipt of written instructions have been received from Departmental Representative.
- .2 Structures to be demolished are based on their condition at time of examination prior to tendering.
 - .1 Remove, protect and store salvaged items as directed by Departmental Representative. Salvage items as identified by Departmental Representative. Deliver to Departmental Representative as directed.

2 PRODUCTS**2.01 EQUIPMENT**

- .1 Equipment and heavy machinery:
 - .1 On-road vehicles to: CEPA-SOR/2003-2, On-Road Vehicle and Engine Emission Regulations and CEPA-SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.

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- .2 Off-road vehicles to: EPA CFR 86.098-10 and EPA CFR 86.098-11.
- .2 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

3 EXECUTION**3.01 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 and walkways, 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.
- .2 Protection of in-place conditions:
 - .1 Work in accordance with Section 01 35 43 - Environmental Procedures.
 - .2 Prevent movement, settlement or damage of adjacent structures, services, walks, paving, trees, landscaping, adjacent grades properties.
 - .1 Provide bracing, shoring and underpinning as required.
 - .2 Repair damage caused by demolition as directed by Departmental Representative.
 - .3 Support affected structures and, if safety of structure being demolished or adjacent structures or services appears to be endangered, take preventative measures, stop Work and immediately notify Departmental Representative
 - .4 Prevent debris from blocking surface drainage system, and electrical systems which must remain in operation.
- .3 Surface Preparation:
 - .1 Refer to Mechanical and Electrical drawings for disconnections.

3.02 DEMOLITION

- .1 Blasting operations are not permitted during demolition.
- .2 Remove contaminated or dangerous materials as 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 Prior to start of Work remove contaminated or hazardous materials as directed by Departmental Representative from site and dispose of in safe manner. Refer Existing Conditions in PART 1.
- .4 Demolish entire structure down to top of pile caps and demolish tunnel up to cut off point shown on drawings.

STRUCTURE DEMOLITION

- .5 Crush concrete generated due to demolition to size suitable for recycling as directed.
- .6 Do not backfill basement areas until inspected by Departmental Representative
- .7 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace as work progresses.
- .8 At end of each day's work, leave Work in safe and stable condition.
 - .1 Protect interiors of parts not to be demolished from exterior elements at all times.
- .9 Demolish to minimize dusting. Keep materials wetted as directed by Departmental Representative.
- .10 Demolish masonry and concrete walls in pieces suitable for reuse as specified.
- .11 Remove structural framing.
- .12 Contain fibrous materials to minimize release of airborne fibres while being transported within facility.
- .13 Only dispose of material specified by selected alternative disposal option as directed by Departmental Representative.
- .14 Remove and dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction.
- .15 Use natural lighting to do Work where possible.
 - .1 Shut off lighting except those required for security purposes at end of each day.

3.03 CLEANING

- .1 Develop Construction Waste Management Plan Waste Reduction Workplan related to Work of this Section and in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
- .3 Designate appropriate security resources / measures to prevent vandalism, damage and theft.
- .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.
 - .1 Label stockpiles, indicating material type and quantity.
- .5 Remove stockpiled material as directed by Departmental Representative, when it interferes with operations of project construction.

STRUCTURE DEMOLITION

- .6 Remove stockpiles of like materials by alternate disposal option once collection of materials is complete.
- .7 Transport material designated for alternate disposal using approved haulers listed in Waste Reduction Workplan and in accordance with applicable regulations.
- .8 Dispose of materials not designated for alternate disposal in accordance with applicable regulations.
 - .1 Disposal facilities must be those approved of and listed in Waste Reduction Workplan.
 - .2 Written authorization from Departmental Representative is required to deviate from disposal facilities listed in Waste Reduction Workplan.

END OF SECTION

Part 1 General**1.1 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prior to beginning of Work on site, submit detailed Waste Reduction Workplan in accordance with Section 01 74 21 - Construction / Demolition Waste Management.
- .3 Submit pre-demolition audit and deconstruction / disassembly plan prior to starting work.
- .4 Before proceeding with demolition of load bearing walls or other walls and where required by authority having jurisdiction, submit for review by Departmental Representative shoring and underpinning drawings prepared by Qualified Professional Engineer registered or licensed in the Province of Ontario, showing proposed method.

1.2 QUALITY ASSURANCE

- .1 Ensure Work is performed in compliance with CSA S350 and applicable provincial regulations.
- .2 Prior to start of Work arrange for site visit with Departmental Representative to examine existing site conditions adjacent to demolition work.
- .3 Meetings:
 - .1 Hold project meetings every week.
 - .2 Ensure key personnel including site supervisor, project manager, subcontractor representatives and WMC attend.
 - .3 WMC must provide written report on status of waste diversion activity at each meeting.
- .4 Departmental Representative will provide written notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Prior to beginning any On-Site work, submit detailed Waste Reduction Workplan in accordance with Section 01 74 21 - Construction / Demolition Waste Management. Indicate:
 - .1 Descriptions of and anticipated quantities in percentages of materials to be salvaged reused, recycled and landfilled.
 - .2 Schedule of selective demolition.
 - .3 Number and location of dumpsters.
 - .4 Anticipated frequency of tipping.
 - .5 Name and address of haulers, waste facilities and waste receiving organizations.
- .2 The Waste Management Co-ordinator is responsible for fulfilment of reporting requirements.
- .3 Submit pre-demolition audit and deconstruction / disassembly plan prior to starting work.
- .4 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction / Demolition Waste Management.

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- .5 Divert excess materials from landfill to site approved by Departmental Representative.

1.4 EXISTING CONDITIONS

- .1 Review "Designated Substance Report" and take precautions to protect environment.
- .2 Should materials resembling spray or trowel applied asbestos, PCB's, Mould or other designated substance listed as hazardous be encountered in course of deconstruction, stop work, take preventative measures, and notify Departmental Representative immediately. Do not proceed until written instructions have been received. Refer to Section 01 35 29.06 - Health and Safety Requirements.
- .3 Structures to be demolished to be based on their condition at time of examination prior to tendering.
- .4 Remove, protect and store salvaged items as directed by Departmental Representative. Salvage items as identified by Departmental Representative. Deliver to Departmental Representative as directed.

Part 2 Products**2.1 EQUIPMENT**

- .1 Demonstrate that tools are being used in manner which allows for salvage of materials in best condition possible.

Part 3 Execution**3.1 PREPARATION**

- .1 Do Work in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .2 Inspect building with Departmental Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .3 Investigate site and structure to determine dismantling, processing and storage logistics required prior to beginning of Work.
- .4 Develop strategy for deconstruction to facilitate optimum salvage of reusable and recyclable materials.
- .5 Obtain necessary permits and approvals. Provide copies to Departmental Representative prior to start of Work on site and within 24 hours of written request.
- .6 Post signs in visible locations and appropriate languages which indicates to workers, subcontractors, haulers, the location of processing and stockpiling of each material, bin location and use e.g. ("CLEAN WOOD ONLY").
- .7 Locate and protect utilities inside and outside the building. Do not disrupt active or energized utilities traversing premises or designated to remain undisturbed. Notify and obtain approval of utility companies before starting demolition.
- .8 Disconnect and re-route all electrical, telephone and communication service lines passing through area to be deconstructed. Post warning signs on electrical lines and equipment which must remain energized to serve other products during period of demolition.

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- .9 Disconnect, cap, plug or divert, as required, existing utilities within the building 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.
- .10 Immediately notify Departmental Representative in case of damage to any utility or service, designated to remain in place.
- .11 Immediately notify the Departmental Representative should uncharted utility or service be encountered, and await instruction in writing regarding remedial action.
- .12 Ensure that demolition activities involve deconstruction and disassembly of component parts and assemblies as opposed to in-situ destruction.
- .13 Ensure that material and assemblies are transferred from heights to floor level using appropriately sized lifts.
- .14 Ensure that material that can be disassembled off site is removed to prevent on site noise production.
- .15 Ensure that all pneumatic tools are fitted with effective exhaust port silencers.

3.2 PROTECTION

- .1 Prevent movement, settlement or damage of adjacent structures, services, walks, paving, landscaping and adjacent grades and parts of building to remain. Provide bracing shoring and underpinning as required. Repair damage caused by deconstruction as directed by Departmental Representative.
- .2 Support affected structures and, if safety of structure being deconstructed or adjacent structures or services appears to be endangered, take preventative measures. Cease operations and immediately notify Departmental Representative.
- .3 Keep noise, dust, and inconvenience to occupant of adjacent buildings to minimum. See acoustic control/mitigation requirements in the Preparation section of this spec section.
- .4 Add wetting to prevent dust migration.
- .5 Provide temporary construction dust screens, covers, railings, supports and other protection as required.

3.3 DISASSEMBLY

- .1 Materials removed from designated structures are property of Contractor.
- .2 Throughout course of deconstruction pay close attention to connections and material assemblies. Employ workmanship procedures which minimize damage to materials and equipment.
- .3 Ensure workers and subcontractors are trained to carry out work in accordance with appropriate deconstruction techniques.
- .4 Deconstruct in accordance with CSA S350 and other applicable safety standards.
- .5 Workers must utilize adequate fall protection including certified harness and belay systems as required by applicable Health & Safety regulations.

DEMOLITION FOR MINOR WORKS**3.4 DEMOLITION**

- .1 Refer to Section 01 00 10 - General Instruction, Scheduling, for day and time of day restrictions on noise producing work. Demolition noise is to be minimized as to lessen the impact on surrounding residential and professional buildings.
- .2 At end of each work shift, leave Work in safe and stable condition.
- .3 Demolish to minimize dusting. Keep materials wetted as directed by Departmental Representative.
- .4 Maintain structural integrity of structure at all times while interior demolitions are taking place. Provide temporary bracing as required.
- .5 Contain fibrous materials (e.g. Insulation) to minimize release of airborne fibres while being transported within building.
- .6 Use natural lighting to do Work where possible. At the end of each work day, turn off all lights except those necessary for security purposes.
- .7 Systematically remove finishes, furnishings, and mechanical and electrical equipment as indicated and as instructed by Departmental Representative.
- .8 Contractor is to provide in depth written description of demolition phasing to Departmental Representative for approval prior to commencing work. Refer to 01 00 10 – General Instructions for general demolition phasing requirements.

3.5 PROCESSING

- .1 Refer also to Section 01 74 21 - Construction / Demolition Waste Management for other processing requirements.
- .2 Designate location for processing of materials which eliminates double handling and provides adequate space to maintain efficient material flow.
- .3 Separate, materials to ensure best possible condition of salvaged materials.
- .4 Keep processing area clean and free of excess debris.
- .5 Supply separate, marked disposal bins for categories of waste material.
- .6 Separate processed materials into organized piles for stockpiling. Provide collection area for materials processed or designated for alternate disposal. Pile materials on pallets to facilitate transport off-site or to storage areas.

3.6 STOCKPILING

- .1 Refer to Section 01 74 21 - Construction / Demolition Waste Management for other processing requirements.
- .2 Label stockpiles, indicating material type and quantity.
- .3 Designate appropriate security resources/measures to prevent vandalism, damage and theft.
- .4 Locate stockpiled materials convenient for use in new construction. Eliminate double handling wherever possible.
- .5 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.

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- .6 Separate from general waste stream each of following materials. Stockpile materials in neat and orderly fashion in location and as directed by Departmental Representative for alternate disposal. Stockpile materials in accordance with applicable fire and safety regulations.
 - .1 Glass fibre ceiling tiles.
 - .2 Wood fibre ceiling tiles.
 - .3 Metal ceiling tiles.
 - .4 Power source poles deemed unfit for reuse by Departmental Representative.
 - .5 Wiring and conduit.
 - .6 Outlets/switches.
 - .7 Floor receptacles.
 - .8 Metal duct work, baffles, HVAC equipment.
 - .9 Demountable partitions.
 - .10 Drapes.
 - .11 Tracks and blinds.
 - .12 Insulation batts.
 - .13 Miscellaneous metals.
 - .14 Gypsum board.
 - .15 Ceramic tile.
 - .16 Clay tile.
 - .17 Carpet.
 - .18 Brick Veneer
 - .19 Concrete block

3.7 REMOVAL FROM SITE

- .1 At end of each work shift, remove all processed materials. No storage of salvaged materials on site is permitted. Remove stockpiled material from site as directed by Departmental Representative when it interferes with operations of project construction. Remove stockpiles of like materials by alternate disposal option once collection of materials is complete.
- .2 Transport material designated for alternate disposal to approved facilities, or receiving organizations listed in waste reduction workplan and in accordance with applicable regulations. Do not deviate from facilities or receiving organizations listed in waste reduction workplan without prior written authorization from Departmental Representative.
- .3 Dispose of materials not designated for alternate disposal in accordance with applicable regulations. Disposal facilities must be approved of and listed in waste reduction workplan. Do not deviate from disposal facilities listed in waste reduction workplan without prior written authorization from Departmental Representative.
- .4 Provide written submittals throughout construction documenting waste management removals and overall summaries at the end of construction as required in Section 01 74 21 - Construction / Demolition Waste Management.

3.8 CLEANING AND RESTORATION

- .1 Keep site clean and organized throughout deconstruction.

DEMOLITION FOR MINOR WORKS

- .2 Upon completion of project, remove debris, trim surfaces and leave work site clean.
- .3 Upon completion of project, reinstate areas, landscaping, parking surfaces, walkways, light standards, affected by Work to condition which existed prior to beginning of Work and to same condition of adjacent, undisturbed areas.

END OF SECTION