

**Part 1            General**

**1.1                REFERENCE STANDARDS**

- .1    ASTM International (ASTM)
  - .1        ASTM F3125 / F3125M Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.
- .2    CSA Group (CSA)
  - .1        CSA B111, Wire Nails, Spikes and Staples.
  - .2        CSA-G40.20 /G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .3        CAN/CSA O86, Engineering Design in Wood.
  - .4        CAN/CSA O121, Douglas Fir Plywood.
  - .5        CSA O151, Canadian Softwood Plywood.
  - .6        CSA O153, Poplar Plywood.
  - .7        CSA-S16, Design of Steel Structures.
  - .8        CAN/CSA S136, PACKAGE Consists of S136-12 – North America Specification for the Design of Cold Formed Steel Structural Members and S136.1-12 - Commentary on North American specification for the design of cold-formed steel structural members.
  - .9        CSA W59, Welded Steel Construction (Metal Arc Welding).
- .3    Forest Stewardship Council (FSC)
  - .1        FSC-STD-01-001 FSC Principles and Criteria for Forest Stewardship.
  - .2        FSC-STD-60-002 Structure and Content of Forest Stewardship Standards.
  - .3        FSC-STD-40-004 Chain of Custody Certification.
- .4    National Lumber Grading Authority (NLGA)
  - .1        NLGA Standard Grading Rules for Canadian Lumber 2014.

**1.2                DEFINITIONS**

- .1    Bracing: temporary support installed in an excavation or a structure to stabilize against deformations or failure. (Resisting lateral loads)
- .2    Shoring: temporary support installed in an excavation or a structure to relieve loads.
- .3    Poling board: a timber plank driven into soft soil, or held in place by waling planks and struts, to support the sides of an excavation
- .4    Soldier pile: a vertical member which takes the side thrust from horizontal sheeting and which is supported by struts across an excavation. A vertical member used to prevent the movement of formwork; is held in place by struts, bolts, or wires.

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.
- .2 Provide shop drawings: in accordance with Section 01 33 00- Submittal Procedures.
  - .1 Provide drawings stamped and signed by professional engineer registered or licensed in Saskatchewan, Canada.
  - .2 Shop drawings to indicate shop and erection details in accordance with performance criteria in 2.2.
  - .3 Provide shoring, bracing and temporary framing drawings signed by professional engineer registered or licensed in Province of Saskatchewan.

### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Packing, shipping, handling and unloading:
  - .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00- Common Product Requirements.
- .2 Packaging Waste Management:
  - .1 Separate products and systems in accordance with Section 01 74 19 - Waste Management and Disposal to the maximum extent economically possible.
  - .2 Separate corrugated cardboard in accordance with the Waste Management Plan and place in designated areas for recycling.
  - .3 Do not burn scrap at the project site.
  - .4 Fold up metal banding, flatten, and place in designated area for recycling

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Structural wood members: parallel strand lumber (PSL) grade No. 3.
  - .1 Forest Stewardship Council (FSC) certified.
    - .1 Lumber:
      - .1 FSC certified.
- .2 Structural steel members: to CSA G40.21, grade 350, type W.
- .3 Wood connections: Poplar plywood to CSA O153 sheathing grade.
  - .1 Forest Stewardship Council (FSC) certified.
    - .1 Lumber:
      - .1 FSC certified.
- .4 Steel connections: steel angles and/or gusset plates to CSA G40.21, grade 350 type W.
- .5 Nails: to CSA B111.
- .6 Bolts: lag screws, nuts and washers to CAN/CSA O86.1.
- .7 High-tensile bolts: to ASTM F3125.

- .8 Welding materials: CSA W59.

## **2.2 PERFORMANCE CRITERIA**

- .1 Ensure that materials, equipment and procedures:
  - .1 Safely support existing structure and construction live loads.
  - .2 Allow work to be accomplished.
  - .3 Minimize risk of damage to historic and archaeological elements.

## **2.3 SOURCE QUALITY CONTROL**

- .1 Timber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood identification: by grade mark in accordance with applicable CSA standards.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Before starting work, verify existing conditions and variations from original Contract Documents and notify Departmental Representative.

### **3.2 PREPARATION**

- .1 Remove stored materials, services from building. Store in area designated by Departmental Representative.
- .2 Before commencing shoring and displacement of structure, brace window and door openings.
  - .1 Remove, protect and store window sashes.
  - .2 Remove, protect and store doors.
  - .3 Protect components: glazing.
- .3 Before beginning shoring and bracing, drain ground to support bracing, excavation, and areas adjacent to foundation. Maintain area free of standing water for duration of the work.
- .4 Before beginning bracing and shoring, protect materials in direct contact with bracing and shoring components.
- .5 Treat wood in contact with the ground or water in accordance with Section 06 05 73 Wood Treatment. ADD SECTION

### **3.3 INSTALLATION – GENERAL**

- .1 Commence work in accordance with Departmental Representatives instructions.
- .2 Obtain approval from Departmental Representative, before execution, for alteration to bracing or shoring system.
- .3 Support individual elements that become loose during shoring or bracing installation.
- .4 Erect structural timber to CAN/CSA O86.1.

- .5 Erect structural steel work to CAN/CSA-S16 and CAN/CSA-S136.
- .6 Weld to CSA W59.

### **3.4 BRACING OF STRUCTURES**

- .1 Compensate for unevenness of wall surfaces:
  - .1 Install packing after review by Departmental Representative.
- .2 Install protection.
- .3 Install and use bracing system to stabilize deformations.

### **3.5 BRACING OF EXCAVATIONS**

- .1 Conduct work in accordance with the current safety standards.
- .2 Excavate by increments of three poling boards and insert boards from bottom of excavation. Fasten poling boards to flanges of soldier piles with wedges.
- .3 Allow drainage in water bearing ground: leave narrow gaps between poling boards.

### **3.6 SHORING OF STRUCTURES**

- .1 Cut rectangular hole in wall to firmly accommodate needle. Ensure snug fit:
  - .1 Ram dry mortar packing. Proportion: 1 cement: 1 lime: 6 sand.
- .2 Compensate for unevenness of wall surfaces:
  - .1 Install packing after review by Departmental Representative.
- .3 Stabilize wall before erecting final raking shores:
  - .1 Install temporary shores, consisting of an upright against wall and raker notched in.
- .4 Prevent loose core from escaping:
  - .1 Install boards, between needles of dead shores.

### **3.7 SHORING OF MASONRY ARCHES**

- .1 Install dead shoring before erecting centering.
- .2 Realign centering before cosmetic repairs as detailed on drawings.
- .3 Remove dead shoring when masonry arches are stabilized.
- .4 Remove centering, progressively, by loosening wedges until downward movement of arch stops.

### **3.8 SHORING OF COLUMNS FOR UNDERPINNING**

- .1 Use method detailed on drawings.
- .2 Provide constant monitoring of hydraulic apparatus during shoring operation.

**3.9 ADJUSTMENT**

- .1 Monitor bracing and shoring system performance and maintain its effectiveness by making adjustments or replacing or repairing damaged and weakened elements of system until final completion of project.
- .2 If adjustments are major or repetitive notify the Departmental Representative.

**3.10 CONSTRUCTION WASTE MANAGEMENT**

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Waste Management and Disposal to the maximum extent economically possible.
- .2 Separate wood waste in accordance with Waste Management Plan and place in designated areas.
- .3 Set aside damaged wood and dimensional lumber off cuts for acceptable alternative uses (e.g. bracing, blocking, cripples, bridging, finger joining, or ties). Store this separated reusable wood waste convenient to cutting station and area of work.
- .4 Do not burn scrap at the project site.
- .5 Place materials defined as hazardous or toxic waste in designated containers.
- .6 Seal and store emptied containers safely away from children for disposal.
- .7 Use chemical products that are biodegradable, have zero or low VOC's, and are non-toxic.
- .8 Dispose of surplus chemical and finishing materials in accordance with federal, provincial and municipal regulations.

**END OF SECTION**

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**Part 1            General**

**1.1                SUMMARY**

- .1    This Section includes the following:
  - .1    Demolition and removal of buildings and structures
  - .2    Demolition and removal of site improvements adjacent to a building or structure being demolished
  - .3    Demolition and removal of concrete foundations and piles
  - .4    Removing below grade construction
  - .5    Disconnecting, capping or sealing, and removing site utilities

**1.2                REFERENCE STANDARDS**

- .1    CSA Group (CSA)
  - .1    CSA S350, Code of Practice for Safety in Demolition of Structures.
- .2    Department of Justice Canada (Jus)
  - .1    Canadian Environmental Assessment Act (CEAA), 2012
  - .2    Canadian Environmental Protection Act (CEPA), 2012
    - .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
    - .3    Transportation of Dangerous Goods Act (TDGA), 1992, c. 34
    - .4    Motor Vehicle Safety Act (MVSA), 1995
    - .5    Hazardous Materials Information Review Act, 1985
- .3    National Fire Protection Association (NFPA)
  - .1    NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations
- .4    National Research Council Canada (NRC)
  - .1    National Building Code of Canada 2015 (NBC).
  - .2    National Fire Code of Canada 2015 (NFC).
- .5    Underwriters' Laboratories of Canada (ULC)
  - .1    CAN/ULC-S660, Standard for Non-metallic Underground Piping for Flammable and Combustible Liquids
  - .2    ULC/ORD-C58.15, Overfill Protection Devices for Flammable Liquid Storage Tanks
  - .3    ULC/ORD-C58.19, Spill Containment Devices for Underground Flammable Liquid Storage Tanks
- .6    U.S. Environmental Protection Agency (EPA)/Office of Water

- .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
- .3 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

### **1.3 DEFINITIONS**

- .1 Demolition: rapid destruction of building following removal of hazardous materials.
- .2 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or wellbeing or environment if handled improperly.
- .3 Waste Management Coordinator (WMC): Contractor representative responsible for supervising waste management activities as well as coordinating related required submittal and reporting requirements.
- .4 Construction Waste Management Plan (CWM Plan): Written plan addressing opportunities for reduction, reuse, or recycling of materials prepared in accordance with Section 01 74 19- Construction Waste Management and Disposal.
- .5 Construction Waste Management Report (CWM Report): Written report identifying actual materials that formed CWM Plan for reduction, reuse, or recycling of materials prepared in accordance with Section 01 74 19- Construction Waste Management and Disposal

### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination: Coordinate with Department Representative for the material ownership including but not limited to:
  - .1 Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.
  - .2 Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered during demolition remain Owner's property.
- .2 Pre-Demolition Meetings:
  - .1 Convene pre-installation meeting 1 week prior to beginning work of this Section, with Department Representative in accordance with Section 01 31 19 - Project Meetings.
- .3 Scheduling:
  - .1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.
  - .2 In event of unforeseen delay notify Department Representative.

## **1.5 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Action Submittals: Provide the following submittals before starting any work of this Section:
  - .1 Shop Drawings: Submit drawings stamped and signed by professional engineer registered or licensed in Saskatchewan as follows:
  - .2 Submit in accordance with Section 01 33 00 - Submittal Procedures, 01 74 19 - Construction Waste Management and Disposal.
  - .3 Schedule of Demolition Activities: Coordinate with Section 01 32 16.16- Construction Progress Schedule.
- .2 Informational Submittals: Provide the following submittals when requested by the Departmental Representative:
  - .1 Qualification Data: Submit information for companies and personnel indicating their capabilities and experience to perform work of this Section including; but not limited to, lists of completed projects with project names and addresses, names and addresses of Departmental Representative, for work of similar complexity and extent.

## **1.6 QUALITY ASSURANCE**

- .1 Regulatory Requirements: Ensure Work is performed in compliance with CEPA, CEAA, TDGA, applicable Provincial/Territorial and Municipal regulations.
- .2 Comply with hauling and disposal regulations of Authority Having Jurisdiction.
- .3 Standards: Comply with ANSI A10.6 and NFPA 241.

## **1.7 SITE CONDITIONS**

- .1 Review "Designated Substance Report" and take precautions to protect environment.
- .2 If material resembling spray or trowel-applied asbestos or other designated substance listed as hazardous be encountered, stop work, take preventative measures, and notify Departmental Representative immediately.
  - .1 Proceed only after receipts of written instructions have been received from Departmental Representative.
- .3 Notify Departmental Representative before disrupting building access or services.
- .4 Environmental protection:
  - .1 Ensure Work is done in accordance with Section 01 35 43- Environmental Procedures.

## **1.8 EXISTING CONDITIONS**

- .1 Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
  - .1 Hazardous materials will be as defined in the Hazardous Materials Act.
  - .2 Hazardous materials will be removed by Departmental Representative before start of the Work.

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**Part 2            Products**

**2.1                EQUIPMENT**

- .1    Equipment and heavy machinery:
- .2    On-road vehicles to: CEPA-SOR/2003-2, On-Road Vehicle and Engine Emission Regulations
- .3    Off-road vehicles to: EPA CFR 86.098-1.
- .4    Machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

**Part 3            Execution**

**3.1                EXAMINATION**

- .1    Survey existing conditions and correlate with requirements indicated to determine extent of demolition required.
- .2    Review Project Record Documents of existing construction provided by Departmental Representative.
- .3    Department Representative does not guaranty that existing conditions are the same as those indicated in Project Record Documents.
- .4    Inventory and record the condition of items being removed and salvaged.
- .5    When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element.
- .6    Promptly submit a written report to Departmental Representative.
- .7    Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during demolition operations.
- .8    Verify that hazardous materials have been remediated before proceeding with demolition operations.

**3.2                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    Protection of In-Place Conditions:
  - .1    Prevent movement, settlement, or damage to adjacent and landscaping features, utilities, structures, and parts of building to remain in place. Provide bracing and shoring required.
  - .2    Keep noise, dust, and inconvenience to occupants to minimum.
  - .3    Protect building systems, services and equipment.

- .4 Provide temporary dust screens, covers, railings, supports and other protection as required.
- .5 Do Work in accordance with Section 01 35 29.06- Health and Safety Requirements.
- .3 Demolition/Removal:
  - .1 Demolish structures as indicated.
  - .2 Removal of Pavements, Curbs and Gutters:
    - .1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by Departmental Representative.
    - .2 Protect adjacent joints and load transfer devices.
    - .3 Protect underlying and adjacent granular materials.
  - .3 Remove parts of existing building to permit new construction.
  - .4 Trim edges of partially demolished building elements to tolerances as defined by Departmental Representative to suit future use.
  - .5 At end of each day's work, leave Work in safe and stable condition.
  - .6 Protect interiors of parts not to be demolished from exterior elements at all times.
  - .7 Demolish to minimize dusting. Keep materials wetted as directed by Departmental Representative.
  - .8 Only dispose of material specified by selected alternative disposal option as directed by Departmental Representative.
- .4 Remove following materials and equipment and store in location designated by Departmental Representative:
  - .1 Occupancy sensors
  - .2 LED lights

### **3.3 SITE RESTORATION & REPAIRS**

- .1 Below Grade Areas: Rough grade below grade areas ready for further excavation or new construction.
- .2 Below Grade Areas: Completely fill below grade areas and voids resulting from structure demolition operations with satisfactory soil materials according to backfill requirements in Section 31 00 00.
- .3 Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes.
- .4 Provide a smooth transition between adjacent existing grades and new grades.
- .5 General: Promptly repair damage to adjacent construction caused by demolition operations.
- .6 Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
- .7 Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

**3.4 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.
- .3 Refer to demolition drawings and specifications for items to be salvaged for reuse.
- .4 Waste Management: separate waste materials for recycling in accordance with Section 01 74 19- Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**END OF SECTION**

**Part 1 General**

**1.1 SUMMARY**

- .1 Section includes descriptions for demolishing, salvaging, recycling and removing of asphalt paving identified in whole or in part, and for backfilling trenches and excavations resulting from site demolition activities a required by scope of work.

**1.2 PRICE AND PAYMENT**

- .1 Removal of existing asphalt pavement will be measured in square metres of surface actually removed regardless of depth removed.
- .2 Payment under this item will include operations involved in removing, hauling and stockpiling designated pavement and cleaning of remaining pavement surface.

**1.3 REFERENCE STANDARDS**

- .1 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Assessment Act (CEAA), 1995, c. 37.
  - .2 Canadian Environmental Protection Act, 1999 (CEPA), c. 33.
- .2 U.S. Environmental Protection Agency (EPA) / Office of Water
  - .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

**1.4 DEFINITIONS**

- .1 Demolish: Detach items from existing construction and legally dispose of them off site, unless indicated to be removed and salvaged or removed and reinstalled.
- .2 Existing to Remain: Existing items of construction that are not removed and that are not otherwise indicated as being removed, removed and salvaged, or removed and reinstalled
- .3 Draft Construction Waste Management Plan (Draft CWM Plan): Detailed inventory of materials in building indicating estimated quantities of reuse, recycling and landfill, prepared in accordance with Section 01 74 19 - Construction Waste Management and Disposal and as follows:
  - .1 Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project.
- .4 Waste Management Coordinator (WMC): Contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.
- .5 Construction Waste Management Plan (CWM Plan): Written plan addressing opportunities for reduction, reuse, or recycling of materials prepared in accordance with Section 01 74 19- Waste Management and Disposal.
- .6 Construction Waste Management Report (CWM Report): Written report identifying actual materials that formed CWM Plan for reduction, reuse, or recycling of materials prepared in accordance with Section 01 74 19- Waste Management and Disposal.

## **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination: Coordinate requirements for Waste Management and Disposal for materials being re used or recycled in accordance with Section 01 45 16.19:
  - .1 Divert excess materials from landfill
  - .2 Separate materials identified for recycling place in identified areas in accordance with Waste Management Plan
  - .3 Label location of salvaged material's storage areas and provide barriers and security devices
  - .4 Remove materials that cannot be salvaged for re use or recycling and dispose of in accordance with applicable codes at licensed facilities
- .2 Pre Construction Meeting: Arrange a pre construction meeting in accordance with Section 01 31 19– Project Meetings; attended by Contractor’s key personnel, and Department Representative to discuss the following:
  - .1 Verify project requirements.
  - .2 Review site conditions.
  - .3 Coordination with other subcontractor’s affected by work of this Section.
  - .4 Examine existing site conditions adjacent to demolition work, prior to start of Work.
  - .5 Waste reporting requirements.

## **1.6 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Action Submittals: Provide following submittals before starting work of this Section:
  - .1 Shop Drawings: Submit shop drawings indicating diagrams or details showing sequence of demolition work.
- .2 Informational Submittals: Provide following submittals during course of work:
  - .1 Certificates: Submit copies of certified weigh bills, bills of lading or receipts from authorized disposal sites and re use and recycling facilities for material removed from site on weekly basis.
- .3 Sustainable Design Submittals:
  - .1 Erosion and Sedimentation Control: submit copy of erosion and sedimentation control plan in accordance with authorities having jurisdiction
  - .2 Construction Waste Management: Submit project CWM Plan highlighting recycling and salvage requirements in accordance with Section 01 74 19- Waste Management and Disposal

## **1.7 QUALITY ASSURANCE**

- .1 Regulatory Requirements: ensure Work is performed in compliance with CEPA, CEAA, TDGA, and applicable Provincial regulations.
- .2 Comply with hauling and disposal regulations of Authority Having Jurisdiction.

## **1.8 SITE CONDITIONS**

- .1 Protect existing site features to remain or identified for salvage or re use; make repairs and restore to a similar condition to existing where damage to these items occurs as directed by Departmental Representative and at no cost to Owner:
  - .1 Remove and store salvaged materials to prevent contamination.
  - .2 Store and protect salvaged materials as required for maximum preservation of material.
  - .3 Handle salvaged materials same as new materials.
- .2 Perform pavement removal work to prevent adverse effects to adjacent watercourses, groundwater and wildlife, and to prevent excess air and noise pollution:
  - .1 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers or onto adjacent properties.
  - .2 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with Authorities Having Jurisdiction.
- .3 Protect existing site features and structures, trees, plants and foliage on site and adjacent properties.

## **Part 2 Products**

### **2.1 EQUIPMENT**

- .1 Use cold milling, planning or grinding equipment with automatic grade controls capable of operating from string line, and capable of removing part of pavement surface to depths or grades indicated.

## **Part 3 Execution**

### **3.1 PREPARATION**

- .1 Verify extent and location of asphalt identified for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities, preserve active utilities traversing site in operating condition.
- .3 Temporary Erosion and Sedimentation Control:
  - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
  - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
  - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- .4 Prior to beginning removal operation, inspect and verify with Departmental Representative areas, depths and lines of asphalt pavement to be removed.

- .5 Protection: protect existing pavement not designated for removal, light units and structures from damage. In event of damage, immediately replace or make repairs to approval of Departmental Representative at no additional cost.

### **3.2 REMOVAL**

- .1 Remove existing asphalt pavement to lines and grades as indicated and established by Departmental Representative on site.
- .2 Demolition of pavements, curbs and gutters:
  - .1 Square up adjacent surfaces to remain in place by saw cutting or other method acceptable to Departmental Representative on site.
  - .2 Protect adjacent joints and load transfer devices.
  - .3 Protect underlying and adjacent granular materials where they are exposed and identified to remain.
  - .4 Prevent contamination with base course aggregates, when removing asphalt pavement for subsequent incorporation into hot mix asphalt concrete paving.
- .3 Use equipment and methods of removal and hauling which do not damage or disturb underlying pavement.
- .4 Prevent contamination of removed asphalt pavement by topsoil, underlying gravel or other materials.
- .5 Suppress dust generated by removal process.

### **3.3 FINISH TOLERANCES**

- .1 Finished surfaces in areas where asphalt pavement has been removed within +/-5 mm of grade specified but not uniformly high or low.

### **3.4 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.
- .3 Sweep remaining asphalt pavement surfaces clean of debris resulting from removal operations using rotary power brooms and hand brooming as required.
- .4 Waste Management: separate waste materials for recycling in accordance with Section 01 74 19- Waste Management and Disposal
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
  - .2 Removed asphalt pavement which is to be recycled in hot mix asphalt concrete under this contract may be stockpiled at designated asphalt plant site.

**END OF SECTION**

**Part 1 General**

**1.1 SUMMARY**

- .1 Section includes descriptions for demolishing, salvaging, recycling and removing site work items identified for removal in whole or in part, and for backfilling trenches and excavations resulting from site demolition activities.

**1.2 PRICE AND PAYMENT PROCEDURES**

- .1 Measurement Procedures: Coordinate with Section 01 74 19– Construction Waste Management and Disposal, and as follows:
  - .1 Measure removal of asphaltic concrete pavement in square metres for each thickness specified in accordance with Section 02 41 13.14
  - .2 Measure removal of Portland cement concrete pavement in square metres for each thickness specified.
  - .3 Measure removal of base and sub-base pavement materials in square metres.
  - .4 Measure removal of concrete in cubic metres.
  - .5 Measure removal of masonry foundations in cubic metres in place.
  - .6 Measure removal of culverts, pipe sewers and drains in metres regardless of diameter.
    - .1 End points of measurements will be at centres of maintenance holes or catch basins or open ends of pipes, as applicable.
  - .7 Measure removal of catch basins and maintenance holes in units.
  - .8 Measure removal of cable duct banks regardless of number of ducts in each bank, in metres from end to end of duct bank.
  - .9 Measure removal of curbs and fences in metres.
  - .10 Payment for salvage, stockpiling, disposal, recycling, excavating, backfilling, and restoration will be included in above removal items.
  - .11 Measure removal of waste and materials designated for alternate disposal from site in tonnes.

**1.3 REFERENCE STANDARDS**

- .1 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Assessment Act (CEAA), 2012
  - .2 Canadian Environmental Protection Act (CEPA), 2012
    - .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
    - .3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34
    - .4 Motor Vehicle Safety Act (MVSA), 1995
    - .5 Hazardous Materials Information Review Act, 1985
- .2 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 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices

#### **1.4 DEFINITIONS**

- .1 Selective Demolition: Sequencing demolition activities to allow separation and sorting of selected site materials.
- .2 Hazardous Substances: dangerous substances, dangerous goods, hazardous commodities and hazardous products, including but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or well being or environment if handled improperly.
- .3 Draft Construction Waste Management Plan (Draft CWM Plan): Detailed inventory of materials in building indicating estimated quantities of reuse, recycling and landfill, prepared in accordance with Section 01 74 19- Construction Waste Management and Disposal and as follows:
  - .1 Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project.
- .4 Waste Management Coordinator (WMC): Contractor's representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.
- .5 Construction Waste Management Plan (CWM Plan): Written plan addressing opportunities for reduction, reuse, or recycling of materials prepared in accordance with Section 01 74 19- Waste Management and Disposal.
- .6 Construction Waste Management Report (CWM Report): Written report identifying actual materials that formed CWM Plan for reduction, reuse, or recycling of materials prepared in accordance with Section 01 74 19- Management and Disposal.

#### **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination: Coordinate with Departmental Representative for the material ownership including the following:
  - .1 Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Departmental Representative's property, demolished materials shall become Contractor's property and shall be removed from Project site.
  - .2 Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Departmental Representative that may be encountered during demolition remain Departmental Representative's property:

- .1 Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Departmental Representative.
- .2 Coordinate with Departmental Representative, who will establish special procedures for removal and salvage operations.
- .2 Pre-Demolition Meetings.
  - .1 Convene pre-installation meeting 2 weeks before beginning work of this Section, with Departmental Representative in accordance with Section 01 31 19- Project Meetings to:
    - .1 Verify project requirements.
    - .2 Verify existing site conditions adjacent to demolition work
    - .3 Coordinate with other construction sub trades
    - .4 Examine existing site conditions adjacent to demolition work, prior to start of Work
    - .5 Waste reporting requirements
  - .2 Hold project meetings every week.
  - .3 Ensure key personnel attend.
  - .4 Contractor will provide written report on status of waste diversion activity at each meeting.
  - .5 Departmental Representative will provide written notification of change of meeting schedule established upon contract award 48 hours prior to scheduled meeting.
- .3 Scheduling:
  - .1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.
  - .2 In event of unforeseen delay notify Departmental Representative.

## **1.6 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Action Submittals: Provide the following submittals before starting any work of this Section:
  - .1 Shop Drawings: Submit drawings stamped and signed by professional engineer registered or licensed in Saskatchewan, Canada as follows:
    - .1 Submit for review and approval selective site demolition drawings, diagrams or details showing sequence of selective site demolition.
    - .2 Submit in accordance with Section 01 33 00- Submittal Procedures.
    - .3 Contractor is responsible for fulfilment of reporting requirements.
  - .2 Schedule of Selective Site Demolition Activities: Coordinate with Section 01 32 16.16
    - .1 Detailed sequence of selective site demolition and removal work, with starting and ending dates for each activity
    - .2 Interruption of utility services
    - .3 Coordination for shutoff, capping, and continuation of utility services
    - .4 Locations of temporary partitions and means of egress

- .3 Construction Waste Management Plan (CWM Plan): Submit a plan of demolition area indicating extent of temporary facilities and supports, methods of removal and demolition prepared by a professional engineer in accordance with requirements of Authority Having Jurisdiction, and as follows:
- .4 Proposed Noise Control and Dust Control Measures: Submit statement or drawing that indicates measures proposed for use, proposed locations, and proposed time frame for their operation.
- .5 Inventory: Submit a list of items that have been removed and salvaged after selective site demolition is complete
  - .1 Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.
  - .2 Pre demolition Photographs: Submit photographs indicating existing conditions of adjoining construction and site improvements prior to starting Work. Include finish surfaces that may be misconstrued as damage caused by selective site demolition operations.
- .2 Informational Submittals: Provide the following submittals when requested by the Departmental Representative:
  - .1 Qualification Data: Submit information for companies and personnel indicating their capabilities and experience to perform work of this Section including; but not limited to, lists of completed projects with project names and addresses, names and addresses of Departmental Representative, for work of similar complexity and extent.

## **1.7 QUALITY ASSURANCE**

- .1 Regulatory Requirements: ensure Work is performed in compliance with CEPA, CEEA, TDGA, and applicable Provincial regulations.
- .2 Comply with hauling and disposal regulations of Authority Having Jurisdiction.

## **1.8 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 watercourses, 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 Burying of rubbish waste materials is not permitted.
  - .5 Disposal of waste of volatile materials including but not limited to, mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers, is not permitted.
  - .6 Ensure proper disposal procedures are maintained throughout the project.
- .2 Pumping of water containing suspended materials into watercourses, storm or sanitary sewers or onto adjacent properties, is not permitted.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with as directed by Departmental Representative.

- .4 Protect trees, plants and foliage on site and adjacent properties where indicated.
- .5 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.
- .6 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.
- .7 Departmental Representative will occupy another building immediately adjacent to demolition area.
- .8 Conduct selective site demolition so Owner's operations will not be disrupted:
  - .1 Provide not less than 72 hours' notice Departmental Representative of activities that will affect operations.
  - .2 Maintain access to existing walkways, exits, and other adjacent occupied or used facilities:
    - .1 Closing or obstructing walkways, exits, or other occupied or used facilities without written permission from Departmental Representative are not permitted.
- .9 Departmental Representative assumes no responsibility for Selective Site elements being demolished:
  - .1 Conditions existing at time of inspection for bidding purpose will be maintained by Departmental Representative as far as practical.
  - .2 Before selective site demolition, remove, protect and store salvaged items as directed by Departmental Representative
    - .1 Salvage items as identified by Departmental Representative.
    - .2 Deliver to Departmental Representative as directed.

## **1.9 EXISTING CONDITIONS**

- .1 Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work:
  - .1 Hazardous materials will be as defined in the Hazardous Materials Act.
  - .2 Hazardous materials will be removed by Owner before start of the Work.
- .2 If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Departmental Representative. Hazardous materials will be removed by Owner under a separate contract or as a change to the Work.
- .3 If material resembling spray or trowel applied asbestos or other substance be encountered in course of demolition, stop work, take preventative measures, and notify Departmental Representative immediately. Proceed only after receipt of written instructions has been received from Departmental Representative.
- .4 Site elements that will be demolished are based on their condition at time of examination prior to tendering.

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**Part 2**            **Products**

**2.1**                **EQUIPMENT**

- .1    Equipment and Heavy Machinery:
  - .1    On-road vehicles to: CEPA-SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations
  - .2    Off-road vehicles to: EPA CFR 86.098-11
  - .3    Machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

**Part 3**            **Execution**

**3.1**                **EXAMINATION**

- .1    Survey existing conditions and correlate with requirements indicated to determine extent of selective site demolition required.
- .2    Departmental Representative does not guaranty that existing conditions are the same as those indicated in Project Record Documents.
- .3    Inventory and record the condition of items being removed and salvaged.
- .4    When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element. Promptly submit a written report to Departmental Representative.
- .5    Perform an engineering survey of condition of adjacent buildings to determine whether removing any site element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective site demolition operations.
- .6    Verify that hazardous materials have been remediated before proceeding with site demolition operations.

**3.2**                **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, parts of existing building to remain, adjacent grades.

- .1 Provide bracing, shoring and underpinning as required.
- .2 Repair damage caused by demolition as directed by Departmental Representative.
- .3 Support affected site elements and, if safety of site element being demolished or services or adjacent structures appears to be endangered, take preventative measures, stop Work and immediately notify Departmental Representative.
- .4 Prevent debris from blocking surface drainage system, elevators, mechanical and electrical systems which must remain in operation.
- .3 Surface Preparation:
  - .1 Disconnect and re-route electrical and service lines within the site to be demolished.
    - .1 Post warning signs on electrical lines and equipment which must remain energized to serve other properties during period of selective site demolition.
    - .2 Disconnect and cap designated mechanical services.
      - .1 Natural gas supply lines: remove in accordance with authority having jurisdiction.
      - .2 Sewer and water lines: remove as directed by Departmental Representative.
      - .3 Other underground services: remove and dispose of as indicated.
  - .3 Disruption of active or energized utilities designated to remain undisturbed is not permitted.

### **3.3 REMOVAL AND DEMOLITION OPERATIONS**

- .1 Remove items as indicated.
- .2 Disruption of items designated to remain in place is not permitted.
- .3 Removal of pavements, curbs and gutters:
  - .1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by Departmental Representative.
  - .2 Protect adjacent joints and load transfer devices.
  - .3 Protect underlying and adjacent granular materials.
- .4 Excavate at least 300 mm below pipe invert, when removing pipes under existing or future pavement area.
- .5 Remove designated trees during demolition.
  - .1 Obtain written approval of Departmental Representative prior to removal of trees.
- .6 Dispose of alternately trees designated for removal and identified by Departmental Representative to be healthy.
  - .1 Grind, chip, or shred other vegetation for mulching and composting.
- .7 Stockpile topsoil for final grading and landscaping:
  - .1 Provide erosion control and seeding if not immediately used.

- .8 Salvage:
  - .1 Dismantle items containing materials for salvage and stockpile salvaged materials at locations as indicated by the Departmental Representative.
- .9 Disposal of Material:
  - .1 Dispose of materials not designated for salvage or reuse on site at authorized facilities approved in Waste Reduction Workplan or as instructed by Departmental Representative.
  - .2 Trim disposal areas to approval of Departmental Representative.
- .10 Backfill: Backfill in areas as indicated and in accordance with Section 31 23 33.01- Excavating, Trenching and Backfilling.

### **3.4 STOCKPILING**

- .1 Label stockpiles, indicating material type and quantity.
- .2 Designate appropriate security resources/measures to prevent vandalism, damage and theft.
- .3 Locate stockpiled materials convenient for use in new construction to eliminate double handling wherever possible.
- .4 Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.

### **3.5 REMOVAL FROM SITE**

- .1 Remove stockpiled material as directed by Departmental Representative, when it interferes with operations of project.
- .2 Remove stockpiles of like materials by alternate disposal option once collection of materials is complete.
- .3 Transport material designated for alternate disposal using approved facilities, haulers, receiving organizations listed in CWM Plan and in accordance with applicable regulations:
- .4 Dispose of materials not designated for alternate disposal in accordance with applicable regulations.
  - .1 Disposal Facilities: approved and listed in Waste Reduction Workplan.
  - .2 Written authorization from Departmental Representative is required to deviate from disposal facilities listed in Waste Reduction Workplan.

### **3.6 RESTORATION**

- .1 Restore areas and existing works outside areas of demolition to conditions that existed prior to beginning of Work.
- .2 Use soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

**3.7 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.
  - .1 Leave Work area clean at end of each day.
  - .2 Remove debris, trim surfaces and leave work site clean, upon completion of Work
  - .3 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 19- Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**END OF SECTION**

## **Part 1           General**

### **1.1               SUMMARY**

- .1     This Section includes requirements for the following:
  - .1       Demolition and removal of buildings and structures.
  - .2       Demolition and removal of site improvements adjacent to a building or structure being demolished.
  - .3       Demolition and removal of concrete foundations and piles.
  - .4       Removing below grade construction.
  - .5       Disconnecting, capping or sealing, and removing site utilities.
- .2     This section does not include for the removal of Hazardous Substances or asbestos abatement, or selective demolition of interior building components and finishes.
- .3     Drawings contain details that suggest directions for solving some of the major demolition and removal requirements for this project; contractor representative is required to develop these details further by submitting a demolition plan prepared by a professional engineer.

### **1.2               RELATED REQUIREMENTS**

- .1     Section 02 41 13– Selective Site Demolition
- .2     Section 02 41 99.08– Demolition for Minor Works
- .3     Section 02 81 01– Hazardous Substances
- .4     Section 31 00 00.01– Earthwork

### **1.3               REFERENCE STANDARDS**

- .1     CSA Group (CSA)
  - .1       CSA S350, Code of Practice for Safety in Demolition of Structures.
- .2     Department of Justice Canada (Jus)
  - .1       Canadian Environmental Assessment Act (CEAA), 2012.
  - .2       Canadian Environmental Protection Act (CEPA), 2012.
    - .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.
    - .3          Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.
    - .4          Motor Vehicle Safety Act (MVSA), 1995
    - .5          Hazardous Substances Information Review Act, 1985
- .3     National Fire Protection Association (NFPA)
  - .1       NFPA 241-13, Standard for Safeguarding Construction, Alteration, and Demolition Operations
- .4     National Research Council Canada (NRC)

- .1 National Building Code of Canada 2015 NBC.
- .5 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.
  - .3 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

#### **1.4 DEFINITIONS**

- .1 Demolition: rapid destruction of building following removal of Hazardous Substances.
- .2 Hazardous Substances: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or wellbeing or environment if handled improperly as defined by the Federal Hazardous Products Act (RSC 1985) including latest amendments.
- .3 Waste Management Co-ordinator (WMC): contractor representative responsible for supervising waste management activities as well as co-ordinating related, required submittal and reporting requirements.
- .4 Draft Construction Waste Management Plan (Draft CWM Plan): Detailed inventory of materials in building indicating estimated quantities of reuse, recycling and landfill, prepared in accordance with Section 01 74 19 - Construction Waste Management and Disposal and as follows:
  - .1 Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project
- .5 Construction Waste Management Plan (CWM Plan): Written plan addressing opportunities for reduction, reuse, or recycling of materials prepared in accordance with Section 01 74 19 - Construction Waste Management and Disposal.
- .6 Construction Waste Management Report (CWM Report): Written report identifying actual materials that formed CWM Plan for reduction, reuse, or recycling of materials prepared in accordance with Section 01 74 19 - Construction Waste Management and Disposal.

#### **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination: Coordinate with Representative for the material ownership as follows:
  - .1 Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Representative's property, demolished materials shall become Contractor's property and shall be removed from Project site.
  - .2 Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Representative that may be encountered during demolition remain Representative's property:

- .1 Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Representative.
- .2 Coordinate with Representative, who will establish special procedures for removal and salvage operations.
- .2 Pre-Demolition Meetings:
  - .1 Convene pre-installation meeting 2 weeks prior to beginning work of this Section, with Departmental Representative in accordance with Section 01 31 19- Project Meetings to:
    - .1 Verify project requirements.
    - .2 Verify existing site conditions adjacent to demolition work.
    - .3 Co-ordination with other construction sub-trades.
  - .2 Hold project meetings every week.
  - .3 Ensure key personnel, subcontractor representatives, Departmental Representative, site supervisor, WMC attend.
  - .4 WMC must provide written report on status of waste diversion activity at each meeting.
  - .5 Departmental Representative will provide written notification of change to meeting schedule established upon contract award 48 hours prior to scheduled meeting.
- .3 Scheduling:
  - .1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.
    - .1 In event of unforeseen delay notify Departmental Representative in writing.

## **1.6 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Action Submittals: Provide the following submittals before starting any work of this Section:
  - .1 Shop Drawings: Submit drawings stamped and signed by professional engineer registered or licensed in Saskatchewan as follows:
    - .1 Submit for review and approval demolition drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning.
  - .2 Submit in accordance with Section 01 33 00- Submittal Procedures.
  - .3 WMC is responsible for fulfilment of reporting requirements.
  - .4 Schedule of Demolition Activities: Coordinate with Section 01 32 16.16- Construction Progress Schedule - Critical Path Method (CPM), and indicate the following:
    - .1 Detailed sequence of demolition and removal work, with starting and ending dates for each activity
    - .2 Interruption of utility services
    - .3 Coordination for shutoff, capping, and continuation of utility services
    - .4 Locations of temporary partitions and means of egress

- .5 Demolition Plan: Submit a plan of demolition area indicating extent of temporary facilities and supports, methods of removal and demolition prepared by a professional engineer in accordance with requirements of Authority Having Jurisdiction.
- .6 Proposed Noise Control and Dust Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation.
- .7 Inventory: Submit a list of items that have been removed and salvaged after demolition is complete.
  - .1 Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.
  - .2 Pre-demolition Photographs: Submit photographs indicating existing conditions of adjoining construction and site improvements prior to starting Work. Include finish surfaces that may be misconstrued as damage caused by demolition operations.
- .2 Informational Submittals: Provide the following submittals when requested by the Departmental Representative:
  - .1 Certificates: Submit Statement of Refrigerant Recovery as follows:
    - .1 Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to regulations of Authority Having Jurisdiction.
    - .2 Include name and address of technician and date refrigerant was recovered.
  - .2 Qualification Data: Submit information for companies and personnel indicating their capabilities and experience to perform work of this Section including; but not limited to, lists of completed projects with project names and addresses, names and addresses of Departmental Representative, for work of similar complexity and extent.

## **1.7 QUALITY ASSURANCE**

- .1 Regulatory Requirements: Ensure Work is performed in compliance with TDGA, CEPA, CEAA, applicable Provincial and Municipal regulations.
  - .1 Comply with hauling and disposal regulations of Authority Having Jurisdiction.
  - .2 Standards: Comply with ANSI A10.6 and NFPA 241
- .2 Regulatory Requirements: Perform work of this Section in accordance with the following:
  - .1 Federal Workers' Compensation Service.
  - .2 Government of Canada, Labour Program: Workplace Safety.

## **1.8 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 watercourses, 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 bury rubbish waste materials.
- .5 Do not dispose of waste or volatile materials including but not limited to: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.
- .6 Ensure proper disposal procedures are maintained throughout project.
- .2 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with as directed by Departmental Representative.
- .4 Protect trees, plants and foliage on site and adjacent properties where indicated.
- .5 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.
- .6 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.
- .7 Representative will occupy another building immediately adjacent to demolition area.
- .8 Conduct structure demolition so Representative's operations will not be disrupted:
  - .1 Provide not less than 72 hours' notice to Departmental Representative of activities that will affect operations.
  - .2 Maintain access to existing walkways, exits, and other adjacent occupied or used facilities:
    - .1 Do not close or obstruct walkways, exits, or other occupied or used facilities without written permission from Departmental Representative.
- .9 Representative assumes no responsibility for buildings and structures being demolished:
  - .1 Conditions existing at time of inspection for bidding purpose will be maintained by Representative as far as practical.
  - .2 Remove, protect and store salvaged items as directed by Representative before structure demolition.
  - .3 Salvage items as identified by Representative.
  - .4 Deliver to Representative as directed.

## **1.9 EXISTING CONDITIONS**

- .1 Existing Conditions: Condition of materials identified as being salvaged or demolished are based on their observed condition on date that tender is accepted.
  - .1 Existing Hazardous Substances: Representative performed a hazardous substances assessment and it is not expected that hazardous substances will be encountered in the Work.
    - .1 Hazardous substances will be removed by a hazardous abatement specialist engaged by the Representative before start of the Work.

- .2 Existing Hazardous Substances: Representative has performed a hazardous substances assessment and identified materials requiring abatement as follows:
  - .1 Hazardous substances are as defined in the Hazardous Products Act.
  - .2 Hazardous substances will be removed by the Contractor as a part of the Contract before starting Work in accordance with work results described in Related Requirements listed above.
- .3 Discovery of Hazardous Substances: Immediately notify Representative if materials suspected of containing hazardous substances are encountered and perform the following activities:
  - .1 Hazardous substances will be as defined in the Hazardous Products Act.
  - .2 Stop work in the area of the suspected hazardous substances.
  - .3 Take preventative measures to limit users' and workers' exposure, provide barriers and other safety devices and do not disturb.
  - .4 Hazardous substances will be removed by Representative under a separate contract or as a change to the Work.
  - .5 Proceed only after written instructions have been received from Representative.

## **Part 2 Products**

### **2.1 EQUIPMENT**

- .1 Equipment and heavy machinery:
  - .1 On-road vehicles to: CEPA-SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.
  - .2 Off-road vehicles to: EPA CFR 86.098-10.
  - .3 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

### **2.2 TEMPORARY SUPPORT STRUCTURES**

- .1 Design temporary support structures required for demolition work and underpinning and other foundation supports necessary for the project using a qualified professional engineer registered or licensed in Province of the Work.

### **2.3 SOIL MATERIALS**

- .1 Satisfactory Soils: Provide soil in accordance with Section 31 00 00.01.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Survey existing conditions and correlate with requirements indicated to determine extent of structure demolition required.
- .2 Review Project Record Documents of existing construction provided by Representative.

- .3 Representative does not guaranty that existing conditions are the same as those indicated in Project Record Documents.
- .4 Inventory and record the condition of items being removed and salvaged.
- .5 When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element.
- .6 Promptly submit a written report to Representative.
- .7 Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during structure demolition operations.
- .8 Verify that Hazardous Substances have been remediated before proceeding with structure demolition operations.

### 3.2 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 Prevent movement, settlement or damage of adjacent structures, properties, paving, adjacent grades, services, parts of existing building to remain, walks, trees, landscaping.
    - .1 Provide bracing, shoring and underpinning as required.
    - .2 Repair damage caused by demolition as directed Departmental Representative.
  - .2 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.
  - .3 Prevent debris from blocking surface drainage system, elevators, mechanical and electrical systems which must remain in operation.
- .3 Surface Preparation:
  - .1 Disconnect and re-route electrical and telephone service lines entering buildings to be demolished.
    - .1 Post warning signs on electrical lines and equipment which must remain energized to serve other properties during period of demolition.
  - .2 Do not disrupt active or energized utilities designated to remain undisturbed.
  - .3 Remove rodent and vermin as required by Departmental Representative.

### **3.3 DEMOLITION**

- .1 Protect demolition work in accordance with Section 01 56 00- Temporary Barriers and Enclosures.
- .2 Blasting operations not permitted during demolition.
- .3 Do blasting operations in accordance with CSA S350.
- .4 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.
- .5 Prior to start of Work remove contaminated or hazardous materials listed as hazardous as directed by Departmental Representative from site and dispose of at designated disposal facilities in safe manner and in accordance with 02 81 01- Hazardous Materials. Refer Existing Conditions in PART 1.
- .6 Demolish structures.
- .7 Crush concrete generated due to demolition of foundations to size suitable for recycling.
- .8 Demolish concrete walls and footings.
- .9 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace as work progresses.
- .10 At end of each day's work, leave Work in safe and stable condition.
- .11 Demolish to minimize dusting. Keep materials wetted as directed by Departmental Representative.
- .12 Demolish masonry and concrete walls.
- .13 Remove structural framing.
- .14 Contain fibrous materials to minimize release of airborne fibres while being transported within facility.
- .15 Remove and dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction.
- .16 Use natural lighting to do Work where possible.
  - .1 Shut off lighting except those required for security purposes at end of each day.

### **3.4 REPAIRS**

- .1 General: Promptly repair damage to adjacent construction caused by structure demolition operations.
- .2 Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
- .3 Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

### **3.5 CLEANING**

- .1 Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 74 19- Construction Waste Management and Removal.
- .2 Divert excess materials from landfill to site approved Departmental Representative.
- .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.
  - .1 Label stockpiles, indicating material type and quantity.
- .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 Wiring and conduit.
  - .2 Outlets/switches.
  - .3 Miscellaneous metals.
- .7 Supply separate, clearly marked disposal bins for categories of waste material. Do not remove bins from site until inspected and approved by Departmental Representative.
- .8 Stockpile on site insulation Batts, steel studs and clips in good condition for reuse in new construction.
- .9 Remove stockpiled material as directed by Departmental Representative, when it interferes with operations of project construction.
- .10 Remove stockpiles of like materials by alternate disposal option once collection of materials is complete.
- .11 Transport material designated for alternate disposal using approved facilities, receiving organizations, haulers listed in Waste Reduction Workplan and in accordance with applicable regulations.
- .12 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 SUMMARY**

- .1 This Section includes requirements for careful removal and salvage, and reconditioning of building components identified for storage on site and subsequent reinstallation forming a part of Project.

**1.2 DEFINITIONS**

- .1 Remove and Salvage: Detach items from existing construction and deliver them to Departmental Representative.
- .2 Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

**1.3 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination Existing Salvaged Work: Coordinate with Departmental Representative for confirmation of materials, components, and items of equipment identified for removal and salvage from their present existing locations and as follows:
  - .1 Items that are turned over to Departmental Representative.
  - .2 On-site storage locations
  - .3 Confirmation of items that are renovated or refurbished ready for reinstallation as a part of Work.
  - .4 Confirmation of items that Departmental Representative will not re use, but will retain as follows:
    - .1 Departmental Representative will pick-up salvaged items from a designated location on site.
    - .2 Transport salvaged items to Departmental Representative's designated storage facility.
    - .3 Constructor is responsible for loading and handling identified salvaged items using their own forces and equipment.

**Part 2 Products**

**2.1 SALVAGED ITEMS**

- .1 Items salvaged by Constructor and retained by Departmental Representative include, but are not limited to:

Work	Deliver To
LED lights and occupancy sensors	Departmental Representatives preferred location

- .2 Confirm with Departmental Representative additional items that appear salvageable prior to disposal.

**Part 3 Execution**

**3.1 SALVAGE**

- .1 Remove and handle salvageable items from site to minimize damage and to ensure that usability is maintained.
- .2 Clean, decontaminate, or remediate hazardous substances (lead based paint, asbestos dust, PCB residue, and similar substances) from salvaged materials so they are safe for reuse.
- .3 Place materials on palettes or wrap in protective film to ensure that loose pieces and projections do not cause injury to personnel, and that salvaged items remain as complete units.
- .4 Clean items of construction or building debris, or materials that are not a part of salvaged work before delivering to Departmental Representative.

**END OF SECTION**

**Part 1      General**

**1.1          SUMMARY**

- .1 Comply with requirements of this Section when performing following work:
  - .1 Removing ceiling tiles that are asbestos-containing material, if the tiles cover an area less than 7.5 square metres and are removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.
  - .2 Removing non-friable asbestos-containing materials, other than ceiling tiles, if the material is installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated at locations indicated on drawings.
  - .3 Break, cut, grind, sand, drill, scrape, vibrate or abrade non-friable asbestos containing materials using non-powered hand-held tools, and the material is wetted to control the spread of dust or fibres.
  - .4 Removing less than one square metre of drywall in which joint-filling compounds that are asbestos containing materials have been used.

**1.2          REFERENCE STANDARDS**

- .1 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).

**1.3          DEFINITIONS**

- .1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .2 Amended Water: water with non-ionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.
- .3 Asbestos-Containing Materials (ACMs): materials that contain 0.5 per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
- .4 Asbestos Work Area: area where work takes place which will, or may, disturb ACMs.
- .5 Authorized Visitors: Engineers, Consultants or designated representatives, and representatives of regulatory agencies.
- .6 Competent worker: in relation to specific work, means a worker who:
  - .1 Is qualified because of knowledge, training and experience to perform the work.
  - .2 Is familiar with the provincial and federal laws and with the provisions of the regulations that apply to the work.
  - .3 Has knowledge of all potential or actual danger to health or safety in the work.
- .7 Friable material: means material that:

- .1 When dry, can be crumbled, pulverized or powdered by hand pressure, or
- .2 is crumbled, pulverized or powdered.
- .8 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .9 Occupied Area: any area of the building or work site that is outside Asbestos Work Area.
- .10 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.
- .11 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for work.

#### **1.4 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submittals in accordance with Section 01 33 00- Submittal Procedures.
- .2 Submit proof satisfactory Departmental Representative that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.
- .3 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.
- .4 Submit proof of Contractor's Asbestos Liability Insurance.
- .5 Submit to Departmental Representative necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.
- .6 Submit proof that all asbestos workers and/or supervisor have received appropriate training and education by a competent person in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.
- .7 Submit proof satisfactory Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.

#### **1.5 QUALITY ASSURANCE**

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial, and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications, more stringent requirement applies. Comply with regulations in effect at time Work is performed.
- .2 Health and Safety:
  - .1 Perform construction occupational health and safety in accordance with Section 01 35 29.06- Health and Safety Requirements.
  - .2 Safety Requirements: worker protection.
    - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:
      - .1 Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to

efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

- .2 Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing shall consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing to include suitable footwear, and to be repaired or replaced if torn.
- .2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.
- .3 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.
- .4 Facilities for washing hands and face shall be provided within or close to the Asbestos Work Area.
- .5 Ensure workers wash hands and face when leaving Asbestos Work Area.
- .6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

## **1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for recycling or reuse in accordance with Section 01 74 19- Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

- .3 Collect and separate for disposal corrugated cardboard, polystyrene, plastic, paper, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Separate for recycling and reuse and place in designated containers metal waste in accordance with Waste Management Plan.
- .5 Place materials defined as hazardous or toxic in designated containers.
- .6 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .7 Fold up metal banding, flatten and place in designated area for recycling.
- .8 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 mils bags or leak proof drums. Label containers with appropriate warning labels.
- .9 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

## **1.7 EXISTING CONDITIONS**

- .1 Reports and information pertaining to ACMs to be handled, removed, or otherwise disturbed and disposed of during this project are bound into this specification.
- .2 ACMs are potentially located in Utilidor (tunnel) offshoots of where previous structures have been abandoned.
- .3 Notify Departmental Representative of friable material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from Departmental Representative.

## **1.8 PERSONNEL TRAINING**

- .1 Before beginning Work, provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, and in use, cleaning, and disposal of respirators and protective clothing.
- .2 Instruction and training related to respirators includes, following minimum requirements:
  - .1 Fitting of equipment.
  - .2 Inspection and maintenance of equipment.
  - .3 Disinfecting of equipment.
  - .4 Limitations of equipment.
- .3 Instruction and training must be provided by a competent, qualified person.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Drop Sheets:

- .1 Polyethylene: 0.15 mm thick.
- .2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.
- .2 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in a concentration to provide thorough wetting of asbestos-containing material.
- .3 Waste Containers: contain waste in two separate containers.
  - .1 Inner container: 0.15 mm thick sealable polyethylene waste bag.
  - .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
  - .3 Labelling requirements: affix pre-printed cautionary asbestos warning in both official languages that is visible when ready for removal to disposal site.
- .4 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
- .5 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.

### **Part 3 Execution**

#### **3.1 PROCEDURES**

- .1 Do construction occupational health and safety in accordance with Section 01 35 29.06-Health and Safety Requirements]. MISSING SECT
- .2 Before beginning Work, isolate Asbestos Work Area using, minimum, preprinted cautionary asbestos warning signs in both official languages that are visible at access routes to Asbestos Work Area.
  - .1 Remove visible dust from surfaces in the work area where dust is likely to be disturbed during course of work.
  - .2 Use HEPA vacuum or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate.
  - .3 Do not use compressed air to clean up or remove dust from any surface.
- .3 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.
  - .1 Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over flooring in Asbestos Work Area where dust and contamination cannot otherwise be safely contained. Drop sheets are not to be reused.
- .4 Wet materials containing asbestos to be cut, ground, abraded, scraped, drilled, or otherwise disturbed unless wetting creates hazard or causes damage.
  - .1 Use garden reservoir type low - velocity fine - mist sprayer.
  - .2 Perform Work to reduce dust creation to lowest levels practicable.
  - .3 Work will be subject to visual inspection and air monitoring.

- .4 Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.
- .5 Frequently and at regular intervals during Work and immediately on completion of work:
  - .1 Dust and waste to be cleaned up and removed using a vacuum equipped with a HEPA filter, or by damp mopping or wet sweeping, and placed in a waste container, and
  - .2 Drop sheets to be wetted and placed in a waste container as soon as practicable.
- .6 Cleanup:
  - .1 Place dust and asbestos containing waste in sealed dust-tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste; wet and fold these items to contain dust, and then place in plastic bags.
  - .2 Clean exterior of each waste-filled bag using damp cloths or HEPA vacuum and place in second clean waste bag immediately prior to removal from Asbestos Work Area.
  - .3 Seal waste bags and remove from site. Dispose of in accordance with requirements of Provincial/Territorial and Federal Authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that the appropriate guidelines and regulations for asbestos disposal are followed.
  - .4 Perform final thorough clean-up of Work areas and adjacent areas affected by Work using HEPA vacuum.

**END OF SECTION**

Approved: 2007-03-31

## **Part 1        General**

### **1.1            REFERENCE STANDARDS**

- .1        American Conference of Governmental Industrial Hygienists (ACGIH), Bioaerosols Assessment and Control 1999.
- .2        Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1        Material Safety Data Sheets (MSDS).
- .3        United States Department of Labor Occupational Safety and Health Administration (OSHA)
  - .1        29 CFR 1910.134 - Respiratory Protection.
  - .2        29 CFR 1910.1200 - Hazard Communication.
- .4        United States Environmental Protection Agency (EPA), Mould Remediation in Schools and Commercial Buildings, 2001.

### **1.2            DEFINITIONS**

- .1        Cleaning solution: detergent solution.
- .2        Competent person: individuals Departmental Representative who can demonstrate that mould remediation training has been obtained, is capable of identifying existing microbial hazards in workplace and selecting appropriate control strategy for microbial exposure.
- .3        Contractor: remediation contractor providing demolition and removal services as defined in specification.
- .4        Fibre reinforced polyethylene sheet (FRPS): rip-proof fibre reinforced polyethylene sheet sheeting with added fibre reinforced adhesive tape along edges.
- .5        HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining particles greater than 0.3 microns in any direction at 99.97% efficiency.
- .6        HVAC: heating ventilating and air-conditioning systems which serve occupied areas. Includes but is not limited to air handling units, duct work, terminal boxes and vents.
- .7        Mould Contaminated Work Area: specific area or location where actual work is being performed or such other areas of a facility where it has been determined that it may be hazardous to public health as result of mould remediation.
- .8        Occupied Area: areas of building or work site that is outside of Mould Contaminated Work Area.
- .9        PPE: Personnel Protection Equipment.
- .10       Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have a minimum of six litres capacity for work.

### **1.3 REGULATORY REQUIREMENTS**

- .1 Comply with regulations in effect at time work is performed. In case of conflict among these requirements or with these specifications the more stringent requirement applies. If no regulations exist, follow guidelines most widely accepted by recognized professional organizations such as occupational hygienists, health professionals or environmental engineers as listed in paragraph 1.2 Referenced Standards.

### **1.4 CLOSEOUT SUBMITTALS**

- .1 Maintain general log to provide permanent record of project. Maintain logs and other required documentation as part of permanent project file.

### **1.5 INSTRUCTION AND TRAINING**

- .1 Before commencing work, provide to Departmental Representative satisfactory proof that every worker has had instruction and training in potential health hazards of mould exposure, handling of hazardous materials, and in use of disposable respirators and protective clothing. This training can be performed as part of program to comply with requirements of OSHA Hazard Communication Standard equivalent 29 CFR 1910.1200.
- .2 Instruction and training must be provided by designated construction safety advisor.

### **1.6 WORKER PROTECTION**

- .1 Non-powered disposable filter-type respirator of type equivalent N95 OSHA 29 CFR 1910.134, suitable for protection against mould and acceptable to Provincial Authority having jurisdiction.
- .2 Gloves and eye protection.
- .3 Disposable paper coveralls are recommended.
- .4 No person required to enter Mould Contaminated Work Area to have facial hair that affects seal between respirator and face.
- .5 Eating, drinking and chewing are not permitted in Mould Contaminated Work Area.
- .6 Before leaving Mould Contaminated Work Area, dispose of protective clothing as waste as specified.
- .7 Ensure workers wash hands and face after leaving Mould Contaminated Work Area. Facilities for washing are located as indicated on drawings.

### **1.7 HOURS OF WORK**

- .1 Typical work schedule - Perform work after normal working hours and/or on weekends. Include in Contract Sum additional costs due to this requirement. Be available to work continuously from beginning to end of project.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Drop Sheets: 0.15 mm thick woven fibre reinforced fabric bonded both sides with fibre reinforced polyethylene sheet.

- .2 Disposal bags: dust-tight 0.15 mm clear polyethylene waste bags.
- .3 Wetting Agent: water to mist mould-containing material.
- .4 Cleaning solution: detergent solution for damp wipe and/or mop.
- .5 Fibre reinforced adhesive tape: used in sealing joints of fibre reinforced polyethylene sheets and for attachment of fibre reinforced polyethylene sheet to finished and unfinished surfaces. Fibre reinforced adhesive tape must be capable of adhering under both dry and wet conditions.
- .6 Materials: provide materials such as fibre reinforced polyethylene sheeting, lumber, nails, and hardware necessary to construct and dismantle barriers that isolate Mould Contaminated Work Area.

## **2.2 TOOLS AND EQUIPMENT**

- .1 Tools and equipment: suitable for use with microbial contamination and must be able to withstand de-contamination.
- .2 Personnel protective equipment (protective clothing, disposable respirators): provided in sufficient quantities for duration of project.
- .3 Vacuum cleaners: equipped with HEPA filters.
- .4 Ladders and/or scaffolds: adequate length, strength and sufficient quantity to support work schedule.

## **Part 3 Execution**

### **3.1 PREPARATION OF MOULD WORK AREA (&lt; 1 to 3 SQUARE METRES IN OCCUPIED SPACE)**

- .1 Mould Contaminated Work Area and areas adjacent and around area: to be unoccupied. Vacating people from spaces adjacent to Mould Work Area is not necessary but is recommended in case of infants (less than 12 months old), elderly people, persons having undergone recent surgery, immune suppressed people or people with chronic inflammatory lung diseases.
- .2 Clean movable objects within proposed Mould Contaminated Work Area using HEPA filtered vacuum equipment, damp wipe surfaces and remove such objects from Mould Contaminated Work Area to secure and clean area.
- .3 Remove visible dust from surfaces in Mould Contaminated Work Area where dust is likely to be disturbed during course of work. Use HEPA vacuum and damp wipe area.
- .4 Do not use compressed air to clean up or remove dust from surfaces.
- .5 Seal off return air grills in Mould Contaminated Work Area with fibre reinforced polyethylene sheeting and fibre reinforced adhesive tape to minimize migration of contaminants to other parts of building.
- .6 Use 0.15 mm fibre reinforced polyethylene drop sheets tightly sealed with fibre reinforced adhesive tape over flooring in Mould Contaminated Work Areas.

**3.2 PREPARATION OF MOULD WORK AREA (&LT; 1 SQUARE METRE IN HVAC SYSTEM)**

- .1 HVAC system: to be shut down prior to remedial activities.
- .2 Take necessary precautions to ensure that components of HVAC system are not contaminated during remediation. Remove and bag filters.
- .3 Barriers: to be erected around Mould Contaminated Work Area before remediation using a single layer of 0.15 mm fibre reinforced polyethylene sheeting affixed to floor and ceiling with fibre reinforced adhesive tape, with slit entry and covering flap, to contain dust and debris.
- .4 Use 0.15 mm fibre reinforced polyethylene drop sheets tightly sealed to floor with fibre reinforced adhesive tape to minimize dust and contamination.

**3.3 MICROBIAL REMEDIATION MOULD WORK AREA (&LT; 1 TO 3 SQUARE METRES IN OCCUPIED SPACE)**

- .1 Use sprayer (low-velocity, fine-mist) to mist (not wet) materials containing mould to be cut scraped. Perform work in a manner to reduce dust creation to lowest levels practicable.
- .2 Non-porous and semi-porous materials can be cleaned using detergent solution and reused depending on depth to which microbial growth has penetrated substrate. Wood to be discarded if fungal growth has affected its soundness.
- .3 Porous materials with more than small area of mould contamination and/or dampness to be removed, discarded and replaced.
- .4 Porous materials identified as lightly contaminated that can be cleaned by washing, damp wiped, or HEPA vacuuming can be reused, but to be discarded and replaced if possible.
- .5 Dispose of contaminated building materials as specified.
- .6 During remediation, should Departmental Representative suspect contamination of areas outside Mould Contaminated Work Area, contractor to stop remediation work and immediately decontaminate these affected areas. Eliminate causes of such contamination. Unprotected individuals are prohibited from entering contaminated areas until a visual inspection determines areas are free from contamination.
- .7 Notify Departmental Representative of mould contaminated material discovered during work and not apparent from drawings, specifications or report pertaining to work. Do not disturb such material pending instructions from Departmental Representative.

**3.4 MICROBIAL REMEDIATION MOULD WORK AREA (&LT; 1 SQUARE METRE IN HVAC SYSTEM)**

- .1 Use sprayer (low-velocity, fine-mist) to mist (not wet) materials containing mould to be cut scraped. Perform work in a manner to reduce dust creation to lowest levels practicable.
- .2 Porous materials in HVAC systems such as insulation of interior lined ducts and filters must be removed to bare (underlying) metal and materials properly discarded.
- .3 Dispose of contaminated building materials as specified.

- .4 During remediation, should Departmental Representative suspect contamination of areas outside Mould Work Area, contractor to stop remediation work and immediately decontaminate these affected areas. Eliminate causes of such contamination. Unprotected individuals shall be prohibited from entering contaminated areas until visual inspection determines the areas are free from contamination.
- .5 Notify Departmental Representative of mould contaminated material discovered during work and not apparent from drawings, specifications, or report pertaining to work. Do not disturb such material pending instructions from Departmental Representative.
- .6 Submit Material Safety Data Sheet for biocides and use as recommended by HVAC manufacturer with HVAC components.

### **3.5 REPAIR AND CLEAN-UP**

- .1 Clean, frequently during work and immediately after completion of work, Mould Contaminated Work Area using a HEPA vacuum and/or by damp mopping with cleaning solution.
- .2 Perform restoration of designated Mould Contaminated Work Area as specifies.
- .3 Leave areas dry and visibly free from contamination, debris and dust.
- .4 Perform final thorough clean-up of work areas and adjacent areas affected by work using HEPA vacuum and/or damp mopping with detergent solution.

### **3.6 WASTE DISPOSAL**

- .1 Place dust and mould-containing waste in doubled-bagged dust-tight 0.15 mm clear polyethylene waste bags. Treat drop sheets and disposable protective clothing as waste; fold these items to contain dust, and place in plastic bags. Securely seal bags.
- .2 Clean exterior of each waste-filled bag using damp cloths and cleaning solution or HEPA vacuum prior to removal from Mould Contaminated Work Area.
- .3 Remove waste bags from site and dispose. There are no special requirements for disposal of mouldy materials, as such they can be disposed of in landfill.

### **3.7 RE-ESTABLISHMENT OF OBJECTS AND SYSTEMS**

- .1 Relocate objects moved to temporary locations to their proper positions. Ensure objects are cleaned before been moved into cleaned areas.
- .2 Remount objects removed to former positions.
- .3 Reinstall filters in HVAC system.
- .4 Re-establish mechanical and electrical systems to proper working order.

### **3.8 FINAL CLEARANCE**

- .1 Departmental Representative to conduct thorough visual inspection to detect visible accumulations of dust or bulk materials remaining in work area. Should dust, debris, microbial contamination, or residue be detected repeat cleaning until area meets approval.

**END OF SECTION**