

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 The list of work sections in this division is indicative and non-exhaustive. It does not exclude the works described in the other specification sections, shown in the drawings or necessary for the execution of the works in keeping with overall intent of the plans.
- .2 Section 01 35 43 – Environmental procedures.
- .3 Section 02 65 00 – Removal of storage tanks.

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB).
 - .1 CGSB 51-GP-51M-81, Polyethylene Sheet for Use in Building Construction.
- .2 Transportation and Dangerous Goods Act (1999).
- .3 Canadian Council of Ministers of the Environment (CCME) Documentation.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Equipment Decontamination Pad: submit equipment decontamination pad design to Departmental Representative for review prior to commencing construction.
- .3 Submit documentation verifying that hazardous materials employees have been trained, tested, and certified to safely and effectively carry out their assigned duties.

1.4 REGULATORY REQUIREMENTS

- .1 Provide erosion and sediments control in accordance with section 01 35 43 Environmental protection.
- .2 Comply with federal, provincial, and local anti-pollution laws, ordinances, codes, and regulations when disposing of waste materials, debris, and rubbish.
- .3 Work to meet or exceed minimum requirements established by federal, provincial, and local laws and regulations which are applicable.
 - .1 Contractor : responsible for complying with amendments as they become effective.
- .4 In event that compliance exceeds scope of work or conflicts with specific requirements of contract notify Departmental Representative and Consultant immediately.

1.5 SEQUENCING AND SCHEDULING

- .1 Do not commence Work involving contact with potentially contaminated materials until decontamination facilities are operational and approved by Departmental Representative.

1.6 SOIL STOCKPILING FACILITIES

- .1 Provide, maintain, and operate storage/stockpiling facilities as indicated.
- .2 Install 8 mils thick liner below proposed stockpile locations to prevent contact between stockpile material and ground. Equip facility with tarps capable of covering stockpiled material.

1.7 DUST AND PARTICULATE CONTROL

- .1 Execute Work by methods to minimize raising dust from construction operations.
- .2 Implement and maintain dust and particulate control measures immediately as determined necessary by Departmental Representative and Consultant during construction and in accordance with the current Province regulations.
- .3 Provide positive means to prevent airborne dust from dispersing into atmosphere. Use potable water for water misting system for dust and particulate control.
- .4 As minimum, use appropriate covers on trucks hauling fine or dusty material. Use watertight vehicles to haul wet materials.
- .5 Prevent dust from spreading to adjacent property sites.
- .6 Departmental Representative and Consultant will stop work at any time when Contractor's control of dusts and particulates is inadequate for wind conditions present at site, or when air quality monitoring indicates that release of fugitive dusts and particulates into atmosphere equals or exceeds specified levels.
- .7 If Contractor's dust and particulate control is not sufficient for controlling dusts and particulates into atmosphere, stop work. Contractor must discuss procedures that Contractor proposes to resolve problem. Make necessary changes to operations prior to resuming excavation, handling, processing, or other work that may cause release of dusts or particulates.

1.8 POLLUTION CONTROL

- .1 Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious toxic substances and pollutants produced by construction operations.
- .2 Be prepared to intercept, clean up, and dispose of spills or releases that may occur whether on land or water. Maintain materials and equipment required for cleanup of spills or releases readily accessible on site.
- .3 Promptly report spills and releases potentially causing damage to environment to :
 - .1 Authority having jurisdiction or interest in spill or release including conservation authority, water supply authorities, drainage authority, road authority, and fire department.
 - .2 Owner of pollutant, if known.
 - .3 Person having control over pollutant, if known.
 - .4 Departmental Representative and Consultant.

- .4 Contact manufacturer of pollutant if known and ascertain hazards involved, precautions required, and measures used in cleanup or mitigating action.
- .5 Take immediate action using available resources to contain and mitigate effects on environment and persons from spill or release.
- .6 Provide spill response materials including, containers, adsorbent, shovels, and personal protective equipment. Make spill response materials available at all times in which hazardous materials or wastes are being handled or transported. Spill response materials : compatible with type of material being handled.

1.9 EQUIPMENT DECONTAMINATION

- .1 Commence Work involving equipment contact with potentially contaminated material only after Equipment Decontamination Facility is operational.
- .2 Decontaminate equipment after working in potentially contaminated work areas and prior to subsequent work or travel on clean areas.
- .3 Perform equipment decontamination on Contractor-constructed equipment decontamination pad.
- .4 At minimum, perform following steps during equipment decontamination: mechanically remove packed dirt, grit, and debris by scraping and brushing without using steam or high-pressure water to reduce amount of water needed and to reduce amount of contaminated rinsate generated. Use high-pressure, low-volume, hot water or steam supplemented by detergents or solvents as appropriate and as approved by Departmental Representative and Consultant. Pay particular attention to tire treads, equipment tracks, springs, joints, sprockets, and undercarriages. Scrub surfaces with long handle scrub brushes and cleaning agent. Rinse off and collect cleaning agent. Air dry equipment in Clean Zone before removing from site or travelling on clean areas. Perform assessment as directed by Departmental Representative and Consultant to determine effectiveness of decontamination.
- .5 Maintain inspection record on site which includes : equipment descriptions with identification numbers or license plates; time and date entering decontamination facility; time and date exiting decontamination facility; and name of inspector with comment stating that decontamination was performed and completed.
- .6 Each piece of equipment will be inspected by Departmental Representative and Consultant after decontamination and prior to removal from site and/or travel on clean areas. Departmental Representative and Consultant will have right to require additional decontamination to be completed if deemed necessary.
- .7 Take appropriate measures necessary to minimize drift of mist and spray during decontamination including provision of wind screens.
- .8 Collect and dispose of decontamination wastewaters and sediments which accumulate on equipment decontamination pad according to the current legislations and the current specifications.
- .9 Transfer sediments and waste water to disposal transport vehicle.

- .10 Furnish and equip personnel engaged in equipment decontamination with protective equipment including suitable disposable clothing, respiratory protection, and face shields.
- .11 Have on hand sufficient pumping equipment, of adequate pumping capacity and associated machinery and piping in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment. Maintain piping and connections in good condition and leak-free.

1.10 WATER CONTROL

- .1 Maintain excavations free of water.
- .2 Protect site from puddling or running water. Grade site to drain.
- .3 Prevent surface water runoff from leaving work areas.
- .4 Do not discharge decontaminated water, or surface water runoff, or groundwater which may have come in contact with potentially contaminated material, off site or to municipal sewers.
- .5 Prevent precipitation from infiltrating or from directly running off stockpiled waste materials. Cover stockpiled waste materials with an impermeable liner during periods of work stoppage including at end of each working day and as directed by Departmental Representative and Consultant.
- .6 Direct surface waters that have not contacted potentially contaminated materials to existing surface drainage systems.
- .7 Control surface drainage including ensuring that gutters are kept open, water is not directed across or over pavements or sidewalks except through approved pipes or properly constructed troughs, and runoff from unstabilized areas is intercepted and diverted to suitable outlet.
- .8 Dispose of water in manner not injurious to public health or safety, to property, or to any part of Work completed or under construction.
- .9 Provide, operate, and maintain necessary equipment appropriately sized to keep excavations, staging pads, and other work areas free from water.
- .10 Contain water from stockpiled waste materials. Transfer potentially contaminated surface waters to wastewater storage tanks separate from wastewater from Personnel Hygiene/Decontamination Facility.
- .11 Have on hand sufficient pumping equipment, machinery, and tankage in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment.

1.11 DEWATERING

- .1 Dewater various parts of Work including, without limitation, excavations, structures, foundations, and work areas.
- .2 Employ construction methods, plant procedures, and precautions that ensure Work, including excavations, are stable, free from disturbance, and dry.

- .3 Dewatering Methods : includes sheeting and shoring; groundwater control systems; surface or free water control systems employing ditches, diversions, drains, pipes and/or pumps; and other measures necessary to enable Work to be carried out in dry conditions.
- .4 Provide sufficient and appropriate labor, plant, and equipment necessary to keep Work free of water including standby equipment necessary to ensure continuous operation of dewatering system.
- .5 Take precautions necessary to prevent uplift of structure or pipeline and to protect excavations from flooding and damage due to surface runoff.
- .6 Test and analyze water generated from dewatering activities and treat to meet required discharge or disposal criteria.

1.12 EROSION AND SEDIMENT CONTROL

- .1 Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas, from stockpiles, staging areas, and other work areas. Prevent erosion and sedimentation.
- .2 Minimize amount of bare soil exposed at one time. Stabilize disturbed soils as quickly as practical. Strip vegetation, regrade, or otherwise develop to minimize erosion. Remove accumulated sediment resulting from construction activity from adjoining surfaces, drainage systems, and water courses, and repair damage caused by soil erosion and sedimentation as directed by Departmental Representative.
- .3 Provide and maintain temporary measures which may include, silt fences, hay or straw bales, ditches, geotextiles, drains, berms, terracing, riprap, temporary drainage piping, sedimentation basins, vegetative cover, dikes, and other construction required to prevent erosion and migration of silt, mud, sediment, and other debris off site or to other areas of site where damage might result, or that might otherwise be required by Laws and Regulations. Make sediment control measures available during construction. Place silt fences and/or hay or straw bales in ditches to prevent sediments from escaping from ditch terminations.
- .4 Hay or Straw Bale : wire bound or string tied; securely anchored by at least 2 stakes or rebars driven through bale 300 mm to 450 mm into ground; chinked (filled by wedging) with hay or straw to prevent water from escaping between bales; and entrenched minimum of 100 mm into ground.
- .5 Silt Fence : assembled, ready to install unit consisting of geotextile attached to driveable posts. Geotextile: uniform in texture and appearance, having no defects, flaws, or tears that would affect its physical properties; and contain sufficient ultraviolet ray inhibitor and stabilizers to provide minimum 2-year service life from outdoor exposure.
- .6 Net Backing : industrial polypropylene mesh joined to geotextile at both top and bottom with double stitching of heavy-duty cord, with minimum width of 750 mm.
- .7 Posts : sharpened wood, approximately 50 mm square, protruding below bottom of geotextile to allow minimum 450 mm embedment; post spacing 2.4 m maximum. Securely fasten each post to geotextile and net backing using suitable staples.

- .8 Plan construction procedures to avoid damage to work or equipment encroachment onto water bodies or drainage ditch banks. In event of damage, promptly take action to mitigate effects. Restore affected bank or water body to existing condition.
- .9 Installation :
 - .1 Construct temporary erosion control items as indicated. Actual alignment and/or location of various items as directed by Consultant.
 - .2 Do not construct bale barriers and silt fence in flowing streams or in swales.
 - .3 Check erosion and sediment control measures weekly after each rainfall; during prolonged rainfall check daily.
 - .4 Bales and/or silt fence may be removed at beginning of work day, replace at end of work day.
 - .5 Whenever sedimentation is caused by stripping vegetation, regrading, or other development, remove it from adjoining surfaces, drainage systems, and watercourses, and repair damage as quickly as possible.
 - .6 Prior to or during construction, Departmental Representative may require installation or construction of improvements to prevent or correct temporary conditions on site. Improvements may include berms, mulching, sediment traps, detention and retention basins, grading, planting, retaining walls, culverts, pipes, guardrails, temporary roads, and other measures appropriate to specific condition. Temporary improvements must remain in place and in operation as necessary or until otherwise directed by Departmental Representative.
 - .7 Repair damaged bales, end runs, and undercutting beneath bales.
 - .8 Unless Departmental Representative, remove temporary erosion and sediment control devices upon completion of Work. Spread accumulated sediments to form a suitable surface for seeding or dispose of, and shape area to permit natural drainage to satisfaction of Departmental Representative. Materials once removed become property of Contractor.
 - .9 Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
- .10 Do not disturb existing embankments or embankment protection.
- .11 Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- .12 If soil and debris from site accumulate in low areas, storm sewers, roadways, gutters, ditches, or other areas where in Departmental Representative's determination it is undesirable, remove accumulation and restore area to original condition.

1.13 PROGRESS CLEANING

- .1 Maintain cleanliness of Work and surrounding site to comply with federal, provincial, and local fire and safety laws, ordinances, codes, and regulations.
- .2 Coordinate cleaning operations with disposal operations to prevent accumulation of dust, dirt, debris, rubbish, and waste materials.

1.14 FINAL DECONTAMINATION

- .1 Perform final decontamination of construction facilities, equipment, and materials which may have come in contact with potentially contaminated materials prior to removal from site.
- .2 Perform decontamination as specified to satisfaction of Departmental Representative. Departmental Representative will direct Contractor to perform additional decontamination if required.

1.15 REMOVAL AND DISPOSAL

- .1 Remove surplus materials and temporary facilities from site.
- .2 Dispose of non-contaminated waste materials, litter, debris, and rubbish off site.
- .3 Do not burn or bury rubbish and waste materials on site.
- .4 Do not dispose of volatile or hazardous wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
- .5 Do not discharge wastes into streams or waterways.
- .6 Dispose of following materials at appropriate off-site facility identified by Contractor and approved by Departmental Representative :
 - .1 Debris including excess construction material.
 - .2 Non-contaminated litter and rubbish.
 - .3 Disposable PPE worn during final cleaning.
 - .4 Wastewater removed from wastewater storage tank.
 - .5 Wastewater generated from final decontamination operations including wastewater storage tank cleaning.
 - .6 Lumber from decontamination pads.
- .7 Dispose of materials as directed by Departmental Representative.
- .8 Wastewater sample and analysis : Laboratory will perform sampling and analysis of stored wastewater for disposal purposes prior to removal from site. Results of analyses will determine appropriate methods of disposal. Upon receipt of analytical results, transfer tank contents without spills or release, as directed by Laboratory, to liquid waste tankers or sanitary sewer.

Part 2 Contaminated soil management

2.1 GENERAL

- .1 As mentioned in the annexed environmental characterization study, soils affected by monocyclic aromatic hydrocarbons (MAH), metals and polycyclic aromatic hydrocarbons (PAH) are present at various locations.
- .2 For the entire project, there are around 16 000 metric tons of contaminated materials to be excavated with metal concentrations and/or PAH and or petroleum hydrocarbons C₁₀ to C₅₀ above the CCME criteria. They must be disposed of in a treatment center or a

disposal center authorized by the MDDELCC. Also, there are around 14 000 metric tons of contaminated material to be excavated with metal concentrations and/or PAH and or petroleum hydrocarbons C₁₀ to C₅₀ below the CCME criteria. They can be recovered as backfilling materials or as recycled foundation material (RFM) during construction if the geotechnical material quality allows it, or disposed in an authorized site by the MDDELCC, if those material cannot be recovered on site. The plans show the vertical position and the environmental quality for each sector to be subject to excavation work.

- .3 **Projected Work is not rehabilitation work. Contaminated soil management only applies to trench spoils not for the all contaminated horizons.**
- .4 Contractor must manage spoils according to the existing provincial regulations and **prioritize** the valorization in backfilling materials of contaminated spoils with a lower than « C » generic criteria of the CCME. No compensation will be granted for any delays generated by said soil management during construction.
- .5 The recommendation criteria by the CCME are those for commercial usage.

2.2 SCOPE OF WORK

- .1 During excavation inside the contaminated sectors identified, a Departmental Representative, Consultant or Laboratory, must be present at all times to validate the management of spoils is performed according to the plans and specifications and regulations in force in Quebec. In the event where potentially contaminated water accumulates in the trenches, said water shall be pumped and taken care of by a specialized contractor or managed according to the current Quebec regulations. The same case applies if Contractor performs groundwater lowering operations.
- .2 Spoils with metal concentrations and/or PAH and/or petroleum hydrocarbons C₁₀-C₅₀ above the CCME criteria must be excavated and immediately loaded in trucks for transportation towards a treatment center or an authorized disposal center by the MDDELCC. Contractor shall pay close attention to not mix any contaminated material, those material must be reused in the trenches, with contaminated materials above the CCME criteria which must be disposed outside of the construction site. If that principle is not respected and less contaminated materials are mixed with contaminated materials above the CCME criteria due to negligence or lack of planning and/or coordination, then the cost of transportation and disposal of the contaminated materials that could have been avoided is at the Contractor's expense.

2.3 SPOILS, EXCAVATION AND TEMPORARY STOCKPILING OF CONTAMINATED MATERIALS

- .1 During excavation work, certain precautions shall be taken for safety reasons and quality control of excavated and in place materials. These precautions are intended as additional information as a result of contaminated material excavation in the work area. Excavation work of contaminated materials within the « A-B », « B-C », « > C » and/or « > CCME » ranges must be conducted under supervision of a Laboratory Representative. Particular attention should be paid to excavation operations to prevent any dilution of contaminated material with clean material.
- .2 In the event where contaminated materials are inferior to the CCME criteria and could not be reused immediately as backfilling material for the trenches, then these can be

transported to a temporary stockpiling site located on the construction site. These materials must be stockpiled on a 0.15 mm thick polyethylene membrane, to avoid contact of contaminated materials with underlying soils. This membrane is not required if the stockpile is located on a concrete or asphalt surface. The materials must be covered by a second polyethylene membrane after each work day to prevent infiltration of precipitation and evaporation of volatile compounds.

- .1 Stockpiling areas for contaminated material are only allowed on paved or unpaved surfaces inside the Work area. Contractor shall find, at his expenses, a stockpiling area outside the construction site in the event that the ingress and egress limits do not give enough stockpiling space for the contractor's soil management.

2.4 SOIL AND MATERIAL MANAGEMENT

- .1 Soil management shall be executed based on the management principles summarized in the excavated contaminated soil management grid presented in the Soil Protection and Contaminated Sites Rehabilitation Policy (MDDELCC, 1999 review in 2004). The environmental characterization plan summarizes the environmental quality of spoils for each sector where excavation is to take place.
- .2 Materials with metal concentrations and/or MAH and/or PAH inferior of the generic criteria « A » can be reused without any restrictions and managed as standard spoil.
- .3 Contaminated materials above level « A » as per the MDDELCC and inferior to the CCME criteria must be reused as backfilling material or RFM.
- .4 Contractor must perform an optimal and careful management of contaminated soils below the CCME criteria in order to reuse those materials as backfilling for the trenches. At all times these materials shall be prioritized as backfill in trenches; that is to say that no uncontaminated material can be reused in trenches before all reusable contaminated soils are fully reused in the trenches. If Contractor performs mismanagement of these soils or neglects this aspect, reusable contaminated soils in surplus must be disposed in an authorized treatment center by the MDDELCC at the Contractor's expense.
- .5 Excess materials of « A-B », « B-C » quality and below the CCME criteria shall be transported towards an authorized site by the MDDELCC after the Departmental Representative's approbation. No expenses related to the disposal of such material are authorized prior to the Departmental Representative's authorization.

2.5 ADDITIONAL SOIL CHARACTERIZATION

- .1 For sectors not subject to characterization and on the Departmental Representative's demand, Contractor must perform surveys up to the rock to allow the laboratory to sample the soils encountered.
- .2 At the request of the Departmental Representative and not to slow the excavation, some excavation volumes in which doubts are raised by the Laboratory on the level of soil contamination must be stored temporarily for sampling and characterization. A 72 hours is required to obtain analytical results.

2.6 OUT OF SITE SPOIL TRANSPORTATION

- .1 The carrier with materials having a concentration in metals and/or PAH and/or petroleum hydrocarbons C_{10} - C_{50} above the generic criteria « A » must obtain a transport manifest for each load routed off-site. Transport manifest are obtained from the Laboratory or the City's Representative. The manifest shall contain the following informations :
 - .1 Carrier's name.
 - .2 Vehicle's registration.
 - .3 The date.
 - .4 Departure and arrival time.
 - .5 Loading source.
 - .6 The type of materials (« A-B », « B-C », « > C »).
 - .7 Destination.
 - .8 City or Departmental representative's signature (issuer of the coupon).
 - .9 Disposal center Representative's signature.
- .2 Transport manifest copy distribution :
 - .1 A copy of the manifest is kept on site by the City or Departmental Representative.
 - .2 A copy of the manifest is kept by the disposal center Representative.
 - .3 A copy of the filled out manifest is given the Contractor and the site Supervisor.
 - .4 A copy is kept by the carrier.

2.7 SITE OUTSIDE THE EASEMENT OF THE ARMOURY FOR TEMPORARY STORAGE OF CONTAMINATED SOIL

- .1 Shall the Contractor decides to temporary store excavated contaminated soil on a private terrain outside the Armoury site, Contractor must provide a copie of the agreement signed by the terrain's owner to the Departmental Representative. All applicable measures concerning stockpiling of contaminated soil contained in the present specification as well as the « Règlement sur le stockage et le centres de transfert de sols contaminés » by the MDDELCC must be strictly adhered to. Upon completion of work, a copy of of the receipt of the owner of the land shall be returned to the Ministry Representative.

2.8 PAIEMENT METHOD

- .1 See section 01 29 00 – Paiement, for the method of payment on the management of contaminated soils.

END OF SECTION