



Public Works and Government Services Canada

Requisition No.: EZ897 180850

Buy and Sell ID

No.: _____ Specifications for

First Stage In Situ Remediation

**Muncho Lake Maintenance Camp, KM 698, Alaska
Highway, BC and Fireside Maintenance Camp, KM 839,
Alaska Highway, BC**

Project No. R.016701.006/007 and R.018388.006/007

APPROVED BY:



Regional Manager ES

24/7/2017
Date


Construction Safety Coordinator

31/07/15
Date

TENDER:


Project Manager

2017-07-25
Date

Real Property Services Branch, Professional and Technical Services, Pacific Region

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1. PART 1 - GENERAL

1.1. Measurement Procedures-Base Work

- 1.1.1. Pre-mobilization Submittals will be paid in accordance with lump sum price established for all Preconstruction Meetings, final design, planning, health and safety, and other Submittals in accordance with the Contract or required and accepted by the Departmental Representative as in accordance with the Contract prior to mobilization to Site.
- 1.1.2. Mobilization will be paid in accordance with lump sum price established for mobilizing all necessary equipment, materials, supplies, facilities, and personnel associated with the Works to the Site. Includes initial insurance and permits. Additional insurance and permits due to changes in scope, cost, and schedule as accepted by the Departmental Representative will be included in Contract amendments.
- 1.1.3. Site Preparation will be paid in accordance with lump sum price established to prepare the Sites for planned construction works. Includes utility location and protection. Also includes Preconstruction Precondition Survey.
- 1.1.4. Site Facilities Provision will be paid in accordance with lump sum price established to design, temporarily provide for duration of Work, and erect all infrastructure for Muncho Lake and Fireside Maintenance Camps in accordance with the Contract. Includes temporary structures and facilities, environmental protection, access, onsite roadways, temporary hoarding, security fencing, federal signage, office facilities, sanitary facilities, stormwater management infrastructure, lighting, and utilities.
- 1.1.5. Site Facilities Operation will be paid in accordance with unit rate price established for time to operate and maintain all infrastructure between mobilization and demobilization for Muncho Lake and Fireside Maintenance Camps. Includes temporary structures and facilities, environmental protection, stockpile areas, access, onsite roadways, temporary hoarding, security fencing, federal signage, office facilities, sanitary facilities, stormwater management infrastructure, lighting, and utilities. Also includes ongoing services including project management, security, utilities, project meetings, inspections, progress Submittals, traffic control, health and safety, Environmental Protection and cleaning. Also, includes living out allowances, travel and room and board. Rate must not vary even if hours of work and/or days of work vary. Time will only be paid for duration in accordance with the Contract and changes in schedule as accepted by the Departmental Representative and included in Extension of Time on Contracts.
- 1.1.6. Standby Time will be paid in accordance with unit rate price established, for time when Work is unable to proceed, and that is directly attributable to any neglect or delay that occurs after the date of the Contract on the part of the Departmental Representative in providing any information or in doing any act that the Contract expressly requires of the Departmental Representative. Includes machinery and labour standby costs. Does not include items covered

by Site Facilities Operation. Standby Time may be pro-rated based on hours of work. Make all efforts to minimize impacts due to delays caused by the Departmental Representative, including re-sequencing Work. Provide documentation of a sufficient description of the facts and circumstances of the occurrence to enable the Departmental Representative to determine whether or not the Standby Time is justified. Reviews, sampling, or other work conducted by the Departmental Representative with time allowances in accordance with the Contract will result in no increase to the Contract Amount nor Extension of Time for completion of the Work.

- 1.1.7. Hydrogen Peroxide Storage Area Provision for Muncho Lake Maintenance Camp will be paid in accordance with lump sum price established to design, temporarily provide for duration of Work, and erect all infrastructure for a Hydrogen Peroxide Storage Area at Muncho Lake Maintenance Camp in accordance with the Contract. Includes temporary structures and facilities, environmental protection, access, security fencing, signage, lighting, and utilities.
- 1.1.8. Hydrogen Peroxide Storage Area Provision for Fireside Maintenance Camp will be paid in accordance with lump sum price established to design, temporarily provide for duration of Work, and erect all infrastructure for a Hydrogen Peroxide Storage Area at Fireside Maintenance Camp in accordance with the Contract. Includes temporary structures and facilities, environmental protection, access, security fencing, signage, lighting, and utilities.
- 1.1.9. Emergency Shower and Eye and Face Wash Equipment Provision will be paid in accordance with lump sum price established to design, temporarily provide for duration of Work, and erect all equipment and infrastructure for a Emergency Shower and Eye and Face Wash Equipment at Muncho Lake and Fireside Maintenance Camps in accordance with the Contract. Includes temporary structures and facilities, access, potable water, security fencing, signage, lighting, and utilities.
- 1.1.10. Muncho Lake Radius Of Influence Testing will be paid in accordance with lump sum price established for advancement of probe rods to specified depths at specified locations, subsequent injection of specified volume of the specified concentration of Hydrogen Peroxide, and backfilling of the injection location. Includes supply, delivery, handling, transport, and storage of Hydrogen Peroxide.
- 1.1.11. Muncho Lake Catalyst Injection First Pass will be paid in accordance with lump sum price established for advancement of probe rods to specified depths at specified locations, subsequent injection of specified volume of the specified concentration of Catalyst, and backfilling of the injection location. Includes supply, delivery, handling, transport, and storage of Catalyst.

- 1.1.12. Muncho Lake Hydrogen Peroxide Injection First Pass will be paid in accordance with lump sum price established for advancement of probe rods to specified depths at specified locations, subsequent injection of specified volume of the specified concentration of Hydrogen Peroxide, and backfilling of the injection location. Includes supply, delivery, handling, transport, and storage of Hydrogen Peroxide.
- 1.1.13. Fireside Radius Of Influence Testing will be paid in accordance with lump sum price established for advancement of probe rods to specified depths at the specified location, subsequent injection of specified volume of the specified concentration of Hydrogen Peroxide, and backfilling of injection location. Includes supply, delivery, handling, transport, and storage of Hydrogen Peroxide.
- 1.1.14. Fireside Hydrogen Peroxide Injection will be paid in accordance with lump sum price established for advancement of probe rods to specified depths at specified locations, subsequent injection of specified volume of the specified concentration of Hydrogen Peroxide, and backfilling of the injection locations. Includes supply, delivery, handling, transport, and storage of Hydrogen Peroxide.
- 1.1.15. Muncho Lake Borehole Advancement and Soil Sample Collection After First Pass will be paid in accordance with lump sum price established for advancement of boreholes to specified depths at specified locations, collection of soil cores for inspection and sample collection by the Departmental Representative, and backfilling of boreholes.
- 1.1.16. Fireside Borehole Advancement and Soil Sample Collection will be paid in accordance with lump sum price established for advancement of boreholes to specified depths at specified locations, collection of soil cores for inspection and sample collection by the Departmental Representative, and backfilling of boreholes.
- 1.1.17. Site Restoration will be paid in accordance with the lump sum price established to restore the Site to make suitable for post-Work. Includes removal from Site all temporary facilities and removal of any waste material.
- 1.1.18. Demobilization will be paid in accordance with lump sum price established for demobilizing all equipment and personnel associated with the Works from the Site. Includes decontaminating all equipment prior to removal from Site.
- 1.1.19. Closeout Submittals will be paid in accordance with lump sum price established for Final Site Inspection (for Certificate of Completion purposes), Closeout Meetings, provision of and completion documents as directed by the Departmental Representative.

1.2. Measurement Procedures – Optional Work

- 1.2.1. Muncho Lake Catalyst Injection Second Pass will be paid in accordance with lump sum price established for advancement of probe rods to specified depths at specified locations, subsequent injection of specified volume of the specified concentration of Catalyst, and backfilling of the injection location. Includes supply, delivery, handling, transport, and storage of Catalyst.
- 1.2.2. Muncho Lake Hydrogen Peroxide Injection Second Pass will be paid in accordance with lump sum price established for advancement of probe rods to specified depths at specified locations, subsequent injection of specified volume of the specified concentration of Hydrogen Peroxide, and backfilling of the injection location. Includes supply, delivery, handling, transport, and storage of Hydrogen Peroxide.
- 1.2.3. Muncho Lake Borehole Advancement and Soil Sample Collection After Second Pass will be paid in accordance with lump sum price established for advancement of boreholes to specified depths at specified locations, collection of soil cores for inspection and sample collection by the Departmental Representative, and backfilling of boreholes.
- 1.2.4. Muncho Lake Hydrogen Peroxide Dilution and Injection will be paid in accordance with the day rate established for the dilution and injection of Hydrogen Peroxide when Hydrogen Peroxide injections at a concentration of 17.5% is unable to proceed. Includes machinery and labour costs. Does not include items covered by Item 1.1.5 (Site Facility Operation), Item 1.1.12 (Muncho Lake Hydrogen Peroxide Injection First Pass), or Item 1.2.2 (Muncho Lake Hydrogen Peroxide Injection Second Pass). Time will only be paid for duration in accordance with the Contract and changes in schedule as accepted by the Departmental Representative and included in Extension of Time on Contracts.
- 1.2.5. Mix Water Supply will be paid in accordance with the unit rate price for volume for the the supply and delivery of Mix Water to Muncho Lake as specified for the mixing of Hydrogen Peroxide. Does not include items covered by 1.1.5 (Site Facility Operation), Item 1.1.12 (Muncho Lake Hydrogen Peroxide Injection First Pass), or Item 1.2.2 (Muncho Lake Hydrogen Peroxide Injection Second Pass). Measurement as recorded by flow measuring device approved by the Departmental Representative and results provided to the Departmental Representative.

1.3. Definitions

- 1.3.1. Certificate of Completion: see General Conditions.
- 1.3.2. Change Order: PWGSC form issued by the Departmental Representative to the Contractor as per the relevant Contemplated Change Notice.
- 1.3.3. Soil Samples: soil samples collected by the Departmental Representative to confirm that the remedial objectives for the Work have been met.

- 1.3.4. Contaminated Material: soil, sediment, and other solid material where substances occur at concentrations that: (i) are above background levels and pose, or are likely to pose, an immediate or long-term hazard to human health or the environment, or (ii) exceed the levels specified in policies and regulations. Includes Hazardous Waste and Waste Quality; does not include Non-Contaminated Material or Waste. Relevant regulations, unless otherwise in accordance with the Contract or as directed by the Departmental Representative, include:
 - 1.3.4.1. For all sites: Canadian Council of Ministers of the Environment (CCME) *Canadian Environmental Quality Guidelines* and CCME *Canada-Wide Standards*.
 - 1.3.4.2. For sites in BC: BC *Hazardous Waste Regulations*, BC *Approved Water Quality Guidelines*, BC *Contaminated Sites Regulation*.
- 1.3.5. Contaminated Water: liquid material where substances occur at concentrations that: (i) are above background levels and pose, or are likely to pose, an immediate or long-term hazard to human health or the environment, or (ii) meet or exceed the levels specified in policies and regulations. Includes Hazardous Waste and Waste Quality Water; does not include Non-Contaminated Water or Sewage Wastewater. Relevant regulations, unless otherwise in accordance with the Contract or as directed by the Departmental Representative, include:
 - 1.3.5.1. For all sites: Canadian Council of Ministers of the Environment (CCME) *Canadian Environmental Quality Guidelines* and CCME *Canada-Wide Standards*.
 - 1.3.5.2. For sites in BC: BC *Hazardous Waste Regulations*, BC *Approved Water Quality Guidelines*.
- 1.3.6. Contemplated Change Notice: PWGSC form issued by the Departmental Representative to the Contractor requesting Contractor to provide a quote, which may result in a Change Order.
- 1.3.7. Contract: see General Conditions.
- 1.3.8. Contract Amount: see General Conditions.
- 1.3.9. Contractor: see General Conditions.
- 1.3.10. Departmental Representative: see General Conditions.
- 1.3.11. Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.
- 1.3.12. Environmental Protection: prevention, control, mitigation, and restoration of pollution and habitat or environmental disruption during construction. Control of Environmental Pollution and Damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; vibrations; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

SUMMARY OF WORK

- 1.3.13. Environmental Protection Plan: plan developed by the Contractor to ensure Environmental Protection and prevent Environmental Pollution and Damage identifying all environmental risks and mitigation measures, including: personnel requirements, emergency contacts, Environmental Protection methods, procedures, and equipment, and emergency response including a Spill Control Plan.
- 1.3.14. Extension of Time: see General Conditions.
- 1.3.15. Extension of Time on Contracts: PWGSC form requesting an Extension of Time.
- 1.3.16. Final Completion: see General Conditions.
- 1.3.17. Hazardous Waste: Contaminated Material which meets the regulatory definition of Hazardous Waste.
- 1.3.18. In-Situ Chemical Oxidation is accomplished by injecting or otherwise introducing chemical oxidizers directly into petroleum hydrocarbon impacted soil and/or groundwater to chemically react with the chemical contaminants in place and reduce them to benign compounds.
- 1.3.19. In-Situ Remediation: remediation of Contaminated Material in place at the Sites. Includes any activity that serves to treat and improve the condition of Contaminated Material without excavating or moving from its current extents. Does not include risk assessment or risk management of material onsite. Does not include encapsulation or solidification in place.
- 1.3.20. Land Surveyor: a person working for the Contractor who is a qualified, registered land surveyor licensed to practice in relevant jurisdiction.
- 1.3.21. Landfill Facility: an existing offsite facility located in Canada that is designed, constructed and operated to prevent any pollution from being caused by the facility outside the area of the facility from waste placed in or on land within the facility.
- 1.3.22. Materials Source Separation Program: consists of a series of ongoing activities to separate reusable and recyclable waste into categories from other types of waste at point of generation.
- 1.3.23. Non-Contaminated Material: soil, sediment, and other solid material excavated incidentally which meets the BC *Contaminated Sites Regulation* Schedule 7 Column IV.
- 1.3.24. Non-Contaminated Water: liquids which are suitable for direct discharge to the environment after removal of sediment, and which is not Contaminated Water or Sewage Wastewater. Includes surface runoff, stormwater, and groundwater which has not come into contact with Contaminated Material.
- 1.3.25. On Site Instruction: notices, instructions, or directions issued by the Departmental Representative to the Contractor.
- 1.3.26. On Site Notice: notice or other communication issued by the Contractor to the Departmental Representative.
- 1.3.27. Overburden: Non-Contaminated Material excavated incidentally above Contaminated Material Extents that is not Topsoil or Contaminated Material.
- 1.3.28. Progress Payment: see General Conditions.

SUMMARY OF WORK

- 1.3.29. PWGSC: Public Works and Government Services Canada. Representative of Canada with control of the Site.
- 1.3.30. Qualified Professional: a person working for the Contractor who is registered in relevant jurisdiction with his or her appropriate professional association, acts under that professional association's code of ethics, and is subject to disciplinary action by that professional association, and through suitable education, experience, accreditation and knowledge can be reasonably relied on to provide advice within his or her area of expertise. Includes Geotechnical Engineers and Environmental Consultants.
- 1.3.31. Quote: Contractor's cost estimate issued to the Departmental Representative as per the relevant Contemplated Change Notice via an On Site Notice.
- 1.3.32. Sewage Wastewater: liquid waste which is not suitable for direct discharge to the environment, and which must be either treated offsite or discharged to a sanitary sewer. Includes water from hand basin, shower, personal hygiene facilities, or other liquid waste from sanitary facilities.
- 1.3.33. Site: work area available to Contractor according to Drawings. Does not include shared or public areas, including common roads.
- 1.3.34. Subcontractor: see General Conditions.
- 1.3.35. Submit/Submittals: documents from the Contractor to the Departmental Representative as: required by Contract; stipulated in permit, certificate, approval, or any other form of authorization; by convention or industry practice. Submittals are final only after review and accepted in writing by Departmental Representative.
- 1.3.36. Substantial Performance: see General Conditions.
- 1.3.37. Superintendent: see General Conditions
- 1.3.38. Supplier: see General Conditions.
- 1.3.39. Topsoil: Non-Contaminated Material excavated incidentally above Contaminated Material Extents that is a surface organic layer to facilitate vegetation growth.
- 1.3.40. Transfer/Interim Storage Facility: a facility specifically used to transfer or short term storage Contaminated Material during offsite transport.
- 1.3.41. Treatment Facility: a facility specifically used to treat Contaminated Material. May be Onsite or Offsite. Onsite facility is located on property under PWGSC control, but may be located at a different location than where construction work occurs.
- 1.3.42. Waste: Non-Contaminated Material that is not soil. Includes cleared and grubbed vegetation, litter, rubbish, debris, cobbles, boulders, excess construction material, lumber, steel, plastic, concrete, and asphalt.
- 1.3.43. Waste Quality: soil or other material that is not suitable for industrial, commercial, urban park, residential, agricultural, wildlands or any other land use specified in the *BC Contaminated Sites Regulation*.
- 1.3.44. Waste Reduction Plan: a written report which addresses opportunities for reduction, reuse or recycling of materials.
- 1.3.45. Work: see General Conditions.

1.3.46. Working Day: see General Conditions.

1.4. Action and Informational Submittals

1.4.1. After hours work: at least 5 Working Days prior to commencing after hours work Submit a schedule showing requested dates, times, and reasons for after hours work. Approval will only be granted for reasons valid in the opinion of the Departmental Representative and if request can be reasonably accommodated by other contracts.

1.5. Work Covered by Contract

- 1.5.1. Work under the Contract covers in-situ remediation of contaminated material by injection of hydrogen peroxide and chemicals for the enhancement of the performance of hydrogen peroxide in target areas.
- 1.5.2. Work to be performed under the Contract includes, but is not limited to, the following items covered further in the Contract:
 - 1.5.2.1. Prime Contractor for health and safety and environmental protection at Site.
 - 1.5.2.2. All required design activities to complete Work.
 - 1.5.2.3. Pre-mobilization Submittals.
 - 1.5.2.4. Progress Submittals, including cash flow and forecasting.
 - 1.5.2.5. Prepare Site for Work, including clearing site as required and provision of onsite temporary office facilities for Departmental Representative and consultants.
 - 1.5.2.6. Design, construct and operate a Hydrogen Peroxide storage area at Muncho Lake and Fireside Maintenance Camps.
 - 1.5.2.7. Supply, install, and operate an emergency shower and eye and face wash equipment at Muncho Lake and Fireside Maintenance Camps.
 - 1.5.2.8. Supply and deliver hydrogen peroxide as specified to Muncho Lake and Fireside maintenance camps.
 - 1.5.2.9. Supply and deliver Catalyst as specified to Muncho Lake and Fireside maintenance camps.
 - 1.5.2.10. Complete a first pass direct injection of Hydrogen Peroxide and Catalyst at the specified depths and locations at Muncho Lake.
 - 1.5.2.11. Complete the direct injection of Hydrogen Peroxide at the specified depths and locations at Fireside.
 - 1.5.2.12. Advance boreholes at Muncho Lake for the evaluation of soil conditions following the first pass direct injection of Hydrogen Peroxide.
 - 1.5.2.13. Advance boreholes at Fireside for the evaluation of soil conditions following the direct injection of Hydrogen Peroxide.
 - 1.5.2.14. Transport Contaminated Material, Non-Contaminated Material, or Waste to a Treatment Facility or Landfill Facility as applicable.
 - 1.5.2.15. Restore Site to pre-existing conditions.
 - 1.5.2.16. Closure Submittals.
 - 1.5.2.17. All ancillary activities required to complete Work.

1.5.3. Green Requirements:

- 1.5.3.1. Use only environmentally responsible green materials/products with no Volatile Organic Compounds (VOC) emissions or minimum VOC emissions of indoor off-gassing contaminants for improved indoor air quality – subject of acceptance of Submittal of Materials Safety Data Sheet (MSDS) Product Data.
- 1.5.3.2. Use materials/products containing highest percentage of recycled and recovered materials practicable – consistent with maintaining cost effective satisfactory levels of competition.
- 1.5.3.3. Adhere to waste reduction requirement for reuse or recycling of waste materials, thus diverting materials from Landfill Facility.
- 1.5.4. Work not included in the Contract comprises such work and services specifically listed as:
 - 1.5.4.1. Not Used.

1.6. Optional Work Covered by Contract

- 1.6.1. Optional Work under the Contract covers in-situ remediation of contaminated material by injection of Hydrogen Peroxide and chemicals for the enhancement of the performance of Hydrogen Peroxide in target areas as determined by progress of the first pass direct injection of Hydrogen Peroxide and at the specified depths and locations at Muncho Lake.
- 1.6.2. Optional Work to be performed under the Contract includes, but is not limited to the following items covered further in the Contract:
 - 1.6.2.1. Complete a second pass direct injection of Hydrogen Peroxide and Catalyst at the specified depths and locations at Muncho Lake.
 - 1.6.2.2. Advance boreholes at Muncho Lake for the evaluation of soil conditions following the second pass direct injection of Hydrogen Peroxide.
- 1.6.3. Dilution and injection of Hydrogen Peroxide at Muncho Lake as directed by the Departmental Representative if injection of Hydrogen Peroxide at a concentration of 17.5% is not possible.
- 1.6.4. Supply and deliver Mix Water for the dilution of Hydrogen Peroxide as directed by the Departmental Representative.

1.7. Location

- 1.7.1. The Site locations are shown on Drawings.
- 1.7.2. There is no civic street address or PIN for the Site.

1.8. Project/Site Conditions

- 1.8.1. Work at the Sites involve contact with contaminated materials and the handling of Hydrogen Peroxide and other materials, requiring appropriate health and safety and environmental protection procedures.
- 1.8.2. Complete list of anticipated contaminants and concentration levels on the Site available separately in assessment reports.

1.8.3. Existing condition on the Site identified according to Drawings.

1.9. Sequence Of Work at the Sites

- 1.9.1. Mobilize to Muncho Lake Maintenance Camp and Fireside Maintenance Camps.
- 1.9.2. Prepare Sites for Work, including utilities location, clearing site as required and provision of onsite temporary office facilities for Departmental Representative and consultants.
- 1.9.3. Construct a Hydrogen Peroxide storage area at Muncho Lake and Fireside Maintenance Camps.
- 1.9.4. Set up an emergency shower and eye and face wash equipment at Muncho Lake Maintenance Camp.
- 1.9.5. Supply and deliver Hydrogen Peroxide as specified to Muncho Lake Maintenance Camp.
- 1.9.6. Supply and deliver Catalyst as specified to Muncho Lake Maintenance Camp.
- 1.9.7. Complete a first pass direct injection of Catalyst and Hydrogen Peroxide at the specified depths and locations at Muncho Lake.
- 1.9.8. Set up an emergency shower and eye and face wash equipment at Fireside Maintenance Camp.
- 1.9.9. Complete the direct injection of Hydrogen Peroxide at the specified depths and locations at Fireside.
- 1.9.10. Advance boreholes at Muncho Lake for the evaluation of soil conditions following the first pass direct injection of Hydrogen Peroxide.
- 1.9.11. Set up an emergency shower and eye and face wash equipment at Muncho Lake Maintenance Camp.
- 1.9.12. Complete a second pass direct injection of Catalyst and Hydrogen Peroxide at the specified depths and locations at Muncho Lake.
- 1.9.13. Advance boreholes at Fireside for the evaluation of soil conditions following the direct injection of Hydrogen Peroxide.
- 1.9.14. Restore Fireside Maintenance Camp to pre-existing conditions.
- 1.9.15. Advance boreholes at Muncho Lake for the evaluation of soil conditions following the second pass direct injection of Hydrogen Peroxide.
- 1.9.16. Restore Muncho Lake Maintenance Camp to pre-existing conditions.
- 1.9.17. Demobilize from Muncho Lake Maintenance Camp.

1.10. Other Contracts

- 1.10.1. Other contracts are currently in progress at Site.
- 1.10.2. Other contracts are:
 - 1.10.2.1. Environmental and other consultants.
 - 1.10.2.2. Site users as identified in Contract Documents.
- 1.10.3. Further contracts may be awarded while the Contract is in progress.
- 1.10.4. Cooperate with other contractors in carrying out their respective works and carry out directions from Departmental Representative.



- 1.10.5. Coordinate Work with that of other contractors. If any part of Work under the Contract depends for its proper execution or result upon Work of another contractor, report promptly to Departmental Representative, in writing, any defects which can interfere with proper execution of this Work.

1.11. Products Supplied by the Departmental Representative

- 1.11.1. Not Used.

1.12. Contractor's Use of Site

- 1.12.1. Use of Site:
 - 1.12.1.1. For the sole benefit of Canada.
 - 1.12.1.2. Exclusive and only for completion of the execution of Work.
 - 1.12.1.3. Assume responsibility for assigned premises for performance of this Work.
 - 1.12.1.4. Be responsible for coordination of all Work activities onsite, including the Work of other contractors engaged by the Departmental Representative.
- 1.12.2. There are no pre-existing arrangements for encroachment on the neighbouring properties. Shoring designs accommodating no offsite encroachment, or arrangements for offsite encroachment, are the responsibility of the Contractor.
- 1.12.3. Perform Work in accordance with Contract. Ensure Work is carried out in accordance with schedule accepted by Departmental Representative.
- 1.12.4. Do not unreasonably encumber Site with material or equipment.
- 1.12.5. Accommodate common areas with other Site users, including roadways.
- 1.12.6. Segregate Contractor's work area from common areas to prevent unintentional multiple employer worksite, as required.

1.13. Existing Permits

- 1.13.1. Existing permits are:
 - 1.13.1.1. None

1.14. Schedule Requirements

- 1.14.1. Work to be initiated: within 5 Working Days of Contract Award.
- 1.14.2. Pre-Mobilization Submittals: within 5 Working Days of Contract Award.
- 1.14.3. Mobilization: within 15 Working Days of Contract Award.
- 1.14.4. Site Works: Final Completion no later than November 1st, 2017 .
- 1.14.5. Completion of the Work: no later than November 30th, 2017. Includes all final Submittals including as-built documents, the Certificate of Completion, and the Statutory Declaration at Final Completion.

1.15. Hours of Work

- 1.15.1. Restrictive as follows:
 - 1.15.1.1. Maximum Working Day work hours including travel to and from place of accommodation and Site are 07:00 to 19:00.

1.15.2. Obtain consent from Departmental Representative for all after hours Work,
including and holidays.

1.15.2.1. Proceed only as directed by the Departmental Representative.

1.16. Security Clearances

1.16.1. Not Used.

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

3.1.1. Not Used.

END OF SECTION

GENERAL INSTRUCTIONS

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

- 1.3.1. Utility Locations: Prior to commencing any subsurface disturbance, Submit drawings identifying all utilities on the Site. Update drawings as directed by the Departmental Representative.
- 1.3.2. Breakdown of Lump Sum Prices: at least 5 Working Days prior to submitting the first Progress Payment, Submit a breakdown of the Contract lump sum prices including labour, material and time, in detail as directed by the Departmental Representative and aggregating Contract Amount.
- 1.3.3. Daily Work Records: at the end of each shift Submit daily Work records, during onsite Work. Include:
 - 1.3.3.1. Quantities for each Description of Work identified in the Unit Price Table and Change Orders.
 - 1.3.3.2. Description of Work performed.
 - 1.3.3.3. Current Site conditions.
 - 1.3.3.4. General information including: date, time shift started and ended, Subcontractor(s) onsite, Health and Safety items, and Environmental Protection items.
 - 1.3.3.5. Signature of Superintendent.
- 1.3.4. Cash Flow: with each Progress Payment, Submit a cash flow forecast. Include:
 - 1.3.4.1. Calculation of planned cost versus actual cost and schedule forecasting and cash flow projections on a monthly basis, indicating anticipated value of future Progress Payments, for each Description of Work identified in the Unit Price Table.
 - 1.3.4.2. Progress Payments will not be processed until cash flow has been accepted by the Departmental Representative.
- 1.3.5. Coordination Meeting Minutes and Drawings: at least 5 Working Days prior to relevant Work commencing, Submit final meeting minutes and drawings from coordination with Subcontractors.
- 1.3.6. Quality Management Plan: within 10 Working Days after Contract award, Submit a quality management plan. Include:
 - 1.3.6.1. Details on planned review, inspection and testing to provide Quality Assurance and Quality Control for the Work.
 - 1.3.6.2. Subcontractors responsible for review, inspection and testing.
 - 1.3.6.3. Schedule of submittals of review, inspection and testing results.



GENERAL INSTRUCTIONS

- 1.3.7. Review, Inspection, and Testing Results: within 5 Working Days of receipt, Submit all results of reviews, inspection, and testing performed as part of the Work, including laboratory reports and sampling chains of custody.

1.4. Division of Specifications

- 1.4.1. This specification is subdivided into Divisions and Sections in accordance with the six digit National Master Specifications System.
- 1.4.2. A Division or Section may consist of the Work of more than one Subcontractor. Responsibility for determining which Subcontractor provides the labour, material, equipment and services required to complete the Work rests solely with the Contractor.

1.5. Documents Required

- 1.5.1. Maintain 1 copy each of the following posted at the job Site:
- 1.5.1.1. General Conditions.
 - 1.5.1.2. Drawings.
 - 1.5.1.3. Specifications.
 - 1.5.1.4. Addenda or other modifications to Contract.
 - 1.5.1.5. Change orders.
 - 1.5.1.6. Copy of current Work schedule.
 - 1.5.1.7. Reviewed and final Shop Drawings Submittals.
 - 1.5.1.8. One set of record Shop Drawings and Specifications for “as-built” purposes.
 - 1.5.1.9. Field and laboratory test reports.
 - 1.5.1.10. Reviewed and accepted Submittals.
 - 1.5.1.11. Manufacturers’ installation and application instructions (as appropriate).
 - 1.5.1.12. *National Building Code of Canada* (as appropriate).
 - 1.5.1.13. Current construction standards of workmanship listed in technical Sections (as appropriate).
 - 1.5.1.14. Health and Safety documents, including all daily toolbox meetings, Notice of Project, and utility clearances.
 - 1.5.1.15. Environmental Protection Plan.
 - 1.5.1.16. Quality Management Plan.
 - 1.5.1.17. Final Meeting Minutes, Agendas and associated attachments.
 - 1.5.1.18. Permits and other approvals.

1.6. Setting out of Work

- 1.6.1. Assume full responsibility for and execute complete layout of Work to locations, lines and elevations according to Drawings.
- 1.6.2. Provide devices needed to layout and construct Work.
- 1.6.3. Supply such services and devices in accordance with the Contract to facilitate Departmental Representative’s inspection of Work.

GENERAL INSTRUCTIONS

1.7. Acceptance of Substrates

- 1.7.1. Each trade must examine surfaces prepared by others and job conditions which can affect his work, and must report defects to the Departmental Representative. Commencement of Work will imply acceptance of prepared Work or substrate surfaces.

1.8. Works Coordination

- 1.8.1. Coordinate Work of Subcontractors.
 - 1.8.1.1. Designate one person to be responsible for review of Contract and Shop Drawings and managing coordination of Work.
- 1.8.2. Convene meetings between Subcontractors whose Work interfaces and ensure awareness of areas and extent of interface required.
 - 1.8.2.1. Provide each Subcontractor with complete Drawings and Specifications for Contract as required, to assist them in planning and carrying out their respective work.
 - 1.8.2.2. Develop coordination drawings when required, illustrating potential interference between Work of various trades and distribute to affected parties.
 - 1.8.2.3. Facilitate meeting and review coordination drawings. Ensure Subcontractors agree and sign off on coordination drawings.
 - 1.8.2.4. Publish minutes of each meeting.
 - 1.8.2.5. Submit a copy of coordination drawings and meeting minutes as directed by the Departmental Representative.
- 1.8.3. Submit Shop Drawings and order of prefabricated equipment or rebuilt components as required only after coordination meeting for such items has taken place.
- 1.8.4. Work coordination:
 - 1.8.4.1. Ensure cooperation between trades in order to facilitate general progress of Work and avoid situations of spatial interference.
 - 1.8.4.2. Ensure that each trade provides all other trades reasonable opportunity for Final Completion of Work and in such a way as to prevent unnecessary delays, cutting, patching and removal or replacement of completed Work.
 - 1.8.4.3. Ensure disputes between Subcontractors are resolved.
- 1.8.5. Failure to coordinate Work is responsibility of Contractor.

1.9. Approvals of Shop Drawings, Product Data and Samples

- 1.9.1. Submit as directed by the Departmental Representative the requested Shop Drawings, product data, MSDS sheets and samples in accordance with the Contract.
- 1.9.2. Allow sufficient time for the following:
 - 1.9.2.1. Review of product data.
 - 1.9.2.2. Acceptance of Shop Drawings.
 - 1.9.2.3. Review of re-submission.
 - 1.9.2.4. Ordering of accepted material and/or products.



GENERAL INSTRUCTIONS

1.10. Relics and Antiquities

- 1.10.1. See General Conditions.

1.11. Additional Drawings

- 1.11.1. The Departmental Representative may furnish additional Drawings for clarification. These additional Drawings have the same meaning and intent as if they were included with Drawings referred to in the Contract.
- 1.11.2. Upon request, Departmental Representative may furnish up to a maximum of 2 sets of Drawings for use by the Contractor at no additional cost. Should more than 2 sets of documents be required the Departmental Representative will provide them at additional cost.

1.12. Record Keeping

- 1.12.1. On Site Instruction: Contractual correspondence from the Departmental Representative to the Contractor. Does not include Contemplated Change Notices, Change Orders, and Extension of Time on Contracts. Sequentially numbered On Site Instructions. Include cross references to applicable On Site Notifications. The status of the Contractor, including the function of Prime Contractor, must not change by reason of any On Site Instructions.
- 1.12.2. On Site Notifications: Contractual correspondence from Contractor to the Departmental Representative. Includes Submittals. Does not include Quotes, and Extension Of Time On Contracts. Must be as a sequentially numbered On Site Notifications. Include cross references to applicable On Site Instructions. The status of the Contractor, including the function of Prime Contractor, must not change by reason of any On Site Notifications.
- 1.12.3. Maintain adequate records to support information provided to Departmental Representative.
- 1.12.4. Maintain asbestos waste shipment records or other Hazardous Waste Manifests for minimum of 3 years from date of shipment or longer period required by applicable law or regulation.
- 1.12.5. Maintain bills of lading for minimum of 300 Working Days from date of shipment or longer period required by applicable law or regulation.

1.13. Change Documents

- 1.13.1. Change Documents do not relieve Contractor of any obligation.
- 1.13.2. Change Documents do not change the Contractor's responsibility for sequencing, methods and means.
- 1.13.3. Change Documents do not change by any reason the status of the Contractor, including the function of Prime Contractor or as supervisor.
- 1.13.4. Change Documents include:
 - 1.13.4.1. Change Order: There may be a change to the Contract Amount by reason of any Change Order. No Extension of Time for completion of the Work by reason of any Change Order.



GENERAL INSTRUCTIONS

- 1.13.4.2. Contemplated Change Notice: No increase to the Contract Amount by reason of any Contemplated Change Notice. No Extension of Time for completion of the Work by reason of any Contemplated Change Notice.
- 1.13.4.3. Extension of Time on Contracts: No increase to the Contract Amount by reason of any Extension of Time on Contracts. There may be an Extension of Time for completion of the Work by reason of an Extension of Time on Contracts.
- 1.13.4.4. Quote: No increase to the Contract Amount by reason of any Quote. No Extension of Time for completion of the Work by reason of any Quote. The status of the Contractor, including the function of Prime Contractor, must not change by reason of any Quote.

1.14. System of Measurement

- 1.14.1. The metric system of measurement (SI) will be employed on the Contract.

2. PART 2 - PRODUCTS

2.1. Not Used

- 2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

- 3.1.1. Not Used.

END OF SECTION

PROJECT MEETINGS

1. PART 1 - GENERAL

1.1. Measurement Procedures

- 1.1.1. See 01 11 00.

1.2. Definitions

- 1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

- 1.3.1. Preconstruction Meeting Minutes: within 2 Working Days of the Preconstruction Meeting, Submit meeting minutes.
- 1.3.2. Progress Meeting Minutes: within 2 Working Days of a Progress Meeting, Submit meeting minutes. Submit revised minutes within 2 Working Days of receiving comments by Departmental Representative.
- 1.3.3. Information for Progress Meetings: at least 2 Working Days prior to scheduled Progress Meetings, Submit all information in accordance with the Contract for Progress Meetings. Include:
- 1.3.3.1. Agenda for the proposed Progress Meeting.
- 1.3.3.2. Updated Project Schedule.
- 1.3.3.3. Copies of transport manifests and disposal receipts for all materials removed from Site.
- 1.3.3.4. Other information as directed by the Departmental Representative or relevant to agenda for upcoming progress meeting.
- 1.3.4. Final Site Inspection: within 2 Working Days of the Final Site Inspection, Submit meeting minutes.
- 1.3.5. Closeout Meetings: within 2 Working Days of the Closeout Meeting, Submit meeting minutes.

1.4. Administrative

- 1.4.1. Schedule and administer project meetings throughout the progress of the Work weekly and at the call of the Departmental Representative.
- 1.4.2. Prepare agenda for meetings.
- 1.4.3. Submit written notice with agenda of each meeting 2 Working Days in advance of meeting date as directed by the Departmental Representative.
- 1.4.4. Provide physical space and make arrangements for meetings, or arrange for teleconference meetings, as directed by Departmental Representative.
- 1.4.5. Preside at meetings.
- 1.4.6. Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- 1.4.7. Maintain records of meeting minutes for a minimum of 2 years after Work is completed.

PROJECT MEETINGS

- 1.4.8. Representative of Contractor, Subcontractor(s) and Supplier(s) attending meetings must be qualified and authorized to act on behalf of party each represents.

1.5. Preconstruction Meeting

- 1.5.1. Within 5 Working Days after award of Contract, request a meeting of parties in Contract to discuss and resolve administrative procedures and responsibilities.
- 1.5.2. Departmental Representative, Contractor, Superintendent, major Subcontractor(s), field inspectors and supervisors must be in attendance.
- 1.5.3. Establish time and location of meeting subject to approval by Departmental Representative and notify parties concerned at least 3 Working Days before meeting.
- 1.5.4. Agenda to include:
- 1.5.4.1. Appointment of official representative of participants in the Work, including Contractor's Superintendent and Departmental Representative.
- 1.5.4.2. Schedule of Work.
- 1.5.4.3. Schedule of Submittals.
- 1.5.4.4. Requirements for temporary facilities.
- 1.5.4.5. Site security.
- 1.5.4.6. Change orders, procedures, approvals required, administrative requirements.
- 1.5.4.7. Monthly Progress Payments, administrative procedures, hold backs.
- 1.5.4.8. Appointment of inspection and testing agencies or firms.
- 1.5.4.9. List of Subcontractor(s).

1.6. Progress Meetings

- 1.6.1. During course of Work schedule progress meetings weekly subject to approval by Departmental Representative.
- 1.6.2. Contractor, Superintendent, major Subcontractor(s) involved in Work, and Departmental Representative are to be in attendance.
- 1.6.3. Agenda to include:
- 1.6.3.1. Review and acceptance of minutes of previous meeting.
- 1.6.3.2. Review health and safety, including incidents, near misses, and corrective measures.
- 1.6.3.3. Review Environmental Protection, including incidents, near misses, and corrective measures.
- 1.6.3.4. Review contractual compliance.
- 1.6.3.5. Review regulatory compliance.
- 1.6.3.6. Review communications, problems or concerns with community.
- 1.6.3.7. Review of Work progress since previous meeting.
- 1.6.3.8. Field observations, problems, conflicts.
- 1.6.3.9. Updated progress schedule detailing activities planned over next 2 week period. Include review of progress with respect to previously established dates for starting and stopping various stages of Work.

PROJECT MEETINGS

- 1.6.3.10. Problems which impede construction schedule.
- 1.6.3.11. Corrective measures and procedures to regain projected schedule.
- 1.6.3.12. Revision to construction schedule.
- 1.6.3.13. Progress schedule, during succeeding Work period.
- 1.6.3.14. Review submittal schedules: expedite as required.
- 1.6.3.15. Maintenance of quality standards.
- 1.6.3.16. Quantities of material transported, treated, and disposed.
- 1.6.3.17. Review proposed changes for effect on construction schedule and on Final Completion date.
- 1.6.3.18. Other business.
- 1.6.4. Submit draft Progress Meeting Minutes for review and comment by Departmental Representative. Incorporate comments into final Progress Meeting Minutes.

1.7. Toolbox Meetings

- 1.7.1. During the course of the Work, schedule daily toolbox meetings at the start of each Work shift. Multiple meetings are required if the Contractor works multiple shifts within a 24-hour period.
- 1.7.2. All on Site workers to attend, including Contractor, Superintendent, major Subcontractor(s), and environmental consultants. Departmental Representative may attend.
- 1.7.3. Agenda to include:
 - 1.7.3.1. Planned Work activities and environmental considerations for that shift.
 - 1.7.3.2. Coordination activities required between Contractor, Subcontractor(s), Departmental Representative, and other contractor(s) including environmental consultant.
 - 1.7.3.3. Health and Safety items.
 - 1.7.3.4. Environmental Protection items.

1.8. Final Site Inspection

- 1.8.1. Within 5 Working Days of completion of Site Works but prior to Demobilization, request a meeting on Site to review the Site.
- 1.8.2. Departmental Representative, Contractor, Superintendent, major Subcontractor(s), field inspectors and supervisors must be in attendance.
- 1.8.3. Establish time and location of meeting subject to approval by Departmental Representative and notify parties concerned at least 3 Working Days before meeting.
- 1.8.4. Agenda to include:
 - 1.8.4.1. Inspect removal of all temporary equipment, materials, supplies, and facilities.
 - 1.8.4.2. Inspect final surface grades.
 - 1.8.4.3. Inspect final vegetation.
 - 1.8.4.4. Inspect permanent facilities for performance and damage.

PROJECT MEETINGS

- 1.8.4.5. Document all damage, deficiencies, missing items, and non-conformance.
- 1.8.5. If required, and in the opinion of the Departmental Representative, perform another Final Site Inspection after resolving all documented damage, deficiencies, missing items, and non-conformance.

1.9. Closeout Meeting

- 1.9.1. Within 10 Working Days of completion of the Work, request a meeting to review the project.
- 1.9.2. Departmental Representative, Contractor, Superintendent, major Subcontractor(s), field inspectors and supervisors must be in attendance.
- 1.9.3. Establish time and location of meeting subject to approval by Departmental Representative and notify parties concerned at least 3 Working Days before meeting.
- 1.9.4. Agenda to include:
 - 1.9.4.1. Review Certificate of Completion.
 - 1.9.4.2. Review final payment.
 - 1.9.4.3. Identify lessons learned.
 - 1.9.4.4. Perform Contractor Performance Evaluation Report Form.

2. PART 2 - PRODUCTS

2.1. Not Used

- 2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

- 3.1.1. Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

- 1.3.1. Schedule: within 5 Working Days after Contract award, Submit a Master Plan.
- 1.3.2. Schedule of Interruption of Services: at least 5 Working Days prior to any shutdown or closure of active utilities or facilities Submit a schedule identifying type of service and dates of shutdown or closure.
- 1.3.3. Project Schedule and Updates: with Progress Payment, Submit a Project Schedule updated as appropriate. Progress Payment submission is incomplete without an updated Project Schedule acceptable to Departmental Representative.

1.4. Requirements

- 1.4.1. Ensure Master Plan and detail Project Schedules are practical and remain within specified Contract duration.
- 1.4.2. Plan to complete Work in accordance with prescribed milestones and time frame.
- 1.4.3. Limit activity durations to maximum of approximately 10 Working Days, to allow for progress reporting.
- 1.4.4. Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.
- 1.4.5. Include Work sequencing description and schedule:
 - 1.4.5.1. Work Sequencing description must describe sequence, methods and means to perform each major task.
 - 1.4.5.2. Work Sequencing schedule must show on a Gantt chart, start, end and dependencies of each major task and also indicates Work to be performed in sequence and in parallel.
 - 1.4.5.3. Major tasks includes all items identified on Unit Price Table.

1.5. Master Plan

- 1.5.1. Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- 1.5.2. Departmental Representative will review and return revised schedules within 5 Working Days.
- 1.5.3. Revise impractical schedule and resubmit within 5 Working Days.
- 1.5.4. Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.6. Project Schedule

- 1.6.1. Develop detailed Project Schedule derived from Master Plan.
- 1.6.2. Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - 1.6.2.1. Dates of commencement and completion of Work for each Description of Work identified on the Unit Price Table.
 - 1.6.2.2. Dates of Submittals including Shop Drawings, product data, MSDS sheets and samples.
 - 1.6.2.3. Dates of inspection and testing.
 - 1.6.2.4. Final Completion date within the time period in accordance with the Contract, including Amendments.

1.7. Project Schedule Reporting

- 1.7.1. Update Project Schedule on monthly basis reflecting activity changes and completions, as well as activities in progress.
- 1.7.2. Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.8. Project Meetings

- 1.8.1. Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
- 1.8.2. Weather related delays with their remedial measures will be discussed and negotiated

2. PART 2 - PRODUCTS

2.1. Not Used

- 2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

- 3.1.1. Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Shop Drawings: at least 5 Working Days prior to commencing applicable Work, Submit Shop Drawings signed by a Qualified Professional.

1.4. General

- 1.4.1. Submission details to be commensurate for type of Work and Site conditions. Details depend on Work performed and Contractor's sequence, methods and means.
- 1.4.2. This section specifies general requirements and procedures for the Contractor's Submittals of Shop Drawings, product data, samples and other submittals in accordance with the Contract to Departmental Representative. Additional specific requirements for Submittals are identified in individual technical sections.
- 1.4.3. Present Shop Drawings, product data and samples in SI Metric units.
- 1.4.4. Where items or information is not produced in SI Metric units, converted values are acceptable.
- 1.4.5. Contractor's responsibility for errors and omissions in Submittals is not relieved by the Departmental Representative's review of Submittals.
- 1.4.6. Notify Departmental Representative in writing at time of Submittals, identifying deviations from requirements of Contract and stating reasons for deviations.
- 1.4.7. Contractor's responsibility for deviations in Submittals from requirements of Contract is not relieved by the Departmental Representative's review of Submittals unless Departmental Representative gives written acceptance of specific deviations.
- 1.4.8. Make any changes in Submittals which Departmental Representative requires to be in accordance with the Contract and resubmit as directed by the Departmental Representative.
- 1.4.9. Notify Departmental Representative in writing, when resubmitting, of any revisions other than those directed by the Departmental Representative.
- 1.4.10. Do not proceed with Work until relevant Submittals are finalized and have been accepted.
- 1.4.11. Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to Submit in ample time is responsibility of Contractor.

SUBMITTAL PROCEDURES

- 1.4.12. Review Submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each Submittal has been checked and coordinated with requirements of Work and Contract. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- 1.4.13. Verify field measurements and affected adjacent Work are coordinated.
- 1.4.14. Adjustments made on Submittals by the Departmental Representative will not result in an increase the Contract Amount nor an Extension of Time for completion of the Work. If adjustments result in an increase to the Contract Amount or an Extension of Time for completion of the Work, notify Departmental Representative and receive approval prior to proceeding with Work.
- 1.4.15. Keep one final copy of each Submittal onsite.

1.5. Submission Requirements

- 1.5.1. Coordinate each Submittal with the requirements of the Work and the Contract. Individual Submittals will not be reviewed until:
 - 1.5.1.1. Submittals are complete.
 - 1.5.1.2. All related information is available.
- 1.5.2. Allow 10 Working Days for Departmental Representative's review of each Submittal, unless otherwise specified.
- 1.5.3. All Submittals are to be sent to Departmental Representative in duplicate as a hardcopy and in electronic format compatible with Departmental Representative's software.
- 1.5.4. Accompany Submittals with On Site Notification:
 - 1.5.4.1. Date.
 - 1.5.4.2. Project title and number.
 - 1.5.4.3. Contractor's name and address.
 - 1.5.4.4. Identification and quantity of each Shop Drawing, product data and sample.
 - 1.5.4.5. Other pertinent data.
- 1.5.5. Submittals must include:
 - 1.5.5.1. Date and revision dates.
 - 1.5.5.2. Project title and number.
 - 1.5.5.3. Name and address of:
 - 1.5.5.3.1. Subcontractor.
 - 1.5.5.3.2. Supplier.
 - 1.5.5.3.3. Manufacturer.
 - 1.5.5.4. Signature of Superintendent, certifying approval of Submittals, verification of field measurements and in accordance with the Contract.
 - 1.5.5.5. Qualified Professional to sign and seal Submittals in accordance with the Contract. Submittals to include at a minimum 1 hard copy of original ink sealed document.
 - 1.5.5.6. Details of appropriate portions of Work as applicable.

1.6. Shop Drawings

- 1.6.1. Shop Drawings are designs, drawings, figures, diagrams, illustrations, schedules, performance charts, brochures and other data intended to illustrate details of a portion of the Work which are provided by the Qualified Professional of record.
- 1.6.2. Maximum sheet size: ANSI E (864 x 1118 mm).
- 1.6.3. Submit, as directed by the Departmental Representative, electronic and 2 hard copies of Shop Drawings for each requirement requested in the specification sections and/or as directed by the Departmental Representative.
- 1.6.4. Cross-reference Shop Drawing information to applicable portions of the Contract.
- 1.6.5. Qualified Professional to sign and seal each individual Shop Drawing.
- 1.6.6. Qualified Professional to sign and seal final Shop Drawings and submit as directed by the Departmental Representative upon Final Completion of the construction project. Final Shop Drawings are prepared by a Qualified Professional to reflect design changes made during the construction or installation. Final Shop Drawings are intended to incorporate addenda, change orders and other significant design changes, but not necessarily Site directions.
- 1.6.7. Shop Drawings must include:
 - 1.6.7.1. The original date of issue.
 - 1.6.7.2. The dates of all applicable revisions.
 - 1.6.7.3. The project title.
 - 1.6.7.4. The project address.
 - 1.6.7.5. The project number.
 - 1.6.7.6. Wherever applicable, the name(s) of the: Contractor, Subcontractor(s), Supplier(s), manufacturers, and separate detailers.
 - 1.6.7.7. The sequence number for each Shop Drawing.
 - 1.6.7.8. Identifications of all products and materials.
 - 1.6.7.9. Relation to adjacent structures or materials.
 - 1.6.7.10. Clearly identified field dimensions.
 - 1.6.7.11. Applicable standards.

1.7. Shop Drawings Review

- 1.7.1. Departmental Representative's review of Shop Drawings is to determine if Shop Drawings are consistent with the general intent of the Contract and are in accordance with the Contract.
- 1.7.2. This review will not mean that Departmental Representative approves the detail design inherent in the Shop Drawings, responsibility for which will remain with Contractor submitting same.
- 1.7.3. This review will not relieve the Contractor of responsibility for errors or omissions in the Shop Drawings or of responsibility for meeting all requirements of the Contract.
- 1.7.4. Without restricting the generality of the foregoing, be responsible for:
 - 1.7.4.1. Dimensions to be confirmed and correlated at the Site.

- 1.7.4.2. Information that pertains solely to fabrication processes or to techniques of construction and installation.
- 1.7.4.3. Coordination of the Work of all sub-trades.

2. PART 2 - PRODUCTS

2.1. Not Used

- 2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

- 3.1.1. Not Used.

END OF SECTION

SPECIAL PROCEDURES FOR TRAFFIC CONTROL

4. PART 1 - GENERAL

4.1. Measurement Procedures

4.1.1. See 01 11 00.

4.2. Definitions

4.2.1. See 01 11 00.

4.3. Action and Informational Submittals

4.3.1. List of Signs and Devices: within 5 Working Days after Contract award and prior to mobilization to Site Submit a list of signs and other devices required for the project.

4.4. Protection of Public Traffic

- 4.4.1. Comply with requirements of acts, regulations and bylaws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.
- 4.4.2. Comply with current version of BC Ministry of Transportation and Infrastructure *Traffic Control Manual for Work on Roadways*.
- 4.4.3. Provide and maintain road access and egress to property fronting Site and in other areas in accordance with the Contract, except where other means of road access exist that are accepted.

4.5. Informational and Warning Devices

- 4.5.1. Provide and maintain signs, flashing warning lights, and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Work which requires road user response.
- 4.5.2. Supply and erect signs, delineators, barricades and miscellaneous warning devices to comply with current version of BC Ministry of Transportation and Infrastructure *Traffic Control Manual for Work on Roadways*.
- 4.5.3. Place signs and other devices in locations recommended in current version of BC Ministry of Transportation and Infrastructure *Traffic Control Manual for Work on Roadways*.
- 4.5.4. Meet with Departmental Representative prior to commencement of Work to prepare list of signs and other devices required for project. If situation onsite changes, revise list for approval.
- 4.5.5. Continually maintain traffic control devices in use:
 - 4.5.5.1. Check signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.
 - 4.5.5.2. Remove or cover signs which do not apply to conditions existing from day to day.

SPECIAL PROCEDURES FOR TRAFFIC CONTROL

4.6. Control of Public Traffic

- 4.6.1. Provide competent flag personnel, trained in accordance with, and properly equipped to, current version of BC Ministry of Transportation and Infrastructure *Traffic Control Manual for Work on Roadways* for situations as follows:
 - 4.6.1.1. When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.
 - 4.6.1.2. In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.

4.7. Operational Requirements

- 4.7.1. Maintain existing conditions for traffic throughout period of Contract except that, when required for construction in accordance with the Contract and when measures have been taken in accordance with the Contract and accepted by Departmental Representative to protect and control public traffic, existing conditions for traffic to be restricted as follows:
 - 4.7.1.1. Maintain existing conditions for traffic crossing right-of-way.

5. PART 2 - PRODUCTS

5.1. Not Used

- 5.1.1. Not Used.

6. PART 3 - EXECUTION

6.1. Not Used

- 6.1.1. Not Used.

END OF SECTION

SPECIAL PROJECT PROCEDURES FOR CONTAMINATED SITES

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

- 1.3.1. Contaminated Material and Non-Contaminated Material Management Plan: within 5 Working Days after Contract award and prior to mobilization to Site, Submit plan detailing management of Contaminated Material and Non-Contaminated Material. Include:
- 1.3.1.1. Sequence, methods and means to ensure different categories of waste are segregated.
 - 1.3.1.2. Sequence, methods and means to transport and store Contaminated Material and Non-Contaminated Material onsite.
 - 1.3.1.3. Sequence, methods and means to transport Contaminated Material and Non-Contaminated Material offsite. Include name, vehicle type, and licenses of transporters. For all transfer stations and interim storage facilities include name of facility; location of facility; copy of valid and subsisting permit, certificate, approval, or other required form of authorization issued by a Facility Regulator for the facility; and evidence of compliance with municipal zoning and bylaws of facility.
- 1.3.2. Transport Manifests: within 5 Working Days of offsite transport, Submit documentation verifying that material has been transported appropriately. Include:
- 1.3.2.1. Method of transport.
 - 1.3.2.2. Name of transport company.
 - 1.3.2.3. Weigh scale receipt including location, date, and weight of loading, as appropriate.
 - 1.3.2.4. Weigh scale receipt including location, date, and weight of unloading.

1.4. Sequencing and Scheduling

- 1.4.1. Commence Work involving contact with Contaminated or potentially Contaminated Material or Wastewater after all applicable Environmental Protection procedures (including those identified in Contaminated Material and Non-Contaminated Material Management Plan and Environmental Protection Plan) and facilities (including those identified in Site Layout) are operational and accepted by Departmental Representative.
- 1.4.2. Plan work sequencing and traffic patterns to prevent contamination of clean areas due to traffic or debris.

SPECIAL PROJECT PROCEDURES FOR CONTAMINATED SITES

1.5. Equipment Decontamination Facility

- 1.5.1. Prior to commencing Work involving equipment contact with potentially Contaminated Material, construct equipment decontamination facilities to accommodate the largest potentially contaminated equipment onsite.
- 1.5.2. Collect and contain equipment decontamination wastewater and sediment. Transfer collected wastewater and sediment to treatment facilities accepted by Departmental Representative.

1.6. Personnel Decontamination Facility

- 1.6.1. Provide an area or areas close to the workers' changing facilities to enable workers and other personnel leaving areas such as exclusion area to remove deleterious and contaminated materials from boots, clothing and skin surfaces.
- 1.6.2. Be responsible for ensuring that all materials, chemicals, protective clothing, wash water and deleterious materials are collected, treated and disposed of in accordance with applicable environmental standards and regulations.
- 1.6.3. Personnel Decontamination Facility to be available for use by persons other than the Contractor's workers and Subcontractors, including federal employees, other contractor(s), and environmental agencies. Provide use of facilities to other persons.

1.7. Equipment Decontamination

- 1.7.1. 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.
- 1.7.2. If required, as directed by the Departmental Representative, use high-pressure, low-volume, hot water or steam supplemented by detergents or solvents as appropriate. Pay particular attention to tooling, casing, and probe rods. Scrub surfaces with long handle scrub brushes and cleaning agent. Rinse off and collect cleaning agent. Air dry equipment in clean area before removing from Site or travelling on clean areas. Perform assessment as directed by the Departmental Representative to determine effectiveness of decontamination.
 - 1.7.2.1. Take appropriate measures necessary to minimize drift of mist and spray during decontamination including provision of wind screens.
 - 1.7.2.2. Collect decontamination wastewater and sediment which accumulate in decontamination location. Treat collected wastewater as Contaminated Water. Manage decontamination sediment as Hazardous Waste.
- 1.7.3. In the opinion of the Departmental Representative, each piece of equipment must be inspected by the Departmental Representative after decontamination and prior to travel on clean areas or demobilization from Site. Perform additional decontamination as required in the opinion of the Departmental Representative.

SPECIAL PROJECT PROCEDURES FOR CONTAMINATED SITES

- 1.7.4. Furnish and equip personnel engaged in equipment decontamination with protective equipment including suitable disposable clothing, respiratory protection, and face shields.

1.8. Progress Decontamination

- 1.8.1. Decontaminate equipment after working in potentially contaminated Work areas and prior to subsequent Work or travel on clean areas.

1.9. Final Decontamination

- 1.9.1. Perform final decontamination of construction facilities, equipment, and materials which may have come in contact with potentially Contaminated Material prior to demobilization from Site.

1.10. Drums

- 1.10.1. Storage of liquid waste: 200 L steel drums meeting Transportation and Dangerous Goods Act, closable lids, complete with labels for marking contents and date filled.
- 1.10.2. Storage of solid waste: 200 L steel drums meeting Transportation and Dangerous Goods Act, closable lids, complete with labels for marking contents and date filled.

1.11. Contaminated Material Management

- 1.11.1. Remove all Contaminated Material within Work areas in accordance with the Contract and as directed by the Departmental Representative.
- 1.11.2. Minimize generation of Contaminated Material to greatest extent practicable. Take necessary precautions to avoid mixing during handling, loading, and transport of Non-Contaminated Material with Contaminated Material, and Waste Quality with Hazardous Waste.
- 1.11.3. Segregate, excavate, handle, stockpile, load, unload, haul, interim storage, treat, and dispose Contaminated Material separately into the following classifications in accordance with the Contract or as directed by the Departmental Representative based on field observations, field measurements, and/or ex-situ characterization:
 - 1.11.3.1. Hazardous Waste
 - 1.11.3.2. Waste Quality
- 1.11.4. Material characterization additional to information provided in Contract required by transport, Treatment Facility or Disposal Facility responsibility of Contractor.

SPECIAL PROJECT PROCEDURES FOR CONTAMINATED SITES

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

3.1.1. Not Used.

END OF SECTION

HEALTH AND SAFETY FOR CONTAMINATED SITES

1. PART 1 - GENERAL

1.1. Measurement Procedures

- 1.1.1. See 01 11 00.

1.2. Definitions

- 1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

- 1.3.1. Submit to Departmental Representative Submittals listed for review.
- 1.3.2. Work affected by Submittal must not proceed until review is complete.
- 1.3.3. Submit the following:
 - 1.3.3.1. Health and Safety Plan.
 - 1.3.3.2. Copies of reports or directions issued by federal and provincial health and safety inspectors.
 - 1.3.3.3. Copies of incident and accident reports.
 - 1.3.3.4. Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
 - 1.3.3.5. Emergency Procedures.
 - 1.3.3.6. Notice of Project.
- 1.3.4. The Departmental Representative will review the Contractor's site-specific project Health and Safety Plan and emergency procedures, and provide comments to the Contractor within 5 Working Days after receipt of the plan.
- 1.3.5. If changes are required, revise the plan as appropriate and resubmit to Departmental Representative within 5 Working Days.
- 1.3.6. Submittal of the Health and Safety Plan, and any revised version, to the Departmental Representative is for information and reference purposes only. It will not:
 - 1.3.6.1. Be construed to imply approval by the Departmental Representative.
 - 1.3.6.2. Be interpreted as a warranty of being complete, accurate and legislatively compliant.
 - 1.3.6.3. Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

1.4. References

- 1.4.1. Government of Canada:
 - 1.4.1.1. Canada Labour Code - Part II.
 - 1.4.1.2. Canada Occupational Health and Safety Regulations.
- 1.4.2. National Building Code of Canada (NBC):
 - 1.4.2.1. Part 8, Safety Measures at Construction and Demolition Sites.
- 1.4.3. Canadian Standards Association (CSA) as amended:
 - 1.4.3.1. CSA Z797-2009 Code of Practice for Access Scaffold.



HEALTH AND SAFETY FOR CONTAMINATED SITES

- 1.4.3.2. CSA S269.1-1975 (R2003) Falsework for Construction Purposes.
- 1.4.3.3. CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures.
- 1.4.4. National Fire Code of Canada 2010 (as amended):
 - 1.4.4.1. Part 5 – Hazardous Processes and Operations and Division B as applicable and required.
 - 1.4.4.2. FCC No. 302, Standard for Welding and Cutting.
- 1.4.5. American National Standards Institute (ANSI):
 - 1.4.5.1. ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.
- 1.4.6. Province of British Columbia:
 - 1.4.6.1. Workers Compensation Act Part 3-Occupational Health and Safety.
 - 1.4.6.2. Occupational Health and Safety Regulation.
- 1.4.7. Transportation of Dangerous Goods Act:
 - 1.4.7.1. Transportation of Dangerous Goods Regulations.

1.5. Regulatory Requirements

- 1.5.1. Comply with codes, acts, bylaws, standards and regulations applicable to the performance of the Work in accordance with the Contract to ensure safe operations at the Sites.
- 1.5.2. In event of conflict between any provision of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Departmental Representative will direct on the course of action to be followed.

1.6. Worker's Coverage

- 1.6.1. Comply fully with the relevant Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the Final Completion of the Work.
- 1.6.2. Maintain Workers coverage as required by relevant acts and regulations during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

1.7. Compliance with Regulations

- 1.7.1. PWGSC may terminate the Contract without liability to PWGSC where the Contractor, in the opinion of PWGSC, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.
- 1.7.2. It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the Work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

HEALTH AND SAFETY FOR CONTAMINATED SITES

1.8. Responsibility

- 1.8.1. Assume responsibility as the Prime Contractor for Work under this Contract.
- 1.8.1.1. Be responsible for health and safety of persons onsite, safety of property onsite and for protection of persons adjacent to Site and environment to extent that they may be affected by conduct of Work.
- 1.8.1.2. Comply with and enforce compliance by employees with safety requirements of Contract, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.9. Health and Safety Coordinator

- 1.9.1. The Health and Safety Coordinator must:
 - 1.9.1.1. Be responsible for completing all health and safety training, and ensuring that personnel that do not successfully complete the required training are not permitted to enter the Site to perform Work.
 - 1.9.1.2. Be responsible for implementing, daily enforcing, and monitoring the site-specific Health and Safety Plan.
 - 1.9.1.3. Be on Site during execution of Work.

1.10. General Conditions

- 1.10.1. Provide safety barricades and lights around Site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.
- 1.10.2. Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the Site:
 - 1.10.2.1. Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.

1.11. Project/Site Conditions

- 1.11.1. Work at Site will involve contact with contaminants identified in Specifications and environmental reports.

1.12. Work Permits

- 1.12.1. Obtain specialty permits related to project before start of Work.

1.13. Filing of Notice

- 1.13.1. The Prime Contractor is to complete and submit a Notice of Project as required by Provincial or Territorial authorities.
- 1.13.2. Provide copies of all notices to the Departmental Representative.

HEALTH AND SAFETY FOR CONTAMINATED SITES

1.14. Health and Safety Plan

- 1.14.1. Conduct a site-specific hazard assessment based on review of Contract, required Work, and project Site. Identify any known and potential health risks and safety hazards.
- 1.14.2. Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:
 - 1.14.2.1. Primary requirements:
 - 1.14.2.1.1. Contractor's safety policy.
 - 1.14.2.1.2. Identification of applicable compliance obligations.
 - 1.14.2.1.3. Definition of responsibilities for project safety/organization chart for project.
 - 1.14.2.1.4. General safety rules for project.
 - 1.14.2.1.5. Job-specific safe work, procedures.
 - 1.14.2.1.6. Inspection policy and procedures.
 - 1.14.2.1.7. Incident reporting and investigation policy and procedures.
 - 1.14.2.1.8. Occupational Health and Safety Committee/Representative procedures.
 - 1.14.2.1.9. Occupational Health and Safety meetings.
 - 1.14.2.1.10. Occupational Health and Safety communications and record keeping procedures.
 - 1.14.2.2. Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the Work.
 - 1.14.2.3. List hazardous materials to be brought onsite as required by Work.
 - 1.14.2.4. Indicate engineering and administrative control measures to be implemented at the Site for managing identified risks and hazards.
 - 1.14.2.5. Identify personal protective equipment (PPE) to be used by workers.
 - 1.14.2.6. Identify personnel and alternates responsible for site safety and health.
 - 1.14.2.7. Identify personnel training requirements and training plan, including site orientation for new workers.
- 1.14.3. Develop the plan in collaboration with all Subcontractors. Ensure that work/activities of Subcontractors are included in the hazard assessment and are reflected in the plan.
- 1.14.4. Revise and update Health and Safety Plan as required, and re-submit to the Departmental Representative.
- 1.14.5. Departmental Representative's review: the review of Health and Safety Plan by Public Service and Procurement Canada (PWGSC) will not relieve the Contractor of responsibility for errors or omissions in final Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract.

HEALTH AND SAFETY FOR CONTAMINATED SITES

1.15. Emergency Procedures

- 1.15.1. List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (ie names/telephone numbers) of:
 - 1.15.1.1. Designated personnel from own company.
 - 1.15.1.2. Regulatory agencies applicable to Work and as per legislated regulations.
 - 1.15.1.3. Local emergency resources.
 - 1.15.1.4. Departmental Representative and site staff.
- 1.15.2. Include the following provisions in the emergency procedures:
 - 1.15.2.1. Notify workers and the first-aid attendant, of the nature and location of the emergency.
 - 1.15.2.2. Evacuate all workers safely.
 - 1.15.2.3. Check and confirm the safe evacuation of all workers.
 - 1.15.2.4. Notify the fire department or other emergency responders.
 - 1.15.2.5. Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.
 - 1.15.2.6. Notify Departmental Representative and Site staff.
- 1.15.3. Provide written rescue/evacuation procedures as required for, but not limited to:
 - 1.15.3.1. Work at high angles.
 - 1.15.3.2. Work in confined spaces or where there is a risk of entrapment.
 - 1.15.3.3. Work with hazardous substances.
 - 1.15.3.4. Underground work.
 - 1.15.3.5. Work on, over, under and adjacent to water.
 - 1.15.3.6. Workplaces where there are persons who require physical assistance to be moved.
- 1.15.4. Design and mark emergency exit routes to provide quick and unimpeded exit.
- 1.15.5. Revise and update emergency procedures as required, and re-submit to the Departmental Representative.

1.16. Hazardous Products

- 1.16.1. Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials, and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to the Departmental Representative and in accordance with the Canada Labour Code.
- 1.16.2. Where use of hazardous and toxic products cannot be avoided:
 - 1.16.2.1. Notify Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS documents as required.
 - 1.16.2.2. As required, in conjunction with Departmental Representative, schedule to carry out Work during "off hours" when tenants have left the building.
 - 1.16.2.3. Provide adequate means of ventilation as required.

HEALTH AND SAFETY FOR CONTAMINATED SITES

1.17. Unforeseen Hazards

- 1.17.1. Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of the Work, immediately stop Work and notify the Departmental Representative verbally and in writing.

1.18. Posted Documents

- 1.18.1. Post legible versions of the following documents onsite:
 - 1.18.1.1. Health and Safety Plan.
 - 1.18.1.2. Sequence of Work.
 - 1.18.1.3. Emergency procedures.
 - 1.18.1.4. Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.
 - 1.18.1.5. Notice of Project.
 - 1.18.1.6. Floor plans or Site plans.
 - 1.18.1.7. Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the Site for review by employees and workers.
 - 1.18.1.8. Workplace Hazardous Materials Information System (WHMIS) documents.
 - 1.18.1.9. Material Safety Data Sheets (MSDS).
 - 1.18.1.10. List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.
- 1.18.2. Post all Material Safety Data Sheets (MSDS) onsite, in a common area, visible to all workers and in locations accessible to tenants when Work of this Contract includes construction activities adjacent to occupied areas.
- 1.18.3. Postings should be protected from the weather, and visible from the street or the exterior of the principal construction site shelter provided for workers and equipment, or as accepted by the Departmental Representative.

1.19. Meetings

- 1.19.1. Attend health and safety preconstruction meeting and all subsequent meetings called by the Departmental Representative.
- 1.19.2. Ensure all site personnel attend a health and safety toolbox meeting at the beginning of each shift, which must include:
 - 1.19.2.1. Sign-in of all attendees.
 - 1.19.2.2. Planned Work activities and environmental considerations for that shift.
 - 1.19.2.3. Hazards associated with these Work activities, including environmental hazards (eg potential for hypothermia, heat exhaustion, heat stroke).
 - 1.19.2.4. Appropriate job-specific safe work procedures.
 - 1.19.2.5. Required personal protective equipment (PPE).
 - 1.19.2.6. Appropriate emergency procedures.
 - 1.19.2.7. Review recent accidents on Site, including near misses.
- 1.19.3. Retain records of all health and safety meetings onsite during Work, and retain as corporate records for a minimum of 7 years after Work is completed.

HEALTH AND SAFETY FOR CONTAMINATED SITES

1.20. Correction of Non-Compliance

- 1.20.1. Immediately address health and safety non-compliance issues identified by the Departmental Representative.
- 1.20.2. Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.
- 1.20.3. The Departmental Representative may issue a "stop work order" if non-compliance of health and safety regulations is not corrected immediately or within posted time.
- 1.20.4. Correct non-compliance.

1.21. Hazardous Occurrence Investigation and Reporting

- 1.21.1. Hazard includes:
 - 1.21.1.1. Any source of potential damage, harm or adverse effects on life, health, property or environment at work. It refers to any biological, chemical, ergonomic, physical, psychosocial and safety factor that is reasonably likely to cause harm or damage to humans, other organisms, or the environment in the absence of its control. Sometimes a hazard is referred to as being the actual harm or the health effect it caused rather than the hazard. For example the disease tuberculosis might be called a hazard by some but in general the tuberculosis-causing bacteria would be considered the "hazard" or "hazardous biological agent". Exposure to tuberculosis would be the hazardous incident. For types of Hazards refer to Annex 3 of the Standard on Hazard Prevention Program.
- 1.21.2. Hazardous Occurrence includes:
 - 1.21.2.1. An event occurring at a PWGSC managed building or worksite, or through the course of an employee's work that results in, or has the potential to result in, a fatality, injury, illness, exposure to a hazardous substance or property damage or an escapement of a hazardous material. For the purpose of investigating, recording and reporting hazardous occurrences, the following are included under this term: disabling injuries, minor injuries and near-misses.
- 1.21.3. Hazardous Occurrence Investigation and Reporting Procedures:
 - 1.21.3.1. Includes information regarding the person involved and the basic circumstances surrounding the hazardous occurrence.
 - 1.21.3.2. Provides a detailed and thorough description of the hazardous occurrence and the sequence of events.
 - 1.21.3.3. Indicates corrective measures that have been taken since the occurrence.
 - 1.21.3.4. Requires the appointment of a qualified investigator.
 - 1.21.3.5. Provides recommendations for additional corrective measures, if required.
- 1.21.4. Fatal or Serious Accidents Procedures:
 - 1.21.4.1. Call emergency number to advise the police organization having jurisdiction to secure the scene and investigate the matter.

HEALTH AND SAFETY FOR CONTAMINATED SITES

- 1.21.4.2. Advise the Departmental Representative of the fatality or serious accident within 1 hour.
- 1.21.4.3. No investigation will be conducted at the scene until the police service having jurisdiction has released the scene.
- 1.21.4.4. No person shall, unless authorized to do so, remove or in any way interfere with or disturb any wreckage, article or thing related to the incident except to the extent necessary to: save a life, prevent injury or relieve human suffering in the vicinity; maintain an essential public service; or prevent unnecessary damage to or loss of property.

1.22. Utility Clearance

- 1.22.1. Contractor is solely responsible for utility clearance.
- 1.22.2. Contractor will not rely upon Drawings or other information provided with utility locations.

1.23. Personal Protective Equipment Program

- 1.23.1. Submit Personal Protective Equipment (PPE) program to the Departmental Representative addressing:
 - 1.23.1.1. Donning and doffing procedures.
 - 1.23.1.2. PPE selection based upon Site hazards.
 - 1.23.1.3. PPE use and limitations of equipment.
 - 1.23.1.4. Work mission duration, PPE maintenance and storage.
 - 1.23.1.5. PPE decontamination and disposal.
 - 1.23.1.6. PPE inspection procedures prior to, during, and after use.
 - 1.23.1.7. Evaluation of effectiveness of PPE program, and limitations during temperature extremes, and other appropriate medical considerations.
 - 1.23.1.8. Medical surveillance requirements for personnel assigned to work at Site.
 - 1.23.1.9. Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment.
 - 1.23.1.10. Site control measures employed at Site including site map, site work zones, use of 'buddy system', site communications including site security, alerting means for emergencies, standard operating procedures or safe work practices, and identification of nearest medical assistance.
 - 1.23.1.11. Decontamination procedures for both personnel and equipment.
 - 1.23.1.12. Emergency response requirements addressing: pre-emergency planning, personnel roles, lines of authority and communication, emergency recognition and prevention, safe distances and places of refuge, site security and control, evacuation routes and procedures, decontamination procedures not covered under decontamination section, emergency medical treatment and first aid, emergency alerting and response procedures, critique of response and follow-up, PPE and emergency equipment, site topography, layout, prevailing

HEALTH AND SAFETY FOR CONTAMINATED SITES

weather conditions, and procedures for reporting incidents to local, provincial, or federal agencies.

- 1.23.1.13. Written respiratory protection program for project activities.
- 1.23.1.14. Procedures dealing with heat and/or cold stress.
- 1.23.1.15. Spill containment program if waste material is generated, excavated, stored, or managed onsite.

1.24. Offsite Contingency and Emergency Response Plan

- 1.24.1. Prior to commencing Work involving handling of hazardous materials, develop offsite Contingency and Emergency Response Plan.
- 1.24.2. Plan must provide immediate response to serious site occurrence such as explosion, fire, or migration of significant quantities of toxic or hazardous material from Site.

1.25. Personnel Health, Safety, and Hygiene

- 1.25.1. Training: ensure personnel entering Site are trained in accordance with specified personnel training requirements. Training session must be completed by Health and Safety Officer.
- 1.25.2. Levels of Protection: establish levels of protection for each Work area based on planned activity and location of activity.
- 1.25.3. Personal Protective Equipment:
 - 1.25.3.1. Furnish site personnel with appropriate PPE as specified above. Ensure that safety equipment and protective clothing is kept clean and maintained.
- 1.25.4. Develop protective equipment usage procedures and ensure that procedures are strictly followed by site personnel; include following procedures as minimum:
 - 1.25.4.1. Ensure prescription eyeglasses worn are safety glasses.
 - 1.25.4.2. Ensure footwear is steel-toed safety shoes or boots.
 - 1.25.4.3. Dispose of or decontaminate PPE worn onsite at end of each workday.
 - 1.25.4.4. Decontaminate reusable PPE before reissuing.
 - 1.25.4.5. Ensure site personnel have passed respirator fit test prior to entering potentially contaminated work areas.
 - 1.25.4.6. Ensure facial hair does not interfere with proper respirator fit.
- 1.25.5. Respiratory Protection:
 - 1.25.5.1. Provide site personnel with extensive training in usage and limitations of, and qualitative fit testing for, air purifying and supplied-air respirators in accordance with specified regulations.
 - 1.25.5.2. Develop, implement, and maintain respirator program.
 - 1.25.5.3. Monitor, evaluate, and provide respiratory protection for site personnel.
 - 1.25.5.4. Ensure levels of protection as listed have been chosen consistent with site-specific potential airborne hazards associated with major contaminants identified onsite.

HEALTH AND SAFETY FOR CONTAMINATED SITES

- 1.25.5.5. In absence of additional air monitoring information or substance identification, retain an industrial hygiene specialist to determine minimum levels of respiratory protection required.
- 1.25.5.6. Immediately notify Departmental Representative when level of respiratory protection required increases.
- 1.25.5.7. Ensure appropriate respiratory protection during Work activities. As minimum requirement, ensure that persons entering potentially contaminated work areas are supplied with and use appropriate respiratory protection.
- 1.25.6. Heat Stress/Cold Stress: implement heat stress or cold stress monitoring program as applicable and include in site-specific Health and Safety Plan.
- 1.25.7. Personnel Hygiene and Personnel Decontamination Procedures. Provide minimum as follows:
 - 1.25.7.1. Suitable containers for storage and disposal of used disposable PPE.
 - 1.25.7.2. Potable water and suitable sanitation facility.
- 1.25.8. Emergency and First-Aid Equipment:
 - 1.25.8.1. Locate and maintain emergency and first-aid equipment in appropriate location onsite including first-aid kit to accommodate number of site personnel; portable emergency eye wash; two 9 kg ABC type dry chemical fire extinguishers.
- 1.25.9. Site Communications:
 - 1.25.9.1. Identify, supply and implement appropriate dedicated communication devices for Site and post emergency numbers near dedicated devices.
 - 1.25.9.2. Ensure personnel use of "buddy" system and develop hand signal system appropriate for site activities.
 - 1.25.9.3. Provide employee alarm system to notify employees of site emergency situations or to stop Work activities if necessary.
 - 1.25.9.4. Furnish selected personnel with 2-way radios.
 - 1.25.9.5. Safety Meetings: conduct mandatory daily safety meetings for personnel, and additionally as required by special or Work-related conditions; include refresher training for existing equipment and protocols, review ongoing safety issues and protocols, and examine new site conditions as encountered. Hold additional safety meetings on as-needed basis.

HEALTH AND SAFETY FOR CONTAMINATED SITES

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

3.1.1. Not Used.

END OF SECTION

ENVIRONMENTAL PROCEDURES

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

- 1.3.1. Environmental Protection Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit a plan detailing protection of the environment. Include as necessary:
 - 1.3.1.1. Comprehensive overview of known or potential environmental issues to be addressed during Work.
 - 1.3.1.2. Identify requirements that plan complies with. Includes: permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract.
 - 1.3.1.3. Names and qualifications of persons responsible for ensuring adherence to Environmental Protection Plan.
 - 1.3.1.4. Names and qualifications of persons responsible for manifesting material to be removed from Site.
 - 1.3.1.5. Names and qualifications of persons responsible for training Site personnel.
 - 1.3.1.6. Description of Environmental Protection personnel training program.
 - 1.3.1.7. Work Area Plan showing proposed activity in each portion of areas, such as exclusion zone(s), decontamination zone(s) and clean zone(s), and identifying areas of limited use or non-use. Ensure plan includes measures for marking limits of use areas and methods for protection of features to be preserved within authorized Work areas.
 - 1.3.1.8. Drawings showing locations of proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials onsite.
 - 1.3.1.9. Historical, Archaeological, Cultural Resources, Biological Resources and Wetlands Plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands. Include procedures if previously unknown historical, archaeological, cultural, and biological resources are discovered during Work.
 - 1.3.1.10. Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Ensure plans include measures to prevent mud transported onto public roads by vehicles or runoff, and mitigation measures if mud is transported onto public roads by vehicles or runoff. Vehicles and vehicle traffic must comply with all federal, provincial, and municipal laws and regulations.



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- 1.3.1.11. Contamination Prevention Plan identifying hazardous, deleterious or regulated substances to be used onsite; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with federal, provincial, and municipal laws and regulations for storage and handling of these materials.
- 1.3.1.12. Spill Control Plan including procedures, instructions, and reports to be used in event of spill of hazardous, deleterious or regulated substances. Identify locations and contents of spill kits.
- 1.3.1.13. Communications Plan identifying emergency contact list and conditions for implementing emergency contact. Emergency contact to include: Contractor emergency response team including Superintendent; Departmental Representative and alternate, and other contractor(s) and individuals as directed by the Departmental Representative; and federal, provincial, and municipal emergency contacts.
- 1.3.1.14. Air Pollution Control Plan detailing provisions to assure that contaminants, dust, debris, materials, and trash, are contained onsite. Include procedures, in accordance with the Contract, if air pollution does not comply with appropriate levels, there are public complaints, or if onsite or offsite damage occurs.
- 1.3.1.15. Non-Contaminated Material Disposal Plan identifying methods and locations for solid waste disposal including clearing waste. Include name, location, provincial or territorial authorizations, and evidence of compliance with municipal zoning and bylaws of Landfill Facility.
- 1.3.1.16. Wastewater Management Plan identifying methods and procedures for management and discharge of Contaminated and Non-Contaminated Water including surface waters and wastewater which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of groundwater, disinfection water, hydrostatic test water, and water used in flushing of lines. Include method of treatment and disposal.
- 1.3.1.17. Wastewater Disposal Plan identifying methods and locations for solid waste disposal including clearing waste. Include name, location, provincial or territorial authorizations, and evidence of compliance with Municipal zoning and bylaws of Disposal Facility and/or copy of municipal permit to discharge to sewer system
- 1.3.1.18. Erosion and Sediment Control Plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, federal, provincial, and municipal laws and regulations.
- 1.3.2. Pollution Control Procedures Modification: immediately when pollution control procedures are inadequate, as directed by the Departmental Representative, Submit modified procedures to resolve problem.

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- 1.3.3. Pollution Control Remediation: immediately when soil, sediment or water contaminated by Contractor's activities are inadequate as directed by the Departmental Representative, Submit remediation procedures.
- 1.3.4. Dust and Particulate Control Procedures Modification: immediately when dust and particulate control measures are inadequate as directed by the Departmental Representative, Submit modified procedures to resolve problem.

1.4. Fires

- 1.4.1. Fires and burning of rubbish onsite not permitted.

1.5. Cleaning

- 1.5.1. Maintain cleanliness of Work and surrounding Site to comply with federal, provincial, and municipal fire and safety laws, ordinances, codes, and regulations applicable to the performance of the Work.
- 1.5.2. Coordinate cleaning operations with disposal operations to prevent accumulation of dust, dirt, debris, rubbish, and waste materials.
- 1.5.3. Ensure cleanup of the Work areas each day after Final Completion of Work.

1.6. Site Clearing and Plant Protection

- 1.6.1. Minimize stripping of Topsoil and vegetation.
- 1.6.2. Restrict tree and plant removal to areas in accordance with the Contract or as directed by the Departmental Representative. Protect all other trees and plants onsite and offsite.

1.7. Vibration

- 1.7.1. Maintain acceptable vibration levels not injurious to public health or safety, to the environment, to onsite or offsite property, or to any part of Work completed or under construction.

1.8. Noise

- 1.8.1. Maintain acceptable noise levels not injurious to public health or safety or to the environment.

1.9. Maintenance of Public Roads

- 1.9.1. Prevent tracking or spilling of debris or material onto public roads.
- 1.9.2. Immediately sweep or scrape up debris or material on public roads.
- 1.9.3. Clean public roads within a 200 m radius of the Site entrance at least once per shift.

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1.10. Pollution Control

- 1.10.1. Pollution includes spills or other releases from Contractor's activities that could potentially contaminate soil, sediment, water, and atmosphere from discharge of hazardous, deleterious or regulated substances, including from equipment and material handling.
- 1.10.2. Provide sequence, methods and means, and facilities to prevent spills or releases.
 - 1.10.2.1. Maintain temporary erosion and pollution control features.
 - 1.10.2.2. Do not store fuel onsite other than tanks forming part of the equipment.
 - 1.10.2.3. Control emissions from equipment and plant to meet applicable authorities' emission requirements.
 - 1.10.2.4. Contractor to regularly inspect all machinery on the Site to ensure it is in good repair and free of leaks.
- 1.10.3. Inadequate procedures:
 - 1.10.3.1. Stop relevant Work if procedures are inadequate to prevent spills or other releases, or when monitoring indicates that release equals or exceeds regulated or levels in accordance with the Contract.
 - 1.10.3.2. Submit procedures proposed to resolve problem.
 - 1.10.3.3. Make necessary changes to operations prior to resuming excavation, handling, processing, or other Work that can cause spills or other releases.
 - 1.10.3.4. Departmental Representative can stop relevant Work at any time when Contractor's Work procedures are inadequate to prevent spills or other releases, or when monitoring indicates that release equals or exceeds regulated quantities or levels in accordance with the Contract. Do not proceed with stopped Work until corrections accepted by Departmental Representative.
- 1.10.4. Be prepared to intercept, cleanup, and dispose of spills or other releases that can occur whether on land or water.
- 1.10.5. Spill kits and containment are to be maintained onsite and ready for deployment in the event of spills or other releases.
 - 1.10.5.1. Spill kits are to include sufficient quantities of absorbent material, containers, booms, shovels and other tools, and personal protective equipment.
 - 1.10.5.2. Spill response materials must be compatible with type of equipment being used or type of material being handled.
 - 1.10.5.3. Spill kits are to be in close proximity to machinery.
 - 1.10.5.4. During the Work there are to be trained and qualified personnel available that are ready to deploy spill kits when necessary.
- 1.10.6. Take immediate action using available resources to contain and mitigate effects on environment and persons from spill or release.
- 1.10.7. Promptly report spills and releases potentially causing damage to environment to:
 - 1.10.7.1. Authority having jurisdiction or interest in spill or other release including conservation authority, water supply authorities, drainage authority, road authority, and fire department.
 - 1.10.7.2. Contractor emergency response team including Superintendent

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- 1.10.7.3. Departmental Representative and other contractor(s) and individuals as directed by the Departmental Representative.
- 1.10.8. Departmental Representative can collect samples for chemical analyses prior to, during, and upon Final Completion of Work to monitor potential pollution caused by Contractor's activities. Assist Departmental Representative in collection of samples.
- 1.10.9. Remediation of soil, sediment or water contaminated by Contractor's activities.
- 1.10.9.1. Remediate all soil, sediment or water contaminated by Contractor's activities associated with the Work onsite and offsite.
- 1.10.9.2. Remediation includes excavation, pumping, testing, transport, treatment and disposal as appropriate for the type of contamination incurred, and at a minimum in accordance with the Contract.
- 1.10.9.3. Submit procedures for remediating soil, sediment or water contaminated by Contractor's activities.
- 1.10.9.4. Remediate as directed by the Departmental Representative.
- 1.10.9.5. Contractor is responsible for any additional investigation, testing, and assessments required as acceptable to the Departmental Representative.

1.11. Dust and Particulate Control

- 1.11.1. Execute Work by methods to minimize raising dust from construction operations.
- 1.11.2. Prevent fugitive dust from the Site from interfering with onsite and offsite uses.
- 1.11.3. Prevent dust from spreading to neighbouring properties.
- 1.11.4. Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads, excavations, and stockpiles.
- 1.11.5. Implement and maintain dust and particulate control measures immediately as directed by the Departmental Representative during Work and in accordance with regulations and in accordance with the Contract.
- 1.11.6. Provide positive means to prevent airborne dust from dispersing into atmosphere. Use fresh (non-saline) water for dust and particulate control.
- 1.11.7. As minimum, use appropriate covers on vehicles, including trucks, barges, and trains, hauling fine or dusty material. Use watertight vehicles to haul wet materials.
- 1.11.8. Inadequate procedures:
 - 1.11.8.1. Stop relevant Work if dust and particulate control is not sufficient for controlling dusts and particulates into atmosphere, or when monitoring indicates that dust or particulate levels equal or exceed regulated or levels in accordance with the Contract.
 - 1.11.8.2. Submit procedures proposed to resolve problem.
 - 1.11.8.3. Make necessary changes to operations prior to resuming excavation, handling, processing, or other Work that can cause release of dusts or particulates.

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- 1.11.8.4. Departmental Representative can stop relevant Work at any time when Contractor's Work procedures are inadequate to prevent release of dusts or particulates, or when monitoring indicates that dust or particulate levels equal or exceed regulated or levels in accordance with the Contract. Do not proceed with stopped Work until corrections accepted by Departmental Representative.

1.12. Non-Contaminated Material Removal

- 1.12.1. Remove all Non-Contaminated Material within Work areas in accordance with the Contract and as directed by the Departmental Representative.
- 1.12.2. Remove surplus materials and temporary facilities from Site.
- 1.12.3. Dispose waste offsite.
- 1.12.4. Do not burn or bury any waste onsite.
- 1.12.5. Do not discharge wastes into streams or waterways.
- 1.12.6. Do not dispose of volatile or hazardous materials such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

1.13. Sewage Wastewater

- 1.13.1. Store Sewage Wastewater from toilet facilities with wastewater from handbasins, and/or showers, for ultimate disposal.
- 1.13.2. Provide, operate, and maintain Sewage Wastewater storage tanks to store Sewage Wastewater.
- 1.13.3. Transport and dispose of Sewage Wastewater at a Disposal Facility, or discharge to municipal sanitary sewer system in compliance with Municipal requirements, as accepted by Departmental Representative.
- 1.13.4. Discharges: comply with applicable discharge limitations and requirements; do not discharge Sewage Wastewater to Site sewer systems that do not conform to or are in violation of such limitations or requirements; and obtain approval prior to discharge of Sewage Wastewater.

1.14. Wastewater Control

- 1.14.1. Dewater various parts of Work including, without limitation, structures, foundations, and Work areas.
- 1.14.2. Employ construction methods, plant procedures, and precautions that ensure Work, are stable, free from disturbance, and dry.
- 1.14.3. Direct surface waters that have not contacted potentially Contaminated Materials to surface drainage systems.
- 1.14.4. Control surface drainage including ensuring that gutters are kept open, wastewater is not allowed across or over pavements or sidewalks except through accepted pipes or properly constructed troughs, and runoff from unstabilized areas is intercepted and diverted to suitable outlet.

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1.15. Non-Contaminated Water Disposal

- 1.15.1. Dispose of Non-Contaminated Water in manner not injurious to public health or safety, to the environment, to onsite or offsite property, or to any part of Work completed or under construction.
- 1.15.2. Control disposal or runoff of Non-Contaminated Water containing suspended materials or other harmful substances in accordance with local authority requirements.
- 1.15.3. Ensure pumped Non-Contaminated Water into waterways, sewer or drainage systems is free of suspended materials. Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, watercourses, or drainage areas.
- 1.15.4. Obtain permits to discharge Non-Contaminated Water to environment or Municipal sewers.
- 1.15.5. Do not discharge water which may have come in contact with potentially Contaminated Material or otherwise be Contaminated directly offsite to the environment or to municipal sewers.

1.16. Erosion and Sediment Control

- 1.16.1. 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.
- 1.16.2. Minimize amount of bare soil or sediment exposed at one time. Stabilize disturbed soil or sediment 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 the Departmental Representative.
- 1.16.3. Provide and maintain temporary erosion and sediment control measures.
 - 1.16.3.1. Temporary erosion and sediment control measures are required to prevent erosion and migration of silt, mud, sediment, and other debris offsite or to other areas of Site where damage might result, or that might otherwise be required by laws and regulations.
 - 1.16.3.2. Temporary erosion and sediment control measures include: silt fences, hay or straw bales, ditches, geotextiles, drains, berms, terracing, riprap, temporary drainage piping, vegetative cover, dikes, mulching, sediment traps, detention and retention basins, grading, planting, retaining walls, culverts, pipes, guardrails, temporary roads, and other measures appropriate to specific condition.
 - 1.16.3.3. Temporary improvements must remain in place and in operation as necessary or until otherwise directed by the Departmental Representative
 - 1.16.3.4. Place silt fences and/or hay or straw bales in ditches to prevent sediment from escaping from ditch terminations.
 - 1.16.3.5. Do not construct bale barriers and silt fence in flowing streams or in swales.

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- 1.16.3.6. Check erosion and sediment control measures weekly after each rainfall; during prolonged rainfall check daily.
- 1.16.3.7. Bales and/or silt fence can be removed at beginning of Working Day, replace at end of Working Day.
- 1.16.3.8. Repair damaged bales, end runs, and undercutting beneath bales.
- 1.16.3.9. Unless directed by the Departmental Representative, remove temporary erosion and sediment control devices upon Final Completion of Work. Temporary erosion and sediment control devices once removed become property of Contractor.
- 1.16.4. 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.
- 1.16.5. Construct fill areas to prevent erosion.
- 1.16.6. Do not disturb existing embankments or embankment protection in accordance with the Contract.
- 1.16.7. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- 1.16.8. If soil, sediment and debris from Site accumulate in low areas, storm sewers, roadways, gutters, ditches, or other areas where it is undesirable, remove accumulation and restore area to original condition, as directed by the Departmental Representative.

1.17. Work In or Adjacent to Waterways

- 1.17.1. Approvals and Practices:
 - 1.17.1.1. Obtain Discharge Approval prior to commencing work which may impact waterways.
 - 1.17.1.2. As required, comply with Fisheries Act Authorization and other relevant authorizations and in accordance with the Contract.
 - 1.17.1.3. Follow practices described in Fisheries and Oceans Canada (September 1993) *Land Development Guidelines for the Protection of Aquatic Habitat*.
 - 1.17.1.4. Follow practices described in BC Ministry of Environment (March 2004) *Standards and Best Practices for Instream Works*.
- 1.17.2. Timing
 - 1.17.2.1. Time work in water to respect timing windows to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed.
 - 1.17.2.2. Minimize duration of in-water work.
 - 1.17.2.3. Conduct instream work during periods of low flow, or at low tide, to further reduce the risk to fish and their habitat or to allow work in water to be isolated from flows.
 - 1.17.2.4. Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation.
- 1.17.3. Site Selection

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- 1.17.3.1. Design and plan activities and works in waterbody such that loss or disturbance to aquatic habitat is minimized and sensitive spawning habitats are avoided.
- 1.17.3.2. Design and construct approaches to the waterbody such that they are perpendicular to the watercourse to minimize loss or disturbance to riparian vegetation.
- 1.17.3.3. Avoid building structures on meander bends, braided streams, alluvial fans, active floodplains or any other area that is inherently unstable and may result in erosion and scouring of the stream bed or the built structures.
- 1.17.3.4. Undertake all instream activities in isolation of open or flowing water to maintain the natural flow of water downstream and avoid introducing sediment into the watercourse.
- 1.17.4. Contaminant and Spill Management
 - 1.17.4.1. Plan activities near water such that materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, poured concrete or other chemicals do not enter the watercourse.
 - 1.17.4.2. Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance and keep an emergency spill kit on site.
 - 1.17.4.3. Ensure that building material used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish.
- 1.17.5. Erosion and Sediment Control
 - 1.17.5.1. Develop and implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. Maintain erosion and sediment control measures until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the waterbody or settling basin and runoff water is clear.
- 1.17.6. Erosion and Sediment Control Plan includes:
 - 1.17.6.1. Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the water body.
 - 1.17.6.2. Measures for managing water flowing onto the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering a waterbody. This includes pumping/diversion of water to a vegetated area, construction of a settling basin or other filtration system.
 - 1.17.6.3. Site isolation measures (e.g., silt boom or silt curtain) for containing suspended sediment where in-water work is required (e.g., dredging, underwater cable installation).
 - 1.17.6.4. Measures for containing and stabilizing waste material (e.g., dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) above the high water mark of nearby waterbodies to prevent re-entry.
 - 1.17.6.5. Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction.

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- 1.17.6.6. Repairs to erosion and sediment control measures and structures if damage occurs.
- 1.17.6.7. Removal of non-biodegradable erosion and sediment control materials once site is stabilized.
- 1.17.7. Shoreline/Bank Re-vegetation and Stabilization
 - 1.17.7.1. Clearing of riparian vegetation should be kept to a minimum: use existing trails, roads or cut lines wherever possible to avoid disturbance to the riparian vegetation and prevent soil compaction.
 - 1.17.7.2. When practicable, prune or top the vegetation instead of grubbing/uprooting.
 - 1.17.7.3. Minimize the removal of natural woody debris, rocks, sand or other materials from the banks, the shoreline or the bed of the waterbody below the ordinary high water mark. If material is removed from the waterbody, set it aside and return it to the original location once construction activities are completed.
 - 1.17.7.4. Immediately stabilize shoreline or banks disturbed by any activity associated with the project to prevent erosion and/or sedimentation, preferably through re-vegetation with native species suitable for the site.
 - 1.17.7.5. Restore bed and banks of the waterbody to their original contour and gradient; if the original gradient cannot be restored due to instability, a stable gradient that does not obstruct fish passage should be restored.
 - 1.17.7.6. If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, then ensure that appropriately-sized, clean rock is used; and that rock is installed at a similar slope to maintain a uniform bank/shoreline and natural stream/shoreline alignment.
 - 1.17.7.7. Remove all construction materials from site upon project completion.
- 1.17.8. Aquatic Life Protection
 - 1.17.8.1. Ensure that all in-water activities, or associated in-water structures, do not interfere with aquatic life passage, constrict the channel width, or reduce flows.
 - 1.17.8.2. Retain a qualified environmental professional to ensure applicable permits for relocating fish are obtained and to capture any fish trapped within an isolated/enclosed area at the work site and safely relocate them to an appropriate location in the same waters. Fish may need to be relocated again, should flooding occur on the site.
 - 1.17.8.3. Screen any water intakes or outlet pipes to prevent entrainment or impingement of fish. Entrainment occurs when a fish is drawn into a water intake and cannot escape. Impingement occurs when an entrapped fish is held in contact with the intake screen and is unable to free itself.
 - 1.17.8.4. Avoid using explosives in or near water. Use of explosives in or near water produces shock waves that can damage a fish swim bladder and rupture internal organs. Blasting vibrations may also kill or damage fish eggs or larvae.
- 1.17.9. Operation of Machinery
 - 1.17.9.1. Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds.

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- 1.17.9.2. Whenever possible, operate machinery on land above the high water mark, on ice, or from a floating barge in a manner that minimizes disturbance to the banks and bed of the waterbody.
- 1.17.9.3. Limit machinery fording of the watercourse to a one-time event (i.e., over and back), and only if no alternative crossing method is available. If repeated crossings of the watercourse are required, construct a temporary crossing structure.
- 1.17.9.4. Use temporary crossing structures or other practices to cross streams or waterbodies with steep and highly erodible (e.g., dominated by organic materials and silts) banks and beds. For fording equipment without a temporary crossing structure, use stream bank and bed protection methods (e.g., swamp mats, pads) if minor rutting is likely to occur during fording.
- 1.17.9.5. Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water

1.18. Noncompliance

- 1.18.1. Departmental Representative will inform Contractor in writing of observed noncompliance with federal, provincial or municipal environmental laws, regulations, permits, or other environmental procedure violations.
- 1.18.2. After receipt of notice, inform the Departmental Representative of the proposed corrective action. Corrective action will be subject to acceptance of Departmental Representative.
 - 1.18.2.1. Do not take action until after receipt of written acceptance.
- 1.18.3. Departmental Representative will issue stop order of Work until satisfactory corrective action has been taken.

2. PART 2 - PRODUCTS

2.1. Not Used

- 2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

- 3.1.1. Not Used.

END OF SECTION



REGULATORY REQUIREMENTS

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Not Used.

1.4. Laws, Regulations, Permits

- 1.4.1. Generally, provincial and municipal laws, regulations, bylaws and other requirements do not apply on federal lands, activities or undertakings. Soil and other materials that are removed from federal lands may become subject to provincial or municipal laws and regulations.
- 1.4.2. Provincial or municipal standards may be used in relation to federal lands only as guidelines for the purpose of establishing remediation goals and objectives. The term "standards" is used in this part in order to maintain consistency in terminology throughout this document, and does not imply that standards contained in provincial or municipal laws and regulations apply on Federal lands, activities or undertakings.
- 1.4.3. Comply with certificates, licenses and other permits enforced at the location concerned required by regulatory federal, provincial or municipal authorities to complete the Work that have already been obtained.
- 1.4.4. Obtain and pay for certificates, licenses and other permits enforced at the location concerned required by regulatory federal, provincial or municipal authorities to complete the Work that have not already been obtained or that are required to be amended.
- 1.4.5. Provide applicable authorities with plans and information required for issue of acceptance certificates.
- 1.4.6. Furnish inspection certificates in evidence that the Work installed conforms with the requirements of the authority having jurisdiction.

1.5. Codes, Bylaws, Standards

- 1.5.1. Meet or exceed requirements of Contract, standards, and codes applicable to the performance of the Work and referenced documents.
- 1.5.2. In any case of conflict or discrepancy, the most stringent requirements will apply.
- 1.5.3. Perform Work in accordance with the *National Building Code* of Canada (NBC), and other requirements or codes in accordance with the Contract, construction standards and/or any other code or bylaw applicable to the performance of the Work.



REGULATORY REQUIREMENTS

- 1.5.4. Certificates, licenses and other permits enforced at the location concerned required by regulatory federal, provincial or municipal authorities to complete the Work: see 01 11 00.
- 1.5.5. Comply with all attachments, references, and reports relevant to Work, including environmental protection.

1.6. Smoking Environment

- 1.6.1. Smoking on the Site is not permitted.

2. PART 2 - PRODUCTS

2.1. Not Used

- 2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

- 3.1.1. Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Not Used.

1.4. Quality of Work

- 1.4.1. Ensure that quality workmanship is performed through use of skilled tradesmen, under supervision of qualified journeyman, or Qualified Professional.
- 1.4.2. As required, meet or exceed standards set out in the National Building Code of Canada as applicable for workmanship, erection methods and procedures.
- 1.4.3. In cases of dispute, perform Work to standard or quality in accordance with any decisions by the Departmental Representative.
- 1.4.4. Follow Departmental Representative's directions to meet the Quality of Work in accordance with the Contract at no increase to the Contract Amount and no increase to Extension of Time for completion of the Work. Quality of Work includes addressing comments on Submittals, modifying environmental procedures, and preventing or remediating contaminated material spills.

1.5. Quality Management

- 1.5.1. Be responsible for all Quality Assurance and Quality Control during the performance of the Work.
- 1.5.2. Quality Assurance and Quality Control includes monitoring, inspecting, testing, documenting and reporting the means, methods, materials, workmanship, processes, and products of all aspects of the Work, including design, construction, and management as necessary to ensure conformance with the Contract.
- 1.5.3. Assist Departmental Representative in quality audit inspections and submit all indicated information within 5 Working Days of collection or as directed.

1.6. Inspection

- 1.6.1. Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Site, allow access to such Work whenever it is in progress. Work at locations other than Site includes offsite Transportation (eg transfer stations), Treatment, and Disposal Facilities.

- 1.6.2. Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative directions, or law of Site.
- 1.6.3. If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- 1.6.4. Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

1.7. Independent Inspection Agencies

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

1.8. Access to Work

- 1.8.1. Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- 1.8.2. Co-operate to provide reasonable facilities for such access.

1.9. Procedures

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

1.10. Rejected Work

- 1.10.1. Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- 1.10.2. Make good other Contractor's work damaged by such removals or replacements promptly.
- 1.10.3. If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, PWGSC will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

1.11. Reports

- 1.11.1. Submit 2 copies of inspection and test reports to Departmental Representative.
- 1.11.2. Provide copies to subcontractor of work being inspected or tested.

1.12. Tests and Mix Designs

- 1.12.1. Furnish test results and mix designs as requested.
- 1.12.2. Test results must be signed by Qualified Professional.
- 1.12.3. The Departmental Representative may require, and pay for, additional inspection and testing services not included above.

2. PART 2 - PRODUCTS

2.1. Not Used

- 2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

- 3.1.1. Not Used.

END OF SECTION

CONSTRUCTION FACILITIES

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

- 1.3.1. Site Layout: within 10 Working Days after Contract award and prior to mobilization to Site, Submit Site Layout drawings showing existing conditions and facilities, construction facilities and temporary controls provided by Contractor. Include:
- 1.3.1.1. Equipment and personnel decontamination areas.
 - 1.3.1.2. Means of ingress, egress and temporary traffic control.
 - 1.3.1.3. Equipment and material staging areas.
 - 1.3.1.4. Stockpile areas and construction details, including base preparation and water control features.
 - 1.3.1.5. Exclusion areas, contaminant handling areas, and other areas identified in Contractor's site-specific Health and Safety Plan and Environmental Protection Plan.
 - 1.3.1.6. Grading, including contours, required to construct temporary facilities.
 - 1.3.1.7. Location of all temporary facilities including: rig wash and decontamination units, office trailers, modular camp structures, parking, storage, environmental monitoring stations, above ground and underground utilities, and temporary facilities and roads.

1.4. Utilities

- 1.4.1. Power is not available at existing Site and must be supplied at the Contractor's expense. Provide power for work force.
- 1.4.2. Water supply is not available at existing Site and must be supplied at the Contractor's expense. Provide water for work force.

1.5. Fire Protection

- 1.5.1. Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.

1.6. Access and Delivery

- 1.6.1. Only the designated entrance in accordance with the Contract can be used for access to Site.
- 1.6.1.1. Maintain for duration of Contract.

CONSTRUCTION FACILITIES

- 1.6.1.2. Make good damage resulting from Contractor's use.
- 1.6.2. Use of the Site will be granted to the Contractor through the Departmental Representative.

1.7. Installation and Removal

- 1.7.1. Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- 1.7.2. Identify areas which have to be graveled or otherwise treated to prevent tracking of mud.
- 1.7.3. Indicate use of supplemental or other staging area.
- 1.7.4. Provide construction facilities in order to execute work expeditiously.
- 1.7.5. Provide temporary utilities in order to execute Work expeditiously.
- 1.7.6. Remove from Site all such Work after use.

1.8. Site Storage/Loading

- 1.8.1. Confine work and operations of employees in accordance with the Contract. Do not unreasonably encumber premises with products.
- 1.8.2. Storage space must be limited to the Site.
- 1.8.3. Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.9. Construction Parking

- 1.9.1. Parking of private vehicles will not be permitted on Site.
- 1.9.2. Provide and maintain adequate access to project site.

1.10. Security

- 1.10.1. Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.
- 1.10.2. Control access to Site and maintain a log of all personnel onsite. No non-Work visitors allowed without prior written consent of Departmental Representative

1.11. Departmental Representative and Consultant Offices

- 1.11.1. Provide office facilities for the exclusive use of the Departmental Representative and their consultants with the following:
 - 1.11.1.1. A work stations within the Factory fabricated modular units in accordance with the Contract.
 - 1.11.1.2. Work stations must include; 1 desk (minimum size 120 cm x 50 cm, minimum height 70 cm), 1 chair (minimum load requirement 100 kg), 1 garbage can, and 1 recycling bin.
 - 1.11.1.3. Building envelope: watertight construction.
 - 1.11.1.4. Completed building: exterior to interior minimum sound attenuation of STC 30.

CONSTRUCTION FACILITIES

- 1.11.1.5. Building interior environment: heated and cooled to maintain temperature of 20 degrees C minimum to 25 degrees C maximum with relative humidity of 35% to 60%.
- 1.11.1.6. Provide ventilation and outdoor air as per ASHRAE 62.1 – 2010 Standard.
- 1.11.1.7. Building lighting: maintain measured lighting level of 200 lx at 1500 mm above finished floor, after building finishes and painting complete.
- 1.11.1.8. Thermal performance of window units: Maximum heat transfer rate (U-value) not to exceed 2.0 W/m²K.
- 1.11.1.9. Regularly collect refuse and recyclables and keep the office clean and properly maintained with heat and light.
- 1.11.1.10. Provide washroom facilities in accordance with the Contract, complete with flush or chemical type toilet, lavatory and mirror and maintain supply of paper towels and toilet tissue.
- 1.11.1.11. The work stations and contents must be for the sole use of the Departmental Representative and their consultant(s) for the duration of the Work and may, if necessary, be used concurrently with other inspection agencies.
- 1.11.2. Installation:
 - 1.11.2.1. Install stable timber foundation.
 - 1.11.2.2. Install level and plumb.
 - 1.11.2.3. Install stairs.
 - 1.11.2.4. Install personnel decontamination facility immediately adjacent to stairs.
- 1.11.3. Provide a minimum of 2 parking spaces for Departmental Representatives and their consultants adjacent to offices.

1.12. Equipment, Tools and Materials Storage

- 1.12.1. Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- 1.12.2. Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.13. Sanitary Facilities

- 1.13.1. Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- 1.13.2. Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.14. Protection and Maintenance of Traffic

- 1.14.1. Provide access and temporary relocated roads as necessary to maintain traffic.
- 1.14.2. Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.
- 1.14.3. Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around

CONSTRUCTION FACILITIES

- and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs.
- 1.14.4. Protect travelling public from damage to person and property.
- 1.14.5. Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- 1.14.6. Verify adequacy of existing roads and allowable load limit on these roads.
Contractor: responsible for repair of damage to roads caused by construction operations.
- 1.14.7. Construct access and haul roads necessary.
- 1.14.8. Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.
- 1.14.9. Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- 1.14.10. Dust control: adequate to ensure safe operation at all times.
- 1.14.11. Location, grade, width, and alignment of construction and hauling roads: subject to approval by Departmental Representative.
- 1.14.12. Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.
- 1.14.13. Provide snow removal during period of Work.
- 1.14.14. Remove, upon completion of work, haul roads designated by Departmental Representative.

1.15. Rig Wash and Decontamination Units

- 1.15.1. Supply, install and operate the rig wash, including the supply of potable water.
- 1.15.2. Supply personnel decontamination units (minimum of 2) for use by hazardous material, testing and inspection personnel working in areas of hazardous materials and for general clean-up of personal protective equipment to remove Contaminated Material. Provide decontamination units for work force
 - 1.15.2.1. At least one personnel decontamination unit must have overhead shower capability.
 - 1.15.2.2. The personnel decontamination units to be available to Departmental Representative and their consultants.
- 1.15.3. The rig wash and personnel decontamination units must be maintained in good working order during onsite Work.
 - 1.15.3.1. The rig wash and personnel decontamination units are subject to acceptance of Departmental Representative units must be removed from the Site during Site Decommissioning.

1.16. Clean-Up

- 1.16.1. Remove construction debris, waste materials, packaging material from work site daily.
- 1.16.2. Clean dirt or mud tracked onto paved or surfaced roadways.
- 1.16.3. Store materials resulting from demolition activities that are salvageable.

CONSTRUCTION FACILITIES

1.16.4. Stack stored new or salvaged material not in construction facilities.

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

3.1.1. Not Used.

END OF SECTION



PRODUCT REQUIREMENTS

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

- 1.3.1. Product Data: at least 5 Working Days prior to use, Submit data on products to be used in Work. Include:
 - 1.3.1.1. Manufacturers' catalogue sheets, MSDS sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products or any other information in accordance with the Contract.
 - 1.3.1.2. Delete information not applicable to project.
 - 1.3.1.3. Supplement standard information to provide details applicable to project.
 - 1.3.1.4. Cross-reference product data information to applicable portions of Contract.
- 1.3.2. Substitution: at least 5 Working Days prior to use and after Contract award, Submit proposals for substituting products, if required. Include statements of respective costs of items originally in accordance with the Contract and the proposed substitution.
- 1.3.3. Quality of Work: at least 5 Working Days prior to Work, Submit alternate means to meet or correct quality of work, if required.

1.4. Products, Material and Equipment

- 1.4.1. Use new products, material and equipment in accordance with the Contract. The term "products" is referred to throughout the specifications.
- 1.4.2. Use products of one manufacturer for material and equipment of the same type or classification in accordance with the Contract.
- 1.4.3. Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation method in accordance with the Contract s.
- 1.4.4. Notify Departmental Representative in writing of any conflict between Contract and manufacturer's instructions. Departmental Representative will instruct which document is to be followed.
- 1.4.5. Deliver, store and maintain packaged material and equipment with manufacturer's seals and labels intact.
- 1.4.6. Prevent damage, adulteration and soiling of products during delivery, handling and storage. Immediately remove rejected products from Site.
- 1.4.7. Store products in accordance with Suppliers' instructions.

PRODUCT REQUIREMENTS

1.5. Quality of Products

- 1.5.1. Products, materials and equipment (referred to as products) incorporated into Work must be new, not damaged or defective, and of the best quality (compatible with the specifications) for the purpose intended. As directed by the Departmental Representative, furnish evidence as to type, source, and quality of the products provided.
- 1.5.2. Defective products will be rejected regardless of previous inspections.
 - 1.5.2.1. Inspection does not relieve responsibility, but is precaution against oversight or error.
 - 1.5.2.2. Remove and replace defective products.
- 1.5.3. Retain purchase orders, invoices and other documents to prove that all products utilized in the Work meet the requirements of the Contract. Produce documents as directed by the Departmental Representative.
- 1.5.4. Should any dispute arise as to quality or fitness of products, the decision rests strictly with the Departmental Representative in accordance with the Contract.
- 1.5.5. Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.6. Availability of Products

- 1.6.1. Immediately upon signing the Contract, review product delivery requirements and anticipate foreseeable supply delays for any items.
- 1.6.2. If delays in supply of products are foreseeable, Notify Departmental Representative of such in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of the Work.
- 1.6.3. In event of failure to Notify Departmental Representative at the start of Work and should it subsequently appear that the Work may be delayed for such reason, the Departmental Representative reserves the right to substitute more readily available products of similar character.

1.7. Manufacturer's Instructions

- 1.7.1. Install or erect products in accordance with the manufacturer's instructions in accordance with the Contract.
 - 1.7.1.1. Do not rely on labels or enclosures provided with products.
 - 1.7.1.2. Obtain written instructions directly from the manufacturer.
- 1.7.2. Notify Departmental Representative in writing of any conflict between Contract and manufacturer's instructions. Departmental Representative will instruct which document is to be followed.
- 1.7.3. Improper installation or erection of products, due to failure in complying with these requirements, authorizes the Departmental Representative to instruct the removal and re-installation.

PRODUCT REQUIREMENTS

1.8. Contractor's Options for Selection of Products for Tendering

- 1.8.1. Products specified by "Prescriptive" specifications: select any product meeting or exceeding requirements in accordance with the Contract.
- 1.8.2. Products specified by performance and referenced standard: select any product meeting or exceeding the referenced standard.
- 1.8.3. Products specified to meet particular design requirements or to match existing materials: use only material in accordance with the Contract.
- 1.8.4. When products are specified by a referenced standard or by performance specifications, as directed by the Departmental Representative obtain from manufacturer and independent laboratory report showing that the product meets or exceeds the requirements in accordance with the Contract.

1.9. Storage, Handling and Protection

- 1.9.1. Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions.
- 1.9.2. Store packaged or bundled products in original and undamaged condition with manufacturer's seals and labels intact. Do not remove from packaging or bundling until required in Work.
- 1.9.3. Store products subject to damage from weather in weatherproof enclosures.
- 1.9.4. Remove and replace damaged products as directed by the Departmental Representative.

1.10. Transportation

- 1.10.1. Pay costs of transportation of products required in performance of Work.
- 1.10.2. Transport products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- 1.10.3. Transport products subject to damage from weather in weatherproof enclosures.
- 1.10.4. Transport in an efficient manner that does not cause delays to the Work schedule.

1.11. Quality of Work

- 1.11.1. Ensure quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately Notify Departmental Representative if required Work is such as to make it impractical to produce results in accordance with the Contract. Provide alternate means to meet or correct quality of work, as accepted by the Departmental Representative.
- 1.11.2. Do not employ anyone unskilled in their required duties.
- 1.11.3. Perform Work to standard of fitness of Quality of Work in accordance with any decision by the Departmental Representative.

PRODUCT REQUIREMENTS

1.12. Coordination

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

1.13. Remedial Work

- 1.13.1. Perform remedial Work required to repair or replace parts or portions of Work as directed by the Departmental Representative as defective or unacceptable. Coordinate adjacent affected Work as required.
- 1.13.2. Perform remedial Work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.14. Storage Tanks

- 1.14.1. Abide by the *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations* for stored petroleum products and allied petroleum products tank system located on federal or Aboriginal land, or within federal jurisdiction as described in the regulations.
- 1.14.2. Temporary storage tanks subject to the regulations must be registered with Environment Canada.
- 1.14.3. Mobile tanks subject to the regulations must be certified to be mobile.
- 1.14.4. Storage tanks to meet the following minimum requirements:
 - 1.14.4.1. Corrosion protection.
 - 1.14.4.2. Secondary containment.
 - 1.14.4.3. Containment sumps, if applicable.
 - 1.14.4.4. Overfill protection.
- 1.14.5. All components of tank system must bear certification marks indicating that they conform to the standards set out in the regulations.
- 1.14.6. Product transfer area must be designed to contain spills.
- 1.14.7. Prepare an emergency plan.
- 1.14.8. Prior to first filling, storage tanks must:
 - 1.14.8.1. Be registered.
 - 1.14.8.2. Be certified and marked.
 - 1.14.8.3. Transfer area be constructed.
 - 1.14.8.4. Emergency plan in place.

2. PART 2 - PRODUCTS

2.1. Asbestos Containing Materials Prohibition

- 2.1.1. Any material containing any degree of asbestos is banned from use in any and all sites, designs and projects.

3. PART 3 - EXECUTION

3.1. Not Used

3.1.1. Not Used.

END OF SECTION

EXAMINATION AND PREPARATION

1. PART 1 - GENERAL

1.1. Measurement Procedures

- 1.1.1. See 01 11 00.

1.2. Definitions

- 1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

- 1.3.1. Preconstruction Condition Survey: within 5 Working Days prior to mobilization to Site, Submit Preconstruction Condition Survey of existing structures, utilities and surface features.

1.4. Qualifications of Surveyor

- 1.4.1. A Land Surveyor, acceptable to Departmental Representative.

1.5. Survey Reference Points

- 1.5.1. Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
- 1.5.2. Make no changes or relocations without prior written notice to Departmental Representative.
- 1.5.3. Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- 1.5.4. Require surveyor to replace control points in accordance with original survey control.

1.6. Survey Requirements

- 1.6.1. Establish permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.
- 1.6.2. Establish lines and levels, locate and lay out.

1.7. Existing Services

- 1.7.1. Size, depth and location of existing utilities and structures as specified are for guidance only. Completeness and accuracy are not guaranteed.
- 1.7.2. Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative. All utilities entering Site must be confirmed prior to subsurface disturbance (ie do not rely on as-built documents). As appropriate, confirm locations of buried utilities by independent utility locator and using hand test excavations or hydrovac methods
- 1.7.3. Remove abandoned service lines within 2m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.

EXAMINATION AND PREPARATION

- 1.7.4. Maintain and protect from damage all utilities and structures encountered, unless Work involves temporarily breaking, rerouting, or connecting into existing utilities.
- 1.7.5. Where Work involves temporarily breaking, rerouting, or connecting into existing utilities, obtain permission from utility companies of intended interruption of services, and carry out Work at times determined by the authorities having jurisdiction.
- 1.7.6. Submit schedule to and obtain approval for any shutdown or closure of active service. Adhere to schedule accepted by Departmental Representative and provide notice to affected parties.
- 1.7.7. Provide temporary services as required to maintain critical building and tenant systems.
- 1.7.8. Where unknown utilities are encountered, immediately verbally notify Departmental Representative and confirm findings in writing.

1.8. Examination

- 1.8.1. Examine Site and Contract and be familiar and conversant with existing conditions likely to affect Work.

1.9. Records

- 1.9.1. Contractor to prepare preconstruction as-built Shop Drawings of all utilities.
- 1.9.2. Contractor to prepare post construction as-built Shop Drawings of all utilities, including existing, reinstated, rerouted, and abandoned.
- 1.9.3. Maintain a complete, accurate log of control and survey work as it progresses.
- 1.9.4. Preconstruction Condition Survey:
 - 1.9.4.1. Conduct Preconstruction Condition Survey of existing structures and other features which can be affected by Work, both onsite and offsite. Includes: buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, roads, survey bench marks, monuments and other features.
 - 1.9.4.2. Survey to include detailed photographic documentation of any preconstruction damage, and measurements where appropriate, including crack width and length, angles out of true. Record written notices to owners of features that have existing damage.
 - 1.9.4.3. Record written notices of offsite owners which refused entry to conduct Preconstruction Condition Survey.

2. PART 2 - PRODUCTS

2.1. Not Used

- 2.1.1. Not Used.

EXAMINATION AND PREPARATION

3. PART 3 - EXECUTION

3.1. Not Used

3.1.1. Not Used.

END OF SECTION

FIRST STAGE IN-SITU REMEDIATION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

- 1.3.1. Hydrogen Peroxide (CAS No 7722-84-1) Product Information from Supplier at least 10 Working Days prior to Delivery.
- 1.3.2. Quality Assurance and Quality Control Program for the Determination of Volume, Mass, and Concentration of Hydrogen Peroxide Supplied, Mixed, and Injected within 10 Working Days after Contract award and prior to mobilization to the Site.
- 1.3.3. Hydrogen Peroxide Supply and Deliver Plan: at least 10 Working Days prior to delivery.
- 1.3.4. On Site Hydrogen Peroxide Storage and Management Plan: at least 10 Working Days prior to installation, submit an On Site Hydrogen Peroxide Storage and Management Plan.
- 1.3.5. Emergency Shower: at least 10 Working Days prior to installation submit documentation describing on site Emergency Shower and Eye and Face Wash Equipment and Setup. Include:
 - 1.3.5.1. Source of Emergency Shower, Eye, and Facewash Water.
 - 1.3.5.2. Confirmation of Compliance with ANSI Z358.1-2014.
- 1.3.6. Equipment and materials list for all components used for the Work: at least 10 Working Days prior to delivery.
- 1.3.7. Monitoring and Testing Results: within 5 Working Days of sampling, submit all monitoring and testing results. Include procedures, frequency of sampling, Quality Assurance and Quality Control testing and documentation to be provided. Provide monitoring and testing results, including any assessments performed by a Qualified Professional.
- 1.3.8. Weigh Scale Certification: at least 5 Working Days prior to use, submit a copy of the Measurement Canada, Weigh Scale Certification for any onsite or offsite weigh scale used during transportation.
- 1.3.9. Weigh Scale Slips: within 10 Working Days of measurement, submit all onsite and offsite weigh scale slips for material.

1.4. As-Built Documents

- 1.4.1. The Departmental Representative will provide 2 sets of Drawings, 2 sets of Specifications, and 2 copies of the original AutoCAD files for “as-built” purposes.

FIRST STAGE IN-SITU REMEDIATION

- 1.4.2. As Work progresses, maintain accurate records to show all deviations from the Contract. Note changes as they occur on as-built Specifications, Drawings and Shop Drawings.
- 1.4.3. Drawings and Shop Drawings: legibly mark each item to record actual construction, including:
 - 1.4.3.1. Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - 1.4.3.2. Field changes of dimension and detail.
 - 1.4.3.3. Changes made by change orders.
 - 1.4.3.4. Details not on original Drawings.
 - 1.4.3.5. References to related Shop Drawings and modifications.
- 1.4.4. Contract Specifications: legibly mark each item to record actual workmanship of construction, including:
 - 1.4.4.1. Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - 1.4.4.2. Changes made by addenda and change orders.
- 1.4.5. As-built information:
 - 1.4.5.1. Record changes in red ink.
 - 1.4.5.2. Mark on 1 set of Drawings, Specifications and Shop Drawings at Final Completion of project and, before final inspection, neatly transfer notations to second set.
 - 1.4.5.3. Submit 1 set in editable AutoCAD 14 file format with all as-built information.
 - 1.4.5.4. Submit all sets as directed by the Departmental Representative.

1.5. Completion Documents

- 1.5.1. Submit as directed by the Departmental Representative, a written certificate that the following have been performed:
 - 1.5.1.1. Work has been completed and inspected by the Departmental Representative in accordance with the Contract.
 - 1.5.1.2. Damage has been repaired, deficiencies have been completed, missing items have been provided, and non-conformance has been corrected, in the opinion of the Departmental Representative.
 - 1.5.1.3. Equipment and systems have been tested, adjusted and balanced, and are fully operational, as applicable.
 - 1.5.1.4. Certificates required by the Fire Commissioner of Canada, and utility companies have been submitted, as applicable.
 - 1.5.1.5. Operation of systems has been demonstrated to the personnel as directed by the Departmental Representative, as applicable.
 - 1.5.1.6. Work is complete and ready for Final Site Inspection.
- 1.5.2. Defective products will be rejected, regardless of previous inspections. Replace defective products.
- 1.5.3. Prepare all documentation required as part of any permits or other authorizations obtained or otherwise the responsibility of the Contractor.

FIRST STAGE IN-SITU REMEDIATION

2. PART 2 - PRODUCTS

2.1. Materials

- 2.1.1. Meet the following requirements for the supply of Hydrogen Peroxide:
 - 2.1.1.1. Stability (3 hours @ 100 Deg C) - $\geq 99.6\%$
 - 2.1.1.2. Apparent pH - ≤ 3.7
 - 2.1.1.3. Supply Hydrogen Peroxide at the specified concentration (% by weight)
- 2.1.2. Meet the following requirements for the supply of Catalyst:
 - 2.1.2.1. Formulation of complex polycarboxylates – ferric iron
 - 2.1.2.2. pH range of 5.5 to 6
 - 2.1.2.3. Dark brown in color
 - 2.1.2.4. Slightly acrid odor
 - 2.1.2.5. Specific gravity of 1.30 ± 0.1
 - 2.1.2.6. Boiling point of 106°C
 - 2.1.2.7. Vapor pressure of 40 mm Hg @ 35°C
 - 2.1.2.8. Supply Catalyst at the specified concentration (% by weight)
 - 2.1.2.9. Readily biodegradable
- 2.1.3. Meet the following requirements for the supply Granular Bentonite:
 - 2.1.3.1. 30 mesh Sodium Bentonite
 - 2.1.3.2. Certified to NSF/ANSI Standard 60
- 2.1.4. Meet the following requirements for the supply Bentonite Chips
 - 2.1.4.1. 6.4 to 9.5 mm Sodium Bentonite
 - 2.1.4.2. Certified to NSF/ANSI Standard 60
- 2.1.5. Meet the following requirements for the supply Bentonite Grout
 - 2.1.5.1. 80% Passing a 200 mesh screen
 - 2.1.5.2. Certified to NSF/ANSI Standard 60
- 2.1.6. Meet the following requirements for the supply of water for mixing, diluting Hydrogen Peroxide or Catalyst, or hydrating Bentonite:
 - 2.1.6.1. Odourless;
 - 2.1.6.2. pH of 6.5-8.5;
 - 2.1.6.3. Total Suspended Solids $< 25 \text{ mg/L}$;
 - 2.1.6.4. Turbidity $< 8 \text{ NTU}$;
 - 2.1.6.5. Concentrations of benzene, toluene, ethylbenzene, xylene, volatile petroleum hydrocarbons, and extractable hydrocarbons shall be non-detectable;
 - 2.1.6.6. Supplied from an uncontaminated source; and
 - 2.1.6.7. Delivered in an uncontaminated container.

2.2. Equipment

- 2.2.1. Rig supplied for advancing probe rods can advance via direct push, has a minimum weight of 7,900 kgs, can generate a down force of 262 kN, and can generate a retraction force of 356 kN.

FIRST STAGE IN-SITU REMEDIATION

- 2.2.2. Rig supplied for advancing boreholes and collecting soil samples can advance probe rods via direct push or a combination of air rotary drilling and direct push of probe rods, has a minimum weight of 7,900 kgs, can generate a down force of 262 kN, and can generate a retraction force of 356 kN.
- 2.2.3. Injection equipment will be constructed of materials compatible with the in situ chemical oxidation treatment process used (chemical and thermal compatibility).
- 2.2.4. Maintained in safe working condition.
- 2.2.5. Injection system shall be inspected daily prior to start up and equipment conditions recorded.
- 2.2.6. Equipment conditions shall be inspected prior to re-start after any required stoppages due to system alteration, maintenance, relocation or solution preparation.
- 2.2.7. Any items noted during the inspections will be rectified prior to continuing operations.
- 2.2.8. Actions taken shall be noted on a preventative maintenance checklist.
- 2.2.9. Equipment shall be cleaned meticulously between injection boreholes and at end of work day.

3. PART 3 - EXECUTION

3.1. 2016 In-Situ Hydrogen Peroxide Injection Pilot Test Summary of Observations

- 3.1.1. 57 mm diameter probe rods were consistently advanced to a depth of 12 m within 15 minutes at Muncho Lake. Refusal did not occur for the 4 points advanced.
- 3.1.2. 57 mm diameter probe rods were consistently advanced to a depth of 29 m within 25 minutes at Fireside. Refusal did not occur for the 3 points advanced at Fireside.
- 3.1.3. Direct injection of an 11.5% m/m solution of Hydrogen Peroxide at Muncho Lake was generally completed at a flow rate of 15 to 20 L/minute.
- 3.1.4. Direct injection of an 11.5% m/m solution of Hydrogen Peroxide at Fireside was generally completed at a flow rate of 15 to 20 L/minute.

3.2. Site Review and Expectations

- 3.2.1. Ensure that all Works comply with the final sealed design documents.
- 3.2.2. It is envisioned that the Contractor and Departmental Representative or delegates will work on a collaborative basis to complete the Work.
- 3.2.3. Coordinate where necessary with other Contractors and with Departmental Representative to ensure there is no impact or safety concern to operations.

FIRST STAGE IN-SITU REMEDIATION

- 3.2.4. Departmental Representative to be present on Site for the Duration of the Work. The Departmental Representative will be responsible for monitoring Work progress, well monitoring, confirming direct push and borehole locations through surveying, vapour monitoring, measuring well and probe rod position at depth, and soil sampling.

3.3. Design, Construction and Operation of Hydrogen Peroxide Storage Area(s) – Muncho Lake and Fireside Maintenance Camps (Base Work)

- 3.3.1. Construct, operate and maintain a secure storage area for Hydrogen Peroxide as required.
- 3.3.2. Design of secure storage area for Hydrogen Peroxide to be signed and sealed by a Qualified Professional.
- 3.3.3. Qualified Professional to confirm that the secure storage area allows for the safe storage and management (including mixing) of Hydrogen Peroxide.
- 3.3.4. The storage area for Hydrogen Peroxide for the project must be constructed to accommodate all required uses and be maintained throughout the course of execution in a safe, environmentally sound manner.
- 3.3.5. Location, alignment, design and construction of the Hydrogen Peroxide storage area is subject to the acceptance of the Departmental Representative.
- 3.3.6. Employ suitable measures to maintain quality, and safe conditions in the Hydrogen Peroxide storage area for the Work.

3.4. Supply, Installation, and Operation of Emergency Shower and Eye and Face Wash Equipment – Muncho Lake and Fireside Maintenance Camps (Base Work)

- 3.4.1. Supply, deliver, install, and operate an Emergency Shower, Eye, and Face Wash equipment as required.
- 3.4.2. Design for Emergency Shower, Eye, and Face Wash equipment to be signed and sealed by a Qualified Professional.
- 3.4.3. Qualified Professional to confirm that the Emergency Shower, Eye, and Face Wash equipment is in compliance with ANSI Z358.1-2014.
- 3.4.4. The location of the Emergency Shower, Eye, and Face Wash equipment must be constructed to accommodate all required uses and be maintained throughout the course of execution in a safe, environmentally sound manner.
- 3.4.5. Location, alignment, design and construction of the Emergency Shower, Eye, and Face Wash equipment is subject to the acceptance of the Departmental Representative.
- 3.4.6. Employ suitable measures to maintain quality, operability, visibility, and safe conditions for the Emergency Shower, Eye, and Face Wash equipment for the Work.

FIRST STAGE IN-SITU REMEDIATION

3.5. Muncho Lake Radius Of Influence Evaluation (Base Work)

- 3.5.1. Notify Departmental Representative at least 5 Working Days in advance of mobilization to Site.
- 3.5.2. Advance 57 mm diameter probe rods as indicated in the final sealed design documents and as directed and located by the Departmental Representative.
- 3.5.3. Supply, deliver, and inject a volume of Hydrogen Peroxide at a concentration and flow rate as indicated in the final sealed design documents or as directed by Departmental Representative.
- 3.5.4. Contractor will be responsible for real time continuous measuring and recording of injection flowrate, injection pressure (at the probe rod), and injected volume.
- 3.5.5. Contractor will be responsible for minimizing bypassing of injected Hydrogen Peroxide during injection through ensuring all fittings and connections are leak free and Hydrogen Peroxide does not daylight at the injection location. Contractor will ensure that injected oxidant is effectively accepted into the subsurface so as to maximize contact with impacted soils. Such acceptance will be certified by the Departmental Representative based on visual absence of daylighting, leaking, and observations of injection pressure.
- 3.5.6. Backfill 57 mm probe rod holes with bentonite chips, bentonite granules, or bentonite grout to ground surface as required or as directed by Departmental Representative following Hydrogen Peroxide injection. Bentonite chips, bentonite granules, or bentonite grout can be placed through either probe rod, tremie pipe, tremie house, or directly in open hole provided a complete seal from bottom of borehole to ground surface is obtained.

3.6. Muncho Lake Catalyst Injection – First Pass (Base Work)

- 3.6.1. Advance 57 mm diameter probe rods as indicated in the final sealed design documents and as directed and located by the Departmental Representative.
- 3.6.2. Supply, deliver, and inject a volume of Catalyst at a concentration and flow rate as indicated in the final sealed design documents or as directed by Departmental Representative. Over the course of injecting at a location raise the probe rod by 1.0 m or as directed by the Departmental Representative. Injection of Catalyst at up to four locations simultaneously can be completed on approval by the Departmental Representative. The Contractor shall not inject Catalyst at pressures exceeding 138 kPa or flowrates exceeding 25 L/minute.
- 3.6.3. Contractor will be responsible for real time continuous measuring and recording of injection flowrate, injection pressure (at the probe rod), and injected volume.
- 3.6.4. Contractor will be responsible for minimizing bypassing of injected Catalyst during injection through ensuring all fittings and connections are leak free and Catalyst does not daylight at the injection location. Contractor will ensure that injected Catalyst is effectively accepted into the subsurface so as to maximize contact with impacted soils. Such acceptance will be certified by the Departmental Representative based on visual absence of daylighting, leaking, and observations of injection pressure.

FIRST STAGE IN-SITU REMEDIATION

- 3.6.5. Backfill 57 mm probe rod holes with bentonite chips, bentonite granules, or bentonite grout to ground surface as required or as directed by Departmental Representative following Catalyst injection. Bentonite chips, bentonite granules, or bentonite grout can be placed through either probe rod, tremie pipe, tremie hose, or directly in open hole provided a complete seal from bottom of borehole to ground surface is obtained.

3.7. Muncho Lake Hydrogen Peroxide Injection – First Pass (Base Work)

- 3.7.1. Advance 57 mm diameter probe rods as indicated in the final sealed design documents and as directed and located by the Departmental Representative.
- 3.7.2. Supply, deliver, and inject a volume of Hydrogen Peroxide at a concentration and flow rate as indicated in the final sealed design documents or as directed by Departmental Representative. Over the course of injecting at a location raise the probe rod by 1.0 m or as directed by the Departmental Representative. Injection of Hydrogen Peroxide at up to four locations simultaneously can be completed on approval by the Departmental Representative. The Contractor shall not inject Hydrogen Peroxide at pressures exceeding 138 kPa or flowrates exceeding 25 L/minute. The Contractor shall supply provisions for the mixing and dilution of Hydrogen Peroxide with water to a concentration of 10% or 5% Hydrogen Peroxide if required and as directed by the Departmental Representative.
- 3.7.3. Contractor will be responsible for real time continuous measuring and recording of injection flowrate, injection pressure (at the probe rod), and injected volume.
- 3.7.4. Contractor will be responsible for minimizing bypassing of injected Hydrogen Peroxide during injection through ensuring all fittings and connections are leak free and Hydrogen Peroxide does not daylight at the injection location. Contractor will ensure that injected oxidant is effectively accepted into the subsurface so as to maximize contact with impacted soils. Such acceptance will be certified by the Departmental Representative based on visual absence of daylighting, leaking, and observations of injection pressure.
- 3.7.5. Backfill 57 mm probe rod holes with bentonite chips, bentonite granules, or bentonite grout to ground surface as required or as directed by Departmental Representative following Hydrogen Peroxide injection. Bentonite chips, granules, or bentonite grout can be placed through either probe rod, tremie pipe, tremie hose, or directly in open hole provided a complete seal from bottom of borehole to ground surface is obtained.

3.8. Fireside Radius of Influence Evaluation (Base Work)

- 3.8.1. Advance 57 mm diameter probe rods as indicated in the final sealed design documents and as directed and located by the Departmental Representative.
- 3.8.2. Supply, deliver, and inject a volume of Hydrogen Peroxide at a concentration and flow rate as indicated in the final sealed design documents or as directed by Departmental Representative.

FIRST STAGE IN-SITU REMEDIATION

- 3.8.3. Contractor will be responsible for real time continuous measuring and recording of injection flowrate, injection pressure (at the probe rod), and injected volume.
- 3.8.4. Contractor will be responsible for minimizing bypassing of injected Hydrogen Peroxide during injection through ensuring all fittings and connections are leak free and Hydrogen Peroxide does not daylight at the injection location. Contractor will ensure that injected oxidant is effectively accepted into the subsurface so as to maximize contact with impacted soils. Such acceptance will be certified by the Departmental Representative based on visual absence of daylighting, leaking, and observations of injection pressure.
- 3.8.5. Backfill 57 mm probe rod holes with bentonite chips, bentonite granules, or bentonite grout to ground surface as required or as directed by Departmental Representative following Hydrogen Peroxide injection. Bentonite chips, bentonite granules, or bentonite grout can be placed through either probe rod, tremie pipe, tremie house, or directly in open hole provided a complete seal from bottom of borehole to ground surface is obtained.

3.9. Fireside Hydrogen Peroxide Injection (Base Work)

- 3.9.1. Advance 57 mm diameter probe rods as indicated in the final sealed design documents and as directed and located by the Departmental Representative.
- 3.9.2. Supply, deliver, and inject a volume of Hydrogen Peroxide at a concentration and flow rate as indicated in the final sealed design documents or as directed by Departmental Representative. Over the course of injecting at a location raise the probe rod by 1.0 m or as directed by the Departmental Representative. The Contractor shall not inject Hydrogen Peroxide at pressures exceeding 138 kPa or flowrates exceeding 25 L/minute. Injection of Hydrogen Peroxide at multiple locations simultaneously can be completed on approval by the Departmental Representative.
- 3.9.3. Contractor will be responsible for real time continuous measuring and recording of injection flowrate, injection pressure (at the probe rod), and injected volume.
- 3.9.4. Contractor will be responsible for minimizing bypassing of injected Hydrogen Peroxide during injection through ensuring all fittings and connections are leak free and Hydrogen Peroxide does not daylight at the injection location. Contractor will ensure that injected Catalyst is effectively accepted into the subsurface so as to maximize contact with impacted soils. Such acceptance will be certified by the Departmental Representative based on visual absence of daylighting, leaking, and observations of injection pressure.
- 3.9.5. Backfill 57 mm probe rod holes with bentonite chips, bentonite granules, or bentonite grout to ground surface as required or as directed by Departmental Representative following Hydrogen Peroxide injection. Bentonite chips, bentonite granules, or bentonite grout can be placed through either probe rod, tremie pipe, tremie hose, or directly in open hole provided a complete seal from bottom of borehole to ground surface is obtained.

FIRST STAGE IN-SITU REMEDIATION

3.10. Muncho Lake Borehole Advancement and Soil Sample Collection – After First Pass (Base Work)

- 3.10.1. Advance 8 boreholes as indicated in the final sealed design documents and as directed and located by the Departmental Representative. Sample collection will be completed by the Departmental Representative.
- 3.10.2. Backfill boreholes with bentonite chips, bentonite granules, or bentonite grout to ground surface as required or as directed by Departmental Representative. Bentonite chips, bentonite granules, or bentonite grout can be placed through either casing, tremie pipe, tremie hose, or directly in open hole provided a complete seal from bottom of borehole to ground surface is obtained.

3.11. Muncho Lake Catalyst Injection – Second Pass (Optional Work)

- 3.11.1. Advance 57 mm diameter probe rods as indicated in the final sealed design documents and as directed and located by the Departmental Representative.
- 3.11.2. Supply, deliver, and inject a volume of Catalyst at a concentration and flow rate as indicated in the final sealed design documents or as directed by Departmental Representative. Over the course of injecting at a location raise the probe rod by 1.0 m or as directed by the Departmental Representative. Injection of Catalyst at up to four locations simultaneously can be completed on approval by the Departmental Representative. The Contractor shall not inject Catalyst at pressures exceeding 138 kPa or flowrates exceeding 25 L/minute.
- 3.11.3. Contractor will be responsible for continuously measuring and recording injection flowrate, injection pressure (at the probe rod), and injected volume.
- 3.11.4. Contractor will be responsible for minimizing bypassing of injected Catalyst during injection through ensuring all fittings and connections are leak free and Catalyst does not daylight at the injection location. Contractor will ensure that injected Catalyst is effectively accepted into the subsurface so as to maximize contact with impacted soils. Such acceptance will be certified by the Departmental Representative based on visual absence of daylighting, leaking, and observations of injection pressure.
- 3.11.5. Backfill 57 mm probe rod holes with bentonite chips, bentonite granules, or bentonite grout to ground surface as required or as directed by Departmental Representative following Catalyst injection. Bentonite chips, bentonite granules, or bentonite grout can be placed through either probe rod, tremie pipe, tremie hose, or directly in open hole provided a complete seal from bottom of borehole to ground surface is obtained.

3.12. Hydrogen Peroxide Injection – Second Pass (Optional Work)

- 3.12.1. Advance 57 mm diameter probe rods as indicated in the final sealed design documents and as directed and located by the Departmental Representative.

FIRST STAGE IN-SITU REMEDIATION

- 3.12.2. Supply, deliver, and inject a volume of Hydrogen Peroxide at a concentration and flow rate as indicated in the final sealed design documents or as directed by Departmental Representative. Over the course of injecting at a location raise the probe rod by 1.0 m or as directed by the Departmental Representative. Injection of Hydrogen Peroxide at up to four locations simultaneously can be completed on approval by the Departmental Representative. The Contractor shall not inject Hydrogen Peroxide at pressures exceeding 138 kPa or flowrates exceeding 25 L/minute. The Contractor shall supply provisions for the mixing and dilution of Hydrogen Peroxide with water to a concentration of 10% or 5% Hydrogen Peroxide if required and as directed by the Departmental Representative.
- 3.12.3. Contractor will be responsible for continuously measuring and recording injection flowrate, injection pressure (at the probe rod), and injected volume.
- 3.12.4. Contractor will be responsible for minimizing bypassing of injected Hydrogen Peroxide during injection through ensuring all fittings and connections are leak free and Hydrogen Peroxide does not daylight at the injection location. Contractor will ensure that injected oxidant is effectively accepted into the subsurface so as to maximize contact with impacted soils. Such acceptance will be certified by the Departmental Representative based on visual absence of daylighting, leaking, and observations of injection pressure.
- 3.12.5. Backfill 57 mm probe rod holes with bentonite chips, bentonite granules, or bentonite grout to ground surface as required or as directed by Departmental Representative following Hydrogen Peroxide injection. Bentonite chips, bentonite granules, or bentonite grout can be placed through either probe rod, tremie pipe, tremie hose, or directly in open hole provided a complete seal from bottom of borehole to ground surface is obtained.

3.13. Fireside Borehole Advancement and Soil Sample Collection (Base Work)

- 3.13.1. Advance 3 boreholes as indicated in the final sealed design documents and as directed and located by the Departmental Representative. Sample collection will be completed by the Departmental Representative.
- 3.13.2. Backfill boreholes with bentonite chips, bentonite granules, or bentonite grout to ground surface as required or as directed by Departmental Representative. Bentonite chips, bentonite granules, or bentonite grout can be placed through either casing, tremie pipe, tremie hose, or directly in open hole provided a complete seal from bottom of borehole to ground surface is obtained.

3.14. Muncho Lake Borehole Advancement and Soil Sample Collection – After Second Pass (Optional Work)

- 3.14.1. Advance 8 boreholes as indicated in the final sealed design documents and as directed and located by the Departmental Representative. Sample collection will be completed by the Departmental Representative.

FIRST STAGE IN-SITU REMEDIATION

- 3.14.2. Backfill boreholes with bentonite chips, bentonite granules, or bentonite grout to ground surface as required or as directed by Departmental Representative. Bentonite chips, bentonite granules, or bentonite grout can be placed through either casing, tremie pipe, tremie hose, or directly in open hole provided a complete seal from bottom of borehole to ground surface is obtained.

END OF SECTION



Drawings

Drawing No.	Drawing Title
801	Muncho Lake Maintenance Camp Site Location
804	Muncho Lake Maintenance Camp Site Plan
805	Muncho Lake Maintenance Camp ROI Injection Plan – Base Work
806	Muncho Lake Maintenance Camp First Pass Catalyst Injection Plan – Base Work
807	Muncho Lake Maintenance Camp First Pass Injection Plan – Base Work
808	Muncho Lake Maintenance Camp Borehole Plan – Post First Pass Injections – Base Work
809	Muncho Lake Maintenance Camp Second Pass Catalyst Injection Plan – Optional Work
810	Muncho Lake Maintenance Camp Second Pass Injection Plan – Optional Work
811	Muncho Lake Maintenance Camp Borehole Plan – Post Second Pass Injections – Optional Work
901	Fireside Maintenance Camp Site Location
902	Fireside Maintenance Camp Site Plan
903	Fireside Maintenance Camp ROI Injection Plan – Base Work
904	Fireside Maintenance Camp Injection Plan – Base Work
905	Fireside Maintenance Camp Borehole Plan – Base Work

APPENDIX A

Site Photographs

APPENDIX B

In-Situ Pilot Testing and Laser-induced Fluorescence Evaluation

APPENDIX C

Borehole Logs