Public Works and Government Services Canada

Requisition No.: EZ113-210191/B

Buy and Sell ID No.: _____

Specifications for

Title: CFB Comox FFTA Source Control

Location: CFB Comox, Lazo, BC

Project No. R.111173.004 Date: _____

APPROVED BY:

Birk, Raman
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TABLE OF CONTENTS

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA K. K. TORNEY # 43575
2020-12-08
For SLR scope

For Civil Scope:
PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA K. L. KONICEK # 44777
2020-12-07

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA D. H. JANSEN # 49279
2020-12-07
FOR STRUCTURAL SCOPE ONLY

DRAWINGS

ANNEXES

ANNEXES (Continued)

1. PART 1 – GENERAL 01 11 00 – SUMMARY OF WORK

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 01 11 00 Summary of Work.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. Not Used.

1.4. Action and Informational Submittals

1.4.1. Not Used.

1.5. Work Covered by Contract

1.5.1. The Department of National Defence (DND) and the Contracting Authority (Public Works and Government Services Canada [PWGSC] referred to herein as Public Services and Procurement Canada [PSPC]) require contaminated soil to be remediated at the Fire Fighting Training Area (Work Site) located within DND's Canadian Forces Base Comox (CFB Comox) in Lazo, on Vancouver Island, British Columbia (BC). CFB Comox is alternately referred to 19 Wing (Wing).

1.5.2. CFB Comox is an operational base. The Contractor's work must be conducted in a manner that does not interfere with CFB Comox operations, except as otherwise described in these Contract documents. Airfield activities and CFB Comox access roadways must take priority and be maintained throughout the Work. Photographs of current site condition are included in Annex A for reference.

1.5.3. PWGSC will designate a representative (the Departmental Representative) to advise, coordinate, and monitor the work on behalf of DND.

1.5.4. The project is not a standard excavation and disposal project, it includes non standard requirements due to the nature of contaminants (e.g., including but not limited to per- and polyfluoroalkyl substances [PFAS], see definitions in 01 11 55), evolving technological options, and a developing regulatory policy. The Contractor must use extra care to conduct its work in a manner that is suitable for environmental cleanup and not in a production manner. The Contractor must conduct its work in a manner to minimize, to the extent practicable, redistribution of contaminated materials, and to comply with environmental protection requirements in these Specifications, Environmental Management Plan (EMP), and any applicable work conditions.

1.5.5. Work under this Contract covers required work elements (Base Work) and optional work elements (Optional Work) and the associated Tender Items for each type of work are listed in the Unit Price Table. The Departmental Representative may elect to include Optional Work as part of the Contract.

1.5.6. Work under this contract is detailed in Drawings and the following text. Both must be viewed together to fully understand the scope of work.

1.5.7. The Contractor must provide all supervision, labour, materials, supplies, tools, equipment, hoisting, transportation, receiving, handling, storage, quality control, environmental protection, surveying, inspection, monitoring, and all other services necessary for the proper execution of the work. The principal items of the work are summarized as follows, but do not represent the full list of work required:

1.5.7.1. Providing personnel and equipment with appropriate experience for site conditions, including experience in remediating site-specific Contaminated Material. Contractor to provide specialized material handling, health and safety, and environmental protection procedures, and must have knowledge of appropriate regulations.

1.5.7.2. Existing condition of the Site identified according to Drawings. Annexes provided for reference purposes only.

1.5.7.3. Providing Contractor and public health and safety responsibilities.

1.5.7.4. Providing environmental and cultural heritage protection responsibilities, including protection of structures, sites, or things that may be valued for their historical, archaeological, architectural, and paleontological significance as determined by the Departmental Representative.

1.5.7.5. Complying with all submissions and documentation requirements.

1.5.7.6. Coordinating with the Departmental Representative (and designated alternates) in performing all work.

1.5.7.7. Conducting Preconstruction, Progress, and Post Construction Condition Surveys.

1.5.7.8. Staging of materials and equipment. Staging of Contractor materials brought in from off site to complete the Work must be conducted within the Work Site, no off site staging allowed.

1.5.7.9. Setup, operation, and maintenance of all Contractor required resources including but not limited to soil stockpile and laydown areas.

1.5.7.10. Demolition, dismantling, temporary relocation, and reinstatement of designated portions of the site facilities, as shown on the Drawings.

1.5.7.11. Disposal of all removed or demolished infrastructure including but not limited to utility piping, culverts, fire hydrant, shed, concrete per the specifications.

1.5.7.12. Flagpole to be protected by Contractor. Costs for protecting flagpole to be included in Site Preparation.

1.5.7.13. Compliance with any applicable permit conditions or requirements, as described in the EMP during completion of remediation activities.

1.5.7.14. Excavating and managing PFAS Contaminated Material from within the Work Site as required in these Specifications and Drawings. A complete list

of anticipated contaminants and concentration levels on the Site available in Annexes.

1.5.7.15. Contaminated Water Management (Turbidity Reduction) includes managing and minimizing all water generated during both the Base Work and Optional Work. Includes the requirement to manage excavation and wash water to minimize water volumes, water storage, sediment load reduction, and water delivery/transfer to alternate on site location. Water will be managed in accordance with 02 61 00.01. Treatment of Contamination in this water (e.g., PFAS and other contaminants) will be conducted by others and is excluded from the Work.

1.5.7.16. Off site destruction and then disposal of PFAS Contaminated Material through the application of high temperature in accordance with the Specifications.

1.5.7.17. Stabilization of PFAS Contaminated Material to reduce PFAS mobility in the environment and by binding contaminants in place reduce groundwater and surface water concentrations. Soil stabilization is intended to improve Site conditions with respect to PFAS mobilization. Stabilization efficacy to be confirmed with specified testing methods and to be conducted in accordance with manufacturers requirements and under the supervision of a Qualified Professional – PFAS (QP– PFAS, see 01 11 55). The Work includes stabilization to meet PFAS Stabilization Efficacy Target (SET) by mixing site soil with approved Amendment(s).

1.5.7.18. Backfilling excavated areas including importing, temporary storage/stockpiling, placing, amending, stabilizing, and compacting specified materials within excavated areas as shown on the Drawings. The Contractor must assume that they will place both engineered imported Backfill Materials and stabilized soil (Stabilized PFAS Contaminated Material) as specified.

1.5.7.19. Site restoration includes:

1.5.7.19.1. Reconstruction and reinstatement of site facilities as shown on the Drawings and as encountered on the Work Site.

1.5.7.19.2. Restoration of the work areas to pre-work condition or as specified (e.g., grading, Topsoil, hydraulic seeding, and native planting).

1.5.7.19.3. Design and construction of a new Fire Fighting Training Area (New FFTA) including all appurtenances,

1.5.7.19.4. Design and construction of a bioswale per the Habitat Restoration Conceptual Plan Drawing to replace the removed retention pond, manage New FFTA storm and clean fire training water discharges, and provide habitat. Includes excavation and excess soil management.

1.5.7.20. Decommissioning of temporary facilities (including stockpile areas), and demobilization, as applicable.

1.5.7.21. Contractor Off-Site work area (if any) restoration, decommissioning of temporary facilities, and demobilization.

1.5.7.22. All proposed storage of soil or debris or any other item originating from the Work Site must first be reviewed and accepted by the Departmental Representative.

1.5.7.23. The Contractor becomes the owner of, and is responsible for, any soil or debris, excavation water, or other material once it is removed or excavated and loaded on a vehicle or other vessel for transport.

1.5.7.24. The Coasting Trade Act applies to all vessels if utilized by the Contractor during completion of the work as part of this Contract.

1.5.7.25. The work to be performed by the Contractor must include all of the requirements specified throughout each of the sections that comprise the Specifications unless otherwise expressly stated to be performed by the Departmental Representative. To fully comprehend the work, the Specifications must be read in conjunction with the Drawings, the Unit Price Table included in the Tender documents, the EMP, site information (including reference drawings, documents, surveys, and other data), and other Contract documents.

1.5.7.26. The Contractor must provide, prior to mobilization, certifications of any marine vessels and barges (if proposed for use).

1.5.7.27. All work must comply with environmental guidelines of the EMP, applicable Laws and Regulations, and any permit requirements.

1.5.7.28. For this Contract, any reference to “days” must be considered working days, unless noted otherwise. “Working Days” is referenced against Federal statutory holidays.

1.5.8. **Work Description – Base Work** - Base Work under this Contract, as shown on Drawings, includes but is not limited to:

1.5.8.1. Set up and maintenance of temporary facilities to support the Work;

1.5.8.2. Structure and abandoned infrastructure demolition and disposal;

1.5.8.3. Temporary dismantling, relocation, and reinstatement of select underground utilities; protection of utility services; protection of buildings;

1.5.8.4. Excavation dewatering and Contaminated Water Management (Turbidity Reduction);

1.5.8.5. Contaminated Soil management including:

1.5.8.5.1. Prescribed PFAS Contaminated Material management methods are a requirement of the Contract, and alternatives (e.g., direct disposal without treatment), even if compliant with regulations, are not allowed under the Contract.

1.5.8.5.2. Prescribed PFAS Contaminated Material managed within this Contract must undergo PFAS Destruction in accordance with these Specifications and the PFAS Destruction Effectiveness Target (DET) prior to Disposal at a PFAS Disposal Facility.

1.5.8.5.3. Excavation of PFAS Contaminated Material including soil and encountered debris;

1.5.8.5.4. PFAS Contaminated material managed in this Contract includes but is not limited to

1.5.8.5.4.1. Excavated and categorized material per Drawings,

1.5.8.5.4.2. spent Granulated Activated Carbon (GAC) in bin per Drawings; and

1.5.8.5.4.3. drummed drill cuttings per Drawings.

1.5.8.5.5. Temporary stockpiling (if proposed);

1.5.8.5.6. Soil classification/segregation is based on pre-existing in situ data; ex situ testing is not anticipated but may be required as directed by the Departmental Representative. Reclassification of material not allowed.

1.5.8.5.7. Segregation of designated soil classes per Definitions and temporary stockpiling (if proposed). Soil is segregated into two categories:

1.5.8.5.7.1. PFAS Contaminated Soil for Destruction: off site management by Destruction (includes surface vegetation and Topsoil in excavation areas, see 02.61.00.02 and on Drawings); or

1.5.8.5.7.2. PFAS Contaminated Soil for Stabilization: soil for reuse in designated on site areas after excavation and stabilizing;

1.5.8.5.8. PFAS Contaminated Soil Stabilization including addition of Amendment, mixing, placement, and compaction;

1.5.8.5.9. Transportation of project materials (including but not limited to PFAS Contaminated Material) to a Destruction Facility or Disposal Facility;

1.5.8.5.10. Destruction of PFAS Contaminated Material at a Destruction Facility and final disposal at a Disposal Facility after Destruction;

1.5.8.5.11. Removal and disposal of designated Concrete at a Disposal Facility;

1.5.8.5.12. Non-Contaminated Quality Soil and Non-Contaminated Quality Water Management, Transport and Disposal is not anticipated except in Site Restoration and Bioswale related activities (e.g., constructing the new bioswale, see 01 25 20).

1.5.8.5.13. All surface organic material (grass, shrubs, trees) i.e., the top 100 mm, are contaminated and will be managed as PFAS Contaminated Material for Destruction.

1.5.8.6. Contaminated Water Management (Turbidity Reduction) in accordance with Specifications.

1.5.8.7. Site restoration includes restoring entire work area to proposed or original condition.

1.5.8.7.1. Restore work areas as specified with approved materials e.g., Topsoil, approved native seed mix (Annex B), native vegetation for bioswale per planting list on Drawings, and watering as required to ensure plant health to maturity,

1.5.8.7.2. Replacement of impacted access roads to original condition,

1.5.8.7.3. Design and construct a bioswale in accordance with concept Drawings to replace existing retention pond, manage New FFTA storm and clean fire water discharges, and to restore habitat. Design and construction of bioswale requires excavation of native soil. Excess soil from bioswale construction will be used to create final site grades outside of the New FFTA.

1.5.8.7.4. Revegetation of work areas,

1.5.8.7.5. Design, supply and construct a New FFTA in accordance with the Drawings including but not limited to hard surfacing, supply and installation of tankage; utilities, power in accordance with the Drawings.

1.5.8.8. Backfill and compact excavated areas to specified grades with
1.5.8.8.1. Backfill Materials (engineered, imported, multiple types), or
1.5.8.8.2. Stabilized PFAS Contaminated Material in accordance with the Specifications. Stabilized PFAS material will preferentially be replaced outside of the New FFTA footprint (see Drawings).

1.5.9. **Work Description – Optional Work** – Optional Work under this Contract, as shown on Drawings, includes but is not limited to additional areas for excavation and restoration to be managed in the same manner as completed in the Base Work. Optional Work includes but is not limited to continuation of the following:
1.5.9.1. Temporary facilities supporting the Work;
1.5.9.2. Protection of utility services; protection of buildings;
1.5.9.3. Excavation dewatering and Contaminated Water Management (Turbidity Reduction);
1.5.9.4. Contaminated Material management including:
1.5.9.4.1. Prescribed PFAS Contaminated Material management methods are a requirement of the Contract, and alternatives (e.g., direct disposal without treatment), even if compliant with regulations, are not allowed under the Contract.
1.5.9.4.2. PFAS Contaminated Material managed within this Contract must be destroyed in accordance with the PFAS Destruction Effectiveness Target (DET) prior to Disposal at a Disposal Facility.
1.5.9.4.3. Excavation of PFAS Contaminated Material including soil and encountered debris;
1.5.9.4.4. Temporary stockpiling (if proposed);
1.5.9.4.5. Soil classification/segregation is based on pre-existing in situ data; ex situ testing is not anticipated but may be required as directed by the Departmental Representative. Reclassification of material not allowed.
1.5.9.4.6. Segregation of designated soil classes per Definitions and temporary stockpiling (if proposed). Soil is segregated into two categories:
1.5.9.4.6.1. PFAS Contaminated Soil for Destruction: off site management by Destruction (includes surface vegetation in excavation areas, see 02.61.00.02); or
1.5.9.4.6.2. PFAS Contaminated Soil for Stabilization: for reuse in designated on site areas after excavation and stabilizing;
1.5.9.4.7. PFAS Contaminated Soil Stabilization including Amendment, mixing, placement, and compaction;
1.5.9.4.8. Transportation of PFAS Contaminated Soil for Destruction to a PFAS Destruction Facility;
1.5.9.4.9. Destruction of PFAS Contaminated Soil at a Destruction Facility and post destruction disposal at a Disposal Facility;
1.5.9.4.10. Non-Contaminated Quality Soil and Non-Contaminated Quality Water Management, Transport and Disposal is not anticipated.

1.5.9.4.11. All surface organic material (grass, shrubs, trees) i.e., the top 100 mm are contaminated and will be managed as PFAS Contaminated Material for Destruction.
1.5.9.5. Contaminated Water Management (Turbidity Reduction) in accordance with Specifications
1.5.9.6. Backfill and compact excavated areas to specified grades with:
1.5.9.6.1. Backfill Materials (engineered, imported, multiple types), or
1.5.9.6.2. Stabilized PFAS Contaminated Material in accordance with the Specifications. Stabilized PFAS material will preferentially be replaced outside of the New FFTA footprint (see Drawings).
1.5.9.7. Optional Work site restoration includes restoring entire work area to proposed or original condition consistent with Base Work including:
1.5.9.7.1. Restore with approved materials i.e., Topsoil, approved native seed mix (Annex B), native vegetation for bioswale, and watering as required to ensure plant health to maturity,
1.5.9.7.2. Replacement of impacted access roads,
1.5.9.7.3. Revegetation of work areas,

1.6. Contractor Use of Work Site

1.6.1. The Contractor's Work Site is indicated on the Drawings.
1.6.2. Canada's site security requirements are presented in 01 11 00 Section 1.7.
1.6.3. The Contractor is designated as Prime Contractor on the Work Site and assumes all responsibilities of Prime Contractor as per relevant acts and regulations. The Contractor must be responsible for all work conducted by the Contractor and its subcontractors on the Work Site.
1.6.4. Coordinate all work activities with the Departmental Representative associated with this Contract at the Work Site.
1.6.5. Perform work in accordance with Contract documents. Ensure that work is carried out in accordance with indicated sequencing.
1.6.6. Use of Site:
1.6.6.1. For the sole benefit of Canada.
1.6.6.2. Exclusive and only for completion of the execution of Work.
1.6.6.3. Assume responsibility of Prime Contractor and control for assigned premises for performance of this Work.
1.6.6.4. Be responsible for coordination of all Work activities onsite, including the Work of other contractors engaged by the Departmental Representative.
1.6.7. There are no pre-existing arrangements for access or encroachment on neighbouring properties. Offsite access, occupancy, or encroachment is the responsibility of the Contractor.
1.6.8. Perform Work in accordance with Contract. Ensure Work is carried out in accordance with schedule accepted by Departmental Representative.
1.6.9. Do not unreasonably encumber Site with material or equipment.
1.6.10. Accommodate common areas with other Site users, including roadways.
1.6.11. Segregate Contractor's work area from common and shared use areas to prevent unintentional multiple employer worksite, as required. Do not obstruct access to

DND property outside of the Work Site. Maintain overhead clearances, keep roadways and walkways clear, and maintain routes for emergency response vehicles.

1.6.12. The Contractor and its subcontractors must provide construction fire safety for all operations conducted on the Work Site, as applicable. Refer to DND Fire Safety Requirements (see 01 35 35).

1.6.13. Provide security of Contractor's and all subcontractors' equipment and material.

1.7. Security Clearances, Site Access and Access Restrictions

1.7.1. The Contractor and its subcontractors will be required to provide the Departmental Representative with the Reliability Status before commencement of work and a duly completed proof of Security Clearance in order to gain access to the Work Site. Refer to the Contract Security Program of PSPC for additional information.

1.7.2. The Contractor shall be responsible for all of their employees and subcontractors while on-site.

1.7.3. Upon entering the base, all contractor personnel have voluntarily consented to a search of their vehicle(s) and contents while on any part of CFB Comox and said military establishments by the Base Commander or designated person. The purpose of any search conducted is to ensure the security of CFB Comox and said military establishments, and/ or material or classified information belonging to the Canadian Armed Forces.

1.7.4. Contractor Work Area is delineated in Drawings, all requirements and restrictions must be obeyed. Drawings identify restricted areas with additional access approval and communication requirements.

1.7.5. Access to other areas of CFB Comox is restricted. Access can be requested through the Departmental Representative with notice. Notice to be provided at least 10 days prior to access to allow coordination and permitting.

1.7.6. All field work must be coordinated and scheduled (including inclusion on the Master Plan) through the Departmental Representative.

1.7.7. All vehicles, personal and corporate, used by the Contractor and his personnel, shall have valid registration, insurance and be equipped with hazard lights.

1.7.8. Since all gates are designated emergency crash gates, one lane must be kept open at all times. Note that fire trucks shall be given right-of-way at all times.

1.7.9. If and when the overall security level at the Wing increases, heightened security checks may take place, and access to the construction site may be limited or curtailed for a period of time.

1.7.10. Site Work restrictions as follows:

1.7.10.1. Site access restrictions are as follows:

1.7.10.1.1. Site to be accessed from Little River Road (Gate A, see Drawings). Commissionaire presence is required at all times during gate-use hours. Commissionaire to be provided by PSPC. Contractor to coordinate schedule with Departmental Representative.

1.7.10.1.2. All contractor personnel require security clearance prior to gaining access and working on-site.

1.7.10.1.3. All contractor personnel must check in with Commissionaire daily at arrival and departure.

1.7.10.1.4. Common access to be delineated and maintained for other use as specified in Drawings. Access to other areas will be only provided with prior Departmental Representative prior approval.

1.7.10.1.5. Construction work to mitigate air quality impacts (e.g., dust or odour) as specified in 01 35 43. Particular care should be taken to not impact nearby stakeholders including but not limited to the Griffin Pub.

1.7.10.1.6. Movement around the site shall be subject to any restrictions imposed by the Departmental Representative. Contractor's must comply with the airfield operating procedures.

1.7.10.2. Working in flight zones restrictions:

1.7.10.2.1. PSPC has designated a Departmental Representative / Air Traffic Control Coordination Zone (DR/ATC Coordination Zone, see Drawings) for the Work. Work in that area requires additional security measures (potentially including commissionaire staff). Work within the DR/ATC Coordination Zone should be coordinated to minimize the number of days in these areas.

1.7.10.2.2. Prior coordination and permits required to work in DR/ATC Coordination Zone. Contractor to coordinate with Departmental Representative. Notice to be provided at least 10 days prior to access to allow coordination and permitting. (e.g., radio communication through a Commissionaire).

1.7.10.2.3. Flight Safety Brief required for all personnel prior to working at the Site.

1.7.10.2.4. Notice to Airmen (NOTAM) will be required when working with equipment tall machinery (exceeding 6 m from ground surface) when working within the DR/ATC Coordination Zone (see Drawings).

1.7.10.2.5. All cameras and any device capable of video and/or still photography shall not be used within the Work area without prior approval. Under no circumstance shall the Contractor take photos or recordings of any activities without prior written approval to be coordinated with Departmental Representative. Should the contractor wish to take photographs of construction progress, a Base Photo Pass must be requested and approved prior to taking any photos on-site, as per the CFB Comox / 19 Wing Photography/ Image Capturing Policy included in Annex B. Photo passes must be arranged with the Departmental Representative at least 15 days in advance.

1.7.10.2.6. Foreign Object Debris (FOD): It is critical that the Contractor contain all construction debris on the site. The Contractor shall be responsible to keep active airfield areas clear of dirt and debris at all times. Inspect the areas regularly and remove any debris found. Under no circumstances is it acceptable to release any debris onto the airfield. Failure to keep active areas free of debris to the satisfaction of the Departmental Representative will result in shut-down of all construction activities until the situation is rectified. Submit FOD Mitigation Plan 10 days prior to mobilization.

1.7.10.2.7. Site wide security restrictions may change through the course of the work due to changing security threats. The Departmental Representative will

inform the Contractor of changes in a timely manner and provide reasonable timelines for implementation of new regulations.

1.8. Location

1.8.1. The Site location is shown on Drawings.

1.9. Project/Site Conditions

1.9.1. Contractor must provide personnel and equipment with appropriate experience for site conditions, including experience in remediating site-specific Contaminated Material. Contractor to provide specialized material handling, health and safety, and environmental protection procedures, and must have knowledge of appropriate regulations.

1.9.2. Work at Site involves Work with Contaminated Material. Complete list of anticipated contaminants and concentration levels on the Site available separately in Annex and/or Drawings.

1.9.3. Existing condition on the Site identified according to Drawings. Annexes provided for reference purposes only.

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. Existing Permits

1.11.1. Existing Permits and Authorizations are included in the Annexes:

1.11.1.1. None

1.11.2. Contractor assumes responsibility for relevant portions of existing permits.

1.11.3. Changes to existing permits must be accepted by Departmental Representative. Changes to existing permits responsibility of Contractor, including resubmission to regulators as determined by the Contractor's Qualified Professional (QP, see 01 11 55). Contractor assumes all responsibility for changed permits.

1.11.4. Permits required other than the existing permits responsibility of Contractor.

1.12. Schedule Requirements

1.12.1. Work to be initiated: as soon as practical, and no later than 20 days, after Contract notice.

1.12.2. Pre-Mobilization Submittals: at least 10 days prior to mobilization to Site, Submit all documents required for mobilization, including at a minimum the Contractor's site-specific project Health and Safety Plan and emergency procedures.
1.12.3. Site Works: Substantial Performance no later than November 1, 2021 to avoid cold and wet weather impacts to the Work.
1.12.4. Final Completion of the Work: No later than February 28, 2022. Includes all final Submittals including as-built documents, the Certificate of Completion, and the Statutory Declaration at Final Completion.

1.13. Hours of Work

1.13.1. Restrictive as follows:
1.13.1.1. Working Days/days are Monday to Saturday.
1.13.1.2. Working Hours are 07:00 to 19:00.
1.13.2. Work outside of Working Days and Working Hours is at Department Representative's sole discretion and must be accepted in writing by Departmental Representative by Submission.
1.13.3. Be responsible for Site outside of Working Days and Working Hours and have a continuous presence on Site as required, in accordance with the Contract, or as directed by the Departmental Representative, to ensure:
1.13.3.1. Protection of health and safety for potentially hazardous activities (e.g. deep open excavations).
1.13.3.2. Site security for Sites in urban environments.
1.13.3.3. Maintenance of environmental monitoring and protection measures for Sites in urban environments or with sensitive neighbouring properties.
1.13.4. Working hours may be further restricted due to airfield or operational activities.

1.14. Security Escort Requirements within Site

1.14.1.1. Work areas are within the secure fenced airfield area at CFB Comox / 19 Wing. All Work must be closely coordinated with the Departmental Representative who will arrange security escorts as required.
1.14.1.2. Gate A and A-1 must be supervised by a security escort when unlocked.
1.14.1.3. Other Work activities may also require additional security escort as determined and arranged by the Departmental Representative. These escorts will have continuous radio contact with Air Traffic Control (ATC) in order to coordinate construction traffic.
1.14.1.4. The Contractor shall arrange specific time periods for work within DR/ATC Coordination Zone (see Drawings) at least 10 days in advance and must be identified in the Master Plan. Coordinate all work with the Departmental Representative. No work to commence within DR/ATC Coordination Zone of the airfield is without prior written approval from the Departmental Representative.
1.14.1.5. Work is subject aircraft traffic delays that should be accounted for in the schedule. Standby time not allowed for air traffic landing.

1.14.1.6. The Contractor shall provide the Departmental Representative a schedule of anticipated Commissionaire escort requirements 15 days prior to the start of work and include these activities in the Master Plan. Changes to this schedule must be submitted a minimum of 3 days in advance of the requirement so that sufficient staffing can be arranged.

1.14.1.7. Although the Departmental Representative will attempt to provide Commissionaire(s) when less than 3 days advance notice is given, Departmental Representative will not be responsible for any work delays if arrangements cannot be made.

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 01 11 55 – GENERAL INSTRUCTIONS

1.1. Measurement Procedures

1.1.1. Before submitting the first progress claim, the Contractor must submit a breakdown of the Contract unit rates and lump sum prices in detail as requested by the Departmental Representative, aggregating to the Contract price.

1.1.2. Measurement and payment for work completed to the Departmental Representative's satisfaction will be made as stipulated in the relevant technical section of the Specification for that work item and the Unit Price Table.

1.1.3. Measurement for Departmental Representative-directed Standby Time must be through formal documented communications (i.e., advisories) with the Contractor. The unit price for Stand-by Time will not be adjusted regardless of the actual quantity used.

1.1.4. No separate payment will be made for 01 11 55 General.

1.1.5. No double billing for services or materials will be allowed.

1.1.6. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. Amendment: Approved Amendments include activated carbon and amorphous aluminum hydroxide-based or modified clay-based material including:

1.2.1.1. Fluorosorb 200 [a Cetco Product] @ 1% minimum dosage rate by weight

1.2.1.2. RemBind Plus [A Ziltek Product] @ 4% minimum dosage rate by weight; or

1.2.1.3. Equivalent (see 02 61 00.05).

1.2.2. Advisory: notices, instructions, or directions issued by the Departmental Representative to the Contractor.

1.2.3. Backfill Material: Backfill Material is defined as engineered virgin materials used in site restoration. Backfill Material will be placed within the excavation and compacted to return to specified grades supporting the New FFTA construction and activities. Backfill Materials are imported except for Stabilized PFAS Contaminated Material. All imported Backfill Materials are subject to specified characterization requirements. Backfill Materials are listed in the following Table and described in 02 61 00.02.

Table 01 11 55 -01
Backfill Material Types

Backfill Material Type	Description (Brief)
Granular Base	<19mm
Crushed Granular Sub-Base	<75mm
100 mm Pit Run Gravel	<100mm
Granular Pipe Bedding	<25mm
Drain Rock	<25mm
Stabilized PFAS Contaminated Material	Reused site soil
Backfill Materials to be specified by Contractor's QP	For Site Restoration and Bioswale construction

1.2.4. Backfill–Owner Supplied – Backfill Material supplied by CFB Comox to be utilized in Site Restoration as stipulated by Departmental Representative. Backfill – Owner Supplied is not anticipated.

1.2.5. Certificate of Completion: see General Conditions.

1.2.6. Certificate of Disposal: The Certificate of Disposal must be a document issued by the Disposal Facility for disposal of destroyed PFAS Contaminated Material, Concrete or other Contaminated Material, which includes on company letterhead:

1.2.6.1. the name and location where the material is being placed for final permanent disposal,

1.2.6.2. a description of the date and quantity for each shipment of material received,

1.2.6.3. total quantity of material received, and

1.2.6.4. signature by the identified authorized company representative.

1.2.6.5. This documentation must be provided by the Contractor to the Departmental Representative upon receipt from the Disposal Facility.

1.2.6.6. The Contractor is required to include with the Certificate of Disposal all scale tickets from each Disposal Facility.

1.2.6.7. Certificates of Disposal will be required at a minimum for:

1.2.6.7.1. PFAS Contaminated Soil for Destruction (post-destruction disposal);

1.2.6.7.2. Concrete Disposal; and

1.2.6.7.3. Any other Contaminated Material disposed.

1.2.7. Certificate(s) of Destruction: The Certificate of Destruction documents destruction of the PFAS Contaminated Material in accordance with the PFAS DET, is issued by the Destruction Facility and must include the following components:

1.2.7.1. Destruction Facility documentation on company letterhead including:

1.2.7.1.1. the name and location where the material has been destroyed and destruction methods,
1.2.7.1.2. a description of the date and quantity for each shipment of material received,
1.2.7.1.3. total quantity of material received (weigh scale receipts),
1.2.7.1.4. date and quantity of material for each destruction event,
1.2.7.1.5. total quantity of material destroyed,
1.2.7.1.6. signature by the identified authorized company representative.
1.2.7.2. Signed and sealed confirmation by a QP-PFAS including:
1.2.7.2.1. data and laboratory certificates from a Commercial Accredited Laboratory demonstrating compliance with PFAS DET,
1.2.7.3. Certificate of Stabilization: The Certificate of Stabilization must be a document issued by the QP-PFAS, that confirms stabilization meets the PFAS SET. The Certificate of Stabilization is on company letterhead and includes:
1.2.7.3.1. a description of the total weight of stabilized material (weigh scale receipts),
1.2.7.3.2. the dates the material was stabilized,
1.2.7.3.3. quantity and type of Amendment utilized, and
1.2.7.3.4. signature by the QP-PFAS and the Contractor.
1.2.8. Change Order: PSPC form issued by the Departmental Representative to the Contractor as per the relevant Contemplated Change Notice.
1.2.9. Classification: material (including soil and water) categorized into different classes based on Site Environmental Quality Criteria. Includes PFAS Contaminated Soil for Destruction and PFAS Contaminated Soil for Stabilization. Sub-classification based on specific parameters as identified in Contract. Re-classification not allowed.
1.2.10. Commercial Accredited Laboratory: The laboratory must be registered under the British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Environmental Data Quality Assurance Regulation and must be accredited for the analyses to be performed according to Standards Council of Canada, Canadian Association of Laboratory Accreditation Inc. (ISO/IEC 17025), or equivalent for an alternate jurisdiction.
1.2.11. Compost: Mixture of soil and decomposing organic matter used as mulch, or soil amendment. Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test. Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio <50) and contain no toxic or growth inhibiting contaminates. Composed bio-solids to: CCME Guidelines for Compost Quality, Category A.
1.2.12. Condition Surveys: includes Preconstruction, Progress and Post Construction Surveys to document site condition prior to, during and after Work. Surveys must be completed by the Contractor's third-party Qualified Professional Surveyor (QPS) in accordance with 02 21 13. Surveys to document ground

elevations conditions prior to, during, and after Work. Each survey to document property lines, grades (surface and excavation elevations), location and condition of buildings, utilities, roadways, pathways, landscaping, significant vegetation, and other infrastructure both onsite and adjacent sites. Progress Surveys must be completed at least daily during active excavation, utility work, and backfilling. The Surveys must be submitted to the Departmental Representative for review and acceptance. Once accepted, they will be used for measurement and payment of Contractor in accordance with the payment items.

1.2.13. Construction Work Plan: Premobilization submittal in accordance with 01 33 00, related to Master Plan, including but not limited to the following components:

1.2.13.1. Shed Demolition Plan

1.2.13.2. Contaminated Water Management (Turbidity Reduction) Plan

1.2.13.3. Contaminated Soil and Water Management Plan

1.2.13.4. Excavation and Backfilling Plan

1.2.13.5. Contaminated Material Transportation Plan

1.2.13.6. PFAS Contaminated Material Destruction Plan

1.2.13.7. PFAS Contaminated Material Stabilization Plan

1.2.13.8. Concrete Disposal

1.2.14. Contaminated Material and PFAS Contaminated Material: material (solid or liquid) 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. Relevant regulations, unless otherwise in accordance with the Contract or as directed by the Departmental Representative, include:

1.2.14.1. Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines, the CCME Canada-wide Standard for Petroleum Hydrocarbons (PHC) in Soil, and the Federal Contaminated Sites Action Plan (FCSAP) Guidance Document on Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites and the FCSAP Interim Advice to Federal Custodian Departments for the Management of Federal Contaminated Sites Containing Perfluorooctane Sulfonate (PFOS) and other Per- and Polyfluoroalkyl Substances (PFAS) document.

1.2.14.2. BC Hazardous Waste Regulation, BC Contaminated Sites Regulation, and BC Approved Water Quality Guidelines.

1.2.14.3. Includes Hazardous Waste Quality and Waste Quality.

1.2.14.4. Includes Site soil quality designations of

1.2.14.4.1. PFAS Contaminated Material for Destruction; and

1.2.14.4.2. PFAS Contaminated Soil for Stabilization.

1.2.14.5. Includes Contaminated Water.

1.2.14.6. Does not include Non-Contaminated Quality material.

1.2.15. Contaminated Water: Contained excavation water, equipment decontamination water, and any other water that contacts Site Contaminated Material during the Work. Contractor will manage turbidity (See 02 61 00.01) with Turbidity

Reduction Equipment but others will treat Contaminated Water for PFAS or other contaminants.

1.2.16. Contemplated Change Notice: PSPC form issued by the Departmental Representative to the Contractor requesting Contractor to provide a quote, which may result in a Change Order.

1.2.17. Contract: see General Conditions.

1.2.18. Contract Amount: see General Conditions.

1.2.19. Contractor: see General Conditions.

1.2.20. Departmental Representative: see General Conditions.

1.2.21. DND WTU: DND maintains a Contaminated Water Treatment Unit (WTU) on site as labelled on Drawings. Contractor will be responsible to transport Contaminated Water after reducing turbidity to the DND WTU for treatment by others.

1.2.22. Design and Construction Plans: Submittal in accordance with 01 25 20 and 01 33 00, including engineered design of the New FFTA and Site Restoration and Bioswale.

1.2.23. Disposal Facility: Must supply a Certificate of Disposal(s) and meet the following requirements including but not limited to:

1.2.23.1. Be 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.

1.2.23.2. The Disposal Facility(ies) must be permanent, existing at the time of the tender, upland facility(ies) that hold a valid and subsisting permit, license, certificate, approval, or any other form of authorization issued by a Facility Regulator (i.e., federal, provincial, or state government) for the handling and disposal of contaminated material that is not suitable for industrial, commercial, urban park, residential, agricultural, wildlands, or any other land use specified in local regulations (including Hazardous Waste Quality Materials, if required). If disposal is to occur in the United States, the minimum level of disposal must be at a Resource Conservation and Recovery Act-permitted Subtitle C Landfill for Hazardous Waste Quality Materials.

1.2.23.3. The Disposal Facility(ies) must operate in accordance with federal, provincial, territorial, state, and/or municipal regulations and guidelines for the disposal of soil or other material that is not suitable for industrial, commercial, urban park, residential, agricultural, wildlands, or any other land use specified in local regulations. The Disposal Facility(ies) must be accepted by the Departmental Representative prior to use. In carrying out the work under the Contract, the Disposal Facility must comply with Laws and Regulations, including complying with any enforcement order or direction of any nature or kind under the Laws and Regulations related to the work under the Contract.

1.2.23.4. In the event the Disposal Facility is a permanent, existing facility at the time of tender, and operates outside the jurisdiction of a federal, provincial, or state government that can issue a permit or any other form of authorization

for its operation, or the Disposal Facility is located on reserve land in Canada that is subject to a land code in force under the First Nation Land Management Act, the First Nations, or an entity designated by the land code or other First Nations law, the Contractor must provide a valid and subsisting permit, certificate, approval, or any other form of authorization issued by the Facility Regulator for the handling, treatment, or disposal of contaminated material, AND must complete and submit Section 3 of the Mandatory CFB Comox FFTA Source Control Project Disposal Facility Form for acceptance by the Departmental Representative. In addition, the Disposal Facility must substantively comply with BC ENV solid waste facility regulations. The Contractor must provide information to demonstrate compliance, and that information must be the same as requested on the "Information Requirements Table for Solid Waste (Form IRT-SW-01.1). https://www2.gov.bc.ca/assets/gov/environment/waste-management/waste-discharge-authorization/guides/irt/irt-sw-01_irt_for_solid_waste.pdf?bcgovtm=CSMLS

1.2.23.5. Should the proposed Disposal Facility(ies) not meet the requirements, the Contractor must provide alternate Disposal Facility(ies) at no additional cost to Canada. The Contractor must submit a separate "Mandatory CFB Comox FFTA Source Control Project Disposal Facility Form" for the alternate Disposal Facility and be accepted by the Departmental Representative prior to use.

1.2.23.6. Disposal Facility for disposal of destroyed PFAS Contaminated Material must have a leachate containment liner(s).

1.2.23.7. Disposal Facility for disposal of Concrete must have a leachate containment liner(s).

1.2.23.8. Site Contaminated Material disposed of at the Disposal Facility are not allowed to be moved out of the Disposal Facility.

1.2.23.9. The Disposal Facility must be accepted by the Departmental Representative prior to material leaving the site.

1.2.23.10. The Contractor may propose to use more than one Disposal Facility to accept the various waste categories, as needed.

1.2.23.11. The Contractor must complete and submit the "Mandatory CFB Comox FFTA Source Control Project Disposal Facility Form" for all proposed Disposal facilities at the time of Tender submission.

1.2.24. Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.

1.2.25. 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.

1.2.26. Environmental Protection Plan (EPP): plan developed by the Contractor to ensure Environmental Protection and prevent Environmental Pollution and Damage. EPP must be based upon the EMP included in Annex C and identifies all environmental risks and mitigation measures, including personnel requirements, emergency contacts, Environmental Protection methods, procedures, and equipment, and includes:

1.2.26.1. Erosion and Sediment Control Plan;

1.2.26.2. Emergency response Plan;

1.2.26.3. Spill Control Plan; and

1.2.26.4. Site Access Plan (for work around Waterbodies).

1.2.27. Environmental Quality Criteria: numerical material criteria used on Site based on Standards and/or Guidelines specified by the Canadian Council of Ministers of the Environment and/or BC Contaminated Sites Regulation, as applicable, using appropriate Land Use and Site-specific Factors. Additional criteria not listed exist for management of PFAS Contaminated Material.

1.2.28. Excavation Extents: lateral and vertical extents of Soil to be excavated, includes Topsoil and overburden, as shown on Drawings.

1.2.29. Extension of Time: see General Conditions.

1.2.30. Extension of Time on Contracts: PSPC form requesting an Extension of Time.

1.2.31. Facility Regulator: Authority to permit activities associated with contaminated material management (e.g., handling, storage, transport, disposal and/or destruction). The appropriate Facility Regulator for a Disposal Facility and PFAS Destruction Facility is based on the following types of facilities:

1.2.31.1. For facilities within provincial/territorial jurisdiction, the relevant provincial/territorial government.

1.2.31.2. For facilities on reserve land in Canada not subject to the First Nation Land Management regime, Indigenous Relations and Northern Affairs Canada.

1.2.31.3. For facilities on reserve land in Canada that is subject to a land code in force under the First Nation Land Management Act, the First Nations, or an entity designated by the land code or other First Nations law.

1.2.31.4. For facilities in the United States of America, either or both the U.S. Environmental Protection Agency and the relevant state agency, as appropriate.

1.2.32. Final Completion: see General Conditions.

1.2.33. Final Excavation Limits: lateral and vertical extents of excavation as determined by Contractor's QPS. Includes all excavated contaminated soil includes Temporary Sloping and Shoring.

1.2.34. FOD: Foreign object debris.

1.2.35. Hazardous Waste Quality: Contaminated material which meets the applicable Regulatory definition of Hazardous Waste.

1.2.36. Landfill Facility: an offsite facility specifically used to introduce Non-Contaminated Quality Soil into the environment for the purpose of final burial.

1.2.37. Master Plan: baseline schedule determined by Contractor compliant with Schedule Requirements. Duration for any portion of the Work based on Master Plan. Related to Construction Work Plan (and required components), requires scheduling of all project tasks and phases.

1.2.38. 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.

1.2.39. National Master Specifications: The Specifications are subdivided in accordance with the current 6 digit National Master Specifications System; the first 2 digits are the Division, the last 4 digits are the Section. A Division 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.

1.2.40. Non-Contaminated Quality: material that does not exceed applicable Environmental Quality Criteria including contains no detectable PFAS based on Routine PFAS Laboratory Analysis.

1.2.41. Oversize Debris: Waste that is required to be excavated and is: larger than 1 cubic metre or larger than 2 metres in one dimension, cannot be removed with a typical excavator with bucket, and requires the use of special equipment (e.g., saws, hydraulic cutters, excavator hammers, vibratory pile extractors). Includes concrete pad and foundations, bedrock, boulders, pipes, and building structures unless specified elsewhere. Concrete removal included in the Work will not be payable as oversize debris. Oversize debris is not anticipated during the Work.

1.2.42. Per- and polyfluoroalkyl substances (PFAS) A family of thousands of chemicals that vary widely in their chemical and physical properties, as well as their potential risks to human health and the environment. PFAS are highly fluorinated aliphatic substances that contain at least one carbon atom in which all the hydrogen atoms have been replaced by fluorine and include chemicals that are either fully fluorinated (i.e., perfluoroalkyl substances) or partially fluorinated (polyfluoroalkyl substances). The PFAS of regulatory focus in Canada primarily belong to a family of chemicals known as the perfluorinated alkyl acids.

1.2.43. Perfluorooctane sulfonate (PFOS): A specific perfluorinated alkyl acid of concern at CFB Comox FFTA. PFOS is an eight-carbon aliphatic substance with a sulfonate or sulfonic acid end group. Under the Basel Convention, materials with a total combined PFOS and perfluorooctanoic acid (PFOA) concentration of 50 mg/kg are to be disposed such that the PFOS content is destroyed or irreversibly transformed.

1.2.44. PFAS Precursors: PFAS that can transform to create perfluoroalkyl acids.

1.2.45. PFAS Contaminated Soil for Destruction: Site material with PFOS concentrations exceeding > 0.54 mg/kg as delineated in Drawings and designated for Destruction. Soil may contain other contaminants as presented in the Annex D. Referred to as Destroyed PFAS Contaminated Material in past tense.

1.2.46. PFAS Contaminated Soil for Stabilization: PFAS Contaminated Material designated for Stabilization onsite as delineated in Drawings with PFOS concentrations greater than 0.14 mg/kg and ≤0.54 mg/kg. Soil may contain other contaminants as presented in the Annex D. Referred to as Stabilized PFAS Contaminated Material in past tense. Stabilized PFAS Contaminated Material must facilitate and not obstruct intended site final use. Stabilized PFAS Contaminated Material to meet specified requirements (see 02 61 00.05).

1.2.47. PFAS Destruction: Destruction of PFAS at a PFAS Destruction Facility to the PFAS Destruction Effectiveness Target (DET) as defined and specified within this contract.

1.2.48. PFAS Destruction Facility: Facility that is a permanent, existing at the time of the tender, upland facility that holds a valid and subsisting permit, license, certificate, approval, or any other form of authorization issued by a Facility Regulator that:

1.2.48.1. Includes specific reference to the acceptance and treatment of PFAS contaminants, or

1.2.48.2. If the permit does not specifically reference the acceptance and treatment of PFAS, has QP-PFAS confirmation that the process meets the PFAS DET and the PFAS Process Control Requirements.

1.2.49. PFAS Destruction Effectiveness Target (DET): The PFAS DET is the permanent removal of PFAS from PFAS Contaminated Material through:

1.2.49.1. Application of temperatures of >1100 degrees Celsius to the PFAS Contaminated Material and/or the process waste products (including emissions) as follows:

1.2.49.1.1. Apply temperatures >1100 degrees Celsius to the PFAS Contaminated Material and generated pre-discharge vapour stream (emissions); or

1.2.49.1.2. Apply temperatures > 400 degrees Celsius to the PFAS Contaminated Material with:

1.2.49.1.2.1. application of temperatures of >1100 degrees Celsius to emissions (e.g. facility vapour oxidizer operates at > 1100 degrees Celsius); or

1.2.49.1.2.2. application of temperatures of >1100 degrees Celsius to emissions and the final treatment process waste products (e.g. GAC, process water, filters).

1.2.49.2. Reduction of PFAS concentrations in the treated PFAS Contaminated Material to levels for each individual PFAS as shown in the following table and as demonstrated by Routine PFAS Laboratory Analysis and performed by Commercial Accredited Laboratory:

Table 01 11 55-02
PFAS DETs

PFAS	PFAS DET (mg/kg)
PFOS	< 0.03
PFOA	< 0.7
PFBA	< 114
PFBS	< 61
PFPeA	< 0.8
PFHxS	< 2.3
PFHxA	< 0.8
PFHpA	< 0.8
PFNA	< 0.08
6:2 FTS	< 0.8
8:2 FTS	< 0.8

1.2.50. PFAS Process Control Requirements: PFAS Destruction Facility process control monitoring that verifies operating conditions meet PFAS DET for each stage in the process, including operating temperatures, residence time and/or other parameters relevant to the destruction process effectiveness.

1.2.51. PFAS Stabilization Efficacy Target (SET): The CFB Comox FFTA PFAS Stabilization Efficacy Target is a reduction of PFAS in leachate equivalent to that reported in Arcadis 2020 (see Annex E for Arcadis 2020) using the prescribed testing methods, site material identified as PFAS Contaminated Soil for Stabilization in the Specifications and Drawings

1.2.52. Prime Contractor: see General Conditions “Contractor”, BC Occupational Health and Safety Regulations “Prime Contractor”.

1.2.53. Progress Payment: see General Conditions.

1.2.54. Progress Survey: Survey conducted using equipment such as tape measurements, non-differential GPS, theodolite, or truck counts. Not a survey conducted by a QPS.

1.2.55. PWGSC: Public Works and Government Services Canada (also known as PSPC: Public Services and Procurement Canada). Representative of Canada with control of the Site, on behalf of DND.

1.2.56. Qualified Marine Surveyor (QMS). The QMS is a marine surveyor with ten (10) or more years of experience in marine operations including tug, barge, and deep-sea operations with previously held positions in ship repair, maintenance, or construction. The QMS must be accepted by the Departmental Representative prior to commencement of work.

1.2.57. Qualified Professional (QP): a person who is registered in relevant jurisdiction with his or her appropriate professional college/association, acts under that

professional college/association's code of ethics, and is subject to disciplinary action by that professional college/association, and through suitable education, experience, accreditation and knowledge can be reasonably relied on to provide advice within his or her area of expertise. Only full membership will be considered to be a QP (i.e. no "in training" designations). Includes:

1.2.57.1. Association of the Chemical Profession of British Columbia.
1.2.57.2. British Columbia College of Applied Biology.
1.2.57.3. British Columbia Institute of Agrologists.
1.2.57.4. Engineers and Geoscientists British Columbia.

1.2.58. Qualified PFAS Professional (QP-PFAS): a person who is registered with his or her appropriate professional college/association, acts under that professional college/association's code of ethics, and is subject to disciplinary action by that professional college/association, and through suitable education, experience, accreditation and knowledge can be reasonably relied on to provide advice within his or her area of expertise. The QP-PFAS will also have the following additional expertise and qualifications:

1.2.58.1. A minimum 5 yrs. of experience as a technical lead on PFAS contamination projects (e.g., remediation, treatment, destruction, disposal), and possess knowledge based on an appropriate combination of formal education, skills, experience, and training in order to provide a technically sound evaluation of the work required under this Contract.
1.2.58.2. The QP-PFAS shall be familiar with applicable federal, provincial, territorial, and local legislation and published guidelines, standards and criteria used to evaluate compliance with the requirements of this Contract.

1.2.59. Qualified Professional Surveyor (QPS): a person who is registered in relevant jurisdiction with his or her appropriate professional college/association, acts under that professional college/association's code of ethics, and is subject to disciplinary action by that professional college/association, and through suitable education, experience, accreditation and knowledge can be reasonably relied on to provide advice within his or her area of expertise. Only full membership will be considered to be a QPS (i.e. no "in training" designations). Includes:

1.2.59.1. Association of British Columbia Land Surveyors.
1.2.59.2. Association of Canada Lands Surveyors.
1.2.59.3. Applied Science Technologists & Technicians of British Columbia registered in Site Improvements Surveys.
1.2.59.4. Engineers and Geoscientists British Columbia.

1.2.60. Quality Management and Control Plan: Plan documenting quality management techniques and control measures including survey control.

1.2.61. Quote: Quotation for Design Change or Additional Work. Contractor’s cost proposal issued to the Departmental Representative as per the relevant Contemplated Change Notice. May be either a Lump Sum Arrangement or a Unit Price Arrangement.

1.2.62. Request For Information: notice or other communication issued by the Contractor to the Departmental Representative.

1.2.63. Record Documents: Record Documents are defined as completion records that document conditions by which construction activities are completed at the Work Site. Record Documents will serve as the final record of conditions at completion of the work. The Contractor must develop and submit the Record Documents to the Departmental Representative for review and acceptance prior to receipt of final payment for the work. The Record Documents include markups and changes to both the Drawings and the Specifications, using DND CAD standards. The drawing portion of the Record Documents must include all as built information at the site as per the Work requirements.

1.2.64. Routine PFAS Laboratory Analysis: Commercial Accredited Laboratory quantification of PFAS parameters including perfluoroalkyl acids and precursors using isotope dilution methods and liquid chromatography/tandem mass spectrometry. Routine PFAS Laboratory Analysis must include at a minimum the following listed parameters.

Soil PFAS Parameters	
perfluorobutanoate / perfluorobutanoic acid	PFBA
perfluorobutane sulfonate / perfluorobutane sulfonic acid	PFBS
perfluoropentanoate / perfluoropentanoic acid	PFPeA
Perfluorohexanoate / perfluorohexanoic acid	PFHxA
perfluorohexane sulfonate/perfluorohexane sulfonic acid	PFHxS
Perfluoroheptanoate / perfluoroheptanoic acid	PFHpA
perfluoroheptane sulfonic acid	PFHpS
Perfluorooctanoate / perfluorooctanoic acid	PFOA
perfluorooctane sulfonate / perfluorooctane sulfonic acid	PFOS
Perfluorononanoate / perfluorononanoic acid	PFNA

1.2.65. Safety Data Sheets (SDS): formerly Material Safety Data Sheets (MSDS) to be retained on site in accordance with regulations.

1.2.66. Sewage: 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.

1.2.67. Site: work area available to Contractor according to Drawings. Does not include shared or public areas, including common roads.

1.2.68. Soil: unconsolidated mineral or organic material, rock, fill, and sediment deposited on land, and other solid material excavated incidentally. Includes Topsoil and overburden. Includes cleared and grubbed vegetation, litter, rubbish, debris, cobbles, boulders, excess construction material, lumber, steel, plastic, concrete, and asphalt and other waste material.

1.2.69. Standby Time: Stand-by Time is defined as time that the Contractor is directed by the Departmental Representative to stop all work due to the Standby Time definition. Standby Time related to CFB Comox airfield operation is to be anticipated. Standby Time is included to compensate the Contractor for potential Departmental Representative-directed Work stoppage associated with Work stoppage due to DND operational needs that occur with less than 24 hours' notice to the Contractor (Standby Time applies). Stand-by Time must be directed and accepted by the Departmental Representative. Contractor downtime, for any reason other than Departmental Representative direction to not work, will not qualify as Stand-by Time and the Contractor must carefully consider all other potential downtime and account for downtime in Tender Item prices.

1.2.69.1. Stand-by Time also will not be paid for under the following conditions:

1.2.69.1.1. If the Contractor's accepted Construction Progress Schedule does not show work to be performed during the period affected by the unanticipated operational need.

1.2.69.1.2. If the Contractor does not have the claimed crews and equipment at the Work Site ready to work, unless the Contractor has received prior acceptance from the Departmental Representative to send the crews home early or bring them in late due to the schedule impact.

1.2.69.1.3. If the Contractor is given a minimum of 24 hours advanced notice of the unanticipated DND operational need that may affect the Contractor's work schedule, to allow the Contractor time to adjust its work schedule.

1.2.69.1.4. If the Contractor delays in delivering to the Departmental Representative its written notification that describes the work prevented as a result of the unanticipated DND operational event;

1.2.69.1.5. If the Contractor could continue working in another area that is not affected by the unanticipated operational need.

1.2.69.1.6. If the Contractor cannot adjust its work activities with a minimum of 24 hours' notice to accommodate the unanticipated DND operational need, the Contractor must substantiate this in writing to the satisfaction of the Departmental Representative. The Departmental Representative must accept the Contractor's justification to be considered for Stand-by Time.

1.2.69.1.7. The request for compensation under this provision has not received the pre-acceptance of the Departmental Representative.

1.2.69.2. Standby Notification:

1.2.69.2.1. Notify the Departmental Representative in writing immediately in advance of all conditions for which the Contractor may request Standby Time payment. Immediately following the impact event, the Contractor must provide the Departmental Representative with the number of hours of Standby Time. If the time is accepted by the Departmental Representative, the Departmental Representative will notify the Contractor of acceptance for payment. The Departmental Representative will have sole discretion as to whether a Stand-by Time event is accepted.

1.2.70. Subcontractor: see General Conditions.

1.2.71. Submit/Submittals: documents from the Contractor to the Departmental Representative as: required by Contract; stipulated in permit, certificate, approval, license, or any other form of authorization; by convention or industry practice. Submittals are final only after review and accepted in writing by Departmental Representative.
1.2.72. Substantial Performance: see General Conditions.
1.2.73. Superintendent: see General Conditions.
1.2.74. Supplier: see General Conditions.
1.2.75. Topsoil: surface organic layer to facilitate vegetation growth that is composed of mixture of particulates, micro-organisms and organic matter which provides suitable medium for supporting intended plant growth. Soil texture based on The Canadian System of Soil Classification, to consist of 50 - 70% sand, less than 25% silt and clay, and between 4% and 15% organic matter (dry weight basis). Contain no toxic elements or growth inhibiting materials. Free from debris or stones over 50 mm and coarse vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume. Consistency: friable when moist. Top 100 mm of existing Topsoil to be managed as PFAS Contaminated Material for Destruction.
1.2.76. Tender Item: Tender Item is defined as a measure of work presented on the Unit Price Table by which the Contractor must provide cost to complete the work as part of the Tender process. Base Work and Optional Work Tender Items are listed in the Unit Price Table
1.2.77. Transfer/Interim Storage Facility: an offsite facility specifically used to transfer or short term storage PFAS Contaminated Materials during offsite transport.
1.2.78. Turbidity Objective: reduction of sediment load to turbidity less than 50 NTU so water is suitable for treatment by others.
1.2.79. Turbidity Reduction Equipment: temporary onsite equipment designed, constructed and operated for the storing, handling and processing of Contaminated Water in such a manner as to reduce turbidity to the Turbidity Objective. Excludes treatment of PFAS or other contaminants in Contaminated Water.
1.2.80. UTCD: Manual of Uniform Traffic Control Devices for Streets and Highways, current version, as amended.
1.2.81. Waste Quality: material that exceeds applicable Environmental Quality Criteria but is not Hazardous Waste.
1.2.82. Wastewater: Non-Contaminated Quality Water that is not Sewage.
1.2.83. Work: see General Conditions.
1.2.84. Workplace Hazardous Materials Information System (WHMIS): BC workplace regulatory system and requirements.

1.3. Related Sections

1.3.1. Not Used.

1.4. Action and Informational Submittals

1.4.1. Permits: at least 10 days prior to mobilization to Site, submit copies of all permits, certificates, approvals, or any other form of authorizations and all reporting required.

1.4.2. Daily Work Records: at the end of each shift Submit daily Work records, during onsite Work (templates in Annex F). Include:

1.4.2.1. Quantities for each Description of Work identified in the Unit Price Table and Change Orders.

1.4.2.2. Description of Work performed.

1.4.2.3. Current Site conditions.

1.4.2.4. General information including: date, time shift started and ended, Subcontractor(s) onsite, Health and Safety items, and Environmental Protection items.

1.4.2.5. Signature of Superintendent.

1.4.3. Cash Flow: with each Progress Payment, Submit a cash flow forecast. Include:

1.4.3.1. 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.

1.4.3.2. Progress Payments will not be processed until cash flow has been accepted by the Departmental Representative.

1.4.4. Coordination Meeting Minutes and Drawings: at least 5 days prior to relevant Work commencing, Submit final meeting minutes and drawings from coordination with Subcontractors.

1.5. Laws and Regulations

1.5.1. Generally, provincial, territorial and municipal laws, regulations, bylaws and other requirements do not apply to federal lands, works or undertakings. Soil, sediment, water or other materials that are removed from federal lands may become subject to provincial, territorial or municipal laws and regulations.

1.5.2. Provincial, territorial 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, territorial or municipal laws and regulations apply on Federal lands, activities or undertakings.

1.6. Green Requirements

1.6.1. 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 SDSs and product data submitted with Health and Safety Plan.

1.6.2. Use materials/products containing highest percentage of recycled and recovered materials practicable – consistent with maintaining cost effective satisfactory levels of competition.
1.6.3. Adhere to waste reduction requirement for reuse or recycling of waste materials, not including soil or water, thus diverting materials from Landfill Facility.

1.7. Smoking Environment

1.7.1. Observe smoking regulations and comply with CFB Comox Smoking Policy (Annex B). Smoking or vaping is only permitted in designated smoking areas. Personnel are not to smoke while in transit to or from a smoking area. All refuse from smoking is to be discarded in approved containers. Smoking is prohibited in areas where hazardous materials are stored, used, or handled.

1.8. System of Measurement

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

1.9. Documents Required

1.9.1. Maintain 1 copy each of the following posted at the job Site:
1.9.1.1. General Conditions.
1.9.1.2. Drawings.
1.9.1.3. Specifications.
1.9.1.4. Addenda or other modifications to Contract.
1.9.1.5. Change orders.
1.9.1.6. Current Work schedule.
1.9.1.7. Reviewed and final Shop Drawings Submittals.
1.9.1.8. One set of record Shop Drawings and Specifications for “as-built” purposes.
1.9.1.9. Field and laboratory test reports.
1.9.1.10. Reviewed and accepted Submittals.
1.9.1.11. Health and Safety documents, including all daily toolbox meetings, Notice of Project, and utility clearances.
1.9.1.12. Environmental Protection Plan.
1.9.1.13. Final Meeting Minutes, Agendas and associated attachments.
1.9.1.14. Permits and other approvals.

1.10. Setting out of Work

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

1.11. Works Coordination

1.11.1. Coordinate Work of Subcontractors.

1.11.1.1. Designate one person to be responsible for review of Contract and Shop Drawings and managing coordination of Work.

1.11.2. Convene meetings between Subcontractors whose Work interfaces and ensure awareness of areas and extent of interface required.

1.11.2.1. Provide each Subcontractor with complete Drawings and Specifications for Contract, to assist them in planning and carrying out their respective work.

1.11.2.2. Develop coordination drawings when required, illustrating potential interference between Work of various trades and distribute to affected parties.

1.11.2.3. Facilitate meeting and review coordination drawings. Ensure Subcontractors agree and sign off on coordination drawings.

1.11.2.4. Publish minutes of each meeting.

1.11.2.5. Submit a copy of coordination drawings and meeting minutes as directed by the Departmental Representative.

1.11.3. Submit Shop Drawings and order of prefabricated equipment or rebuilt components only after coordination meeting for such items has taken place.

1.11.4. Work coordination:

1.11.4.1. Ensure cooperation between trades in order to facilitate general progress of Work and avoid situations of spatial interference.

1.11.4.2. 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.

1.11.4.3. Ensure disputes between Subcontractors are resolved.

1.11.5. Failure to coordinate Work is responsibility of Contractor.

1.12. Record Keeping

1.12.1. Advisory: Contractual correspondence from the Departmental Representative to the Contractor. Does not include Change Documents. To be sequentially numbered. Include cross references to applicable Request For Information. The status of the Contractor, including the function of Prime Contractor, must not change by reason of any Advisory.

1.12.2. Request For Information: Contractual correspondence from Contractor to the Departmental Representative. Includes Submittals. Does not include Change Documents. Must be sequentially numbered. Include cross references to applicable Advisory. Status of the Contractor, including the function of Prime Contractor, must not change by reason of any Request For Information.

1.12.3. Maintain adequate records to support information provided to Departmental Representative.

1.12.4. Maintain 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 ladings for minimum of 300 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 methods, means and sequences.

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.

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: There may be a change to the completion of the Work by reason of an Extension of Time on Contracts. No increase to the Contract Amount by reason of any 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.

1.14. Inspection

1.14.1. 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 Facilities.

1.14.2. Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative or applicable law.

1.14.3. 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.

1.14.4. 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.

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

1. PART 1 – GENERAL 01 25 20 - MOBILIZATION AND DEMOBILIZATION

1.1. Measurement Procedures

1.1.1. Pre-Mobilization Submittals will be paid in accordance with lump sum price established for all Preconstruction Meetings, final engineered design (excluding New FFTA Design and Construction, see 1.1.5 below), planning, health and safety, and other Submittals (see 01 33 00) in accordance with the Contract or required and accepted by the Departmental Representative as in accordance with the Contract prior to mobilization to Site. Includes Preconstruction Condition Survey and Preconstruction Documents (includes as-builts).

1.1.2. Mobilization will be paid in accordance with lump sum price established for mobilizing all necessary equipment, materials, supplies, facilities, utilities (e.g., power, sanitary, telecommunications) and personnel associated with the Works to the Site.

1.1.3. Site Preparation will be paid in accordance two lump sum prices established for Base Work and Optional Work. Both lump sum prices are established to prepare the Site for planned construction works. Includes as required and not accounted for elsewhere: water diversion and associated infrastructure and equipment, removal or temporary removal of existing infrastructure, disposal of removed infrastructure (except for Shed Demolition and Disposal [see 02 61 13] and Concrete Disposal [see 02 61 00.16] which have specific unit rates or unless specified in another unit rate), preparation of stockpile areas, utility location and protection, and upgrades to temporary onsite access roads. Also includes removal of any incidental or generated material.

1.1.4. Site Restoration and Bioswale will be paid in accordance with the lump sum price established to restore the Site to make suitable for post-Work use according to Drawings. Site Restoration will be paid in accordance with two lump sum prices established for Base Work and Optional Work. The Base Work includes Site restoration and bioswale while the Optional Work includes Site Restoration excluding the bioswale. Both lump sum prices include re-establishment of pre-existing infrastructure, bioswale design and construction (in Base Work, see Drawings), bioswale excavation and excess soil management (in Base Work), final grading, Topsoil supply and placement, and revegetation (including hydroseeding). Site Restoration includes vegetation watering as required to ensure plant maturity.

1.1.5. New FFTA Design and Construction will be paid in accordance with the lump sum price established to design and reconstruct the New FFTA to make suitable for post-Work use according to Drawings. Includes all design, supply, provision, transport and costs for constructing New FFTA including but not limited to:

1.1.5.1. design of New FFTA by Contractor's QP as shown on the Drawings,

1.1.5.2. supply, installation, as required to fully construct the New FFTA including:
1.1.5.2.1. select Backfill Materials (e.g., Granular Base, Granular Pipe Bedding, see 02 61 00.02) including supply, onsite and offsite handling, loading, hauling, unloading, placing, grading, compacting, and Contractor's proof of characterization to demonstrate compliance with Contract,
1.1.5.2.2. final grading in the New FFTA, asphalt and concrete surfacing, and protection devices (e.g., jersey barriers),
1.1.5.2.3. drainage piping (e.g., surface water catch basins, transfer piping),
1.1.5.2.4. training water underground storage tanks and all related appurtenances (e.g., buoyancy requirements, sump pumps and power stubs),
1.1.5.2.5. all utility work required to facilitate construction of the New FFTA (e.g., fire hydrant, water main, local water service to Gas Hut) including restoration (e.g., asphalt along Route 66 or landscaped areas) required to match existing.

1.1.6. Demobilization will be paid in accordance with lump sum price established for deconstructing and demobilizing all facilities, equipment, and personnel associated with the Works from the Site including any incidental or generated material. Includes decontaminating all equipment prior to removal from Site.

1.1.7. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. Not Used.

1.4. Action and Informational Submittals

1.4.1. Preconstruction Documents: at least 5 days prior to commencing any disturbance, submit drawings identifying all existing infrastructure, including utilities, on the Site. Update drawings as directed by the Departmental Representative.

1.4.2. Site Restoration and Bioswale Design as part of the Design and Construction Plans (see 01 33 00). Plan to be prepared by a QP in accordance with the specifications and Drawings within 20 days after Contract award. Submit for review by the Departmental Representative dimensioned scaled drawings to show location, general arrangement with key dimensions and positions, including all construction, material, and planting details. Submit the detailed Design to the Departmental Representative for review and acceptance and update as directed by the Departmental Representative within 10 days of receipt of comments.

1.4.3. New FFTA Design prepared as part of the Design and Construction Plans (see 01 33 00). Plan to be prepared by a QP in accordance with the specifications and Drawings within 20 days after Contract award. Submit for review by the

Departmental Representative dimensioned scaled drawings to show location, general arrangement with key dimensions and positions, construction details, and material details. Submit the detailed Design to the Departmental Representative for review and acceptance and update as directed by the Departmental Representative within 10 days of receipt of comments.

1.4.4. Preconstruction Condition Survey: at least 5 days prior to commencing any disturbance, Submit a report by Contractor's QPS documenting property lines, original site grades (surface elevations) and condition of buildings, utilities, roadways, pathways, landscaping, significant vegetation, and other infrastructure both onsite and adjacent sites that may be potentially impacted by the Work.

1.4.5. Breakdown of Lump Sum Prices: at least 5 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.

1.4.6. As-built documents: Submit within 10 days of completing site Work, provide Drawings showing all Work, including infrastructure, utilities, excavation limits, Backfill Material limits and compaction, final grades, and any other improvements or reinstatements.

1.4.7. Post Construction Condition Survey: within 10 days of completing site Work, Submit a report by Contractor's QPS documenting property lines, original site grades (surface elevations) and condition of buildings, utilities, roadways, pathways, landscaping, significant vegetation, and other infrastructure both onsite and adjacent sites that may be potentially impacted by the Work.

1.4.8. Closeout Documents: within 15 days of Final Completion of Site Restoration, Submit Completion Documents.

1.5. Examination

1.5.1. Determine condition of existing Site and requirements to make the Site suitable for Work.

1.5.2. Preconstruction Condition Survey to be completed by Contractor's QPS prior to commencing any other Work.

1.5.3. Post Construction Condition Survey to be completed by Contractor's QPS after completing all other Work.

1.5.4. Condition Surveys to include property lines, site grades (surface elevations) and condition of buildings, utilities, roadways, pathways, landscaping, significant vegetation, and other features (including infrastructure) both onsite and adjacent sites that may be potentially impacted by the Work.

1.6. Mobilization and Demobilization

1.6.1. Move all personnel, equipment, supplies, and incidentals to and from the Site.

1.7. Protection of Features

1.7.1. Protect existing features with temporary barriers and enclosures as required by applicable local regulations.

1.7.2. Protect natural and man-made features required to remain undisturbed.
1.7.3. Protect existing trees from damage unless otherwise required or located in an area to be occupied by new construction.
1.7.4. Protect above ground and buried utilities that are required to remain undisturbed or in continuous operation during the Work, as identified on Drawings.
1.7.5. Protect features from surface water damage by temporary structures to divert flow as appropriate.
1.7.6. Protection of Monitoring Wells
1.7.6.1. Protect all monitoring wells unless specifically confirmed by Departmental Representative.
1.7.6.2. Protect all monitoring wells outside area of surface disturbance, including Excavation Extents.
1.7.6.3. Protect monitoring wells within area of surface disturbance, including Excavation Extents, as identified in Contract Documents.
1.7.6.4. Replace protected monitoring damaged by Work using methods, means, and sequences as directed by the Departmental Representative at Contractor's expense.
1.7.7. Security and Safety:
1.7.7.1. Provide safety measures to ensure worker and public safety as required including but not limited to requirements in Sections:
1.7.7.1.1. 01 11 00 (1.7 and 1.14)
1.7.7.1.2. 01 35 13
1.7.7.1.3. 01 35 29.14
1.7.7.2. The Contractor shall be responsible to supply, install, maintain and remove all temporary fencing/barricades and gates (see 01 56 00).
1.7.7.3. Security and/or safety requirements dictate that construction areas be cordoned off. To meet this requirement, temporary fencing and/or barricades in accordance with 01 56 00 shall be installed where shown on the Drawings.
1.7.7.4. Security measures as prescribed in Drawings, must not exceed DND height restrictions and will be secured to ensure no FOD.

1.8. Site Clearing

1.8.1. Prepare site as required to complete Work.
1.8.2. Divert water and associated infrastructure and equipment as required to facilitate Work in the dry.
1.8.3. Remove obstructions from surfaces to be worked.
1.8.4. Demolish and dispose or temporarily remove existing infrastructure in accordance with the Contract or as required to facilitate Work. Work includes removal of culverts, utilities and other infrastructure located within the excavation area. Submit notification in writing to Departmental Representative at least 5 days in advance of demolition.

1.9. Existing Utility Services

1.9.1. Under the Work, the following utilities to be removed, relocated permanently or temporarily as indicated on the Drawings. The following list is a summary and is not to be relied upon:

1.9.1.1. Existing fire hydrant and water service line to be temporarily disconnected, removed, disposed, and replaced in a new location outside of New FFTA footprint;

1.9.1.2. Local water service to Gas hut to be temporarily disconnected, removed, disposed, replaced outside of New FFTA footprint;

1.9.1.3. CFB Comox main water distribution supply line to be temporarily disconnected, removed, disposed and replaced in a new location outside of New FFTA footprint.

1.9.2. Prior to commencing the Work, the Contractor must obtain a dig permit in accordance with RP Ops Dig Permit Policy in Annex B.

1.9.3. Utility disruptions and downtime must be minimized. Temporary utility disruptions may be limited to particular periods (including potentially non Working Days or Hours) at the discretion of the DND and the Departmental Representative at no cost to Canada.

1.9.4. Any utility disruption to be coordinated in advance with Departmental Representative. A minimum of 15 days prior notice required for each disconnection event.

1.9.5. Size, depth and location of existing utilities and structures as provided in Contract are for guidance only. Completeness and accuracy are not guaranteed.

1.9.6. Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative prior to commencing any other Work. All utilities entering Site must be confirmed prior to subsurface disturbance (i.e., 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.

1.9.7. Remove abandoned service lines within 2 m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.

1.9.8. Maintain and protect from damage all utilities and structures encountered, unless Work involves temporarily breaking, rerouting, or connecting existing utilities.

1.9.9. Where Work requires temporarily breaking, rerouting, or connecting into existing utilities, obtain permission from both users and utility companies of intended interruption of services, and carry out Work at times determined by the authorities having jurisdiction.

1.9.10. 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.

1.9.11. Provide temporary services as required to maintain critical systems.

1.9.12. Where unknown utilities are encountered, Contractor to follow DND Dig Permit policies and immediately verbally notify Departmental Representative. Findings to be confirmed in writing.

1.10. Site Restoration and Bioswale

1.10.1. Site Restoration includes all labour, supplies, equipment, transportation, excavation, storage, backfilling, grading, quality control, environmental protection, surveying, inspection, monitoring, and all other services necessary for site restoration including bioswale design and construction and site restoration outside of the New FFTA.

1.10.2. Bioswale design and construction:

1.10.2.1. bioswale and landscaping design by QP in accordance with Drawings, best management guidelines, and industry practice,

1.10.2.2. excavation and excess soil from the bioswale construction will be used to create final site grades outside of the New FFTA,

1.10.2.3. supply and installation of all required elements (e.g., topsoil, filter rock, liner, underdrain, slope protection, native vegetation). All imported Backfill Materials (e.g., amended soil, stone chip, and storage layer, per Drawings) subject to characterization requirements of this specification (see 02 61 00.02).

1.10.3. Restoration outside of New FFTA and bioswale:

1.10.3.1. Final grading per Drawings and to allow tractor mowing,

1.10.3.2. Final site grades must be within 5 cm of pre-existing grades before Work commenced, unless otherwise specified.

1.10.3.3. Re-establish pre-existing drainage, unless otherwise specified.

1.10.3.4. Topsoil supply (see 32 91 19.13) and placement, revegetation including hydroseeding with approved seed (see 32 92 19.16), and

1.10.4. Reinstate pre-existing utilities and other infrastructure to original location and condition, meeting current standards, codes, and other requirements, unless otherwise identified according to Drawings or as directed by the Departmental Representative.

1.10.5. Reinstate surface to pre-existing conditions or as specified in Drawings, including surface material (e.g. vegetation, gravel, pavement), unless otherwise identified according to Drawings or as directed by the Departmental Representative.

1.10.6. All seeding to be consistent with CFB Comox Accepted Grass Seed Mixes and Specifications (Annex B) unless otherwise identified according to Drawings.

1.10.7. Deconstructing and removal from Site all temporary facilities and removal of any incidental or generated material.

1.10.8. Clean permanent access roads of debris, soil, material and contamination resulting from Work as required or as directed by Departmental Representative, with no increases to Contract Amount or Extension of Time for completion of the Work and as follows:

1.10.8.1. All shared access routes and areas per Drawings; and

1.10.8.2. Route 66 section adjacent to site to be cleaned via street sweeper daily when using Route 66 or as directed by Departmental Representative.

1.10.9. Upon Final Completion, remove Non-Contaminated Quality Soil and Debris, trim slopes, and correct defects as directed by the Departmental Representative.
1.10.10. Protect newly graded areas from traffic and erosion and maintain free of trash or debris until demobilization is completed and accepted by the Departmental Representative.

1.11. New FFTA Design

1.11.1. New FFTA to be designed and constructed in accordance with the Drawings including all labour, supplies, equipment, transportation, Backfill Material, storage, backfilling, compacting, grading, hard surfacing, quality control, environmental protection, surveying, inspection, monitoring, as necessary to meet Drawing and specifications.
1.11.2. New FFTA design and construction:
1.11.2.1. design by QP for its intended purpose in accordance with Drawings,
1.11.2.2. design to include multiple QPs as required (e.g., engineer, electrical, geotechnical, structural),
1.11.2.3. design to specify all methods and materials (e.g., piping, pumps, tankage, fire hydrant, power),

1.12. As-Built Documents

1.12.1. The Departmental Representative will provide paper copies of the Construction Documents upon request as per the Special Instructions to Bidders. Electronic copies of data and drawings in their native format are available on request.
1.12.2. Postconstruction Condition Survey to be completed by Contractor's QPS.
1.12.3. 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.
1.12.4. Drawings and Shop Drawings: legibly mark each item to record actual construction, including:
1.12.4.1. Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
1.12.4.2. Field changes of dimension and detail.
1.12.4.3. Changes made by change orders.
1.12.4.4. Details not on original Drawings.
1.12.4.5. References to related Shop Drawings and modifications.
1.12.5. Contract Specifications: legibly mark each item to record actual workmanship of construction, including:
1.12.5.1. Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
1.12.5.2. Changes made by addenda and change orders.
1.12.6. As-built information:
1.12.6.1. Record changes in red ink.

1.12.6.2. 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.
1.12.6.3. Submit 1 set in editable AutoCAD file format with all as-built information.
1.12.6.4. Submit all sets as directed by the Departmental Representative.
1.12.7. As required, surveying to be completed by Contractor's QPS for as-built documents.

1.13. Completion Documents

1.13.1. See also 01 78 30 - Close out Submittals
1.13.2. Submit as directed by the Departmental Representative, a written certificate that the following have been performed:
1.13.2.1. Work has been completed, and inspected and accepted by the Departmental Representative, in accordance with the Contract.
1.13.2.2. Destruction and Disposal of Contaminated Material and PFAS Contaminated Material has been completed and Disposal of all other materials has been completed with Certificates of Disposal and Certificates of Destruction included.
1.13.2.3. Stabilization of PFAS Contaminated Material has been completed with Certificate of Stabilization included.
1.13.2.4. 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.
1.13.2.5. Contractor's QP report documenting Backfill Material placement, compaction, and methods has met all requirements of the Contract.
1.13.2.6. Equipment and systems have been tested, adjusted and balanced, and are fully operational, as applicable.
1.13.2.7. Hydrant commissioning and certification to meet requirements of CFB Comox Fire officials and DND.
1.13.2.8. Operation of systems has been demonstrated to the personnel as directed by the Departmental Representative, as applicable.
1.13.2.9. Work is complete and ready for Final Site Inspection.
1.13.3. Defective products will be rejected, regardless of previous inspections. Replace defective products.
1.13.4. Prepare all documentation required as part of any permits or other authorizations obtained or otherwise the responsibility of the Contractor.

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 01 31 19 – PROJECT MEETINGS

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 01 31 19 Project Meetings.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. Not Used.

1.4. Action and Informational Submittals

1.4.1. Preconstruction Meeting Minutes: within 2 days of the Preconstruction Meeting, Submit meeting minutes.

1.4.2. Progress Meeting Minutes: within 2 days of a Progress Meeting, Submit meeting minutes. Submit revised minutes within 2 Working Days of receiving comments by Departmental Representative.

1.4.3. Information for Progress Meetings: at least 2 days prior to scheduled Progress Meetings, Submit all information in accordance with the Contract for Progress Meetings. Include:

1.4.3.1. Agenda for the proposed Progress Meeting.

1.4.3.2. Updated Project Master Plan (Schedule).

1.4.3.3. Copies of transport manifests and disposal receipts for all materials removed from Site.

1.4.3.4. Other information as directed by the Departmental Representative or relevant to agenda for upcoming progress meeting.

1.4.4. Final Site Inspection: within 2 days of the Final Site Inspection submit meeting minutes.

1.4.5. Closeout Meetings: within 2 days of the Closeout Meeting, Submit meeting minutes.

1.5. General and Administrative

1.5.1. Meetings are required throughout the duration of the work as described in these Specifications.

1.5.2. The Contractor must attend all required meetings and provide required preparation and follow-up materials.

1.5.3. The Contractor must schedule and administer project meetings throughout the progress of the Work weekly and at the call of the Departmental Representative.

1.5.4. The Contractor must:
1.5.4.1. prepare agenda for meetings.
1.5.4.2. Submit written notice with agenda of each meeting 2 days in advance of meeting date as directed by the Departmental Representative.
1.5.4.3. Provide physical space and make arrangements for meetings, or arrange for teleconference meetings, as directed by Departmental Representative.
1.5.4.4. Preside at meetings.
1.5.4.5. Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
1.5.4.6. Maintain records of meeting minutes for a minimum of 2 years after Work is completed.
1.5.4.7. Representative of Contractor, Subcontractor(s) and Supplier(s) attending meetings must be qualified and authorized to act on behalf of party each represents.

1.6. Preconstruction (Kickoff) Meeting

1.6.1. Within 5 days after Contract award, request a meeting of parties in Contract to discuss and resolve administrative procedures and responsibilities.
1.6.2. Departmental Representative, Contractor, Superintendent, major Subcontractor(s), field inspectors and supervisors must be in attendance.
1.6.3. Establish time and location of meeting subject to approval by Departmental Representative and notify parties concerned at least 3 days before meeting.
1.6.4. Agenda to include:
1.6.4.1. Appointment of official representative of participants in the Work, including Contractor's Superintendent and Departmental Representative.
1.6.4.2. Schedule of Work including Master Plan.
1.6.4.3. Schedule of Submittals including premobilization Submittals including Insurance, Contract Security, Health and Safety Plan, and Environmental Protection Plan.
1.6.4.4. Requirements for temporary facilities.
1.6.4.5. Site security, Health and Safety, Environmental Protection, coordination with other Site users including consultants and other contractors.
1.6.4.6. Change orders, procedures, approvals required, administrative requirements.
1.6.4.7. Monthly Progress Payments, administrative procedures, hold backs.
1.6.4.8. Appointment of inspection and testing agencies or firms.
1.6.4.9. List of Subcontractor(s).

1.7. Progress Meetings

1.7.1. During course of Work schedule progress meetings weekly subject to approval by Departmental Representative.
1.7.2. Contractor, Superintendent, major Subcontractor(s) involved in Work, and Departmental Representative are to be in attendance.

1.7.3. Agenda to include:
1.7.3.1. Review and acceptance of minutes of previous meeting.
1.7.3.2. Review health and safety, including incidents, near misses, and corrective measures.
1.7.3.3. Review Environmental Protection, including incidents, near misses, and corrective measures.
1.7.3.4. Review contractual compliance.
1.7.3.5. Review regulatory compliance.
1.7.3.6. Review communications, problems or concerns with community.
1.7.3.7. Review of Work progress since previous meeting.
1.7.3.8. Field observations, problems, conflicts.
1.7.3.9. 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.
1.7.3.10. Problems which impede construction schedule.
1.7.3.11. Corrective measures and procedures to regain projected schedule.
1.7.3.12. Revision to construction schedule.
1.7.3.13. Progress schedule, during succeeding Work period.
1.7.3.14. Review submittal schedules: expedite as required.
1.7.3.15. Maintenance of quality standards.
1.7.3.16. Quantities of material transported, destroyed, and disposed.
1.7.3.17. Review proposed changes for effect on construction schedule and on Final Completion date.
1.7.3.18. Other business.
1.7.4. Submit draft Progress Meeting Minutes for review and comment by Departmental Representative. Incorporate comments into final Progress Meeting Minutes.

1.8. Toolbox Meetings

1.8.1. During the course of the Work, schedule daily toolbox (tailgate) meetings at the start of each Work shift. Multiple meetings are required if the Contractor works multiple shifts within a 24-hour period.
1.8.2. All on Site workers to attend, including Contractor, Superintendent, major Subcontractor(s), and environmental consultants. Departmental Representative may attend.
1.8.3. Agenda to include:
1.8.3.1. Planned Work activities and environmental considerations for that shift, including hazards, mitigation measures, and emergency procedures.
1.8.3.2. Review previous relevant incident or near-miss reports, both from Site and other Sites.
1.8.3.3. Coordination activities, and roles and responsibilities, required between Contractor, Subcontractor(s), Departmental Representative, other contractor(s) including environmental consultant, site users, and protection of general public and offsite resources.

1.8.3.4. Health and Safety items, including PPE requirements.
1.8.3.5. Environmental Protection items, including emergency equipment.

1.9. Final Site Inspection

1.9.1. Within 5 days of completion of Site Works but prior to Demobilization, request a meeting on Site to review the Site.
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 days before meeting.
1.9.4. Agenda to include:
1.9.4.1. Inspect removal of all temporary equipment, materials, supplies, and facilities.
1.9.4.2. Inspect final surface grades.
1.9.4.3. Inspect final vegetation.
1.9.4.4. Inspect permanent facilities for performance and damage.
1.9.4.5. Document all damage, deficiencies, missing items, and non-conformance.
1.9.5. 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.

1.10. Closeout Meeting

1.10.1. Within 10 days of completion of the Work, request a meeting to review the project.
1.10.2. Departmental Representative, Contractor, Superintendent, major Subcontractor(s), field inspectors and supervisors must be in attendance.
1.10.3. Establish time and location of meeting subject to approval by Departmental Representative and notify parties concerned at least 3 days before meeting.
1.10.4. Agenda to include:
1.10.4.1. Review Certificate of Completion.
1.10.4.2. Review final payment.
1.10.4.3. Identify lessons learned.
1.10.4.4. 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 01 32 16.07 – CONSTRUCTION PROGRESS

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 01 32 16.07 Construction Progress.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. Not Used.

1.4. Action and Informational Submittals

1.4.1. Master Plan: within 10 days after Contract award, Submit a Master Plan.

1.4.2. Schedule of Interruption of Services: at least 5 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.

1.4.3. 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.

1.5. Requirements

1.5.1. Ensure Master Plan and detail Project Schedules are practical and are compliant with Schedule Requirements.

1.5.2. Plan to complete Work in accordance with prescribed milestones and time frame.

1.5.3. Limit activity durations to maximum of approximately 10 days, to allow for progress reporting.

1.5.4. Ensure that it is understood that Contract award or time of beginning, rate of progress, Certificate of Completion as defined times of completion are of essence of this contract.

1.5.5. Include Work sequencing description and schedule:

1.5.5.1. Work Sequencing description must describe methods, means, and sequences to perform each major task.

1.5.5.2. 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.

1.5.5.3. Major tasks includes all items identified on Unit Price Table.

1.6. Master Plan

1.6.1. Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
1.6.2. Departmental Representative will review and return revised schedules within 5 days.
1.6.3. Revise impractical schedule and resubmit within 5 days.
1.6.4. Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.7. Project Schedule

1.7.1. Develop detailed Project Schedule as updates to Master Plan.
1.7.2. Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
1.7.2.1. Dates of commencement and completion of Work for each Description of Work identified on the Unit Price Table.
1.7.2.2. Dates of Submittals including Shop Drawings, product data, SDS sheets and samples.
1.7.2.3. Dates of inspection and testing.
1.7.2.4. Final Completion date within the time period in accordance with the Contract, including Amendments.

1.8. Project Schedule Reporting

1.8.1. Update Project Schedule at least every 3 weeks reflecting activity changes and completions, as well as activities in progress.
1.8.2. Project Schedule with updates to include notification of work in DR/ATC Coordination Zone.
1.8.3. 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.

1.9. Project Meetings

1.9.1. 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 accepted dates shown on baseline schedule.
1.9.2. 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 01 33 00 – SUBMITTAL PROCEDURES

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 01 33 00 Submittal Procedures.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. Not Used.

1.4. Action and Informational Submittals

1.4.1. Shop Drawings: at least 5 days prior to commencing applicable Work, Submit Shop Drawings signed by a Contractor's QP.

1.4.2. Required Action and Information Submittals are identified in each Section under Subsection 1.4. Other Submittals may be required as determined by Departmental Representative.

1.5. General

1.5.1. Submission details to be commensurate for type of Work and Site conditions. Details depend on Work performed and Contractor's methods, means, and sequences.

1.5.2. Contractor’s responsibility for errors and omissions in Submittals is not relieved by the Departmental Representative’s review of Submittals.

1.5.3. Notify Departmental Representative in writing at time of Submittals, identifying deviations from requirements of Contract and stating reasons for deviations.

1.5.4. 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.

1.5.5. Make any changes in Submittals which Departmental Representative requires to be in accordance with the Contract and resubmit.

1.5.6. Notify Departmental Representative in writing, when resubmitting, of any revisions other than those directed by the Departmental Representative.

1.5.7. Do not proceed with Work until relevant Submittals are finalized and have been accepted.

1.5.8. 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.

1.5.9. 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.
1.5.10. Verify field measurements and affected adjacent Work are coordinated.
1.5.11. 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.
1.5.12. Keep one final copy of each Submittal onsite.

1.6. Submission Requirements

1.6.1. Coordinate each Submittal with the requirements of the Work and the Contract. Individual Submittals will not be reviewed until:
1.6.1.1. Submittals are complete.
1.6.1.2. All related information is available.
1.6.2. Allow 10 days for Departmental Representative's review of each Submittal, unless otherwise specified. No Standby Time charges or increases to Contract Amount or Extension of Time for Departmental Representative's review.
1.6.3. All Submittals are to be sent to Departmental Representative in duplicate as a hardcopy and in electronic format compatible with Departmental Representative's software.
1.6.4. Submittals must include:
1.6.4.1. Date and revision dates.
1.6.4.2. Project title and number.
1.6.4.3. Name and address of:
1.6.4.3.1. Subcontractor.
1.6.4.3.2. Supplier.
1.6.4.3.3. Manufacturer.
1.6.4.4. Signature of Superintendent, certifying approval of Submittals, verification of field measurements and in accordance with the Contract.
1.6.4.5. Contractor's QP and QP-PFAS to sign and seal Submittals in accordance with the Contract or as required by the nature of the Submittal.
1.6.4.6. Details of appropriate portions of Work as applicable.

1.7. Submittals

1.7.1. This summary list is presented for the Contractor's convenience only, but no warranty is given to its accuracy or completeness. In the event of any discrepancies with the requirements of the individual Specification sections, those individual Specification sections apply.

Table 01 33 00-01
Submittal List - Summary

Table 1 – Submittal List - Summary

Project Submittal List – Pre-Mobilization			
#	**Section**	**Submission**	**Submitted When**
1	01 11 55 01 41 00	Permits	At least 10 days prior to mobilization to site
2	01 25 20	Preconstruction Documents	At least 5 days prior to commencing any disturbance
	01 25 20	Design and Construction Plans includes: • Site Restoration and Bioswale Design • New FFTA Design	Within 20 days after Contract award
	01 35 13	FOD Mitigation Plan	At least 10 days prior to mobilization to site
	01 11 55	Construction Work Plan includes: • Shed Demolition Plan (02 41 13) • Contaminated Water Management (Turbidity Reduction) Plan (02 61 00.01) • Contaminated Soil and Water Management Plan (02 61 00.02) • Excavation and Backfilling Plan (02 61 00.02) • Contaminated Material Transportation Plan (02 61 00.03) • PFAS Contaminated Material Destruction Plan (02 61 00.04) • PFAS Contaminated Material Stabilization Plan. (02 61 00.05) • Concrete Disposal (02 61 00.06)	With Master Plan, Within 10 days after Contract award
5	01 32 16.07	Master Plan (Schedule)	Within 10 days after Contract award
3	01 25 20	Preconstruction Condition Survey	At least 5 days prior to commencing any disturbance
4	01 31 19	Preconstruction Meeting Minutes	Within 2 days of the preconstruction meeting

Table 1 – Submittal List – Summary (Continued)

Project Submittal List – Pre-Mobilization (Continued)			
#	**Section**	**Submission**	**Submitted When**
6	01 33 00	Shop Drawings	At least 5 days prior to commencing applicable work
8	01 35 29.14	Site Specific Health and Safety Plan	Within 7 days after Contract award and prior to mobilization to site
9	01 35 43	Environment Protection Plan	Within 10 days after Contract award and prior to mobilization to site
10	01 45 00	Quality Management and Control Plan	Within 10 days after Contract award
11	01 52 00	Site Layout	Within 10 days after Contract award and prior to mobilization to site
Project Submittal List – During Project			
#	**Section**	**Submission**	**Submitted When**
1	01 11 55	Daily Work Records	At the end of each shift
2	01 11 55	Cash Flow	With each progress payment
3	01 11 55	Coordination Meeting Minutes and Drawings	At least 5 days prior to relevant work commencing
4	01 25 20	Breakdown of Lump Sum Prices	At least 5 days prior to submitting the first progress payment
5	01 31 19	Progress Meeting Minutes	Within 2 days of a progress meeting
6	01 31 19	Information for Progress Meetings	At least 2 days prior to scheduled progress meetings
7	01 32 16.07	Schedule of Interruption of Services	At least 5 days prior to any shutdown or closure of active utilities or facilities
8	01 32 16.07	Project Master Plan (Schedule) and Updates	Submit with progress payment

Table 1 – Submittal List – Summary (Continued)

Project Submittal List – During Project (Continued)			
#	**Section**	**Submission**	**Submitted When**
9	01 35 43	Spill and Response Reports for Spills	Notify Departmental Representative within 12 hours of all spills and provide 19 Wing Comox Spill and Release Incident Report within 24 hours.
10	01 35 43	After Hours Work	At least 5 days prior to commencing after hours work
11	01 45 00	Review, Inspection and Testing Results	Within 5 days of receipt
12	01 52 00	Signs	At least 5 days prior to posting
13	02 61 00.01	Contaminated Water Treatment (Turbidity Reduction)	Within 5 days of conducting initial operations testing and prior to operating or discharge or within 5 days of sampling
14	02 61 00.02	Backfill Material Quality	At least 5 days prior to brining material onsite
15	02 61 00.02	Backfill Samples	At least 10 days prior to brining material to site
16	01 56 00	Temporary Hoarding and Fencing	At least 5 days prior to installation
17	02 61 00.01	Turbidity Reduction Equipment Testing	Within 5 days of conducting initial operations testing and prior to operating or discharge, or within 5 days of sampling
18	02 61 00.03	Certificate of Seaworthiness	Prior to barge shipments
19	02 61 00.03	Transport Manifests	Within 5 days of offsite transport
20	02 61 00.03	Weigh Scale Certification	At least 5 days prior to use
21	02 61 00.03	Weight Scale Slips	Within 10 days of measurement

Table 1 – Submittal List – Summary (Continued)

Project Submittal List – During Project (Continued)			
#	**Section**	**Submission**	**Submitted When**
22	02 61 00.04	Certificate of Destruction	Within 30 days of treatment at PFAS Destruction Facility and prior to payment, and prior to Final Completion
23	02 61 00.05	Certificate of Stabilization	Within 30 days of completing PFAS Stabilization and prior to payment, and prior to Final Completion
24	02 61 00.06	Certificate of Disposal	Within 30 days of disposal at Disposal Facility and prior to payment, and prior to Final Completion
Project Submittal List – Project Completion			
#	**Section**	**Submission**	**Submitted When**
1	01 25 20	As-Built Documents	Within 10 days of completing site work
2	01 25 20	Post-Construction Condition Survey	Within 10 days of completing the site work
3	01 25 20	Close-out Documents	Within 20 days of Final Completion of site restoration
4	01 31 19 01 78 30	Final Site Inspection	Within 2 days of the final site inspection
5	01 31 19 01 78 30	Closeout Meetings	Within 2 days of the closeout meeting
6	01 78 30	Record Documents	No later than 10 days after completion of the work
7	01 78 30	Certificate of Completion	No later than 10 days after completion of the work

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 01 34 14 – SPECIAL PROCEDURES FOR TRAFFIC CONTROL

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 01 34 14 Special Procedures for Traffic Control.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. See 01 52 00.

1.4. Action and Informational Submittals

1.4.1. Not Used.

1.5. Protection of Public Traffic

1.5.1. Comply with requirements of Acts, Regulations and By-Laws 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

1.5.2. When working on travelled way:

1.5.2.1. Place equipment in position to present minimum of interference and hazard to travelling public.

1.5.2.2. Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.

1.5.2.3. Do not leave equipment on travelled way overnight.

1.5.2.4. Do not close any lanes of road without approval of Departmental Representative. Before re-routing traffic erect suitable signs and devices in accordance with the Contract and permits or approvals.

1.5.2.5. Keep travelled way graded, free of potholes and of sufficient width for required number of lanes of traffic.

1.5.2.6. Provide minimum 6 m wide temporary roadway for traffic in two-way sections through Work and on detours.

1.5.2.7. Provide minimum 3.5 m wide temporary roadway for traffic in one-way sections through Work and on detours.

1.5.2.8. Provide and maintain road access and egress to property fronting along Work under Contract and in other areas as indicated, unless other means of road access exist that meet approval of Departmental Representative.

1.6. Informational and Warning Devices

1.6.1. Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.

1.6.2. Supply and erect signs, delineators, barricades and miscellaneous warning devices as specified in Part D, Temporary Conditions Signs and Devices, of UTCD manual.

1.6.3. Place signs and other devices in locations recommended in UTCD manual.

1.6.4. Prior to commencement of Work submit a list of signs and other devices required for project. If situation on site changes, revise list to approval of Departmental Representative.

1.6.5. Continually maintain traffic control devices in use by:

1.6.5.1. Checking signs daily for legibility, damage, suitability and location.

1.6.5.2. Clean, repair or replace to ensure clarity and reflectance.

1.6.5.3. Removing or covering signs which do not apply to conditions existing from day to day.

1.7. Control of Traffic

1.7.1. Provide competent flag persons, trained in accordance with, and properly equipped as specified in the UTCD manual in following situations:

1.7.1.1. When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.

1.7.1.2. When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.

1.7.1.3. When workmen or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.

1.7.1.4. Where temporary protection is required while other traffic control devices are being erected or taken down.

1.7.1.5. For emergency protection when other traffic control devices are not readily available.

1.7.1.6. In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.

1.7.1.7. At each end of restricted sections where pilot cars are required.

1.7.1.8. Delays to public traffic due to contractor's operators: maximum 15 minutes.

1.7.2. Where roadway, carrying two-way traffic, is restricted to one lane provide portable traffic signal system for 24 hours each day. Adjust, as necessary, and regularly maintain system during period of restriction. Signal system to meet requirements of Part IV of UTCD.

1.8. Access Routes

1.8.1. Site access routes will be identified by the Departmental Representative.

1.8.2. All Contractors' vehicles must follow the designated access routes.

1.8.3. The Contractor will be responsible to ensure that all personnel are familiar with the routes prior to use.
1.8.4. The Contractor will supply and install signs and markings to clearly identify the access routes to be used to the satisfaction of the Departmental Representative.
1.8.5. Vehicles and drivers not following designated access routes will be removed and permanently barred from the site.
1.8.6. Any mud or debris tracked or blown onto the active aircraft operation surface by the Contractor's activities must be removed immediately so as not to present a hazard to aircraft engines.
1.8.7. The use of calcium chloride for dust control will not be permitted on the airport.

1.9. Operational Requirements

1.9.1. Maintain existing conditions for traffic throughout period of contract except that, when required for construction under contract and when measures have been taken as specified and approved by Departmental Representative to protect and control public traffic.
1.9.2. Maintain existing conditions for traffic crossing right-of-way.

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 01 35 13 – SPECIAL PROCEDURES FOR AIRPORT FACILITIES

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 01 35 13 Special Project Procedures for Airport Facilities.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. Not Used.

1.4. Action and Informational Submittals

1.4.1. FOD Mitigation Plan: Submit FOD Mitigation Plan 10 days prior to mobilization. FOD Mitigation plan to detail equipment requirements and other efforts to keep nearby active airfield areas clear of dirt and debris at all times. Plan to include inspection details (e.g., schedule and forms) and response plan if FOD identified.

1.5. Standby

1.5.1. Standby Time related to CFB Comox operations is inherent to CFB Comox operations and is to be expected. Standby Time definition, and notification requirements for payment for this Tender Item are defined.

1.6. General Protection

1.6.1. Do not disrupt airport business except as permitted by Departmental Representative.

1.6.2. Provide temporary protection for safe handling of public, personnel, pedestrians and vehicular traffic in accordance with the Contract.

1.6.3. Provide secure barricades and signs complete with reflective tape, lighted by night and during poor visibility with red lights and flags by day where directed by Departmental Representative to prevent personnel from inadvertently crossing into operational areas.

1.7. Coordination

1.7.1. Prior to start of work, Departmental Representative will arrange for a mandatory Flight Safety Briefing of all Contractor's personnel by Base Authority on procedures for movement of equipment and personnel, and work on, or adjacent to designated Departmental Representative / Air Traffic Control (DR/ATC)

Zone (e.g., active runways, taxiways, or aprons, see Drawings,) (i.e., active runways, taxiways and aprons) as shown on Drawings.

1.7.2. The Departmental Representative reserves the right to immediately have removed from the Base any personnel who disobey any safety or Flight Safety regulation and/or procedures.

1.8. Flight Safety and DR/ATC Coordination Zone

1.8.1. Prior to permitting personnel to work within the designated DR/ATC Coordination Zone (see Drawings) obtain Departmental Representative written approval which will include specific clearance from Air Traffic Control (ATC) or Commissionaire designated for this purpose.

1.8.2. Prior to starting work obtain necessary closure of adjacent facilities.

1.8.3. Contractor vehicles are not to access the airfield.

1.8.4. Contractor's vehicles used on the airfield must be equipped with an orange rotary beacon or must be escorted by a vehicle equipped with such a beacon.

1.8.5. FOD control procedures will be enforced by the Departmental Representative at all times in construction and operational areas. Keeping active runways, taxiways and aprons adjacent to the work clean during the Work shall be the responsibility of the Contractor.

1.8.6. The Contractor shall maintain at the construction site and Departmental Representative approved, sufficiently sized and powered:

1.8.6.1. Street sweeper tractor with power broom or similar vehicle, fitted with a non-metallic motorized rotary sweeper broom, minimum width 2.4 m, for FOD control and clean-up of adjacent operational surfaces affected by construction activities. Site FOD sweeps shall be conducted at the end of each day and when directed by the Departmental Representative.

1.8.6.2. Water truck capable of supplying enough water for dust control as well as construction needs.

1.9. Evacuation

1.9.1. The Contractor shall be required to abandon and evacuate the work sites as directed, should an emergency situation be declared by Airport Authorities.

1.10. Radio Escort

1.10.1. The Contractor's employees and equipment that are authorized to enter the secure area will be restricted from other designated work areas unless being escorted by a radio-controlled vehicle complete with a rotating beacon.

1.10.2. Any Contractor's employee found outside of the work site limit, without an escort, will have their security pass revoked and will no longer be allowed inside the security area.

1.11. Security Personnel

1.11.1. See 01 11 00 and 01 35 29.14.

1.12. Vehicles

1.12.1. Vehicles and equipment required to be within DR/ATC Coordination Zone of the airfield must be equipped with 360° rotating amber beacons unless as approved by Departmental Representative.

1.12.2. Vehicle operators to be guided by requirements of the Transport Canada Manual of Airport Traffic Directive for the Operation of Vehicles on Airport movement Areas.

1.12.3. Company vehicles will be removed from the construction site when not actually in use. If company vehicles are left at the airport they are to be stored in the staging/storage area or a location directed by Departmental Representative.

1.13. Unserviceable Areas

1.13.1. Mark off areas made unserviceable for aircraft by Work of this Contract by providing plainly visible danger markings by day and red lights by night in accordance with 01 56 00 – Temporary Barriers and Enclosures.

1.13.2. Open flames and inflammable fuels are not permitted.

1.14. Airport Facilities

1.14.1. Departmental Representative will validate location of underground utilities after Contractor has located utilities. Notify Departmental Representatives of work areas sufficiently in advance of operations so that underground facilities can be located. The Contractor is responsible to locate and maintain locates. Comply with DND RP Ops OC Directive No. A24 – RP Ops Dig Permit Policy.

4. PART 2 - PRODUCTS

4.1. Not Used

4.1.1. Not Used.

5. PART 3 - EXECUTION

5.1. Not Used

5.1.1. Not Used.

END OF SECTION

1. PART 1 – GENERAL 01 35 13.43 – SPECIAL PROCEDURES FOR CONTAMINATED SITES

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 01 35 13.43 Special Project Procedures for Contaminated Sites.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.1.3. For payment of Contaminated Water Management (Turbidity Reduction) see 02 61 00.01

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. Not Used.

1.4. Action and Informational Submittals

1.4.1. Contaminated Soil and Water Management Plan: within 10 day after Contract award and prior to mobilization to Site. Contaminated Soil and Water Management Plan to meet requirements and include submittal requirements detailed in Sections 02 61 00.01 and 02 61 00.02

1.5. Sequencing and Scheduling

1.5.1. Commence Work involving contact with Contaminated or potentially PFAS Contaminated Materials or Water after all applicable Environmental Protection procedures and facilities (including those identified in Site Layout) are operational and accepted by Departmental Representative.

1.5.2. Plan work sequencing and traffic patterns to prevent contamination of clean areas due to traffic or debris.

1.6. Drums

1.6.1. Significant use of drums for storing materials is not anticipated. If significant drum storage is warranted Contractor must:

1.6.1.1. Provide, maintain, and operate drum staging pad as required.

1.6.1.2. Construct drum staging pad with sump capable of collecting leachate and rain runoff. Place impermeable liner that contours over top of berm, and collects leachate and runoff from staging pad which is conducted solely to sump on staging pad. Leachate is Contaminated Water.

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

1.7. Personnel Decontamination Facility

1.7.1. 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 soils from boots, clothing and skin surfaces.

1.7.2. Be responsible for ensuring that all materials, chemicals, protective clothing, wash water and deleterious materials are collected, treated or destroyed and disposed of in accordance with applicable environmental standards and regulations.

1.7.3. 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.

1.8. Equipment Decontamination Facility

1.8.1. The Contractor must provide, operate, and maintain necessary equipment, pumps, and piping required to collect and contain equipment decontamination wastewater per the requirements of the EMP.

1.8.2. Prior to commencing Work involving equipment contact with potentially contaminated soil, construct equipment decontamination facilities to accommodate the largest potentially contaminated equipment onsite.

1.8.3. Collect and contain equipment decontamination wastewater and sediment. Manage equipment decontamination wastes in accordance with the Contract, see details in:

1.8.3.1. 01 35 13.13 and

1.8.3.2. 02 61 00.01.

1.9. Equipment Decontamination

1.9.1. 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.

1.9.2. 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 tire treads, equipment tracks, springs, joints, sprockets, and undercarriages. Scrub surfaces with long handle scrub brushes and cleaning agent. Rinse off and collect cleaning agent. Air dry equipment in clean area before removing from Site or travelling on clean areas. Perform assessment as directed by the Departmental Representative to determine effectiveness of decontamination.

1.9.2.1. Take appropriate measures necessary to minimize drift of mist and spray during decontamination including provision of wind screens.

1.9.2.2. Collect decontamination wastewater and sediment which accumulate in decontamination location. Designate and manage collected wastewater as

PFAS Contaminated Water. Manage decontamination sediment as Waste Quality.

1.9.3. 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.

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

1.10. Progress Decontamination

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

1.11. Final Decontamination

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

1.12. Vehicular Access

1.12.1. Maintenance and use at any area used for the Contract during performance of the work:

1.12.1.1. Prevent contamination of access roads. Immediately scrape up debris or material on access roads that is suspected to be contaminated as determined by the Departmental Representative; transport and place into designated area accepted by the Departmental Representative. At a minimum, clean access roads at least once per shift.

1.13. PFAS Contaminated Materials and Contaminated Water Management (Turbidity Reduction)

1.13.1. Remove all PFAS Contaminated Materials and Contaminated Water within Work areas in accordance with the Contract and as directed by the Departmental Representative. Remove Non-Contaminated Quality Soil and Non-Contaminated Water incidental to the Work or as directed by the Departmental Representative.

1.13.2. All excavation water to be assumed Contaminated Water. Contractor responsible to minimize excavation water volumes by eliminating surface water flow into excavation and sequencing excavation. Owner's Water Treatment Plant will accept:

1.13.2.1. a maximum of 5,000 L daily

1.13.2.2. max turbidity of <50 NTU.

1.13.3. Material and Water will be Classified by the Departmental Representative based on in situ results. Departmental Representative responsible for Classification. Contractor cannot re-Classify material.
1.13.4. Handle (including excavation, transportation, Destruction, and Disposal) material separately into the Classifications in accordance with the Contract or as directed by the Departmental Representative. Take necessary precautions to avoid mixing of different Classifications. Do not blend, or mix and dilute, different material Classifications. No reclassification of material allowed.
1.13.5. Contractor responsible for Transportation, Destruction, and Disposal based on Classification by Departmental Representative. Contractor responsible for material blended, or mixed and diluted, based on re-Classification by Departmental Representative. No increases to Contract Amount or Extension of Time due to material blended, or mixed and diluted.
1.13.6. Material characterization (e.g. sampling and testing) of parameters additional to information provided in Contract as required by the Contractor (e.g. for Transportation, Destruction Facility or Disposal Facility purposes) responsibility of Contractor.
1.13.7. Material segregation additional to Contract as required for Transportation, Destruction Facility or Disposal Facility responsibility of Contractor.

1.14. Soil Stockpile Construction

1.14.1. Stockpile material within work area in locations identified by Departmental Representative.
1.14.2. Stockpiles to be managed in accordance with CFB Comox / 19 Wing Soil Management Plan (Annex C).
1.14.3. Provide, maintain, and operate temporary storage/stockpiling facilities as per Contractor's Site Layout.
1.14.4. Stockpiles must be monitored daily to ensure requirements are met. Departmental Representative must be notified of any issues and subsequent issue resolutions including documenting when completed.
1.14.5. Segregate excavated soil into separate Classifications, and segregate Contaminated Soil from Non-Contaminated Quality Soil, into separate stockpiles to prevent cross-contamination.
1.14.6. Prevent precipitation into Stockpiles from infiltrating or from directly running off stockpiled materials. Cover stockpiled materials with an impermeable cover during periods of Work stoppage including at end of each day and as directed by the Departmental Representative.
1.14.7. Securely fasten covers over stockpiled material at all times until material is loaded for transport. Weighting required on all covers to eliminate FOD.
1.14.8. Store excavated Non-Contaminated Quality Soil only on Non-Contaminated Quality surface areas. Ensure no contact between Non-Contaminated Quality Soil and Contaminated Soil.

1.14.9. New temporary stockpile construction:

1.14.9.1. Prepare surface material as required to maintain liner integrity and stockpile integrity. Clear and grub stockpile area, ensure no sharp protrusions. Compact surface soil as required to prevent settlement. Grade bottom of stockpile area to prevent leachate from migrating outside of stockpile area.

1.14.9.2. Install impermeable liner (e.g. asphalt or minimum 20 mil (0.5 mm) polyethylene) below proposed stockpile locations to prevent contact between stockpile material and ground.

1.14.9.3. Construct adequate berms around stockpile to ensure material remains within stockpile area and that surface water does flow into stockpile area.

1.14.10. Temporary stockpile operation:

1.14.10.1. Segregate Contaminated Soil into separate Classifications, and segregate Contaminated Soil from Non-Contaminated Quality Soil, into separate stockpiles to prevent cross-contamination.

1.14.10.2. Cover stockpiled material when not being worked or sampled to prevent release of airborne dust, vapours, or odours, and to prevent saturation and leachate generation from material. Securely fasten covers over stockpiled material until material is loaded for transport. Cover to be impermeable (e.g. minimum 5 mil polyethylene) and securely fashioned to prevent blowing off.

1.14.10.3. Prevent Non-Contaminated Quality Water, including surface runoff water, from coming into contact with Contaminated Soil stockpiles.

1.15. Stockpile Loading

1.15.1. Place Contaminated Soil in Stockpiles in locations and thicknesses according to Contract.

1.15.2. Soil cannot be placed within 1.5 m of berms or sump to maintain adequate drainage and to avoid damaging the liner or geotextile material.

1.15.3. Mechanical equipment cannot work within 1.5 m of sump or berms.

1.15.4. Trucks are only to operate in Stockpiles when there is a minimum of 1 m of soil present or as directed by the Departmental Representative. Trucks should minimize or eliminate turning while in facility. Trucks cannot dump directly on liner but only on areas with 1 m of soil present and the dumped soil must remain 1.5 m from the sump and berms when placed.

1.15.5. Tracked equipment is only to operate in Stockpiles when there is a minimum of 0.5 m of soil present or as directed by the Departmental Representative.

1.15.6. Be responsible for, and make good repairs of, any damage to Stockpiles caused by placement or amendment.

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 01 35 29.14 – HEALTH AND SAFETY FOR CONTAMINATED SITES

PSPC Update on Asbestos Use

Effective April 1, 2016, all PSPC contracts for new construction and major rehabilitation will prohibit use of asbestos-containing materials.

COVID 19

All contractors shall follow Canadian Construction Association COVID-19 - Standardized Protocols for All Canadian Construction Sites, Provincial Regulations and Federal Site-Specific Guidelines.

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 01 35 29.14 Health and Safety for Contaminated Sites.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.1.3. Submittals to be paid in Mobilization/Demobilization Submittals (see 01 25 20).

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 01 25 20 Mobilization / Demobilization

1.4. Action and Informational Submittals

1.4.1. Submit to Departmental Representative Submittals listed for review.

1.4.2. Work affected by Submittal must not proceed until review is complete.

1.4.3. Site Specific Health and Safety Plan: within 7 days after Contract award and prior to mobilization to Site,

1.4.4. Submit a health and safety plan. Include:

1.4.4.1. Results of site-specific safety hazard assessment.

1.4.4.2. Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.

1.4.5. Submit digital copy of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative.

1.4.6. Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

1.4.7. Submit copies of incident and accident reports.

1.4.8. Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 10 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental

Representative within 10 days after receipt of comments from Departmental Representative.

1.4.9. Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

1.4.10. Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.

1.4.11. On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations to be submitted within 10 days after Contract award and prior to mobilization.

1.4.12. Prior to commencing Work submit:

1.4.12.1. Complete set of SDS, and all other documentation required by WHMIS requirements.

1.4.12.2. Emergency Procedures.

1.4.12.3. Notice of Project.

1.5. References

1.5.1. Government of Canada:

1.5.1.1. Canada Labour Code - Part II. (as amended)

1.5.1.2. Canada Occupational Health and Safety Regulations. (as amended)

1.5.2. National Building Code of Canada (NBC): (as amended)

1.5.2.1. Part 8, Safety Measures at Construction and Demolition Sites.

1.5.3. The Canadian Electrical Code (as amended)

1.5.4. Canadian Standards Association (CSA) (as amended):

1.5.4.1. CSA Z797-2009 Code of Practice for Access Scaffold.

1.5.4.2. CSA S269.1-1975 (R2003) Falsework for Construction Purposes.

1.5.4.3. CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures.

1.5.4.4. CSA Z1006-10 Management of Work in Confined Spaces.

1.5.4.5. CSA Z462-18 Workplace Electrical Safety Standard

1.5.5. National Fire Code of Canada 2015 (as amended):

1.5.5.1. Part 5 – Hazardous Processes and Operations and Division B as applicable and required.

1.5.6. American National Standards Institute (ANSI): (as amended)

1.5.6.1. ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.

1.5.7. Province of British Columbia (as appropriate):

1.5.7.1. Workers Compensation Act Part 3-Occupational Health and Safety. (as amended)

1.5.7.2. Occupational Health and Safety Regulation. (as amended)

1.6. Regulatory Requirements

1.6.1. Comply with specified codes, acts, bylaws, standards and regulations to ensure safe operations at site.

1.6.2. 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 advise on the course of action to be followed.

1.7. Worker's Compensation Board Coverage

1.7.1. 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.

1.7.2. 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 Completion is issued.

1.8. Compliance with Regulations

1.8.1. Conduct a site-specific hazard assessment based on review of Contract documents, required work, and project site. Identify any known and potential health risks and safety hazards.

1.8.2. Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:

1.8.2.1. Primary requirements:

1.8.2.1.1. Contractor's safety policy.

1.8.2.1.2. Identification of applicable compliance obligations.

1.8.2.1.3. Definition of responsibilities for project safety / organization chart for project.

1.8.2.1.4. General safety rules for project including COVID 19 protocols.

1.8.2.1.5. Job-specific safe work procedures.

1.8.2.1.6. Inspection policy and procedures.

1.8.2.1.7. Incident reporting and investigation policy and procedures.

1.8.2.1.8. Occupational Health & Safety Committee / Representative procedures.

1.8.2.1.9. Occupational Health & Safety meetings.

1.8.2.1.10. Occupational Health & Safety communications and record keeping procedures.

1.8.2.2. 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 site work.

1.8.2.3. List hazardous materials to be brought on site as required by work.

1.8.2.4. Indicate Engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.

1.8.2.5. Identify PPE to be used by workers.

1.8.2.6. Identify personnel and alternates responsible for site safety and health.

1.8.2.7. Identify personnel training requirements and training plan, including site orientation for new workers.

1.8.3. 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.

1.8.4. Revise and update Health and Safety Plan as required and re-submit to the Departmental Representatives.

1.8.5. Departmental Representative's review: the review of Site-Specific Health & Safety Plan by PSPC shall not relieve the Contractor of responsibility for errors or omissions in final Site-Specific Health and Safety Plan or of responsibility for meeting all requirements of construction and contract documents.

1.9. General Requirements – Site-Specific Safety Plan

1.9.1. Develop written Site-Specific Safety Plan based on hazard assessment prior to commencing any site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

1.9.2. Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.10. Filing of Notice

1.10.1. The Prime Contractor must complete and submit a Notice of Project as required by Provincial authorities.

1.10.2. Provide copies of all notices to the Departmental Representative.

1.11. Safety Assessment

1.11.1. Perform site specific safety hazard assessment related to project.

1.12. Meetings

1.12.1. Attend health and safety preconstruction meetings and all subsequent meetings call by the Departmental Representative.

1.13. Regulatory Requirements

1.13.1. Do Work in accordance with Regulatory Requirements.

1.14. Responsibility

1.14.1. Assume responsibility as the Prime Contractor for work under this contract.

1.14.2. Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

1.14.3. Comply with and enforce compliance by employees with safety requirements of Contract documents, applicable Federal, Provincial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.15. Compliance Requirements

1.15.1. Comply with the CCA COVID-19 – Standardized Protocols for All Canadian Construction Sites.

1.15.2. Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations

1.15.3. Comply with the B.C. Workers Compensation Act and Worksafe B.C. Occupational Health and Safety Regulations.

1.15.4. The most stringent will apply.

1.16. Unforeseen Hazards

1.16.1. When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, advise Safety Officer and follow procedures in accordance with Acts and Regulations of Province having jurisdiction and immediately advise Departmental Representative verbally and in writing.

1.17. Health and Safety Coordinator

1.17.1. The Health and Safety Coordinator must:

1.17.1.1. Be responsible for completing all health and safety training, ensure that personnel that do not successfully complete the required training are not permitted to enter the site to perform the work.

1.17.1.2. Be responsible for implementing, daily enforcing, and monitoring the Site Specific Safety Plan or Health and Safety Plan.

1.17.1.3. Be on site during execution of work.

1.18. Posting of Documents

1.18.1. Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Territory having jurisdiction, and in consultation with Departmental Representative.

1.19. Correction of Non-Compliance

1.19.1. Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.

1.19.2. Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.

1.19.3. Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.20. Work Stoppage

1.20.1. Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

1.21. General Conditions

1.21.1. Provide safety barricades and lights around work site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.

1.21.2. Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.

1.21.2.1. Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required (see 01 34 14 and 01 56 00).

1.21.2.2. Secure site at night time or provide security guard as deemed necessary to protect site against entry.

1.22. Project/Site Conditions

1.22.1. Work at site will involve contact with:

1.22.1.1. Multi-employer work site.

1.22.1.2. Federal employees and general public.

1.22.1.3. Energized electrical services.

1.22.1.4. Working from heights.

1.22.1.5. Working in open exposed to unpredictable weather.

1.22.1.6. High volumes of vehicular and pedestrian traffic.

1.22.1.7. Contaminants identified in Contract Documents and environmental reports.

1.23. Utility Clearance

1.23.1. The Contractor is solely responsible for all utility detection and clearances prior to starting the work.

1.23.2. Prior to commencing the Work, the Contractor must obtain a dig permit in accordance with RP Ops Dig Permit Policy in Annex B.

1.23.3. The Contractor will not rely solely upon the Drawings or other information provided for Utility locations.

1.24. Regulatory Requirements

1.24.1. Comply with specified codes, acts, bylaws, standards, and regulations to ensure safe operations at site (the most stringent will apply).

1.24.2. 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 advise on the course of action to be followed.

1.25. Work Permits

1.25.1. Obtain specialty permit(s) related to project before start of work.

1.26. Emergency Procedures

1.26.1. List standard operating procedures and measures to be taken in emergency situations. Include an emergency response and emergency evacuation plan and emergency contacts (i.e. names/telephone numbers) of:
1.26.1.1. Designated personnel from own company.
1.26.1.2. Regulatory agencies applicable to work and as per legislated regulations.
1.26.1.3. Local emergency resources.
1.26.1.4. Departmental Representative.
1.26.1.5. A route map with written directions to the nearest hospital or medical clinic.
1.26.2. Include the following provisions in the emergency procedures:
1.26.2.1. Notify workers and the first-aid attendant, of the nature and location of the emergency.
1.26.2.2. Evacuate all workers safely.
1.26.2.3. Check and confirm the safe evacuation of all workers.
1.26.2.4. Notify the fire department or other emergency responders.
1.26.2.5. Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.
1.26.2.6. Notify Departmental Representative.
1.26.3. Provide written rescue/evacuation procedures as required for, but not limited to:
1.26.3.1. Work at high angles.
1.26.3.2. Work in confined spaces or where there is a risk of entrapment.
1.26.3.3. Work with hazardous substances.
1.26.3.4. Underground work.
1.26.3.5. Work on, over, under and adjacent to water.
1.26.3.6. Workplaces where there are persons who require physical assistance to be moved.
1.26.4. Design and mark emergency exit routes to provide quick and unimpeded exit.
1.26.5. Revise and update emergency procedures as required and re-submit to the Departmental Representative.
1.26.6. Contractors must not rely solely upon 911 for emergency rescue in a confined space, working at heights, etc.

1.27. Hazardous Products

1.27.1. Comply with requirements of WHMIS regarding use, handling, storage and disposal of hazardous materials, and regarding labelling and provision of SDS acceptable to the Departmental Representatives and in accordance with the Canada Labour Code.
1.27.2. Where use of hazardous and toxic products cannot be avoided:
1.27.2.1. Advise Departmental Representative beforehand of the product(s) intended for use. Submit applicable SDS and WHMIS documents as per 01 33 00.
1.27.2.2. Provide adequate means of ventilation.

1.27.2.3. The contractor shall ensure that the product is applied as per manufacturers recommendations.
1.27.2.4. The contractor shall ensure that only pre-approved products are brought onto the work site in an adequate quantity to complete the work.

1.28. Asbestos Hazard

1.28.1. Carry out any activities involving asbestos in accordance with current applicable Federal and Provincial Regulations.
1.28.2. Removal and handling of asbestos will be in accordance with current applicable Provincial / Federal Regulations.

1.29. PCB Removals

1.29.1. Polychlorinated biphenyls (PCBs) not expected to be encountered.
1.29.2. Carry out any activities involving PCBs in accordance with current applicable Federal and Provincial Regulations.
1.29.3. Removal and handling of PCBs will be in accordance with current applicable Provincial / Federal Regulations.
1.29.4. Mercury-containing fluorescent tubes and ballasts which contain PCBs are classified as hazardous waste.

1.30. Removal of Lead-Containing Paint

1.30.1. Lead- Containing Paint is not expected to be encountered.
1.30.2. All paints containing Toxicity Characteristic Leaching Procedure (TCLP) lead concentrations above 5 ppm are classified as Hazardous Waste.
1.30.3. Carry out demolition activities involving lead-containing paints in accordance with applicable Provincials Regulations.

1.31. Electrical Safety Requirements

1.31.1. Comply with authorities and ensure that when installation new facilities or modifying existing facilities, all electrical personnel are completed familiar with existing and new electrical circuits and equipment and their operation.
1.31.2. Comply with Worksafe BC OHS Regulation Part 19 – Electrical Safety (as amended).
1.31.3. Before undertaking any work, coordinate required energizing and de-energizing of new and existing circuits with Departmental Representative.
1.31.4. Maintain electrical safety procedures and take necessary precautions to ensure safety of all personnel working under this Contract, as well as safety of other personnel on site.

1.32. Electrical Lockout

1.32.1. Develop, implement and enforce use of established procedures to provide electrical lockout and to ensure the health and safety of workers for every event where work must be done on any electrical circuit or facility.

1.32.2. Prepare the lockout procedures in writing, listing step-by-step processes to be followed by workers, including how to prepare and issue the request / authorization form. Have procedures for review upon request by the Departmental Representatives.

1.32.3. Keep the documents and lockout tags at the site in a log book for the full duration of the Contract. Upon request, make such data available for viewing by Departmental Representatives or by any authorized safety representative.

1.33. Overloading

1.33.1. Ensure no part of work is subjected to a load which will endanger its safety or will cause permanent deformation.

1.34. Falsework

1.34.1. Design and construction falsework in accordance with CSA S269.1-1975 (R2003).

1.35. Scaffolding

1.35.1. Design, construct and maintain scaffolding in a rigid, secure and safe manner, in accordance with CSA Z797-2009 (as amended) and B.C. Occupational Health and Safety Regulations. (as amended)

1.36. Confined Spaces

1.36.1. Carry out work in compliance with current Provincial / Territorial regulations.

1.37. Fire Safety and Hot Work

1.37.1. Obtain Departmental Representative's authorization before any welding, cutting or any other hot work operations can be carried out on site.

1.37.2. Hot work includes cutting/melting with use of torch, flame heating roofing kettles, or other open flame devices and grinding with equipment which produces sparks.

1.37.3. Hot Work permits are a mandatory requirement for any hot work activities.

1.38. Fire Safety Requirements

1.38.1. Comply with CFB Comox DND Fire Safety Requirements (see 01 35 35).

1.38.2. Store oily/paint-soaked rags, waste products, empty containers and materials subject to spontaneous combustion in approved, sealed containers and remove from site on a daily basis.

1.38.3. Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada. (as amended)

1.38.4. Portable gas and diesel fuel tanks are not permitted on most federal work sites. Approval from the Departmental Representative is required prior to any gas or diesel tank being brought onto the work site.

1.39. Posted Documents

1.39.1. Post legible versions of the following documents onsite:
1.39.1.1. Site Specific Safety Plan or Health and Safety Plan
1.39.1.2. Sequence of Work (Master Plan).
1.39.1.3. Emergency procedures.
1.39.1.4. Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.
1.39.1.5. Notice of Project.
1.39.1.6. Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the Site for review by employees and workers.
1.39.1.7. WHMIS documents.
1.39.1.8. Post all SDS 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.
1.39.1.9. List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.
1.39.2. 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.

1.40. Meetings

1.40.1. Attend health and safety preconstruction meeting and all subsequent meetings called by the Departmental Representative.
1.40.2. Ensure all site personnel attend a health and safety toolbox meeting at the beginning of each shift, which must include:
1.40.2.1. Sign-in of all attendees.
1.40.2.2. Planned Work activities and environmental considerations for that shift.
1.40.2.3. Hazards associated with these Work activities, including environmental hazards (e.g. potential for hypothermia, heat exhaustion, heat stroke).
1.40.2.4. Appropriate job-specific safe work procedures.
1.40.2.5. Required PPE.
1.40.2.6. Appropriate emergency procedures.
1.40.2.7. Review recent accidents on Site, including near misses.
1.31.1. 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.

1.41. Hazardous Occurrence Investigation, Recording and Reporting (HOIRR)

1.41.1. Hazard includes:

1.41.1.1. 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.

1.41.2. Hazardous Occurrence includes:

1.41.2.1. An event occurring at a 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.

1.41.3. Hazardous Occurrence Investigation and Reporting Procedures:

1.41.3.1. Includes information regarding the person involved and the basic circumstances surrounding the hazardous occurrence.

1.41.3.2. Provides a detailed and thorough description of the hazardous occurrence and the sequence of events.

1.41.3.3. Indicates corrective measures that have been taken since the occurrence.

1.41.3.4. Requires the appointment of a qualified investigator.

1.41.3.5. Provides recommendations for additional corrective measures, if required.

1.41.4. Fatal or Serious Accidents Procedures:

1.41.4.1. Call emergency number to advise the police organization having jurisdiction to secure the scene and investigate the matter.

1.41.4.2. Advise the Departmental Representative of the fatality or serious accident within 1 hour.

1.41.4.3. No investigation will be conducted at the scene until the police service having jurisdiction has released the scene.

1.41.4.4. Unless authorized to do so, do not allow anyone to 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.

1.42. Personal Protective Equipment Program

1.42.1. Submit PPE program with the Site Specific Health and Safety Plan to the Departmental Representative addressing as appropriate:

1.42.1.1. Donning and doffing procedures.

1.42.1.2. PPE selection based upon Site hazards.

1.42.1.3. PPE use and limitations of equipment.
1.42.1.4. Work mission duration, PPE maintenance and storage.
1.42.1.5. PPE decontamination and disposal.
1.42.1.6. PPE inspection procedures prior to, during, and after use.
1.42.1.7. Evaluation of effectiveness of PPE program, and limitations during temperature extremes, and other appropriate medical considerations.
1.42.1.8. Medical surveillance requirements for personnel assigned to work at Site.
1.42.1.9. 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.
1.42.1.10. 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.
1.42.1.11. Decontamination procedures for both personnel and equipment.
1.42.1.12. 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 weather conditions, and procedures for reporting incidents to local, provincial, or federal agencies.
1.42.1.13. Written respiratory protection program for project activities.
1.42.1.14. Procedures dealing with heat and/or cold stress.
1.42.1.15. Spill containment program if waste material is generated, excavated, stored, or managed onsite.

1.43. Correction of Non-Compliance

1.43.1. Immediately address health and safety non-compliance issues identified by the Departmental Representative.
1.43.2. Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.
1.43.3. 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.

1.44. Offsite Contingency and Emergency Response Plan

1.44.1. Prior to commencing Work involving handling of hazardous materials, develop offsite Contingency and Emergency Response Plan.

1.44.2. 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.

1.45. Personnel Health, Safety, and Hygiene

1.45.1. Training: ensure personnel entering Site are trained in accordance with specified personnel training requirements. Training session must be completed by Health and Safety Officer.

1.45.2. Levels of Protection: establish levels of protection for each Work area based on planned activity and location of activity.

1.45.3. Personal Protective Equipment:

1.45.3.1. Ensure all site personnel are furnished with appropriate PPE.

1.45.3.2. Unless identified otherwise in site-specific health and safety plan, minimum PPE to include: industrial protective headwear, high-visibility safety apparel, and protective footwear.

1.45.3.3. Ensure that safety equipment and protective clothing is kept clean and maintained.

1.45.4. Develop protective equipment usage procedures and ensure that procedures are strictly followed by site personnel; include following procedures as minimum:

1.45.4.1. Ensure industrial protective headwear is of appropriate CSA Standard and meets other appropriate standards.

1.45.4.2. Ensure high-visibility safety apparel is of appropriate CSA Standard and meets other appropriate standards.

1.45.4.3. Ensure protective footwear is of appropriate CSA Standard and meets other appropriate standards.

1.45.4.4. Dispose of or decontaminate PPE worn onsite at end of each day.

1.45.4.5. Decontaminate reusable PPE before reissuing.

1.45.4.6. Ensure site personnel have passed respirator fit test prior to entering potentially volatile contaminated work areas, as appropriate.

1.45.4.7. Ensure facial hair does not interfere with proper respirator fit.

1.45.5. Respiratory Protection:

1.45.5.1. 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.

1.45.5.2. Develop, implement, and maintain respirator program.

1.45.5.3. Monitor, evaluate, and provide respiratory protection for site personnel.

1.45.5.4. Ensure levels of protection as listed have been chosen consistent with site-specific potential airborne hazards associated with major contaminants identified onsite.

1.45.5.5. In absence of additional air monitoring information or substance identification, retain an industrial hygiene specialist to determine minimum levels of respiratory protection required.
1.45.5.6. Immediately notify Departmental Representative when level of respiratory protection required increases.
1.45.5.7. 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.
1.45.6. Heat Stress/Cold Stress: implement heat stress or cold stress monitoring program as applicable and include in site-specific Health and Safety Plan.
1.45.7. Personnel Hygiene and Personnel Decontamination Procedures. Provide minimum as follows:
1.45.7.1. Suitable containers for storage and disposal of used disposable PPE.
1.45.7.2. Potable water and suitable sanitation facility.
1.45.8. Emergency and First-Aid Equipment:
1.45.8.1. 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; 2 - 9 kg ABC type dry chemical fire extinguishers.
1.45.9. Site Communications:
1.45.9.1. Identify, provide and implement appropriate dedicated communication devices for Site and post emergency numbers near dedicated devices.
1.45.9.2. Ensure personnel use of "buddy" system and develop hand signal system appropriate for site activities.
1.45.9.3. Furnish selected personnel with 2-way radios. Provide employee alarm system to notify employees of site emergency situations or to stop Work activities if necessary.
1.45.9.4. 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.

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 01 35 35 – DND FIRE SAFETY REQUIREMENTS

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 01 35 35 DND Fire Safety Requirements.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 01 33 00 - Submittal Procedures

1.3.2. 01 35 29.14 – Health and Safety for Contaminated Sites

1.4. Action and Informational Submittals

1.4.1. Submittals must be in accordance with 01 33 00.

1.4.2. The Contractor's Site Specific Health and Safety Plan (see 01 35 29.14) must include emergency procedures to be used in the case of fire within the work area and all procedures must comply with applicable regulations. Plan must include emergency contact numbers.

1.5. Construction and On-Board Fire Safety

1.5.1. The Contractor must provide construction fire safety in accordance with the National Fire Code of Canada.

1.6. Fire Safety Enforcement

1.6.1. Within the confines of the CFB Comox, the prescription and enforcement of mandatory Fire Safety measures will be exercised under the authority of the Departmental Representative.

1.6.2. Comply with and enforce compliance by all Contractor personnel with all requirements of this Specification section, and with the most recent edition of the National Building Code of Canada and the National Fire Code of Canada, including all subsequent revisions issued by the National Research Council of Canada.

1.6.3. The Departmental Representative reserves the right to require the dismissal from site of persons deemed careless or otherwise in violation of the Fire Safety Requirements.

1.7. Fire Department Briefing

1.7.1. The Departmental Representative will coordinate arrangements for preconstruction Meeting following Contract award. The Contractor will be briefed on fire safety by the Departmental Representative or their designated representative before work starts.

1.8. Reporting Fires

1.8.1. The Contractor must inform the Departmental Representative of all fire incidents at the Work Site, regardless of size.

1.8.2. The Contractor must immediately report fire incidents to the local fire department via 911 and indicate that they are at CFB Comox.

1.8.3. Person reporting fire will remain in contact with emergency services to assist in directing local fire department to scene of fire.

1.8.4. When reporting fire by telephone, give location of fire and the name or number of nearest building/gate, and be prepared to verify location.

1.9. Fire Warning System

1.9.1. A fire warning must be provided to notify construction personnel of a fire emergency in the construction area.

1.9.2. The system used must be capable of being heard throughout the Work Site.

1.10. Fire Protection and Alarm Systems

1.10.1. Coordinate Work regarding fire hydrant temporary removal and replacement as per Contract.

1.10.2. Fire protection and alarm systems will not be:

1.10.2.1. Obstructed.

1.10.2.2. Shut off.

1.10.2.3. Left inactive at the end of a day or shift without authorization from the Departmental Representative.

1.10.3. Do not use fire hydrants, standpipes, or hose systems for other than firefighting purposes unless authorized by the Departmental Representative.

1.10.4. Be responsible/liable for costs incurred from the fire department, the building owner and the tenants, resulting from false alarms.

1.11. Fire Protection System Impairment

1.11.1. Notify the Departmental Representative 15 days prior to shutting down any active fire protection system, including water supply, fire suppression, fire detection, and life safety systems.

1.11.2. Where a fire protection system that provides fire alarm monitoring is impaired in an existing building, a fire watch may be required at the discretion of the Departmental Representative.

1.11.3. Implement all fire protection system impairments in accordance with the National Fire Code of Canada and other information to be provided at the preconstruction Meeting.

1.12. Fire Extinguishers

1.12.1. In addition to other requirements of this Specification, supply fire extinguishers, as directed by the Departmental Representative, necessary to protect work in progress and the Contractor's physical plant on site.

1.12.2. Fire extinguishers may be required in the following areas as directed by the Departmental Representative

1.12.2.1. Adjacent to hot works

1.12.2.2. In areas where combustibles are stored

1.12.2.3. Near or on any internal combustion engines

1.12.2.4. Adjacent to areas where flammable liquids or gases are stored or handled

1.12.2.5. Adjacent to temporary oil fired or gas fired equipment

1.12.3. Extinguishers must be sized as 4-A:40-B:C 9 kilograms (20 pounds) unless otherwise directed by the Departmental Representative.

1.12.4. Extinguishers must be of the dry chemical type unless otherwise required by the hazard being protected.

1.12.5. The Contractor may assume the quantity of extinguishers based on a maximum travel distance between extinguishers of 23 m.

1.13. 1.10 Access for Fire Fighting

1.13.1. Access for firefighting must be provided in accordance with the National Fire Code of Canada.

1.13.2. Advise the Departmental Representative of work that would impede fire apparatus response. This includes violation of minimum horizontal and overhead clearance, as prescribed by the Departmental Representative, erecting of barricades, and digging of trenches.

1.13.3. Minimum horizontal clearance: Clear width of not less than 5 m, or as defined by the Departmental Representative.

1.13.4. Minimum vertical clearance: Overhead height of not less than 6 m, or as defined by the Departmental Representative.

1.14. Smoking Precautions

1.14.1. Smoking is prohibited in all buildings

1.14.2. Smoking in Work Site must comply with Occupational Health and Safety Regulations, WorkSafeBC.

1.14.3. Observe posted smoking restrictions near existing buildings. See Annex B for 'Smoking Policy - Tobacco and Cannabis Use on 19 Wing'.

1.15. Rubbish and Waste Materials

1.15.1. Keep rubbish and waste materials at minimum quantities.

1.15.2. Burning of rubbish is prohibited.

1.15.3. Removal:

1.15.3.1. Remove rubbish from Work Site at end of a day or shift or as directed.

1.15.4. Storage:
1.15.4.1. Store oily waste in approved receptacles to ensure maximum cleanliness and safety.
1.15.4.2. Deposit greasy or oily rags and materials subject to spontaneous combustion in approved receptacles and remove as directed by the Departmental Representative.

1.16. Flammable and Combustible Liquids

1.16.1. Handle, store and use of flammable and combustible liquids in accordance with the National Fire Code of Canada.
1.16.2. Keep flammable and combustible liquids such as gasoline, kerosene, and naphtha for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing Underwriters' Laboratory of Canada or Factory Mutual seal of approval. Obtain written authorization from the Departmental Representative for storage of quantities of flammable and combustible liquids exceeding 45 litres.
1.16.3. Do not transfer flammable and combustible liquids inside buildings.
1.16.4. Do not transfer flammable or combustible liquids in vicinity of open flames or any type of heat-producing devices.
1.16.5. Do not use flammable liquids having flash point below 38°C such as naphtha or gasoline as solvents or cleaning agents.
1.16.6. Store flammable and combustible waste liquids, for disposal, in approved containers located in a safe ventilated area. Keep quantities to a minimum and notify the Departmental Representative when disposal is required.
1.16.7. Dumping or burning of flammable liquids on site is prohibited.
1.16.8. The Departmental Representative reserves the right to require removal from the site of any storage containers not acceptable to the Departmental Representative.

1.17. Hot Works

1.17.1. The Contractor must implement a hot works program in accordance with the National Fire Code of Canada and National Fire Protection Association 51B Standard for Fire Prevention during Welding, Cutting and Other Hot Work.
1.17.2. The Contractor must coordinate, through the Departmental Representative, a "hot work" permit from DND for all hot works in the construction area. Frequency of renewal for hot works permits is at the discretion of the Departmental Representative.
1.17.3. When work is carried out in dangerous or hazardous areas involving use of heat, provide fire watchers equipped with sufficient fire extinguishers. Determination of dangerous or hazardous areas along with level of protection necessary for fire watch is at discretion of the Departmental Representative.
1.17.4. Provide fire watch service for work on scale established and in conjunction with the Departmental Representative as defined in the Fire Department Briefing. Fire watchers must be trained in the use of fire extinguishing equipment.

1.17.5. Area of hot works:
1.17.5.1. Hot works must be carried out in an area free of combustible and flammable content.
1.17.5.2. Where carrying out hot works in an area free of combustible and flammable content is not possible:
1.17.5.2.1. All flammable and combustible materials within 15 m of the hot works must be protected in accordance with the National Fire Code of Canada.
1.17.5.2.2. A fire watch must be provided during the hot work and for a period of not less than 60 minutes unless otherwise directed by the Departmental Representative.
1.17.5.2.3. A final inspection of the hot work area must be conducted not less than 4 hours after the completion of hot works unless otherwise directed by the Departmental Representative.
1.17.5.3. Where there is a possibility of sparks leaking onto combustible materials in areas adjacent to the areas where the hot work is carried out:
1.17.5.3.1. Openings in walls, floors, or ceilings must be covered or closed to prevent the passage of sparks to such adjacent areas.
1.17.6. Protection of flammable and combustible materials:
1.17.6.1. Any combustible or flammable material, dust, or residue must be:
1.17.6.1.1. Removed from the area where hot works is carried out; or
1.17.6.1.2. Protected from ignition by non-combustible materials.
1.17.7. Fire extinguisher:
1.17.7.1. A fire extinguisher must be provided within 3 m of all hot works. The minimum size must be 9 kilograms (20 pounds) ABC unless otherwise directed by the Departmental Representative.

1.18. Hazardous Substances

1.18.1. Work entailing use of toxic or hazardous materials, chemicals and/or explosives, or otherwise creating hazard to life, safety, or health, must be in accordance with National Fire Code of Canada.
1.18.2. Obtain from the Departmental Representative a hot work permit for work involving welding, burning, or use of blowtorches and salamanders, in buildings or facilities.
1.18.3. When work is carried out in dangerous or hazardous areas involving use of heat, provide fire watchers equipped with sufficient fire extinguishers. Determination of dangerous or hazardous areas along with level of protection necessary for fire watch is at discretion of the Departmental Representative. The Contractor is responsible for providing fire watch service for work on scale established and in conjunction with the Departmental Representative at pre-work conference.
1.18.4. Provide ventilation where flammable liquids, such as lacquers or urethanes are used. Eliminate all sources of ignition. Inform the Departmental Representative prior to and at completion of such work.

1.19. Questions and/or Clarification

1.19.1. Direct questions or clarification on Fire Safety in addition to above requirements to the Departmental Representative.

1.20. Fire Inspection

1.20.1. Coordinate site inspections through the Departmental Representative.
1.20.2. Allow the Departmental Representative unrestricted access to the Work Site.
1.20.3. Cooperate with the Departmental Representative during routine fire safety inspection of the Work Site.
1.20.4. Immediately remedy unsafe fire situations observed by the Departmental Representative.

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 01 35 43 - ENVIRONMENTAL PROTECTION

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 01 35 43.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 02 61 00.01 Contaminated Sites - Water Management (Turbidity Reduction)

1.3.2. 02 61 00.02 Contaminated Sites - Excavation and Backfill

1.3.3. 02 61 00.03 Contaminated Sites - Transportation

1.3.4. 02 61 00.04 Contaminated Sites - Destruction

1.3.5. 02 61 00.05 Contaminated Sites - Stabilization

1.3.6. 02 61 00.06 Contaminated Sites - Concrete Disposal

1.4. Action and Informational Submittals

1.4.1. Environmental Protection Plan: submit within 10 days after Contract award and prior to mobilization to Site, Submit a plan detailing protection of the environment in accordance with the EMP. Include:

1.4.2. Comprehensive overview of known or potential environmental issues to be addressed during Work.

1.4.2.1. 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.

1.4.2.2. Communications 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.

1.4.2.3. Work Area 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.

1.4.2.4. 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.

1.4.2.5. Historical, Archaeological, Cultural Resources, Biological Resources and Valued Habitat Protection identifying methods, means, and sequences for preventing, monitoring, and controlling protection of historical, archaeological, cultural resources, biological resources and valued habitat. Include procedures if previously unknown historical, archaeological, cultural, and biological resources are discovered during Work. Includes Species At Risk.

1.4.2.6. Non-Contaminated Quality Soil and Non-Contaminated Quality Water Management, Transport and Disposal is not anticipated during the Work except in Site Restoration and Bioswale (see 01 25 20).

1.4.2.7. Contractor is responsible for its own sanitation including onsite handling to manage Solid Waste, Sewage, and Wastewater. Contractor shall identify offsite disposal facilities to manage Solid Waste. Copy of permit, certificate, approval, license, or other required form of authorization issued by a Facility Regulator for the disposal of relevant Non-Contaminated Material.

1.4.2.8. Traffic Management Plan to include traffic management on and offsite and to manage both vehicles and pedestrians including signage and traffic control personnel for Site ingress and egress. Traffic management Plan to clearly differentiate between plans for public off site areas; DND property shared use areas; and areas within the Contractor Work Area. Traffic Management Plan, vehicles and vehicle traffic must comply with all federal, provincial, and municipal laws and regulations (see 01 34 14).

1.4.2.9. Noise Control identifying methods, means, and sequences for preventing, monitoring, and controlling noise for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Include thresholds and procedures if: noise does not comply with appropriate levels, or if there are public complaints.

1.4.2.10. Vibration Control identifying methods, means, and sequences for preventing, monitoring, and controlling vibration for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; in accordance with the Contract; in accordance with recommendations from the Contractor's QP. Include thresholds and procedures if: vibration does not comply with appropriate levels, there are public complaints, or if onsite or offsite damage occurs.

1.4.2.11. Vapours, Dust, and Particulate Control identifying methods, means, and sequences for preventing, monitoring, and controlling vapours, dust and other airborne particulates for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Include thresholds and procedures if: vapours, dust, and particulates do not comply

with appropriate levels, there are public complaints, or if onsite or offsite damage occurs.

1.4.2.12. Spill Control in accordance with CFB Comox policy (Annex B) identifying methods, means, and sequences for preventing, monitoring, and controlling spills for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Identify reporting requirements for spills. Identify locations and contents of spill kits.

1.4.2.13. Erosion and Sediment Control identifying methods, means, and sequences for preventing, monitoring, and controlling onsite surface water, erosion and sedimentation for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract.

1.4.2.14. Work in or Adjacent to Waterways Control, as required and in accordance with EMP (Annex C), identifying methods, means, and sequences for preventing, monitoring, and controlling work in or adjacent to waterways for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Include measures for protection of fish and wildlife during Work in or Adjacent to Waterways including isolation and dewatering of work zones and monitoring. Include coordination with owner's Environmental Consultant for fish and wildlife salvage prior to Work in or Adjacent to Waterways.

1.4.2.15. Monitoring requirements for general compliance with Environmental Protection Plan.

1.4.2.16. Environmental Protection Plan must be signed and sealed by Contractor's QP, as required by potential impact to environment by Contractor's methods, means and sequences.

1.4.3. Submit amended Environmental Protection Plan if there are changes to the assumed site conditions, changes to the Work procedures, or in the event that any methods and procedures are inadequate as directed by the Departmental Representative.

1.4.4. Notify Departmental Representative of all spills as soon as possible and within at least 12 hours. Submit Spill and Response Report to Departmental Representative for all Spills within 24 hours or as required to meet the 19 Wing Comox Spill and Release Incident Report requirements. Include all 19 Wing Comox Spill and Release Incident Report details including at a minimum: description of spill (location, time, quantity and quality), notifications (including copies of any reports forwarded to regulatory agencies), and describe any remediation activities (time, quantity, quality, and fate of spill impacted material). Include environmental analytical results for spill or other environmental testing.

1.4.5. After hours work: at least 5 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, if request can be reasonably accommodated by other contractors and Site users, and third parties are not adversely affected, in the sole opinion of the Departmental Representative.

1.5. Contractor's Qualified Professional

1.5.1. Perform design, construction, monitoring, reporting, and other required tasks under the supervision of the Contractor's QP applicable to the performance of the Work.

1.6. Cleaning

1.6.1. 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.

1.6.2. Coordinate cleaning operations with disposal operations to prevent accumulation of dust, dirt, debris, rubbish, and waste materials.

1.6.3. Ensure cleanup of the Work areas each day after completion of Work.

1.7. Site Clearing and Plant Protection

1.7.1. All clearing, stripping of vegetation, alteration of planted areas, movement of animals, shall be complete in accordance with the EMP and related Contract Documents.

1.7.2. Minimize stripping of Topsoil and vegetation. Use existing trails, roads or cut lines wherever possible to avoid disturbance to the vegetation and prevent soil compaction.

1.7.3. Protect all other trees and plants onsite and offsite. Tree removal is not allowed.

1.7.4. Immediately stabilize shoreline or banks disturbed by any activity associated with the Work to prevent erosion and/or sedimentation, preferably through re-vegetation with native species suitable for the site.

1.7.5. Restore bed and banks of the waterbody per the Drawings.

1.7.6. Rock reinforcement/armouring is not expected as part of the Work, however, if 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.

1.8. Archaeological

1.8.1. Attend archaeological awareness training if provided by Departmental Representative.

1.8.2. Abide by Chance Find Procedures developed by Departmental Representative, as appropriate.

1.9. Species At Risk

1.9.1. Protect all Species At Risk, including meeting all federal, provincial, and municipal laws and regulations.

1.9.2. Modify Work procedures, including stopping Work, as instructed by Contractor's QP or Departmental Representative to protect Species At Risk.

1.9.3. Contractor to implement EPP in accordance with EMP (Annex C) requirements designed protect Species At Risk, other requirements may be necessary and are the responsibility of the Contractor.

1.9.4. Contractor to report to Departmental Representative all Species At Risk observed.

1.10. Non-Contaminated Quality Soil and Non-Contaminated Quality Water Management

1.10.1. Solid waste

1.10.1.1. Remove all Non-Contaminated Quality Soil within Work areas in accordance with the Contract and as directed by the Departmental Representative.

1.10.1.2. Remove surplus materials and temporary facilities from Site.

1.10.1.3. Do not burn or bury any waste onsite.

1.10.1.4. Do not discharge wastes into streams or waterways.

1.10.1.5. Do not dispose of volatile or hazardous materials such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

1.10.1.6. Dispose of all Non-Contaminated Quality Soil at a Landfill Facility.

1.10.2. Sewage

1.10.2.1. Store Sewage from toilet facilities with wastewater from handbasins, and/or showers, for ultimate disposal.

1.10.2.2. Provide, operate, and maintain Sewage storage tanks to store Sewage.

1.10.2.3. Transport and dispose of Sewage at a Disposal Facility, or discharge to municipal sanitary sewer system in compliance with Municipal requirements, as accepted by Departmental Representative.

1.10.2.4. Discharges: comply with applicable discharge limitations and requirements; do not discharge Sewage 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.

1.10.3. Wastewater

1.10.3.1. Dewater various parts of Work including, excavations, structures, foundations, and Work areas, unless otherwise specified or directed by Departmental Representative.

1.10.3.2. Employ construction methods, plant procedures, and precautions that ensure Work, including excavations, are stable, free from disturbance, and dry.

1.10.3.3. Direct surface waters away from the excavation and work areas and direct surface water into pre-existing surface drainage patterns.

1.10.3.4. 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.

1.10.3.5. Dispose of Wastewater 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.

1.10.3.6. Control disposal or runoff of Wastewater containing suspended materials or other harmful substances in accordance with this Contract and local authority requirements.

1.10.3.7. Ensure pumped Wastewater 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.

1.10.3.8. Obtain permits to discharge Wastewater to environment or municipal system (sewer, ditches).

1.10.3.9. Do not discharge water which may have come in contact with potentially Contaminated Soil or otherwise be Contaminated directly offsite to the environment or to municipal system.

1.11. Non-Contaminated Quality Material Transport and Disposal

1.11.1. Non-Contaminated Quality Material is not expected except in Site Restoration and Bioswale (see 01 25 20).

1.11.2. Assume ownership of, and be responsible for, Non-Contaminated Quality Soil once it is loaded on a vehicle, barge, or other vessel for Transport. Assume ownership of, and be responsible for, Non-Contaminated Quality Soil Disposed.

1.11.3. Transport material as soon as practical; do not unreasonably stockpile onsite.

1.11.4. Cover material while being transported to prevent release of airborne dust, vapours, or odours, and to prevent saturation and leachate generation from material.

1.11.5. Excess water in material must not be allowed to flow out of vehicle or vessel during transport.

1.11.6. Stabilize material as necessary.

1.11.7. All vehicles, vessels and operators must be appropriately licensed and equipped to transport Non-Contaminated Quality Soil.

1.11.8. Barges must be inspected by an independent Marine Surveyor for stability and safety.

1.11.9. Non-Contaminated Quality Soil Disposal: dispose all Non-Contaminated Quality Soil, at Landfill Facility provided by Contractor and accepted by the Departmental Representative.

1.11.10. Landfill Facility must:

1.11.10.1. Be an existing offsite facility located in Canada or the United States.

1.11.10.2. Be 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.

1.11.10.3. Hold a valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by the BC government, as appropriate, for the Disposal of relevant Non-Contaminated Quality Soil.
1.11.10.4. Comply with requirements of acts, regulations, bylaws, and other requirements, in force or appropriately adopted as guidelines, including the *BC Environmental Management Act* and BC Landfill Criteria for Municipal Solid Waste, municipal zoning bylaws, or equivalent.
1.11.11. Dispose material as soon as practical and within 100 days of leaving Site or as required by Contract unless otherwise accepted by Departmental Representative.
1.11.12. Material sent to a Landfill Facility must be permanently stored at that facility.
1.11.13. If proposed Landfill Facility is not acceptable to Departmental Representative, provide an alternate Landfill Facility that is acceptable.

1.12. Traffic Management

1.12.1.1. See also 01 34 14 – Special Procedures for Traffic Control
1.12.1.2. Contractor is responsible for traffic management in and around Work areas including:
1.12.1.2.1. public roads (Little River Rd)
1.12.1.2.2. CFB Comox roads (including but not limited to Route 66),
1.12.1.2.3. shared access routes identified on Drawings, and
1.12.1.2.4. any other traffic routes that may be impacted by the Work.
1.12.2. Where applicable, traffic to include pedestrian traffic.
1.12.3. Traffic management in accordance with Traffic Management Plan.
1.12.4. Ensure pedestrians have safe and unencumbered access in public areas. Provide traffic control personnel wherever Contractor's activities (including vehicle crossings) impedes sidewalks, pathways, bike paths, roadways, or other public routes, or elsewhere as required or as directed by Departmental Representative.
1.12.5. Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs (see 01 34 14).
1.12.6. 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.
1.12.7. Comply with current version of WorkSafeBC Occupational Health and Safety Regulation Part 18 Traffic Control, as appropriate.
1.12.8. Comply with current version of BC Ministry of Transportation and Infrastructure 2015 Interim Traffic Management Manual for Work on Roadways.
1.12.9. Obtain all necessary permits or other authorizations regarding traffic control, including access and road usage.
1.12.10. 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.

1.12.11. Prevent tracking or spilling of debris or material onto private and public roads.
1.12.12. Immediately sweep or scrape up debris or material on private and public roads.
1.12.13. Clean public roads within a minimum 200 m radius of the Site entrance or as required at least once per shift, or as directed by Departmental Representative.
1.12.14. Departmental Representative can stop relevant Work at any time when Contractor's Work procedures are inadequate, when reasonable use of neighbouring properties are impacted, or when monitoring indicates that levels equal or exceed regulated or levels in accordance with the Contract. Do not proceed with stopped Work until corrections accepted by Departmental Representative.

1.13. Noise, Vibration, Vapours, and Dust Control

1.13.1. See 02 55 10.
1.13.2. Maintain acceptable levels not injurious or objectionable to worker safety, public health, the environment, and equipment and infrastructure.
1.13.3. Comply with applicable municipal bylaws and other applicable requirements unless otherwise specified or directed by Departmental Representative; Contractor's QP to may determine lower acceptable levels.
1.13.4. Maximum levels allowed at site boundaries to prevent nuisance, unless otherwise accepted by Departmental Representative:
1.13.4.1. Noise: 65 dBa.
1.13.4.2. Vibration: 0.315 m/s2 (based on ISO 2631-1).
1.13.4.3. Dust PM10: 50 µg/m^3.
1.13.5. Departmental Representative can stop relevant Work at any time when Contractor's Work procedures are inadequate, when reasonable use of neighbouring properties are impacted, or when monitoring indicates that levels equal or exceed regulated or levels in accordance with the Contract. Do not proceed with stopped Work until corrections accepted by Departmental Representative.
1.13.6. Specific procedures to prevent dust:
1.13.6.1. Cover or wet down relevant Work to prevent vapours and blowing dust and debris, including temporary roads, excavations, and stockpiles. In urban environments or if sensitive neighbouring properties (e.g., residences) provide full time coverage or wetting down.
1.13.6.2. Covers to be impermeable (e.g., minimum 5 mil polyethylene) and securely fashioned to prevent blowing off. Use fresh (non-saline) water for dust and particulate control.
1.13.6.3. Use appropriate covers on vehicles, including trucks, barges, and trains, hauling vapour-generating or fine or dusty material. Use watertight vehicles to haul wet materials.

1.14. Spill Control

1.14.1. 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.

1.14.2. Prevent spills or releases.

1.14.2.1. Maintain temporary erosion and pollution control features.

1.14.2.2. Do not store fuel onsite other than tanks forming part of the equipment.

1.14.2.3. 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.

1.14.2.4. Control emissions from equipment and plant to meet applicable authorities' emission requirements.

1.14.2.5. Contractor to regularly inspect all machinery on the Site to ensure it is in good repair and free of leaks.

1.14.3. Be prepared to intercept, cleanup, and dispose of spills or other releases that can occur whether on land or water.

1.14.4. Spill kits and containment are to be maintained onsite and ready for deployment in the event of spills or other releases.

1.14.4.1. Spill kits are to include sufficient quantities of absorbent material, containers, booms, shovels and other tools, and personal protective equipment.

1.14.4.2. Spill response materials must be compatible with type of equipment being used or type of material being handled.

1.14.4.3. Spill kits are to be proximal to machinery.

1.14.4.4. During the Work there are to be trained and qualified personnel available that are ready to deploy spill kits when necessary.

1.14.5. Take immediate action using available resources to contain and mitigate effects on environment and persons from spill or release.

1.14.6. Promptly report all spills and releases potentially causing damage to environment to:

1.14.6.1. Authority having jurisdiction or interest in spill or other release including conservation authority, water supply authorities, drainage authority, road authority, and fire department.

1.14.6.2. Contractor emergency response team including Superintendent.

1.14.6.3. Departmental Representative and other contractor(s) and individuals as directed by the Departmental Representative.

1.14.6.4. Use 19 Wing Comox Spill and Release Incident Report for spill reporting and report within timelines specified herein.

1.14.7. 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.

1.14.8. Remediation of soil, sediment or water contaminated by Contractor's activities.
1.14.8.1. Remediate all soil, sediment or water contaminated by Contractor's activities associated with the Work onsite and offsite.
1.14.8.2. Remediation includes excavation, pumping, testing, transport, treatment, destruction and disposal as appropriate for the type of contamination incurred, and at a minimum in accordance with the Contract.
1.14.8.3. Submit procedures for remediating soil, sediment or water contaminated by Contractor's activities prior to implementation.
1.14.8.4. Remediate as directed by the Departmental Representative.
1.14.8.5. Contractor is responsible for any additional investigation, testing, and assessments required as acceptable to the Departmental Representative.
1.14.9. Departmental Representative can stop relevant Work at any time when Contractor's Work procedures are inadequate, when reasonable use of neighbouring properties are impacted, or when monitoring indicates that levels equal or exceed regulated or levels in accordance with the Contract. Do not proceed with stopped Work until corrections accepted by Departmental Representative.

1.15. Erosion and Sediment Control

1.15.1. Prepare an Erosion and Sediment Control Plan as a component of the EPP. Implement the erosion and sediment control to minimize risk of sedimentation of a waterbody during all phases of the project. Erosion and sediment control measures should be maintained 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.
1.15.2. Install effective erosion and sediment control measures before starting work to prevent sediment from entering the water body.
1.15.3. Manage 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. For example, pumping/diversion of water to a vegetated area, construction of a settling basin or other filtration system.
1.15.4. Implement 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).
1.15.5. Contain and stabilize 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.
1.15.6. Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction.
1.15.7. Repair erosion and sediment control measures and structures if damage occurs.
1.15.8. Remove non-biodegradable erosion and sediment control materials once site is stabilized.

1.15.9. Departmental Representative can stop relevant Work at any time when Contractor's Work procedures are inadequate, when reasonable use of neighbouring properties are impacted, or when monitoring indicates that levels equal or exceed regulated or levels in accordance with the Contract. Do not proceed with stopped Work until corrections accepted by Departmental Representative.

1.16. Work In or Adjacent to Waterways

1.16.1. Approvals and Practices:

1.16.1.1. As required, comply with Fisheries Act Approval and other relevant authorizations, permits and approvals and in accordance with the Contract. Obtain amendments as required by Contractor's methods, means, and sequences only if recommended by Contractor's QP and accepted by Departmental Representative.

1.16.1.2. Restrict Work as described in, and follow requirements in, Contract including Environmental Effects Determination (EED), Environmental Management Plan (EMP), Aquatic Effects Assessment, Environmental Mitigation Strategy, or similar documents. Variations allowed only if recommended by Contractor's QP and accepted by Departmental Representative.

1.16.1.3. Follow practices described in Land Development Guidelines for the Protection of Aquatic Habitat (Fisheries and Oceans Canada/Ministry of Environment, Lands and Parks, 1993 September) and Measures to avoid causing harm to fish and fish habitat including aquatic species at risk (Fisheries and Oceans Canada, 2018 December 14).

1.16.1.4. Follow practices described in Standards and Best Practices for Instream Works (BC Ministry of Environment, 2004 March).

1.16.2. Timing

1.16.2.1. 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.

1.16.2.2. Minimize duration of in-water work.

1.16.2.3. 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.

1.16.2.4. Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation.

1.16.3. Site Selection

1.16.3.1. Design and plan activities and works in wetland and waterbody such that loss or disturbance to aquatic habitat is minimized.

1.16.3.2. Plan, design and construct approaches to wetland and waterbody such that they are perpendicular to the watercourse to minimize loss or disturbance to riparian vegetation. Environmental Protection Plan to include a Site Access Plan detailing any access and egress to Waterways and including equipment types and methods to limit riparian vegetation clearing for approval by the Departmental Representative.

1.16.3.3. 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.

1.16.3.4. 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.

1.16.4. Shoreline/bank Re-vegetation and Stabilization

1.16.4.1. 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. When practicable, prune or top the vegetation instead of grubbing/uprooting. Coordinate with Departmental Representative for fish and wildlife salvage prior to conducting Work within or Adjacent to waterbodies

1.16.4.2. 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. Coordinate with Departmental Representative to conduct pre-clearing nesting bird surveys prior to vegetation clearing

1.16.4.3. 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.

1.16.4.4. 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.

1.16.4.5. 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.

1.16.4.6. Remove all construction materials from site upon project completion and before Final Completion.

1.16.4.7. Do not remove riparian vegetation if the riparian area is identified as part of critical habitat of an aquatic listed Species At Risk.

1.16.5. Aquatic Life Protection

1.16.5.1. 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, or result in the stranding or death of aquatic life.

1.16.5.2. Contractor's QP 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.

1.16.5.3. Any capture and relocation of an endangered or threatened aquatic Species At Risk will require approval from Department of Fisheries and Oceans.

1.16.6. Water Intake or Outlet Pipe Screening:

1.16.6.1. 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.

1.16.6.2. Screens should be located in areas and depths of water with low concentrations of fish throughout the year.

1.16.6.3. Screens should be located away from natural or artificial structures that may attract fish that are migrating, spawning, or in rearing habitat.

1.16.6.4. The screen face should be oriented in the same direction as the flow.

1.16.6.5. Ensure openings in the guides and seals are less than the opening criteria to make “fish tight”.

1.16.6.6. Screens should be located a minimum of 300 mm (12 in.) above the bottom of the watercourse to prevent entrainment of sediment and aquatic organisms associated with the bottom area.

1.16.6.7. Structural support should be provided to the screen panels to prevent sagging and collapse of the screen.

1.16.6.8. Large cylindrical and box-type screens should have a manifold installed in them to ensure even water velocity distribution across the screen surface. The ends of the structure should be made out of solid materials and the end of the manifold capped.

1.16.6.9. Heavier cages or trash racks can be fabricated out of bar or grating to protect the finer fish screen, especially where there is debris loading (woody material, leaves, algae mats, etc.). A 150 mm (6 in.) spacing between bars is typical.

1.16.6.10. Provision should be made for the removal, inspection, and cleaning of screens.

1.16.6.11. Ensure regular maintenance and repair of cleaning apparatus, seals, and screens is carried out to prevent debris-fouling and impingement of fish.

1.16.6.12. Pumps should be shut down when fish screens are removed for inspection and cleaning.

1.16.7. Explosives:

1.16.7.1. No use of explosives in expected. Prior Departmental Representative approval required for use.

1.16.8. Operation of Machinery

1.16.8.1. Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds.

1.16.8.2. 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.

1.16.8.3. 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.

1.16.8.4. 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.

1.16.8.5. 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.

1.16.8.6. Do not ford, place crossing materials or operate machinery on the bed of a waterbody where SARA-listed shellfish occur, or critical habitat or residences of freshwater SARA-listed aquatic species occur.

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 01 41 00 – REGULATORY REQUIREMENTS

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 01 41 00 Regulatory Requirements.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55

1.3. Related Sections

1.3.1. Not Used.

1.4. Action and Informational Submittals

1.4.1. Permits: at least 10 days prior to mobilization to Site, submit copies of all permits, certificates, approvals, or any other form of authorizations and all reporting required to support the Work and as specified in the Contract.

1.5. Laws, Regulations, Permits

1.5.1. Generally, provincial, territorial and municipal laws, regulations, bylaws and other requirements do not apply to federal lands, works or undertakings. Soil, sediment, water or other materials that are removed from federal lands may become subject to provincial, territorial or municipal laws and regulations.

1.5.2. Provincial, territorial 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, territorial or municipal laws and regulations apply on Federal lands, activities or undertakings.

1.5.3. Comply with certificates, licenses and other permits enforced at the location concerned required by regulatory federal, provincial, territorial or municipal authorities to complete the Work that have already been obtained.

1.5.4. Obtain and pay for certificates, licenses and other permits enforced at the location concerned required by regulatory federal, provincial, territorial or municipal authorities to complete the Work that have not already been obtained or that are required to be amended.

1.5.5. Provide applicable authorities with plans and information required for issue of acceptance certificates.

1.5.6. Furnish inspection certificates in evidence that the Work installed conforms with the requirements of the authority having jurisdiction.

1.6. Codes, Bylaws, Standards

1.6.1. Meet or exceed requirements of Contract, standards, and codes applicable to the performance of the Work and referenced documents.

1.6.2. In any case of conflict or discrepancy, the most stringent requirements will apply.

1.6.3. 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.

1.6.4. Certificates, licenses and other permits enforced at the location concerned required by regulatory federal, provincial, territorial or municipal authorities to complete the Work (see 01 11 00).

1.6.5. Comply with all attachments, references, and reports relevant to Work, including environmental protection.

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 01 45 00 – QUALITY CONTROL

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 01 45 00 Quality Control.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55

1.3. Related Sections

1.3.1. 02 21 13 – Survey and Position Control

1.4. Action and Informational Submittals

1.4.1. Quality Management and Control Plan: within 10 days after Contract award, Submit a quality management plan. Include:

1.4.1.1. Details on planned review, inspection and testing to provide Quality Assurance and Quality Control for the Work.

1.4.1.2. Subcontractors responsible for review, inspection and testing.

1.4.1.3. Schedule of submittals of review, inspection and testing results.

1.4.2. Review, Inspection, and Testing Results: within 5 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.

1.5. Description

1.5.1. This section presents Contractor requirements for quality control, including coordination with material suppliers, testing agencies, and other entities that may be employed by the Departmental Representative during completion of the work. The intent of this section is to require the Contractor to establish a necessary level of control that will:

1.5.1.1. Provide sufficient information to assure both the Contractor and the Departmental Representative that the Specification requirements are being and have been met.

1.5.2. The Contractor must establish, provide, and maintain a Quality Management and Control Plan as specified herein, detailing the methods and procedures that will be taken to ensure that all materials and completed construction elements conform to the Drawings, Specifications, and other requirements. Although guidelines are established and certain minimum requirements are specified herein and elsewhere in the Specifications, it is the responsibility of the Contractor to ensure that construction and construction quality control are accomplished in accordance with the stated purpose and Specifications as described herein.

1.5.3. The Contractor must be prepared to discuss and present, at the preconstruction Meeting, its understanding of the quality control requirements. The Contractor may not begin any construction until the Quality Management and Control Plan has been reviewed and accepted by the Departmental Representative.

1.6. Inspection

1.6.1. The Contractor must allow the Departmental Representative access to the work. If part of the work is in preparation at locations other than the Work Site (i.e., the Contractor Off-Site Offload Facility, Disposal Facility, and Processing Facility), the Contractor must allow access to such work whenever and wherever it is in progress.

1.6.2. Give timely notice requesting inspection if work is designated for special tests, inspections, or reviews by the Departmental Representative's instructions.

1.6.3. If the Contractor covers, or allows to be covered, work that has been designated for special tests, inspections, or reviews before such is made, uncover such work, have inspections or tests satisfactorily completed, and make good such work.

1.7. Access to Work

1.7.1. The Contractor must allow inspection/testing agencies access to Work Site and off-site facilities (i.e., loading facilities, Destruction Facility, and material source locations) as applicable.

1.7.2. The Contractor must make accessible to the Departmental Representative all construction equipment that is employed for completion of the work.

1.7.3. The Contractor must cooperate to provide reasonable facilities for such access.

1.8. Procedures

1.8.1. Notify the appropriate entity and the Departmental Representative in advance of requirements for tests so attendance arrangements can be made.

1.8.2. Submit samples or materials required for testing, as requested in the Specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in work.

1.8.3. Provide labor and facilities to obtain and handle samples and materials at the Work Site and Contractor Off-Site Offload Facility. Provide sufficient space to store samples as necessary.

1.8.4. Complete required materials testing as described in the Specifications for which the work applies. Results of laboratory testing must be reviewed by the Departmental Representative to determine compliance with the requirements of the work.

1.9. Rejected Work

1.9.1. 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 the Departmental Representative as failing to conform to the Contract documents. Replace or re-execute in accordance with the Contract documents at no cost to Canada.

1.9.2. Make good other Contractor's work damaged by such removals or replacements promptly.

1.9.3. If, in the opinion of the Departmental Representative, it is not expedient to correct defective work or work not performed in accordance with the Contract documents, the Departmental Representative will deduct from the Tender Price the difference in value between work performed and that called for by Contract documents, the amount of which will be determined by the Departmental Representative.

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 01 51 00 – TEMPORARY UTILITIES

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 01 51 00 Temporary Utilities.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55

1.3. Related Sections

1.3.1. 01 35 43 – Environmental Protection

1.4. Action and Informational Submittals

1.4.1. Submittals in accordance with 01 33 00

1.5. Installation and Removal

1.5.1. Note the Work area is poorly serviced with utilities and the Contractor is responsible to provide temporary services.

1.5.2. Provide temporary utilities (e.g., power, water, sewer) and controls in order to execute work expeditiously.

1.5.3. Remove from site all such work after use.

1.6. Dewatering

1.6.1. Provide temporary drainage and pumping facilities to keep excavations and site free from standing water, as detailed in 01 35 43.

1.7. Water Supply

1.7.1. Owner will provide supply of potable water for construction use from existing water main. Contractor to not interrupt service to CFB Comox and obtain approvals for all use and connects through the Departmental Representative.

1.8. Temporary Communication Facilities

1.8.1. Provide and pay for all temporary communication necessary for own use to complete the Work.

1.8.2. There are no communication lines in the work area.

1.8.3. Security restrictions may exist (i.e., photography policies) for communication services and devices.

1.9. Fire Protection

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

1.9.2. Burning rubbish and construction waste materials is not permitted on site.

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 01 52 00 – CONSTRUCTION FACILITIES

1.1. Measurement Procedures

1.1.1. 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 in accordance with the Contract. Includes site preparation, temporary structures, facilities and services, environmental protection, stockpile areas, access, onsite roadways, temporary hoarding, security fencing, federal signage, office facilities, sanitary facilities, stormwater management infrastructure, lighting, and utility services.

1.1.2. Site Facilities - Operation will be paid in accordance with two daily unit rate prices established for Base Work and Optional Work. Both unit rates include operation and maintenance of all infrastructure between mobilization and demobilization. Includes site preparation, 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 administration, overhead, project management, meetings, security, surveying, noise monitoring, vibration monitoring, utility services, project meetings, inspections, progress Submittals, traffic control, health and safety, Environmental Protection, cleaning, and operation during inclement weather. Also includes living out allowances, travel and room and board.

1.1.3. Weigh Scale: provision and operation of Contractor supplied Weigh Scale will be paid in accordance with two lump sum prices established for determining material weights during the Base Work and Option Work.

1.1.4. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 01 34 14 – Special Procedures for Traffic Control

1.3.2. 01 35 13 – Special Procedures for Airport Facilities

1.3.3. 01 35 43 - Special Procedures for Contaminated Sites

1.4. Action and Informational Submittals

1.4.1. Site Layout: within 10 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:

1.4.1.1. Equipment and personnel decontamination areas.

1.4.1.2. Fencing
1.4.1.3. Means of ingress, egress and temporary traffic control.
1.4.1.4. Equipment and material staging areas.
1.4.1.5. Stockpile areas and construction details, including base preparation and water control features.
1.4.1.6. Exclusion areas, contaminant handling areas, and other areas identified in Contractor's site-specific Health and Safety Plan and Environmental Protection Plan.
1.4.1.7. Grading, including contours, required to construct temporary facilities.
1.4.1.8. Location of all temporary facilities including: onsite Turbidity Reduction Equipment, truck wash and decontamination units, weigh scale; office trailers, modular camp structures, parking, storage, environmental monitoring stations, above ground and underground utilities, roads, and other temporary facilities.
1.4.2. Signs: at least 5 days prior to posting, Submit any signs viewable by public.
1.4.3. Submit for review by the Departmental Representative proof of accurate calibration and certification of weigh scale facilities that will be used for measurement and payment of Contract unit rates.

1.5. Examination
1.5.1. Site Verification of Conditions:
1.5.1.1. Contractor to determine condition of existing Site and requirements to make the Site suitable for Work.

1.6. Site Preparation
1.6.1. Site Preparation and operation includes construction, operation and maintenance for the duration of the Work,
1.6.2. Non-Contaminated Quality Soil and clearing and grubbing is not expected in accordance with the Work.
1.6.3. All vegetation and brush will be managed as Contaminated Material
1.6.4. If Identified and with Departmental Representative approval, dispose of Non-Contaminated Quality Soil at a Landfill.
1.6.5. Remove obstructions, ice and snow, from surfaces to be worked.

1.7. Utility Services
1.7.1. Utility Services (including electrical power, potable water, sewers, and telecommunications) not identified as being available on Site must be supplied at the Contractor’s expense. Provide supplied utilities for entire work force, including Subcontractors and Departmental Representative and their consultants.

1.8. Sanitary Facilities
1.8.1. Provide sanitary facilities for work force (including Contractor, Subcontractors, Departmental Representative, and Consultants) in accordance with governing regulations and ordinances.

1.8.2. Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.9. Fire Protection

1.9.1. See 01 35 35

1.10. Access and Delivery

1.10.1. Only the designated entrance (Gate A off of Little River Rd) in accordance with the Contract can be used for access to Site.

1.10.1.1. Maintain for duration of Contract.

1.10.1.2. Make good damage resulting from Contractor's use.

1.10.2. Use of the Site will be granted to the Contractor through the Departmental Representative.

1.11. Installation and Removal

1.11.1. 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.

1.11.2. Identify areas to be graveled or otherwise treated to prevent tracking of mud.

1.11.3. Indicate use of supplemental or other staging area.

1.11.4. Provide construction facilities in order to execute work expeditiously.

1.11.5. Provide temporary utilities in order to execute Work expeditiously.

1.11.6. Remove from Site all such Work after use.

1.12. Site Storage/Loading

1.12.1. Confine work and operations of employees in accordance with the Contract. Do not unreasonably encumber premises with products.

1.12.2. Storage space must be limited to the designated work Site as shown on Drawings.

1.12.3. Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.13. Construction Parking

1.13.1. Parking of private vehicles will be limited to designated areas only in the Drawings, unless otherwise agreed to by Departmental Representative.

1.13.2. No additional parking space will be provided.

1.13.3. Provide and maintain adequate access to project site.

1.14. Security

1.14.1. Be responsible security of site and contents of site after working hours and during holidays. Provide onsite security personnel as appropriate and in accordance with the Contract.

1.14.2. Control access to Site and maintain a log of all personnel onsite. No non-Work visitors allowed without prior written consent of Departmental Representative.

1.14.2.1. All personnel access to comply with CFB Comox Security requirements (see 01 11 00 and 01 35 29.14).

1.15. Departmental Representative and Consultant Offices

1.15.1. Provide office facilities for the exclusive use of the Departmental Representative and their consultants with the following minimum intent, modified as per the Contract, or as directed by the Departmental Representative:

1.15.1.1. Three work stations within factory fabricated modular units.

1.15.1.2. Work stations must include; 1 desk (minimum size 120 cm x 50 cm, minimum height 70 cm), 1 swivel desk chair (minimum load requirement 100 kg), 1 bookshelf (minimum 3 shelves with a minimum shelf height of 32 cm), 1 locking filing cabinet (minimum dimensions 50 cm x 39 cm x 60 cm), 1 garbage can, and 1 recycling bin.

1.15.1.3. Building envelope: watertight construction.

1.15.1.4. Completed building: exterior to interior minimum sound attenuation of STC 30.

1.15.1.5. 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%.

1.15.1.6. Provide ventilation and outdoor air as per ASHRAE 62.1 – 2010 Standard.

1.15.1.7. Building lighting: maintain measured lighting level of 200 lx at 1500 mm above finished floor, after building finishes and painting complete.

1.15.1.8. Thermal performance of window units: Maximum heat transfer rate (U-value) not to exceed 2.0 W/m2K.

1.15.1.9. Regularly collect refuse and recyclables and keep the office clean and properly maintained with heat and light.

1.15.1.10. Provide private washroom facilities in offices in accordance with the Contract, complete with flush or chemical type toilet, lavatory and mirror and maintain supply of paper towels and toilet tissue.

1.15.1.11. 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.

1.15.2. Installation:

1.15.2.1. Install level and plumb.

1.15.2.2. Install stairs.

1.15.2.3. Adjust doors and windows for smooth operation.

1.15.3. Provide a minimum of 4 parking spaces for Departmental Representative and their consultants adjacent to offices.

1.16. Equipment, Tools and Materials Storage

1.16.1. Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

1.16.2. Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.17. Construction Signage

1.17.1. Provide and erect 2 project signs within 10 days of mobilization in a location designated by Departmental Representative. Project signs must, unless otherwise directed by Departmental Representative, include: name of Client, name of Project, and information contact number in both official languages using graphic symbols to CAN/CSA-Z321. Project signs to be a minimum of 1200 x 2400 mm.

1.17.2. Contractor signage must be accepted by Departmental Representative.

1.17.3. Contractor signage must include at a minimum:

1.17.3.1. Name of Contractor.

1.17.3.2. Emergency contact number.

1.17.3.3. Name and contact number of PSPC Departmental Representative.

1.17.3.4. Personal Protective Equipment requirements.

1.17.3.5. Other pertinent safety warnings (e.g. “open excavation”).

1.17.4. Maintain accepted signs and notices in good condition for duration of project and dispose of offsite on completion of project or earlier if directed by Departmental Representative.

1.18. Onsite Traffic Management

1.18.1. To be managed in accordance with Contractors Traffic Management Plan (see 01 34 14).

1.18.2. Available traffic routes for the Work are shown in Drawings; coordination of shared traffic routes shall be described in the Traffic Management Plan.

1.18.3. Refer to and comply with 01 35 13 for additional details on traffic management.

1.18.4. Where applicable, traffic to include pedestrian traffic.

1.18.5. Provide access and temporary relocated roads as necessary to maintain traffic.

1.18.6. Maintain and protect traffic on affected roads during construction period.

1.18.7. Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs.

1.18.8. Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

1.18.9. Verify adequacy of existing roads and allowable load limit on these roads. Contractor responsible for repair of damage to roads caused by construction operations.

1.18.10. In the event of an emergency, emergency vehicles shall have priority.

1.18.11. At the end of each day or when not in use, remove all equipment from within DR/ATC Coordination Zone and park in the Laydown Area as shown on the Drawings, unless otherwise agreed upon by the Departmental Representative.

1.19. Onsite and Offsite Roads

1.19.1. To be managed in accordance with Traffic Management Plan (see 01 35 43).
1.19.2. Where applicable, traffic to include pedestrian traffic.
1.19.3. Construct, operate and maintain the onsite access roads as required.
1.19.4. Provide photographic documentation of roads used by construction vehicles before, during and after Work.
1.19.5. Design of temporary onsite access roads to be signed and sealed by Contractor's QP.
1.19.6. Contractor's QP to confirm that the temporary onsite access roads allow for the safe transport of materials and equipment.
1.19.7. Any temporary access, detour and haul roads associated with the project must be constructed to accommodate all required uses and be maintained throughout the course of construction operations in a safe, environmentally sound manner.
1.19.8. Location, alignment, design and construction of all detour, access and haul roads subject to the acceptance of the Departmental Representative.
1.19.9. Employ suitable measures to maintain quality, visibility, and safe conditions in the use of access, detour and haul roads associated with the Work.
1.19.10. Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
1.19.11. Dust control: adequate to ensure safe operation at all times.
1.19.12. Provide snow removal during period of Work.
1.19.13. Remove, upon completion of work, haul roads designated by Departmental Representative.
1.19.14. Repair damage incurred from use of roads as directed by the Departmental Representative.
1.19.15. Clean onsite access roads as directed by the Departmental Representative.

1.20. Truck Wash and Decontamination Units

1.20.1. Provide, install and operate truck wash, including the installation of a water supply, or as directed by the Departmental Representative:
1.20.1.1. No vehicles which have come in contact with Contaminated Material must leave the Site without passing through the truck wash.
1.20.1.2. The truck wash must provide, at a minimum, the ability to wash truck tires and load boxes to a minimum height of 1.7 m.
1.20.1.3. Truck wash must have a solid separation tank
1.20.1.4. All solids and liquids collected must be classified as Contaminated Soil and Contaminated Water and managed in accordance with this Specification.
1.20.2. Provide 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 PPE to remove Contaminated Material. Provide decontamination units for work force.
1.20.2.1. At least one personnel decontamination unit must have overhead shower capability.
1.20.2.2. The personnel decontamination units to be available to Departmental Representative and their consultants.

1.20.2.3. The personnel decontamination units are subject to acceptance of Departmental Representative.
1.20.3. The truck wash and personnel decontamination units must be maintained in good working order during onsite Work.
1.20.4. The truck wash and personnel decontamination units must be removed from the Site during Site Decommissioning.

1.21. Weigh Scale

1.21.1. Provide, install and operate weigh scale on site for measurement of Contract unit rates, as applicable.
1.1.1. All weigh scales used for the Work must be proven accurate via calibration and certified. At least 5 days prior to use, submit a copy of the Measurement Canada, Weigh Scale Certification for any onsite or offsite weigh scale used during excavation, transportation, destruction or disposal.
1.21.2. Weigh Scale quantities will be computed and reported to the nearest whole tonne.
1.21.3. Weigh scale to be used for payment by weight per accurately calibrated weigh scales. The weigh scales must be capable of printing a weight ticket including time, date, truck number, and weight. Weight tickets furnished by a public weigh-master will be acceptable. An accurately recorded tare weight of hauling equipment with operator must be provided on each weight ticket.

1.22. Clean-Up

1.22.1. Remove construction debris, waste materials, packaging material from work site daily.
1.22.2. Clean dirt or mud tracked onto paved or surfaced roadways.
1.22.3. Store materials resulting from demolition activities that are salvageable.
1.22.4. Stack stored new or salvaged material not in construction facilities.

1.23. Storage Tanks

1.23.1. 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.
1.23.2. Temporary storage tanks subject to the regulations must be registered with Environment Canada.
1.23.3. Mobile tanks subject to the regulations must be certified to be mobile.
1.23.4. Storage tanks to meet the following minimum requirements:
1.23.4.1. Corrosion protection.
1.23.4.2. Secondary containment.
1.23.4.3. Containment sumps, if applicable.
1.23.4.4. Overfill protection.
1.23.5. All components of tank system must bear certification marks indicating that they conform to the standards set out in the regulations.
1.23.6. Product transfer area must be designed to contain spills.

1.23.7. Prepare an Emergency Plan to be included in the Site Health and Safety Plan.
1.23.8. Prior to first filling, storage tanks must:
1.23.8.1. Be registered.
1.23.8.2. Be certified and marked.
1.23.8.3. Transfer area be constructed.
1.23.8.4. Emergency plan in place.

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 01 56 00 – TEMPORARY FENCING AND BARRIERS

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 01 56 00 Temporary Fencing and Barriers.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding measurement and payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55

1.3. Related Sections

1.3.1. Not Used.

1.4. Action and Informational Submittals

1.4.1. Temporary Hoarding and Fencing: at least 5 days prior to installation, Submit a description of temporary hoarding and fencing.

1.5. Installation and Removal

1.5.1. Provide temporary controls in order to execute Work expeditiously.

1.5.2. Provide secure, rigid guard rails and barricades around Work area as indicated on Drawings or additionally as required by WCB Regulations.

1.5.3. Fence to be secured to meet FOD requirements

1.5.4. Fence to be of less than or equal to 2 m height if located within 60 m of the airfield.

1.5.5. Fencing enclosures to withstand wind pressure.

1.5.6. Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.

1.5.7. Maintain and relocate protection until such work is complete.

1.5.8. Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.5.9. Remove from site all such work after use.

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 01 78 30 – CLOSE OUT SUBMITTALS

1.1. Measurement Procedures

1.1.1. Closeout Submittals will be paid in accordance with lump sum price established including the following:

1.1.1.1. Final Site Inspection (for Certificate of Completion purposes),

1.1.1.2. Closeout Meetings,

1.1.1.3. Postconstruction Condition Survey; and

1.1.1.4. Final as-built documents sealed by Contractor's QP.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55

1.3. Related Sections

1.3.1. 01 33 00 – Submittal Procedures

1.4. Action and Informational Submittals

1.4.1. No later than 10 days after completion of the Work, submit to the Departmental Representative, 4 final copies of Record Documents and other required post-construction documents in English.

1.4.1.1. The Record Documents must be submitted according to requirements in these Specifications and will include an electronic version of Drawings and Specifications, with changes recorded in red. Each document must be marked and stamped "as-built" by the Contractor.

1.4.1.2. Other project closeout submissions must be submitted in accordance with the requirements of each section of the Specification.

1.4.2. No later than 10 days after completion of the Work, submit to the Departmental Representative, 1 copy of the Certificate of Completion.

1.5. Inspection and Declaration

1.5.1. Contractor Inspection: The Contractor and subcontractors must conduct inspection of the work, identify deficiencies and defects, and repair as required to conform to requirements of the Contract documents.

1.5.1.1. Notify the Departmental Representative, in writing, of satisfactory completion of Contractor Inspection and that corrections have been made.

1.5.1.2. Request Departmental Representative Inspection.

1.5.2. Departmental Representative Inspection: The Departmental Representative, accompanied by the Contractor, will inspect the work to identify defects or deficiencies. The Contractor must compile a deficiency list describing all noted

defects and deficiencies, for review and acceptance by the Departmental Representative.

1.5.3. The Contractor must correct deficient work, as advised by the Departmental Representative, at no extra cost to Canada.

1.5.4. Completion Tasks: Submit written certificates in English that tasks have been performed as follows:

1.5.4.1. Work: Completed and inspected for compliance with Contract documents.

1.5.4.2. Defects: Corrected and deficiencies completed.

1.5.4.3. Certificates required by local authorities having jurisdiction and utilities: Submitted.

1.5.4.4. Work: Complete and ready for Final Inspection.

1.5.4.5. Final Inspection: When Completion Task items are completed, request Final Inspection of the work by the Departmental Representative, and the Contractor. If work is deemed incomplete by the Departmental Representative, complete outstanding items and request re-inspection.

1.6. Recording Information on Project Record Documents

1.6.1. Record information on a set of blue-line/black-line drawings.

1.6.2. Maintain separate colours for each major item when recording information.

1.6.3. Record information concurrently with construction progress.

1.6.3.1. Do not conceal work until required information is recorded. Meet with the Departmental Representative, if requested, to review the status of as-built drawings.

1.6.4. Drawings and shop drawings: Mark each item to record actual construction, including:

1.6.4.1. Measured Excavation Extents.

1.6.4.2. Measured final FFTA construction details.

1.6.4.3. Measured locations of structures, internal utilities, and appurtenances, referenced to visible and accessible features of construction.

1.6.4.4. Field changes of dimension and detail.

1.6.4.5. Changes made by change orders.

1.6.4.6. Details not on original Drawings.

1.6.4.7. References to related shop drawings and modifications.

1.6.5. Contract Specifications: Mark each item to record actual construction, including:

1.6.5.1. Manufacturer, trade name, and catalogue number of each product/material actually installed, particularly optional items and substitute items.

1.6.5.2. Changes made by addenda and change orders.

1.6.6. Other documents: Maintain manufacturer's certifications, inspection certifications, and field test records, required by individual sections of the Specifications.

1.6.7. Provide digital photos for site records.

1.6.8. Any additional information provided as part of daily construction report, in a digital format.

1.6.9. Submit the Record Documents (the complete record of "as-built" information) for review and acceptance by the Departmental Representative. If corrections are required, make such corrections to the Departmental Representative's satisfaction, and re-submit for review and acceptance by the Departmental Representative.

1.7. Certificate of Completion

1.7.1. See also 01 25 20

1.7.2. Submit a written certificate that the following have been performed:

1.7.2.1. Work has been completed and inspected for compliance with the Contract documents.

1.7.2.2. Equipment and systems have been tested, adjusted, and balanced, and are fully operational.

1.7.2.3. Operation of systems has been demonstrated to the DND personnel indicated by the Departmental Representative.

1.7.2.4. Defects have been corrected and deficiencies have been completed.

1.7.2.5. Work is complete and ready for Final Inspection and handover.

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 01 91 13 – COMMISSIONING REQUIREMENTS

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 01 91 13 Commissioning Requirements.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. Not Used.

1.4. Action and Informational Submittals

1.4.1. Submittals in accordance with 01 33 00 (Submittal Procedures)

1.4.2. Commissioning submittals include:

1.4.2.1. Operation and Maintenance Manual for all installed systems and materials

1.4.2.2. Minutes of DND Training Exercise

1.4.2.3. As-built documentation and required by Contract including but not limited to Record Documents prepared, sealed, and signed by a QP employed by the Contractor as required by 01 78 30 (Closeout Submittals).

1.5. Procedures

1.5.1. Contractor to verify that all equipment and systems are complete, clean, and operating in normal and safe manner prior to conducting start-up, and testing.

1.5.2. Provide 14 days advance notice prior to Commissioning. Ensure Departmental Representative and appropriate DND Representatives are present for commissioning.

1.5.3. Conduct start-up and testing in following distinct phases:

1.5.3.1. Included in delivery and installation:

1.5.3.1.1. Verification of conformity to Specifications, approved shop drawings, and completion of performance verification reports.

1.5.3.1.2. Visual inspection of quality of installation.

1.5.3.2. Start-up: follow accepted start-up procedures. Start Commissioning after other elements of the work affecting start-up and performance verification have been completed.

1.5.3.3. Operational testing: document equipment performance.

1.5.3.4. System performance verification to include repeat tests after correcting deficiencies.

1.5.3.5. The Contractor assumes liabilities and costs for inspections, including disassembly and re-assembly after approval, starting, testing, and adjusting, including supply of testing equipment.

1.6. Test Results

1.6.1. If start-up, testing produces unacceptable results, repair, replace or repeat specified procedures until acceptable results are achieved.

1.6.2. Provide labour and materials, assume costs for re-commissioning.

1.7. Commissioning Performance Verification

1.7.1. Carry out commissioning under actual operating conditions, over entire operating range, in all modes.

1.7.2. Commissioning procedures to be repeatable and reported results are to be verifiable.

1.7.3. Follow equipment manufacturer's operating instructions.

1.7.4. Departmental Representative will witness activities and verify results.

1.8. Deficiencies, Faults, and Defects

1.8.1. Correct deficiencies found during start-up and commissioning to satisfaction of the Departmental Representative.

1.8.2. Report problems, faults, or defects affecting commissioning to the Departmental Representative in writing. Stop commissioning until problems are rectified. Proceed only with written acceptance from the Departmental Representative.

1.9. Completion of Commissioning

1.9.1. Upon completion of commissioning, leave systems in normal operating mode.

1.9.2. Supply, deliver, and document maintenance materials, spare parts, and special tools as specified.

1.9.3. Prepare and supply manual for all systems including all manufacture and installation data and maintenance plans.

1.9.4. Deliver a training exercise for DND personnel on use of all constructed components.

1.9.5. Commissioning to be considered complete when Contract commissioning deliverables have been submitted and accepted by the Departmental Representative.

1.10. Occupancy

1.10.1. Contractor is solely responsible for all permitting and testing in support of occupancy and for obtaining Occupancy.

1.10.2. Cooperate fully with the Departmental Representative during stages of acceptance and occupancy of facility.

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 02 21 13 – SURVEYING AND POSITION CONTROL

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 01 21 13 Surveying and Position Control.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 01 11 55 - General Instruction

1.3.2. 01 33 00 - Submittal Procedures

1.3.3. 01 45 00 - Quality Control

1.3.4. 01 78 30 - Closeout Submittals

1.4. Action and Informational Submittals

1.4.1. Submittals in accordance with 01 33 00 (Submittal Procedures)

1.4.2. As part of the Quality Management and Control Plan in 01 45 00 (Quality Control), the Contractor must submit a surveying plan and the name of the QPS or QP (Engineer) employed by the Contractor who will be responsible for preparation and submittal of the Survey and Positioning Control Plan and Record Documents of the constructed works.

1.4.3. Record Documents, showing the final accurate “as-built” condition of the constructed works, prepared, sealed, and signed by a QPS or QP (Engineer) employed by the Contractor, must be submitted to Departmental Representative as required by 01 78 30 (Closeout Submittals).

1.5. Survey

1.5.1. The Contractor must employ a third-party QPS (i.e., not the Contractor’s own survey crew) to conduct measurement and payment of Preconstruction and Post Construction Condition Surveys. The Contractor’s QPS that is licensed to perform topographic surveys in British Columbia to conduct Preconstruction and Post Construction Condition Surveys including Final Excavation Extents to be used for measurement and payment purposes.

1.5.2. The Contractor’s third-party QPS must perform the Preconstruction Survey prior to commencing the Work or conducting any excavation.

1.5.3. The Contractor’s third-party QPS must perform the Post Construction (final) Survey following the Departmental Representative’s acceptance of the work, based on Progress Survey results. Final measurement and payment for the work will be determined using the Contractor’s third-party QPS survey results.

1.5.4. The Contractor must establish its survey and positioning control to provide an accurate method of horizontal and vertical control before any work starts.
1.5.5. The Contractor must provide daily progress surveying and positioning control, as described further in this section, to provide quality control of the work and to calculate or verify volumes, areas, limits, positions, and other aspects of the work.
1.5.6. Progress Survey data collected by the Contractor must be used for work progress tracking and for monthly progress payment for work completed.
1.5.7. The Contractor may complete Progress Surveys using in-house survey resources.
1.5.8. Methods and procedures for topographic surveys must be in accordance with or exceed the accuracy requirements of Engineering Design – Control and Topographic Surveying manual (EM 1110-1-1005), dated January 2007, as prepared by USACE, respectively.
1.5.9. The Departmental Representative may review the Contractor's survey work or conduct its own surveys throughout the construction work as a quality assurance check of the Contractor's Preconstruction, Progress, and Post Construction Condition Survey work. The Contractor must accommodate the Departmental Representative's surveyor. If there are discrepancies between the Contractor's and Departmental Representative's Progress and/or Post-Construction Surveys, the Contractor's surveyor or engineer must coordinate with the Departmental Representative's surveyor to determine which survey is inaccurate. If the Departmental Representative determines that the Contractor's survey means and methods are inaccurate, the Contractor must adjust and correct its surveying means and methods at no extra cost to Canada.
1.5.10. The Contractor must calculate completed in situ quantities for applicable payment items, based on Progress Survey data, for progress reporting and measurement and payment purposes.
1.5.11. This work includes furnishing all labor, materials, tools, equipment, and incidentals required for surveying in support of the overall project as described in the Contract documents and in these Specifications.
1.5.12. Preconstruction, Progress, and Post Construction Condition Surveys:
1.5.12.1. Surveys must be completed using the Horizontal Universal Transverse Mercator (UTM) Zone 10N, North American Datum 1983 (NAD83 Datum) and Vertical (Chart Datum [CD]) provided in 01 11 55 (General Instructions) and on the Drawings.
1.5.12.2. The Contractor's third-party QPS or QP (Engineer) must stamp all the Departmental Representative-accepted Preconstruction and Post Construction Condition Surveys. The Contractor's third-party QPS or QP (Engineer) does not need to stamp the Progress Surveys.
1.5.12.3. Submit all surveys to the Departmental Representative in electronic drawing format as described below.
1.5.12.4. Submit Preconstruction Condition Survey to the Departmental Representative at least 10 days prior to commencing construction activities.

1.5.12.5. Submit daily Progress Surveys and calculated quantities to the Departmental Representative as part of the Contractor's Daily Construction Report.

1.5.12.6. Submit Post Construction Condition Surveys and calculated quantities to the Departmental Representative within 24 hours after completing the Post-Construction Survey, and as part of the Contractor's Daily Construction Report.

1.5.13. Electronic Drawing Requirements:

1.5.13.1. Submit all survey data in AutoCAD Civil 3D 2013 format or older format if acceptable to the Departmental Representative and *.pdf format.

1.5.13.2. Submit all survey data in a separate ASCII text file with XYZ spot elevation data.

1.5.13.3. The Departmental Representative will provide the Contractor with the Work Site base map file in *.dwg format for Contractor use.

1.5.13.4. Provide plan view contour drawing, using 0.2 m contour intervals (using even number intervals).

1.5.13.5. Provide plan view spot elevation drawing.

1.5.13.6. Provide cross sections through the area where work was completed at no greater than 15-m spacing between cross sections or at the Departmental Representative-requested spacing. Cross section information must show the preconstruction elevations, progress or post construction elevations, and final Backfill Material placement details.

1.5.13.7. Indicate on the Drawing, at a minimum, the date of survey, datums, extent of survey coverage, elevation markings (for spot elevations and contour lines), locations of cross sections, scale bar, any limits of required offsets, and licensed surveyor or engineer stamp (for Preconstruction and Post Construction Condition Surveys).

1.5.14. Quantity Calculations

1.5.14.1. The Contractor must submit its quantity (volume) calculations to the Departmental Representative for review and acceptance. The Contractor must also submit supporting information to help the Departmental Representative verify that the Contractor's calculated quantities are accurate. Supporting information may include, but is not limited to, certified weight tickets, barge tonnage estimates (based on barge displacement measurements), and other field inspection information that the Contractor may elect to use for quality control purposes and proposed in the Quality Management and Control Plan and accepted.

1.5.14.2. Quantities must be computed to the nearest in situ cubic metre based on comparison to the Contractor's third-party Preconstruction Condition Survey or relevant Progress Surveys. Quantities must be broken down by each Tender Item listed in the Unit Price Table.

1.5.14.3. Quantities must be computed using Triangulated Irregular Network (TIN) or similar three-dimensional calculation methods using generated surfaces from the survey data. The Contractor must describe its quantity calculation

method(s) in the Survey Plan. Double end area method will not be an acceptable quantity calculation method.

1.5.14.4. Quantities calculations must be submitted on a daily basis as part of the Daily Construction Report, and as part of progress payment requests for completion of the work.

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Survey Accuracy

3.1.1. The horizontal accuracy for measured elevations must be +/- 0.25 m; the vertical accuracy must be +/- 0.1 m.

3.1.2. Positioning Methods

3.1.2.1. Observation data will be recorded electronically.

3.1.2.2. Observed ranges must be corrected for scale, calibration, and automatic variations when present.

3.1.2.3. Accuracy of horizontal position must be within +/- 0.25 m.

3.1.2.4. Accuracy for vertical positioning must be +/- 0.1 m.

3.1.2.5. The Contractor must provide verification of positioning accuracy throughout completion of in-water construction activities, and submit documentation once a week as part of the Daily Construction Report.

END OF SECTION

1. PART 1 – GENERAL 02 41 13 – SHED DEMOLITION AND DISPOSAL

1.1. Measurement Procedures

1.1.1. Shed Demolition and Disposal will be paid in accordance with lump sum price established for all necessary approvals, equipment, materials, supplies, facilities, and personnel associated with demolition of the shed i.e., Shed Demolition and Disposal. Payment will include all costs in connection with demolition, sorting, transport, and disposal of the demolition wastes off site to a Disposal Facility, including any environmental fees/levies and all work incidental thereto, as specified and as shown on the Drawings.

1.1.2. Concrete disposal including shed foundation, sidewalks, and pads are separate (see 02 61 00.06).

1.1.3. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55

1.3. Related Sections

1.3.1. 01 35 29.14 – Health and Safety for Contaminated Sites

1.3.2. 02 61 00.06 – Concrete Disposal

1.4. Action and Informational Submittals

1.4.1. Submittals in accordance with 01 33 00 (Submittal Procedures)

1.4.2. Shed Demolition Plan as part of the Construction Work Plan (see 01 33 00): within 10 days after Contract award and prior to mobilization to Site, submit methods, means, and sequences for Shed demolition.

1.5. Site Conditions

1.5.1. The shed is not serviced (no power, no water, etc.).

1.5.2. Review environmental site information and the EMP and take precautions to protect human health and the environment.

1.5.3. For Hazardous Materials Survey report see Annex C. Review all Data Reports for information regarding composition and condition of items to be demolished, and geotechnical conditions.

1.5.4. Should material resembling spray or trowel-applied asbestos or other designated substance listed as hazardous be encountered, stop work, take preventative measures, and notify the Departmental Representative immediately. Do not proceed until written instructions have been received from the Departmental Representative.

1.5.5. There are no known utilities at or leading to the shed.

1.5.6. The Contractor must inspect the Work Site to thoroughly familiarize himself with site conditions before starting structure demolition work.

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 – EXECUTION

3.1. Preparation and Protection

3.1.1. Notify the Departmental Representative not less than 7 days prior to commencing structure demolition activities. Structure demolition work must not commence until the Departmental Representative has reviewed and accepted the Contractor's Construction Work Plan (see 01 11 55). Schedule work in conformance with the sequencing requirements of the Specifications.

3.1.2. Within 10 days after Contract award, inspect site with the Departmental Representative to verify location and extent of demolition work.

3.1.3. Do work in accordance with 01 35 29.14 (Health and Safety Requirements for Contaminated Sites).

3.1.4. Perform (and report on) Preconstruction Condition Survey inspections of existing structures in advance of any demolition work.

3.1.5. Protection:

3.1.5.1. Ensure that structure demolition work does not adversely affect adjacent watercourses, groundwater, and wildlife, or contribute to excess air and noise pollution.

3.1.5.2. Ensure nearby utilities are not disrupted or damaged.

3.1.5.3. Post warning signs on electrical lines and equipment, which must remain energized to serve other equipment and services during period of demolition.

3.1.5.4. Perform demolition in accordance with 01 35 13.43, 01 35 43, 02 55 10, the EMP, and the EPP.

3.1.5.5. Carry out structure demolition in conformance with local authority and DND including noise by-laws as stipulated in 01 35 43.

3.1.5.6. Prevent debris from blocking surface drainage system, mechanical, and electrical systems.

3.1.5.7. Keep noise, dust, and inconvenience to CFB Comox users to minimum.

3.1.5.8. Provide temporary dust screens, covers, railings, supports, and other protection as required.

3.1.6. Maintain full vehicular and pedestrian access, for DND vehicles and personnel on nearby roadways as shown on the Drawings, except as allowed in advance by the Departmental Representative.

3.2. 3.4 Disassembly, Demolition and Disposal

3.2.1. Complete any structure demolition, temporary structures relocation, and protection applicable to the Work.

3.2.2. Contractor will dismantle (including foundations), disconnect, remove and dispose of waste and debris contained in building B273 as shown on Drawings.

3.2.3. The Contractor becomes the owner of, and is responsible for, any materials, soil, sediment, debris, waste, designated for demolition, or other material once it is removed to be loaded onto a vehicle, barge, or other vessel for transport to a Contractor Disposal Facility.

3.2.4. Ensure workers and subcontractors are trained to carry out work in accordance with appropriate demolition techniques.

3.2.5. The Contractor staff on site for the demolition must have previous demolition experience, and must be present on site throughout structure demolition work.

3.2.6. Carry out demolition in accordance with CAN/CSA S350 and other applicable safety standards.

3.2.7. Workers must utilize adequate fall protection as required by WorkSafeBC.

3.2.8. Ensure that the sequence of disassembly and demolition is such that collapse of the structure is prevented.

3.2.9. Structure demolition materials and debris may be stockpiled within the Work Site only at location(s) reviewed and accepted by the Departmental Representative. Label stockpiles, indicating material type and quantity.

3.2.10. Remove from the Work Site all demolition debris to a Disposal Facility approved under the Contract.

3.2.11. Transport material designated for disposal by approved haulers to a Disposal Facility listed in the Construction Work Plan and in accordance with regulations. Do not deviate from haulers and Disposal Facilities listed in the Construction Work Plan without prior written authorization from the Departmental Representative.

3.2.12. Keep site clean and organized throughout structure demolition work.

END OF SECTION

1. PART 1 – GENERAL 02 55 10 – DUST CONTROL

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 02 55 10 Dust Control.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 01 35 13.43 – Special Procedures for Contaminated Sites

1.3.2. 02 41 13 – Shed Demolition and Disposal

1.3.3. 02 61 00.02 – Contaminated Sites - Material Excavation and Backfill

1.4. Action and Informational Submittals

1.4.1. Submittals in accordance with 01 33 00 (Submittal Procedures)

1.5. Dust Control Requirements

1.5.1. Supply, store, apply, as necessary water for dust control as approved by Departmental Representative.

1.5.2. Supply, installation, relocation as necessary, and final removal of dust screens for dust control as approved by Departmental Representative.

2. PART 2 - PRODUCTS

2.1. Materials

2.1.1. Water for all uses during the Work may only be sourced from the CFB Comox potable water supply as approved by the Departmental Representative.

2.1.2. Nearby fire hydrant may be used with approval and in accordance with industry standard procedures to mitigate water quality and pressure risks.

2.1.3. Dust Screens: to the Departmental Representative's acceptance.

3. PART 3 – EXECUTION

3.1. Application

3.1.1. Ensure that dust arising from all Contractor operations, such as truck transportation, material stockpiling, and demolition work, is controlled by water application and use of dust screens.

3.1.2. Prevent debris, dust, and any sediment laden waters from entering any drainage system, or water course in accordance with the EMP and EPP.

3.1.3. Ensure that dust blown from the work does not affect adjacent facilities, specifically airfield operations.

3.1.4. Apply water as required for dust control, and when directed by the Departmental Representative. Dust control methods must be chosen such that a minimal amount of water is required.

3.1.5. Apply water with distributors equipped with spray system to ensure uniform application and with means of shut off.

3.1.6. Runoff from water used for dust control must not enter storm drains or run directly or indirectly into the aquatic environment.

3.1.7. Provide temporary dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of work, and public.

3.1.8. Maintain, relocate as necessary, and remove dust screens at completion of those portions of the work that may generate airborne dust.

3.1.9. Secure and cover material in open trucks hauling excavated material and re-use the covers.

3.1.10. If the Contractor’s dust and particulate control is not sufficient for controlling dusts and particulates into atmosphere, stop work. Discuss, with the Departmental Representative, procedures to resolve the problem. Make necessary changes to operations prior to resuming excavation, handling, processing, or other work that may cause release of dusts or particulates.

3.1.11. Take extra precautions, when necessary, to ensure that dust control measures are adequate during hot and dry weather, if there are strong winds, or if sediment is stockpiled overnight.

END OF SECTION

1. PART 1 – GENERAL 02 61 00.01 – CONTAMINATED SITES – WATER MANAGEMENT (TURBIDITY REDUCTION)

1.1. Measurement Procedures

1.1.1. Contaminated Water Management (Turbidity Reduction) -Provision will be paid in accordance with lump sum price established to design, temporarily provide for duration of Work, and erect all onsite ancillary tanks, storage containers, equipment and piping to collect, store, sample and transport contaminated or potentially Contaminated Water. Includes supply of equipment and materials for transporting Contaminated Water after turbidity reduction to the DND Water Treatment Area (see Drawings). Includes provision of all supplies and equipment to reduce turbidity i.e., Turbidity Reduction Equipment. Includes provision of dewatering equipment for Contaminated Water from excavation.

1.1.2. Contaminated Water Management (Turbidity Reduction) -Operation will be paid in accordance with two lump sum prices established for Base Work and Optional Work. Both lump sum prices include:

1.1.2.1. all onsite ancillary tanks, storage containers, equipment and piping to collect, store, sample and transport Contaminated or potentially Contaminated Water.

1.1.2.2. operation of dewatering of Contaminated Water from excavation.

1.1.2.3. treating Non-Aqueous Phase Liquids, if any.

1.1.2.4. operation of Turbidity Reduction Equipment and transfer piping.

1.1.2.5. testing to demonstrate compliance with Contract.

1.1.2.6. transporting Contaminated Water after turbidity reduction to the DND Water Treatment Area (located as shown on Drawings).

1.1.3. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. Not Used.

1.4. Action and Informational Submittals

1.4.1. Contaminated Water Management (Turbidity Reduction) Plan as a component of the Construction Work Plan (see 01 11 55 and 01 33 00): within 10 days after Contract award and prior to mobilization to Site,

1.4.2. Submitted plan to detail and include:

1.4.2.1. methods, means, and sequences for Contaminated Water Management (Turbidity Reduction)

1.4.2.2. supply of equipment (Turbidity Reduction Equipment) to treat sediment load as per Specifications.
1.4.2.3. Must be signed by Contractor's QP.
1.4.3. Turbidity Reduction Equipment Testing:
1.4.3.1. Within 5 days of conducting initial operations testing, and prior to operating or transfer, Submit results of initial operations test.
1.4.3.2. Within 5 days of sampling Submit sampling results of operational (recurrent) testing.

2. PART 2 - PRODUCTS

2.1. Not Used
2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Contaminated Water
3.1.1. Assume ownership of, and be responsible for Contaminated Water during capture, storage, and treatment in accordance with these Specifications in Turbidity Reduction Equipment.

3.2. Contaminated Water Treatment
3.2.1. Design and Contaminated Water Management (Turbidity Reduction) Requirements:
3.2.1.1. Design and Operating Criteria: design Turbidity Reduction Equipment capable of treating Contaminated Water generated from dewatering excavations and Work areas to meet Turbidity Objective and filter water through 5-micron particulate filter prior to transfer to DND WTU.
3.2.1.2. Discharge to environment is not considered necessary for the Work and is not allowed.
3.2.2. Initial Testing: determine performance of Turbidity Reduction Equipment provided by Contractor as follows prior to commencing excavation:
3.2.2.1. Test run with potable water to ensure operation, no leaks are occurring, and no contaminants are introduced into treated water.
3.2.2.2. Performance verification (turbidity reduction) with Contaminated Water test batch to ensure treatment is effective. Treat, store, test, and assess samples by Contractor's QP.
3.2.2.3. Provide access for independent collection of treated stored water samples by the Departmental Representative.

3.2.3. Operational Testing:

3.2.3.1. Operate the Turbidity Reduction Equipment using experienced, qualified personnel and in accordance with manufacturer's instructions and procedures as Submittals by Contractor.

3.2.3.2. Collect, analyze, and assess samples as required by Contractor's QP, and at a minimum of every 72 hours of operation.

3.2.3.3. Provide access for independent collection of samples by the Departmental Representative.

3.2.3.4. On basis of analytical results by Contractor or Departmental Representative obtained from samples collected post treatment, cease transfer and make Plant modifications required for effluent to satisfy Turbidity Objective as directed by the Departmental Representative. Perform Initial Testing after Plant modifications.

3.2.4. All solids generated by the Contaminated Water Management (Turbidity Reduction) operations shall be designated as PFAS Contaminated Soil for Destruction including filters or filtration devices.

3.2.5. Decommissioning/Dismantling:

3.2.5.1. Decontaminate and remove salvageable components of Turbidity Reduction Equipment including treatment system, pumps, piping, and electrical equipment.

3.2.5.2. Dispose of non-salvageable equipment and materials at Disposal Facility accepted by the Departmental Representative. Decontaminate salvageable equipment as required prior to demobilization from Site.

END OF SECTION

1. PART 1 – GENERAL 02 61 00.02 – CONTAMINATED SITES – EXCAVATION AND BACKFILL

1.1. Measurement Procedures

1.1.1. Concrete Disposal (see 02 61 00.06).

1.1.2. Excavation will be paid in accordance with two unit rate prices established for Base Work and Optional Work. Both unit rate prices will be based upon volume of material removed to excavate to Final Excavation Extents according to Drawings measured as the difference between Preconstruction and Post Construction Condition Survey. Includes temporary sloping and shoring design, provision, installation, removal, supervision, and inspection. Includes all onsite handling, loading, hauling, unloading and stockpiling, including hauling to Stockpiles as required.

1.1.2.1. Interim Excavation volume as recorded in situ Excavation volume using Progress Survey.

1.1.2.2. Final Excavation volume as recorded in situ Excavation volume using Contractor's QPS, based on difference between Preconstruction Condition Survey and Final Excavation Limits.

1.1.2.3. Measurement as recorded in situ Excavation volume using Progress Survey for interim measurement and Contractor's QPS for final excavation volume extents (as-built). In situ volume is simple dimensions of excavation and does not consider ex situ bulking (expansion or swell) and in situ compaction (densifying) factors

1.1.3. Backfill Material unit rates include all supply, handling, loading, hauling, unloading, placing, grading, compacting and Contractor's analytical testing and inspections to demonstrate compliance with Contract. Payment in accordance with multiple unit rates as allowed in Base Work and Optional Work and established per weight recorded on weigh scale certified by Measurement Canada and results provided to Departmental Representative. Select Backfill Materials are included in other items and have no specified unit rate as per the following table.

Table 02 61 00.02 -01
Backfill Material Types and Payment

Backfill Material Type (per MMCD)	Description (Brief)	Payment
Granular Base	<19mm	Included in New FFTA construction, no unit rate, see 32 11 23
Crushed Granular Sub-Base	<75mm	Unit rate; by weight, see 32 11 16
100 mm Pit Run Gravel	<100mm	Unit rate; by weight, see 32 11 16
Granular Pipe Bedding	<25mm for utilities	no unit rate, included in New FFTA construction, see 01 25 00
Drain Rock	<25mm for utilities	no unit rate, included in New FFTA construction, see 01 25 00
Stabilized PFAS Contaminated Material	Reused site soil	Payment per PFAS Stabilization costs, see 02 61 00.05
Miscellaneous Backfill Materials to be specified by Contractor's QP	Per Contractor's Site Restoration and Bioswale Design	Included in Site Restoration and Bioswale, no unit rate, see 01 25 20

1.1.4. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.2.2. Unsuitable materials:

1.2.2.1. Weak, chemically unstable, and compressible materials.

1.2.2.2. Frost susceptible materials:

1.2.2.3. Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136.

1.2.2.4. Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.

1.2.2.5. Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.3. Related Sections

1.3.1. 01 35 13.43 – Special Procedures for Contaminated Sites
1.3.2. 01 35 29.14 – Health and Safety for Contaminated Sites
1.3.3. 01 35 43 – Environmental Protection.
1.3.4. 01 45 00 – Quality Control
1.3.5. 31 05 00 – Common Works Results – Earthworks, Exterior, Improvements, Utilities
1.3.6. 31 22 13 – Rough Grading
1.3.7. 32 11 16 – Granular Sub-Bases
1.3.8. 32 11 23 –Granular Base
1.3.9. 32 12 16.01 – Asphalt Paving.

1.4. Action and Informational Submittals

1.4.1. Within 10 days of Contract award, submit copies of applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract including but not limited to
1.4.1.1. Destruction Facility(ies), and
1.4.1.2. Disposal Facility(ies).
1.4.2. Submit Contaminated Soil and Water Management Plan and Excavation and Backfilling Plan as part of the Construction Work Plan (see 01 11 55 and 01 33 00) on schedule specified including the required Plans detailing methods, means, and sequences for Work and documenting compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Plans to include:
1.4.2.1. Excavation Temporary Slope and Shoring Design must be signed and sealed by Contractor's QP, as required by ground conditions, excavation depth, shoring type, or support type.
1.4.2.2. Methods, means, and sequences for excavation
1.4.2.3. Methods, means, and sequences for excavation dewatering and heave protection.
1.4.2.4. Methods, means and sequences for backfilling,
1.4.2.5. Personnel and equipment decontamination.
1.4.2.6. Segregation of different Classifications.
1.4.2.7. Support of structures design.
1.4.2.8. Procedures for excavations adjacent to utilities or other structures if the excavation has the potential to impact utilities or other structures.
1.4.2.9. Methods and Procedures for PFAS Contaminated Soil for Stabilization in accordance with 02 61 00.05.
1.4.3. Backfill Material Quality (includes all imported Backfill Materials): at least 10 days prior to bringing material onsite, submit documentation signed and sealed by Contractor's QP verifying that material is acceptable for import and intended use. Include:

1.4.3.1. Preliminary Site Investigation-Stage 1, or equivalent, performed by Contractor's QP for each import source.
1.4.3.2. Grain-size distribution information.
1.4.3.3. Chemical analyses for Potential Contaminants of Concern, including metals.
1.4.3.4. Testing to be performed by Contractor's QP at sufficient frequency to characterize all Backfill Material. Test using appropriate guidelines and practices. Testing frequencies to meet specifications.
1.4.4. Backfill Material Interim Monitoring and Testing Results: within 5 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 Contractor's QP. Include:
1.4.4.1. Backfill Material testing results, including geotechnical and environmental quality, confirming results meet requirements in Contract and in the Contractors Excavation and Backfilling Plan.
1.4.4.2. Compaction testing results, confirming results meet requirements in Contract and in the Contractors Excavation and Backfilling Plan.

1.5. References

1.5.1. Master Municipal Contract Documents (MMCD), Platinum Edition Volume II - 2009, British Columbia. Contractor to maintain a copy on-site at all times.
1.5.2. American Society for Testing and Materials International (ASTM)
1.5.2.1. ASTM C117-04, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
1.5.2.2. ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
1.5.2.3. ASTM D422-632002, Standard Test Method for Particle-Size Analysis of Soils.
1.5.2.4. ASTM D698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ^{3}) (600 kN-m/m ^{3}).
1.5.2.5. ASTM D1557-02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ^{3}) (2,700 kN-m/m ^{3}).
1.5.2.6. ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
1.5.3. Canadian General Standards Board (CGSB)
1.5.3.1. CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
1.5.3.2. CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
1.5.4. Canadian Standards Association (CSA International)
1.5.4.1. CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
1.5.4.2. CSA-A3001-03, Cementitious Materials for Use in Concrete.

1.5.4.3. CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
1.5.5. U.S. Environmental Protection Agency (EPA)/Office of Water
1.5.6. EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.6. Existing Conditions

1.6.1. Carefully examine existing mapping of site utilities prior to excavation.
1.6.2. Buried services:
1.6.2.1. Before commencing work verify location of buried services on and adjacent to site by either soil hydrovactor excavation or hand-digging methods.
1.6.2.2. Remove obsolete buried services within 2 m of foundations: cap cut-offs.
1.6.2.3. Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
1.6.2.4. Prior to beginning excavation Work, notify applicable Departmental Representative and establish the location and state of use of buried utilities and structures. Clearly mark such locations to prevent disturbance during Work.
1.6.2.5. Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
1.6.2.6. Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing or re-routing.
1.6.2.7. Record location of maintained, re-routed and abandoned underground lines.
1.6.2.8. Confirm locations of recent excavations adjacent to area of excavation.
1.6.3. Existing buildings and surface features:
1.6.3.1. Conduct, with Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, pavement, survey benchmarks and monuments which may be affected by Work.
1.6.3.2. Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.
1.6.3.3. Where required for excavation, cut roots or branches as directed by Departmental Representative.

1.7. Free Phase Products

1.7.1. Floating free phase substance (Non-Aqueous Phase Liquids) is not expected.
1.7.2. When floating free phase substance (Non-Aqueous Phase Liquids) is present, remove free phase from saturated soil or sediment without further contaminating soil, sediment or groundwater prior to commencing other construction Work.
1.7.3. Collect free phase product (Non-Aqueous Phase Liquids), load, and transport to a Disposal Facility.

2. PART 2 - PRODUCTS

2.1. Materials

2.1.1. Short term temporary liners and covers to be a minimum of 5 mil plastic.

2.1.2. Erosion and sediment control materials to meet the most stringent requirements of 01 35 43 and following minimum requirements:

2.1.2.1. Hay or Straw Bale: wire bound or string tied; securely anchored by at least 2 stakes or rebars driven through bale 300 mm to 450 mm into ground; chinked (filled by wedging) with hay or straw to prevent water from escaping between bales; and entrenched minimum of 100 mm into ground.

2.1.2.2. Silt Fence: assembled, ready to install unit consisting of geotextile attached to driveable posts. Geotextile: uniform in texture and appearance, having no defects, flaws, or tears that would affect its physical properties; and contain sufficient ultraviolet ray inhibitor and stabilizers to provide minimum 2-year service life from outdoor exposure.

2.1.2.3. Net Backing: industrial polypropylene mesh joined to geotextile at both top and bottom with double stitching of heavy-duty cord, with minimum width of 750 mm.

2.1.2.4. Posts: sharpened wood, approximately 50 mm square, protruding below bottom of geotextile to allow minimum 450 mm embedment; post spacing 2.4 m maximum. Securely fasten each post to geotextile and net backing using suitable staples.

2.2. Backfill Materials

2.2.1. Backfill quality to meet DND requirements and Contractor to supply data as required for DND.

2.2.2. Gravel to be composed of inert, durable material, reasonably uniform in quality and free from soft or disintegrated particles. In absence of satisfactory performance records over a five year period for particular source of material, soundness to be tested according to ASTM C88 or latest issue. Maximum weight average losses for coarse and fine aggregates to be 30% when magnesium sulphate is used after five cycles.

2.2.3. All imported virgin Backfill Material as listed in Table 02 61 00.02-01 above to MMCD (MMCD 2009, BC, 31 05 17 – Aggregates and Granular Materials, see Annex E).

2.2.4. Backfill Material Characterization Requirements:

2.2.4.1. Stockpiling of material on DND property prior to receipt of quality data and confirmation that it meets specifications is not allowed. With the Departmental Representatives approval, a risk-based approach can be taken if necessary, in order to potentially allow stockpiling. Sampling must be completed prior to delivery and use of the material. If the material is found to exceed the required criteria it must be removed from DND property.

2.2.4.2. Departmental Representative will inspect Backfill Material brought onsite and will not allow import of fill material that varies from Submittal samples.

2.2.4.3. Contractor to conduct additional testing as directed by the Departmental Representative to confirm suitability and facilitate testing by Departmental Representative to confirm suitability.

2.2.4.4. Samples may be tested for geotechnical and environmental quality by Departmental Representative. Backfill Material testing may take up to 15 days not including day of sample provision.

2.2.4.5. Environmental quality requirements may be modified by the Departmental Representative taking into consideration background concentrations, commercially available material, and site-specific factors and/or land use.

2.2.4.6. Any import fill material which has a discrete sample exceeding the environmental quality requirements specified must be removed from the Site and replaced, including relevant placed material, as directed by the Departmental Representative. An alternate source of Backfill Material must be provided, with no increases to Contract Amount, no Standby and no Extension of Time for completion of the Work.

2.2.4.7. Gradations to be within limits specified when tested to ASTM C117-13 (Standard Test Method for Materials Finer than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing) and ASTM C136-06 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates). Sieve sizes to SCC CAN/CGSB-8.1-88 (Sieves, Testing, Woven Wire, Inch Series) and CAN/CGSB-8.2-M88 (Sieves, Testing, Woven Wire, Metric Series).

2.2.4.8. Sampling frequency: sample, analyse, and compare to Contract requirements each Backfill Material and source for grain-size distribution and chemical analyses as specified at the following frequency:

2.2.4.8.1. Two random samples for the first 1,000 m^3.

2.2.4.8.2. One random sample for every subsequent (or portion thereof) 1,000 m^3 up to 10,000 m^3.

2.2.4.8.3. One random sample for every subsequent (or portion thereof) 10,000 m^3.

2.2.4.8.4. Sampling frequency must be increased as directed by the Departmental Representative for each of the following:

2.2.4.8.4.1. If the import source does not have a Preliminary Site Investigation-Stage 1 approved by the Contractor's QP as having no Areas of Potential Environmental Concern. Sample frequency increases to at least 1 random sample for every 500 m^3.

2.2.4.8.4.2. If any sample collected does not meet requirements according to Contract.

2.2.4.9. Environmental quality information and sampling will include at a minimum the following:

2.2.4.9.1. All tested samples of imported fill must meet the Canadian Council of Ministers of the Environment Soil Quality Guidelines for Agricultural Land Use (or ambient background concentrations). If this is not possible, Departmental Representative must engage DND during the selection process for imported fill;

2.2.4.9.2. Backfill Material must be virgin material and must not contain any recycled material, except for Stabilized PFAS Contaminated Material.

2.2.4.9.3. At a minimum, imported fill must be tested for: metals, VOCs, PAHs, hydrocarbons and Routine PFAS Analysis. Sampling analysis must meet federal CCME requirements and conform with previous site analytical packages (see Annex D). Sampling requirements to confirm presence/absence of contaminants will be determined by the Departmental Representative.

2.2.4.9.4. Backfill Material sampling for PFAS must be for Routine PFAS Analysis as conducted by an Accredited Commercial laboratory. Individual PFAS compound results must be less than 0.01 mg/kg.

2.2.4.9.5. Import fill material that is cobble sized or larger (> 64 mm) brought onsite must be tested by the Contractor for Acid Rock Drainage (ARD) and Metals Leaching (ML) potential using Acid Base Accounting (ABA) for assessment of ARD potential and more specifically using the Modified Sobek Test Method. The potential for metals leaching must use Shake Flask Extraction (SFE) Method for analysis of metals leaching. See guidance document Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials MEND Report 1.20.1, Natural Resources Canada, Price 2009. Gradations to be within limits specified when tested to ASTM C117-13 (Standard Test Method for Materials Finer than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing) and ASTM C136-06 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates). Sieve sizes to SCC CAN/CGSB-8.1-88 (Sieves, Testing, Woven Wire, Inch Series) and CAN/CGSB-8.2-M88 (Sieves, Testing, Woven Wire, Metric Series).

2.2.4.10. Geotechnical quality requirements:

2.2.4.10.1. Backfill Material must be granular aggregate composed of inert, clean, tough, durable particles of crushed rock, gravel and sand capable of withstanding the deleterious effects of exposure to water, freeze-thaw, handling, spreading and compacting. The aggregate particles must be uniform in quality and free from clay lumps, wood and free from an excess of flat or elongated pieces. In absence of satisfactory performance records over a five year period for particular source of material, soundness to be tested according to ASTM C88 or latest issue. Maximum weight average losses for coarse and fine aggregates to be 30% when magnesium sulphate is used after five cycles.

2.2.4.10.2. Backfill Material total silt and clay content not to exceed 15% by mass or as required by Contract unless otherwise accepted by Departmental Representative.

2.2.5. Asphalt, as required, must, at minimum, meet the specifications for: Upper Course #1 mix-type as specified in 32 12 16; of the current version of the *BC Master Municipal Construction Document (2009) Platinum Edition*.

3. PART 3 - EXECUTION

3.1. Survey

3.1.1. See 02 21 13 and 31 05 00.

3.2. Temporary Erosion and Sedimentation Control

3.2.1. See 01 35 43.

3.3. Surface Preparation and Operation

3.3.1. Protect existing features in accordance with applicable local regulations.

3.3.2. Keep excavations clean, free of standing water, and loose soil.

3.3.3. Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative.

3.3.4. Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

3.3.5. Protect buried services that are required to remain undisturbed.

3.3.6. Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

3.3.7. Cut any pavement neatly along limits of proposed excavation in order that Stripping of Overburden surface may break evenly and cleanly.

3.3.8. Surficial 100 mm of grass, vegetation, overburden and Topsoil to be assumed Contaminated and managed as PFAS Contaminated Material for Destruction. Segregation of overburden and Topsoil from mineral soil at Contractors risk. No additional payment to be supplied for organic matter in PFAS Contaminated soil for Destruction.

3.3.9. Retention pond sediment to a depth of 1.5 m is PFAS Contaminated Material for Destruction and must be destroyed per 02 61 00.04.

3.3.10. During restoration, place suitable imported Topsoil (see 32 91 19.13 and 32 91 19.16) to meet restoration requirements per Drawings.

3.3.11. Security and Safety:

3.3.11.1. Ensure Excavations are secure during onsite Work, provide, install, and remove fencing, temporary hoarding, and other security measures as required and specified.

3.4. Temporary Sloping and Shoring

3.4.1. Design, provide, install, remove, supervise, and inspect appropriate sloping or shoring to allow excavation of Excavation Extents according to Drawings or as directed by Departmental Representative.

3.4.2. Contractor is responsible for the protection and temporary support of all project excavations.

3.4.3. Departmental Representative responsible for determining Excavation Extents.

3.4.4. Contractor's QP to determine Excavation Extents.

3.4.5. Drawings are for reference purposes only and are Conceptual and not Issued For Construction.

3.4.6. Design Requirements:

3.4.6.1. Design must be completed by, and is the sole responsibility of, the Contractor's QP. All Shop Drawings of sloping and shoring design to be signed and sealed by Contractor's QP.

3.4.6.2. Act as sloping or shoring structures for excavations as well as for stability of foundations and infrastructure during remediation excavation.

3.4.6.3. Allow excavation of all Contaminated Soil laterally and vertically on the Site to Excavation Extents in accordance with the Contract. Additional excavation is not anticipated, contamination will remain at Excavation Extents.

3.4.6.4. Provide a safe working environment for personnel and equipment within the excavation area, including collection of confirmatory samples or other work that may be required at the base of the excavation.

3.4.6.5. Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with 01 35 29.14 - Health and Safety for Contaminated Sites.

3.4.6.6. Where conditions are unstable, Contractor to retain and pay costs for geotechnical engineer to review condition and provide recommendations

3.4.6.7. Construct temporary Works to depths, heights and locations as indicated by Contractor's QP.

3.4.6.8. Additional design requirements as determined by the Contractor's QP.

3.4.6.9. Additional sloping or shoring may be required to extend excavation beyond Excavation Extents according to Drawings. Revise Temporary Sloping and Shoring design as required by Contractor's QP.

3.4.6.10. Temporary shoring cannot have any tiebacks or supports which extend beyond the project Site boundary.

3.4.6.11. Temporary shoring must not flex or bend when exposed while excavations are occurring on the Site.

3.4.6.12. Sloping and shoring structures are temporary structures only. Resistance to seismic loads will be at the sole discretion of the Contractor's QP. Be responsible for any failures and resultant costs should the temporary sloping or shoring fail due to a seismic event during the construction period.

3.4.6.13. Temporary sloping and shoring designs to be completed in accordance with methods in current version of Canadian Foundation Engineering Manual.

3.4.7. Installation:

3.4.7.1. Installation must be supervised by, and is the sole responsibility of, the Contractor's QP. All inspection reports of sloping and shoring to be signed and sealed by Contractor's QP.

3.4.7.2. All installation activities must take place on the Site. No staging or construction activities are to take place on adjacent properties.

3.4.8. Maintain side slopes of excavations in safe condition by appropriate methods and in accordance with relevant regulations.

3.4.9. During backfill operation:

3.4.9.1. Unless otherwise identified according to Drawings or as directed by the Departmental Representative, remove temporary shoring from excavations.

3.4.10. Temporary sloping and shoring excavated material:

3.4.10.1. Material excavated for sloping or shoring may be re-used as backfill to replace material removed as accepted by Contractor's QP and Departmental Representative.

3.4.10.2. Material excavated for sloping or shoring that is accepted for backfilling must follow procedures in accordance with requirements of Contractor's QP and meet Contract Documents.

3.4.10.3. Material excavated for sloping or shoring not accepted must be removed from Site.

3.4.10.4. Do not remove bracing until backfilling has reached respective levels of such bracing.

3.4.10.5. Pull sheeting in increments that will ensure compacted backfill is maintained at elevation at least 500 mm above toe of sheeting.

3.4.10.6. When sheeting is required to remain in place, cut off tops at elevations as indicated.

3.4.10.7. Upon completion of substructure construction remove cofferdams, shoring and bracing.

3.5. Excavation

3.5.1. Notify Departmental Representative at least 5 days in advance of excavation operations.

3.5.2. All or any existing underground utilities are not necessarily shown on the Contract Drawings. Existing Underground utilities shall be located, and all utility companies contacted, prior to installing any new underground services.

3.5.3. Test holes are required to determine exact location and depths of existing utilities. Discrepancies shall be referred to the Departmental Representative.

3.5.4. Excavate to lines, grades, elevations and dimensions according to Drawings or as directed by Departmental Representative using methods, means, and sequences as determined by Contractor’s QP.

3.5.5. Excavate all Contaminated Soil laterally and vertically on the Site to Excavation Extents in accordance with the Contract.

3.5.6. Excavation must not interfere with bearing capacity of adjacent foundations, slabs and infrastructure. Contractor to notify Departmental Representative immediately where undermining of infrastructure occurs. Contractor responsible for devising and executing a remediation plan for filling all voids associated with undermining of slabs and foundations.

3.5.7. For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 30 m of trench in advance of installation operations. No more than 5 m of trench may be exposed at end of day’s operation and must be securely covered. Road plates are to be used to cover exposed excavations in areas of vehicular travel.

3.5.8. Do not disturb soil within branch spread of trees or shrubs that are to remain.
3.5.8.1. If excavating through roots, excavate by hand and cut roots with sharp axe or saw, as directed by QP.
3.5.9. Machine cut banks and slopes.
3.5.10. Protect bottom of excavations from excessive traffic.
3.5.11. Grade excavation top perimeter to prevent surface water run-off into excavation.
3.5.12. Keep excavated and stockpiled materials safe distance away from edge of excavation.
3.5.13. Restrict vehicle operations directly adjacent to open excavations.
3.5.14. Remove debris, if encountered.
3.5.15. Remove concrete, masonry, paving, walks, demolished foundations and rubble and other obstructions encountered during excavation offsite.
3.5.16. Remove concrete pads to be demolished as shown on Drawings.
3.5.17. Reduce size of concrete and other debris to allow to be Transported, Treated, and Disposed, as required.
3.5.18. Non-Contaminated Quality Soil is not anticipated except in Site Restoration and Bioswale (see 01 25 20).
3.5.19. Earth bottoms of excavations to be undisturbed soil or sediment, level, free from loose, soft or organic material.
3.5.19.1. Subgrade for paved areas to be reviewed and approved by the Contractor's geotechnical engineer prior to placement of fill materials.
3.5.19.2. Any soft/loose areas identified should be excavated and replaced with structural fill placed and compacted as specified (see Drawings, 32 11 16, and 32 11 23) or as directed by Contractor's Geotechnical Engineer.
3.5.20. Notify Departmental Representative when bottom of excavation is reached based on Excavation Extents. Survey excavation extents as required to support payment items including but not limited to progress survey, Final Excavation Extents, and Condition Surveys.
3.5.21. Provide assistance for collection of confirmation samples as directed to the Departmental Representative at no additional cost. Confirmation samples will be collected to document excavation limit quality but will not be used to change excavation extents.
3.5.22. Obtain acceptance by Departmental Representative of completed excavation.

3.6. Dewatering and Heave Protection

3.6.1. Keep excavations free of water while Work is in progress unless otherwise identified according to Drawings or as directed by the Departmental Representative.
3.6.2. Provide to Departmental Representative details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs, if any.
3.6.3. Plan for excavation below groundwater table to avoid quick conditions or heave.
3.6.4. Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.

3.6.5. Provide and maintain temporary drainage and diversion outside of excavation limits.
3.6.6. Manage water in accordance with 02 61 00.01. Manage water to containment facilities and in manner not detrimental to public and private property, or portion of Work completed or under construction.
3.6.7. Keep excavations, staging pads, and other Work areas free from water. Provide standby equipment to ensure continuous operation of dewatering system.
3.6.8. Dewatering Methods: includes sheeting and shoring; groundwater control systems; surface or free water control systems employing ditches, diversions, drains, pipes and/or pumps; and other measures necessary to enable Work to be carried out in dry conditions.
3.6.9. All collected water to be considered Contaminated Water and collected in accordance with 02 61 00.01.

3.7. Bedding and Surround of Underground Services

3.7.1. Place and compact granular material for bedding and surround of underground services as indicated.
3.7.2. Place bedding and surround material in unfrozen condition.

3.8. Soil Stockpiling

3.8.1. See 01 35 13.43
3.8.2. Stockpile material within work area in locations identified by Departmental Representative. Stockpiling only allowed within excavation footprint or in location identified.
3.8.3. Provide, maintain, and operate temporary storage/stockpiling facilities as per Contractor's Site Layout.
3.8.4. Segregate Contaminated Soil from Non-Contaminated Quality Soil into separate stockpiles to prevent cross-contamination.
3.8.5. Prevent precipitation from infiltrating or from directly running off stockpiled materials. Cover stockpiled materials with an impermeable cover during periods of Work stoppage including at end of each day and as directed by the Departmental Representative.
3.8.6. Securely fasten covers over stockpiled material until material is loaded for offsite transport.
3.8.7. Although not anticipated, store excavated Non-Contaminated Quality Soil only on non-contaminated surface areas. Ensure no contact between excavated Non-Contaminated Quality Soil and drainage of Contaminated Material.
3.8.8. Store excavated PFAS Contaminated Material in temporary stockpiles, if planned.
3.8.8.1. Stockpile height not to exceed 2 m and should be protected from erosion.
3.8.8.2. Install impermeable liner (e.g. asphalt or minimum 20 mil (0.5 mm) polyethylene) below proposed stockpile locations to prevent contact between stockpile material and ground.

3.8.8.3. Cover stockpiled material when not being worked or sampled to prevent release of airborne dust, vapours, or odours, and to prevent saturation and leachate generation from material. Cover to be impermeable (e.g., minimum 5 mil polyethylene) and securely fashioned to prevent blowing off.

3.8.8.4. Prevent Non-Contaminated Quality Water, including surface runoff water, from contact with Contaminated Soil stockpiles.

3.8.9. Segregate different suspect material in discrete stockpiles to facilitate ex situ characterization for Classification as directed by the Departmental Representative.

3.8.10. Assist Departmental Representative in collection of stockpile, excavation limit and confirmatory samples for ex situ characterization. Ex situ characterization is anticipated to be limited; however, the Contractor must allow for some sampling. Sampling will not change excavation extents.

3.9. Backfill Types and Compaction

3.9.1. Use only specified Backfill Material and Stabilized PFAS Contaminated Material in accordance with the Contract and which has been recommended by Contractor's QP, and previously accepted as a Submittal. Backfill Material types are described in 02 61 00.02 Part 2.

3.9.2. Compact material in accordance with the more stringent of the Contractors Excavation and Backfilling Plan or Contract to ensure no long-term settlement and is suitable for planned post-remediation use. Machine compact all fill materials unless otherwise according to Contract.

3.9.3. Backfill materials:

3.9.3.1. Landscaped surfaces: for areas not subject to vehicle or building loading and outside ditch lines, backfill with Stabilized PFAS Contaminated Material except as shown otherwise on Contract Drawings. Compact to 90% modified proctor density.

3.9.3.2. Driving surfaces: backfill with imported granular material. Place backfill material in uniform layers not exceeding 200 mm compacted to 95% Modified Proctor Maximum Dry Density thickness up to grades indicated. Compact each layer before placing succeeding layer.

3.10. Backfilling

3.10.1. Areas to be backfilled to be free from debris, snow, ice, water and frozen ground to greatest extent practicable. Do not use backfill material which is frozen or contains ice, snow or debris to greatest extent practicable.

3.10.2. Backfill immediately only if required for stability purposes as determined by the Contractor's QP.

3.10.3. Unless required to backfill immediately, do not proceed with backfilling operations until completion of following:

3.10.3.1. Departmental Representative has inspected and approved installations.

3.10.3.2. Departmental Representative has inspected and accepted Contaminated Material Extents by the Departmental Representative based on survey data

3.10.3.3. Departmental Representative has inspected and approved of construction below finish grade.
3.10.3.4. Inspection, testing, approval, and recording location of underground utilities.
3.10.3.5. Removal of concrete formwork.
3.10.3.6. Removal of shoring and bracing; backfilling of voids with satisfactory soil material.
3.10.3.7. Surveying has been completed by the Contractor's QP for Final Excavation Limits and as-built documents, including utilities locations.
3.10.3.8. After collection of samples from the Final Excavation Extents.
3.10.3.9. Departmental Representative has inspected and accepted Backfill Material as per 02 61 00.02 Part 2.
3.10.3.10. Imported fill material brought onsite can be sampled and tested for geotechnical and environmental quality by Departmental Representative. Backfill Material testing may take up to 5 days not including day of sample collection.
3.10.3.11. Departmental Representative has inspected and accepted compaction results for previous lift.
3.10.3.12. Removal of shoring and bracing; backfilling of voids with satisfactory Backfill Material.
3.10.4. Backfilling around installations:
3.10.4.1. Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
3.10.4.2. Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 150 mm.
3.10.4.3. Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
3.10.4.3.1. Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Departmental Representative.
3.10.5. All structural fill should extend beyond footing and hard surfaced areas so that compact/dense native soils, or approved structural fill are present within an area extending one metre laterally from the edge of the foundation and then at a 1H:1V (Horizontal:Vertical) downward projection.
3.10.6. Place unshrinkable fill in areas as indicated.
3.10.7. Consolidate and level unshrinkable fill with internal vibrators.
3.10.8. Place Backfill Material in uniform layers as specified (see Drawings, 32 11 16, and 32 11 23). Compact each layer to the satisfaction of the Contractor's QP and in accordance with the Contract before placing succeeding layer. If backfilling is allowed to proceed in the wet (i.e., underwater), use self-compacting backfill as required by Contractor's QP in accordance with the Contractors Excavation and Backfilling Plan.

3.10.9. Backfill compaction to be tested by Contractor's QP in accordance with the Contractors Excavation and Backfilling Plan or as directed by Departmental Representative.
3.10.10. Notify Departmental Representative when final backfill grade is reached.

3.11. Testing
3.11.1. See 01 45 00 and 31 05 00

3.12. Restoration
3.12.1. Existing underground utilities may need to be lowered or rose to suit the final design grades in accordance with minimum and maximum cover requirements for each utility.
3.12.2. Upon completion of Work, remove waste materials and debris per the Contract, trim slopes, and correct defects as directed by Departmental Representative.
3.12.3. Replace topsoil as indicated.
3.12.4. Reinstate lawns to elevation which existed before excavation.
3.12.5. Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
3.12.6. Restore surface to match existing.
3.12.6.1. Minimum topsoil depth: 100 mm
3.12.6.2. Minimum asphalt thickness: 80 mm
3.12.7. Clean and reinstate areas affected by Work as directed by Departmental Representative.
3.12.8. Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.
3.12.9. Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION

1. PART 1 – GENERAL 02 61 00.03 – CONTAMINATED SITES – TRANSPORTATION

1.1. Measurement Procedures

1.1.1. Material transportation including imported supplies and materials and Contaminated Material transportation will not be paid separately. These costs must be included in the applicable unit rates e.g.:

1.1.1.1. PFAS Contaminated Soil for Destruction or

1.1.1.2. PFAS Contaminated Soil for Stabilization.

1.1.1.3. Concrete Disposal.

1.1.1.4. Shed Demolition and Disposal.

1.1.2. Transportation includes all handling, loading, hauling, unloading, transfer, interim storage, and transport to and from intermediate locations and final placement location.

1.1.3. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 02 61 00.04 – Contaminated Sites - Destruction

1.3.2. 02 61 00.05 – Contaminated Sites - Stabilization

1.4. Action and Informational Submittals

1.4.1. Contaminated Material Transportation Plan as part of the Construction Work Plan (see 01 11 55 and 01 33 00): within 10 days after Contract award and prior to mobilization to Site, submit methods, means, and sequences for Contaminated Material Transportation on land and on water as applicable for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Include for each Transfer/Interim Storage Facility:

1.4.1.1. Copy of permit, certificate, approval, license, or other required form of authorization issued by a Facility Regulator for the Transfer/Interim Storage Facility of relevant Contaminated Material.

1.4.1.2. Letter from Contractor's QP that the Transfer/Interim Storage Facility is appropriate for the nature, type, concentration, and quantity of Contaminated Material to be transferred or stored in accordance with any authorization and complies with appropriate government requirements of a general nature (e.g., BC Landfill Criteria).

1.4.1.3. Letter from Transfer/Interim Storage Facility signed by Contractor's QP that they can accept within the schedule in Contract Documents the nature, type,

concentration, and quantity of Contaminated Material to be Transferred/Interim Stored at the Facility, signed by an authorized representative of the Facility.

1.4.2. Certificate of Seaworthiness: Prior to barge shipments, submit a Certificate of Seaworthiness by an independent licensed Qualified Marine Surveyor for all marine vessels transporting Contaminated Material.

1.4.3. Transport Manifests: within 5 days of offsite transport, submit documentation verifying that material has been transported appropriately. Include:

1.4.3.1. Method of transport.

1.4.3.2. Name of transport company.

1.4.3.3. Weigh scale receipt including location, date, and weight of loading, as appropriate.

1.4.3.4. Weigh scale receipt including location, date, and weight of unloading.

1.4.4. Weigh Scale Certification to be provided as specified in 01 52 00.

1.4.5. Weigh Scale Slips: within 10 days of measurement, Submit all onsite and offsite weigh scale slips for material.

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Contaminated Soil Transport

3.1.1. Assume ownership of, and be responsible for, Contaminated Material once it is loaded on a vehicle, barge, or other vessel for transport.

3.1.2. Transport material as soon as practical; do not unreasonably stockpile onsite.

3.1.3. Cover material while being transported to prevent release of airborne dust, vapours, or odours, and to prevent saturation and leaching from material.

3.1.4. All vehicles must be watertight. Excess water in material must not be allowed to flow out of vehicle or vessel during transport.

3.1.5. Stabilize material for transport as necessary.

3.1.6. All vehicles, vessels and operators must be appropriately licensed and equipped to transport Contaminated Material.

3.1.7. Barges must be certified by an independent Qualified Marine Surveyor for stability.

3.1.8. Manifest and correlate quantities of all Contaminated Material transported from Site documenting nature, type, concentration, and quantity removed from Site. Include all Transfer/Interim Storage, Treatment, Destruction, and Disposal Facilities. Discrepancies in manifests must be resolved as required by

regulations and as acceptable to the Departmental Representative. Discrepancies include:

3.1.8.1. No manifest or an incomplete manifest.
3.1.8.2. Material transported does not match the description in the manifest.
3.1.8.3. Amount transported differs by more than 5% in the manifest.
3.1.8.4. Material transported is in a hazardous condition.
3.1.9. Transfer/Interim Storage Facility must:
3.1.9.1. Be an existing offsite facility located in Canada or the United States.
3.1.9.2. Be designed, constructed and operated for the transfer or interim storage of Contaminated Material.
3.1.9.3. Hold a valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by a Facility Regulator for the transfer or interim storage of relevant Contaminated Material.
3.1.9.4. Comply with requirements of acts, regulations, bylaws, and other requirements, in force or appropriately adopted as guidelines, including the *BC Environmental Management Act* and BC Landfill Criteria for Municipal Solid Waste, municipal zoning bylaws, or equivalent.

3.2. Barge Use and Operation

3.2.1. Barges must be inspected by an independent Marine Surveyor for stability and safety.
3.2.2. The Contractor must ensure that all vessels are operated in compliance with all applicable safety and navigation requirements per Transport Canada (TC) and the Canada Shipping Act 2001 and its regulations, International Maritime Organization, U.S. Coast Guard, or Classification Society rules and standards.
3.2.3. Material transported by barge requires that the Contractor meet any applicable Laws and Regulations governing travelled waters.

END OF SECTION

1. PART 1 – GENERAL 02 61 00.04 – CONTAMINATED SITES – DESTRUCTION

1.1. Measurement Procedures

1.1.1. Contaminated Soil for Destruction will be paid in accordance with two unit rate price established for Base Work and Optional Work. Both unit rate prices based upon weight of material as recorded at the CFB Comox site and sent for destruction. Includes all costs associated with Destruction from receipt at the PFAS Destruction Facility to final disposal at a PFAS Disposal Facility required by the Contract including but not limited to sampling and monitoring required to confirm compliance with DET and PFAS Process Control Requirements. Includes transportation related costs (see 02 61 00.03). Weigh scale to be certified per 02 61 00.03. Weigh scale results provided to Departmental Representative on Certificates of Destruction. Contaminated Soil for Destruction includes destruction of spent Granulated Activated Carbon (in drums or bin) and drummed drilling cuttings.

1.1.2. Payment to be made upon acceptable provision of the following:

1.1.2.1. Weigh scale certificates at the Site prior to transportation;

1.1.2.2. Certificate of Destruction; and

1.1.2.3. Certificate of Disposal (post destruction).

1.1.2.4. Certificates of Destruction and Certificates of Disposal must be received prior to Final Completion.

1.1.2.5. Certificate of Destruction must be provided by the Contractor to the Departmental Representative upon receipt from the Destruction Facility.

1.1.3. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55. The following definitions are of importance for this section:

Table 02 61 00.04-01
Relevant Terms

Terms
Certificate of Destruction
Disposal Facility
PFAS Destruction
PFAS Destruction Facility
PFAS Destruction Effectiveness Target (DET)
PFAS Process Control Requirements

1.3. Related Sections

1.3.1. 01 33 00 – Submittal Procedures
1.3.2. 02 61 00.03 – Contaminated Sites - Transportation

1.4. Action and Informational Submittals

1.4.1. Prior to Mobilization and within 10 days after Contract award, the successful tenderer must submit:
1.4.1.1. Provide an example Certificate of Destruction;
1.4.1.2. A permit or other form of authorization indicating the Destruction Facility can accept the PFAS material and a copy of the permit or other form of authorization for review by the Departmental Representative,
1.4.1.3. If the PFAS Destruction Facility permit does not include specific reference to the treatment of PFAS by the Facility Regulator, supply the following:
1.4.1.3.1. PFAS Contaminated Material Destruction Plan contained within the Construction Work Plan (01 11 55 and 01 33 00): including the methods, means, and sequences for PFAS Destruction for compliance with the PFAS DET and other relevant Specification Definitions and listing data that will be provided to support PFAS Process Control Requirements and confirmation of destruction in the interim destruction reporting stage (i.e., after destruction of the first 100 tonnes of material and before destruction of 500 tonnes).
1.4.2. If the PFAS Destruction Facility permit does not include specific reference to the treatment of PFAS by the Facility Regulator, supply the following data after destruction of the first 100 tonnes of material and before destruction of 500 tonnes:
1.4.2.1. Demonstrating PFAS concentration reductions. Interim sampling frequency, to confirm process efficacy, to be suitable for characterization and as recommended by QP-PFAS, and
1.4.2.2. supporting PFAS Process Control Requirements.
1.4.3. During the Work, prior to demobilization/Substantial Performance and in support of payment provide:
1.4.3.1. Weigh Scale receipts upon removal from Site within 10 days of measurement;
1.4.4. Final Completion provide:
1.4.4.1. Certificate of Destruction: before Final Completion. Submit documentation verifying that materials have been destroyed by Contractor. Certificate of Destruction information to include specified data per Definitions (see 01 11 55).

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Contaminated Soil Destruction

3.1.1. All PFAS Destruction Facility(ies), including processes and requirements must be accepted by the Departmental Representative prior to mobilization. In carrying out the work under the Contract, the PFAS Destruction Facility must comply with laws and regulations, including complying with any enforcement order or direction of any nature or kind under the laws and regulations related to the work under the Contract.

3.1.2. Should the proposed Destruction Facility(ies) not meet the requirements, the Contractor must provide alternate Destruction Facility(ies) that meet the Specification requirements at no additional cost to Canada. The Contractor must submit a separate "Mandatory CFB Comox FFTA Source Control Project Destruction Facility Form" for the alternate Destruction Facility and be accepted by the Departmental Representative prior to use.

3.1.3. Contaminated soil volumes for destruction include the following as shown on Drawings:

3.1.3.1. excavated soil per Drawings;

3.1.3.2. for clarity, sediment in retention pond is to be Destroyed per this section regardless of the quality of near surface material;

3.1.3.3. for clarity, surface organic material (grass, shrubs, trees) i.e., the top 100 mm, are contaminated (per 01 11 00) and is to be Destroyed in accordance with this section regardless of the quality of near surface material;

3.1.3.4. spent Granulated Activated Carbon (in bins or drums);

3.1.3.5. drummed drilling water and cuttings (up to 75 drums including drum disposal)

3.1.4. Assume ownership of, and be responsible for, PFAS Contaminated Material destroyed offsite once the material is loaded at the CFB Comox Site for transportation.

3.1.5. PFAS Destruction: treat at PFAS Destruction Facility provided by Contractor and accepted by the Departmental Representative.

3.1.6. PFAS Destruction Facility must meet the Contract requirements, Contractor to provide QP-PFAS confirmation of compliance with PFAS DET.

3.1.7. Destruction of material as soon as practical and within 100 days of leaving Site or as required by Contract unless otherwise accepted by Departmental Representative.

3.1.8. Soil sent to an PFAS Destruction Facility must subsequently be Disposed of at a Disposal Facility after destruction in accordance with the Contract.

END OF SECTION

1. PART 1 – GENERAL 02 61 00.05 – CONTAMINATED SITES – STABILIZATION

1.1. Measurement Procedures

1.1.1. PFAS Stabilization of PFAS Contaminated Soil for Stabilization will be measured and paid by weight in accordance with two unit rate prices established for Base Work and Optional Work for material designated as PFAS Contaminated Soil for Stabilization. Includes all post excavation onsite equipment, materials, supplies, facilities, utilities, and personnel for handling, loading, hauling, unloading, stockpiling, mixing, placing, compaction and grading to meet Contract requirements. Measurement as recorded ex situ by Site weigh scale prior to Stabilization (see 01 52 00 and 02 61 00.02). Supply of Amendment(s) is separate.

1.1.1.1. Payment for PFAS Stabilization of PFAS Contaminated Soil for Stabilization will be upon satisfactory receipt of the following:

1.1.1.1.1. Weigh scale certificates;

1.1.1.1.2. Geotechnical Compaction report; and

1.1.1.1.3. Certificates of Stabilization.

1.1.1.1.4. Certificates of Stabilization must be received prior to Final Completion.

1.1.2. PFAS Amendment Product will be paid in accordance with two lump sum prices established for Base Work and Optional Work for supply of the PFAS Stabilization Amendment including all costs associated with Amendment supply. Payment will include all costs in connection with supply of the Amendment, including taxes; import fees, environmental fees/levies, restocking fees, and all work incidental thereto. PFAS Stabilization Amendment includes all measures required to supply the Amendment and deliver to the site so that the material is ready for use intended use.

1.1.3. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55. The following definitions are of importance for this section:

Table 02 61 00.05-01
Relevant Terms

Term
Amendment
Certificate of Stabilization
PFAS Stabilization Efficacy Target (SET)
Qualified PFAS Professional
Routine PFAS Laboratory Analysis

1.3. Related Sections

1.3.1. Not Used.

1.4. Action and Informational Submittals

1.4.1. PFAS Contaminated Material Stabilization Plan (contained within the Construction Work Plan, see 01 11 55 and 01 33 00): within 10 days after Contract award and prior to mobilization to Site, submit detailed methods, means, and sequences for PFAS Contaminated Soil Stabilization for compliance with the PFAS SET. The PFAS Stabilization Plan must include the following:

1.4.1.1. Design Requirements: document the process (including but not limited to flowchart, detailed soil handling procedures, dosing rates, total Amendment needs (by weight), equipment and mixing methods, compaction, water application rates, and curing times) and confirms process compliance with manufacturer's instructions.

1.4.1.2. Process Control Requirements: Document process control monitoring to verify required operating conditions. For each stage in the process, detail operating condition requirements (e.g., temperatures, water content, other) and monitoring methods. List process monitoring data that will be provided to support confirmation of Stabilization in the Certificate of Stabilization and provide an example Certificate of Stabilization.

1.4.2. Amendment Equivalency Proposal and Documentation: If not using Fluorosorb 200 [a Cetco Product] at a 1% minimum dosage rate by weight or RemBind Plus [A Ziltek Product] at a 4% minimum dosage rate by weight, the Contractor will

1.4.2.1. Propose an equivalent Amendment with supporting peer-reviewed literature documenting PFAS Stabilization effectiveness for conditions (e.g., pH, soil texture, organic carbon content, soil mineralogy) and PFAS parameters (including fluorotelomer sulfonates and short- and long-chain perfluoroalkyl acids) consistent with the Site. Proposal to include a detailed plan to demonstrate Amendment effectiveness with Site PFAS Contaminated Material through testing. Testing methods must conform with those performed by Arcadis, 2020 (see Annex E); and

1.4.2.2. Conduct Amendment effectiveness testing with Site PFAS Contaminated Material prior to mobilization and to the satisfaction of the Departmental Representative. Amendment effectiveness testing will conform with testing methods performed by Arcadis (see Annex E). Amendment effectiveness testing:

1.4.2.2.1. is not required if using Fluorosorb 200 [a Cetco Product] @ 1% minimum dosage rate by weight or RemBind Plus [A Ziltek Product] @ 4% minimum dosage rate by weight,

1.4.2.2.2. will be performed under the supervision of and reported by a QP-PFAS, and

1.4.2.2.3. will confirm the specified equivalency.

1.4.3. Certificate of Stabilization: within 30 days of completing Stabilization and before Final Completion. Submit documentation verifying compliance with the PFAS SET.

2. PART 2 - PRODUCTS

2.1. Amendment

2.1.1. Amendment to meet the requirements of Contract.
2.1.2. Stabilized PFAS Contaminated Material must meet the following:
2.1.2.1. Demonstrated compliance with PFAS SET prior to mobilization either by using
2.1.2.1.1. Fluorosorb 200 [a Cetco Product] at a 1% minimum dosage rate by weight,
2.1.2.1.2. RemBind Plus [A Ziltek Product] at a 4% minimum dosage rate by weight, or
2.1.2.1.3. Equivalent via Amendment Equivalency Proposal and Documentation;
2.1.2.2. Be compacted to density of not less than 90% modified maximum proctor dry density test in accordance with ASTM D1557;
2.1.3. Proposed Amendment must be approved by the Departmental Representative prior to mobilization. Contractor must present equivalent Amendment(s) in the event that the Proposed Amendment is unacceptable.

3. PART 3 - EXECUTION

3.1. Contaminated Soil Stabilization

3.1.1. Conduct PFAS Stabilization with Approved Amendment in accordance with the accepted PFAS Contaminated Material Stabilization Plan and as directed by Manufacturer and Contractor's QP-PFAS.
3.1.2. The PFAS Stabilization Process must be approved by the Departmental Representative prior to mobilization. In carrying out the work under the Contract, the PFAS Stabilization process must comply with laws and regulations, including complying with any enforcement order or direction of any nature or kind under thelaws and regulations related to the work under the Contract.
3.1.3. PFAS Stabilization must support and not obstruct final site use objectives including:
3.1.3.1. construction of the New FFTA (adjacent),
3.1.3.2. final restoration including bioswale, vegetated field and future tractor mowing of restored field areas.
3.1.4. PFAS Stabilization must be conducted within the project schedule.
3.1.5. Submit Certificate of Stabilization required by Final Completion date.

3.1.6. If proposed PFAS Contaminated Material Stabilization Plan is not acceptable to Departmental Representative, provide an alternate method that is acceptable and meets the requirements of the Specifications.

3.2. Compaction

3.2.1. Compaction equipment to be capable of obtaining required material densities.
3.2.2. Compact to density of not less than 90% modified maximum proctor dry density test in accordance with ASTM D1557.
3.2.3. Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.
3.2.4. Apply water as necessary during compaction to obtain specified density.
3.2.5. In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.
3.2.6. Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.3. Quality Control Testing

3.3.1. Inspection and testing of granular base compaction shall be carried out by the Contractor's QP.
3.3.1.1. Minimum testing frequency: 1 test per 1,000 m^2/lift.
3.3.2. Submit compaction test results to Departmental Representative for review and approval as they become available.
3.3.3. Contractor shall conduct and submit satisfactory compaction test results to Departmental Representative prior to placement of subsequent granular base lifts or pavement wearing course. The Departmental Representative will not consider payment for placement of any granular base unless satisfactory quality control test results are submitted by the Contractor.

3.4. Proof Rolling

3.4.1. For proof rolling use standard roller of 41,000 kg gross mass with four pneumatic tires
3.4.2. each carrying 10,250 kg and inflated to 620 kPa. Four tires arranged abreast with centre to centre spacing of 730 mm maximum.
3.4.2.1. Non-standard proof rolling equipment will not be accepted.
3.4.3. Proof roll at level in subbase as indicated on Contract Drawings for subbase (see 32 11 16 – Granular Sub-Bases).
3.4.4. Make sufficient passes with proof roller to subject every point on surface to three separate passes of loaded tire.

END OF SECTION

1. PART 1 – GENERAL 02 61 00.06 – CONTAMINATED SITES – CONCRETE DISPOSAL

1.1. Measurement Procedures

1.1.1. Concrete Disposal will be paid in accordance with lump sum price established to remove, transport, and dispose of Concrete at a Disposal Facility. Includes Removal, Transportation, Treatment, Destruction, or any other processing of material not required by the Contract but required by Regulations, Disposal Facility, or for other reasons. Certificates of Disposal required for payment and at or before Final Completion.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 01 33 00 – Submittal Procedures

1.3.2. 01 35 13.43 – Special Procedures for Contaminated Sites

1.3.3. 02 61 00.02 – Contaminated Sites - Excavation and Backfill

1.4. Action and Informational Submittals

1.4.1. Concrete Disposal must be detailed within the Construction Work Plan (see 01 11 55 and 01 33 00): Submit within 10 days after Contract award and prior to mobilization to Site, submit methods, means, and sequences for Concrete Disposal.

1.4.2. Provide applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract.

1.4.3. Complete a Mandatory CFB Comox FFTA Source Control Project Disposal Facility Form for the concrete Disposal Facility as per the specifications.

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Contaminated Concrete Disposal

3.1.1. Concrete for disposal as shown on Drawings:
3.1.1.1. foundation of Shed (see 02 41 13) and sidewalk,
3.1.1.2. nearby concrete pad,
3.1.1.3. large concrete pad at southeast corner of FFTA; and
3.1.1.4. other concrete encountered during Work.
3.1.2. Assume ownership of and be responsible for all Concrete managed within the Contract.
3.1.3. Concrete cannot be recycled and must be disposed as contaminated at Disposal Facility provided by Contractor and accepted by the Departmental Representative.
3.1.4. Dispose of concrete as soon as practical and within 100 days of leaving Site or as required by Contract unless otherwise accepted by Departmental Representative.
3.1.5. Material sent to a Disposal Facility must be permanently stored at that facility.
3.1.6. If proposed Disposal Facility is not acceptable to Departmental Representative, provide an alternate Disposal Facility that is acceptable.

END OF SECTION

1. PART 1 – GENERAL 03 20 00 – CONCRETE REINFORCING

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 03 20 00 Concrete Reinforcing. Payment will be paid in accordance with lump sum price established for New FFTA Design and Construction (see 01 25 20).

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 01 33 00 - Submittal Procedures

1.3.2. 01 35 13.43 – Special Procedures for Contaminated Sites

1.3.3. 02 61 00.02 – Contaminated Sites - Excavation and Backfill

1.3.4. 03 30 00 – Cast-in-Place Concrete

1.4. Action and Informational Submittals

1.4.1. Submit in accordance with 01 33 00.

1.4.2. Product Data:

1.4.2.1. Submit manufacturer's instructions, printed product literature and data sheets for proprietary materials used in Cast-In-Place Concrete and additives and include product characteristics, performance criteria, physical size, finish, and limitations.

1.4.3. Shop Drawings:

1.4.3.1. Submission of reinforcing shop drawings is not required.

1.4.4. Quality Assurance Submittals:

1.4.4.1. Mill Test Report: upon request, submit to Departmental Representative certified copy of mill test report of reinforcing steel, prior to beginning reinforcing work.

1.4.4.2. Upon request submit in writing to Departmental Representative proposed source of reinforcement material.

1.5. References

1.5.1. Editions of all Referenced Standards to be the ones designated by the applicable Building Code in force at the time of building permit application, as indicated on Structural Drawings. For Standards not referenced by the Building Code, use the latest editions.

1.5.2. American Concrete Institute (ACI)

1.5.2.1. SP-66, ACI Detailing Manual.

1.5.3. ASTM International (ASTM)
1.5.3.1. ASTM A1064/A1064M, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
1.5.4. CSA Group (CSA)
1.5.4.1. CSA A23.1-14 /A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
1.5.4.2. CAN/CSA A23.3-14, Design of Concrete Structures.
1.5.4.3. CSA G30.18, Carbon Steel Bars for Concrete Reinforcement.
1.5.5. Reinforcing Steel Institute of Canada (RSIC)
1.5.5.1. RSIC, Reinforcing Steel Manual of Standard Practice.

1.6. Delivery, Storage And Handling

1.6.1. Deliver, store and handle materials in accordance with manufacturer's written instructions.
1.6.2. Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
1.6.3. Storage and Handling Requirements:
1.6.4. Store materials in dry location off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
1.6.5. Replace defective or damaged materials with new.
1.6.6. Handle, transport, store and install epoxy coated reinforcing steel bars to prevent damage to coating. Prevent bar-to-bar abrasion and excessive sagging. Do not drop or drag bars. Store on suitable non-metallic supports. For lifting use nylon lifting slings, padded slings, separators or other means recommended by epoxy coated reinforcing steel supplier.

2. PART 2 – PRODUCTS

2.1. Materials

2.1.1. Substitute different size bars only if permitted in writing by Departmental Representative.
2.1.2. Reinforcing steel: billet steel, grade 400, deformed bars to CSA G30.18, unless indicated otherwise.
2.1.3. Reinforcing steel: weldable low alloy steel deformed bars to CSA G30.18.
2.1.4. Chairs, bolsters, bar supports, spacers: to CSA A23.1/A23.2.
2.1.5. Tie wire: 1.5 mm diameter annealed wire.
2.1.6. Mechanical splices: subject to approval of Departmental Representative.
2.1.7. Plain round bars: to CSA G40.20/G40.21.

2.2. Fabrication

2.2.1. Fabricate reinforcing steel in accordance with CSA A23.1/A23.2 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

2.2.1.1. SP-66 unless indicated otherwise.

2.2.2. Obtain Departmental Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.

2.2.3. Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

3. PART 3 - EXECUTION

3.1. Field Bending

3.1.1. Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.

3.1.2. When field bending authorized, bend without heat, applying slow and steady pressure.

3.1.3. Replace bars, which develop cracks or splits.

3.2. Placing Reinforcement

3.2.1. Cutting or puncturing vapour retarder is not permitted; repair damage and reseal vapour retarder before placing concrete.

3.2.2. Place reinforcing steel as indicated on placing drawings in accordance with CSA A23.1/A23.2.

3.2.3. Use plain round bars as slip dowels in concrete.

3.2.3.1. Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint.

3.2.3.2. Apply thick even film of mineral lubricating grease when paint is dry.

3.2.4. Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.

3.2.5. Maintain cover to reinforcement during concrete pour.

END OF SECTION

1. PART 1 – GENERAL 03 30 00 – CAST IN PLACE CONCRETE

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 03 30 00 Cast In Place Concrete. Payment will be paid in accordance with lump sum price established for New FFTA Design and Construction (see 01 25 20).

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 01 33 00 - Submittal Procedures

1.3.2. 01 35 13.43 – Special Procedures for Contaminated Sites

1.3.3. 03 20 00 – Concrete Reinforcing

1.4. Action and Informational Submittals

1.4.1. Provide submittals in accordance with 01 33 00 - Submittal Procedures.

1.4.2. Product Data:

1.4.2.1. Submit manufacturer's instructions, printed product literature and data sheets for proprietary materials used in Cast-In-Place Concrete and additives and include product characteristics, performance criteria, physical size, finish and limitations.

1.4.3. Site Quality Control Submittals:

1.4.3.1. Provide testing results reports for review by Departmental Representative and do not proceed without written approval when deviations from mix design or parameters found.

1.4.3.2. Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in PART 3 - FIELD QUALITY CONTROL.

1.4.3.3. Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time of 120 minutes for concrete delivered to site of Work and discharged after batching.

1.5. References

1.5.1. Editions of all Referenced Standards to be the ones designated by the applicable Building Code in force at the time of building permit application, as indicated on Structural Drawings. For Standards not referenced by the Building Code, use the latest editions.

1.5.2. ASTM International (ASTM)

1.5.2.1. ASTM C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
1.5.2.2. ASTM C494/C494M, Standard Specification for Chemical Admixtures for Concrete.
1.5.2.3. ASTM C1017/C1017M, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
1.5.2.4. ASTM D1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
1.5.2.5. ASTM D1752, Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
1.5.3. CSA Group (CSA)
1.5.3.1. CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
1.5.3.2. CSA A283, Qualification Code for Concrete Testing Laboratories.
1.5.3.3. CSA A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005),

1.6. Abbreviations and Acronyms

1.6.1. Portland Cement: hydraulic cement, blended hydraulic cement (XXb - b denotes blended) and Portland-limestone cement types:
1.6.1.1. GU, GUb and GUL - General use cement.
1.6.1.2. MS and MSb - Moderate sulphate-resistant cement.
1.6.1.3. MH, MHb and MHL - Moderate heat of hydration cement.
1.6.1.4. HE, HEb and HEL - High early-strength cement.
1.6.1.5. LH, LHb and LHL - Low heat of hydration cement.
1.6.2. Fly ash types:
1.6.2.1. F - with CaO content maximum 8%.
1.6.2.2. CI - with CaO content 15 to 20%.
1.6.2.3. CH - with CaO minimum 20%.
1.6.3. GGBFS - Ground, granulated blast-furnace slag.

1.7. Quality Assurance

1.7.1. Provide Departmental Representative, minimum 4 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.
1.7.1.1. Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture meet specified requirements.
1.7.2. Upon request prior to beginning Work, inform Departmental Representative of source of fly ash.
1.7.2.1. Changing source of fly ash without written approval of is prohibited.

1.7.3. Upon request prior to starting concrete work, provide proposed quality control procedures for review by Departmental Representative on following items:
1.7.3.1. Falsework erection.
1.7.3.2. Hot weather concrete.
1.7.3.3. Cold weather concrete.
1.7.3.4. Curing.
1.7.3.5. Finishes.

1.8. Delivery, Storage and Handling
1.8.1. Delivery and Acceptance Requirements:
1.8.2. Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.
1.8.2.1. Modifying maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1/A23.2. is prohibited.
1.8.2.2. Deviations submitted for review by Departmental Representative.
1.8.2.3. Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

1.9. Site Conditions
1.9.1. Placing concrete during rain or weather events that could damage concrete is prohibited.
1.9.2. Protect newly placed concrete from rain or weather events in accordance with CSA A23.1/A23.2.
1.9.3. Cold weather protection:
1.9.3.1. Maintain protection equipment, in readiness on Site.
1.9.3.2. Use such equipment when ambient temperature below 5°C, or when temperature may fall below 5°C before concrete cured.
1.9.3.3. Placing concrete upon or against surface at temperature below 5°C is prohibited.
1.9.4. Hot weather protection:
1.9.4.1. Protect concrete from direct sunlight when ambient temperature above 27°C.
1.9.4.2. Prevent forms of getting too hot before concrete placed. Apply accepted methods of cooling not to affect concrete adversely.
1.9.5. Protect from drying.

2. PART 2 – PRODUCTS

2.1. Design Criteria

2.1.1. Performance: to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.

2.2. Materials

2.2.1. Portland Cement: to CSA A3001.
2.2.2. Blended hydraulic cement: to CSA A3001.
2.2.3. Fly Ash: to CSA A3001, Type CL.
2.2.4. Water: to CSA A23.1.
2.2.5. Aggregates: to CSA A23.1/A23.2 do not use recycled concrete as aggregates.
2.2.6. Admixtures:
2.2.6.1. Air entraining admixture: to ASTM C260.
2.2.6.2. Chemical admixture: to ASTM C1017 and ASTM C494. Departmental Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.
2.2.7. Premoulded joint fillers:
2.2.7.1. Bituminous impregnated fibre board: to ASTM D1751.
2.2.7.2. Sponge rubber: to ASTM D1752, Type I, firm grade.

2.3. Mixes

2.3.1. Alternative 1 - Performance Method for specifying concrete: to meet Departmental Representative performance criteria to CSA A23.1/A23.2.
2.3.1.1. Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as in Quality Control Plan.
2.3.1.2. Provide concrete mix to meet following plastic state in coordination with all trades involved:
2.3.1.3. Provide concrete mix to meet following hard state requirements:
2.3.1.3.1. Durability and class of exposure: C-1.
2.3.1.3.2. Compressive strength at 28 age: 35 MPa minimum.
2.3.1.3.3. Intended application: Exterior Slab on Grade
2.3.1.3.4. Aggregate size 20 mm maximum.

3. PART 3 – EXECUTION

3.1. Preparation

3.1.1. Obtain Departmental Representative's written approval before placing concrete.
3.1.1.1. Provide 24 hours minimum notice prior to placing of concrete.
3.1.2. Place concrete reinforcing in accordance with 03 20 00:
3.1.2.1. Development of cold joints not allowed.
3.1.2.2. Ensure concrete delivery and handling facilitate placing with minimum of re-handling, and without damage to existing structure or Work.
3.1.3. Pumping of concrete permitted only after approval of equipment and mix.
3.1.4. Disturbing reinforcement and inserts during concrete placement is prohibited.
3.1.5. Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.
3.1.6. Protect previous Work from staining.
3.1.7. Clean and remove stains prior to application for concrete finishes.
3.1.8. Maintain accurate records of poured concrete items to indicate date, location of pour, quality, workability, air content, temperature and test samples taken.

3.2. Installation/Application

3.2.1. Do cast-in-place concrete work to CSA A23.1/A23.2.
3.2.2. Sleeves and inserts:
3.2.2.1. Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain written approval of modifications from Departmental Representative before placing of concrete.
3.2.2.2. Confirm locations and sizes of sleeves and openings shown on drawings.
3.2.2.3. Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.
3.2.3. Finishing and curing:
3.2.3.1. Finish concrete to CSA A23.1/A23.2.
3.2.3.2. Use procedures as noted in CSA A23.1/A23.2 to remove excess bleed water. Ensure surface not damaged.
3.2.3.3. Provide broom or burlap finish unless otherwise indicated.
3.2.3.4. Rub exposed sharp edges of concrete with carborundum to produce 3 mm minimum radius edges unless otherwise indicated.
3.2.4. Joint fillers:
3.2.4.1. Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Departmental Representative.
3.2.4.2. When more than one piece required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.
3.2.4.3. Locate and form construction joints as indicated.
3.2.4.4. Install joint filler.

3.3. Field Quality Control

3.3.1. Site tests: conduct tests as follows in accordance with 01 45 00 - Quality Control and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

3.3.1.1. Concrete pours.

3.3.1.2. Slump.

3.3.1.3. Air content.

3.3.1.4. Compressive strength at 7 and 28 days.

3.3.1.5. Air and concrete temperature.

3.3.2. Inspection and testing of concrete and concrete materials carried out by testing laboratory designated by Contractor for review to CSA A23.1/A23.2.

3.3.3. Ensure testing laboratory certified to CSA A283.

3.3.4. Contractor will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

3.3.5. Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.

END OF SECTION

1. PART 1 – GENERAL 31 05 00 – COMMON WORKS RESULTS – EARTHWORKS, EXTERIOR, IMPROVEMENT, UTILITIES

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 31 05 00 Common Work Results.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 01 33 00 – Submittal Procedures

1.3.2. 01 35 13.43 – Special Procedures for Contaminated Sites

1.3.3. 01 45 00 – Quality Control

1.3.4. 02 61 00.02 – Contaminated Sites - Excavation and Backfilling

1.4. Action and Informational Submittals

1.4.1. Submittals in accordance with 01 33 00 (Submittal Procedures)

1.4.2. Submit name of professional engineer retained by the Contractor for geotechnical testing review and approval by Departmental Representative.

1.4.3. Submit name of testing laboratory retained by Contractor for materials testing for review and approval by Departmental Representative.

1.4.4. Submit Backfill Material data as required (see 01 35 13.43 and 02 61 00.02) including but not limited to environmental and geotechnical quality prior to, during and after import and use.

1.5. Geotechnical Quality Assurance

1.5.1. Retain and pay for the services of a qualified independent geotechnical testing agency under the supervision of a registered professional engineer, and pay the cost of testing services for quality control including, but not limited to, the following:

1.5.1.1. Sieve analysis of sands and aggregates to be supplied

1.5.1.2. Standard proctor density curves for Backfill Materials

1.5.1.3. Compaction control tests for backfill and embankment material including the following:

1.5.1.3.1. Trench bedding (service) - once per 75 m of trench at 1.0 m vertical lifts

1.5.1.3.2. Trench backfill (service) - once per 75 m of trench at 1.0 m vertical lifts

1.5.1.3.3. Trench bedding (pipeline) - once per every 75 m of trench at 1.0 m vertical lifts with min. one between manholes.

1.5.1.3.4. Trench backfill (pipeline) - once per every 75 m of trench at 1.0 m vertical lifts with min. one between manholes.
1.5.1.3.5. Imported Granular Base - once per 50 square metres
1.5.1.4. Concrete mix design and testing
1.5.1.5. Concrete strength tests (minimum three specimen cylinders in accordance with CSA a23.1) for the following:
1.5.1.5.1. Reinforced Concrete (central area) - once per 50 square metres (minimum one per day during concrete placing)
1.5.1.6. Asphalt mix design and testing
1.5.1.7. Asphalt tests for the following:
1.5.1.7.1. Asphalt FFTA surface – once per 50 square metres
1.5.2. When site excavated material granular backfill is proposed for use as backfill the contractor shall employ a professional geotechnical engineer with experience in geotechnical engineering for performance of in-place density and sieve testing. The site material shall fall within one of the granular backfill material specifications as per MMCD 31 05 17.

1.6. Survey
1.6.1. The Contractor is to retain a QPS to complete:
1.6.1.1. A pre-construction survey of any site features not already surveyed
1.6.1.2. All site layout, both vertical and horizontal, for pipes, manholes, underground features, roads, ditches, and surface features.
1.6.1.3. All as-constructed locations of utilities and surface features.
1.6.1.4. A copy of the as-constructed survey and drawing markups are to be compiled and provided to the Departmental Representative electronically within 10 days of construction completion.

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 31 22 13 – ROUGH GRADING

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 31 22 13 Rough Grading. Payment will be paid in accordance lump sum price established for other prices (e.g., Site Restoration and Bioswale or New FFTA Design and Construction) depending upon location per the Drawings.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 01 45 00 – Quality Control

1.3.2. 02 61 00.01 – Contaminated Water Management (Turbidity Reduction)

1.3.3. 02 61 00.02 – Contaminated Sites – Excavation and Backfilling

1.3.4. 31 05 00 - Common Works Results – Earthworks, Exterior Improvements and Utilities

1.4. Action and Informational Submittals

1.4.1. Submittals in accordance with 01 33 00 (Submittal Procedures)

1.5. Existing Conditions

1.5.1. Known underground and surface utility lines and buried objects are as indicated on site plan.

1.5.2. Refer to dewatering in Related Sections.

2. PART 2 - PRODUCTS

2.1. Materials

2.1.1. Refer to dewatering in Related Sections.

2.1.2. Excavated or graded material existing on site suitable to use as fill for grading work if approved by Departmental Representative and a qualified geotechnical engineer retained by the contractor.

3. PART 3 - EXECUTION

3.1. Examination

3.1.1. Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for rough grading installation in accordance with manufacturer's written instructions.

3.1.1.1. Inform Departmental Representative of unacceptable conditions immediately upon discovery.

3.1.1.2. Proceed with installation only after unacceptable conditions have been remedied.

3.2. Grading

3.2.1. Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.

3.2.2. Rough grade to depths below finish grades as shown in Contract Drawings

3.2.3. Slope rough grade away from building at minimum 2%.

3.2.4. Grade ditches to depth as indicated in Contract Drawings.

3.2.5. Prior to placing fill over existing ground, scarify surface to depth of 150 mm minimum before placing fill over existing ground. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

3.2.6. Compact filled and disturbed areas to modified maximum dry density to ASTM D1557, as follows:

3.2.6.1. 90% under landscaped areas.

3.2.6.2. 95% under paved and drive surfaces.

3.2.7. Do not disturb soil within branch spread of trees or shrubs to remain.

3.3. Testing

3.3.1. See 01 45 00 and 31 05 00 for geotechnical testing requirements.

3.4. Protection

3.4.1. Protect existing site features including fencing, trees, landscaping, natural features, bench marks, monitoring wells, buildings, pavement, surface or underground utility lines which are to remain. If damaged, restore to original or better condition unless directed otherwise.

3.4.2. Maintain access roads to prevent accumulation of construction related debris on roads.

END OF SECTION

1. PART 1 – GENERAL 32 11 16 –GRANULAR SUB-BASES

1.1. Measurement Procedures

1.1.1. Backfill Material will be paid in accordance with unit rates in Base Work per Table 02 61 00.02-01 and as follows:

1.1.1.1. Crushed Granular Sub-Base will be paid in accordance with unit rate price established for weight of material. Includes all costs for equipment, materials, supplies, facilities, utilities, and personnel for characterization, sampling, handling, loading, hauling, unloading, stockpiling, and compaction to meet the requirements of Contract. Measurement as recorded on Weigh Scale (see 01 52 00) and results provided to Departmental Representative. Payment will be made upon receipt of all of the following:

1.1.1.1.1. Weigh Scale Sheets;

1.1.1.1.2. Characterization Quality Data; and

1.1.1.1.3. Geotechnical compaction confirmation report.

1.1.1.2. 100mm Pit Run Gravel will be paid in accordance with unit rate price established for weight of material. Includes all costs for equipment, materials, supplies, facilities, utilities, and personnel for characterization, sampling, handling, loading, hauling, unloading, stockpiling, and compaction to meet the requirements of Contract. Measurement as recorded on Weigh Scale (see 01 52 00) and results provided to Departmental Representative. Payment will be made upon receipt of the following:

1.1.1.2.1. Weigh Scale Sheets;

1.1.1.2.2. Characterization Quality Data; and

1.1.1.2.3. Geotechnical compaction confirmation report.

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 01 35 13.43 – Special Procedures for contaminated Sites

1.3.2. 01 35 30 – Health and Safety Requirements

1.3.3. 01 35 43 – Environmental Protection.

1.3.4. 01 45 00 – Quality Control

1.3.5. 02 61 00.02 – Contaminated Sites – Excavation and Backfill

1.3.6. 31 05 00 – Common Works Results – Earthworks, Exterior Improvements, and Utilities

1.3.7. 32 11 23 – Granular Base

1.3.8. 32 12 16.01 – Asphalt Paving

1.4. Action and Informational Submittals

1.4.1. Submittals in accordance with 01 33 00 (Submittal Procedures).

1.5. References

1.5.1. Master Municipal Contract Documents (MMCD), Platinum Edition Volume II - 2009, British Columbia. Contractor to maintain a copy on-site at all times.

1.5.2. American Society for Testing and Materials (ASTM)

1.5.2.1. ASTM C117-04, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.

1.5.2.2. ASTM C131-06, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

1.5.2.3. ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

1.5.2.4. ASTM D422-63(2007), Standard Test Method for Particle-Size Analysis of Soils.

1.5.2.5. ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN$^-$m/m^3).

1.5.2.6. ASTM D1557-09, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3) (2,700 kN-m/m^3).

1.5.2.7. ASTM D1883-07e2, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.

1.5.2.8. ASTM D4318-10, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

1.5.3. Canadian General Standards Board (CGSB)

1.5.3.1. CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

2. PART 2 - PRODUCTS

2.1. Materials

2.1.1. Crushed Granular Sub-Base in accordance with MMCD 31 05 17 – Aggregates and Granular Material.

2.1.2. 100mm Pit Run Gravel in accordance with MMCD 31 05 17 – Aggregates and Granular Material.

3. PART 3 - EXECUTION

3.1. Placing

3.1.1. Place Crushed Granular Sub-Base after satisfactory quality control test results on the underlying subgrade have been submitted and the subgrade is inspected and approved by Departmental Representative.
3.1.2. Construct Crushed Granular Sub-Base course to depth and grade in areas indicated.
3.1.3. Ensure no frozen material is placed.
3.1.4. Place material only on clean unfrozen surface, properly shaped and compacted and free from snow or ice.
3.1.5. Begin spreading sub-base material on crown line or high side of one-way slope.
3.1.6. Place Crushed Granular Sub-Base using methods which do not lead to segregation or degradation.
3.1.7. Place material to full width in uniform layers not exceeding 200 mm compacted thickness.
3.1.8. Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
3.1.9. Remove and replace portion of layer in which material has become segregated during spreading.

3.2. Compaction

3.2.1. Compaction equipment to be capable of obtaining required material densities.
3.2.2. Compact to density of not less than 95% modified maximum proctor dry density test in accordance with ASTM D1557.
3.2.3. Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.
3.2.4. Apply water as necessary during compaction to obtain specified density.
3.2.5. In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.
3.2.6. Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.3. Quality Control Testing

3.3.1. Inspection and testing of Crushed Granular Sub-Base compaction shall be carried out by the Contractor.
3.3.1.1. Minimum testing frequency: 1 test per 1,000 m^2/lift.
3.3.2. Submit compaction test results to Departmental Representative for review and approval as they become available.
3.3.3. Contractor shall conduct and submit satisfactory compaction test results to Departmental Representative prior to placement of subsequent Crushed Granular Sub-Base or base lifts. The Departmental Representative will not consider payment for placement of any Crushed Granular Sub-Base unless satisfactory quality control test results are submitted by the Contractor.

3.4. Proof Rolling

3.4.1. For proof rolling use standard roller of 41,000 kg gross mass with four pneumatic tires

3.4.2. each carrying 10,250 kg and inflated to 620 kPa. Four tires arranged abreast with centre to centre spacing of 730 mm maximum.

3.4.2.1. Non-standard proof rolling equipment will not be accepted.

3.4.3. Proof roll at level in sub-base as indicated on Contract Drawings.

3.4.4. Make sufficient passes with proof roller to subject every point on surface to three separate passes of loaded tire.

3.4.5. Where proof rolling reveals areas of defective subgrade:

3.4.5.1. Remove sub-base to expose defective subgrade.

3.4.5.2. Remove defective subgrade material to depth and extent as directed by Departmental Representative. Backfill excavated subgrade material with common material and compact in accordance with the Contract (see Drawings).

3.4.5.3. Replace sub-base material and compact in accordance with this Section.

3.5. Site Tolerances

3.5.1. Finished sub-base surface to be within 25 mm of elevation as indicated but not uniformly high or low.

3.6. Protection

3.6.1. Maintain finished subbase in condition conforming to this section until succeeding base is constructed, or until sub-base is accepted by Departmental Representative.

END OF SECTION

1. PART 1 – GENERAL 32 11 23 –GRANULAR BASE

1.1. Measurement Procedures

1.1.1. Backfill Material will be paid in accordance with unit rate in the Base Work as described in Table 02 61 00.02-01.

1.1.2. Granular Base Backfill Material will be paid in accordance with unit rate price established for weight of material. Includes all costs for equipment, materials, supplies, facilities, utilities, and personnel for characterization, sampling, handling, loading, hauling, unloading, stockpiling, and compaction to meet the requirements of Contract. Measurement as recorded on Weigh Scale (see 01 52 00) and results provided to Departmental Representative. Payment will be made upon receipt of all of the following:

1.1.2.1. Weigh Scale Sheets;

1.1.2.2. Characterization Quality Data; and

1.1.2.3. Geotechnical compaction confirmation report.

1.1.3. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 01 35 13.43 – Special Procedures for contaminated Sites.

1.3.2. 01 35 30 – Health and Safety Requirements.

1.3.3. 01 35 43 – Environmental Protection.

1.3.4. 01 45 00 – Quality Control.

1.3.5. 02 61 00.02 – Contaminated Site – Excavation and Backfill.

1.3.6. 31 05 00 - Common Works Results – Earthworks, Exterior Improvements, and Utilities.

1.3.7. 32 11 16 – Granular Sub-Bases.

1.3.8. 32 12 16.01 – Asphalt Paving.

1.3.9. 32 13 13 – Concrete Paving.

1.4. Action and Informational Submittals

1.4.1. Submittals in accordance with 01 33 00 (Submittal Procedures).

1.5. References

1.5.1. Master Municipal Contract Documents (MMCD), Platinum Edition Volume II - 2009, British Columbia. Contractor to maintain a copy on-site at all times.

1.5.1.1. American Society for Testing and Materials (ASTM)

1.5.1.2. ASTM C117-04, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.

1.5.1.3. ASTM C131-06, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
1.5.1.4. ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
1.5.1.5. ASTM D422-63(2007), Standard Test Method for Particle-Size Analysis of Soils.
1.5.1.6. ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).
1.5.1.7. ASTM D1557-09, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft^3) (2,700 kN-m/m^3).
1.5.1.8. ASTM D1883-07e2, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
1.5.1.9. ASTM D4318-10, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
1.5.2. Canadian General Standards Board (CGSB)
1.5.2.1. CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

1.6. Delivery, Storage, And Handling
1.6.1. Deliver and stockpile aggregates in accordance with 02 61 00.02

2. PART 2 - PRODUCTS

2.1. Materials
2.1.1. Granular Base: material in accordance with 02 61 00.02 and MMCD 31 05 17 – Aggregates and Granular Material.

3. PART 3 - EXECUTION

3.1. Sequence of Operation

3.1.1. Place Granular Base after satisfactory quality control test results on the underlying sub-base have been submitted and the surface is inspected and approved by Departmental Representative.

3.1.2. Placing

3.1.2.1. Construct Granular Base to depth and grade in areas indicated.

3.1.2.2. Ensure no frozen material is placed.

3.1.2.3. Place material only on clean unfrozen surface, properly shaped and compacted and free from snow and ice.

3.1.2.4. Begin spreading base material on crown line or on high side of one-way slope.

3.1.2.5. Place material using methods which do not lead to segregation or degradation of aggregate.

3.1.2.6. Place material to full width in uniform layers not exceeding 150 mm compacted thickness.

3.1.2.7. Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

3.1.2.8. Remove and replace that portion of layer in which material becomes segregated during spreading.

3.1.3. Compaction Equipment

3.1.3.1. Compaction equipment to be capable of obtaining required material densities.

3.1.4. Compacting

3.1.4.1. Compact to density of not less than 95% modified maximum proctor dry density test in accordance with ASTM D1557.

3.1.4.2. Shape and roll alternately to obtain smooth, even and uniformly compacted base.

3.1.4.3. Apply water or aerate as necessary during compacting to obtain specified density.

3.1.4.4. In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.

3.1.4.5. Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.1.4.6. Where the work reveals defective base or sub-base of greater volume than indicated on the drawings, remove defective materials to depth and extent as directed by Departmental Representative and replace with new materials. With prior approval, this additional work will be paid for as a Change Order.

3.2. Quality Control Testing

3.2.1. Inspection and testing of Granular Base compaction shall be carried out by the Contractor.

3.2.1.1. Minimum testing frequency: 1 test per 1,000 m^2/lift.

3.2.2. Submit compaction test results to Departmental Representative for review and approval as they become available.

3.2.3. Contractor shall conduct and submit satisfactory compaction test results to Departmental Representative prior to placement of subsequent Granular Base lifts or pavement wearing course. The Departmental Representative will not consider payment for placement of any Granular Base unless satisfactory quality control test results are submitted by the Contractor.

3.3. Site Tolerances

3.3.1. Finished base surface to be within plus or minus 15 mm of established grade and cross section but not uniformly high or low. Finished surface not to have irregularities exceeding 15 mm when checked with a 4.5 m straightedge placed in any direction.

3.4. Protection

3.4.1. Maintain finished base in condition conforming to this Section until succeeding material is applied or until acceptance by Departmental Representative.

END OF SECTION

1. PART 1 – GENERAL 32 12 16 – ASPHALT PAVING

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 32 12 16 Asphalt Paving. Payment will be paid in accordance with lump sum price established for New FFTA Design and Construction (see 01 25 20).

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 01 35 13.43 – Special Procedures for contaminated Sites.

1.3.2. 01 35 30 – Health and Safety Requirements.

1.3.3. 01 35 43 – Environmental Protection.

1.3.4. 01 45 00 – Quality Control.

1.3.5. 02 61 00.02 – Contaminated Sites - Excavation and Backfill.

1.3.6. 31 05 00 - Common Works Results – Earthworks, Exterior Improvements, and Utilities.

1.3.7. 32 11 16 – Granular Sub-Bases.

1.3.8. 32 11 23 – Granular Base.

1.4. Action and Informational Submittals

1.4.1. Submittals in accordance with 01 33 00.

1.4.2. All required submissions shall be submitted to the Departmental Representative in writing.

1.4.3. The Contractor shall be responsible for all sampling, testing, analysis and reporting for the selection of materials and the preparation of mix designs for the required submissions. The Contractor shall use qualified technicians and appropriately certified laboratories for any testing involved. The Departmental Representative will make the work site available to the Contractor to inspect the site.

1.4.4. Any testing information provided to the Contractor by the Departmental Representative is for general guidance only and shall not be relied upon by the Contractor for the required submissions. The approval of submissions by the Departmental Representative shall not alleviate the Contractor of responsibility for conformance with Contract requirements.

1.5. References

1.5.1. It shall be the Contractor’s responsibility to obtain these references.

1.5.2. Master Municipal Contract Documents (MMCD), Platinum Edition Volume II - 2009, British Columbia. Contractor to maintain a copy on-site at all times.
1.5.3. American Association of State Highway and Transportation Officials (AASHTO)
1.5.3.1. AASHTO M320 (2010) - Standard Specification for Performance-Graded Asphalt Binder.

1.6. Hot Mix Asphalt Materials and Mix Design Work

1.6.1. Prior to starting the Work, the Contractor shall supply the Departmental Representative with Material Safety Data Sheets (MSDS) for all materials to be incorporated in the Work.
1.6.2. The job mix formulas (JMFs) shall be submitted to the Departmental Representative at least 7 days prior to the start of operations with the mix type, and shall include as a minimum for each mix type all documentation required by MMCD 32 12 16 – Hot Mix Asphalt Concrete Paving.
1.6.3. No hot-mix asphalt of a mix type shall be produced for payment until the Contractor's job mix formula for the mix type has been approved by the Departmental Representative. The Departmental Representative will complete the job mix formula review for a mix type within 5 days.
1.6.4. The approved job mix formula for a hot-mix asphalt mixture shall be in effect until a Contractor technically supported request for minor adjustments, if any, is approved by the Departmental Representative. Should a change in source or properties of materials be required, a new job mix formula submission for the mix type must be approved by the Departmental Representative before the change is made.

1.7. Quality Control

1.7.1. While the Departmental Representative will make the results of Quality Assurance (QA) testing available to the Contractor, the Contractor shall be responsible for the necessary quality control testing and adjustments to produce uniform, acceptable hot-mix asphalt mixes and pavements in conformance with the Contract requirements.
1.7.2. The Contractor shall conduct such process control inspection, sampling and testing as is necessary to ensure that any hot-mix asphalt aggregates and hot-mix asphalt are in conformance with the Contract requirements. No payment will be made for asphalt paving until satisfactory quality control test results have been submitted by the Contractor.
1.7.3. The Contractor’s quality control testing program shall be in accordance with BC MMCD 32 12 16 – Hot Mix Asphalt Concrete Paving.

2. PART 2 - PRODUCTS

2.1. Materials General Requirements

2.1.1. Unless otherwise specified in the Contract, the Contractor shall supply all materials necessary for the execution and completion of the Work.

2.2. Aggregates

2.2.1. Aggregates shall be in accordance with MMCD 31 05 173 – Aggregates and Granular Materials.

2.3. Asphalt Cement

2.3.1. The asphalt cement shall be in accordance with MMCD 32 12 16 – Hot Mix Asphalt Concrete Paving

2.4. Hot Mix Asphalt

2.4.1. Hot mix asphalt mixtures shall be in accordance with MMCD 32 12 16 – Hot Mix Asphalt Concrete Paving

2.5. Rap (Processed Reclaimed Asphalt Pavement)

2.5.1. The use of RAP is not permitted.

3. PART 3 - EXECUTION

3.1. General

3.1.1. Placement and compaction of hot mix asphalt shall be in accordance MMCD 32 12 16 – Hot Mix Asphalt Concrete Paving

3.1.2. Where discrepancies arise, between the MMCD 32 12 16 – Hot Mix Asphalt Concrete Paving and this Specification, this Specification shall govern.

3.2. Application of Tack Coat

3.2.1. When and where specified in the Contract.

3.3. Finish Tolerances

3.3.1. Finished asphalt surface to be within 5 mm of design elevation but not uniformly high or low.

3.3.2. Finished asphalt surface not to have irregularities exceeding 5 mm when checked with 4.5 m straight edge placed in any direction, including across the joints.

3.4. Acceptance

3.4.1. Acceptance will be in accordance MMCD 32 12 16 – Hot Mix Asphalt Concrete Paving except that the payment adjustments specified therein will not be applied.

3.5. Defective Work

3.5.1. Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required. If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form true and even surface and compact immediately to specified density.

3.5.2. Repair areas showing checking, rippling, or segregation.

3.5.3. Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement.

3.5.4. Defective areas identified by the Departmental Representative shall be removed to a depth of at least the thickness of the course involved and replaced with acceptable hot-mix asphalt of the same type compacted to the satisfaction of the Departmental Representative, all at the Contractor's cost.

END OF SECTION

1. PART 1 – GENERAL 32 91 19.13 – TOPSOIL

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 31 91 19.13 Topsoil. Payment will be paid in accordance with Site Restoration lump sum rates as established in both Base Work and Optional Work (see 01 25 20).

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 01 35 13.43 – Special Procedures for contaminated Sites

1.3.2. 01 35 30 – Health and Safety Requirements

1.3.3. 01 35 43 – Environmental Protection.

1.3.4. 01 45 00 – Quality Control

1.3.5. 02 61 00.02 – Contaminated Sites - Excavation and Backfill

1.3.6. 31 05 00 - Common Works Results – Earthworks, Exterior Improvements, and Utilities

1.4. Action and Informational Submittals

1.4.1. Submittals in accordance with 01 33 00.

1.4.2. Backfill Material related submittals in accordance with 02 61 00.02

1.5. References

1.5.1. Canadian Council of Ministers of the Environment (CCME)

1.5.1.1. PN1340-[2005], Guidelines for Compost Quality.

1.5.2. Canadian Society of Landscape Architects (CSLA)/Canadian Nursery Landscape Association (CNLA)

1.5.2.1. Canadian Landscape Standard [2016], First Edition

1.5.2.2. Canadian Nursery Stock Standard [2017], Ninth Edition

1.6. Delivery, Storage, And Handling

1.6.1. Deliver and stockpile aggregates in accordance with Backfill Material requirements (see 02 61 00.02).

2. PART 2 - PRODUCTS

2.1. Materials

2.1.1. Fertilizer not allowed.

2.1.2. Topsoil organic material may include compost Category A in accordance with [CCME PN1340], unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.

2.1.3. Advise Departmental Representative of sources of Topsoil to be utilized with sufficient lead time for testing.

2.1.4. Contractor is responsible for amendments to imported soil(s) as specified.

2.1.5. Conduct soil testing as recommended by QP.

2.1.6. Carry out testing of topsoil by testing laboratory designated by Departmental Representative.

3. PART 3 - EXECUTION

3.1. Temporary Erosion and Sedimentation Control

3.1.1. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent areas in accordance with the EMP and EPP (see 01 35 43).

3.1.2. Stockpile Topsoil in approved locations as specified (see 01 35 13.43 and 01 35 43)

3.2. Preparation of Existing Grade

3.2.1. Verify that grades are correct.

3.2.1.1. If discrepancies occur, notify Departmental Representative and do not start work until instructed by Departmental Representative.

3.2.2. Compact grades to meet industry standard to allow for tractor mowing or as per the Contract in accordance with Contractor's QP.

3.2.3. Grade soil, eliminate uneven areas and low spots, ensure positive drainage.

3.2.4. Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.

3.2.4.1. Remove soil contaminated with calcium chloride, toxic materials and petroleum products.

3.2.4.2. Remove debris which protrudes more than 75 mm above surface.

3.2.4.3. Dispose of removed material off site.

3.2.5. Cultivate entire area which is to receive topsoil to minimum depth of [100] mm.

3.2.5.1. Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.3. Placing and Spreading Of Topsoil

3.3.1. Place Topsoil after Departmental Representative has accepted subgrade.

3.3.2. Spread Topsoil in uniform layers not exceeding 150 mm.

3.3.3. Spread Topsoil to the following 150 mm minimum depths after settlement.
3.3.4. Manually spread Topsoil around trees, shrubs and obstacles.
3.3.5. Avoid spreading or grading in wet, frozen, or saturated state.

3.4. Finish Grading

3.4.1. Grade to eliminate rough spots and low areas and ensure positive drainage.
3.4.1.1. Prepare loose friable bed by means of cultivation and subsequent raking.
3.4.2. Consolidate topsoil to required bulk density using equipment approved by [DCC Representative] [Departmental Representative] [Consultant].
3.4.2.1. Leave surfaces smooth, uniform and firm against deep footprinting.

3.5. Surplus Material

3.5.1. Dispose of surplus materials off-site at Contractors cost and risk.

END OF SECTION

1. PART 1 – GENERAL 32 92 19.16 – HYDRAULIC SEEDING

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 32 92 19.16 Hydraulic Seeding. Payment will be paid in accordance with lump sum prices as established in both Base Work and Optional Work (see 01 25 20).

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. Annex B – DND Documents (Accepted Grass Seed Mixes and Specifications)

1.4. Action and Informational Submittals

1.4.1. Submittals in accordance with 01 33 00.

1.4.2. Product Data:

1.4.2.1. Submit manufacturer's instructions, printed product literature and data sheets for seed, mulch, tackifier, fertilizer, liquid soil amendments and micronutrients.

1.4.2.2. Submit copies of WHMIS MSDS in accordance with 01 35 43.

1.4.3. Submit in writing 7 days prior to commencing work:

1.4.3.1. Volume capacity of hydraulic seeder in litres.

1.4.3.2. Amount of material to be used per tank based on volume.

1.4.3.3. Number of tank loads required per hectare to apply specified slurry mixture per hectare.

1.4.4. Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4.5. Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.

1.5. Administrative Requirements

1.5.1. See Annex B - DND Documents (Accepted Grass Seed Mixes and Specifications), in the event of conflict, DND Document presides.

1.5.2. Scheduling:

1.5.2.1. Schedule hydraulic seeding using grass mixtures and mixtures containing Certified Canada No. 1 as per items listed below.

1.5.2.1.1. Schedule hydraulic seeding to coincide with preparation of soil surface.

1.5.2.1.2. All seeding shall be done during calm weather and on soil that is free of frost, snow and standing water, when seasonal conditions are likely to

ensure successful germination and continued growth of all species of seed in the grass mix.

1.5.2.1.3. Schedule hydraulic seeding using grass mixtures after frost has left ground and before June 15th or between September 1st and October 15th. Note that unanticipated variances in weather may require that alternate dates be considered. Include hydraulic seeding schedule in Master Plan. Variations from this schedule only with prior approval by Departmental Representative.

1.6. References

1.6.1. Canada Seed Act.

1.6.2. British Columbia Landscape Standard, 6th edition, 2001.

1.7. Delivery, Storage and Handling

1.7.1. Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.

1.7.2. Seed shall be packed and delivered in original containers clearing showing:

1.7.2.1. Name of supplier

1.7.2.2. Analysis of seed mixture

1.7.2.3. Percentage of pure seed

1.7.2.4. Year of production

1.7.2.5. Net weight (mass)

1.7.2.6. Date and location of bagging

1.8. Hydraulic Seeding Inspection

1.8.1. Hydraulic seeding will remain free of defects in accordance with General Conditions

1.8.2. Hydraulic seeding growth to be approved prior to Final Completion.

1.8.3. Inspection will be conducted by Departmental Representative.

1.9. Quality Assurance

1.9.1. Certificate of Seed Analysis to be approved by Departmental Representative.

1.9.2. Seeded areas to be inspected by Contractor and Departmental Representative at 30, 60, and 90 day periods following seeding.

1.9.3. At the 30-day inspection within the seeded area:

1.9.3.1. The applied cover shall be visually intact and shall form a uniform, cohesive mat.

1.9.3.2. Germination of the nurse crop shall be visually evident.

1.9.4. At the 60-day inspection within the seeded area:

1.9.4.1. The nurse crop shall be evident at mature height in an evenly dispersed, uniform cover.

1.9.4.2. Germination of the specified permanent seed species shall be visually evident in an evenly dispersed uniform cover.

1.9.4.3. There shall not be any significant bare areas, both in terms of quantity and size.
1.9.4.4. Non-seeded, non-specified vegetation shall not exceed 20% of the seeded earth area.
1.9.5. At the 90-day inspection within the seeded area:
1.9.5.1. The specified permanent seed species shall be at an average height of 50 mm in an evenly dispersed, uniform cover.
1.9.5.2. There shall not be any significant bare areas, both in terms of quantity and size.
1.9.5.3. Non-seeded, non-specified vegetation shall not exceed 20% of the seeded earth area.

2. PART 2 - PRODUCTS

2.1. Materials

2.1.1. Seed: "Canada pedigreed grade" in accordance with Government of Canada Seeds Act and Regulations.
2.1.2. Grass seed for all seeded lawn areas shall meet the requirements of the Canada Seed Act for Certified Canada No. 1 Seed
2.1.3. Seed mixture and composition in accordance with Annex B – DND Documents (Accepted Grass Seed Mixes and Specifications)
2.1.4. Mulch: specially manufactured for use in hydraulic seeding equipment, non-toxic, water activated, green colouring, free of germination and growth inhibiting factors with following properties:
2.1.4.1. Type I mulch:
2.1.4.1.1. Made from wood cellulose fibre.
2.1.4.1.2. Organic matter content: 95% plus or minus 0.5%.
2.1.4.1.3. Value of pH: 6.0.
2.1.4.1.4. Potential water absorption: 900%.
2.1.4.2. Type II mulch:
2.1.4.2.1. Made from newsprint, raw cotton fibre and straw, processed to produce fibre lengths of 15 mm minimum and 25 mm maximum. Greater proportions of ingredients to be straw.
2.1.5. Tackifier: water soluble vegetable carbohydrate powder.
2.1.6. Water: Site sourced only, free of impurities that would inhibit germination and growth.
2.1.7. Fertilizer is not allowed.
2.1.8. Inoculants: inoculant containers to be tagged with expiry date.

3. PART 3 - EXECUTION

3.1. Examination

3.1.1. Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for hydraulic seeding in accordance with manufacturer's written instructions.

3.1.1.1. Visually inspect substrate in presence of Departmental Representative.

3.1.1.2. Inform Departmental Representative of unacceptable conditions immediately upon discovery.

3.1.1.3. Proceed with installation only after unacceptable conditions have been remedied.

3.2. Protection of Existing Conditions

3.2.1. Protect structures, signs, guide rails, fences, plant material, utilities and other surfaces not intended for spray.

3.2.2. Immediately remove any material sprayed where not intended as directed by Departmental Representative.

3.3. Preparation of Surfaces

3.3.1. Do not perform work under adverse field conditions such as wind speeds over 10 km/h, frozen ground or ground covered with snow, ice or standing water.

3.3.2. Fine grade areas to be seeded free of humps and hollows.

3.3.2.1. Ensure areas are free of deleterious and refuse materials.

3.3.3. Cultivated areas identified as requiring cultivation to depth of 25 mm.

3.3.4. Ensure areas to be seeded are moist to depth of 150 mm before seeding.

3.3.5. Obtain Departmental Representative's approval of grade and topsoil depth before starting to seed.

3.4. Slurry Application

3.4.1. Ensure seed is placed under supervision of certified Landscape Planting Supervisor.

3.4.2. Hydraulic seeding equipment:

3.4.2.1. Slurry tank.

3.4.2.2. Agitation system for slurry to be capable of operating during charging of tank and during seeding, consisting of recirculation of slurry and/or mechanical agitation method. Capable of seeding by 50 m hand operated hoses and appropriate nozzles.

3.4.2.3. Tank volume to be certified by certifying authority and identified by authorities "Volume Certification Plate".

3.4.3. Apply slurry uniformly, at optimum angle of application for adherence to surfaces and germination of seed.

3.4.3.1. Using correct nozzle for application.

3.4.3.2. Using hoses for surfaces difficult to reach and to control application.

3.4.4. Blend application 300 mm into adjacent grass areas or sodded areas to form uniform surfaces.
3.4.5. Re-apply where application is not uniform.
3.4.6. Remove slurry from items and areas not designated to be sprayed.

3.5. Cleaning
3.5.1. Progress Cleaning: clean in accordance with 01 35 43.
3.5.1.1. Leave Work area clean at end of each day.
3.5.1.2. Keep pavement and area adjacent to site clean and free from mud, dirt, and debris at all times.
3.5.2. Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with 01 35 43.
3.5.2.1. Clean and reinstate areas affected by Work.
3.5.3. Waste Management: separate waste materials for reuse and recycling in accordance with 01 35 43.
3.5.3.1. Remove recycling containers and bins from site and dispose of materials at appropriate facility.
3.5.3.2. Divert unused fertilizer from landfill to official hazardous material collections site.

3.6. Protection
3.6.1. Protect seeded areas from trespass until plants are established.
3.6.2. Remove protection devices as directed by Departmental Representative.

3.7. Maintenance During Establishment Period
3.7.1. Ensure maintenance is carried out under supervision of certified Landscape Maintenance Supervisor.
3.7.2. Perform following operations from time of seed application until acceptance by Departmental Representative.
3.7.3. Grass Mixture:
3.7.3.1. Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.
3.7.3.2. Mow grass to 60 mm whenever it reaches height of 100 mm. Remove clippings which will smother grass offsite.
3.7.3.3. Fertilize seeded areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles; water in well.
3.7.3.4. Control weeds by mechanical or chemical means utilizing acceptable integrated pest management practices.
3.7.3.5. Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.

3.8. Acceptance

3.8.1. Seeded areas will be accepted by Departmental Representative provided that:

3.8.1.1. Plants are uniformly established. Seeded areas are free of rutted, eroded, bare or dead spots.

3.8.1.2. Areas have been mown at least twice.

3.8.1.3. Areas have been fertilized.

3.8.2. Areas seeded in fall will achieve final acceptance in following spring, one month after start of growing season provided acceptance conditions are fulfilled.

3.9. Maintenance

3.9.1. Perform following operations from time of acceptance until end of warranty period:

3.9.1.1. Repair and reseed dead or bare spots to satisfaction of Departmental Representative.

3.9.1.2. Mow areas seeded, remove clippings that will smother grassed areas, offsite.

3.9.2. Fertilize seeded areas in accordance with fertilizing program.

END OF SECTION

1. PART 1 – GENERAL 33 05 13 – MANHOLES AND CATCH BASIN STRUCTURES

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 33 05 13 Manholes and Catch Basin Structures. Payment will be in accordance with lump sum price established for New FFTA Design and Construction (see 01 25 20).

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 01 33 00 Submittal Procedures

1.3.2. 01 35 30 – Health and Safety Requirements

1.3.3. 01 35 43 – Environmental Protection.

1.3.4. 01 45 00 – Quality Control

1.3.5. 31 05 00 – Common Works Results – Earthworks, Exterior Improvements, and Utilities

1.3.6. 32 12 16.01 – Asphalt Paving.

1.4. Action and Informational Submittals

1.4.1. Submittals in accordance with 01 33 00.

1.4.2. Product Data:

1.4.2.1. Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

1.4.3. Quality assurance submittals: submit following in accordance with 01 45 00.

1.4.3.1. Submit manufacturer's test data and certification at least 2 weeks prior to beginning Work. Include manufacturer's drawings, information and shop drawings where pertinent.

1.4.3.2. Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

1.4.3.3. Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.

1.5. References

1.5.1. Master Municipal Contract Documents (MMCD), Platinum Edition Volume II - 2009, British Columbia. Contractor to maintain a copy on-site at all times.

1.5.2. American Society for Testing and Materials International (ASTM)

1.5.2.1. ASTM A48/A48M-00, Standard Specification for Gray Iron Castings.
1.5.2.2. ASTM C117-04, Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing.
1.5.2.3. ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
1.5.2.4. ASTM C139-05, Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
1.5.2.5. ASTM C478M-06, Standard Specification for Precast Reinforced Concrete Manhole Sections Metric.
1.5.2.6. ASTM D1557-12e1, Modified Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
1.5.3. Canadian General Standards Board (CGSB)
1.5.3.1. CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
1.5.3.2. CAN/CGSB-8.2-M88], Sieves, Testing, Woven Wire, Metric.
1.5.3.3. Canadian Standards Association (CSA International)
1.5.3.4. CAN/CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
1.5.3.5. CAN/CSA-A3000-03(R2005), Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
1.5.3.5.1. CSA-A3001-03, Cementitious Materials for Use in Concrete.
1.5.3.5.2. CSA-A3002-03, Masonry and Mortar Cement.
1.5.3.6. CAN/CSA-A165 Series-04, CSA Standards on Concrete Masonry Units (Consists of A165.1, A165.2 and A165.3).
1.5.3.7. CAN/CSA-G30.18-M92(R2002), Billet Steel Bars for Concrete Reinforcement.
1.5.3.8. CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
1.5.4. Health Canada/Workplace Hazardous Materials Information System (WHMIS)
1.5.4.1. Material Safety Data Sheets (MSDS).

1.6. Quality Assurance

1.6.1. Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section, with contractor's representative and Departmental Representative to:
1.6.1.1. Verify project requirements.
1.6.1.2. Review installation and substrate conditions.
1.6.1.3. Co-ordination with other building subtrades.
1.6.1.4. Review manufacturer's installation instructions and warranty requirements.

1.7. Delivery, Storage and Handling

1.7.1. Packing, shipping, handling and unloading:
1.7.1.1. Deliver, store and handle materials in accordance with manufacturer's written instructions.
1.7.2. Waste Management and Disposal:
1.7.2.1. Separate waste materials for reuse and recycling in accordance with 01 35 43.

2. PART 2 - PRODUCTS

2.1. Materials

2.1.1. Cast-in-place concrete:
2.1.1.1. Cement: to CAN/CSA-A3001, Type GU.
2.1.1.2. Concrete mix design to produce minimum 27.6 MPa minimum compressive strength at 28 days and containing 25 mm maximum size coarse aggregate, with water/cement ratio to CAN/CSA-A23.1.
2.1.1.2.1. Air entrainment to CAN/CSA-A23.1, class C-3 exposure.
2.1.1.3. Supplementary cementing materials: with minimum 20% Type F fly ash replacement, by mass of total cementitious materials to CAN/CSA A3001.
2.1.2. Precast manhole units: to ASTM C478M, circular or oval.
2.1.2.1. Top sections eccentric cone or flat slab top type with opening offset for vertical ladder installation.
2.1.2.2. Monolithic bases to be approved by Departmental Representative.
2.1.3. Precast catch basin sections: to ASTM C139 and ASTM C478M.
2.1.4. Joints: made watertight using rubber rings, bituminous compound, epoxy resin cement.
2.1.5. Mortar:
2.1.5.1. Masonry Cement: to CAN/CSA-A3002.
2.1.6. Ladder rungs: to CAN/CSA-G30.18, No.25M billet steel deformed bars, hot dipped galvanized to CAN/CSA-G164.
2.1.6.1. Rungs to be safety pattern (drop step type).
2.1.7. Adjusting rings: to ASTM C478M.
2.1.8. Concrete Brick: to CAN3-A165 Series.
2.1.9. Drop manhole pipe: same as sewer pipe.
2.1.10. Galvanized iron sheet: approximately 2 mm thick.
2.1.11. Steel gratings, I-beams and fasteners: as indicated.
2.1.12. Frames, gratings, covers to dimensions as indicated and following requirements:
2.1.12.1. Metal gratings and covers to bear evenly on frames.
2.1.12.1.1. Frame with grating or cover to constitute one unit.
2.1.12.1.2. Assemble and mark unit components before shipment.
2.1.12.2. Gray iron castings: to ASTM A48/A48M, strength class 30B.
2.1.13. Backfill Materials:
2.1.13.1. Granular Pipe Bedding in accordance with Drawings and MMCD (see Annex E).

2.1.13.2. Drain Rock in accordance with Drawings and MMCD (see Annex E).
2.1.13.3. Backfill Materials including Granular Pipe Bedding, Drain Rock and others in accordance with 02 61 00.02 and Drawings. All Backfill Materials subject to characterization and approval per 02 61 00.02.
2.1.14. Unshrinkable fill: in accordance with 02 61 00.02.

3. PART 3 - EXECUTION

3.1. Manufacturer's Instructions
3.1.1. Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2. Excavation and Backfill
3.2.1. Excavate and backfill in accordance with 02 61 00.02 and per Drawings.
3.2.2. Obtain approval of Departmental Representative before installing manholes or catch basins.

3.3. Concrete Work
3.3.1. Position metal inserts in accordance with dimensions and details as indicated.

3.4. Installation
3.4.1. Construct units in accordance with details indicated, plumb and true to alignment and grade.
3.4.2. Complete units as pipe laying progresses.
3.4.2.1. Maximum of three units behind point of pipe laying will be allowed.
3.4.3. Dewater excavation to approval of Departmental Representative and remove soft and foreign material before placing concrete base.
3.4.4. Cast bottom slabs directly on undisturbed ground.
3.4.5. Set precast concrete base on 150 mm minimum of granular bedding compacted to 95% Modified Proctor Density to ASTM D1557.
3.4.6. Precast units:
3.4.6.1. Set bottom section of precast unit in bed of cement mortar and bond to concrete slab or base.
3.4.6.2. Make each successive joint watertight with rubber ring gaskets, bituminous compound, cement mortar, epoxy resin cement, or combination of these materials.
3.4.6.3. Clean surplus mortar and joint compounds from interior surface of unit as work progresses.
3.4.6.4. Plug lifting holes with concrete plugs set in cement mortar or mastic compound.
3.4.7. For sewers:
3.4.7.1. Place stub outlets and bulkheads at elevations and in positions indicated.

3.4.7.2. Bench to provide smooth U-shaped channel.
3.4.7.2.1. Side height of channel to be 0.75 times full diameter of sewer.
3.4.7.2.2. Slope adjacent floor at 1 in 20.
3.4.7.2.3. Curve channels smoothly.
3.4.7.2.4. Slope invert to establish sewer grade.
3.4.8. Compact Backfill Material to 95% Modified Proctor Density to ASTM D1557.
3.4.9. Place unshrinkable Backfill Material in accordance with 02 61 00.02.
3.4.10. Installing units in existing systems:
3.4.10.1. Where new unit is installed in existing run of pipe, ensure full support of existing pipe during installation, and carefully remove that portion of existing pipe to dimensions required and install new unit as specified.
3.4.10.2. Make joints watertight between new unit and existing pipe.
3.4.10.3. Where deemed expedient to maintain service around existing pipes and when systems constructed under this project are ready for operation, complete installation with appropriate break-outs, removals, redirection of flows, blocking unused pipes or other necessary work.
3.4.11. Set frame and cover to required elevation on no more than three courses of brick.
3.4.11.1. Make brick joints and join brick to frame with cement mortar.
3.4.11.2. Parge and make smooth and watertight.
3.4.12. Place frame and cover on top section to elevation as indicated.
3.4.12.1. If adjustment required use concrete ring.
3.4.13. Clean units of debris and foreign materials.
3.4.13.1. Remove fins and sharp projections.
3.4.13.2. Prevent debris from entering system.

3.5. Field Quality Control

3.5.1. 01 45 00.

3.6. Cleaning

3.6.1. Proceed in accordance with 01 35 43.
3.6.2. On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

1. PART 1 – GENERAL 33 11 16 – SITE WATER UTILITY DISTRIBUTION PIPING

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 33 11 16 Site Water Utility Distribution. Payment will be in accordance with lump sum price established for New FFTA Design and Construction (see 01 25 20).

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 31 05 00 Common Works Results – Earthworks, Exterior Improvements, and Utilities.

1.3.2. 32 11 23 –Granular Base.

1.3.3. 32 11 16 – Granular Sub-Bases.

1.3.4. 02 61 00.02 – Contaminated Sites - Excavation and Backfill.

1.4. Action and Informational Submittals

1.4.1. Submittals in accordance with 01 33 00.

1.4.2. Product Data:

1.4.2.1. Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.

1.4.2.2. Pipe certification to be on pipe.

1.5. References

1.5.1. Master Municipal Contract Documents (MMCD), Platinum Edition Volume II - 2009, British Columbia. Contractor to maintain a copy on-site at all times.

1.5.2. American National Standards Institute/American Water Works Association (ANSI/AWWA)

1.5.2.1. ANSI/AWWA B300-10, Standard for Hypochlorites.

1.5.2.2. ANSI/AWWA B303-10, Standard for Sodium Chlorite.

1.5.2.3. ANSI/AWWA C207-07, Standard for Steel Pipe Flanges for Waterworks Service, 4 Inch through 144 Inch (100 mm through 3,600 mm).

1.5.2.4. ANSI/AWWA C208-07, Standard for Dimensions for Fabricated Steel Water Pipe Fittings.

1.5.2.5. ANSI/AWWA C500-09, Standard for Metal-Seated Gate Valves for Water Supply Service.

1.5.2.6. ANSI/AWWA C651-05, Standard for Disinfecting Water Mains.

1.5.2.7. ANSI/AWWA C800-05, Standard for Underground Service Line Valves and Fittings.
1.5.2.8. ANSI/AWWA C900-07, Standard for Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings, 4 Inch through 12 Inch (100 mm - 300 mm), for Water Transmission and Distribution.
1.5.2.9. AWWA C901, Polyethylene (PE) Pressure Pipe and Tubing, 1/2 In. (13 mm) through 3 In. (76 mm), for Water Service
1.5.3. ASTM International
1.5.3.1. ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
1.5.3.2. ASTM A307-10, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile.
1.5.3.3. ASTM B88M-05(2011), Standard Specification for Seamless Copper Water Tube Metric.
1.5.3.4. ASTM C117-04, Standard Test Methods for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
1.5.3.5. ASTM C136-06, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
1.5.3.6. ASTM D698-07e1, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).
1.5.3.7. American Water Works Association (AWWA)/Manual of Practice
1.5.3.8. AWWA M17-2006, Installation, Field Testing, and Maintenance of Fire Hydrants.
1.5.4. Canadian General Standards Board (CGSB)
1.5.4.1. CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
1.5.4.2. CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
1.5.4.3. CSA International
1.5.4.4. CAN/CSA-B137 Series-09, Thermoplastic Pressure Piping Compendium. (Consists of B137.0, B137.1, B137.2, B137.3, B137.4, B137.4.1, B137.5, B137.6, B137.8, B137.9, B137.10, B137.11 and B137.12).
1.5.4.5. CAN/CSA-B137.1-09, Polyethylene Pipe, Tubing, and Fittings for Cold-Water Pressure Services.
1.5.4.6. CAN/CSA-B137.3-09, Rigid Polyvinyl Chloride (PVC) Pipe for Pressure Applications.
1.5.4.7. CSA G30.18-09, Carbon and Steel Bars for Concrete Reinforcement.
1.5.5. Underwriters' Laboratories of Canada (ULC)
1.5.5.1. CAN/ULC-S520-07, Standard for Fire Hydrants.
1.5.5.2. CAN/ULC-S543-09, Standard for Internal-Lug, Quick Connect Couplings for Fire Hose.

1.6. Delivery, Storage and Handling

1.6.1. See 01 35 13.43 and 01 35 43.

1.6.2. Deliver, store and handle materials in accordance with manufacturer's instructions.
1.6.3. Storage and Handling Requirements:
1.6.3.1. Store materials off ground and in accordance with manufacturer's recommendations.
1.6.3.2. Store and protect water distribution piping from nicks, scratches, and blemishes.
1.6.3.3. Replace defective or damaged materials with new.

1.7. Scheduling of Work
1.7.1. Schedule Work to minimize interruptions to existing services.
1.7.2. Submit schedule of expected interruptions for approval and adhere to interruption schedule as approved by Departmental Representative.
1.7.3. Notify Departmental Representative and occupants minimum of 24 hours in advance of interruption in service.
1.7.4. Notify as specified fire department of planned or accidental interruption of water supply to hydrants.
1.7.5. Provide and post "Out of Service" sign on hydrant not in use.
1.7.6. Interfere with traffic movement only in accordance with Traffic Management Plan.

2. PART 2 - PRODUCTS

2.1. Not Used
2.1.1. Not Used.

2.2. Pipe, Joints and Fittings
2.2.1. Polyvinyl chloride pressure pipe: to AWWA C900, DR 18 (pressure class 235 psi), gasket bell end, cast iron outside diameter.
2.2.1.1. Joints: push-on integrally thickened bell and spigot type to ASTM D3139 with single elastomeric gasket to ASTM F477.
2.2.2. PVC injection-moulded fittings shall be DR18, conforming to AWWA C907 and certified to CSA B137.2. PVC compound is 12454B according to ASTM D1784.
2.2.3. Bolts to be carbon steel, Grade B to ASTM A307, heavy hex style, zinc plated to ASTM B633. Bolt sizes to AWWA C110
2.2.4. Nuts and washers: to be carbon steel, Grade A, to ASTM A563. Washers to be flat hardened steel to ASTM F436. Nuts and washers to be zinc plated to ASTM B633.
2.2.5. Tie rods to be continuous threaded, quenched and tempered alloyed steel to ASTM A354, Grade BC. To be zinc plated to ASTM B633. Tie rods to be minimum 19 mm diameter or greater.
2.2.6. Couplings:

2.2.6.1. Minimum pressure class: 225 psi
2.2.6.2. To AWWA C219, with compression gaskets.
2.2.6.3. Epoxy coated to AWWA C213
2.2.6.4. Stainless steel bolts and nuts to ASTM F593.

2.3. Valves and Valve Boxes

2.3.1. Valves to open counter clockwise.
2.3.2. Gate valves: to AWWA C500 with working pressure of 250 psi, standard iron body, bronze mounted wedge valves with non-rising stems, stem seal to be O-ring type, joints as shown in the Contract Drawings.
2.3.3. Cast iron valve boxes:
2.3.3.1. Base to be large round type.
2.3.3.2. Top of box to be marked "WATER".

2.4. Service Connections

2.4.1. Underground services line valves and fittings 19 to 50 mm to AWWA C800 suitable for 1035 kPa working pressure
2.4.2. HDPE pressure pipe: to CSA-B137.1 and AWWA C901, minimum pressure rating 200 psi.
2.4.3. Corporation stops to be bronze to ASTM B62, AWWA thread inlet, compression type outlet
2.4.4. Curb stops to be bronze to ASTM B62, compression type, inverted key, ball or cylinder type construction utilizing rubber O-ring seals.
2.4.4.1. All fitting and valve connections on polyethylene to have solid fluted stiffening liners manufactured from stainless steel to ANSI T304 designed for the appropriate type and ID of pipe.
2.4.5. Service valve boxes:
2.4.5.1. Curb stop valve boxes on 25 mm diameter and smaller services to be telescoping assembly comprised of threaded cast iron top with bronze pentagon centre plug, 25 NPS iron pipe, cast iron base allowing threaded insertion of 25 NPS pipe and accommodation for curb stop valve and 14 mm diameter steel operating rod attached to curb stop valve with bronze cotter pin.
2.4.6. Service connections for PVC pipe:
2.4.6.1. Service connections less than 100 mm: corporation stop, tapped to main using AWWA threads, complete with stainless service saddle. Service saddle to consist of circumferential band type complete with side bars and fingers, keeper bar, stud bolts, nuts, washers and gaskets.
2.4.6.2. Service connections 100 mm and over: use tee fitting or tapping valve and sleeve.
2.4.7. Tee connections: for services above 100 mm. Tee connections to be fabricated of same material and to same standards as specified pipe fittings and to have ends matching pipe to which they are joined.

2.5. Granular Pipe Bedding and Surround Material

2.5.1. Granular Pipe Bedding and Drain Rock material to MMCD, 02 61 00.02 and Drawings.
2.5.2. Backfill Material subject to characterization requirements per 02 61 00.02.
2.5.3. Concrete mixes and materials required for bedding cradles, encasement, supports, thrust blocks: to 03 30 00.

2.6. Backfill Material

2.6.1. As per 02 61 00.02.

2.7. Pipe Disinfection

2.7.1. Sodium hypochlorite, Calcium hypochlorite to AWWA B300 to disinfect water mains.
2.7.2. Disinfect water mains in accordance with AWWA C651.
2.7.3. Dechlorinate flushed water with ascorbic acid dechlorination product.

3. PART 3 - EXECUTION

3.1. Examination

3.1.1. Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for distribution piping installation in accordance with manufacturer's written instructions.
3.1.1.1. Visually inspect substrate and inform Departmental Representative of unacceptable conditions immediately upon discovery.
3.1.1.2. Proceed with installation only after unacceptable conditions have been remedied.

3.2. Preparation

3.2.1. Clean pipes, fittings, valves, hydrants, and appurtenances of accumulated debris and water before installation.
3.2.1.1. Inspect materials for defects.
3.2.1.2. Remove defective materials from site.

3.3. Trenching

3.3.1. Do trenching work in accordance with 02 61 00.02.
3.3.2. Ensure trench depth allows coverage over pipe of 1 m minimum from finished grade.

3.4. Granular Bedding

3.4.1. Place granular pipe bedding material in uniform layers not exceeding 150 mm compacted thickness to depth as indicated below bottom of pipe.
3.4.2. Do not place material in frozen condition.
3.4.3. Shape bed true to grade to provide continuous uniform bearing surface for pipe.

3.4.4. Shape transverse depressions in bedding as required to suit joints.
3.4.5. Compact each layer full width of bed to 95% minimum of corrected maximum dry density.
3.4.6. Fill authorized or unauthorized excavation below design elevation of bottom of specified bedding in accordance with 02 61 00.02 with compacted bedding material.

3.5. Pipe Installation

3.5.1. Terminate and cap building water service 1 m outside building wall opposite point of connection to main with allowances made for testing and disinfection.
3.5.1.1. Install coupling necessary for connection to building plumbing.
3.5.1.2. If plumbing is already installed, make connection; otherwise cap or seal end of pipe and place temporary marker to locate pipe end.
3.5.2. Lay pipes to AWWA C600 manufacturer's standard instructions and specifications.
3.5.2.1. Do not use blocks except as specified.
3.5.3. Join pipes in accordance with manufacturer's recommendations.
3.5.4. Bevel or taper ends of PVC pipe to match fittings.
3.5.5. Handle pipe by methods recommended by pipe manufacturer. Do not use chains or cables passed through pipe bore so that weight of pipe bears on pipe ends.
3.5.6. Lay pipes on prepared bed, true to line and grade.
3.5.6.1. Ensure barrel of each pipe is in contact with shaped bed throughout its full length.
3.5.6.2. Take up and replace defective pipe.
3.5.6.3. Correct pipe which is not in true alignment or grade or pipe which shows differential settlement after installation greater than 10 mm in 3 m.
3.5.7. Face socket ends of pipe in direction of laying. For mains on grade of 2% or greater, face socket ends up-grade.
3.5.8. Do not exceed permissible deflection at joints as recommended by pipe manufacturer.
3.5.9. Keep jointing materials and installed pipe free of dirt and water and other foreign materials.
3.5.9.1. Whenever work is stopped, install a removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.
3.5.10. Cut pipes in approved manner as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.
3.5.11. Align pipes before jointing.
3.5.12. Install gaskets to manufacturer's recommendations. Support pipes with hand slings or crane as required to minimize lateral pressure on gasket and maintain concentricity until gasket is properly positioned.
3.5.13. Avoid displacing gasket or contaminating with dirt or other foreign material.
3.5.13.1. Remove disturbed or contaminated gaskets.
3.5.13.2. Clean, lubricate and replace before jointing is attempted again.

3.5.14. Complete each joint before laying next length of pipe.
3.5.15. Minimize deflection after joint has been made.
3.5.16. Apply sufficient pressure in making joints to ensure that joint is completed to manufacturer's recommendations.
3.5.17. When stoppage of work occurs, block pipes in an approved manner to prevent creep during down time.
3.5.18. Recheck plastic pipe joints assembled above ground after placing in trench to ensure that no movement of joint has taken place.
3.5.19. Do not lay pipe on frozen bedding.
3.5.20. Do hydrostatic and leakage test and have results approved by Departmental Representative before completing surface works.
3.5.21. Backfill remainder of trench.

3.6. Valve Installation

3.6.1. Install valves to manufacturer's recommendations at locations as indicated.
3.6.2. Support valves located in valve boxes or valve chambers by means of bedding same as adjacent pipe. Valves not to be supported by pipe.

3.7. Service Connections

3.7.1. Terminate building water service 1 m outside building wall.
3.7.1.1. Install coupling necessary for connection to building plumbing.
3.7.1.2. If plumbing is already installed, make connection, otherwise cap or seal end of pipe and place temporary marker to locate pipe end.
3.7.2. Do not install service connections until satisfactory completion of hydrostatic, leakage tests, and disinfection of water main.
3.7.3. Employ only competent workmen equipped with suitable tools to carry out tapping of mains, cutting and flaring of pipes.
3.7.4. Place temporary location marker at ends of plugged or capped unconnected water lines.
3.7.4.1. Each marker to consist of a stake extending from pipe end at pipe level to 60 mm above grade.
3.7.4.2. Paint exposed portion of stake blue with designation "WATER SERVICE LINE".

3.8. Thrust Blocks and Restrained Joints

3.8.1. For thrust blocks: do concrete Work in accordance with 03 30 00 - Cast-in-Place Concrete.
3.8.2. Place concrete thrust blocks between valves, tees, plugs, caps, bends, changes in pipe diameter, reducers, hydrants and fittings and undisturbed ground as indicated or as directed by Departmental Representative.
3.8.3. Keep joints and couplings free of concrete.
3.8.4. Do not backfill over concrete within 48 hours after placing.
3.8.5. For restrained joints: use restrained joints as shown in Contract Documents.

3.9. Hydrostatic and Leakage Testing

3.9.1. Do tests in accordance with AWWA C605 – Underground Installation of Polyvinyl Chloride.

3.9.2. Provide labour, equipment and materials required to perform hydrostatic and leakage tests hereinafter described.

3.9.3. Notify Departmental Representative at least 48 hours in advance of proposed tests.

3.9.3.1. Perform tests in presence of Departmental Representative.

3.9.4. Where section of system is provided with concrete thrust blocks, conduct tests at least 5 days after placing concrete.

3.9.5. When testing is done during freezing weather, protect hydrants, valves, joints and fittings from freezing.

3.9.6. Strut and brace caps, bends, tees, and valves, to prevent movement when test pressure is applied.

3.9.7. Open valves.

3.9.8. Expel air from main by slowly filling main with potable water.

3.9.8.1. Install corporation stops at high points in main where no air-vacuum release valves are installed.

3.9.8.2. Remove stops after satisfactory completion of test and seal holes with plugs.

3.9.9. Do not exceed allowable leakage, including lateral connections.

3.9.10. Locate and repair defects if leakage is greater than amount specified.

3.9.11. Repeat test until leakage is within specified allowance for full length of water main.

3.10. Pipe Surround and Backfill

3.10.1. Upon completion of pipe laying and after Departmental Representative has inspected Work in place, surround, cover, and backfill pipes as per 02 61 00.02.

3.11. Painting of Hydrants

3.11.1. After hydrant flow tests, paint caps and ports to meet colour selections approved by authority having jurisdiction.

3.12. Flushing and Disinfecting

3.12.1. Complete all flushing and disinfection to AWWA C651

3.12.2. Flushing and disinfecting operations: witnessed by Departmental Representative.

3.12.2.1. Notify Departmental Representative at least 5 days in advance of proposed date when disinfecting operations will begin.

3.12.2.2. Complete disinfection works concurrent with pressure test.

3.12.3. Flush water mains through available outlets with a sufficient flow of potable water to produce velocity of 0.8 m/s, within pipe until foreign materials have been removed and flushed water is clear and a minimum of one pipe volume has been flushed.

3.12.4. Provide connections and pumps for flushing as required with approved and certified backflow prevention device.
3.12.5. Open and close valves, hydrants and service connections to ensure thorough flushing.
3.12.6. When flushing has been completed introduce strong solution of chlorine of minimum 25 mg/L free chlorine into water main and ensure that it is distributed throughout entire system.
3.12.7. Rate of chlorine application to be proportional to rate of water entering pipe.
3.12.8. Chlorine application to be close to point of filling water main and to occur at same time.
3.12.9. Operate valves, hydrants and appurtenances while main contains chlorine solution.
3.12.10. Flush line to remove chlorine solution after 24 hours.
3.12.11. Measure chlorine residuals at extreme end of pipe-line being tested.
3.12.11.1. After 24 hours, take further samples to ensure that there is still not less than 10 ppm of chlorine residual remaining throughout system.
3.12.12. Perform bacteriological tests on water main, after chlorine solution has been flushed out.
3.12.12.1. Take samples in accordance with AWWA C651.
3.12.12.2. Should contamination remain or recur during this period, repeat disinfecting procedure.
3.12.12.3. Contractor to coordinate, deliver and pay for all testing
3.12.13. Take water samples at service connections, in suitable sequence, to test for chlorine residual.

3.13. Tie-Ins

3.13.1. Provide a shutdown and tie-in plan to the Departmental Representative for review 5 days prior to any planned shutdowns.
3.13.2. All water service tie-ins to be completed after-hours. Timing to be confirmed with Departmental Representative
3.13.3. Provide a temporary sump and pump for trench de-watering, including any water discharged from watermains. Dirty water shall not enter watermains or services during the tie-in.
3.13.4. Provide clean, square cuts on any watermains or services free of burrs.
3.13.5. Clean, swab and disinfect any materials used for the tie-in per AWWA C651.
3.13.6. Install all couplers, valves, and fittings per manufacturer's recommendation.
3.13.7. When tie-in is complete, slowly fill the watermain and purge air. Flush the line until water runs clear and is free of additional disinfectant. Visually observe all exposed joints for leaks and rectify in a timely manner.

3.14. Cleaning

3.14.1. See 01 35 13.43 and 01 35 43.
3.14.2. Leave Work area clean at end of each day.

END OF SECTION

1. PART 1 – GENERAL 33 31 23 – SITE STORM PRESSURE SEWER

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 33 31 23 Site Storm Pressure Sewer. Payment will be in accordance with lump sum price established for New FFTA Design and Construction (see 01 25 20).

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 31 05 00 - Common Works Results – Earthworks, Exterior Improvements, and Utilities.

1.3.2. 32 11 23 – Granular Base.

1.3.3. 32 11 16 – Granular Sub-Bases.

1.3.4. 02 61 00.02 – Contaminated Sites - Excavation and Backfill.

1.4. Action and Informational Submittals

1.4.1. Submittals in accordance with 01 33 00.

1.4.2. Product Data:

1.4.2.1. Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.

1.4.2.2. Pipe certification to be on pipe.

1.5. References

1.5.1. Master Municipal Contract Documents (MMCD), Platinum Edition Volume II - 2009, British Columbia. Contractor to maintain a copy on-site at all times.

1.5.2. American National Standards Institute/American Water Works Association (ANSI/AWWA)

1.5.2.1. ANSI/AWWA C800-05, Standard for Underground Service Line Valves and Fittings.

1.5.2.2. AWWA C906, Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 65 In. (100 mm Through 1,650 mm), for Waterworks

1.5.3. ASTM International

1.5.3.1. ASTM C117-04, Standard Test Methods for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.

1.5.3.2. ASTM C136-06, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.

1.5.3.3. ASTM D1557, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).
1.5.4. Canadian General Standards Board (CGSB)
1.5.4.1. CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
1.5.4.2. CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
1.5.5. CSA International
1.5.5.1. CAN/CSA-B137 Series-09, Thermoplastic Pressure Piping Compendium. (Consists of B137.0, B137.1, B137.2, B137.3, B137.4, B137.4.1, B137.5, B137.6, B137.8, B137.9, B137.10, B137.11 and B137.12).

1.6. Delivery, Storage and Handling
1.6.1. See 01 35 13.43 and 01 35 43.
1.6.2. Deliver, store and handle materials in accordance with manufacturer's instructions.
1.6.3. Storage and Handling Requirements:
1.6.3.1. Store materials off ground and in accordance with manufacturer's recommendations.
1.6.3.2. Store and protect piping from nicks, scratches, and blemishes.
1.6.3.3. Replace defective or damaged materials with new.

1.7. Scheduling of Work
1.7.1. Schedule Work to minimize interruptions to existing services.
1.7.2. Submit schedule of expected interruptions for approval and adhere to interruption schedule as approved by Departmental Representative.
1.7.3. Notify Departmental Representative and occupants minimum of 24 hours in advance of interruption in service.

2. PART 2 - PRODUCTS

2.1. Pipe, Joints And Fittings
2.1.1. HDPE pressure pipe: to CSA-B137.1 and AWWA C901, minimum pressure rating 160 psi.

2.2. Valves and Valve Boxes
2.2.1. Valves to open counter clockwise.

2.3. Granular Pipe Bedding and Surround Material
2.3.1. Granular material and Drain Rock to MMCD, 02 61 00.02 and Drawings.
2.3.2. Backfill Material subject to characterization requirements per 02 61 00.02.
2.3.3. Concrete mixes and materials required for bedding cradles, encasement, supports, thrust blocks: to 03 30 00.

2.4. Backfill Material

2.4.1. As per 02 61 00.02.

3. PART 3 - EXECUTION

3.1. Examination

3.1.1. Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for distribution piping installation in accordance with manufacturer's written instructions.

3.1.1.1. Visually inspect substrate and inform Departmental Representative of unacceptable conditions immediately upon discovery.

3.1.1.2. Proceed with installation only after unacceptable conditions have been remedied.

3.2. Preparation

3.2.1. Clean pipes, fittings, valves, and appurtenances of accumulated debris and water before installation.

3.2.1.1. Inspect materials for defects.

3.2.1.2. Remove defective materials from site.

3.3. Trenching

3.3.1. Do trenching work in accordance with 02 61 00.02.

3.4. Granular Bedding

3.4.1. Place granular bedding material in uniform layers not exceeding 150 mm compacted thickness to depth as indicated below bottom of pipe.

3.4.2. Do not place material in frozen condition.

3.4.3. Shape bed true to grade to provide continuous uniform bearing surface for pipe.

3.4.4. Shape transverse depressions in bedding as required to suit joints.

3.4.5. Compact each layer full width of bed to 95% modified proctor density.

3.4.6. Fill authorized or unauthorized excavation below design elevation of bottom of specified bedding in accordance with 02 61 00.02 with compacted bedding material.

3.5. Pipe Installation

3.5.1. Place temporary location marker at ends of plugged or capped unconnected pressure sewer lines.

3.5.1.1. Each marker to consist of a stake extending from pipe end at pipe level to 60 mm above grade.

3.5.1.2. Paint exposed portion of stake blue with designation "PRESSURE STORM SERVICE LINE".

3.5.2. Lay pipes to AWWA C605 manufacturer's standard instructions and specifications.

3.5.2.1. Do not use blocks except as specified.

3.5.3. Join pipes in accordance with manufacturer's recommendations.
3.5.4. Bevel or taper ends of pipe to match fittings.
3.5.5. Lay pipes on prepared bed, true to line and grade.
3.5.5.1. Ensure barrel of each pipe is in contact with shaped bed throughout its full length.
3.5.5.2. Take up and replace defective pipe.
3.5.6. Do not exceed permissible curvature (minimum bending radius) as recommended by pipe manufacturer.
3.5.7. Keep jointing materials and installed pipe free of dirt and water and other foreign materials.
3.5.7.1. Whenever work is stopped, protect open end of pipe laid to prevent entry of foreign materials.
3.5.8. Cut pipes in approved manner as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.
3.5.9. Align pipes before jointing.
3.5.10. Do not lay pipe on frozen bedding.
3.5.11. Perform hydrostatic and leakage test and have results approved by Departmental Representative before completing surface works.
3.5.12. Backfill remainder of trench.

3.6. Valve Installation

3.6.1. Install valves to manufacturer's recommendations at locations as indicated.
3.6.2. Support valves located in valve boxes or valve chambers by means of bedding same as adjacent pipe. Valves not to be supported by pipe.

3.7. Hydrostatic and Leakage Testing

3.7.1. Perform tests in accordance with AWWA M55 – no leakage allowed.
3.7.2. Provide labour, equipment and materials required to perform hydrostatic and leakage tests hereinafter described.
3.7.3. Notify Departmental Representative at least 48 hours in advance of proposed tests.
3.7.3.1. Perform tests in presence of Departmental Representative.
3.7.4. Where section of system is provided with concrete thrust blocks, conduct tests at least 5 days after placing concrete.
3.7.5. When testing is done during freezing weather, protect hydrants, valves, joints and fittings from freezing.
3.7.6. Strut and brace caps, bends, tees, and valves, to prevent movement when test pressure is applied.
3.7.7. Locate and repair defects if leakage is observed or pressure drop is greater than allowable amount.
3.7.8. Repeat test until zero leakage is observed and pressure drop is within specified allowance for full length of pressure sewer.

3.8. Pipe Surround and Backfill

3.8.1. Upon completion of pipe laying and after Departmental Representative has inspected Work in place, surround, cover, and backfill pipes as per 02 61 00.02.

3.9. Tie-Ins

3.9.1. Tie-ins to be completed using tapping saddles into the existing gravity sewer, without interrupting sewage flows from existing facility.

END OF SECTION

1. PART 1 – GENERAL 33 41 00 – STORM UTILITY DRAINAGE PIPING

1.1. Measurement Procedures

1.1.1. No separate payment will be made for 33 41 00 Storm Utility Drainage Piping. Payment will be in accordance with lump sum price established for New FFTA Design and Construction (see 01 25 20).

1.1.2. The Contactor must refer to the Unit Price Table for details regarding Measurement and Payment for the Contract work.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Related Sections

1.3.1. 31 05 00 - Common Works Results – Earthworks, Exterior Improvements, and Utilities.

1.3.2. 32 11 23 – Granular Base.

1.3.3. 32 11 16 – Granular Sub-Bases.

1.3.4. 02 61 00.02 – Contaminated Sites – Excavation and Backfill.

1.4. Action and Informational Submittals

1.4.1. Submittals in accordance with 01 33 00.

1.4.2. Product Data:

1.4.2.1. Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

1.4.2.2. Certification to be marked on pipe.

1.5. References

1.5.1. Master Municipal Contract Documents (MMCD), Platinum Edition Volume II - 2009, British Columbia. Contractor to maintain a copy on-site at all times.

1.5.2. ASTM International

1.5.2.1. ASTM C117-04, Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.

1.5.2.2. ASTM C136-06, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.

1.5.2.3. ASTM C443M-10, Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric).

1.5.2.4. ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

1.5.2.5. ASTM D1557-12e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft^3 (2,700 kN-m/m^3)).
1.5.2.6. ASTM D1056-07, Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.
1.5.2.7. ASTM D2680-01(2009), Standard Specification for Acrylonitrile- Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping.
1.5.2.8. ASTM D3034-08, Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
1.5.2.9. ASTM F405-05, Standard Specification for Corrugated Polyethylene (PE) Tubing and Fittings.
1.5.2.10. ASTM F794-03(2009), Standard Specification for Poly(Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter.
1.5.2.11. ASTM A760, Standard Specification for Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains
1.5.3. Canadian General Standards Board (CGSB)
1.5.3.1. CAN/CGSB-8.1-M89, Sieves, Testing, Woven Wire, Inch Series.
1.5.3.2. CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
1.5.3.3. CAN/CGSB-34.9-94, Asbestos-Cement Sewer Pipe.
1.5.3.4. CSA International
1.5.3.5. CAN/CSA-A3000-08, Cementitious Materials Compendium.
1.5.3.6. CAN/CSA-B1800-06, Thermoplastic Non-pressure Pipe Compendium - B1800 Series.
1.5.3.7. CSA G401-07, Corrugated Steel Pipe Products.
1.5.4. U.S. Environmental Protection Agency (EPA) / Office of Water
1.5.4.1. EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.6. Scheduling

1.6.1. Schedule Work to minimize interruptions to existing services and to maintain existing flow during construction.
1.6.2. Submit schedule of expected interruptions for approval and adhere to approved schedule.

1.7. Delivery, Storage and Handling

1.7.1. See 01 35 13.43 and 01 35 43.
1.7.2. Deliver, store and handle materials in accordance with manufacturer's instructions.
1.7.3. Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

1.7.4. Storage and Handling Requirements:
1.7.4.1. Store materials in accordance with manufacturer's recommendations.
1.7.4.2. Store and protect pipes from damage.
1.7.4.3. Replace defective or damaged materials with new.

2. PART 2 - PRODUCTS

2.1. Plastic Pipe
2.1.1. Type PSM Poly Vinyl Chloride (PVC): to ASTM D3034 CAN/CSA-B182.2.
2.1.1.1. Standard Dimensional Ratio (SDR), 100 mm diameter and less: SDR28, greater than 100 mm: SDR 35.
2.1.1.2. Locked-in Separate gasket and integral bell system.
2.1.1.3. Nominal lengths: 4.6 m.
2.1.2. Corrugated polyethylene pipe: high density to ASTM F667 ASTM F405 BNQ-3624-115.

2.2. Corrugated Steel Pipe
2.2.1. Pipe to CSA G401, except external helical corrugation pattern to be 19 mm x 19 mm x 190 mm as described in AASHTO M36 or ASTM A760.
2.2.2. Pipe material: galvanized Type II
2.2.3. Pipe wall thickness: in accordance with manufacturer’s recommendations given minimum and maximum cover limits and condition.
2.2.4. Couplers: hugger band type complete with O-ring gasket. Coupler to be 500 mm wide.
2.2.5. Maximum installed vertical deflection not to exceed 5% of base inside diameter. Maximum installed horizontal deflection not to exceed 3% of base inside diameter.

2.3. Granular Pipe Bedding and Surround Material
2.3.1. Granular material and Drain Rock to MMCD, 02 61 00.02 and Drawings.
2.3.2. Backfill Material subject to characterization requirements per 02 61 00.02.
2.3.3. Concrete mixes and materials for bedding, cradles, encasement, supports: in accordance with 03 30 00.

2.4. Backfill Material
2.4.1. As indicated on Drawings and in accordance with 02 61 00.02.
2.4.2. Unshrinkable fill: in accordance with 02 61 00.02.

3. PART 3 - EXECUTION

3.1. Preparation

3.1.1. Clean pipes and fittings of debris and water before installation and remove defective materials from site to approval of Departmental Representative.

3.2. Trenching

3.2.1. Do trenching Work in accordance with 02 61 00.02.

3.2.2. Protect trench from contents of sewer.

3.3. Granular Bedding

3.3.1. Place bedding in unfrozen condition.

3.3.2. Place granular bedding material in uniform layers not exceeding 300 mm compacted thickness to depth as indicated.

3.3.3. Shape bed true to grade and to provide continuous, uniform bearing surface for pipe.

3.3.3.1. Do not use blocks when bedding pipes.

3.3.4. Shape transverse depressions as required to suit joints.

3.3.5. Compact each layer full width of bed to at least 95 % Modified Proctor Density to ASTM D155.

3.3.6. Fill excavation below bottom of specified bedding adjacent to manholes or catch basins with lean mix concrete compacted bedding material.

3.4. Installation

3.4.1. Install culverts in accordance with MMCD 33 42 13 – Pipe Culverts

3.4.2. Lay and join pipe in accordance with manufacturer's recommendations and to approval of Departmental Representative.

3.4.3. Handle pipe using methods approved by Departmental Representative.

3.4.3.1. Do not use chains or cables passed through rigid pipe bore so that weight of pipe bears upon pipe ends.

3.4.4. Lay pipes on prepared bed, true to line and grade with pipe inverts smooth and free of sags or high points.

3.4.4.1. Ensure barrel of each pipe is in contact with shaped bed throughout its full length.

3.4.5. Begin laying at outlet and proceed in upstream direction with socket ends of pipe facing upgrade.

3.4.6. Joint deflection permitted within limits recommended by pipe manufacturer.

3.4.7. Water to flow through pipes during construction only as permitted by Departmental Representative.

3.4.8. Whenever Work is suspended, install removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.

3.4.9. Install plastic pipe and fittings in accordance with CAN/CSA-B1800.

3.4.10. When any stoppage of Work occurs, restrain pipes as directed by Departmental Representative, to prevent "creep" during down time.

3.4.11. Plug lifting holes with Departmental Representative approved prefabricated plugs, set in shrinkage compensating grout.
3.4.12. Cut pipes as required for special inserts, fittings or closure pieces, as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.
3.4.13. Make watertight connections to manholes and catch basins.
3.4.13.1. Use shrinkage compensating grout when suitable gaskets are not available.
3.4.14. Use prefabricated saddles or approved field connections for connecting pipes to existing sewer pipes.
3.4.14.1. Joint to be structurally sound and watertight.
3.4.15. Temporarily plug open upstream ends of pipes with removable watertight concrete, steel or plastic bulkheads.

3.5. Pipe Surround

3.5.1. Upon completion of pipe laying, and after Departmental Representative has inspected pipe joints, surround and cover pipes as indicated.
3.5.1.1. Leave joints and fittings exposed until field testing is completed.
3.5.2. Hand place surround material in uniform layers not exceeding 300 mm compacted thickness as indicated.
3.5.2.1. Do not dump material within 3 m of pipe.
3.5.3. Place layers uniformly and simultaneously on each side of pipe.
3.5.4. Compact each layer full width of bed to at least 95 % Modified Proctor Density to ASTM D1557.
3.5.5. When field test results are acceptable to Departmental Representative, place surround material at pipe joints.

3.6. Backfill

3.6.1. Place backfill material in unfrozen condition.
3.6.2. Place backfill material, above pipe surround, in uniform layers not exceeding 300 mm compacted thickness up to grades as indicated.
3.6.3. Compact each layer full width of bed to at least 95 % Modified Proctor Density to ASTM D1557.
3.6.4. Place unshrinkable backfill in accordance with 02 61 00.02.

3.7. Field Tests and Inspections

3.7.1. Provide means of access to permit Departmental Representative to do inspections.
3.7.2. Repair or replace pipe, pipe joint or bedding found defective.
3.7.3. Remove foreign material from sewers and related appurtenances by flushing with water.
3.7.4. Television and photographic inspections:
3.7.4.1. Carry out inspection of installed sewers by closed circuit television camera, photographic camera or by other related means. Contractor will pay for costs

of tests. Work to be completed to MMCD 33 01 30.1 – CCTV Inspection of Pipelines and 33 01 30.2 – Cleaning of Sewers.

3.7.4.2. Submit reports to Departmental Representative within 10 days of completion of the field work on a continuous basis as the inspection area or pipeline types are finalized.

3.7.4.3. Submit inspection report, digital video on DVD-R and corresponding digital report on CD-R to Departmental Representative for review.

3.8. Cleaning

3.8.1. See 01 35 13.43 and 01 35 43.

3.8.2. Leave Work area clean at end of each day.

END OF SECTION