1 SUMMARY OF WORK

.1 The Work generally includes construction of a Buoy Maintenance Area and associated roadwork at BIO including but not neccessarily limited to:
.1 Full project Quality Control.
.2 Submission and execution of specified plan requirements.
.3 Removals and relocations
.4 Underground utility removal
.5 Identification and tracing of unidentified underground utilities and services
.6 Mass and trench excavation
.7 Surplus fill placement.
.8 Surplus fill removal.
.9 Embankment re-shaping
.10 Rock excavation
.11 Grading
.12 Backfilling
.13 Granular materials
.14 Heavy duty concrete pad and apron construction.
.15 Roadways and area paving
.16 Paint markings
.17 Fencing
.18 Watermains
.19 Sanitary sewers and storm sewers
.20 Temporary work, fencing and barriers
.21 Controlled access
.22 Reinstatement and all incidentals
.23 Power lighting, conduits and cables and associated electrical Work.
.24 Electrical services.

2 PROJECT COORDINATION

.1 Coordinate progress of the Work, progress schedules, submittals, use of site, temporary utilities, and construction facilities. Other contractors may be working on the site at the same time on other projects outside the scope of this Work.

.2 Project construction activities are to be confined to the area within the construction site boundary indicated except when otherwise authorized by the Departmental Representative.

3 CONTRACTOR'S PERSONNEL

.1 Make available on a full time basis a Site Superintendent to supervise all aspects of the Work. This individual is to be present at and identified in the pre-construction meeting.

.2 Make available on a full time basis a Contractor's QC Manager in accordance with Section 01 45 00.

4 DEPARTMENT RERRESENTATIVE'S SUBCONSULTANTS

.1 The Departmental Representative's geotechnical subconsultant is TerrAtlantic Engineering Limited.

.2 The Departmental Representative's surveyor is Servant, Dunbrack, MacKenzie and MacDonald (SDMM).

5 CONTRACTOR'S REPORTING REQUIREMENTS

.1 Survey Requirements:
.1 Establish lines and levels, locate and lay out, by instrumentation.

.2 Records:
.1 Maintain a complete, accurate log of control and survey work as it progresses. Submit according to Section 01 33 00.

.3 Subsurface Conditions:
.1 Promptly notify Departmental Representative in writing if subsurface conditions at Place of the Work differ materially from those indicated in Contract Documents, or reasonable assumption of probable conditions based thereon.
.2 After prompt investigation, should Departmental Representative determine that conditions do differ materially, instructions will be issued for changes in the Work.

6 PROJECT MEETINGS

.1 Administrative:
.1 Departmental Representative will schedule and administer project preconstruction and commissioning meetings.
.2 Contractor will schedule and administer QMP meetings. Refer to Section 01 31 00.

7 SUBMITTALS

.1 Administrative:
.1 Submit to Departmental Representative submittals listed for all materials and procedures requiring approval as indicated. Submit electronically (PDF file format) in a timely manner and orderly sequence so as to not cause delay in the Work.
.2 Work affected by submittal shall not proceed until review is complete.
.3 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 co-ordinated with requirements of the Work and Contract Documents.

7 SUBMITTALS (Cont'd)

.1 Administrative:(Cont'd)

.4 Verify field measurements and affected adjacent Work are co-ordinated.

.5 Refer to Section 01 33 00 for detailed submittal procedures.

.2 Shop Drawings and Product Data:

.1 "Shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of the Work.

.2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connection, explanatory notes and other information necessary for completion of Work.

.3 Submit product data sheets or brochures as indicated in Section 01 33 00 for requirements requested in specification Sections and as Departmental Representative may reasonably request where shop drawings will not be prepared due to standardized manufacture of product.

.3 Samples:

.1 Submit for review, samples in duplicate as requested in respective specification Sections.

.2 Deliver samples prepaid to Departmental Representative's business address.

.4 Interim survey and data records:

.1 Provide total station interim survey records and ASCII data files in electronic format, compatible with issued for construction contract documents, by 1400 hours each Friday throughout the duration of construction.

.5 As-built drawings and Total Station Survey Data:

.1 After award of Contract, Contractor will use a clean set of drawings for purpose of maintaining as-built drawings. Accurately and neatly record deviations from Contract Documents caused by site conditions and changes ordered by Departmental Representative.

.2 Record locations of concealed components of mechanical and electrical services.

.3 Identify drawings as "AS BUILTS". Maintain in new condition and make available for inspection on site by Departmental Representative.

.4 Provide final total station survey to Departmental Representative upon project substantial completion.

.5 On completion of Work and prior to final inspection, submit record documents to Departmental Representative.

7 SUBMITTALS (Cont'd)

.5 (Cont'd)
.6 The certificate of substantial performance will not be issued until as-built drawings and completed total station survey have been completely provided.

.6 Operations and Maintenance Data:
.1 Submit electronic (PDF file format) copies of the following, or as indicated in the Contract Documents, prior to application for Final Payment:
.1 General description, list of equipment including nameplate information, installation, operation and maintainance instructions, and parts list.
.2 Names, addresses and phone numbers of Sub-Contractors, suppliers and manufacturers.
.3 Guarantees and warranties.
.2 Type lists and notes. Use clear drawings, diagrams and manufacturer's literature.
.3 The certificate of substantial performance will not be issued until this material has been completely provided.

8 SCHEDULE

.1 Schedules:
.1 Construction Schedule.
.2 Schedule is to be updated and e-mailed to the Departmental Representative on a bi-weekly basis.

.2 Format:
.1 Prepare schedule in form of horizontal bar chart.
.2 Provide horizontal time scale identifying first work day of each week.
.3 Schedule to be in PDF file format.

.3 Submission:
.1 Submit initial schedules within seven (7) days after award of Contract.

9 QUALITY ASSURANCE

.1 Inspection:
.1 Departmental Representative shall have access to the Work at all times.

.2 Departmental Representative's Independent Inspection Agencies:
.1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of Quality Assurance. Cost of such services will be borne by PWGSC.
.2 Provide equipment required for executing inspection and testing by PWGSC appointed agencies.

9 QUALITY ASSURANCE (Cont'd)

.3 Provision of Departmental Representative's quality assurance does not relieve Contractor's responsibility for quality control.

10 QUALITY CONTROL

.1 Refer to Section 01 45 00 for full requirements of the Contractor's Quality Control programme.

11 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

.1 Installation/Removal:
.1 Provide construction facilities and temporary controls in order to execute work expeditiously and safely.
.2 Remove from site all such Work after use.

.2 Dewatering:
.1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

.3 Site Storage/Loading:
.1 Confine the Work and operations of employees to limits indicated by Contract Documents. Do not unreasonably encumber premises with products or equipment.
.2 Do not load or permit to be loaded any part of the Work with a weight or force that will endanger the Work.

.4 Water Supply:
.1 Arrange for connection of water supply with Departmental Representative and pay costs for coordination, inspection, testing and usage at prevailing rates.

.5 Project Cleanliness:
.1 Maintain the Work in tidy condition, free from accumulation of waste products and debris.
.2 Remove waste material and debris from site at end of each working day.

12 CONSTRUCTION PARKING

.1 Parking will not be permitted on roadways adjacent to the job site. Parking may be accomodated on the site or on a designated area adjacent to the site, subject to approval by the Departmental Representative.

13 MATERIAL AND EQUIPMENT

.1 Product and Material Quality:

.1 Products, materials, equipment and articles (referred to as Products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. Furnish evidence as to type, source and quality of Products provided.

.2 Workmanship:

.1 Workmanship to be best quality, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is impractical to produce required results.

.2 Do not employ any unfit person or anyone unskilled in their required duties.

.3 Decisions as to quality or fitness of workmanship in cases of dispute rest solely with Departmental Representative, whose decision is final.

14 EQUIVALENTS AND ALTERNATES

.1 Where a particular brand of manufactured item is described or specified, it is to be regarded as a standard. Other brands may be accepted by the Departmental Representative.

.2 No equivalent or alternative products will be made before acceptance of bids.

.3 After award of Contract, the Contractor may apply, in writing, for substitutions. Otherwise the Contractor will be held to terms of specifications. No extra will be allowed for approved equivalents.

.4 When the Departmental Representative is prepared to approve a brand of manufactured article as an alternate to any specified item, although the alternate brand may not be equivalent to that specified, it may be used but only after price adjustments have been negotiated and approved.

.5 If alternate requires modifications, adjustments or additions to the specified work, submit to Departmental Representative these modifications, adjustments, or additions in same detail as included in the Contract Documents.

.6 Approval in principle by the Departmental Representative of these modifications, adjustments, or additions in no way relieves the Contractor of any obligation or liability under the Contract to provide a complete finished product.

14 EQUIVALENTS AND ALTERNATES (Cont'd)

.7 No change or substitution can be made without written consent of the Departmental Representative.

15 FIRE SAFETY PLAN

.1 Provide Departmental Representative with a Fire Safety Plan at the pre-construction meeting.

16 PROJECT CLOSEOUT

.1 Final Cleaning:
.1 When the Work is substantially performed, remove surplus products, tools construction machinery and equipment not required for performance of remaining Work.
.2 Remove waste materials and debris from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
.3 Leave work broom clean before inspection process commences.

.2 Inspection/Takeover Procedures:
.1 Prior to application for completion inspection by the Departmental Representative, carefully inspect the Work and confirm it is complete, that major and minor construction deficiencies are complete and defects are corrected. Notify Departmental Representative in writing, of satisfactory completion of the Work and request an inspection.
.2 During Departmental Representative's inspection, a list of deficiencies and defects will be tabulated. Correct same.
.3 When the Departmental Representative considers deficiencies and defects have been corrected and requirements of Contract have been performed, make application for final certificate of completion in accordance with General Terms and Conditions.

17 UTILITIES

.1 Do not operate valves, electrical and telephone controls on existing utility systems.

.2 Apply to Departmental Representative for permission to operate water systems and only operate water systems in accordance with and in the presence of the Departmental Representative.

.3 When a connection is made to an existing watermain, an inspection of the joint must be made by the

17 UTILITIES (Cont'd)

.3 (Cont'd)
Departmental Representative while the watermain is under pressure, prior to backfilling.

18 INTERRUPTION OF EXISTING WATER SERVICES

.1 The Work will require an interuption to water service in order to complete the connections to the existing water system. Complete this Work outside of the normal working hours unless otherwise approved by the Departmental Representative. Coordinate this portion of the Work at a time acceptable to the Departmental Representative. All disruptions to the water services are to be completed as outlined in the approved Water System Operations Plan.

END

1 RESPONSIBILITY

.1 The planning, scheduling, management and execution of the Work in accordance with the Contract is the responsibility of the Contractor.

2 WORK SCHEDULING

.1 Electronically submit a construction schedule showing commencement and completion of all work within the time stated in the accepted tender and accounting for all required operations and commissioning plans. The schedule shall be sufficiently detailed to allow the Departmental Representative and the Contractor to plan, monitor and coordinate tasks and resources efficiently to achieve completion of the work on time.

.2 Schedule Work in cooperation with the Departmental Representative. Departmental Representative's decision is final in regards to time and order of work.

.3 Completed schedule will be to the Departmental Representative approval. When schedule has been approved by the Departmental Representative take necessary measures to complete work within scheduled time. Do not change schedule without Departmental Representative's approval.

.4 This work schedule must take into consideration and reflect the Work, special conditions and operational restrictions set out below and as described on the drawings.

.5 Confirm all sub-trades are made aware of the hours of work and operational restrictions.

.6 Interim reviews of work progress based on previously approved schedule will be conducted as decided by PWGSC and schedules will be updated and revised by the Contractor in conjunction with and to approval of PWGSC.

.7 In every instance, work scheduling, no matter how minimal the risk or impact on safety or inconvenience might appear, will be subject to prior review and approval by the Departmental Representative.

3 PHASING OF CONSTRUCTION

.1 Supply sufficient resources and/or Work sufficient hours to complete the Work no later than the dates listed on the Drawings or in these Specifications.

4 OPERATIONAL RESTRICTIONS

.1 Recognize that operations will be affected by implementation of this Contract. Perform the Work with utmost regard to the safety and convenience of users. All work activities must be planned and scheduled with this in mind. The Contractor will not be permitted to disturb any portion of the site without providing temporary facilities as necessary to ensure safe and direct passage through disturbed or otherwise affected areas.

.2 Meet with Departmental Representative on a weekly basis to identify intended work areas, activities and scheduling for the coming week.

.3 To assure that construction work may proceed productively without the risk to safety of BIO users, portions of the work may have to be scheduled for performance in "off-hours".

.4 For the purposes of this contract, "off-hours" are defined generally as the period between 2200 hours and 0600 hours. Dependent on the nature and location of the work and the time of the year, "off-hours" could be subject to redefinition to start or end at adjusted time periods. Scheduling of "off-hours" work will be subject to approval by Departmental Representative.

.5 At all times for the duration of this contract, provide and maintain corridors for safe passage of employees and others during the Work of this contract without exposure to hazards of construction activity and who must also be protected from exposure to dust, noise and hazardous materials. Be aware that all temporary corridors, passageways, etc. must be accessible and that fire escape routes must be accessible and maintained at all times for the duration of the project. Do not, under any circumstances block fire exits or fire routes.

.6 Have at disposal on site for installation as and when required, signage mounted on self-supporting stands and/or trailer-mount type warning the public and users of construction activities in progress and alerting need to exercise caution in proceeding through disturbed areas. Self-supporting signage to be professionally printed, provided on wooden backing, to be coloured and to express bilingual messages as directed by the Departmental Representative. Generally, maximum sign size will be in the order of 1 m^2 in area. Number of signs required will be dependent on number of areas under construction at any one time. Include costs for the

4 OPERATIONAL RESTRICTIONS (Cont'd)

.6 (Cont'd)
supply and installation of these signs in the tender price.

.7 Use dust control by approved materials and methods when required or as directed.

.8 Provide 24 hours notice to Departmental Representative for any activity causing restricted or deminished access to users of operational areas.

END

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

1. This Section details the measurement method to be used for payment purposes. Unit price items and lump sum item measurements are full compensation for the work necessary to complete each item in the contract, in combination for all work necessary to complete the Work as a whole, and provided in accordance with the Construction Schedule and other plans indicated requiring submittal to and approval by the Departmental Representative.

2. The unit price items and lump sum item measurements for all items will be full compensation for the work of the Item and will include but not be limited to the cost of furnishing all labour, materials, tools, construction utilities and equipment necessary to complete the work in accordance with the Contract, Drawings and Specifications, and will cover all costs of surety, mobilization, and assistance to the Departmental Representative. Each item will include but not be limited to all necessary management, supervision, labour, materials, plant and services, security provisions, and all operations and allowances customary and necessary to complete each item and the Contract as a whole notwithstanding the fact that not every such necessary operation is mentioned or included specifically for measurement.

3. All measurement shall be along a horizontal plane unless otherwise indicated.

4. All measurement for lump sum item to be percentage completion basis.

5. The numbers of the unit price items described in this Section correspond to the numbers of the Unit Price Table.

1.2 LUMP SUM ITEM

1. No separate measurement for payment will be made for any work completed under this item.

2. Include all necessary management, supervision, labour, materials, tools, equipment, plant and services, security provisions, and all operations and allowances customary and necessary to complete each item and the Contract as a whole notwithstanding the fact that not every such necessary operation is mentioned or included specifically for measurement.

3. The work of the lump sum will include but not necessarily be limited to the following:
    1. Project Management.
    2. Construction site control and coordination.
    3. Plan and schedule submissions, and other submissions and reports as specified.
    4. Assistance to Departmental Representative.
    5. Mobilization and demobilization.
    6. Departmental Representative's and Contractor's site offices.
    7. Permitting and/or permissions in accordance with requirements of authorities having jurisdiction.
    8. Regulatory requirements.
    9. Coordination of work by external utilities (NSPI, Aliant and any others).
    10. Environmental protection measures beyond unit price items 33 and 34, maintenance and removal.
    11. Pollution and sedimentation control.
    12. Quality Control, independent laboratory monitoring, and independent laboratory testing and reporting.
    13. Blasting Preconstruction Condition Survey and Post-Construction Condition Survey.
    14. Inspections as specified.
    15. Security provisions and allowances.
    16. Temporary works, public utilities maintenance, utilities required for construction, roads and access.
    17. Dust control and snow clearing.
    18. Construction hoarding and shoring.
    19. Control of water and dewatering.
    20. Collection and disposal of demolition materials, surplus materials and wastes.
    21. Protective coatings.
    22. Pipe cleaning and flushing.
    23. Marker tape and marker stakes.
    24. Abandonment of selected underground utilities and works.
    25. Reinstatement of disturbed surfaces with matching materials and thicknesses.
    26. Commissioning.
    27. Training.
    28. Interim records and interim topographic survey data submissions, field records and topographic survey, and record drawings and Operations & Maintenance Manuals.
    29. Warranties.
    30. Cleaning.
    31. All other incidentals.

32. Temporary Fencing, Construction Safety and Access

Provision of temporary fencing as indicated and specified in Section 01 50 00, temporary signage, all equipment and personnel for construction safety and access control, and performed in accordance with Departmental Representative approved plan.

33. Temporary Traffic Control

Provision of traffic control and access including all equipment and personnel required for related temporary construction as specified in Section 01 50 00 and performed in accordance with Departmental Representative approved plan.

34. Electrical Service, Distribution System and Lighting Controls

Provision of functional, fully integrated electrical power and distribution system required to interconnect, commission and operate the Buoy Maintenance Area as indicated on drawings. Includes, but is not necessarily limited to excavation, bedding and backfilling to suit, pad-mount transformer, lighting control cabinet, 600/347V distribution panel located in lighting control cabinet, 120/208V mini power centres, support structures, associated direct-buried conduits and cables, electrical plug-in points, and electrical service connection.

This excludes: concrete-encased ductbanks.

35. Painted Traffic Lines and Markings

Provision of painted traffic lines as indicated and in accordance with colour and geometrical configuration standards specified in the TAC Manual of Uniform Traffic Control Devices.

36. Miscellaneous Demolition

Removal of existing miscellaneous infrastructure elements including but not necessarily limited to excavation, removal and/or relocation of all signs and sign posts, footings, foundations, jersey barriers, fencing, railings, wooden items, and backfill and reinstatement of surfaces which are not

included in other pay items. This item also includes all electrical work associated with removals and relocations, and all work required to return relocated items to fully operational service where indicated.

37. Connections to Existing Watermain

Locating existing main, disconnection of existing system at point of connection, supply and installation of pipe, nipples, fittings, incidentals to provide connection, testing, common excavation, backfilling and all reinstatement to top of subgrade.

38. STC 1000 Interceptor

Excavation, bedding and backfilling to suit, pipe connections, and provision of proprietary pre-cast interceptor assembly as indicated including miscellaneous metals and other incidentals. Also includes adjustment to finished grade as required.

39. 3-Way Valve Manhole

Excavation, bedding and backfilling to suit, and provision of all auxiliary piping, pipe connections, 3-way valve, indicator post head assembly, pipe support, insulation, miscellaneous metals and other incidentals. Also includes adjustment to finished grade as required.

40. Sanitary Connection to Existing Manhole

Locating existing structure, supply and installation of all fittings, repair of structure to suit connection, incidentals to provide connection, testing, common excavation, backfilling and all reinstatement to top of subgrade.

40. Urban Traffic Signs

Provision of complete sign and round sign post assembly in accordance with HRM Standard detail HRM 61 - Sign, and as indicated.

1.3 UNIT PRICE ITEMS

1. Clearing

Unit of Measurement: Square Metre (m^2)

This item includes: cutting and disposal of all trees and brush from area indicated.

2. Grubbing

Unit of Measurement: Square Metre (m^2)

This item includes: removal and disposal of all stumps, roots, downed timber, embedded logs, rootmat and humus off site.

This item also includes the stripping of topsoil, stockpiling on site for re-use on site or as directed by Departmental Representative for future use of surplus remaining.

3. Mass Excavation and Embankment - Common

Unit of Measurement: Cubic Metre (m^3)

Method of Measurement: average end area method between cross sections taken after grubbing, topsoil removal and asphalt removal to lines and elevations indicated.

This item includes: excavation, placement and compaction of embankment elements to lines and elevations indicated, and disposal of surplus, miscellaneous, or unsuitable materials. Dispose of surplus, miscellaneous, or unsuitable materials off site as directed by Departmental Representative.

4. Mass Excavation and Embankment – Rock

Unit of Measurement: Cubic Metre (m^3)

Method of Measurement: average end area method between cross sections. Dimensions used to calculate end areas shall be width and depth from top surface of rock as exposed before excavation to bottom surface of rock as exposed after excavation. Boulders one cubic metre or larger will be classified as rock. Boulders removed from the excavation will be measured along the three maximum perpendicular axes.

This item includes: removal by hammering and/or blasting, mass excavation of rock, placement and compaction to lines and elevations indicated, and disposal of surplus, miscellaneous or unsuitable rock materials on site.

5. Trench Excavation – Rock

Unit of Measurement: Cubic Metre (m^3)

Method of Measurement: average end area method between cross sections. Dimensions used to calculate end areas shall be theoretical trench width and depth from top surface of rock as exposed before excavation to bottom surface of rock as exposed after excavation. Boulders one cubic metre or larger will be classified as rock. Boulders removed from the excavation shall be measured along the three maximum perpendicular axes.

This item includes: removal by hammering and/or blasting, trench excavation of rock, placement and compaction to lines and elevations indicated, and disposal of surplus, miscellaneous or unsuitable rock materials on site.

6. Mass Excavation – Unsuitable Material

Unit of Measurement: Cubic Metre (m^3)

Method of Measurement: average end area method between cross sections taken before and after excavation.

This item includes: excavation and disposal off site.

7. Replacement of Unsuitable or Contaminated Soils with Structural Fill

Unit of Measurement: Cubic Metre (m^3)

Method of Measurement: average end area method between cross sections less theoretical trench volume.

This item includes: placement of Structural Fill material in locations where unsuitable or contaminated material has been excavated beyond the limits of the theoretical trench. Written authorization of Departmental Representative is required prior to this form of replacement work.

8. Watermain

Unit of Measurement: Metre (m)

Method of Measurement: along centreline of pipe through fittings, and valves.

This item includes: provision of pipe system complete with all bedding, fittings and pipe protection, thrust blocks and restraints, insulation, flushing, chlorination, dechlorination, testing, excavation, backfilling and all reinstatement to top of subgrade.

9. Fire Hydrants

Unit of Measurement: Each (Ea)

This item includes: provision of hydrant complete with hydrant tee, lead, gate valve and valve box, fittings, thrust blocks, restraints, insulation, ZN24-48 anodes, flushing, chlorination, dechlorination, testing, excavation, backfilling and all reinstatement to top of subgrade.

10. Direct Buried Valves

Unit of Measurement: Each (Ea)

This item includes: provision of direct buried valves complete with valve boxes, appurtenances, anodes and asphalt aprons where required.

11. Storm Gravity Pipe

Unit of Measurement: Metre (m)

Method of Measurement: along centreline of pipe through manholes and catchbasins.

This item includes: excavation, bedding and backfilling to suit, supply and placement of pipe, complete with all fittings, testing, and reinstatement to top of subgrade.

12. Storm Catchbasins and Manholes

Unit of Measurement: Each (Ea)

This item includes: excavation, bedding and backfilling to suit, pipe connections, supply and placement of manholes and catchbasins, applicable frames and covers, testing, and details as indicated. Also includes adjustment to finished

grade as required.

13. Storm Headwalls

Unit of Measurement: Each (Ea)

This item includes: excavation, bedding and backfilling to suit, pipe connections, and supply and placement of pre-cast concrete headwall complete with galvanized safety screening.

14. Sanitary Gravity Pipe

Unit of Measurement: Metre (m)

Method of Measurement: along centreline of pipe through manholes.

This item includes: excavation, bedding and backfilling to suit, supply and placement of pipe complete with all fittings, testing, and reinstatement to top of subgrade.

15. Sanitary Manholes

Unit of Measurement: Each (Ea)

This item includes: excavation, bedding and backfilling to suit, pipe connections, supply and placement of manholes, including waterproofing system, insulation, applicable frames and covers, testing, and details as indicated. Also includes adjustment to finished grade as required.

16. Closed Circuit Television (CCTV) Inspection

Unit of Measurement: Metre (m)

Method of Measurement: along centreline of pipe.

This item includes: television inspections, records and reports of storm and sanitary gravity lines. Also includes mandrill testing of all pipes prior to videoing.

17. High-Mast Lighting Tower

Unit of measurement: Each (Ea)

This item includes: provision high-mast lighting tower unit including but not necessarily limited to excavating, bedding and backfilling to suit, reinforced concrete base, pole and mounting

hardware, light fixtures and internal wiring system as indicated on the Project Drawings.

18. Concrete-Encased Ductbank

Unit of Measurement: Metre (m)

Method of Measurement: along centreline of ductbank.

This item includes: provision of concrete-encased ductbank. Includes, but is not necessarily limited to excavation, bedding and backfilling to suit, conduit and associated fittings, conduit spacers, concrete, reinforcing steel and conduit pull strings. Also includes: provision of termination details at utility pole and transformer connection points in accordance with NSP standards.

19. Bollards

Unit of Measurement: Each (Ea)

This item includes: excavation, supply and placement of electrically insulated or conventional non-insulated bollards as indicated on the Project Drawings.

20. Armour Stone Swale

Unit of Measurement: Linear Metre (m)

Method of Measurement: along centreline of swale invert.

This item includes: excavation, geotextile liners, and type 2 and armour materials to provide for swale assembly as indicated on the Project Drawings.

21. Rip-Rap

Unit of Measurement: Square Metre (m^2)

Method of Measurement: slope measure.

This item includes: placement of Type 2 bedding and Rip-Rap for embankment reconstruction as indicated on the Project Drawings.

22. Surge - Type C3

Unit of Measurement: Cubic Metre (m^3)

Method of Measurement: average end area method of volume of surge material between cross sections taken before and after excavation.

This item includes: placement and compaction of Surge rock as directed by Departmental Representative.

23. Boulder Safety Barrier

Unit of Measurement: Metre (m)

Method of Measurement: along centreline of boulder wall.

This item includes: provision of boulders for safety barrier at position and intervals as indicated on drawings.

24. Gravel Type 1

Unit of Measurement: Metric ton (tonne)

Method of Measurement: approved truck slips.

This item includes: placement and compaction of Type 1 gravel as indicated.

25. Gravel Type 2

Unit of Measurement: Metric ton (tonne)

Method of Measurement: approved truck slips.

This item includes: placement and compaction of Type 2 gravel as indicated.

26. Asphalt

Unit of Measurement: Metric ton (tonne)

Method of Measurement: approved truck slips.

1. Asphalt Type C-HF and Tack Coat

This item includes: supply, placement, compaction and testing of type C-HF asphalt to the thickness indicated and application of tack coat as specified.

2. Asphalt Type B-HF and Prime Coat

This item includes: supply, placement, compaction and testing of type B-HF asphalt to the thickness indicated and application of prime coat as specified.

27. Concrete Specialties

1. Washdown Pad

Unit of Measurement: Square Metre (m^2)

This item includes: provision of functioning washdown pad including but not necessarily limited to Type 1 and 2 gravels as indicated, reinforced concrete structure, jointwork, lateral connections, and integral cast pre-cast base units including frames and covers as indicated on the Project Drawings.

2. Chain Laydown Area

Unit of Measurement: Square Metre (m^2)

This item includes: provision of heavy-duty concrete pavement structure including but not necessarily limited to Type 1 and 2 gravels as indicated, and concrete panels complete with various jointwork as indicated on the Project Drawings.

28. W-Beam Guiderail

Unit of Measurement: metre (m)

Method of Measurement: along top of guiderail from terminal end to terminal end.

This item includes: provision of guiderail assemblies as indicated on the Project Drawings.

29. Fencing, Chainlink

Unit of Measurement: Metre (m)

Method of Measurement: slope measure.

This item includes: provision of fencing complete with gates (new or salvaged as applicable) and fencing footings as indicated on the Project Drawings.

This item also includes: re-use of existing fence components and/or elements where indicated.

30. Topsoil and Sod

Unit of Measurement: Square Metre (m^2)

Method of Measurement: slope measure.

This item includes: subgrade preparation to receive topsoil, supply and placing of topsoil, mulch, erosion control agent, straw protection, water lime and fertilizer as specified, and maintenance.

31. Hydraulic Seeding

Unit of Measurement: Square Metre (m^2)

Method of Measurement: slope measure of indicated area at mean depth.

This item includes: subgrade preparation to receive topsoil, supply and placing of topsoil, supply and placing hydraulic seeding mix, mulch, erosion control agent, straw protection, water and fertilizer as specified, and maintenance.

32. Jersey Barrier Unit

Unit of Measurement: Each (Ea)

This item includes: provision of standard pre-cast concrete jersey barrier units as indicated on the Project Drawings.

33. Sediment Control Fence

Unit of Measurement: Metre (m)

Method of Measurement: slope measure.

This item includes: supply, installation, maintenance and removal, including stakes and fabric, and reinstatement of area.

Quantity indicated in the Unit Price Table represents maximum quantity to be paid under the contract. All other additional Sediment Control Fencing and/or other environmental protection measures, installations, and related maintenance and removals required to satisfy environmental protection requirements remain the responsibility

of the Contractor, are incidental to the work and will not be measured for payment.

34. Sediment Control Berm

Unit of Measurement: Each (Ea)

This item includes: supply, installation, maintenance and removal, sediment removal and reinstatement of area as indicated on the Project Drawings.

Quantity indicated in the Unit Price Table represents maximum quantity to be paid under the contract. All other additional Sediment Control Berms and/or other environmental protection measures, installations, and related maintenance and removals required to satisfy environmental protection requirements remain the responsibility of the Contractor, are incidental to the work and will not be measured for payment.

35. Demolition and Removal

1. Storm System Demolition

Unit of Measurement: Metre (m)

Method of Measurement: along the centre of removed pipe through manholes and catchbasins.

This item includes: excavation, removal and disposal off-site, and reinstatement to top of subgrade as required.

2. Storm Manhole/Catchbasin Demolition

Unit of Measurement: Each (Ea)

This item includes: excavation, disconnection, removal and disposal of complete units off site, and backfilling as indicated to accommodate design.

3. Disposal of Existing Construction Waste

Unit of Measurement: Metric ton (tonne)

Method of Measurement: approved truck slips.

This item includes: disposal off site of existing miscellaneous unsuitable, randomly mixed, construction waste and debris currently located within the Buoy Maintenance Area in

accordance with Nova Scotia Environment regulations. Items for disposal include but are not necessarily limited to: reinforced concrete, plain concrete, asphalt, scrap metal, brick, block, random construction demolition debris, various pipe, waste granular materials, soils, and garbage.

4. Disposal of Existing Fencing

Unit of Measurement: Metre (m)

Method of Measurement: slope measure.

This item includes: disposal off site of existing chain link fencing and fencing footings to be removed, currently located within the Buoy Maintenance Area, in accordance with Nova Scotia Environment regulations.

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Inspecting and testing by inspecting firms or testing laboratories designated by Departmental Representative for the purpose of carrying out Quality Assurance testing.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

.1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under various sections.

1.3 APPOINTMENT AND PAYMENT

.1 Departmental Representative will appoint and pay for services of testing laboratory for purposes of Quality Assurance except as follows:
.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
.2 Inspection and testing performed exclusively for Contractor's convenience.
.3 Testing of electrical equipment and systems.
.4 Mill tests and certificates of compliance.
.5 Quality Control tests specified to be carried out by Contractor as indicated in Sections 01 45 00 and 01 91 31.
.6 Additional tests specified in the following paragraph.

.2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, the Contractor will pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected Work.

1.4 CONTRACTOR'S RESPONSIBILITIES

.1 The Contractor is responsible for Quality Control. Refer to Section 01 45 00

.2 Provide labour, equipment and facilities to:
.1 Provide access to Work to be inspected and tested.
.2 Facilitate inspections and tests.

.2 (Cont'd)

(Cont'd) .3 Make good Work disturbed by inspection and test.

.4 Provide storage on site for Departmental Representative's laboratory's exclusive use to store equipment and cure test samples.

.3 Notify Departmental Representative in accordance with Section 01 45 00 to allow for assignment of laboratory personnel and scheduling of test.

.4 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.5 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

PART 2 - PRODUCTS Not applicable.

PART 3 - EXECUTION Not applicable.

END

1 ADMINISTRATIVE

.1 The Departmental Representative will:
.1 Schedule and administer project progress meetings during the progress of the Work.
.2 Prepare agenda for meetings.
.3 Distribute written notice of each meeting four days in advance of meeting date to the Contractor.
.4 Provide physical space and make arrangements for meetings.
.5 Preside at meetings.
.6 Record the minutes. Include significant proceedings and decisions. Identify action by the parties.
.7 Reproduce and distribute copies of minutes within three days after each meeting and transmit to meeting participants and the Contractor.

.2 Representatives of Contractor, Subcontractor and suppliers attending meetings shall be qualified and authorized to act on behalf of the party each represents.

.3 The Contractor will administer additional meetings as specified in other sections of this specification.

2 PRECONSTRUCTION MEETING

.1 Within five (5) calendar days after award of Contract, the Departmental Representative will schedule a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Senior representatives of BIO, PWGSC, Security personnel, Departmental Representative, Contractor, major Subcontractors to be in attendance.

.3 Departmental Representative will establish time and location of meeting and notify parties concerned minimum two (2) days before meeting.

.4 Agenda to include the following:
.1 Appointment of official representatives of participants in the Work, including the Contractor's Site Departmental Representative.
.2 Schedule of Work, progress scheduling, work phases and plans. Refer to Section 01 32 16.
.3 Quality Management Plan (QMP) and related items: refer to Section 01 45 00.
.4 Submission schedule for:
.1 Quality Management Plan: Refer to Section 01 45 00.
.2 Fire Safety Plan.
.3 Commission Plan: Refer to Section 01 91 31.

2 PRECONSTRUCTION MEETING (Cont'd)

.4 Agenda to include the following:(Cont'd)

.4 Submission schedule for:(Cont'd)

.4 Health and Safety Plan: Refer to Section 01 35 29.

.5 Environmental Protection Plan: Refer to Section 01 35 43.

.6 Traffic Control Plan and associated Temporary Layout Plans: Refer to Section 01 50 00.

.7 Water System Operations Plan: Refer to Section 33 11 00.

.8 Water System Commissioning Plan: Refer to Section 33 11 00.

.5 Schedule of submission of shop drawings, samples in accordance with Section 01 33 00.

.6 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences.

.7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

.8 As-built drawings.

.9 Maintenance data.

.10 Take-over procedures, acceptance, warranties.

.11 Monthly progress claims, administrative procedures, photographs, holdbacks.

.12 Appointment of inspection and testing agencies or firms.

.13 Insurances, transcript of policies.

.14 Safety, traffic control, security requirements.

3 CONSTRUCTION PROGRESS MEETINGS

.1 During course of Work, progress meetings will initially be scheduled weekly by the Departmental Representative.

.2 Contractor, Contractor's Site representative, major Subcontractors involved in Work, PWGSC and BIO to be in attendance.

.3 Notification: minimum two (2) days prior to meetings.

.4 The Departmental Representative will circulate record minutes of meetings to attending parties and affected parties not in attendance within three (3) days after meeting.

.5 Agenda will include, but not necessarily be limited to:

.1 Safety.

.2 Design and construction.

.3 Schedule.

3 CONSTRUCTION PROGRESS MEETINGS (Cont'd)

.5 (Cont'd)

.4 Contractor's QMP Progress Report.

.5 Operations coordination.

END

PART 1 - GENERAL

1.1 DEFINITIONS

.1 Activity: An element of Work performed during course of Project. An activity normally has an expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart): A graphic display of schedule related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: Original approved plan (for Project, work package, or activity), plus or minus approved scope changes.

.4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.

.5 Duration: Number of work periods (not including holidays or other nonworking periods) required to complete an activity or other Project element. Usually expressed as workdays or workweeks.

.6 Master Plan: A summary level schedule that identifies major activities and key milestones.

.7 Milestone: A significant event in Project, usually completion of major deliverable.

.8 Project Schedule: The planned dates for performing activities and the planned dates for meeting milestones. A dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

.9 Project Planning, Monitoring and Control System: Overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

1.2 PROJECT MILESTONES

.1 Incorporate project schedule compulsory milestones into the Contractor's Master Plan and Detailed Schedule as follows:

.1 Within 2 weeks of award: Completion of initial environmental protection mitigation measures, installation of site office trailers and required submissions.

.2 Within 10 weeks of award: Completion of subgrade construction (including clearing, grubbing, common and rock excavation, fill, rough ditching, excess stockpiling, and earthworks) and underground utility services.

.3 Within 12 weeks of award: Completion of sub-base gravels, rip-rap, guiderails and concrete pads.

.4 Within 14 weeks of award: Completion of base gravels. The supply of base gravels to the site and their installation on site prior to contract completion date is acceptable to the Departmental Representative as an alternative in the schedule to completion within 14 weeks of award.

.5 Prior to 31 March 2014: Completion of electrical systems (including transformer and transfer switches, light poles, lights, underground conduits, etc.).

.6 Prior to contract completion date: Completion of hot-mix asphalt paving, site reinstatement and all other specified work items.

1.3 REQUIREMENTS

.1 Confirm Master Plan and Detail Schedules are practical, remain within specified Contract duration and satisfies requirements of Phasing Plan.

.2 Plan to complete Work in accordance with prescribed milestones, time frame and construction restrictions.

.3 Limit activity durations to maximum of approximately ten (10) working days, to allow for progress reporting.

.4 Confirm that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.4 SUBMITTALS

.1 Submit to Departmental Representative within five (5) working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.2 Submit Project Schedule to Departmental Representative within ten (10) working days of acceptance of Master Plan.

1.5 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 Clearly indicate Phasing Plan construction phase of each activity.

.3 Departmental Representative will review and return revised schedules within five (5) working days.

.4 Revise impractical schedule and resubmit within five (5) working days.

.5 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.6 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Confirm detailed Project Schedule includes as minimum milestone and activity types as follows:

.1 Award.
.2 Shop Drawings, Samples.
.3 Permits.
.4 Mobilization.
.5 Excavation.
.6 Backfilling.
.7 Paving.
.8 Water System.
.9 Storm System.
.10 Sanitary System.
.11 Concrete Work.
.12 Lighting.
.13 Electrical.
.14 Piping.
.15 Testing and Commissioning.
.16 Supplied equipment - long delivery items.

1.7 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.8 PROJECT MEETINGS

.1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable.

END

1 RELATED SECTIONS

.1 Quality Control: Section 01 45 00

.2 Project Closeout: Section 01 77 00

2 ADMINISTRATIVE

.1 This section specifies general requirements and procedures for submissions of shop drawings, product data, samples, and as-built drawings to Departmental Representative for review. Additional specific requirements for submissions are specified in individual sections of these specifications.

.2 Submit to Departmental Representative submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

.3 Work affected by submittal shall not proceed until review is complete.

.4 Present all information in SI Metric units.

.5 Where items are or information is not produced in SI Metric units converted values are acceptable.

.6 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 co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.

.7 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.8 Verify field measurements and affected adjacent Work are coordinated.

.9 Contractor's responsibility for errors and omissions in submissions is not relieved by Departmental Representative's review of submittals.

.10 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative's review.

2 ADMINISTRATIVE (Cont'd)

.11 Keep one (1) reviewed copy of each submission on site.

3 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.3 Electronically submit all shop drawings and product data. Provide via e-mail PDF file format for the Departmental Representative's review.

.4 Allow five (5) working days for Departmental Representative's review of each submission.

.5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of any revisions other than those requested.

.7 Accompany submissions with transmittal letter, in duplicate, containing:
.1 Date.
.2 Project title and number.
.3 Contractor's name and address.
.4 Identification and quantity of each shop drawing, product data and sample.
.5 Other pertinent data.

.8 Submissions to include:
.1 Date and revision dates.
.2 Project title and number.

3 SHOP DRAWINGS AND PRODUCT DATA (Cont'd)

.8 Submissions to include:(Cont'd)
.3 Name and address of:
.1 Subcontractor.
.2 Supplier.
.3 Manufacturer.
.4 Contractor's engineer's stamp, signed by Contractor's engineer certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
.5 Details of appropriate portions of Work as applicable:
.1 Fabrication.
.2 Layout, showing dimensions, including identified field dimensions, and clearances.
.3 Setting or erection details.
.4 Capacities.
.5 Performance characteristics.
.6 Standards.
.7 Operating weight.
.8 Wiring diagrams.
.9 Single line and schematic diagrams.
.10 Relationship to adjacent work.

.9 After Departmental Representative's review, distribute copies.

.10 Delete information not applicable to project.

.11 Supplement standard information to provide details applicable to project.

.12 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. E-mailed submissions will be responded to by e-mail. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

4 SAMPLES

.1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to Departmental Representative's business address site office.

.3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.

4 SAMPLES (Cont'd)

.4 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.5 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.

.6 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

.7 Where samples are rejected, new samples shall be submitted as soon as possible after notification of rejection. New samples shall be marked "Second Submission", in addition to the required information on the label.

.8 Remove rejected samples from the site.

5 INTERIM SURVEY RECORDS

.1 Interim total station survey record documents will be provided weekly as indicated in Section 01 10 00.

.2 Provide total station topographied survey data of sufficient detail and resolution to allow accurate quantity take offs for purposes of volume and area measurements for payment to satisfaction of Departmental Representative. Lack of sufficient data will cause delay or prevent payment of progress claims.

.3 Provide interim record and feature code data in accordance with latest PWGSC CAD standards.

.4 Provide interim record data and feature code of water and sanitary sewer infrastructure specifically in accordance with requirements set forth in "Halifax Water Design and Construction Specifications (Municipal Water & Wastewater Systems)", 2013 Edition.

6 AS-BUILT DRAWINGS

.1 As the Work progresses, indicate changes and deviations in the location of Work concealed by the finished Work, and such other approved changes that occur during progress of Work, to ensure that an accurate record is provided for future maintenance and alterations.

6 AS-BUILT DRAWINGS (Cont'd)

.2 Provide record and feature code data in accordance with latest PWGSC CAD standards.

.3 Provide record data and feature code of water and sanitary infrastructure specifically in accordance with requirements set forth in "Halifax Water Design and Construction Specifications (Municipal Water & Wastewater Systems)", 2010 Edition.

.4 White prints will be provided by the Departmental Representative. Record changes in the Work on these prints in red ink.

.5 Dimension location of concealed Work: indicate at which point dimension is taken to concealed Work. Dimension all terminations and offset of runs of concealed Work.

.6 Record Work constructed differently than shown on Contract Documents, changes in the work caused by site conditions, by Departmental Representative, Contractor and subcontract originated changes, and by site instruction, supplementary instruction, field orders, change orders, addenda, correspondence and directions of jurisdictional authorities.

.7 Pay the cost of uncovering and making good facilities, systems and services, which have been installed prematurely, before specified as-built measurements have been obtained by the Contactor and approved by the Departmental Representative.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submissions.

.9 Record the following information:
.1 Location of utilities and appurtenances concealed in construction, referenced to visible and accessible features.
.2 Field changes of dimension and detail.
.3 Location of all capped or terminated services and utilities.
.4 Chases for mechanical, electrical and other services.
.5 Elevations.
.6 Electrical service installation locations all to be dimensioned and referenced.
.7 All design elevations and details dimensioned and marked-up to consistently report finished installation conditions.

6 AS-BUILT DRAWINGS (Cont'd)

.10 Adhere to the following Quality Control Tolerances:
.1 Take horizontal measurements to an accuracy of 25 mm plus or minus.
.2 Take vertical measurements to an accuracy of 25 mm plus or minus.
.3 Present all as-built drawing measurements in SI metric units.
.4 Measure elements which fall within the scope of the contract and locate in reference to the coordinate system used.

.11 Identify each as-built drawing as a "Project As-Built Copy". Maintain in good condition, do not use for construction purposes and make available to Departmental Representative at all times. Submit electronic versions of all hard copy submissions on CD.

.12 Maintain in a state current to Project. Such state will be considered a condition precedent for validation of applications for payment. The Departmental Representative's visual review will constitute proof that as-built drawings are current.

.13 Submit complete Project as-built drawings to the Departmental Representative with application for Certificate of Completion.

END

1 CODES AND STANDARDS

.1 All contract forms, codes, specifications, standards, manuals, and installation application and maintenance instructions referred to in the Specifications will be of the latest published editions at the date of submission of the Tender unless otherwise stated in the Specifications or not acceptable to the authorities having jurisdiction. Specifications establish minimum acceptable standards of materials and workmanship. Materials and workmanship must meet or exceed requirement of the reference standards specified.

.2 Where no standard is referred to, materials or workmanship must meet requirements of the applicable standard of the Canadian Standards Association, Canadian General Standard Board or the National Building Code, whichever is the most stringent according to the Departmental Representative.

.3 Nothing contained in the Contract Documents shall be so construed as to be in conflict with any law, by-law, or regulation of the municipal, provincial or other authorities having jurisdiction. Perform Work in conformity with all such laws, by-laws, and regulations.

2 REQUIREMENTS OF REGULATORY AGENCIES

.1 Exercise pollution and environmental control of construction activities as required during the Work.

.2 Except where special permission is obtained maintain clear access on public roads.

.3 Maintain road, parking and frontage curbs clear of construction materials and debris, including excavated materials. Clean and sweep areas as frequently as required to ensure that they are free of materials, debris and excavated materials.

3 FIRE RATINGS

.1 Where Specifications require a material, component, or assembly to be fire rated, the fire rating shall be as determined or listed by one of the following testing authorities if approved by the appropriate authorities having jurisdiction:

.1 Underwriter's Laboratories of Canada (ULC).
.2 Underwriter's Laboratories Inc. (ULI).
.3 Factory Mutual Laboratories (FML).
.4 The National Board of Fire Underwriter's (NBFU).
.5 Insurance Advisory Organization (IAO).
.6 Warnock Hersey Testing (WHT).

3 FIRE RATINGS (Cont'd)

.2 Where reference is made to only one testing authority, an equivalent fire rating as determined or listed by any other authority mentioned above is acceptable if approved by the authorities having jurisdiction.

4 TRADEMARKS AND LABELS

.1 Trademarks and labels, including applied labels shall not be visible in the finished work. Such trademarks or labels shall be removed by grinding if necessary, or painted out where the particular material has been painted.

.2 The exception of this requirement will be those essential to obtain identification of mechanical and electrical equipment and those required to be visible by authorities having jurisdiction.

5 SMOKING

.1 Comply with smoking restrictions as put forth by BIO.

END

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Comply with Occupational Health and Safety Act, 1996, C.7 S.1

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

1.2 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).

.3 National Building Code of Canada, Part 8.

.4 Province of Nova Scotia
- .1 Occupational Health and Safety Act, 1996, C.7 S.1

1.3 COMPLIANCE REQUIREMENTS

.1 Comply with Occupational Health and Safety Act for Province of Nova Scotia, and Regulations made pur suant to the Act.

.2 Comply with Canada Labour Code - Part II (entitled Occupational Heafth and Safety) and the Canada Occupational Heafth and Safety Regulations (COSH) as well as any other regulations made pursuant to the Act.

.3 Observe construction safety measures of:
- .1 Part 8 of National Building Code.
- .2 Municipal by-laws and ordinances.

.4 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply.

.5 Maintain Workers Compensation Coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter in Good Standing.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Make submittals to Departmental Representative in accordance with Section 01 33 00 - Submittal Procedures of the following documents including all updates issued as they occur:

.1 Site-specific Health and Safety Plan. Health and Safety Plan must include:

.1 Results of site specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for site tasks and construction operations found in work plan.

.3 Submit one (1) electronic copy in pdf file format of Contractor's authorized representative's work site health and safety inspection reports.

.4 Reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.5 Incident and accident reports.

.6 WHMIS MSDS - Material Safety Data Sheets.

.7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within five (5) days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within five (5) days after receipt of comments from Departmental Representative.

.8 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.

.9 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.

.10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations. Provide emergency contact numbers to Departmental Representative.

1.5 HEALTH AND SAFETY REPRESENTATIVE

.1 Designate qualified and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

.1 Have site-related working experience specific to project activities.

.2 Have working knowledge of occupational safety and health regulations.

1.5 HEALTH AND SAFETY REPRESENTATIVE (Cont'd)

.1 (Cont'd)
.3 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
.4 Be on site during execution of Work.
.5 Assign designated Health & Safety Site Representative and provide information showing proof of Representative's competence and reporting relationship in Contractor's company.

1.6 SAFETY MEETINGS

.1 Prior to commencement of Work, attend health and safety meeting conducted by Departmental Representative. Have Contractor's Site Superintendent in attendance. Departmental Representative will advise of time and location.

.2 Provide site safety orientation session to workers and other authorized persons prior to granting them access to work site. Brief persons on site conditions and on the minimum site safety rules in force at site.

.3 Conduct site specific occupational health and safety meetings during the entire work as follows:
.1 Formal meetings on a minimum monthly basis.
.2 Informal tool box meetings on a regular basis from a predetermined schedule.

.4 Keep workers informed of anticipated hazards,on safety practices and procedures to be followed and of other pertinent safety information related to:
.1 Progress of Work;
.2 New sub-trades arriving on site and;
.3 Changes in site and project conditions.

.5 Record and post minutes of meetings. Make copies available to Departmental Representative upon request.

1.7 HEALTH AND SAFETY PLAN

.1 Develop written site-specific Project Health and Safety Plan, based on hazard assessments, prior to commencement of work. Submit plan to Departmental Representative within seven (7) calendar days of Contract Award date.

.2 Health and Safety Plan shall contain the following three (3) parts:
.1 Part 1: List of individual health risks and safety hazards identified by hazard assessments.

1.7 HEALTH AND SAFETY PLAN (Cont'd)

.2 (Cont'd)

.2 Part 2: List of specific measures to control or mitigate each hazard and risk identified in part one of Plan. Describe the engineering controls, personnel protective equipment and safe work practises to be implemented and followed when performing work related to each identified hazard or risk.

.3 Part 3: Emergency Measures and Communications Procedures as follows:

.1 Emergency Measures: on-site operating procedures,evacuation measures and emergency response to be implemented in the occurrence of an incident. Procedures to be specific and relevant to identified hazards. Measures to complement and be integrated withthe facility and tenants Emergency Response Plans in place at site.

.1 On-site Contingency and Emergency Response Plan shall include:

.1 Operational procedures, evaculation measures and communication process to be implemented in the event of an emergency.

.2 Evacuation Plan: site and fIoor plan layouts showing escape routes, marshalling areas. Detaifs on alarm notification methods, fire drills, location of fire fighting equipment and other refated data.

.3 Name, dutie and responsibilities of persons desiqnated as Emergency Warden(s) and deputies.

.4 Emergency Contacts: name and telephone number of officials from:

.1 General Contractor and subcontractors.

.2 Pertinent Federal and Provincial Departments and Authorities having jurisdiction.

.3 Local emergency resoure organizations.

.5 Harmonize Plan with Facility's Emergency Response and Evacuation Plan. Departmental Representative will provide pertinent data including name of Facility Management contacts.

.2 Communication Procedures:

.1 List of names and telephone numbers of designated officials, to be contacted should an incident or emergency situation occur, including the following:

.1 Contractor and all Subcontractors.

1.7 HEALTH AND SAFETY PLAN (Cont'd)

.2 (Cont'd)

.3 Part 3:(Cont'd)

.2 Communication Procedures:(Cont'd)

.2 Federal and Provincial Departments and local emergency resources organizations, as resources organizations, as applicable laws and regulations.

.3 Officials from facilities located in vicinity where work is carried out. Departmental Representative will provide list of names to be included.

.2 Implement procedures at site to communicate and share information between workers, subcontractors, and General Contractor on work activities, and in particular those which might endanger workers and employees.

.3 List of critical construction activities to be communicated with the Departmental Representative which could affect operations, or pose a risk to the health and safety of employees and to the general public. Develop list in consultation with the Departmental Representative.

.3 Prepare Health and Safety Plan in a three column format, addressing the three parts specified above, as follows:

Column 1	Column 2	Column 3
Identified Hazard	Control Measures Implemented	Emergency Measures & Communications Procedures

.4 Develop Health and Safety Plan in collaboration with all subcontractors. Address all work and activities of subcontractors as they arrive on site. Immediately update Plan and submit to Departmental Representative.

.5 Implement, maintain and enforce compliance with requirements of the Health and Safety Plan until final completion of work and demobilization from site.

.6 As Work progresses, review and update Plan addressing additional health risks and safety hazards identified byon-going hazard assessments.

.7 Submit revised versions of Plan to Departmental Representative.

1.7 HEALTH AND SAFETY PLAN (Cont'd)

.2 (Cont'd)

.3 Part 3:(Cont'd)

.8 Post a typed written copy, including all updates, of the Health and Safety Plan in a common visible location at work site.

.9 Submission of the Health and Safety Plan, and updates, to the Departmental Representative is for review and information purposes only. It's submission will not be construed to imply the approval by Departmental Representative, be interpreted as a warranty of being complete, accurate and legislative compliant and shall not relieve Contractor of their legal obligations for the provision Health and Safety on the construction project.

.10 Assign responsibility, obligation and authority to such designated person(s) to stop and start Work as deemed necessary for reasons of health and safety.

.11 Provide names of designated individuals to Departmental Representative.

.12 Conduct regularly scheduled safety inspections of work site as follows:

.1 Informal Inspections:carry out on a minimum bi-weekly basis. Note deficiencies and remedial action taken in a log book or diary.

.2 Formal Inspections: carry out on a minimum monthly basis. Use standardized safety checklist forms. Prepare written report for each formal inspection. Document deficiencies, remedial action needed and assign responsibility for rectification to appropriate subcontractor or worker.

.13 Distribute monthly reports to subcontractors for their pursuance. Follow-up and ensure appropriate action and corrective measures are taken.

.14 Maintain safety inspection documentation on site. Submit copies of formal inspection reports to Departmental Representative.

.15 All persons in Contractor's employ responsible for health and safety requirements specified in the Contract Documents to be competent in Occupational Health and Construction Safety as defined in the Provincial Occupational Health And Safety Act.

1.8 FILING OF NOTICE

.1 File Notice of Project with pertinent provincial health and safety authorities prior to beginning of Work.

1.9 PROJECT/SITE CONDITIONS

.1 The following are known or potential project related safety hazards at site:
.1 Work immediately adjacent/atop high steep embankments with heavy equipment and construction personnel.
.2 Local Traffic.
.3 Working adjacent to rockcuts which have potential to release rock into ditches and onto roadway below.
.4 Blasting operations.
.5 Working near saltwater.
.6 Trenching.
.7 Lifting/crane work.
.8 High voltage installations.
.9 Other construction contractors working on or nearby site.
.10 BIO staff and public at large moving around site.

.2 Obtain from Departmental Representative, copy of MSDS Data sheets of existing hazardous materials stored on site or being used by facility personnel in the course of their operations.

.3 Above lists will not be construed as being complete and inclusive of all safety and health hazards encountered as a result of Contractor's operations during the course of Work. Include above items into the hazard assessment program specified herein.

1.10 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

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

1.11 MINIMUM SITE SAFETY RULES

.1 Notwithstanding requirement to abide by federal and provincial health and safety regulations, ensure the following minimum safety rules are obeyed by persons granted access to Work Site:
.1 Wear appropriate PPE pertinent to the Work or assigned task; minimum being hard hat, sfety footwear, safety glasses and hearing protection.
.2 Immediately report unsafe condition at site, near-miss accident, injury and damage.
.3 Maintain site and storage areas in a tidy condition free of hazards causing injury.
.4 Obey warning signs and safety tags.

.2 Brief persons of disciplinary protocols to be taken for non-compliance. Post rules on site.

1.12 SITE CONTROL AND ACCESS

.1 Control Work site and entry points. Grant and allow entry to only workers and other persons so authorized. Immediately stop non-authorized persons from circulating within construction areas and remove from site.

.2 Implement procedures for granting permission to enter onto work site to all persons who require access. Procedures to include the provision of a site safety orientation session.

.3 Delineate and isolate construction areas from other areas of site by use of appropriate means. Erect barricades, fences, hoarding and temporary lighting as required. See Section 01 50 00, Section 01 35 00 and 01 57 00 for minimum requirements.

.4 Erect signage at entry points and at other strategic locations around site, clearly identifying construction area(s) as being "off-limits" to non-authorized persons. Signage must be professionally made in both official languages or by use of well understood graphic symbols.

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

.6 Ensure persons granted access are fitted and wear appropriate personnel protective equipment (PPE). Be responsible for the provision of such PPE to persons who require access to conduct work or perform inspections.

1.13 HAZARD ASSESSMENTS

.1 Implement and carry out a health and safety hazard assessment program as part of the work. Program to include:

.1 Initial hazard assessment carried out immediately upon notification of contract award and prior to commencement of work.

.2 On-going hazard assessments performed during the progress of work identifying new or potential health risks and safety hazards not previously known. As a minimum, carry out hazard assessments when:

.1 New subtradework, new subcontractor(s) or new workers arrive at the site to commence another portion of the work.

.2 The scope of work has been changed by Change Order.

.3 Potential hazard or weakness in current health and safety practices are identified by Departmental Representative or by an authorized safety representative.

.3 Hazard assessments to be project and site specific, based on review of contract documents, site and weather conditions.

.4 Each hazard assessment to be made in writing. Keep copies of all assessments on site for duration of work. Upon request, make available to Departmental Representative for inspection.

1.14 PROTECTION

.1 Provide temporary facilities for protection and safe passage of pedestrians and vehicular traffic around and adjacent to work site.

.2 Provide safety barricades, lights and signage on work site as required to provide a safe working environment for workers.

.3 Carry out work placing emphasis on health and safety of public, employees, site personnel and protection of the environment.

1.15 PERMITS

.1 Obtain permits, licenses and compliance certificates, at appropriate times and frequency as stipulated by authorities having jurisdiction.

.2 Where particular permit or compliance certificate cannot be obtained at the required stage of work, notify Departmental Representative in writing and obtain Departmental Representative's approval to proceed prior to carrying out that portion of work.

1.15 PERMITS (Cont'd)

.3 Post all permits on site. Submit copies to Departmental Representative.

1.16 RESPONSIBILITY

.1 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.

.2 Comply with and enforce compliance by employees and other persons granted access to work site with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.17 INCIDENT REPORTING

.1 Investigage and report the following incidents to Departmental Representative:
.1 Incidents requiring notification to Provincial Department of Occupational Safety and Health, Workers Compensation Baord or to other regulatory Agency.
.2 Medical aid injuries.
.3 Property damage in excess of $10,000.00.
.4 Interruptions to Facility operations resulting in an operational loss to a Federal department in excess of $5,000.00.

.2 Submit report in writing.

1.18 TRAINING

.1 Confirm that workers, subcontractors and other authorized persons granted access to site are trained and have been fully instructed, by a qualified instructor, on:
.1 Safe operation of tools and equipment.
.2 Conduct proper wearing and use of personnel protective equipment (PPE) training as applicable to the purpose and activities to be conducted on site.
.3 Follow safe work practices and procedures during the performance of their given work tasks or function on site.
.4 Provide site conditions and minimum site safety rules at the site orientation sessions.

.2 Make training records readily available for review by Departmental Representative upon request.

1.19 TOOLS AND EQUIPMENT SAFETY

.1 Implement and follow a scheduled tool and equipment inspection/maintenance program at work site. Regularly check tools, equipment and machinery for safe operation and perform maintenance at pre-established time and frequency intervals as recommended by manufacturer. Include subcontractors equipment as part of the inspection process.

.2 Use standardized checklists to ensure established safety checks are stringently followed.

.3 Immediately tag and remove items found faulty or defective off site.

.4 Maintain written documentation on each inspection. Make available to Departmental Representative upon request.

1.20 HAZARDOUS PRODUCTS

.1 Comply with requirements of Workplace Hazardous Materials Information Systems (WHMIS).

.2 Keep MSDS data sheets on site. Provide copies of all data sheets to Departmental Representative upon receipts of materials on site.

.3 Post all MSDS data sheets on site, in a common area, visible to workers.

1.21 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.

1.22 POSTING OF DOCUMENTS

.1 Confirm applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Nova Scotia and in consultation with Departmental Representative.

1.23 CORRECTION OF NON-COMPLIANCE

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

1.23 CORRECTION OF NON-COMPLIANCE (Cont'd)

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

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

1.24 BLASTING

.1 Refer to Section 31 23 16 - Rock Removal.

1.25 POWDER ACTUATED DEVICES

.1 Use powder actuated devices only after receipt of written permission from Departmental Representative.

1.26 WORK STOPPAGE

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

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable.

PART 1 - GENERAL

1.1 WORK INCLUDED

.1 This Section outlines environmental protection procedures to be planned and implemented by the Contractor in the event hazardous material, pollution control and disposal is required during construction.

.2 The Departmental Representative will monitor and test excavated rocks, soils and groundwater to establish level of contamination encountered. The Departmental Representative will provide direction on the extent of control and disposal effort required by the Contractor.

.3 The Environmental Protection Plan submitted by the Contractor must provide for disposal of hazardous and/or contaminated materials, soils, and/or groundwater off site and in accordance with Federal, Provincial and Municipal regulations.
.1 Allow for three (3) days on-site temporary storage and/or alternative construction work scheduling throughout the duration of site work to permit Departmental Representative testing and issuing of direction to the Contractor as indicated in Clause 1.1.2 above.

1.2 RELATED SECTIONS

.1 Submittal Procedures: Section 01 33 00

.2 Clearing and Grubbing: Section 31 11 00

.3 Rough Grading: Section 31 22 13

.4 Excavating, Trenching and Backfilling: Section 31 23 10

.5 Rock Removal: Section 31 23 16

1.3 REGULATIONS

.1 Adhere to all applicable regulatory provisions in their execution of the construction project, including, but not limited to the following:
.1 Canadian Environmental Assessment Act.
.2 Fisheries Act.
.3 Migratory Birds Convention Act.
.4 Department of the Environment Act.
.5 Canadian Environmental Protection Act.
.6 Canada Water Act.
.7 Canada Wildlife Act.
.8 Federal Policy on Wetland Conservation.

1.3 REGULATIONS (Cont'd)

.1 (Cont'd)
.9 A Wildlife Policy for Canada.
.10 Toxic Substance Management Policy.
.11 Pollution Prevention - Federal Strategy for Action.

1.4 DEFINITIONS

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

.2 Environmental Protection: prevention/control of pollution and habitat or environment 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; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.5 SITE CONDITIONS

.1 Environmental and Geotechnical Investigations have been carried out at the site. Any interpretations made will be at the Tenderers own risk and Departmental Representative will not be held responsible for the interpretation of these documents.
.1 Refer to Section 31 22 13 and 31 23 16 for lists of reports.

1.6 PLANNING, ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

.2 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative.

.3 Environmental Protection Plan must account for items covered in environmental report site conditions and include comprehensive overview of known or potential environmental issues to be addressed during construction.

1.6 PLANNING, ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)

.4 Address topics at level of detail commensurate with environmental issues and required construction tasks.

.5 Include in Environmental Protection Plan:

.1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.

.2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.

.3 Names and qualifications of persons responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Work Area Plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.

.6 Spill Response Plan including procedures, equipment, instructions, and reports to be used in event of unforeseen release or spill of regulated substance.

.7 Non-Hazardous Solid Waste Disposal Plan identifying methods and locations for solid waste disposal including clearing debris.

.8 Air Pollution Control Plan detailing provisions to assure that dust, debris, materials, and trash are contained on project site.

.9 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.10 Waste Water Management Plan identifying methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

.11 Watershed Management Plan that defines procedures for identifying and protecting storm runoff watershed area from construction activity and site contaminants.

.12 Storm Water Pollution Prevention Plan (SWPPP) identifying type and location of pollution, erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with the plan, Federal, Provincial, and Municipal laws and regulations.

1.6 PLANNING, ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)

.5 (Cont'd)

.13 Traffic Control Plan including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Ensure plan includes measures to minimize amount of mud transported onto adjacent paved surfaces by vehicles or runoff.

.14 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 on site.

1.7 FIRES

.1 Fires and burning of rubbish on site not permitted.

1.8 DRAINAGE

.1 Provide Storm Water Pollution Prevention Plan (SWPPP) identifying type and location of pollution, erosion and sediment controls provided, coordinated with Watershed Management Plan and to meet intent of controls indicated on drawings. Ensure plan includes monitoring and reporting requirements to assure that control measures are in compliance with Federal, Provincial, and Municipal laws and regulations.

.2 Provide temporary drainage and pumping required to keep excavations and site free from water.

.3 Confirm pumped water into waterways, storm sewer or drainage systems is free of suspended materials.

.4 Control disposal or runoff of water containing suspended materials or other harmful substances unsuitable for discharge into waterways, storm sewers or drainage systems in accordance with local authority requirements.

1.9 SITE CLEARING AND PLANT PROTECTION

.1 Refer to Sections 31 11 00 and 31 22 13.

1.10 SITE GRADING AND EXCAVATION

.1 Refer to Sections 31 22 16 and 31 23 10.

1.11 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this Contract and in accordance with SWPPP.

.2 Control emissions from equipment and plant to local authorities' emission requirements.

.3 Prevent extraneous materials from contaminating air and waterways beyond application area.
.1 Provide temporary enclosures where directed by Departmental Representative.

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.

1.12 ENVIRONMENTAL INCIDENT OR EMERGENCY

.1 Report all hazardous material or contaminant releases, fuel spills or leaks immediately to the Departmental Representative.

.2 Promptly contain and cleanup release or spill to satisfaction of Departmental Representative.

.3 The Contractor will be provided with contact numbers at the pre-construction meeting prior to commencement of Work.

1.13 SPILL RESPONSE

.1 The Spill Response Plan must be able to be implemented to enable rapid and effective response in the event of a release or spill.

.2 Maintain response equipment readily available on site. Response equipment such as absorbent material and open-ended barrels for collection of cleanup debris shall be stored in an accessible location on site. Open-ended barrels must be UN performance packaging certified open head drums.

.3 Personnel working on the project must be knowledgeable about spill response procedures.

.4 Refueling and maintenance of equipment must only occur at approved area on level, hard surface areas away from sensitive receptor such as drainage areas.

.5 All heavy equipment, machinery and tools must be free from leaks. Repair or remove from the site any faulty equipment/machinery immediately.

1.14 NON-COMPLIANCE NOTIFICATION

.1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection Plan.

.2 Inform Departmental Representative of proposed corrective action in writing within twenty-four (24) hours of receipt of non-compliance notification.
.1 Do not take action until after receipt of written approval by Departmental Representative.

.3 Departmental Representative will issue stop order of Work until satisfactory corrective action has been taken.

.4 No time extensions or equitable adjustments will be allowed to the Contractor for such suspensions.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 GENERAL PROCEDURES

.1 Provide hazardous material and contamination control and disposal as directed by Departmental Representative and in accordance with this and related Work sections.

END

PART 1 - GENERAL

1.1 RELATED WORK

.1 Commissioning: Section 01 91 31

1.2 PURPOSE

.1 To provide information to enable the Contractor to establish and maintain Quality Control through the implementation of a documented Quality Management Plan (QMP) and Commissioning Plan (Cx) incorporating all construction activities of this project.

1.3 DEFINITIONS

.1 Quality Assurance: the planned and systematic activities implmented in a quality system so that quality requirements for a product or service will be fulfilled.

.2 Quality Control: the observation techniques and activities used to fulfill requirements for quality.

1.4 INTRODUCTION

.1 The Contractor is responsible for Quality Control.

.2 The Contractor is responsible for producing quality construction through compliance with plans, specifications, permits and accepted standards of the industry.

.3 The Contractor is responsible for the delivery of Work that meets the standards of quality demanded by the specification as it applies to the materials, workmanship, and completed results. The purpose of the Contractor QMP is to assist in the fulfillment of this obligation and to provide to the Departmental Representative a means to confirm the specified level of quality will be achieved.

.4 The Contractor will strive to obtain a uniform, high quality level of workmanship throughout all phases of procurement, fabrication, construction, installation and commissioning of equipment.

.5 The Departmental Representative will carry out Quality Assurance. The Departmental Representative's carrying out of Quality Assurance in no way relieves the Contractor of any obligation or liability under the Contract to provide for Quality Control.

1.5 QMP SCOPE

.1 Establish and maintain a QMP as described in this section. This QMP is the key element in establishing the level of quality required under the terms and conditions of this contract and consist of:
.1 The QC Organization
.2 QC Procedures
.3 Commissioning Plan
.4 Coordination and Mutual Understanding kick off Meeting
.5 QC and Cx Meetings
.6 Three phases of control
.7 Submittal review and approvals
.8 Testing
.9 Inspections and certifications; and
.10 Checklists

.2 The QMP will include but not necessarily be limited to provision of submittals, shop drawings, samples, testing and/or commissioning of items and/or assemblies indicated in the Commissioning Brief included in Appendix and the various sections of the specifications.

.3 The QMP will cover on-site and off-site work and be keyed to the work sequence.

.4 Acceptance of the QMP is required prior to the start of construction. The Departmental Representative reserves the right to require changes in the QMP and operations as necessary.

.5 The only construction Work that is authorized to proceed prior to the acceptance of the QMP is mobilization of storage and office trailers, temporary utilities, and surveying.

.6 Notify the Departmental Representative, in writing, of any proposed changes in the QMP or changes to the QC organization personnel, a minimum of ten (10) work days prior to proposed change. Proposed changes are subject to acceptance by the Departmental Representative.

.7 The Quality Management Plan (QMP) structure has three (3) phases of control defined as:
.1 QMP Quality Planning
.2 QMP Quality Control
.3 QMP Quality Assurance

.8 Coordination of the three phases of control will be the responsibility of the Contractor's QC Manager (QM).

1.5 QMP SCOPE (Cont'd)

.9 Commissioning (Cx) is a systematic process of confirming project systems meet the requirements and perform interactively according to the Contract. Cx is a vital element of Quality and must be considered at each stage of construction. The QMP and Cx plans are crucial to this process by coordinating, verifying and documenting measures to achieve the following objectives:
.1 Verify and document that the applicable equipment and systems are installed in accordance with the design intent as expressed through the contract and according to the manufacturer's recommendations and industry accepted standards,
.2 Verify and document that equipment and systems receive complete operational checkout by the installing contractors,
.3 Verify and document proper performance of equipment and systems,
.4 Verify that operation and maintenance (O&M) documentation is complete, and
.5 Verify and document that the operational staff are adequately trained.
.6 Ensure smooth and successful transfer of custody.

1.6 QMP QUALITY PLANNING

.1 Formulate, organize and implement as required, written procedures and instructions to describe how quality assurance approach will be executed.

.2 Conform to all contractual requirements, specifications, schedule, applicable standards and codes.

.3 Maintain an effective shop drawing verification and approval system.

.4 Establish as-built drawing review to ensure that the contract requirements meet the specifications.

.5 Establish a system of inspection reporting that demonstrates and active site inspection routine employing checklists. Compile accurate records of events/results, attach test certificates and other required documentation.

.6 Provide specialized inspection services for independent third party testing of high risk work.

.7 Maintain material ordering procedures and records that verify and confirm the materials purchased meet the specified standards.

1.6 QMP QUALITY PLANNING (Cont'd)

.8 Develop a deficiency reporting procedure to identify non-conformances. The procedure must cover a verification process to correct the non-conformances and reactivate the inspection process. All non-conformances are to be identified to the Contractor's Superintendent and Departmental Representative, daily.

.9 Establish a system commissioning process to cover the commissioning requirements identified in the commissioning plan.

.10 The QMP is to be submitted to the Departmental Representative for review and comments, prior to activation and installation of each component of Work.

.11 QM to prepare and submit reports on the entire QMP progress on a weekly basis. The QMP weekly progress report will cover all aspects of the plan, identify progress for the current week and forecast the following week's activities. Issue these reports electronically to the Departmental Representative and Contractor Superintendent.

1.7 QMP QUALITY CONTROL

.1 Quality Control is that part of the QMP, which focuses on fulfilling the project quality requirements. Control to consist of processes and procedures to ensure quality products and workmanship are realized.

.2 Following the Quality Management Plan prepared and approved for each component of Work, complete and report on the following:
.1 Verify materials and/or equipment complies with the approved shop drawings, product data and samples.
.2 Verify that the equipment and labour to perform the work is appropriate and qualified.
.3 Verify the installation of the work has been prepared in accordance with good workmanship practices, manufacturers' recommendations/instructions and the contract documents.
.4 Verify all material / equipment pre-checks have been performed by qualified persons.
.5 Verify any and all connections points have undergone quality control checks by either this installation or by another verification of the connection material/equipment.
.6 At any time in the process, if a non-conformance occurs, direct the process to stop and activate a deficiency report. Work process can

1.7 QMP QUALITY CONTROL (Cont'd)

.2 (Cont'd)
.6 (Cont'd)
reconvene at the beginning of the QMP, once the non-conformance has been corrected.
.7 When the QMP report has been completed for each component of work, notarize the report and distribute to the Departmental Representative.

.3 Allow the Departmental Representative access to the Work. If part of the Work is in preparation at locations other than the construction site, allow access to such Work whenever it is in progress.

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

.5 If Contractor covers or permits work to be covered 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.

.6 The Departmental Representative may order any 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.

.7 The Departmental Representative maintains the right, and will typically audit; the performance of the QMP, its documentation and installations, to verify compliance to the Contract Documents.

1.8 QMP QUALITY ASSURANCE

.1 Quality Assurance is that part of the QMP, which focuses on verifying that the project Quality Control requirements and performance criteria have been achieved. Assurance to consist of processes and procedures to ensure quality products and workmanship are realized.

.2 Coordination with the Departmental Representative's Quality Assurance process will be the responsibility of the Contractor's QM.

1.9 INDEPENDENT INSPECTION AGENCIES

.1 Arrange and pay for QMP Independent Inspection Agencies, as required to perform quality control testing.

.2 Arrange and pay for equipment and manpower, as required for executing inspection and testing by Independent Inspection Agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection and/or testing, request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Independent Inspection Agencies at no cost to the Departmental Representative. Pay all costs for retesting and re-inspection.

.5 Independent Inspection Agencies required to perform quality control testing include, but are not necessarily limited to the following components of Work:
.1 Grade and volume control.
.2 Soils.
.3 Asphalt.
.4 Concrete.
.5 High voltage electrical systems.
.6 Low voltage electrical systems.
.7 Water distribution system.
.8 Storm sewer system.
.9 Sanitary sewer system and related components.

.6 The Departmental Representative may elect to arrange and pay for Quality Assurance testing over and above the Contractor's QMP activities to examine any Work as part of this contract. Allow access to the Work as required to facilitate this testing.

1.10 PROCEDURES

.1 The QM must notify Departmental Representative 48 hours in advance of requirement for QMP independent inspection agency tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.

1.10 PROCEDURES (Cont'd)

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

.4 Assist Departmental Representative to obtain samples as part of the QMP Quality Assurance process.

1.11 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other contractor's work damaged by such removals or replacements promptly.

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

1.12 TESTS AND MIX DESIGNS

.1 The QM will furnish test results and mix designs to the Independent Inspection Agency for review.

.2 Pay for all costs of tests and mix designs required in Contract Documents or those required by law of Place of Work.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.1 QC ORGANIZATION .1 QC Manager (QM):

.1 QM will implement and manage the Contractor's QMP. No construction Work or testing may be performed unless the QM is on the Work site.

.2 The QM is required to attend project kick off meetings, QMP Meetings, Coordination and Mutual Understanding Meeting, conduct the QMP Meetings, perform the three phases of control, perform submittal review and approval, confirm testing is performed and provide QC certifications and documentation required in this Contract. The QM is responsible for managing and coordinating the three phases of control and documentation performed by the QC Specialists, testing laboratory personnel and any other inspection and testing personnel required by this Contract. The QM is the manager of all QC activities.

.3 The individual must be familiar with the requirements and have experience in the areas of hazard identification and safety compliance.

.4 The QM is responsible to collect, coordinate and compile the elements of the QMP that will be executed by the Contractor and his sub-contractors.

.5 The QM is responsible to manage the performance of the sub-contractors and ensure adherence to the QMP. In addition, the QM will perform quality audits on those portions of the QMP that are executed by sub-contractors and report on their compliance as part of the QMP Reporting.

.2 Commissioning Manager:

.1 Designate a Commissioning Manager (CM) to coordinate the Cx and documentation thereof, who is subordinate to the QM. The CM directs and coordinates Cx activities and submits Cx reports to the Departmental Representative to meet the submittal and reporting requirements as defined in Cx plan. The CM coordinates the actions of the QC Specialists, Testing Laboratory Personnel, subcontractors and other inspection and testing personnel required by this Contract.

3.2 QUALITY MANAGEMENT PLAN (QMP) .1 Provide, for acceptance by the Departmental Representative, a Construction QMP submitted in a three-ring binder that includes a table of contents, with major sections identified with tables, with pages numbered sequentially, and that documents the proposed method and responsibilities for

3.2 QUALITY MANAGEMENT PLAN (QMP) (Cont'd)

.1 (Cont'd)
accomplishing commissioning activities during the construction of the project:
.1 QC Organization: A chart showing the QC organizational structure.
.2 Names and Qualifications: Names and qualifications, in resume format, for each person in the QC organization.
.3 Duties, Responsibility and Authority of QMP Personnel: Duties, responsibilities, and authorities of each person in the QC organization.
.4 Outside Organizations: A listing of outside organizations, such as consulting engineering firms, QC testing firms and laboratories which will be employed by the Contractor and a description of the services these firms will provide.
.5 Appointment Letters: Letters signed by an officer of the firm appointing the QM and stating that they are responsible for implementing and managing the QC Program as described in the Contract. Include in letters the responsibilities of the QM to implement and manage the three phases of control, and their authority to stop Work which is not in compliance with the Contract. Letters of direction are to be issued by the QM to all other QC Specialists outlining their duties, authorities, and responsibilities. Include copies of the letters in the QC Plan.
.6 Submittal Procedures and Initial Submittal Register: Procedures for reviewing, approving and managing submittals. Provide the name(s) of the person(s) in the QC organization authorized to review and certify submittals prior to approval.
.7 Testing Laboratory Information: Testing laboratory certification and description of investigative responsibilities to be implemented.
.8 Testing Plan and Log: A testing plan and log that includes the tests required, referenced by the specification paragraph number requiring the test, the frequency, and the person responsible for each test.
.9 Procedures to Complete Rework Items: Procedures to identify, record, track, and complete rework items.
.10 Documentation Procedures:
.1 List of Definable Activities: A definable activity (DA) is a task that is separate and distinct from other tasks and has control requirements and work crews unique to that task. A DA is identified by different trades or disciplines and is an item or activity on the construction schedule. Include in the list of DAs, but not be limited to, all critical path activities. Include all activities for which

3.2 QUALITY MANAGEMENT PLAN (QMP) (Cont'd)

.1 (Cont'd)

.10 Documentation Procedures:(Cont'd)

.1 (Cont'd)

this specification required QC specialists or specialty inspection personnel.

.2 Procedures for Performing the Three Phases of Control: Identify procedures used to ensure the three phases of control to manage the quality on this project. For each DA, a Preparatory and Initial Phase checklist will be filled out during the Preparatory and Initial Phase meetings. Conduct the Preparatory and Initial Phases and meetings with a view toward obtaining quality construction by planning ahead and identifying potential problems for each DA.

.3 Checklists: Checklists must be created for each DA. The input for the checklists must be extracted from the contract documents, and the industry and DND standards referenced therein. These checklists will form the backbone of the QMP documentation.

.2 The Cx Plan is a subset of the QMP but has elements that take place throughout the entire construction. The Cx Plan is managed by the Contractor's CM and is further described in Section 01 91 31 - Commissioning.

3.3 COORDINATION AND MUTUAL UNDERSTANDING MEETING

.1 Prior to submission of the QMP, the QM will meet with the Departmental Representative to discuss the QMP requirements of this Contract. The purpose of this meeting is to develop a mutual understanding of the QMP requirements prior to plan development and submission.

.2 The purpose of this meeting is to develop a mutual understanding of the QMP details, including documentation, administration for on-site and off-site work, design intent, Cx, environmental requirements and procedures, coordination of activities to be performed, and the coordination of the Contractor's management, production and QMP personnel. At the meeting, the QM will be required to explain in detail how three phases of control will be implemented for each DA.

.3 QM will coordinate activities included in various sections to assure efficient and orderly installation of each component. Coordinate operations included under different sections that are dependant on each other for proper installation and operation.

3.3 COORDINATION AND MUTUAL UNDERSTANDING MEETING (Cont'd)

.4 As a minimum, the Contractor's personnel required to attend include the Project Manager, Project Superintendent, QM, and subcontractor representatives. Each Subcontractor who will be assigned QC responsibilities must have an authorized representative of the firm at the meeting. Minutes of the meeting will be prepared by the QM and signed by the Contractor and the Departmental Representative. Provide a copy of the signed minutes to all attendees and include in the QMP.

.5 If a new QM is appointed, the Coordination and Mutual Understanding Meeting will be repeated.

3.4 QMP PROGRESS REPORT

.1 After the start of construction, conduct weekly QMP progress report in conjunction with Departmental Representative Construction Progress Meeting. Contractor QM will prepare the minutes of the progress report and provide a copy to the Departmental Representative within two (2) working days to include into the minutes of the Construction Progress meeting. As a minimum, accomplish the following at each meeting:

.1 Review the minutes of the previous report.
.2 Review the schedule and the status of work and rework.
.3 Review the status of submittals.
.4 Review the Work to be accomplished in the next two weeks and the documentation required.
.5 Resolve QC and production problems.
.6 Address items that may require revising the QMP.
.7 Review the status of training completion.
.8 Review Cx Plan and Progress.

3.5 THREE PHASES OF CONTROL

.1 The Three Phases of Control are: Quality Planning, Quality Control and Quality Assurance. The Quality Planning Phase is intended to ensure that the Contractor reviews, verifies and is effectively prepared to execute Work. The Quality Control Phase is intended to ensure that the Contractor initiates and executes the Work in accordance with requirements. The Quality Assurance Phase is intended to ensure that all Work, testing and documentation are complete and compliant. QM will cover both on-site and off-site Work with the Three Phases of Control.

.2 Quality Planning Phase: QMP progress report will be conducted by the QM and attended by the subcontractor

3.5 THREE PHASES OF CONTROL (Cont'd)

.2 Quality Planning Phase:(Cont'd)
QC personnel, the Project Superintendents, and the CM. When a DA is performed by a subcontractor, that subcontractor's foreman shall attend the planning phase meeting. Document the results of the planning phase actions in the daily contractor QMP report and in the Planning Phase checklist. Perform the following prior to beginning Work on each DA:
.1 Review each paragraph of the applicable specification sections and extract metrics from the technical specifications and the referenced standards.
.2 Assemble the metrics into comprehensive checklists for use for each time a DA is executed.
.3 Review the Contract drawings.
.4 Verify field measurements are as indicated on construction and /or shop drawings before confirming product orders.
.5 Verify appropriate shop drawings and submittals for material and equipment have been submitted and approved for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required.
.6 Review the testing plan and ensure that provisions have been made to provide the required QC testing.
.7 Examine the work area to ensure that the required preliminary work has been completed.
.8 Coordinate the schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
.9 Arrange for the return of shipping/packaging materials, such as wood pallets, where economically feasible.
.10 Examine the required materials, equipment and sample work to ensure that they are on hand and conform to the approved shop drawings and submitted data.
.11 Discuss specific controls used and construction methods, construction tolerance, workmanship standards, and the approach that will be used to provide quality construction by planning ahead and identifying potential problems for each DA.
.12 Review and verify that applicable safety requirements are met, and that required Material Safety Data Sheets (MSDS) are submitted.
.13 Review the Cx Plan and confirm preliminary Work items have been completed and documented.
.14 Complete applicable checklists

.3 Quality Control Phase: QM will notify the Departmental Representative at least two (2) work days in advance of each quality control phase. When

3.5 THREE PHASES OF CONTROL (Cont'd)

.3 Quality Control Phase:(Cont'd)
construction crews are ready to start work on a DA, conduct the quality control phase with (the QC specialists) the project Superintendent, and the foreman responsible for that DA. Observe the initial segment of the DA to ensure that the work complies with the Contract requirements. Document the results of the initial phase in the weekly QC Report and in the quality control phase checklists. Repeat the quality control phase for each new crew to work on-site, or when acceptable levels of specified quality are not being met. Perform the following for each DA:
.1 Establish the quality of workmanship required.
.2 Resolve conflicts.
.3 Confirm testing is performed by the approved laboratory.
.4 Check to confirm all applicable safety requirements are met.
.5 Review the Cx plan and confirm all preparatory work items have been completed and documented
.6 Witness complete applicable checklists for each DA.

.4 Quality Assurance Phase: QM will verify with the Departmental Representative that QA has correlated QC results as frequently as necessary, until the completion of each DA and document in the daily QMP Report:
.1 Confirm Work is in compliance with Contract requirements.
.2 Maintain the quality of workmanship required.
.3 Confirm testing is performed by the approval laboratory.
.4 Confirm rework items are being corrected.
.5 Confirm manufacturers' representatives have performed necessary inspections if required and perform safety inspections.
.6 Review the Cx plan and ensure all work items, testing, and documentation has been completed.
.7 Confirm that the quality checklists for each DA is completed and filed.

.5 Continuous Improvement: QM will conduct additional quality planning and quality control phases on the same DA if the quality of on-going work is unacceptable, if there are changes in the applicable QC organization, if there are changes in the on-site production supervision or work crew, if the Work on a DA is resumed after substantial period of inactivity, or if other problems develop.

3.5 THREE PHASES OF CONTROL (Cont'd)

.6 Incorporate any 'lessons learned' or modifications into the QMP identified as a result of the Continuous Improvement as part of the Quality Assurance Phase.

3.6 SUBMITTAL REVIEW AND APPROVAL

.1 Procedures for submission, review and approval are detailed throughout this section of this specification.

3.7 TESTING

.1 Except as stated otherwise in the specification sections, perform sampling and testing under this Contract.

.2 Construction materials testing must be provided by an accredited laboratory and will be required to submit a copy of the Certification of Accreditation and Scope of Accreditation. The policy applies to the specific laboratory performing the actual testing, not just the Corporate office.

.3 The Departmental Representative retains the right to check laboratory equipment in the proposed laboratory and the laboratory technician's testing procedures, techniques, and other items pertinent to testing, for compliance with the standards set forth in the contract.

.4 QM will cite applicable Contract requirements, tests or analytical procedures used. Provide actual results and include a statement that the item tested or analyzed conforms or fails to conform to specified requirements. If the item fails to conform, notify the Departmental Representative immediately. Conspicuously stamp the cover sheet for each report in large red letters

.5 QM will furnish the signed reports, certifications, and a summary report of field tests at the end of each week to the Departmental Representative. Attach a copy of the summary report to the last weekly Contractor QMP Report of each month.

.6 QM is required to complete tests prior to demonstration of the electrical functional tests in presence of the CA. Advise the Departmental Representative of the timing of these tests.

3.8 TRAINING

.1 Prior to acceptance of the facility by the Departmental Representative, the CM must provide a comprehensive project-specific operational personnel training program for the systems and equipment of the facility specified in the technical specifications of this Contract. The trainees must include the Departmental Representative and respective designated personnel. The Contractor is responsible for coordinating, scheduling, and ensuring that training is completed. Instructors must be well-versed in the particular system that they are presenting. Provide instruction time on site at a location approved by the Departmental Representative.

.2 CM will submit a written training plan to the Departmental Representative for review and approval prior to training. Coordinate and schedule the training with the Departmental Representative. Include within the plan the following elements:
.1 Equipment included in training.
.2 Intended audience.
.3 Location of training.
.4 Objectives.
.5 Subjects covered including description.
.6 Duration of training on each subject.
.7 Methods (classroom lecture, video, site walk-through, actual operational demonstrations, written handouts, etc.)
.8 Instructor and instructor qualifications for each subject

.3 Training content must stress and enhance the importance of system interactions, troubleshooting, and long-term preventative maintenance and operation. The core of this training will be based on manufacturer's recommendations and the operation and maintenance information provided as a part of this Contract. A review of environmentally-related aspects of the Operation and Maintenance Manuals will be included. Include the following for each commissioned system:
.1 Design intent.
.2 Use of O&M Manuals.
.3 Review of control drawings and schematics.
.4 Start-up, normal operation, shutdown, unoccupied operation, seasonal changeover, manual operation, controls set-up and programming, troubleshooting, and alarms as applicable.
.5 Interactions with other systems.
.6 Adjustments and optimizing methods for energy conservation.
.7 Relevant health and safety issues.
.8 Special maintenance and replacement sources.

3.8 TRAINING (Cont'd)

.3 (Cont'd)
.9 Discussion of how the feature or system is environmentally responsive

.4 The Departmental representative will provide a list to the QM and CM, a list of all personnel who will be attending these formal training sessions.

.5 The CM is responsible for overseeing and approving the content and adequacy of the training. The CM must interview the facilities manager and Departmental Representative to determine the special needs and areas where training will be most valuable. The Departmental Representative and CM must decide how rigorous the training should be for each piece of equipment. The CM is to communicate the results to the QM, who will provide each trainee in the course a written course outline, listing the major and minor topics to be discussed by the instructor on each day of the course.

.6 If, at the end of the training course, there are questions from trainees that remain unresolved, the instructor will send the answers, in writing, to the Departmental Representative for transmittal to the trainees, and the training package,as applicable, should be modified to include the appropriate clarifications.

.7 CM will develop criteria for determining that the training was satisfactory completed, including attending some of the training, and upon fulfillment of the criteria, validate training completion. The CM will recommend approval of the training to the Departmental Representative using a standard form and the CM and Departmental Representative will sign the approval form. Provide completed and signed validation of training forms as provided in the QMP for all training sessions accomplished. Provide two (2) copies of the signed training validation forms to the Departmental Representative.

3.9 DOCUMENTATION

.1 QM will maintain current and complete records of on-site and off-site QMP operations and activities.

.2 Reports are required for each day that Work is performed and must be attached to the QMP weekly report. Account for each calendar day throughout the life of the contract. Every space on the forms must be filled in. Use N/A if nothing can be reported in one of the spaces. The Project Superintendent and the QM must prepare and sign the QMP Reports which are to

3.9 DOCUMENTATION (Cont'd)

.2 (Cont'd)
be submitted weekly. The reporting of Work must be identified by terminology consistent with the construction schedule. Include in the reports pertinent information such as directions received, problems encountered during construction, work progress, conflicts or errors in the drawings or specifications, field changes, safety hazards encountered, instruction given and corrective actions taken, delays encountered and a record of visitors to the work site, quality control problem areas, deviations from the QMP, construction deficiencies encountered, meetings held. For each entry in the report(s), identify the schedule DA that is associated with the entered remark.

.3 QM will establish and maintain the following in a series of three ring binders. Divide and tab the binders as shown below. These binders must be readily available to the Departmental Representative during all business hours and contain:
.1 All completed Quality Planning, Control and Assurance Phase Checklists, arranged by specification section.
.2 All milestone inspections, arranged by DA.
.3 An up-to-date copy of the Testing Plan and Log with supporting field test reports, arranged by specification section.
.4 Copies of all contract modifications, arranged in numerical order. Also include documentation that modified work was accomplished.
.5 An up-to-date copy of the Rework Items List.
.6 Maintain up-to-date copies of all punch lists issued by the QC staff to the Contractor and Sub-Contractors and all punch lists issued by the Departmental Representative.
.7 Commissioning documentation including Cx checklists, schedules, test, and reports
.8 Training documentation indicating training subject, applicable specification section and personnel trained.

.4 Reports are required for each day that Work is performed in their area of responsibility. QC Specialist or subcontractor reports must include the same documentation requirements as the QMP Report for their area of responsibility. These reports are to be prepared, signed and dated by the QC Specialists or subcontractor and attached to the weekly QMP report.

.5 As tests are performed the CM and the QM will report and record on their results.

3.9 DOCUMENTATION (Cont'd)

.6 QM must maintain a list of Work that does not comply with the Contract, identifying what items need to be reworked, the date the item was originally discovered, the date the item will be corrected by, and the date the item was corrected. There is no requirement to report a rework item that is corrected the same day it is discovered. Attach a copy of the list to the weekly QMP Report.

.7 QM is required to confirm that as-built drawings are kept current on a daily basis and marked to show deviations which have been made from the Contract drawings. Confirm each deviation has been identified with the appropriate modifying documentation (e.g. Change Order Number, Request for Information Number, etc.) Submit total station interim survey records in accordance with Section 01 10 00. QM or QC Specialties assigned to an area of responsibility must initial each revision. Upon Completion of Work, QM will furnish a certificate attesting to the accuracy of the as-built drawings prior to submission to the Departmental Representative.

END

1 RELATED SECTIONS

.1 Environmental Protection: Section 01 57 00

.2 Cleaning: Section 01 74 00

.3 Project Closeout: Section 01 77 00

2 REFERENCES

.1 CAN/CSA Z321-96(R2006), Signs and Symbols for the Workplace.

.2 CAN/CSA S269.2-FM87(R2003), Access Scaffolding for Construction Purposes.

3 ACCESS

.1 Provide and maintain adequate access to project site.

.2 Provide snow removal when required during period of Work.

4 SANITARY FACILITIES

.1 Be responsible for washroom facilities unless approved otherwise by the Departmental Representative.

5 STORAGE SHEDS

.1 Provide, as required, secure, weathertight sheds with raised floors, for storage of materials, tools and equipment which are subject to damage by weather. Locate storage sheds as directed by the Departmental Representative.

6 ACCESS/PARKING

.1 Departmental Representative will designate Contractor's access to project site as well as parking facilities for workmen. Be advised that while parking facilities for workers and sub-contractors will be on BIO property, such parking facilities may be remote from the actual site of the work. In any case, follow all instructions from the Departmental Representative in regards to parking facilities.

7 CONTRACTOR'S SITE OFFICE

.1 Be responsible for and provide own site office, hook-up of electricity, heat, lights and telephone. Locate site office as directed by Departmental Representative.

8 DEPARTMENTAL REPRESENTATIVE'S SITE OFFICE

.1 Provide a minimum 20 ft. lighted and heated secure site office trailer located as directed by Departmental Representative and outfit as follows:
- .1 Desk and chair set
- .2 Activated telephone and internet jacks
- .3 Power hook-ups
- .4 Two (2) folding leg meeting tables
- .5 Twelve (12) meeting chairs
- .6 Microwave and stand
- .7 Mini-fridge.
- .8 Water dispenser
- .9 900mm x 1200mm white board mounted on wall
- .10 Access stairs

9 CONSTRUCTION HOARDING

.1 Provide temporary construction hoarding required to carry out the Work while at the same time providing maximum safety, security and access as required to maintain on-going operations.

.2 Provide construction hoarding in locations and alignments as directed by the Departmental Representative to protect personnel from exposure to hazards of construction and from exposure to dust and noise generated by construction.

.3 Construct hoarding to be of durable construction materials suitable to the environment in which they are placed and approved by the Departmental Representative.

10 POWER

.1 Connect to existing power supply at Contractor's cost in accordance with NSP requirements and in accordance with the Canadian Electrical Code. Incurred costs, service and utility charges will be borne by the Contractor. Make arrangements for the use of such services through the Departmental Representative.

.2 Electrical power and lighting systems installed under this Contract may be used for construction requirements if approved by the Departmental Representative and provided that guarantees are not affected thereby. Make good any damage incurred. Replace lamps which have been used over a period greater than three (3) months.

.3 Supply and install temporary lighting for the safe transit of and the convenience of building employees and the travelling public in those areas where normal lighting levels have been reduced as a result of the

10 POWER (Cont'd)

.3 (Cont'd) Work of this Contract. Pigtails not acceptable; temporary lighting must be of the enclosed fluorescent type so as not to present a hazard. Minimum acceptable lighting levels shall not be lower than 300 lux.

11 WATER SUPPLY

.1 Make arrangements with Halifax Water for the use of temporary water for construction and testing. The Contractor is responsible for all incurred costs.

12 TEMPORARY TELEPHONES

.1 Provide and pay for temporary telephones for own use. Make all necessary arrangements, application, obtain permits and pay all fees and charges for services and use.

13 FIRST AID FACILITY

.1 Provide, maintain and pay for all costs for first aid facility as required by the Occupational Health & Safety Act.

14 DUST TIGHT SCREENS

.1 Provide dust tight screens or partitions to localize dust generating activities and for protection of workers, finished areas of Work and the public.

.2 Maintain and relocate protection until such work is complete.

15 PROTECTION OF INFRASTRUCTURE

.1 Prevent overloading of any part of existing infrastructure. Do not cut, drill or sleeve any load bearing structural member without written approval of the Departmental Representative.

.2 Provide protection for infrastructure and equipment during performance of the Work.

.3 Be responsible for damage incurred due to lack of or improper protection.

16 HEATING AND VENTILATING

.1 Pay costs associated with temporary heat and ventilation used during construction, including costs of installation, fuel, operation, maintenance and removal of equipment. Use of direct-fired heaters discharging waste products into work areas will not be permitted unless prior approval is given by Departmental Representative.

.2 Provide temporary heat and ventilation in enclosed areas as required to:
.1 Facilitate progress of Work.
.2 Protect Work and products against dampness and cold.
.3 Prevent moisture condensation on surfaces.
.4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
.5 Provide adequate ventilation to meet health regulations for safe working environment.

.3 Maintain minimum temperature of 10°C or higher where specified as soon as finishing work is commenced and maintain until acceptance of installation by Departmental Representative.

.4 Ventilation:
.1 Prevent accumulations of dust, fumes, mists, vapours, or gases in areas occupied during construction.
.2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
.3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
.4 Ventilate storage spaces containing hazardous or volatile materials.

.5 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
.1 Conform with applicable codes and standards.
.2 Enforce safe practices.
.3 Prevent abuse of services.
.4 Prevent damage to finishes.
.5 Vent direct-fired combustion units to outside.

.6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.7 Use of new or existing systems for temporary heating, ventilating or air conditioning will not be permitted.

17 TRAFFIC CONTROL

.1 Prior to the start of construction, submit to Departmental Representative for approval a "BIO Buoy Maintenance Area Traffic Control Plan". Plan to detail measures taken to control the movement of traffic around the construction area.

.2 Provide and maintain concrete barriers, signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from project work which may require road user response.

.3 Provide traffic control in accordance with the Temporary Workplace Traffic Control Manual issued by the Nova Scotia Department of Transportation and Infrastructure Renewal.

.4 Meet with Departmental Representative prior to commencement of work to determine allowable diversions of traffic and access to construction area, and to prepare a list of signs and other devices required for project. If situation on site changes, revise list to approval of Departmental Representative.

.5 Continually maintain traffic control devices in use by:
.1 Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.
.2 Removing or covering signs which do not apply to conditions existing from day to day.

18 TEMPORARY FENCING

.1 Provide and maintain temporary safety and security fencing, lighting and signage required to protect and route pedestrians through the Work site.

.2 BIO site security is to remain at all times. Provide temporary security fencing to satisfaction of Departmental Representative. Adjust positioning of temporary security fencing as required to suit needs of construction.

.3 Fencing to meet the Nova Scotia Transportation and Infrastructure Renewal and Nova Scotia Labour requirements, and be constructed using the following types:
.1 1.0m metal fencing mounted on Jersey barriers.
.2 1.8m free-standing metal frame and mesh fencing.
.3 1.8m temporary chain link fencing.

18 TEMPORARY FENCING (Cont'd)

.3 (Cont'd)
.4 Temporary site perimeter fencing to match fabric height and barbed wire configuration of existing permanent perimeter security fencing less concrete footings.

.4 Plastic roll angle iron post type fencing and equivalent may be used as approved by the Departmental Representative only.

.5 Prior to the start of construction submit to Departmental Representative for approval a detailed, written plan outlining what measures will be taken to control the movement of pedestrians within the construction area.

19 FIRE ROUTES

.1 Maintain access at all times including overhead clearances for use by emergency response vehicles.

20 SITE SIGNS AND NOTICES

.1 Safety and Instruction Signs and Notices:
.1 Signs and notices for safety and instruction to be in both official languages Graphic symbols and conform to CAN/CSA-Z321.

.2 Maintenance and Disposal of Site Signs:
.1 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Departmental Representative.

21 SCAFFOLDING

.1 Design and construct scaffolding in accordance with CAN/CSA-S269.2 and latest Nova Scotia Occupational Health and Safety Regulations.

.2 Erect scaffolding independent of walls. Remove promptly when no longer required.

22 REMOVAL OF TEMPORARY FACILITIES

.1 Remove temporary facilities from site when directed by Departmental Representative. Refer to Section 01 77 00.

END

1 WORK INCLUDED

.1 This section specifies requirements for providing temporary erosion and sedimentation control measures.

2 REFERENCE DOCUMENTS

.1 The following reference documents form a part of this specification and are available at Nova Scotia Environment or Fisheries and Oceans Canada:

.1 Fisheries and Oceans Canada: Guidelines for a Stationary Type Screen at Water Intakes to Prevent Losses of Juvenile Salmon and Trout.

.2 Guidelines for Temporary Intake Screens.

.3 N.S. Environment Pit and Quarry Guidelines (latest edition).

.4 N.S. Environment Construction and Demolition Debris Disposal Site Guidelines (latest edition).

.5 Nova Scotia Water Course Alteration Specifications in affect at the time of tender.

.1 Legal Conditions
.2 General Specifications
.3 Bank Stabilization
.4 Beach Enhancement
.5 Bridges
.6 Culverts
.7 Dams
.8 Diversion of Watercourse
.9 Dredging
.10 Dry Hydrants
.11 Fishing Equipment
.12 Fords
.13 Pipelines
.14 Ponds
.15 Wharves

3 EROSION CONTROL PLAN

.1 Refer to Section 01 35 43.

4 PERMITS AND APPROVALS

.1 Confirm all staff and subcontractors are aware of all terms and conditions of any permit/approval issues.

5 DISPOSAL OF WASTES

.1 Dispose of rubbish and waste materials at authorized site.

.2 Do not dispose of waste, volatile or deleterious materials into waterways, storm or sanitary sewers.

6 DRAINAGE

.1 Do not pump or drain water containing suspended materials into waterways, sewer or drainage systems.

.2 Control disposal or runoff of water containing suspended materials or other harmful substances with use of siltation fences, sedimentation ponds, diversion ditches, silt curtains, sedimentation blankets, slope stabilization and the like, all in accordance with required environmental regulations, permits or approvals.

7 WORK IN OR ADJACENT TO WATERCOURSES

.1 Do not operate construction equipment in watercourse or in any way alter a watercourse or withdraw water from a watercourse without first obtaining necessary permits or approvals.

.2 Do not use watercourse beds or banks for borrow material.

.3 Do not dump excavated fill, waste material or debris in watercourse.

.4 Design and construct temporary crossings to minimize erosion to watercourse.

.5 Do not skid logs or construction materials across watercourses.

.6 Avoid spawning beds when constructing temporary crossings of watercourses.

.7 Do not blast under watercourses or within 100 m of spawning beds without obtaining necessary permits or approvals.

.8 Provide a buffer zone in combination with appropriate erosion and sedimentation control when working adjacent to watercourse. Consult with regulatory agencies.

8 POLLUTION CONTROL

.1 Prior to the commencement of construction activities, prepare a contingency plan, which addresses procedures to follow in the event of a pollution incident and ensure all staff are aware of these procedures. Provide copy of contingency plan to Departmental Representative.

.2 Immediately report any environmental emergency, such as a spill of a contaminant, to Departmental Representative.

8 POLLUTION CONTROL (Cont'd)

.3 Maintain temporary erosion and pollution control devices installed under this contract until the Work is completed is as specified in the Contract Documents.

.4 Remove temporary erosion and pollution control measures prior to project completion unless directed otherwise.

.5 Control emissions from equipment to requirement of authority having jurisdiction.

.6 Provide temporary enclosures to protect environment from effects of sandblasting.

.7 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.

.8 Keep paved surfaces clean. Provide mechanical sweeping to satisfaction of Departmental Representative. Control dust by application of calcium chloride or water.

9 CONTROL FEATURES

.1 Provide and maintain erosion and sedimentation control features where required, as directed, or as indicated prior to construction. Co-ordinate locations with Departmental Representative. Do not remove control features until authorized by the Departmental Representative.

10 SEDIMENT CONTROL FENCE

.1 Sediment control fence: preassembled silt fence with industrial woven geotextile fabric pre-stapled to wood posts spaced as indicated.
.1 Acceptable product:
.1 Envirofence as manufactured by Mirafi Inc.,
.2 Terrafence as manufactured by Terrafix.
.3 Nilex Silt Fence.

.2 Install sediment control fence in the locations directed and as required.

.3 Install extra 50 mm x 75 mm x 1200 mm long posts at midpoints between supplied posts. Attach fence with roofing nails and roofing tins. Provide wood strapping along top of fence as shown.

.4 Excavate 150 x 150 mm trench along length of fence as indicated. Lay fabric bottom in trench and backfill with selected excavated material.

11 SEDIMENT CONTROL BERMS

.1 Sediment control berms: clear stone as specified in Section 31 23 10.

.2 Geotextile: non-woven, needle-punched polyester filter fabric.
- .1 Acceptable products:
  - .1 Solmax 53
  - .2 Terrafix 270R
  - .3 Trevira 1120

.3 Construct sediment control berms to the cross sections shown, using materials indicated on the Drawings. Locate where and as directed or required.

12 MAINTENANCE OF FENCE AND BERM

.1 Maintain siltation control features throughout the construction period. Repair damage to original condition.

.2 Remove accumulated sediment from behind sediment control fence and berms when and as directed by the Departmental Representative.

END

1 RELATED SECTIONS

.1 General Requirements: Section 01 10 00.

.2 Submittal Procedures: Section 01 33 00.

.3 Quality Control: Section 01 45 00.

2 REFERENCE STANDARDS

.1 If there is question as to whether any product or system is in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.

.2 The cost for such testing will be born by Contractor in event of non-conformance.

.3 Conform to latest date of issue of referenced standards in effect on date of submission of Tenders, except where specific date or issue is specifically noted.

3 QUALITY

.1 Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of Products provided.

.2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.3 Should any dispute arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.

.4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or similar item throughout construction.

.5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

4 GENERAL

.1 Use new material and equipment unless otherwise specified.

.2 Within seven (7) days of written request by Departmental Representative, submit following information for materials and equipment proposed for supply:
.1 Name and address of manufacturer,
.2 Trade name, model and catalogue number,
.3 Performance, descriptive and test data,
.4 Manufacturer's installation or application instructions,
.5 Evidence of arrangements to procure.

.3 Use products of one manufacturer for material and equipment of same type or classification unless otherwise specified.

5 MANUFACTURERS INSTRUCTIONS

.1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.

.2 Notify Departmental Representative in writing of any conflict between these specifications and manufacturers instructions. Departmental Representative will designate which document is to be followed.

6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and maintain packaged material and equipment with manufacturer's seals and labels intact.

.2 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.

.3 Store material and equipment in accordance with suppliers instructions.

.4 Touch-up damaged factory finished surfaces to approval of Departmental Representative. Use primer or enamel to match original. Do not paint over name plates.

.5 Store products subject to damage from weather in weatherproof enclosures.

.6 Store cementitious products clear of earth or concrete floors, and away from walls.

6 DELIVERY, STORAGE AND HANDLING (Cont'd)

.7 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.8 Store sheet materials clear of ground. Slope to shed moisture.

.9 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.10 Remove and replace damaged products at own expense to approval of Departmental Representative.

7 PRODUCT AVAILABILITY

.1 Review Product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of Products are foreseeable, notify the Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In the event of failure to notify the Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, the Departmental Representative reserves the right to substitute more readily available products of similar character, at no increase in Contract Price.

END

PART 1 - GENERAL

1.1 QUALIFICATIONS OF SURVEYOR

.1 Qualified registered land surveyor, licensed to practice in Nova Scotia, acceptable to Departmental Representative.

1.2 SURVEY REFERENCE POINTS

.1 Existing base horizontal and vertical control points are designated on drawings.

.2 Locate, confirm and protect control points prior to starting work. Preserve permanent reference points during construction.

.3 Make no changes or relocations without prior written notice to Departmental Representative.

.4 Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

.5 Require surveyor to replace control points in accordance with original survey control.

1.3 SURVEY REQUIREMENTS

.1 Establish one (1) permanent bench mark on site, referenced to established bench marks by survey control points. Record location, with horizontal and vertical data in Project Record Documents.

.2 Establish lines and levels, locate and lay out, by instrumentation.

.3 Stake for grading, fill and topsoil placement and landscaping features.

.4 Stake slopes and berms.

.5 Establish pipe invert elevations.

.6 Establish lines and levels for mechanical and electrical work.

1.4 EXISTING SERVICES

.1 Before commencing Work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.

1.4 EXISTING SERVICES (Cont'd)

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

1.5 LOCATION OF EQUIPMENT AND FIXTURES

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Inform Departmental Representative of impending installation and obtain approval for actual location.

.4 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

1.6 RECORDS

.1 Maintain a complete, accurate log of control and survey work as it progresses.

.2 On completion of site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

.3 Record locations of maintained, re-routed and abandoned service lines.

1.7 SUBMITTALS

.1 Submit name and address of Surveyor to Departmental Representative.

.2 On request of Departmental Representative, submit documentation to verify accuracy of field engineering work.

.3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

1.8 SUBSURFACE CONDITIONS

.1 Promptly notify Departmental Representative in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.2 After prompt investigation, should Departmental Representative determine that conditions do differ materially, instructions will be issued for changes in Work as provided in General Conditions.

PART 2 - PRODUCTS Not applicable.

PART 3 - EXECUTION Not applicable.

END

1 RELATED SECTIONS

.1 General Requirements: Section 01 10 00

.2 Temporary Facilities: Section 01 50 00

.3 Project Closeout: Section 01 77 00

2 MATERIALS

.1 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

.2 Provide list of materials to be used for cleaning and submit MSDS sheets for each item used. Cleaning materials to be approved by the Departmental Representative before using.

3 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, as a result of construction activities.

.2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.

.3 Remove waste material and debris from site and deposit in waste container at end of each working day.

.4 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.5 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

.6 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate construction.

4 FINAL CLEANING

.1 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove all waste products and debris, and leave Work clean and suitable for occupancy.

.3 Prior to final review, remove surplus products, tools, construction machinery and equipment.

4 FINAL CLEANING (Cont'd)

.4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.

.5 Remove stains, spots, marks and dirt from electrical and mechanical fixtures.

.6 Clean lighting reflectors, lenses, and other lighting surfaces. Replace spent lamps.

END

PART 1 - GENERAL

1.1 WORK INCLUDED

.1 This Section includes text, schedules and procedures for systematic Waste Management Program for construction and demolition, including:
.1 Diversion of materials.
.2 Waste Audit (WA) - Schedule A.
.3 Waste Reduction and Recycling Workplan (WRRW) - Schedule B.

.2 Procedures for management of hazardous wastes are excluded from this Section. Refer to Section 01 35 43.

1.2 RELATED SECTIONS

.1 Submittal Procedures: Section 01 33 00

.2 Environmental Procedures: Section 01 35 43

1.3 WASTE MANAGEMENT GOALS

.1 Prior to start of Work, conduct meeting with Departmental Representative to review and discuss the Waste Management Plan and Goals.

.2 Provide Departmental Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.

.3 Accomplish maximum control of solid construction waste.

1.4 DEFINITIONS

.1 Class III: non-hazardous waste - construction renovation and demolition waste.

.2 Demolition Waste Audit (DWA): relates to actual waste generated from project.

.3 Inert Fill: inert waste - exclusively asphalt and concrete.

.4 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.

1.4 DEFINITIONS (Cont'd)

.5 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.

.6 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.

.7 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

.8 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes returning reusable items including pallets or unused products to vendors.

.9 Separate Condition: refers to waste sorted into individual types.

.10 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.

.11 Waste Audit (WA): detailed inventory of waste materials. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition or deconstruction project. Indicates quantities of reuse, recycling and landfill.

.12 Waste Management Co-ordinator (WMC) : contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.

.13 Waste Reduction and Recycling Workplan (WRRW): written report which addresses opportunities for reduction, reuse, or recycling of materials (Schedule B). WRRW is based on information acquired from WA.

.14 Hazardous Materials: dangerous substances and goods, hazardous commodities and products, such as poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or any other material that can endanger human health or well being or the environment if handled improperly.

.15 Alternate Disposal: the reuse and recycling of materials by a designated facility, user or receiving

1.4 DEFINITIONS (Cont'd)

.15 Alternate Disposal:(Cont'd)
organization which has a valid Certificate of Approval to operate. The alternative to landfill disposal.

1.5 DOCUMENTS

.1 Maintain at job site, one copy of following documents:
.1 Waste Audit (WA).
.2 Waste Reduction and Recyling Workplan (WRRW).

1.6 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

.2 Submit the WRRW to Departmental Representative within ten (10) days of contract award and prior to the removal of any material from site.

.3 Submit copies of certified weigh bills, bills of lading and used building material receipts from authorized disposal sites and reuse and recycling facilities for all material removed from site to Departmental Representative at the completion of Project. Written authorization from Departmental Representative is required to deviate from the facilities listed in Waste Reduction and Recycling Program.

.4 A diary of materials leaving the site indicating date, type of material and destination will be kept by the Waste Management Coordinator and a copy provided to the Departmental Representative at the end of the Project.

1.7 WASTE AUDIT (WA)

.1 Conduct WA prior to project start-up. Amend WA over course of construction as required.

.2 Prepare WA.

.3 Record on WA extent to which materials or products used consist of recycled or reused materials or products.

1.8 WASTE REDUCTION AND RECYCLING WORKPLAN (WRRW)

.1 Prepare WRRW prior to project start-up.

.2 Structure WRRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.

.3 Describe management of waste.

.4 Identify opportunities for reduction, reuse, and recycling of materials. Based on information acquired from WA.

.5 Post WRRW or summary where workers at site are able to review content.

.6 Set realistic goals for waste reduction, recognize existing barriers and develop strategies to overcome these barriers.

.7 Monitor and report on waste reduction by documenting total volume of actual waste removed from project.

1.9 MATERIALS SOURCE SEPARATION PROGRAM (MSSP)

.1 Prepare MSSP and have ready for use prior to project start-up.

.2 Implement MSSP for waste generated on project in compliance with approved methods and as reviewed by Departmental Representative.

.3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.

.4 Provide containers to deposit reusable and recyclable materials.

.5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.

.6 Locate separated materials in areas which minimize material damage.

.7 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.
.1 Transport to approved and authorized recycling facility.

.8 Collect, handle, store on-site, and transport off-site, salvaged materials in combined condition.
.1 Ship materials to site operating under Certificate of Approval.

1.9 MATERIALS SOURCE SEPARATION PROGRAM (MSSP) (Cont'd)

.8 (Cont'd)
.2 Materials must be immediately separated into required categories for reuse or recycling.

1.10 STORAGE, HANDLING AND PROTECTION

.1 Unless specified otherwise, materials for removal become Contractor's property.

.2 Separate non salvageable materials from salvaged items. Transport and deliver non salvageable items to licensed disposal facility.

.3 Support affected structures. If safety of building is endangered, cease operations and immediately notify Departmental Representative.

.4 Protect surface drainage, mechanical and electrical from damage and blockage.

.5 Separate and store materials produced during dismantling of structures in designated areas.

.6 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
.1 On-site source separation is recommended.

1.11 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of waste, volatile materials, mineral spirits, oil or paint thinner into waterways, storm, or sanitary sewers.

.3 Keep records of construction waste including:
.1 Number and size of bins.
.2 Waste type of each bin.
.3 Total tonnage generated.

.4 Remove materials from deconstruction as deconstruction/disassembly Work progresses.

1.12 USE OF SITE AND FACILITIES

.1 Execute Work with least possible interference or disturbance to normal use of surrounding areas.

.2 Maintain security measures established by existing facility and provide temporary security measures approved by Departmental Representative.

1.13 SCHEDULING

.1 Co-ordinate Work with other activities on site to achieve timely and orderly progress of Work.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 SELECTIVE DEMOLITION

.1 Limit demolition to within project site boundaries and protect adjacent areas from demolition activities.

3.2 APPLICATION

.1 Do Work in compliance with WRRW.

.2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.3 RECYCLING

.1 Supply separate disposal bins for all categories of waste material. Do not empty bins until inspected and approved by Departmental Representative.

.2 Provide monthly recycling and reuse reports to the Departmental Representative outlining and documenting the actual quantities of materials reused, recycled and landfilled each month, including a breakdown of and uses for each waste stream (including invoices, weigh bills, etc.).

.3 Include outline of the Interim Report in the Contract WRRW proposal.

3.4 WASTE REDUCTION AND RECYCLING WORKPLAN (WRRW)

.1 Calculate volumes/quantities of each type of material and indicate how the waste will be disposed of and/or how the materials will be recycled.

.2 Complete the estimated quantity of the Reuse and Recycling Worksheet and the Waste Generating Worksheet, submit to Departmental Representative.

.3 Contact reuse and salvage companies to determine which materials may be removed and/or delivered for reuse. Complete the Reuse Facilities List and submit to Departmental Representative.

3.4 WASTE REDUCTION AND RECYCLING WORKPLAN (WRRW) (Cont'd)

.4 Contact C&D recyclers and make arrangements for the materials which can be recycled. Complete the Recyclers Facilities List and submit to Departmental Representative.

.5 Compile a list of waste disposal companies, haulers and sites, using the Haulers and Disposal companies List, submit to Departmental Representative.

.6 During demolition, track C&D waste on an ongoing basis, using the Demolition Debris Audit Worksheet, submit worksheets to Departmental Representative on a weekly basis.

.7 Worksheets and lists form part of the Waste Reduction and Recycling Program.

.8 Inform Departmental Representative, in writing, when there is a change from the original Reuse and Recycling Program.

.9 In a cost effective manner, divert reusable and/or recyclable materials away from landfills.

3.5 CLEANING

.1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.

.2 Cleanup work area as work progresses.

END

1 RELATED SECTIONS

.1 Submittal Procedures: Section 01 33 00

.2 Cleaning: Section 01 74 00

2 INSPECTION AND DECLARATION

.1 Contractor's Inspection: conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
.1 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
.2 Request Departmental Representative's Inspection. The Departmental Representative will coordinate concurrent Halifax Water inspection.

.2 Departmental Representative's Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Correct Work accordingly.

.3 Completion: submit written certificate that following have been performed:
.1 Work has been completed and inspected for compliance with Contract Documents.
.2 Defects have been corrected and deficiencies have been completed.
.3 Equipment and systems have been tested, adjusted and balanced and are fully operational.
.4 Operation of systems have been demonstrated to operational personnel.
.5 Submitted as-built drawings and total station survey data have been approved by Departmental Representative as complete.
.6 Work is complete and ready for Departmental Representative's Final Inspection.

.4 Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request reinspection.

3 FACILITY OCCUPANCY

.1 Departmental Representative will have the right to take possession of and use any completed or partially completed portion of the Work regardless of time of completion of entire work, providing it does not interfere with the Contractor's work. Such taking possession or use of all, or part of the works thereof, will not be construed as final acceptance of the Work, or any portion thereof, or an

3 FACILITY OCCUPANCY (Cont'd)

.1 (Cont'd) acknowledgement of fulfillment of the terms of the Contract.

4 REMOVAL OF TEMPORARY FACILITIES

.1 Remove temporary offices, storage sheds, fencing, barricades, and any other temporary facilities from site.

.2 Clean up and restore proper finish grade to all areas which have been used for stockpiling materials and/or waste, for temporary buildings or facilities, for temporary roads and traffic areas or on which the final grade has been disturbed or damaged by any cause.

5 FINAL CLEANING

.1 Complete final cleaning as specified in Section 01 74 00.

6 COMPLETION CERTIFICATES

.1 Refer to General Terms and Conditions for procedures regarding the issuance of completion certificates.

7 GUARANTEE PERIOD

.1 Upon written notice during the guarantee period immediately replace, repair, or otherwise make good all defective work, materials, or equipment at no additional cost to Departmental Representative. Note that the guarantee period extends until twelve (12) months after the official acceptance date for the entire project (Final Certificate of Completion), and/or longer periods as provided in accordance with the Specifications.

END

1 SUBMITTALS

.1 Six (6) weeks prior to commissioning, provide QMP commissioning plan including schedule of all commissioning-related activities as specified in individual sections.

.2 QMP commissioning plan to fulfill commissioning requirements of items indicated within, but not necessarily limited to, Commissioning Brief in attached appendix and requirements of specifications.

.3 Prior to start of Work, submit name of Equipment Supplier's personnel proposed to perform services.

.4 Submit documentation to confirm personnel compliance with quality assurance provision.

.5 Commissioning services shall be as described herein and as specified in the individual specification sections.

2 RELATED SECTIONS

.1 Work Scheduling and Operational Restrictions: Section 01 14 00

.2 Quality Control: Section 01 45 00

.3 Division 02 through 34 inclusive

3 GENERAL

.1 Verification of the performance of the following items:

.1 Civil/municipal elements:

.1 Water distribution system.
.2 Sanitary sewer system.
.3 Three-way valve manhole assembly.
.4 STC 1000 Interceptor assembly.
.5 Storm sewer system.
.6 Manholes and catch basins.

.2 Electrical elements:

.1 Transformer and electrical service connection at NSP O/H pole.
.2 Lighting control and power distribution cabinet.
.3 Flood lights and light towers.
.4 Power centres.
.5 Power plug-ins.
.6 Wiring.

.3 Submit completed Commissioning Plan for approval by Departmental Representative prior to implementation.

3 GENERAL (Cont'd)

.2 The Commissioning Objectives are:
.1 To bring the civil, electrical and related systems and components from a state of "static completion" to a state of "dynamic operation".
.2 To verify conformance to Contract Requirements.
.3 To confirm the equipment meets the design intent of the Specifications and function in accordance with defined operational requirements.
.4 To confirm the completed facility meets user stated requirements.
.5 To provide all testing documents, certification and records.
.6 To fully train and equip Departmental Representative designated personnel to operate, maintain and trouble shoot all systems.

.3 QMP Commissioning Plan to consist of:
.1 Details regarding the roles and responsibilities of the Departmental Representative/ design/construction team during all phases of commissioning.
.2 Documentation defining design assumptions and performance standards of proposed systems.
.3 Description of systems, intended operation and performance details.
.4 Static testing and verification procedures.
.5 Functional performance testing procedures.
.6 Documentation requirements for test results.
.7 Seasonal or deferred commissioning.
.8 Training plan for operators.
.9 Preparation of the Interim and Final Commissioning Reports.
.10 Consideration to work restrictions and their impact on existing facility performance as detailed in Section 01 14 00.

4 PROCEDURES - GENERAL

.1 Comply with procedural standards of certifying association under whose standard services will be performed.

.2 Notify Departmental Representative three (3) days prior to beginning of operations.

.3 Accurately record data for each step.

.4 Report to Departmental Representative any deficiencies or defects noted during performance of services.

5 CONTRACTOR'S RESPONSIBILITIES

.1 Preparation of QMP commissioning plan and provides commissioning.

.2 Confirm subcontractors and suppliers carry out applicable tests and procedures prior to Departmental Representative's review.

.3 Arranges for walk through and commissioning reports, procedures and demonstration, after work has been reviewed, tested and commissioned.

.4 Arranges for and schedules training sessions, including preparation and distribution of documentation and related materials.

.5 Performs and documents all preliminary tests, assembles manuals of completed test forms and verification forms.

.6 Performs component start-up and testing with manufacturers of supplied equipment.

.7 Manages installation of the systems.

.8 Performs system start-up and testing.

.9 Fills out the commissioning data sheets and test forms/manual.

.10 Provides training and instruction and prepares Operating and Maintenance Manual for presentation to the operating and maintenance personnel.

.11 Is present for operation of system through tests with the Departmental Representative.

.12 Obtains code-required inspections and certifications and approvals.

.13 Obtains permits from authorities having jurisdiction.

.14 Prepares record drawings.

.15 Obtains and submit warranties to Departmental Representative.

.16 Organizes and submits Operating and Maintenance Manual from the subcontractors, suppliers and manufacturers to Departmental Representative.

.17 Assembles and delivers all spare parts and special tools.

6 EQUIPMENT SUPPLIER'S RESPONSIBILITIES

.1 The Supplier refered to in this sub-section is the Contractor's supplier. Supplier's submissions will be made through the Contractor to the Departmental Representative.

.2 At the completion of commissioning, provide a written statement affirming that the systems are operating properly in accordance with the design intent of the Specification and the construction drawings and specifications.

.3 The Supplier will confirm necessary labour and materials are arranged in order to implement commissioning.

.4 The Supplier is responsible for the following:
.1 Assisting the Contractor with creating the Commissioning Plan and Commissioning Schedule.
.2 All testing procedures and data recording forms. Submit samples of documents to Departmental Representative for review.
.3 Schematics and flow diagrams necessary for commissioning.
.4 The Interim Commissioning Report which contains all required commissioning information except for Work remaining to be done as seasonal or deferred commissioning Work.
.5 Seasonal commissioning requirements.
.6 The Final Commissioning Report. Provide five (5) copies to the Departmental Representative.

.5 Supplier will supply the services of a qualified, factory-trained technical representative at no additional cost to the Contract to commission the equipment. Additional commissioning services to be at the discretion of the Departmental Representative.

.6 The Supplier's technical representative will provide the services stated in the relevant technical sections and operate and demonstrate the equipment to personnel designated by the Departmental Representative.

.7 Rectify Work deficiencies identified during the commissioning process to the satisfaction of the Departmental Representative.

7 DEPARTMENTAL REPRESENTATIVE'S RESPONSIBILITIES

.1 Inspect installation.

.2 Certify completion of Contractor's commissioning.

.3 Receive all test reports from the Contractor and verify results.

.4 Participate in the equipment start-up testing conducted by the Contractor and verify results.

.5 Review shop drawings.

.6 Communicate apparent deviations from the specifications.

.7 Communicate the interface of various systems and how they effect each other, coordinate and execute system integration work.

.8 Review the equipment operating and maintenance manuals prepared by the Contractor.

.9 Participate in the performance testing process.

.10 Review the Record Drawings.

.11 Make staff available to the Departmental Representative at appointed times for training by manufacturer's representatives and providing labour to conduct Work within existing facilities that is not included in this Contract.

8 COMMISSIONING MEETINGS

.1 Affected parties must participate in specific commissioning meetings throughout the period that commissioning is taking place or being planned. Commissioning meetings will be coordinated and chaired by the Departmental Representative. The Contractor will take minutes and distribute minutes within five (5) working days of the subject meeting. The Contractor will update and circulate the updated commissioning schedule two (2) working days prior to commissioning meetings.

END