

## SECTION 165

### PROTECTION OF THE ENVIRONMENT

**165.01 General** - This Section covers the general and specific provisions for the protection of the environment under the direction of the Ministry Representative, in cooperation with any Federal and/or Provincial Environment officers or an Environmental Monitor, as designated in the Special Provisions.

**165.01.01 Intent of Specifications** - These Specifications give the Ministry or its Agent the right to exercise control over environmental aspects of the work. The Contractor shall adhere to specific instructions if the work may result in an adverse impact on the environment.

The Ministry will determine the significance of environmental impacts in consultation with Environmental Agencies. The Ministry reserves the right of approval over the general methods employed by the Contractor in the performance of the work, but only insofar as they may affect relations with Environmental Agencies and the protection of aquatic and terrestrial resources, the health and safety of public, and protection of socio-community resources and features.

These specifications are for the protection of the environment, and shall be given such interpretation as will secure this intent.

**165.01.02 Definitions** - For the purposes of this Section, the following general terms are defined as follows:

**a)** “Appropriately Qualified Professional” means an applied scientist or technologist specializing in a relevant applied science or technology including, but not necessarily limited to, agrology, forestry, biology, engineering, geomorphology, geology, hydrology, hydrogeology or landscape architecture. An appropriately qualified professional must be recognized in British Columbia with the appropriate professional organization, and acting under that association’s Code of Ethics and subject to disciplinary action by that association. He or she must also be someone who, through demonstrated suitable education, experience, accreditation and knowledge relevant to the particular matter, may be reasonably relied on to provide advice within his or her area of expertise.

**b)** “Construction Environmental Management Plan” means an action plan which addresses the how, when, who, where and what of integrating environmental mitigation and monitoring measures throughout an existing or proposed operation or activity. It encompasses all the elements that are sometimes addressed separately in mitigation, monitoring and action plans.

**c)** “Deleterious Substance or Material” is defined as a substance harmful to fish or fish habitat (Canada Fisheries Act).

**d)** “Designated” shall mean designated in the Special Provisions or by the Ministry Representative.

**e)** “Environment” refers to the physical, biological, social, spiritual and cultural components that are interrelated and affect the growth and development of living organisms. The term “environment” in these specifications shall include socio-community issues and resources.

**f)** “Environmental Agencies” shall mean the appropriate regulating branches of the Federal and Provincial agencies responsible for the management and protection of the Environment and human resources. A partial listing of these agencies and their areas of concern is given in the joint publication “Land Development Guidelines for the Protection of Aquatic Habitat”, Fisheries and Oceans Canada and Ministry of Environment, Lands and Parks (1992), hereafter referred to as the “Land Development Guidelines” and the “Standards and Best Practices for Instream Works”, Ministry of Water, Land and Air Protection (2004).

**g)** “Environmental Approval” is defined as the written authority issued to a person or company by a government agency that allows the person or company to do something that otherwise may not be permitted by law or which is not defined in law. An Environmental Approval is a broad, generic term referring to informal or formal authorization for actions that may have an adverse effect on the environment, such as

**(i)** undertaking an activity (e.g., authorization from fishery agencies to proceed with work within the wetted perimeter of a fish-bearing stream); or

**(ii)** discharging some form of material (e.g., approval under the British Columbia Environmental Management Act to introduce waste into the environment or the storage of special waste for a period of 12 months or less).

The term “approval” can include related forms of authorization such as permits and licenses.

**h)** “Environmental Monitor” shall mean an agent hired by the Contractor to ensure the Contractor’s compliance with the environmental protection aspects of Standard Specifications, Special Provisions, permits and approvals, and to advise the Contractor and Ministry Representative on environmental issues and problems.

i) “Environmental Procedures” are written work procedures documenting environmental protection measures to be used to mitigate potential environmental impacts from activities in Environmentally Sensitive Areas.

j) “Environmentally Sensitive Areas” shall mean areas requiring special management and attention to protect resources, habitat or species (which includes and is not limited to water quality, identified sensitive areas, fish and fish habitat, vegetation, rare and endangered flora/fauna, landscaping and visual aesthetics, soil conservation (including dust control), air quality and archaeological, heritage and cultural resources).

k) “Environmental Timing Window” shall mean any period suitable for environmentally sensitive construction work as Designated by an Environmental Agency or other federal, provincial, municipal or local agency. This window represents the period that the natural or human environment is likely less susceptible to adverse impacts. A common example of an Environmental Timing Window on highway construction projects is a Fishery Timing Window. Timing windows may also be imposed for the protection of breeding birds, retention of significant recreational activities, maintenance of critical traffic patterns, etc.

l) “Fisheries Sensitive Zone” is defined as the instream aquatic habitats, as well as out-of-stream supporting habitat features such as side channels, wetlands, and vegetated riparian areas adjacent to these features.

m) “Fishery Timing Window” refers to the time period(s) of reduced risk for important commercial, sport, and resident fish species, based on their life histories. The Fishery Timing Window is the time of year during which there are no fish eggs or alevins present in the substrates of local Watercourses, and the period when fish migration (juvenile out-migration and adult spawning in-migration) is not occurring. This is generally the preferred period for (i) instream work or (ii) work adjacent to or over top of fish-bearing streams with the potential to create adverse impacts on fish or fish habitat. The Fishery Timing Window is that period of any given year which is at any time so Designated by the Environmental Agencies. “Fishery Timing Window” and “Instream Work Window” are synonymous.

n) “Habitats” are defined as those parts of the environment on which terrestrial and/or aquatic species depend, directly or indirectly, in order to carry out their life processes.

o) “Impact” is defined as an alteration, either positive or negative, to the environment brought about as a direct or indirect result of a highway project, including

construction, operation and maintenance work (e.g., the consequence of a highway-related activity interacting with its surroundings).

p) “Instream Work Window” and “Fishery Timing Window” are synonymous.

q) “Mitigation” refers to a procedure or an action designed to avoid, reduce or control the severity, magnitude, duration and/or frequency of environmental impacts of a project through design alternatives, scheduling or other means.

r) “Permit” refers to a formal authorization, typically granted to proponents by an Environmental Agency, for discharging agreed upon quantities and types of regulated substances such as pollutants or waste. For example, under Section 8 of the British Columbia Waste Management Act, a permit may be issued to introduce waste into the environment or to store special waste subject to environmental protection requirements which are deemed advisable. The permit can specify the procedures or requirements respecting the handling, treatment, transportation, discharge or storage of waste that the holder of the permit must fulfill. The term “permit” can be defined by applicable legislation. The term “permit” is synonymous with the term “license”, and the two terms are often used interchangeably.

s) “Riparian Area” is defined as the land adjacent to the normal high water level in a stream, river, lake or pond and extending to the portion of land that is directly influenced by the presence of adjacent ponded or channeled water, or a groundwater zone fed by surface water bodies (e.g., zone in which rooted vegetation is influenced). Riparian areas typically contain important vegetation resources which provide several critical functions for the survival of fish (e.g., protection from predators, shade for temperature regulation of the Watercourse, and sources of food).

t) “Sedimentation” is defined as the deposition of material carried in water, usually as a result of a reduction in water velocity below the point at which material can be transported.

u) “Watercourses” shall apply to all bodies of water including streams, rivers, canals, ditches, lakes, ponds, and wetlands.

v) “Wetted Perimeter” is the area of stream channel extending to the normal high water marks as is evident in the field as the boundary on the stream bank between the scoured channel and the edge of rooted vegetation, or as marked in the field by the Ministry Representative or the Environmental Monitor. It may be defined by Station number and/or as highlighted on the plan drawings.

## SECTION 165

**165.01.03 General Restraints for Watercourses and Groundwater** - The following general restraints in regard to the protection of any Watercourse shall apply:

- a) The Contractor shall place and/or dispose of all organic material, refuse, ash, petroleum products and other deleterious materials so as not to directly or indirectly pollute any Watercourse or groundwater. The placement and disposal of all such products and materials shall be done in an environmentally acceptable manner.
- b) Except as required by the Contract Documents, all inorganic material shall be placed and/or disposed of in a manner that does not obstruct or unduly disturb any permanent or seasonal Watercourse. Any such obstruction or disturbance shall be restored to the original drainage pattern as reasonably required by the Ministry Representative. Any removal of inorganic material from a Watercourse shall be done in a manner that minimizes adverse impacts and shall be carried out as directed by the Ministry Representative.
- c) All activities within the wetted perimeter of any Watercourse shall be kept to an absolute minimum. Machinery and equipment shall not be operated within the wetted perimeter of any Watercourse other than under the authority of the Ministry Representative. An Environmental Monitor shall be present at the direction of the Ministry Representative during any work within the wetted perimeter of any Watercourse on the Project.

The preceding requirements, a) through c), are considered incidental to the price bid for work under Contract and no other compensation will be made.

**165.01.04 Designated Streams and Designated Environmentally Sensitive Areas** - Any Watercourse or Environmentally Sensitive Area Designated in the Special Provisions or by the Ministry Representative is subject to all of the restraints of this Section.

**165.02 Environmental Monitor** - The Contractor shall retain the services of an Environmental Monitor.

The Environmental Monitor shall be an independent Appropriately Qualified Professional.

The Environmental Monitor shall be suitably experienced in:

- The preparation and implementation of environmental protection plans including, but not limited to: Construction Environmental Management Plans (CEMP) for mitigating environmental impacts of highway and bridge projects, including erosion and sediment control plans, spill contingency plans, clearing and grubbing plans, reclamation plans, environmental monitoring plans;

## PROTECTION OF THE ENVIRONMENT

- liaising with Environmental Agencies;
- applying for Environmental Approvals;
- fish salvage operations; and
- sampling, analysis and monitoring of water quality.

The Environmental Monitor shall be available throughout the duration of the Work to represent the Contractor in all matters related to the protection of the environment and will attend all key meetings at which environmental protection measures are to be discussed.

The Environmental Monitor and the Contractor shall work together on the development and implementation of the Construction Environmental Management Plan and associated plans and applications for Environmental Approvals.

Unless otherwise approved by the Ministry Representative, the Environmental Monitor shall be on-site during work in Environmentally Sensitive Areas including, but not limited to the following activities:

- installation and decommission of temporary stream crossings, work bridge works, construction accesses, and in-stream sediment control and isolation measures;
- fish salvage operations;
- excavations, or placement of riprap, within the Wetted Perimeter of streams;
- construction activities in and around listed species or ecosystems; and
- cement pours in and around Designated Watercourses. .

**165.02.01 Planning and Scheduling** - The Contractor shall carefully plan and schedule construction activities in a manner that ensures the avoidance or absolute minimization of environmental damage. The Contractor shall be familiar with and be able to identify those areas and times which present environmental problems and shall prepare schedules and work methods accordingly. The Contractor shall forward a copy of each of the schedules to the Ministry Representative at least one week in advance of commencement of each of these operations, unless otherwise specified in the contract.

**165.02.02 Construction Environmental Management Plan** The Contractor shall provide a Construction Environmental Management Plan (CEMP) which describes in detail the approach to be taken in addressing environmental issues associated with the Project and the correlation of the CEMP to the project schedule.

The CEMP shall be provided to the ministry prior to mobilization to the site. The Contractor shall make copy of the CEMP accessible to personnel on-site.

## SECTION 165

## PROTECTION OF THE ENVIRONMENT

Mandatory elements of the CEMP will include, but not be limited to, the following:

- a demonstration of work compliance with the environmental protection requirements of the Contract, including, but not limited to, the Standard Specifications, Special Provisions, and Environmental Approvals.
- a demonstration of an understanding of the specific environmental issues involved with the Project, including Environmental Approvals;
- indicate an understanding of Ministry/Contractor responsibilities;
- all the tasks required and clearly identify the duration and sequence of each task leading to the receipt of agency approvals, and its linkage to the project schedule; Environmental Procedures;
- Erosion and Sediment Control Plan;
- Spill Contingency Plan;
- Clearing and Grubbing Plan; and
- Reclamation Plan;
- Environmental Incident Reporting Plan
- Environmental Monitoring Plan identifying the Work activities during which the Environmental Monitor will be on-site; and
- Construction Waste Management Plan
- Air Quality and Dust Control Plan
- Contact names, positions and telephone numbers of individuals responsible for elements of the plan and Environmental Agency contacts.

The CEMP will clearly indicate how the Project will be undertaken to avoid negative impacts pertaining to, but not limited to, the following resources:

- water quantity and quality (including all surface and sub-surface sources),
- identified sensitive areas,
- fish and fish habitat,
- wildlife,
- vegetation (including riparian plant communities),
- rare and endangered flora/fauna,
- landscaping and visual aesthetics,
- soil conservation (including site stability, dust control),
- air quality, and
- archaeological, heritage, and cultural resources.

The Contractor, in consultation with the Ministry Representative, Environmental Monitor and the

Environmental Agencies, shall be responsible for determining the conditions under which the work must be carried out in Environmentally Sensitive Areas, and for making all required on-site examinations and examinations of documents supplied and referenced by the Ministry in order to fully comprehend the environmental aspects of the work required.

**165.02.03 Environmental Procedures** - The Ministry may require one or more detailed sets of Environmental Procedures for any work in and around Environmentally Sensitive Areas, such as critical fish habitat. When a set of Environmental Procedures is required, the Contractor shall prepare and submit the procedures for approval by the Ministry Representative and the Environmental Agencies prior to undertaking work in these areas. These detailed procedures shall be an element of the CEMP. The Contractor shall forward a copy of the approved set of procedures to the Ministry, prior to undertaking the work. The Environmental Procedures shall contain the following items:

- a) Existing environmental conditions. Identification of the environmental resources (e.g. fish species and habitat) in the area of the proposed work.
- b) Description of work proposed in the Environmentally Sensitive Area. Summary of the proposed work, equipment to be used, schedule of activities, and location.
- c) Environmental protection measures. Statement concerning the protective measures that will be used to protect environmental resources (e.g., species and habitat) from each anticipated adverse impact.
- d) Contingency plan. Description of alternative or backup plan in the event of an environmental emergency or failure of any of the protective measures.
- e) Environmental monitoring requirements. Indication of any specific or unique environmental monitoring requirements to ensure compliance with environmental specifications and proper implementation of the CEMP.

Environmental procedures will be required for, but not limited to, the following activities within Environmentally Sensitive Areas;

- Clearing or grubbing;
- Streambed or streambank excavation, or riprap placement in a Watercourse;
- Installation or decommissioning of temporary features such as work bridges, cofferdams, instream shoring, tote roads, or construction accesses; and
- Other activities as directed by the Ministry Representative.

## SECTION 165

The Contractor shall consult with the Environmental Monitor and, if necessary, Fisheries and Oceans Canada (DFO) and the Ministry of Environment for specific recommendations about the preparation of the Environmental Procedures. The Environmental Procedures must be approved by the Ministry Representative and the Environmental Agencies prior to commencement of work in Environmentally Sensitive Areas.

**165.02.04 Project Orientation and Meetings** - The Contractor shall arrange regular meetings with the Ministry Representative, and the Environmental Monitor. Other interested parties may be asked to attend (e.g., Agency Representatives), whose representation is necessary because of the specific type or location of work being undertaken. The purpose of such regular meetings will be to outline the schedule of upcoming construction and proposed activities, and to review the activities of the previous week. Such regular meetings do not relieve the Contractor from attending or arranging other types of meetings as required due to the nature or extent of the work being done.

The Contractor shall arrange and conduct such regular meetings during construction, subject to the following conditions:

- a) Meetings shall be held on a weekly basis when construction activities are to proceed during an Environmental Timing Window, during a period when work is to proceed in an Environmentally Sensitive Area, or during a period when the proposed construction activity elsewhere on a project is to proceed for a duration greater than two weeks and has the potential to cause adverse environmental impacts.
- b) During periods other than that specified above, regular environmental meetings shall be held every two weeks, or as otherwise agreed to by the Ministry Representative.
- c) In the event that the Environmental Monitor or the Ministry Representative deem the Contractor's compliance regarding environmental requirements to be inadequate at any time during the Project, the frequency of the weekly or biweekly regular meetings shall be increased accordingly until the Environmental Monitor and the Ministry are satisfied with the Contractor's compliance rate.
- d) The Contractor's Environmental Monitor will record highlights from the meetings (e.g., summary of major discussion items and key action items) and forward a copy to the Contractor, as well as include this material in the Project Environmental Progress Reports.
- e) During the maintenance phase of the Project, the Contractor shall conduct regular environmental meetings with the Environmental Monitor on a

## PROTECTION OF THE ENVIRONMENT

quarterly basis, unless operations are to be conducted within Environmentally Sensitive Areas that pose potential environmental concerns. In the event that operations are to be conducted within such areas, the Contractor and Environmental Monitor shall conduct weekly environmental meetings for the duration of the maintenance work in such areas.

The Contractor is responsible for ensuring that the foreman, operators, and work crews (including any subcontractors) understand the specific environmental issues on the work site and their responsibilities under this Section. The Contractor's Environmental Monitor will give all construction personnel a brief environmental orientation prior to such personnel commencing work in any Environmentally Sensitive Area on the Project. The Contractor's Environmental Monitor will ensure that construction personnel are familiar with the environmental requirements and acceptable construction practices on the Project. The Contractor shall support the Contractor's Environmental Representative's role in this regard.

**165.02.05 Activity Within Designated Watercourses and Environmentally Sensitive Areas** - All activities that are conducted within the wetted perimeter of any Designated Watercourse or within other Designated Environmentally Sensitive Areas must conform to the timing restrictions stated in the Special Provisions, and to the Environmental Timing Windows given in the approvals of the Environmental Agencies. Construction work must be scheduled so that all operations affecting the Fisheries Sensitive Zone or other Designated Environmentally Sensitive Areas can be completed within these time periods. Prior to the commencement of any construction activities, all work in these areas must be approved by the Environmental Agencies and the Ministry Representative.

The Contractor must give at least 48 hours notice to the Ministry Representative in advance of any construction-related activity in Designated areas. Construction activities within Designated Watercourses or other Environmentally Sensitive Areas shall not commence without the approval of the Environmental Monitor.

**165.02.06 Inclement Weather** - The Contractor shall cease operations, modify construction methods, or relocate to an alternative site within the project area during periods of inclement weather to avoid siltation of Designated Watercourses. If the Ministry Representative judges that the Contractor is not complying with the intent of this Section, the Ministry Representative may direct the Contractor as to measures required without additional compensation for delays or alterations in the Contractor's work.

**165.02.07 Work Stoppage** - Prior to initiating work stoppages, the Contractor shall initiate and complete any mitigative and environmental protection measures required

## SECTION 165

to safeguard the environment and the Project during work stoppages.

The Contractor shall give the Ministry Representative sufficient notice of impending shutdowns to enable the Ministry Representative, Contractor, and, if employed, the Environmental Monitor to examine the project. This notice shall be sufficient to permit the Contractor adequate time to install all necessary additional environmental mitigation measures as may be directed by the Ministry Representative.

The Contractor shall ensure the Environmental Monitor and construction personnel inspect Environmentally Sensitive Areas on the Project on a regular basis during any extended work stoppages (e.g., weekends, statutory holidays, Christmas vacation periods) to prevent environmental problems. If potential adverse environmental impacts are observed during work stoppage periods, the Contractor shall initiate and undertake any required environmental measures to avoid or minimize impacts.

### **165.03 Compliance, Enforcement and Payment**

**165.03.01 Compliance with Specifications -** The Contractor is responsible for ensuring that all subcontractors and employees are in compliance with these Specifications and all applicable environmental legislation and regulatory requirements at all times, and shall take immediate action to rectify problems in this regard. The Contractor shall initiate action to rectify environmental problems within the time period as specified by the Ministry Representative. The Contractor shall have available such additional safeguards, safety devices and protective equipment as are necessary to protect the environment. The Contractor shall be responsible for ensuring sufficient safety devices and protective equipment (e.g., pumps, silt fence, armoring, tarps, fuel spill cleanup kits, etc.) are readily available at all times during construction of the Project. The location and inventory of safety devices and protective equipment shall be documented and placed in a prominent location in the Contractor's field office. A copy of this information shall be updated as necessary and provided to the Ministry Representative.

The Environmental Monitor shall inspect and monitor conditions at, and in the vicinity of, the project to ensure acceptable levels of pollution and disturbance are not exceeded, and to ensure compliance with the environmental specifications contained herein and in the Special Provisions.

The frequency of such inspection and monitoring efforts shall correspond to the sensitivity and location of construction activities, as well as to the environmental conditions (e.g., increased monitoring and inspection will be conducted during periods of inclement weather). In the event that the Ministry Representative is not satisfied with

## PROTECTION OF THE ENVIRONMENT

the frequency and duration of such inspection and monitoring, the Contractor and/or the Environmental Monitor will be required to increase their efforts in this regard to a level satisfactory to the Ministry.

**165.03.02 Compliance with Environmental Legislation and Regulatory Requirements -** The Contractor shall observe and comply with all federal, provincial, municipal and local laws and regulations which seek to ensure that construction work does not adversely affect the environment or social-community resources.

In the event of conflict between the requirements set out in these Specifications and quality control laws, statutes, regulations and ordinances of federal, provincial, municipal or local agencies, the more restrictive requirements or regulations shall apply. A violation of the environmental laws and regulations reported to the Ministry by the responsible agencies may result in the issuance of a non-conformance report. Should the situation warrant more stringent measures, it may also result in the issuance of a stop-work order until the violation is corrected. The Contractor shall have no recourse for reimbursement due to delays or alterations to construction activities arising from such violations or the correction of such violations.

The Contractor shall observe and comply with all terms and conditions of Environmental Approvals. Unless otherwise indicated, the Contractor is responsible for all work needed to comply with the terms and conditions of Environmental Approvals. The Contractor shall make copies of all Environmental Approvals accessible to personnel on-site.

**165.03.03 Temporary Pollution Control -** The Contractor shall be responsible for implementation of any temporary environmental protection measures, such as pollution control measures. If the Contractor fails to respond to this requirement or to the instructions in this regard from the Ministry Representative or the Environmental Monitor within directed time span, the Ministry Representative may take whatever action is necessary to provide the proper corrective measures. In the event the Contractor fails to take reasonable action to implement temporary environmental control measures, the Ministry's Representative shall determine the need for additional corrective action. The Ministry's Representative may deduct incurred costs from any money due or to become due to the Contractor for any corrective action taken in this regard.

**165.03.04 Responsibility for Damage to Environment -** The Contractor shall bear sole responsibility for any direct or indirect damage to the environment which occurs as a result of failure to comply with Environmental Approvals, these Specifications, the directions of the Ministry Representative or recommendations of the Environmental Monitor.

**165.03.05 Stop Work Orders** - In the event that the Ministry Representative determines that some aspect of the construction is creating or will result in a substantial adverse effect on environmental values or resources on or adjacent to the project site, the Ministry Representative may issue a "stop work order" on behalf of the Ministry. The Contractor shall subsequently be responsible for advising the Ministry Representative of the intended remedial action. The Ministry Representative may direct the Contractor to cease construction work on an unaffected portion of the site so that any necessary equipment can be immediately diverted to address the environmental emergency. In such an event the Contractor will not be entitled to any claim for compensation from the Ministry.

In the event that an Environmental Monitor is employed, and the Ministry Representative cannot be contacted, the Environmental Monitor will assume the Ministry Representative's role regarding Stop Work Orders, as detailed above, until such time as the Ministry Representative can be contacted. The Environmental Monitor will fully document all such instances. In such an event, the Contractor will not be entitled to any legal recourse or claim for compensation from the Ministry.

The Contractor shall be required to modify or halt any aspect of construction or maintenance that the Environmental Agencies determine poses or will pose an environmental concern. The Environmental Agencies may verbally direct the Contractor to modify or halt any such activity or submit formal written instructions to that effect. In either case, the Contractor's immediate compliance with their instructions will be mandatory. The Contractor shall document any such requests by the Environmental Agencies and forward a copy of this documentation to the Ministry within five working days of the initial notification by the Agencies.

**165.03.06 Payment** - All other requirements for compliance with these environmental specifications shall be considered incidental to the price bid for the Project under contract and no other compensation shall be made to the Contractor. However, the Contractor may be eligible for reimbursement for the installation of any additional environmental works (e.g., enhancement measures) where directed and approved in writing by the Ministry Representative and not covered in this Section or elsewhere in the Special Provisions or Schedule of Quantities and Unit Prices. Any eligible reimbursement will be paid for by an Order for Extra Work. The Ministry Representative will be responsible for determining the Contractor's eligibility in this regard and for identifying what environmental work is beyond the scope of the Contract and these specifications.

**165.04 Erosion, Sediment, and Drainage Control** - All works shall be undertaken in a manner that avoids or absolutely minimizes erosion problems and the discharge of siltation or other deleterious substances into any

Watercourse. The Contractor shall not disturb Designated Watercourses, unless the express written consent of the Environmental Agencies is obtained prior to initiating construction activities in such areas. No obstruction or debris shall be placed in any Watercourse during any operations, unless specified in the Special Provisions or by the Ministry Representative, or for Designated Watercourses approved by the Environmental Agencies. Should any material be inadvertently placed within the normal high water wetted perimeter of a Watercourse, the Ministry Representative shall be notified immediately and the Contractor shall remove the material immediately, using environmentally acceptable construction procedures and under the direction of the Environmental Monitor.

**165.04.01 Erosion and Sediment Control Plan (ESCP)**

– The Contractor is responsible for preparing and implementing an ESCP for the project in accordance with the methodology of the "National Guide to Erosion and Sediment Control on Roadway Projects", Transportation Association of Canada 2005. The Contractor shall incorporate all permanent soil erosion control features into the project at the earliest practicable time, as outlined in the accepted work schedule, and shall be responsible for temporary erosion and sediment control measures, including daily inspection of the integrity of such measures during adverse weather conditions or when construction operations are proceeding in Environmentally Sensitive Areas. Control measures shall be capable of continuous operation during working and non-working hours, and are subject to approval by the Ministry Representative. Any deficiencies which are observed in erosion control measures shall be immediately corrected.

The Ministry Representative has the authority to define Environmentally Sensitive Areas or conditions, such as areas of erodible soil, and to direct the Contractor to provide temporary erosion and sediment control measures. These measures may include, but may not be limited to:

- interceptor ditches or berms to direct runoff away from erodible areas;
- slope protection measures such as mulches, hydroseeding, erosion mats, geotextiles, filter fabric, polyethylene covers, or riprap;
- silt fences;
- ditch blocks to reduce flow velocities, and;
- sediment control measures, such as settling ponds.

The Contractor shall have sufficient materials, such as clean rock, granular material, and filter fabric available on-site for emergency protection measures when required.

The Contractor shall regularly maintain sediment and drainage control measures, such that they function as designed. Immediate action shall be taken by the Contractor to correct any deficiency observed in the operation of erosion and sediment control measures. In

## SECTION 165

the event that a deficiency in any sediment or drainage control measures is directly or indirectly creating an adverse environmental impact, the Contractor shall initiate the necessary action to correct the problem within one hour of observing or being informed of the situation. In the event that a deficiency in any sediment or drainage control measures poses the potential to create an adverse environmental impact, the Contractor shall take action within two days of observing or being informed of the situation. In the event that environmental conditions or the status of the situation change in regards to a potential deficiency, the Contractor shall accelerate any proposed correction measure(s) by taking immediate action (i.e., within one hour). The judgment of the need and timing for corrective action in regard to sediment or drainage control measures shall be at the discretion of the Ministry Representative, Environmental Monitor, and the Environmental Agencies.

Sediment and debris accumulations which compromise the functioning of the erosion and sediment control measures shall be removed by the Contractor and disposed of in an environmentally acceptable location and manner. At a minimum, silt fence structures shall be cleaned when sediment accumulation heights exceed 30 cm along any portion of the structure.

In the absence of site-specific requirements from the Fisheries and Oceans Canada or the British Columbia Ministry of Environment, the Contractor shall comply with criteria for suspended solids in runoff water from the site as agreed upon prior to construction by the Ministry Representative and Environmental Agencies.

Sediment and drainage control methods are detailed in the "National Guide to Erosion and Sediment Control on Roadway Projects" and the "Land Development Guidelines", the "Standards and Best Practices for Instream Works and the Ministry publication "Control of Erosion and Shallow Slope Movement". Compliance with the spirit and intent of these guidelines is mandatory. The determination of the Contractor's compliance with these guidelines shall be at the discretion of the Ministry Representative and Environmental Agencies.

The Contractor, as directed by the Ministry Representative and in consultation with the Contractor's Environmental Representative, shall be responsible for the preparation and implementation of any Plan(s) required for the Project. Such plans will form an essential component of the Contractor's environmental protection program, in terms of identifying environmentally acceptable construction practices for erosion and sediment controls at specific sites. The Erosion and Sediment Control Plan(s) will be subject to, but not limited to the following requirements:

- Prior to commencement of construction activities on the Project and thereafter when deemed necessary, the Contractor and the Environmental Monitor will identify areas and major construction activities for

## PROTECTION OF THE ENVIRONMENT

which the Contractor will be required to prepare one or more Erosion and Sediment Control Plans. Designation of these areas and activities will be done in consultation with the Environmental Agencies and the Ministry Representative.

- In addition to activities within the Project area, a Erosion and Sediment Control Plan shall be submitted for activities related to the Contractor's work in areas away from the project that have the potential to create adverse environmental impacts, which will be determined by the Contractor in consultation with the Environmental Monitor, the Environmental Agencies and the Ministry. These activities are not confined to the areas immediately adjacent to the right-of-way, but also in other locations in which the work or associated activities will be conducted, including but not limited to haul or access roads, temporary structures, borrow and granular excavations, staging/laydown areas, material storage sites and disposal sites.
- The Contractor shall not commence work in any area so identified until a Erosion and Sediment Control Plan has been submitted and accepted by the Ministry and involved Environmental Agencies.
- The acceptance and approval of the Contractor's Erosion and Sediment Control Plan or updated Plan shall be valid only so long as the conditions and anticipated conditions upon which the Plan and its acceptance were based continue to be applicable.
- The Contractor shall at all times be responsible for ensuring that work is carried out in accordance with a Erosion and Sediment Control Plan or updated Plan, which has been accepted by the Ministry and Environmental Agencies.
- The Ministry or the Environmental Agencies may request the Contractor to update and resubmit its plan(s) at any time, and may require the Contractor to cease work until the update(s) has been submitted and accepted. Whether or not the Ministry or the Environmental Agencies so request, the responsibility for carrying out the work in accordance with a validly accepted Plan lies entirely with the Contractor.
- The Ministry or the Environmental Agencies may order the Contractor to stop work or to take other precautionary or remedial measures whenever the Contractor is carrying out any work that is not in accordance with a Erosion and Sediment Control Plan or updated Plan which has been accepted by the Ministry or the Environmental Agencies, and for which that acceptance is still valid. All costs of any resulting delay shall be borne entirely by the Contractor.

## SECTION 165

At a minimum, a Erosion and Sediment Control Plan will include the following information and will be prepared in a format satisfactory to the Ministry Representative and the Ministry:

- a) A schedule for the proposed activities, as they pertain to the Erosion and Sediment Control Plan and construction staging, including anticipated duration of construction.
- b) A description of the construction procedures that will be used to limit the potential for erosion and sediment production, including estimates of work areas where applicable (e.g., volume of material in a proposed stockpile site), description of construction equipment to be used, and staging of operations.
- c) A detailed description of the site-specific measures for runoff and drainage management.
- d) A detailed description of the site-specific mitigation measures and design information for erosion prevention and control (e.g., sizing of culverts, ditches or sediment/detention ponds, silt fence specifications, and description of ditching and berming).
- e) A schedule that identifies the various sloped areas by station and the dates in which they will be protected using temporary and permanent revegetation measures, such as hydroseeding.
- f) A detailed description of mitigative measures for ensuring acceptable water quality and quantity at points of discharge to Watercourses, including sizes and specifications for any proposed water treatment facilities.
- g) A key plan and drawings, in suitable scale and detail, of the site and proposed mitigative measures and applicable construction procedures.
- h) A written commitment of on-site equipment (e.g., water pumps) and materials (e.g., silt fence, hay bales, rock armoring, and ditch breakers) for erosion, sediment and drainage control to deal with emergency situations that may arise.
- i) A written commitment of on-site equipment and staff to handle any fish salvage and transfer operations, if required.

A description of the specific monitoring procedures prior to, during and after completion of construction activities at this site.

### **165.04.02 Not used.**

**165.04.03 Sediment Control Ponds** - The Contractor shall construct sediment control ponds where necessary to prevent the release of unavoidably entrained sediments in runoff from the construction site, and shall construct stormwater detention ponds for the temporary and/or permanent control and discharge of stormwater runoff.

## PROTECTION OF THE ENVIRONMENT

The Contractor shall provide designs for and construct sediment control ponds, as well as stormwater detention ponds, on a site-specific basis in a manner that conforms to the "National Guide to Erosion and Sediment Control on Roadway Projects" or "Land Development Guidelines", other than for the following exception(s):

- Sediment control ponds and dry or wet stormwater detention ponds shall be designed and constructed to accommodate the 10-year return period storm under developed conditions with a minimum 0.60 metre freeboard to the top of the berm.

The Contractor is referred to Section 3 of the "Land Development Guidelines" for other pond design criteria and Section 8 of that publication, for sample calculations for water flows and pond sizes.

If during construction the settlement pond is filled to capacity and is still required for sediment control, accumulated settled sediments shall be removed from sediment control ponds and stormwater detention ponds. Such sediments shall be disposed of in an environmentally acceptable location and manner.

**165.04.04 Maintenance of Drainage Patterns** - Except where interceptor ditches or berms are required to divert sediment laden runoff from the site to a sediment control pond, original drainage patterns shall be maintained throughout construction operations. Interceptor ditches or berms shall be constructed to divert water entering the site away from erosion prone areas. The Contractor will not rely on drainage courses or conduits being shown on the Drawings, and will make whatever investigation is necessary. Where a natural Watercourse traversing the construction site crosses this interceptor ditch or berm, an armoured or lined ditch or a culvert shall be installed in order to pass accumulated flows through or around the construction site in a manner that maintains the natural runoff pattern, unless otherwise directed by the Ministry Representative.

All ditches constructed for interception of clean water outside the work site(s) to divert it around the work site(s) and for collection of treated water from the work site(s) shall be designed and constructed to accommodate the 10-year return period storm with a 0.3 m freeboard under developed conditions. Temporary and/or permanent drainage ditches, including those constructed for erosion and sediment control shall be designed to prevent high water velocities and erosion by including measures such as check dams, drop structures or erosion-resistant liners or armoring.

**165.04.05 Storm Drainage Systems** - In order to minimize siltation, the Contractor may be required to block storm drain inlets, or to activate inlets by means of sandbags, berms or swales, as circumstances require, or at the direction of the Ministry Representative. Berms shall be constructed of clean, non-erodible granular material.

The Contractor shall maintain, on a regular basis, any inlets activated during the course of construction. Any deficiencies noted in these works shall be corrected immediately in the event that the inlet is plugged and within the same day if the site is relatively dry.

The Contractor shall ensure adequate inspection and correction of any storm drainage system deficiencies for sites within the influence of the Project. During periods of inclement weather, the Contractor shall ensure project staff inspect storm drainage systems throughout the day, and if necessary, make arrangements for inspection and maintenance during regular work stoppage periods, such as evenings or weekends. At a minimum, such inspections shall be carried out at the start of the regular workday, at mid-day in the workday, and one hour prior to end of the regular workday. Furthermore, in the event of flooding problems, the Contractor shall be responsible for any damages or compensation resulting from impacts on residences or businesses caused by a failure or deficiency in the Contractor's design and maintenance of the storm drainage system.

During concrete curb and gutter construction, road surface runoff shall be directed by berms or swales away from concrete which has been poured within the previous 48 hours.

#### **165.05 Clearing and Grubbing Plan (CGP)**

The Contractor is responsible for preparing and implementing a detailed CGP for the project. The Contractor shall prepare the CGP in consultation with the Environmental Monitor and the Ministry Representative. The Contractor will obtain approval for this plan from the Environmental Monitor and Ministry Representative and any necessary tree removal permits from the Ministry of Forests and/or municipal agencies prior to initiating any clearing and grubbing operations within 50 m of any Designated Watercourse or Environmentally Sensitive Area.

**165.05.01 Limits for Clearing and Grubbing** - Clearing and/or grubbing shall extend only to the Designated limits, as defined in the Contract Drawings and marked on site. Prior to clearing or grubbing, marked limits will be inspected by the Ministry Representative, who may amend them. The Contractor may be required to use close-cut, no grub practices (i.e., cutting trees at ground level and not removing root system) or undertake hand clearing at environmentally sensitive sites, as Designated in the Special Provisions or by the Ministry Representative.

The Contractor shall minimize ground disturbance in the vicinity of any Watercourse or Environmentally Sensitive Area, and shall not proceed with clearing and grubbing closer than 50 m from a Designated Watercourse or Environmentally Sensitive Area prior to marking the limits of the Fisheries Sensitive Zone or Environmentally Sensitive Area. The width of these zones, if not specified

in the Special Provisions, will be determined by the Ministry Representative in consultation with the Environmental Agencies. The Contractor shall mark the limits of any Fisheries Sensitive Zone or Environmentally Sensitive Area, such as orange flagging tape or orange snow fence, at a minimum height of 1.5 m.

All clearing and grubbing activities in this zone must be granted prior approval by the Environmental Agencies. The Contractor shall not conduct approved grubbing operations within this zone until ready to proceed with earthwork and stabilization.

In areas near Designated Watercourses or other Environmentally Sensitive Areas determined by the Ministry Representative to be of high erosion or siltation potential, the surface area of erodible soil exposed at one time may be limited by the Ministry Representative. This will supersede SS 200.03 and SS 200.04. The Ministry Representative may confine grubbing to an area where excavation and earthwork is to be actively conducted within approximately 30 days following the completion of grubbing operations. In the event that a highway project consists only of clearing and grubbing operations, the cleared ground shall be protected and able to withstand specified periods of inclement weather.

**165.05.02 Protection of Vegetation** - The Contractor shall protect all vegetation growing outside of the Designated and marked areas for clearing and grubbing, as specified in SS 769 "Protection and Retention of Vegetation", with the exception of danger trees, which must be hand-felled and removed with minimum disturbance to retained vegetation.

**165.05.03 Clearing Activities** - Falling of timber into a Watercourse is prohibited except in situations in which safety considerations dictate otherwise or unless approved by the Environmental Monitor. Any trees or large pieces of woody debris that accidentally fall into a Watercourse and require removal shall be removed in a manner that minimizes the disturbance of the Watercourse and adjacent banks, and is approved by the Ministry Representative. Skidding of logs across Watercourses will not be permitted. The Environmental Monitor must be present during removal of any large woody debris or trees from Watercourses.

**165.05.04 Disposal of Combustible Materials** - The Contractor shall comply with the Forest Act and the Open Burning Smoke Control Regulation under the British Columbia Environmental Management Act. For additional information regarding the regulation, the Contractor should contact regional staff in the British Columbia Ministry of Environment office and the Fire Centre staff in the British Columbia Ministry of Forests.

The Contractor shall prevent heat or smoke damage to all vegetation that has been Designated for preservation. The use of waste oil and/or tires as fire accelerators shall not be

permitted. The Contractor may be required to use a forced air method of burning. Burning piles shall not be located within 50 m of any Watercourse, wetland or other Environmentally Sensitive Area, or in areas where ditches are to be constructed without written approval of the Ministry Representative.

In situations in which the material generated as a result of clearing and/or grubbing may not be burned on site, the Contractor shall dispose of it in a manner approved by the Ministry Representative who may require approval of the British Columbia Ministry of Environment.

#### **165.06 Stripping Operations**

**165.06.01 Exposure of Erodible Earth** - In areas where erosion or siltation is anticipated, the duration of exposure of erodible earth material shall be minimized. In such cases the surface area of erodible earth material exposed at one time shall be determined and approved in writing by the Ministry Representative. (See SS 165.05.01 Limits for Clearing and Grubbing)

**165.06.02 Placement of Stripped Material** - The Contractor shall avoid placement of stripped materials on lands within the Agricultural Land Reserve and in areas adjacent to Watercourses or other Environmentally Sensitive Areas. Erosion and sediment control measures must be taken prior to and after placement of stockpiles of stripped material in areas where natural drainage or storm water could erode the stockpile and thereby transport pollutants to surface waters. The location of stockpiles and erosion control measures must be approved by the Ministry Representative prior to placement of stripped materials and may be specified in the Special Provisions. The Contractor shall ensure that all stockpiles are stable.

Polyethylene sheeting or other suitable tarp material shall be used to cover temporarily exposed steep surfaces or stockpiles of erodible materials, such as topsoil, sand, gravel or roadbase fill. The Contractor shall ensure such erodible materials are properly covered with sheeting or suitable tarp materials immediately after creation of any temporary stockpiles. Such sheeting or tarp materials shall be examined and maintained on a regular basis. The sheeting or tarp materials shall be sufficiently anchored to prevent displacement by winds.

**165.06.03 Slope Protection** - The Contractor shall employ suitable techniques to prevent the initiation of surface soil erosion and movement of sediments from slopes, particularly those exposed as a result of clearing, grubbing and stripping operations. Acceptable techniques and conditions of implementation of erosion and sediment control measures for slopes are outlined in the "National Guide to Erosion and Sediment Control on Roadway Projects", Section 3 (i.e., entitled "Slope Protection and Surface Protection") of the "Land Development Guidelines" and the MoT publication "Manual of Control of Erosion and Shallow Slope Movement". Compliance

with the requirements specified in this Section, as well as any Authority/MoT manual(s) developed specifically for the Project, will be mandatory.

#### **165.07 Earthwork Operations (Subgrade Construction)**

**165.07.01 Excavation and Disposal of Waste or Surplus Material** - The creation and use of any site on Crown or private lands for the placement and disposal of waste or surplus material requires prior approval from the Ministry Representative and may require the approval of the Agricultural Land Commission or representatives of British Columbia Ministry of Forests and Range and other Environmental Agencies. Unless another time period is specified in the Special Provisions or by the Ministry Representative, not less than fifteen days prior to disposing of any waste or surplus material, the Contractor shall submit to the Ministry Representative for approval, a proposal delineating the locations and extent of the areas in which the Contractor intends to dispose of such material. The proposal shall describe the nature of the material and the methods to be employed in material placement, stabilizing and site revegetation. If a disposal site is required off the right-of-way, the proposal shall also indicate the procedures for any required land clearing activity. The proposal will be reviewed by the Ministry Representative who may consult with Environmental Agencies. No waste or surplus material shall be disposed of until the proposal has been approved. All work shall be done in accordance with the approved proposal.

All waste disposal sites shall be selected such that spoil is prevented from entering any Watercourse. The excavated material shall be properly drained, spread and trimmed to a stable slope not exceeding 1.5 to 1, in a manner which minimizes disturbance of Watercourses and vegetated areas. All waste sites shall be revegetated immediately after creation of the waste disposal site, or else suitable temporary erosion control measures, such as tarps, shall be used until revegetation is undertaken. The Contractor is responsible for ensuring that revegetation is successfully accomplished unless otherwise specified in the Special Provisions.

**165.07.02 Work in Areas of High Water Table** - Work in areas of high water table shall be scheduled to proceed during dry weather periods unless otherwise specified in the Special Provisions. The Contractor shall adopt all necessary mitigation measures to avoid or minimize adverse impacts in such areas.

**165.07.03 Drilling and Blasting** - Blasting operations shall be conducted in a manner that minimizes the disturbance of residences, businesses and public infrastructure (e.g., schools and churches) and to aquatic and terrestrial habitats and organisms due to shock waves, noise and vibration.

The Contractor shall not conduct blasting within 400 m of fish habitat without the approval of the blasting plan by the Fisheries and Oceans Canada; British Columbia Ministry of Environment, Fish and Wildlife offices and the Ministry Representative. The Environmental Agencies and the Ministry Representative may require the Contractor to undertake mitigative measures such as scheduling of works in Timing Windows given by the Environmental Agencies, smaller staggered blasts or use of blasting mats to minimize impacts, and hydro-acoustic monitoring. Vibrations and shock waves in fisheries habitat resulting from blasts shall comply with the Fisheries and Oceans Canada "Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters".

Blasting operations shall be controlled to minimize the entry of fly rock into Watercourses or adjacent to the right-of-way, particularly in an urban setting. If required by the Environmental Agencies, the Contractor shall comply with the Agencies' directions in removal of fly rock from Watercourses and Environmentally Sensitive Areas at no cost to the Ministry.

When blasting is to be conducted adjacent to or in a Designated Environmentally Sensitive Area, the Contractor shall provide at least 24 hours notice of each blast to the Ministry Representative. The Contractor shall provide at least 24 hours written notice to those individuals or groups potentially affected by shock waves, noise and vibration from blasting operations.

**165.07.04 Pile Driving** - Pile Driving operations shall be conducted in a manner that minimizes the disturbance of residences, businesses and public infrastructure (e.g., schools and churches) and to aquatic and terrestrial habitats and organisms due to shock waves, noise and vibration.

The Contractor shall not conduct pile driving within or near fish habitat without the approval of the Environmental Procedures by the Fisheries and Oceans Canada; British Columbia Ministry of Environment, and the Ministry Representative. The Environmental Agencies and the Ministry Representative may require the Contractor to undertake mitigative measures such as scheduling of works in Timing Windows given by the Environmental Agencies, smaller staggered pile driving or use of bubble curtains to minimize impacts, and hydro-acoustic monitoring. Vibrations and shock waves in fisheries habitat resulting from pile driving shall comply with the Fisheries and Oceans Canada and BC Marine and Pile Driving Contractors Association "Best Management Practices for Pile Driving".

The Contractor shall provide at least 24 hours notice of pile driving activities to the Ministry Representative. The Contractor shall provide at least 24 hours written notice to those individuals or groups potentially affected by shock waves, noise and vibration from pile driving operations.

**165.08 Borrow and Sand / Gravel Pits** - All Borrow and Sand/Gravel pit locations, operations, reclamation and revegetation shall comply with the Ministry of Energy and Mines / MoT / Natural Resources Canada joint publication "Reclamation and Environmental Protection Guidelines for Sand, Gravel and Quarry Operations in British Columbia".

**165.08.01 Control of Drainage** - Prior to borrow excavations, or quarry, sand or gravel pit development, all surface water entering the site shall be controlled so that its entrance into the operating area is prevented. Drainage shall be controlled throughout borrow operations in order to prevent natural drainage and surface runoff from carrying sediment into adjacent Watercourses. The Contractor shall prepare an Erosion and Sediment Control Plan (see SS 165.04.02) prior to the creation and/or operation of any borrow excavations or quarry, sand or gravel pit development sites. The Contractor shall also prepare a Reclamation Plan.

**165.08.02 Location and Development of Borrow and Sand/Gravel Pits** - Clearing for borrow and sand/gravel pits shall comply with SS 165.05 - Clearing and Grubbing. All organic strippings topsoil shall be stockpiled for future reclamation.

Borrow excavations shall not be located in the wetted perimeter of a Watercourse or on a stream floodplain at a location likely to create a new channel to the stream at a time of flooding, without the approval of the Environmental Agencies. Borrow sources located within 100 metres of the wetted perimeter of a Watercourse or at distances less than 100 m from any water-impounding dyke or dam embankment will require the design of a Professional Engineer or Professional Geologist. Final floor elevations shall be sufficiently high that they will not be subject to fluctuations in the groundwater table.

In erosion-prone areas, overburden removal shall be restricted to an area that will be excavated within one year. The open face(s) of the borrow pit should be no larger than necessary for efficient pit operation. Material should be exhausted at one location in a pit prior to the opening of a new face to remove a similar type and grade of material.

The Contractor shall be responsible for maintaining the functionality of erosion, sediment and drainage control measures within and around borrow and sand/gravel pits throughout all phases of overburden and material removal, as well as during periods of work stoppages. Borrow and/or sand/gravel pits shall be rehabilitated and decommissioned in an environmentally acceptable manner and to the satisfaction of the Ministry and the Environmental Agencies.

To minimize the spread of noxious weed seeds between construction sites and gravel pits/quarries, all crushing equipment and mining vehicles must be cleaned with a power/high pressure washer (manually cleaned in freezing

temperatures), before entering any MoT pit or quarry. If the pit contains noxious weeds the crushing equipment and mining vehicles must also be cleaned with a power/high pressure washer (manually cleaned in freezing temperatures) before leaving the pit/quarry. Prior to the production of aggregates the pit floor, crusher/plant location, equipment-parking area, stockpile site(s), pit face(s) and area to be mined will be inspected by the Contractor for the presence of noxious weeds. If noxious weeds are present they must be removed mechanically by the contractor. Noxious weeds are defined as non-native plants species listed in the Weed Control Act.

**165.08.03 Washing Operations** - In locations where siltation of a fish-bearing Watercourse may occur, approval shall be obtained from the Environmental Agencies prior to the establishment of aggregate washing operations, and all wash water shall be subject to SS 165.04. Where possible the Contractor may be directed by the Ministry Representative to use water from pit dewatering or clarified water from the sediment pond(s) in the wash plant.

Waste or surplus material shall be disposed of at a waste disposal site approved by the Ministry Representative. The Contractor shall create and designate, with appropriate signing, suitable sites and facilities for disposal of waste or surplus material. In particular, the disposal of deleterious materials, such as surplus concrete or concrete wash water in sites other than those approved by the Ministry Representative and the Environmental Agencies is prohibited. The Contractor and the Contractor's Environmental Monitor shall be responsible for ensuring all construction personnel, including subcontractors, are made aware of this requirement. In the event that it is not feasible to install a suitable concrete waste disposal site immediately adjacent to the work site, such as during a concrete pour on a long bridge deck, then the Contractor shall take the necessary precautions to isolate the work site from any Watercourse or other Environmentally Sensitive Area and to temporarily collect the concrete waste or wash water and transport it to a nearby suitable disposal facility. The Contractor shall notify and seek approval from the Ministry and the Environmental Agencies for any changes in the location of waste disposal sites during construction operations.

### **165.09 Detour, Access and Haul Roads**

**165.09.01 Design, Construction and Operation of Access Roads** - Any temporary access, detour and/or haul roads, including associated lay-down or staging areas, associated with the project shall be constructed to accommodate all required uses and maintained throughout the course of construction operations in a safe, environmentally sound manner.

The location, alignment, design and construction of all detour, access and haul roads shall be subject to the approval of the Ministry Representative, and the

appropriate Environmental Agencies. The Contractor shall be responsible for applying for and acquiring Environmental Approvals for access roads not previously identified in Environmental Approvals acquired by the Ministry.

Clearing shall extend no further than safe operation requires, or to the edge of cut or toe of fill. Root systems of cleared vegetation shall not be removed except in the area of cuts or actual road surface.

The Contractor shall employ suitable measures to maintain air quality, visibility, and safe conditions in the use of access, detour and/or haul roads associated with the Project.

**165.09.02 Drainage and Erosion Control** - Drainage structures shall be incorporated into and maintained for the duration of the project along all detour, access and haul roads to minimize erosion and maintain drainage patterns.

**165.09.03 Abandonment** - The Contractor shall winterize haul and access roads at the end of the construction season and shall ensure proper drainage control measures are in place. Culvert inlets and outlets shall be flagged. During periods of work stoppages, the Contractor shall ensure sufficient inspection and maintenance of the access, detour and/or haul roads such that adverse environmental impacts are avoided or minimized. In the event that potential or existing environmental problems are identified by the Contractor, its staff, the Ministry, the Environmental Agencies or the public, the Contractor will take immediate steps to rectify the problem and ensure corrective action is taken to prevent future recurrence of similar problems.

When no longer required by the Contractor or the Ministry, construction roads shall be properly decommissioned, including measures such as blocking such roads off from vehicular traffic, scarifying the compacted surfaces and revegetating the area as stipulated in Environmental Approvals.. All drainage and crossing structures shall be removed, and sufficient cross ditches and ditch blocks constructed and stabilized to restore the original drainage patterns and prevent erosion. The Ministry Representative may require that windrows along the side of the road be removed, and the road surface sloped to drain in the direction of the surrounding contours. Fill may be required to be pulled back onto the road if it is judged to be unstable. Remaining cut slopes shall not exceed the natural angle of repose. Reclamation works required by the Ministry Representative may include, but may not be limited to decompaction of the road surface, revegetation of exposed soil surfaces, and reforestation.

**165.10 Instream Works** - In general the Contractor shall comply with the requirements specified in the applicable sections of "Standards and Best Practices for Instream Works", "A Users' Guide to Working in and Around Water" as well as those requirements noted below. The

Contractor, in consultation with the Environmental Monitor, shall prepare a detailed set of Environmental Procedures for any work within a Fisheries Sensitive Zone, within the wetted perimeter of any fish-bearing Watercourse (or any Watercourse that flows directly into a fish-bearing stream), or for any work with the potential to cause major adverse impacts on a fish-bearing Watercourse (e.g., concrete pour for a bridge deck over a fish-bearing Watercourse, hydroblasting of bridge substructures over a fish-bearing Watercourse, etc.).

No clearing or equipment operation shall take place in a Fisheries Sensitive Zone prior to Ministry and environmental agency approvals. Waste material generated during instream works shall not be stored or dumped within the floodplain unless otherwise approved by the Ministry Representative.

Drainage of waterbodies, such as wetlands, swamps or beaver ponds, shall be subject to the approval of the Ministry Representative who will consult the Environmental Agencies, unless drainage of these areas is specifically required as part of the Contract and has been approved by Fisheries and Oceans Canada and British Columbia Ministry of Environment.

**165.10.01 Fish Passage and Fish Salvage** - Unless the Contractor has written approval from the Ministry Representative and the Environmental Agencies, any instream works in fish bearing streams shall provide for fish passage. It is the Contractor's responsibility to contact the Environmental Agencies to determine fish passage requirements for the specific location.

The Contractor and the Environmental Monitor shall be responsible for fish salvage operations, including the timely acquisition of fish collection permits from Fisheries and Oceans Canada and the British Columbia Ministry of Environment.

**165.10.02 Management of Water Discharges** - During preparation of stream diversions, culvert installations and other operations involving dewatering where drainage could readily reach a Designated Watercourse, all effluent and silt-laden water shall be discharged to a sediment control pond or a vegetated area acceptable to the Ministry Representative and the Environmental Monitor for removal of silt prior to its release into that Watercourse. This requirement also applies to the control of discharge resulting from curing areas of recent concrete pours for bridges or drainage structure headwalls. The direct discharge or discharge via seepage of untreated, silt-laden water or other deleterious substance into any Watercourse is prohibited.

**165.10.03 Encroachment of Fill into Watercourses** - Embankments which encroach on the Wetted Perimeter of fish-bearing Watercourses shall either be isolated and dewatered, by means of a cofferdam, until surfaced with riprap, or constructed of clean granular material and riprap

or shot rock which is free of fine-grained material or other potential contaminants. Riprap composition and placement may be further detailed in the Special Provisions. The method of placement of this material shall be such that disturbance and/or alteration of aquatic habitats is absolutely minimized. Fill material must be entirely contained within the proposed fill cross section.

**165.10.04 Temporary Stream Crossings** - Prior to construction, the Contractor shall provide the Ministry Representative with a plan for approval, describing the proposed locations and types of stream crossings, complete with construction procedures and timing of construction. The Contractor shall forward a copy of the approved plan to the Ministry and obtain Environmental Approvals as needed. Temporary stream crossings shall be subject to the same environmental constraints as permanent crossings, and shall be built to pass, at least, the 10 year return period flood for the time of year during which the structure will be in place. Wherever possible, vegetative cover shall be maintained in order to minimize erosion.

Temporary stream crossings that have been constructed during periods of low precipitation (i.e. summer and late winter) shall be completely removed prior to periods of increased precipitation (i.e. fall and spring freshet), unless otherwise approved by the Ministry Representative.

**165.10.05 Instream Equipment Operation or Crossings** - The entering or crossing of any Watercourse by construction equipment, when not specified in the Special Provisions or Environmental Approvals, shall require the Contractor to receive written approval of the Ministry Representative and to submit applications or notifications to the Environmental Agencies, as needed. The Contractor shall notify the Ministry Representative 48 hours prior to allowing equipment to cross or enter Designated streams. The Environmental Monitor shall be present while equipment enters into and exits from any Designated Watercourse.

Upon completion, the banks shall be restored, stabilized and revegetated to prevent erosion. This work shall be completed to the satisfaction of the Ministry Representative.

**165.10.06 Culvert Installations** - Unless otherwise approved by the Ministry Representative, culvert installation in Watercourses shall involve an appropriate method of isolating the work site from the stream, such as the diversion of the stream around the culvert site, and the placement of the culvert in the "dry".

Installation of riprap and other protective works shall be carried out at the earliest possible time following culvert installation in order to prevent erosion and siltation.

**165.10.07 Culvert Obstructions** - Unless the Watercourse is dry, an obstructed culvert shall be cleared by mechanical means. Any variance to using mechanical

means to clear wet obstructed culverts must have the prior approval of the Workers' Compensation Board.

**165.10.08 Channel Diversions** - Channel diversions shall be performed in accordance with the Special Provisions. If not specified in the Special Provisions, methods shall be approved by the Ministry Representative, and shall comply with the "Standards and Best Practices for Instream Works", "A Users' Guide to Working in and Around Water", and the "Land Development Guidelines".

**165.10.09 Bridge Construction** - Bridge Endfills shall be constructed implementing fully the applicable subsections of SS 165, and SS 769, Protection and Retention of Vegetation. The Fisheries Sensitive Zone shall not be disturbed until construction of the endfill or crossing structure is ready to proceed. The Contractor may be required to hand fall trees and leave the root systems in place using close-cut no-grub techniques.

**165.10.10 Watercourse Clean-up** - Final Watercourse clean-up shall consist of, but not be restricted to, the removal of temporary haul roads and temporary crossings, the reshaping of the stream to its original configuration, width and depth, the protection of stream banks, revegetation, and the removal of all construction related material and debris, including any material and debris deposited upstream or downstream of the site as a result of operations, under the direction of the Environmental Monitor and to the satisfaction of the Ministry Representative. All abandoned temporary diversions shall be plugged and stabilized. In the event that erosion has occurred during the course of construction, the Contractor will be required to recontour, stabilize and revegetate the affected area.

**165.11 Ditch Maintenance** - To reduce the risk of damage to aquatic habitat and sensitive life stages of fish and other aquatic organisms, the Contractor shall ensure that the excavation and maintenance of ditches is conducted in an environmentally sound manner.

Excavation for ditch cleaning of any ditch that contains or directly drains into fish-bearing waters shall be performed only within Timing Windows as detailed in the "Land Development Guidelines, Appendix III", Ministry of Environment reduced risk timing windows documents, or as specified in the Special Provisions.

The Contractor shall consult local Environmental Agencies for the locations of sensitive areas and local Timing Windows prior to commencement of ditch maintenance. Areas identified as Fisheries Sensitive Zones shall be revegetated by the Contractor prior to the close of the timing window.

**165.12 Bridge Maintenance** - In performing any bridge rehabilitation or maintenance, the Contractor shall follow the procedures specified in the document "Federal Fisheries Guidelines for the Protection of Fish and Fish

Habitat during Bridge Maintenance Operations in British Columbia".

The Contractor shall take measures to ensure absolute minimal loss of paint and abrasive material into Watercourses during bridge cleaning. Mitigation measures may include placement of ground covers, lined nets or tarpaulins to capture falling debris, blast enclosures to encase the section of the bridge to be abrasively blasted, use of vacuum-shrouded power tools, and use of floating booms and barges to trap floating debris. Similar measures shall also be employed to assist in mitigating paint spray drift.

### 165.13 Servicing and Operation of Equipment

**165.13.01 Transport of Materials** - The Contractor shall use equipment and containers that are capable of safely transporting petroleum products and/or hazardous materials in compliance with Section 7.33.1 of the Federal "Transport of Dangerous Goods Regulations" for bulk containers, and Sections 7.21 and 7.23 of the same regulations for materials in packages or small containers. These regulations shall apply to both on-road and on-site transport. In addition to compliance with the Federal Transport of Dangerous Goods Regulations, the transportation of fuel trailers, fuel tanks on skids, and non-commercial fuel trucks shall comply with all the requirements of the Motor Vehicle Act and the British Columbia Fire Code.

The Contractor shall take the necessary precautions to prevent the loss of materials during transport on public highways, roads, access roads, and haul routes. Trucks carrying loose materials shall be covered and restraints shall be used to prevent materials from blowing or falling from vehicles. The Contractor shall be responsible for collection and removal of any and all litter deposited by vehicles or equipment along access routes during construction-related activities, including removal of dirt and mud deposited from truck tires on municipal roadways.

**165.13.02 Location and Installation of Fuel Storage Facilities** - The siting and installation of all fuel storage facilities shall be the responsibility of the Contractor. Fuel storage shall not be located within 30 m of a Watercourse, within a Watercourses flood plain, or where there is a potential for any spilled fuel to enter a Watercourse or groundwater. Fuel storage facilities shall be located on flat or gently sloping ground and shall be dyked to contain at least 125% of the total capacity of the storage containers. Dykes shall be constructed of impermeable material or lined to ensure that petroleum products cannot escape.

All large fuel storage tanks must be locked and secured when not in use. Automatic shut-off nozzles shall be installed on all dispensing units over 250 ℓ capacity. Fuel storage tanks must be drained within one week of

## SECTION 165

completion of construction or within one month of a prolonged shutdown period.

All small fuel storage containers, such as 45 gallon (200 litre) drums, used as a fuel cache shall be installed on a stable storage rack, within an impermeable containment device capable of capturing at least 125% of the total capacity of the storage container(s). A cover, such as a tarp, must be placed over the top of the fuel cache to prevent accumulation of precipitation in the containment device. The small fuel storage container(s) shall contain a metal spigot with a padlock placed on the container when not in use.

In the transport, storage and/or dispensing of fuel and other petroleum-based products, the Contractor shall comply with the requirements outlined in the Ministry of Environment, Lands and Parks/Ministry of Forests publication: "Environmental Standards & Guidelines for Fuel Handling, Transportation and Storage" (December, 1995).

The Contractor shall be responsible for all costs associated with clean-up and disposal of any escaped toxic and hazardous substances.

**165.13.03 Servicing of Equipment** - The fueling, servicing or washing of machines or equipment within the wetted perimeter or riparian zone of Watercourses is prohibited. No equipment refuelling or serviced should be undertaken within 30m of any Watercourse or surface water drainage. On-site fuelling and lubrication of equipment shall also be conducted as far as possible from detention and sediment control facilities. The Ministry Representative may require that servicing be conducted at Designated sites.

Refuse generated during the servicing of equipment (e.g., air and oil filters, hydraulic fluids, petroleum products) shall be collected and disposed of in an environmentally acceptable location and manner. Where possible, the Contractor is encouraged to recycle lubricants and other waste materials generated during the servicing of equipment and machinery, or alternatively dispose of such materials and refuse at nearby recycling depots. The dumping of oil or other deleterious materials on the ground or in any Watercourse is strictly prohibited. The Contractor shall provide a means of catching and retaining drained oil or other deleterious materials and shall properly dispose of these materials in a location approved by the Ministry Representative.

**165.13.04 Equipment Operation in Environmentally Sensitive Areas** - Construction equipment shall be operated only within the Designated construction site and access roads. Equipment operators shall not be allowed to damage or destroy vegetation or streambanks outside of this area.

The operation of equipment and machinery in a Fisheries Sensitive Zone must be:

## PROTECTION OF THE ENVIRONMENT

- a) authorized by the Ministry Representative
- b) kept to an absolute minimum, and
- c) undertaken only during the period(s) specified in the Special Provisions.

When working in any Designated Watercourse, equipment shall be in good working condition free of leaks, use biodegradable hydraulic fluid and shall be steam cleaned of oil, grease and other contaminants deleterious to aquatic species, prior to commencing work. When working in or near any Watercourse, the Contractor shall ensure that all hydraulic systems, fuel systems and lubricating systems are in good repair. Equipment with fuel or fluid leaks shall not be permitted to enter the wetted perimeter of any Watercourse. Equipment developing such leaks shall be removed immediately and repaired.

### 165.13.05 Pile Driving Operations

As a result of noise and pressure waves generated by pile driving and their potential harmful effect on fish redds and emergent life stages, Fisheries and Oceans Canada may include conditions in Environmental Approvals that require the employment of measures such as scheduling of works during instream Timing Windows, deploying of bubble curtains or other mitigative apparatus, and/or undertaking hydro-acoustic or fish monitoring programs. The Environmental Approvals may stipulate that the pile driving activities must cease if the monitoring programs identify a potential harmful effect on fish. The Contractor shall be responsible for all activities needed to carry out the work in compliance with the Environmental Approvals, Standards and Best Practices.

### 165.14 Waste Disposal and Toxic/Hazardous Materials

**165.14.01 General** - All non-toxic or non-hazardous wastes which are not Designated as combustible waste to be burned on-site shall be either recycled or disposed of in an approved sanitary landfill or other specialized area as indicated in the Special Provisions or as directed by the Ministry Representative. Any waste material that is inadvertently dumped in or adjacent to Watercourses or other Designated Environmentally Sensitive Areas shall be removed by the Contractor and disposed of in an approved manner at the Contractor's expense.

The Contractor shall be responsible for the regular collection and disposal of all waste material generated by employees and sub-contractors. The Contractor shall take the necessary precautions to prevent loss of these materials during transport on public highways and roads, and shall be responsible for cleanup of all of these materials and all litter deposited by employees and subcontractors along access routes during construction-related activities, at no expense to the Ministry. Construction debris shall not be allowed to accumulate on the construction site but shall be collected promptly and regularly removed from the site. The Contractor shall ensure that waste materials are placed

and stored in suitable containers. Waste material shall be disposed of at an approved waste disposal site. The Contractor shall be responsible for providing and regularly servicing animal-proof refuse containers and for ensuring that all employees and subcontractors dispose of wastes to keep the Project clear of waste and garbage.

**165.14.02 Spill Contingency Plans** - Contingency plans for the clean-up of toxic or hazardous spills shall be prepared prior to construction and submitted, together with a list of spill abatement equipment to be stored on the job site, to the Ministry Representative for review. The Ministry Representative may require the Contractor to have on site any additional equipment or materials deemed necessary to deal with a potential spill. The Contractor shall promptly replace any used spill abatement and clean-up materials and maintain a sufficient inventory of materials throughout construction operations. For operations being conducted adjacent to or within the wetted perimeter of a Watercourse or other Environmentally Sensitive Area, the Contractor shall have an approved spill kit ready for use nearby.

The Contractor shall immediately report any spill of any toxic or hazardous material verbally to the Ministry Representative and the Provincial Emergency Program (24 hour phone line: 1-800-663-3456). Written notification of the spill must follow within two weeks of this verbal report. The Contractor shall immediately take the necessary steps to abate the discharge and provide the necessary labour, equipment, materials and absorbents to contain and remove the spill, clean up the affected area, dispose of waste materials at an approved disposal site, and restore the area to the satisfaction of the Environmental Agencies, at the Contractor's expense. Any soil contaminated by spills shall be removed and replaced by comparable substitutes at the expense of the Contractor. Contaminated soil and vegetation removed shall be disposed of in an approved waste disposal site. If the Contractor fails to respond to the Ministry Representative's requirements for cleanup, the Ministry reserves the right to take whatever action is necessary to clean up the spill and deduct incurred costs from any money due or to become due to the Contractor.

The Environmental Monitor shall document any spills observed in the vicinity of the Project that are not the result of Project-related activities, and notify the Environmental Agencies of such incidents.

**165.14.03 Contaminated Sites** - If an area within or adjacent to the project site has been identified as a possible source of contaminated or hazardous material and the defined contaminated or hazardous material has not been removed prior to the start of the project, the Contractor shall notify the Ministry Representative at least two weeks prior to the time work is scheduled in or adjacent to that area.

In the event that the Contractor locates material on the

project site believed to be contaminated or hazardous, and which has not been previously identified, the Contractor shall immediately cease work in that area and notify the Ministry Representative. The Ministry Representative will seek investigation and disposal recommendations from regional staff of the British Columbia Ministry of Environment, Environmental Management office. No work shall proceed in the identified or suspected area until such time as these materials have been removed to the satisfaction of the Ministry Representative, representatives of the British Columbia Ministry of Environment Environmental Protection office, and the British Columbia Workers' Compensation Board. Unless it is specified in the Special Provisions, or agreement is made with the Ministry Representative to carry out such work, the Contractor is not responsible for the removal of contaminated or hazardous materials, which are not the result of the Contractor's actions.

**165.14.04 Concrete Wastes** - The Contractor shall isolate fresh concrete or cement from any Watercourse for 48 hours after placement. Containers or trucks carrying cement or fresh concrete shall be washed at a site approved by the Ministry Representative. Concrete wastes, including wastewater from batching or cleaning, or cutting cured concrete shall only be disposed of at approved and Designated disposal sites (i.e., location identified with proper signing). All cement-contaminated wastewater from cleaning or mixing is to be considered toxic, and must be prevented from entering any Watercourse for at least 48 hours to allow the water to reach neutral pH. Any cement or concrete-contaminated wastewater shall be tested prior to release into a Watercourse. In the event that such wastewater pH levels are unacceptable in terms of water quality for fish and other aquatic species, the Contractor shall take the necessary measures to contain and treat such wastewater until acceptable pH levels are achieved (i.e., pH levels are the same as the receiving waters).

The Contractor shall securely store on-site and use suitable equipment and materials for the mitigation of concrete spills into or in areas adjacent to Watercourses. For example, cylinders of gaseous carbon dioxide shall be kept on the Project site, which shall be used in the event of concrete or concrete leachate discharges into any Watercourse. During any concrete pour within 15 m of, or in work areas above the wetted perimeter of any Watercourse, the Contractor shall ensure that carbon dioxide cylinders and suitable application devices (e.g., weighted soaker hoses) are available on-site and ready for use in the carbonation of water columns to neutralize any concrete leachate that is inadvertently discharged into the Watercourse. Where concrete leachate is allowed to enter settling ponds, such that pH levels become very high, bubbling with carbon dioxide may not be an effective buffering agent. In such cases, it may be necessary to use other methods, such as acid buffers. The Ministry

## SECTION 165

Representative shall be responsible for assisting the Contractor in identifying appropriate mitigation options and monitoring effectiveness of procedures to mitigate unacceptable pH levels.

Aged, broken concrete shall only be used as riprap with the approval of the Ministry Representative and the Environmental Agencies. The Contractor shall remove broken concrete or concrete wastes that have been inadvertently placed in non-approved sites on the Project and dispose of them at an approved waste disposal site.

**165.14.05 Petroleum Wastes** - Refuse generated during the servicing of equipment shall be removed from the site and disposed of in a location and manner that has been approved by the Ministry Representative. The dumping of oil or other deleterious materials (such as diesel used to wash out dump boxes) on the ground is prohibited. Where facilities are located within a reasonable distance, the Contractor shall dispose of wastes at recycling depots.

Solids, sludges and other pollutants generated as a result of construction or removed during the course of treatment or control of wastewaters shall be disposed of in a manner that prevents their direct or indirect discharge to any Watercourse or groundwaters. Effluent generated by the water scrubber of an asphalt mixing plant must be given retention time in suitably sized, impermeable settling ponds prior to release into an adjacent Watercourse. The required retention time will be determined by the Ministry Representative in consultation with representatives from British Columbia Environment.

Asphalt pavement shall be stockpiled for recycling in a specified location, or disposed of in a location approved by the British Columbia Ministry of Environment, as directed by the Ministry Representative.

**165.15 Pesticides** - The use of all pesticides is subject to pre-approval by the Ministry Representative. The use of herbicides for vegetation control, other than noxious weeds, is not permitted. The Contractor shall comply with all Federal, Provincial and local regulations relative to the storage, use, and proper disposal of pesticides. Relevant legislation includes the Federal Pest Control Products Act and the British Columbia Pesticide Control Act. All pesticide wastes, washwaters, solvents, and containers shall be disposed of in compliance with the British Columbia Environmental Management Act, Special Waste Regulation.

### **165.16 Air and Noise Pollution**

**165.16.01 Noise and Emissions** - All activities, equipment, processes and work operated or performed by the Contractor in accomplishing the specified construction shall be in strict accordance with Federal, Provincial and local regulations governing noise levels and air emission standards. The Ministry Representative may require the Contractor to have maintenance performed on equipment or alter practices which are judged to produce excessive

## PROTECTION OF THE ENVIRONMENT

noise or emissions.

**165.16.02 Dust Control** - Application and handling of the any dust palliative, with the exception of water, shall be in compliance with the Ministry standards as given in "Maintenance Guidelines for Dust Palliatives and Gravel Road Stabilization".

Dust control techniques may also be required by the Ministry Representative during other construction operations, including but not limited to demolition, drilling, sand blasting and concrete cutting.

### **165.17 Use of Water**

**165.17.01 Authorization for Use** - For any source of water not specified in the Special Provisions, the Contractor is required to contact British Columbia Ministry of Environment Water Stewardship Division office before any water is diverted, impounded, pumped or used for any purpose, including dust control, compaction, or operation of a work camp. Authorization in the form of an approval for short term use of water may be required to be obtained through an application to FrontCounter BC. The Contractor should be aware that, if required, a water application approval may take at least six weeks to process.

Downstream water flow must be maintained at all times during water takings in fish-bearing waters.

Prior to commencing any work which may affect potable water supplies downstream of the construction area, the Contractor shall ensure that all owners of licensed water intakes have been notified.

Water sources must be approved by the Ministry Representative. In order to reduce the impact on local water supplies and Watercourses, the Contractor may be required to use uncontaminated wastewater, such as that pumped from the surface of sedimentation basins.

**165.17.02 Screened Intake Requirements** - The intakes of all pumps or diversions used to withdraw water from fish-bearing Watercourses shall be screened in accordance with the Fisheries and Oceans Canada "Freshwater Intake End-of-Pipe Fish Screen Guideline".

The Contractor shall provide and maintain stable access routes to all water withdrawal sites. The location of all such routes shall be subject to the approval of the Ministry Representative and the Environmental Agencies.

### **165.18 Support Facilities**

**165.18.01 Location and Operation of Support Facilities** - The preservation of trees, shrubs, ground cover, fish and wildlife must be considered in site selection and construction of all temporary support facilities. During site preparation, vegetation shall be removed using selective hand clearing (close-cut with no grubbing) in preference to blanket clearing with heavy machinery, retaining vegetative cover wherever possible.

## SECTION 165

The Contractor shall locate temporary field offices, storage, plant and other facilities on pre-existing cleared portions of the job-site or on areas to be cleared during the course of routine construction unless otherwise authorized by the Ministry Representative.

Where possible, for aesthetic purposes, work camps and parking areas shall be located behind a vegetative screen buffer. The Ministry Representative may require that work vehicles and heavy equipment shall be parked in Designated locations only.

The Contractor shall abide by all pollution control practices, laws, ordinances and regulations applicable to the construction of work camps and support facilities. The Contractor shall obtain the approval of the British Columbia Ministry of Health, the British Columbia Ministry of Environment Environmental Management offices, and any applicable local authority prior to the installation and/or operation of sewage disposal and potable water distribution systems.

Work camps, field office facilities and work sites shall be kept clear of litter and garbage. The Contractor shall be responsible for providing and regularly servicing animal-proof refuse containers and for instructing all employees to dispose of food wastes accordingly. Sanitary landfill operations shall be located well away from the main camp in order to minimize conflicts with wildlife.

Solid wastes shall be recycled or disposed at an approved landfill facility where possible. Burning of combustible solid wastes shall be subject to all applicable emission guidelines. Solid waste containers shall be large enough to contain all of the wastes generated between collection periods. The containers shall be constructed such that spilled liquids are contained and access by insects and wildlife is prevented. Storage areas and containers shall be maintained in a sanitary condition and shall be covered to prevent spreading of wastes by water, wind or animals. Transportation of solid waste shall be performed in a manner which prevents littering during transit to the disposal site.

Sanitary landfill sites shall be located a minimum of 450 m from Watercourses or campsites, and shall be situated such that contamination of any stream, lake or groundwater system is avoided. The location of all sanitary landfill sites must be approved by British Columbia Ministry of Environment, Municipal or local officials and the Ministry Representative. The bottom of the landfill site shall be located at least 2 m above the water table. Trees and other vegetation shall be removed progressively as the size of the landfill increases in order to minimize erosion by wind and water.

Sanitary wastes shall not be discharged into Watercourses or on the soil surface. All temporary toilets shall be equipped with approved septic tanks having safe drainage or with closed holding tanks which are emptied only into

## PROTECTION OF THE ENVIRONMENT

approved treatment plants or sewage tanker trucks. All temporary toilets used on -site shall be placed in environmentally acceptable areas, and shall be secured to avoid or minimize damage from vandalism.

**165.18.02 Abandonment of Sites** - Upon completion of construction, all temporary support facilities and camp infrastructure, including buildings, equipment, lumber, refuse, surplus materials, fencing and other such items shall be removed. The original drainage pattern shall be re-established, and all disturbed areas shall be revegetated.

The Contractor shall ensure that all project-related sites are left in an environmentally acceptable manner, subject to the approval of the Ministry Representative and the Environmental Agencies. Decommissioned construction areas, material sources and access roads shall be reclaimed by the Contractor such that as much of the original forest, wildlife, agricultural productivity, recreational use, etc. as possible is restored or enhanced.

### 165.19 Protection of Livestock and Wildlife

**165.19.01 Protection of Livestock and Wildlife** - Harassment of livestock or wildlife in and adjacent to the project site is prohibited. The presence of livestock or wildlife in or adjacent to the project site, field office trailers or construction camp shall not be encouraged by feeding. The Contractor is required to inform work crews of the location of wildlife and livestock crossing sites situated within the boundaries of the construction area.

If it is necessary to arrange the removal or transfer of beavers, bears or other wildlife from the work-site or camp the Contractor shall contact a British Columbia Ministry of Environment Fish and Wildlife representative prior to taking action, and follow the course of action recommended.

**165.19.02 Disturbance of Fish and Wildlife** - Rules regarding hunting, fishing and the discharge of firearms by the Contractor, employees and sub-contractors, within the project area during the period of construction, shall be made in consultation with the Ministry Representative and the local British Columbia Ministry of Environment Fish and Wildlife office. The Contractor shall be responsible for ensuring compliance with these rules.

**165.20 Archaeological and Paleontological Discoveries** - In the event that any item of archaeological, heritage, historical, cultural or scientific interest is found on the project site, such item(s) shall remain the property of the Province and the Contractor shall, on making or being advised of such a find, immediately cease operations in the affected area, minimize activities which create ground disturbance in and adjacent to the affected area, and notify the Ministry Representative of the discovery. The Ministry Representative will notify the Archaeology Branch of the British Columbia Ministry of Tourism, Sport and the Arts. Work shall not resume within 30 m of the discovery site until an appropriate directive has been

## SECTION 165

received from that agency.

To protect archaeological and paleontological sites that are situated within or adjacent to a project site, the Contractor may be required to use a variety of mitigative measures, including but not limited to drainage or erosion control, slope stabilization measures, or erecting fences or other suitable barriers to protect archaeological or paleontological sites that are situated within or adjacent to a project site. These measures, with any negotiated extensions of time for completion of the contract they require, will be determined and adopted at the discretion of the Ministry Representative. The costs associated with such mitigative measures will be borne by the Ministry, unless otherwise specified in the Special Provisions.

A buffer zone, in which no land alteration or other activity is permitted, may be required to ensure adequate site

## PROTECTION OF THE ENVIRONMENT

protection. The width of this buffer zone shall be determined by the Ministry Representative in consultation with a representative of the Archaeology Branch of the British Columbia Ministry of Tourism, Sport and the Arts. The Contractor shall be responsible for the actions of employees and sub-contractors with respect to site vandalism and the unlicensed collection of artifacts from Designated archaeological sites in and around the construction area.

**165.21 Resolution of Disputes** - In the event that a dispute arises between the Contractor and the Ministry, or the Environmental Monitor and the Ministry regarding environmental matters related to the project, the Ministry, or where appropriate, the Environmental Agencies, will have the final decision.