

# Erosion & Sediment Control (ESC)\* Permit Applications

The purpose of this document is to provide information pertaining to the minimum requirements for Erosion & Sediment Control (ESC) Permits. It outlines the components of the ESC plan submission, roles and responsibilities, performance and environmental monitoring requirements associated with the ESC Permit. The ESC plan is a component of the [Construction Impact Mitigation Strategy](#) (CIMS) package and will be reviewed in coordination with the Traffic Management Plans submitted for CIMS.

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*"This information is provided for convenience only and is not in substitution of applicable City Bylaws or Provincial or Federal Codes or laws. You must satisfy yourself that any existing or proposed construction or other works complies with such Bylaws, Codes or other laws."*

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## Overview

Soil erosion on construction sites can be a major source of water pollution in the City's drainage system, having a considerable impact on the system's capacity to function and a significant detrimental impact on creeks and streams. [Burnaby Watercourse Bylaw 1988](#) prohibits the discharge of sediment laden water and other contaminants to streams, creeks, waterways, watercourses, waterworks, ditches, drains, sewers and storm sewers.

ESC Permit applications are made through the City's Engineering Department and are required to be issued prior to the release of associated construction permits. ESC Permits are commonly associated with but not limited to Engineering Agreements, Building Permits and Soil Deposition/Removal Permits, including staging areas, landscaped buffers and access ways.

Single and two family construction sites do not require an ESC Permit but are required to follow Best Management Practices as outlined in the [Sediment Control Measures for Residential Construction Sites](#) guidelines.

Construction work must not commence until the ESC Permit is issued or deemed not required by the Engineering Department.

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## 1.0 Definitions

- *Bylaw* means Burnaby Watercourse Bylaw 1988.
- *City* means City of Burnaby.
- *Developer* means an owner who rezones land, or applies for a building permit, preliminary plan approval (PPA), or enters into an engineering agreement;
- *ESC Designer* means a Professional Engineer (P.Eng.) registered and in good standing with Engineers and Geoscientists British Columbia, who assumes responsibility for developing and amending ESC Plans for the construction works, commissioning, maintenance and decommissioning of the ESC works, and ensuring site compliance with the *Bylaw*, all applicable policies, and ESC Permit requirements.
- *ESC Monitor* means a Qualified Professional, whether acting independently or under the direct supervision of the *ESC Designer*, who assumes responsibility for inspecting, monitoring and reporting on the ESC facilities constructed and installed pursuant to the approved ESC Plan, as well as providing recommendations to the *ESC Designer* on maintenance, alterations, or remedial actions to be taken to maintain/restore site compliance.
- *Qualified Professional (QP)* means an individual, who: (a) is registered and in good standing with one or more of the following professional organizations: Engineers and Geoscientists British Columbia; Association of BC Forest Professionals; College of Applied Biology; Applied Science Technologists and Technicians of BC; BC Institute of Agrologists; EnviroCert International (Certified Professional in Erosion and Sediment Control); or BC Society of Landscape Architects; and (b) is acting under that organization's code of ethics and subject to disciplinary action by that organization; and (c) has an area of expertise that is recognized in the field of Erosion and Sediment Control for the purpose of providing all or part of the design, inspection and monitoring of ESC Best Management Practices (BMPs); and (d) is acting within their area of expertise.
- *Significant Rainfall Event (SRE)* means any precipitation event which meets or exceeds the intensity of 25 mm in a 24-hour period.

## 2.0 ESC Plan Submission

The ESC Plan submitted to the *City* must:

- be designed, signed, and sealed by the *ESC Designer*;
- consist of a multi-stage design that accounts for changing site conditions as work progresses during the following phases (where applicable): land clearing, grubbing and grading, the installation of services or infrastructure, the building construction, the final grading and landscaping;
- include City of Burnaby's ESC Drawing Notes on a separate sheet; and
- include the completed ESC Plan Submission Checklist

## 3.0 ESC Permit Requirements

### 3.1 Performance Standard

- 3.1.1 It is prohibited to discharge into the *City's* drainage system directly or indirectly any water that does not continuously and at all times meet or exceed the following water quality criteria:
- pH must be within **6.5 – 8.5**; and
  - turbidity must not exceed **50 NTU**.

3.1.2 Compliance with the limits outlined in 3.1.1 must be monitored at all points of discharge.

### **3.2 Ingress and Egress**

3.2.1 All sites must have dedicated construction ingress and egress area(s); their locations must be approved by the Transportation Division of the Engineering Department. Entry and exit from the site must be restricted to these areas and may require a [Traffic Control Permit](#).

3.2.2 All projects which involve significant soil work must utilize a wheel wash (either mechanical or passive systems) during the bulk excavation phase. A paved surface and speed bump must be provided between the wheel wash and the *City* roadway and be designed to prevent offsite flows (i.e. minimum 2% reverse grade).

3.2.3 Mechanical wheel washes must be minimum 2.0 tire revolutions in length. For passive wheel wash design refer to [BBY-R110](#).

3.2.4 Projects with minor soil work may request ingress/egress areas which utilize the existing pavement or a truck stand. For truck stand design refer to [BBY-A632](#).

### **3.3 Water Treatment System**

A properly designed and functioning on-site water treatment system is required to ensure that the discharge water quality remains in accordance with the *Bylaw*, permits and policies. The water treatment system must have capabilities to neutralize pH and reduce turbidity/suspended solids throughout the duration of the soil disturbing activities and concrete work for the development.

At a minimum, the water treatment system must include the following:

- pH adjustment unit;
- Chitosan injection unit;
- Settling tank(s) and/or pond(s);
- Automated sand filtration unit;
- Independent real-time monitoring water quality device with remote alert notification system and flow diversion when non-compliant levels of turbidity and/or pH are detected (see Appendix A for list of pre-approved vendors); and
- Detention pond/tank with sufficient holding capacity for non-compliant water.

#### Water Treatment Chemicals

- The *City* allows the use of chitosan (1-2% in liquid form) and carbon dioxide (CO<sub>2</sub>) for on-site water treatment.
- All chemicals utilized on-site must be labelled in accordance with the current WHMIS requirements.
- Safety Data Sheets (SDS) must be prepared in accordance with the current WHMIS requirements and be readily available on site for all chemicals used, including chitosan acetate and carbon dioxide.
- Chemicals must not be used beyond their expiry date.

#### Water Treatment System Sizing

- Water treatment system must be sized using the modified rational method at a minimum to a 5-year rainfall. If site-specific time of concentration and run-off coefficient are not attainable, time of

concentration of 15 min and run-off coefficient of 0.6 must be used. Site-specific values are subject to verification by the *ESC Designer* and acceptance by the City's Engineering Department.

- Use Burnaby's IDF curves from the [City of Burnaby Engineering Department Design Criteria Manual](#).
- A [water treatment system schematic](#) must be submitted with the ESC Plan to confirm the components and sequencing of the system.

#### Detention and Settling Ponds

- Detention and settling pond calculations, dimensions and design details must be signed and sealed by an *ESC Designer*.
- Settling ponds, detention ponds or sumps greater than 1.0 meter in total depth are required to have high visibility safety fencing.

### **3.4 Post-Treatment Qualifications**

- 3.4.1 All discharge points from the site including discharges from the water treatment system(s) must be monitored continuously, in real-time. **It is prohibited to pump out or otherwise discharge untreated water from the work site to the City's storm sewer system, watercourse, or other drainage system in such a manner as to bypass the independent real-time water monitoring system.** Real-time monitoring system must be powered on during all discharges.
- 3.4.2 The real-time discharge monitoring must be performed by a qualified service provider that is independent from the water treatment system supplier and *ESC Monitor*. See Appendix A for list of pre-approved vendors.
- 3.4.3 Water treatment and independent real-time monitoring systems must be connected to the same source of power and operational at the same time.
- 3.4.4 The real-time monitoring system must remain in place until the water treatment system is removed.

### **3.5 Operation and Maintenance**

- 3.5.1 All ESC facilities must be inspected and maintained daily, except for the following:
- Maintenance of ESC facilities such as water treatment system, independent real-time monitoring system, and wheel wash must occur with the appropriate frequency required to meet the s. 3.1.1 continuously and at all times.
- 3.5.2 The *Developer*/persons responsible must correct any deficiencies in ESC works identified by the *ESC Monitor* immediately. If the *Developer*/persons responsible fail to correct the deficiencies, the City will fine the *Developer* under the Watercourse Bylaw 1988.

### **3.6 Alterations to ESC Works and Decommissioning**

#### General

- Any alterations to the ESC works including removal of the ESC components must be reviewed and authorized in writing by the *ESC Designer* before alterations take place.
- ESC facilities may be decommissioned with written authorization from the *ESC Designer* and in the presence of the *ESC Monitor*.
- Disturbed areas must be restored and finished landscape treatment must be applied as per

landscape architect's specifications.

#### Removal of Wheel Wash

- Wheel wash must remain in place until the onsite works have progressed to a point where the wheel wash is no longer required, such as onsite paving and installation of driveways. **Written notification must be submitted to the City prior to the removal of the wheel wash.** The notification must be prepared by the *ESC Monitor* and include a detailed description of any remaining soil work and proposed BMPs in lieu of the wheel wash. A [Traffic Control Permit](#) may be required if any remaining work impacts the road, lane, path, sidewalk, bike lane, or any other portion of City right-of-way.

#### Removal of Water Treatment and Real-Time Monitoring Systems

- Water treatment system components (e.g.: pH adjustment unit, settling tanks, sand filter, and real-time monitoring system) must remain in place until the *Developer* is able to demonstrate that the untreated stormwater meets water quality criteria stated in s. 3.1.1 at least 95% time (by volume, based on the real-time data) over a 4-week period. The 4-week period in question should include at least one SRE.

## 4.0 Environmental Monitoring Criteria

The *Developer* must retain an *ESC Monitor* to undertake ESC monitoring and reporting to ensure adherence to the *Bylaw* and ESC Permit requirements during construction.

The *ESC Monitor* must assume responsibility for noting all ESC deficiencies in the monitoring report. If a deficiency is noted, the *ESC Monitor* must include recommendations for corrective actions in the report. If a deficiency with high potential for sediment trackout, concrete washout or release/overflow of non-compliant water is identified during an inspection, the site must be considered non-compliant.

### 4.1 Monitoring Frequency and Duration

#### Frequency

- All inspections/monitoring must be carried out by *ESC Monitor* weekly during the wet season (October 1<sup>st</sup> to April 30<sup>th</sup>) and every two (2) weeks during the dry season (May 1<sup>st</sup> to September 30<sup>th</sup>) and within 24 hours of each SRE all year round. If more than two SREs in one given week (Monday through Sunday) are recorded, two site inspections per week will be deemed acceptable, except for when a deficiency is identified during an inspection.

#### Duration

- ESC monitoring must continue until construction work, including onsite landscaping, is completed.
- To request ESC Permit closure, a final monitoring report signed and sealed by the *ESC Designer* must be submitted to the *City*. The final report must confirm that all ESC measures have been removed from the *City* property and all sediment has been removed from the roadways.

### 4.2 Monitoring Parameters

Grab samples for compliance monitoring must be collected from a clearly identified sample port located at the point of water treatment system discharge and analyzed for turbidity, pH, and temperature using industry-standard calibrated field measurement devices.

## 4.3 Reporting Requirements

Weekly, every two weeks and post-SRE ESC monitoring must be documented and reported to the *City* by emailing to [SCSMonitoringReports@burnaby.ca](mailto:SCSMonitoringReports@burnaby.ca) as per the following requirements:

### Non-compliant sites:\*

- The *ESC Monitor* must submit the first page of the template inspection report to the *City* within 24 hours of the inspection date.
- The complete report must be submitted within 48 hours of the inspection date.

\* If a deficiency with high potential for sediment track-out, concrete washout or release/overflow of non-compliant water is noted, site must be considered non-compliant.

### Compliant sites:

- Monthly summary must be submitted within 7 days of the last day of the month.

## 5.0 ESC Permit Application Process

All ESC Permits are issued directly from the Engineering Department. Inquiries can be directed to the Engineering Department at 604-294-7460 or [engineering@burnaby.ca](mailto:engineering@burnaby.ca).

- *Developer/ESC Designer* submits an ESC Plan prepared in accordance with Section 2, as the first step of the ESC Permit application process.
- *City* reviews and accepts the ESC Plan or requires amendments to be made, until the ESC Plan is to the satisfaction of the *City*.
- Once the ESC Plan is accepted, *ESC Designer* submits a signed and sealed ESC cost estimate.
- Once the ESC cost estimate is accepted and paid for, *City* issues the ESC Permit and *Developer* may proceed with installation of the ESC works pursuant to the accepted ESC Plan.

Associated construction permits (e.g. Building Permit) will be issued when the *City* confirms receipt of all of the following:

- ESC Commissioning Report signed and sealed by the *ESC Designer* confirming that ESC works are installed pursuant to the accepted ESC Plan and fully operational.
- Letter of Undertaking signed by sealed by *ESC Monitor* and sealed by the *ESC Designer*.
- Access to the independent real-time monitoring data.

## 5.1 ESC Permit Fee

### 5.1.1 General

In order to generate the ESC Permit fee, a detailed cost estimate for all proposed ESC facilities including installation, maintenance, monitoring and removal is required. **The ESC cost estimate must be prepared and signed and sealed by the *ESC Designer*.**

The ESC Permit fee will be calculated at 1% of the ESC cost estimate and the Engineering Department will provide an invoice for the ESC Permit.

#### 5.1.2 Estimating wheel wash and water treatment costs

##### Wheel wash

- For a passive wheel wash system, determine costs based on construction and material estimate.
- For a mechanical wheel wash system, multiply monthly rental and service fees by the duration the wheel wash is anticipated to be required on site.
- Water supply backflow preventer installation cost.
- Pavement costs between the wheel wash and the road.

##### Water treatment and independent real time water monitoring systems

- For a detention/settling pond, determine costs based on construction and decommissioning estimate.
- For a water treatment system and real-time discharge monitoring, multiply monthly rental and service fees by 12 months.
- Include total estimated cost of water treatment chemicals based on the typical dose rates and anticipated annual site discharge volume. Include calculation details.

## 5.2 ESC Commissioning Report

When ESC works are installed and ready to be put in operation, the *ESC Designer* must review the ESC facilities and verify their operational readiness. An ESC Commissioning Report must be prepared, signed and sealed by the *ESC Designer* confirming that all ESC works are installed pursuant to the accepted ESC Plan and fully operational.

Any missing works or components, absence of power source, missing connections, incorrect system sequencing, etc. shall render the ESC incomplete and require another review.

## 5.3 Letter of Undertaking

A Letter of Undertaking must state that:

- *ESC Designer* assumes responsibility for developing and amending ESC Plans for the construction works, commissioning, maintenance and decommissioning of the ESC works, and ensuring site compliance with the *Bylaw*, all applicable policies, and ESC Permit requirements.
- *ESC Monitor* assumes responsibility for inspecting, monitoring and reporting on the ESC facilities constructed and installed pursuant to the approved ESC Plan, as well as providing recommendations to the *ESC Designer* on maintenance, alterations, or remedial actions to be taken to maintain/restore site compliance.



## 6.0 ESC Permit Violations

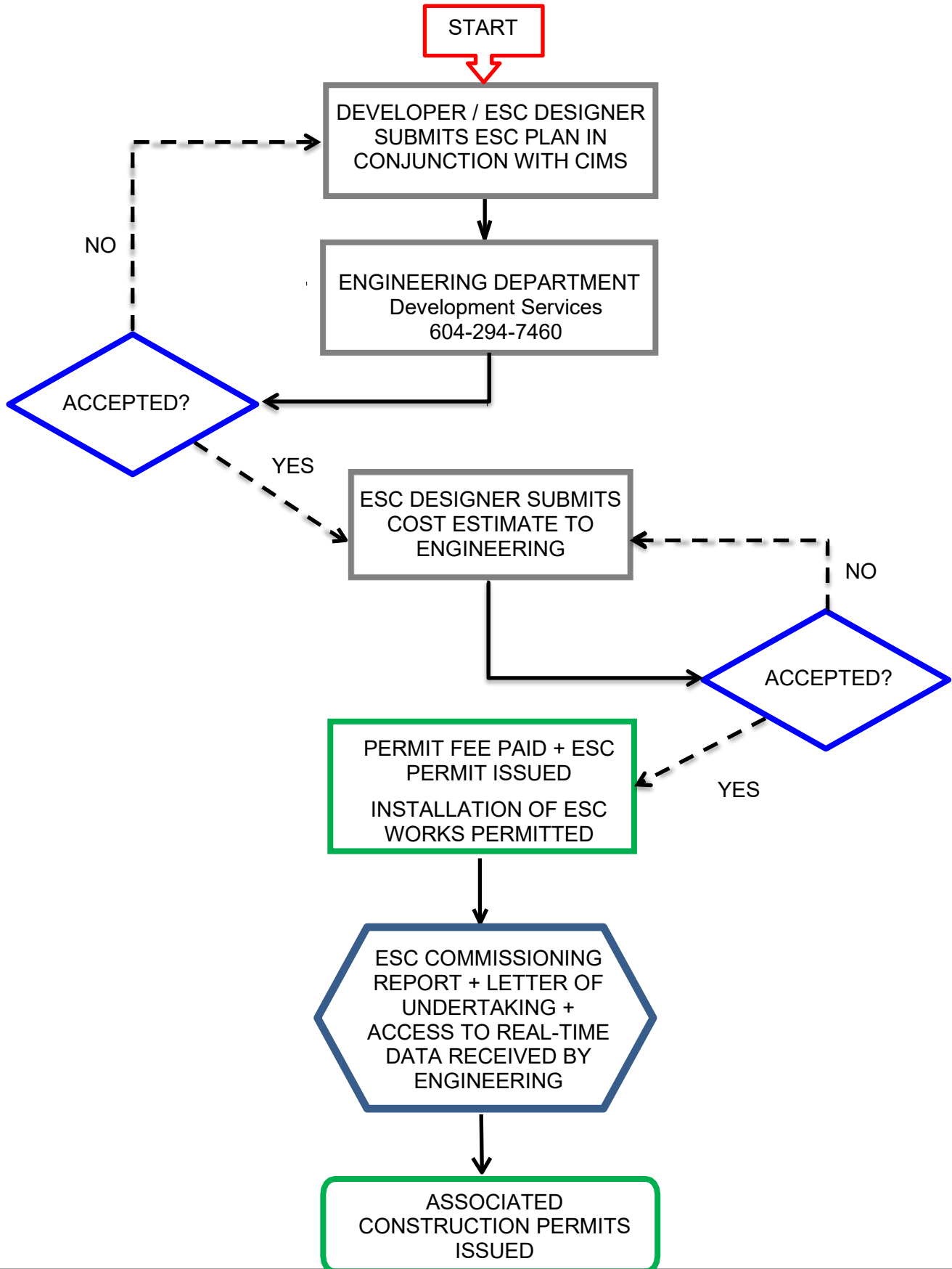
The *City* may authorize a stop work order for continued non-compliance. Stop work order may only be lifted when the offence is remedied to the satisfaction of the *City*. If no action is taken to remedy the offence by the *Developer*, the *City* will mitigate the offence at the *Developer's* expense.

### References:

As per the *Bylaw* Section 11, every owner and occupier shall pay to the City of Burnaby within thirty (30) days of demand of same, all costs and expenses incurred by or on behalf of the City of Burnaby in restoring or cleaning any stream, creek, waterway, watercourse, waterworks, ditch, drain, sewer or storm sewer or soil, caused by the breach of any provision of this Bylaw, and for installing and maintaining interceptors, catch basins and containment barriers, and for disposing of contaminants abandoned contrary to this Bylaw and for installing and maintaining sediment control ponds, settling ponds and retention ponds and generally taking all remedial measures required in order to comply with this Bylaw. Any amount unpaid together with interest thereon on the 31st day of December in any year shall be added to and form part of the property taxes payable in respect of the real property on which the discharge or leakage of contaminants, abandonment of contaminants, fouling, obstructing or impeding of any stream, creek, waterway, watercourse, waterworks, ditch, drain, sewer or storm sewer, installation and maintenance of interceptors, catch basins, containment barriers, sediment control ponds, settling ponds and retention ponds, or breach of this Bylaw occurred and shall be treated as taxes in arrear.

As per the *Bylaw* Section 12, every person who violates any of the provisions of the *Bylaw* shall be guilty of an offence punishable on summary conviction and shall be liable to a fine not exceeding \$10,000 and in default of payment to imprisonment not exceeding six (6) months, and each day that the offence is continued shall constitute a separate offence.

## ESC PERMIT APPLICATION PROCESS FLOW CHART



## ESC Plan Submission Checklist

This checklist must be completed by the *ESC Designer* and included with the ESC Plan submission. Check off each item that has been included in your ESC Plan and provide additional information, as needed. For items that have not been checked off an explanation is required.

- ☐ Property line designation
- ☐ Building footprint/layout
- ☐ Excavation footprint for each phase of development
- ☐ Estimated soil volumes for each phase of excavation
- ☐ Environmentally sensitive areas (e.g. riparian setback)
- ☐ Perimeter protection measures
- ☐ Dedicated ingress/egress
- ☐ Laydown area location and dimensions
- ☐ Storm drain inlet protection measures
- ☐ Stockpile material management
- ☐ Swales (check dams)
- ☐ Additional BMPs (provide details)
- ☐ Protection measures for exposed soils and slopes
- ☐ Surface water conveyance to the water treatment system
- ☐ Site-specific run-off and flow rate calculations
- ☐ Water treatment system(s) following s. 3.4 – design calculations, diagram & process description
- ☐ Water treatment system discharge point shown (on private property)
- ☐ Sampling port at the point of water treatment system discharge
- ☐ Independent real-time monitoring system(s) by an approved vendor (Appendix A) shown on each discharge point to the *City's* storm system
- ☐ 2% reverse grade paved surface and speed bump between the wheel wash and the City roadway
- ☐ Truck pad leading into and out of the wheel wash following BBY-A632
- ☐ Wheel wash facilities (provide details)
- ☐ Construction vehicle travel route on city streets shown with arrows to/from construction site
- ☐ City of Burnaby ESC Drawing Notes included as a separate sheet in the ESC Plan
- ☐ ESC Plan signed and sealed by *ESC Designer* and reviewed and signed by the *ESC Monitor*.

Signed: \_\_\_\_\_  
ESC Designer


Date: \_\_\_\_\_

Signed: \_\_\_\_\_  
ESC Monitor

Date: \_\_\_\_\_

## Appendix A

### List of Pre-Qualified Vendors for Independent Real-Time Water Quality Monitoring

Vendor	Information
 <b>Flowlink</b> ENVIRONMENTAL	<a href="http://www.flowlink.ca">www.flowlink.ca</a>
 <b>BANNER</b> environmental engineering consultants ltd.	<a href="http://www.banneree.com">www.banneree.com</a>
 <b>INSTRATUS</b>	<a href="http://www.instratus.ca">www.instratus.ca</a>

## **Appendix B**

City of Burnaby ESC Drawing Notes

THE FOLLOWING INFORMATION MUST BE INCLUDED WITH ALL ESC DRAWING SUBMITTALS TO THE CITY OF BURNABY (THE CITY). THE INFORMATION PROVIDED IS GENERAL AND MAY NEED TO BE MODIFIED FOR COMPLEX WORKS.

**1. GENERAL NOTES**

- 1.1. THE DEVELOPER MUST COMPLY WITH THE REQUIREMENTS OF ALL REGULATORY AUTHORITIES, FEDERAL, PROVINCIAL AND MUNICIPAL GOVERNMENT DEPARTMENTS INCLUDING THE DEPARTMENT OF FISHERIES AND OCEANS CANADA AND MINISTRY OF ENVIRONMENT, IN THE PROTECTION OF FISH AND WILDLIFE DURING THE CONSTRUCTION OF THE WORKS.
- 1.2. SPECIFICALLY, THE DEVELOPER MUST ENSURE THAT ALL EXCAVATION AND CONSTRUCTION PROCEDURES ARE UNDERTAKEN IN SUCH A MANNER AS TO PREVENT SILT-LADEN AND/OR CONCRETE-IMPACTED RUNOFF FROM THE SITE OF THE WORK FROM ENTERING THE DOWNSTREAM DRAINAGE SYSTEM, AND AT A MINIMUM MUST FOLLOW PROCEDURES AS RECOMMENDED IN "LAND DEVELOPMENT GUIDELINES FOR THE PROTECTION OF AQUATIC HABITAT" BY DEPARTMENT OF FISHERIES AND OCEANS.
- 1.3. THE ESC MEASURES SHOWN ON THE ESC PLAN DRAWINGS MUST BE DEEMED MINIMUM AND NOT WITHSTANDING COMPLIANCE, THE DEVELOPER IS ULTIMATELY RESPONSIBLE FOR ESC PERFORMANCE FOR THE DURATION OF THE PROJECT.
- 1.4. CONSTRUCTION WORK MUST NOT COMMENCE UNTIL ESC PERMIT IS ISSUED.
- 1.5. WATER TREATMENT SYSTEM MUST BE SIZED USING THE MODIFIED RATIONAL METHOD AT A MINIMUM TO A 5-YEAR RAINFALL. IF SITE-SPECIFIC TIME OF CONCENTRATION AND RUN-OFF COEFFICIENT ARE NOT ATTAINABLE, TIME OF CONCENTRATION OF 15 MIN AND RUN-OFF COEFFICIENT OF 0.6 MUST BE USED. SITE-SPECIFIC VALUES ARE SUBJECT TO VERIFICATION BY THE ESC DESIGNER AND ACCEPTANCE BY THE CITY'S ENGINEERING DEPARTMENT.
- 1.6. ALL SITES MUST HAVE DEDICATED CONSTRUCTION INGRESS AND EGRESS AREA(S); THEIR LOCATIONS MUST BE APPROVED BY THE TRANSPORTATION DIVISION OF THE ENGINEERING DEPARTMENT. ENTRY AND EXIT FROM THE SITE MUST BE RESTRICTED TO THESE AREAS.
- 1.7. ALL EXPOSED SLOPES AND SPOIL STOCKPILES MUST BE COVERED WITH 6 MM POLYETHYLENE SHEETING OR EROSION CONTROL MATTING, ALL WELL AS ANCHORED WITH WEIGHTS OR STAPLED IN PLACE TO RESIST WIND.
- 1.8. EROSION CONTROL MATTING MUST BE COMBINATION STRAW/COCONUT FIBER BLANKET TYPE SC150 AS MANUFACTURED BY NORTH AMERICAN GREEN OR APPROVED EQUIVALENT. BLANKET MUST BE PLACED STRICTLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- 1.9. DURING CONSTRUCTION THE DEVELOPER MUST ENSURE THAT ALL DISTURBED AREAS ARE KEPT DEWATERED WITH CONCENTRATED SURFACE RUNOFF EITHER DIRECTED AROUND WORK AREAS WITH INTERCEPTOR DITCHES OR TEMPORARILY CONTAINED WITHIN CLOSED CONDUITS.
- 1.10. THE DEVELOPER MUST INSTALL A TEMPORARY CUTOFF AND INTERCEPTOR DITCH SYSTEM AS NECESSARY PRIOR TO AND DURING GRADING AND SERVICING CONSTRUCTION TO COLLECT ALL SURFACE RUNOFF AND PROTECT DISTURBED AND EXPOSED SOILS FROM EROSION. THE DITCHING SYSTEM MUST BE ENCLOSED WITH TEMPORARY CULVERTS AT ACCESS CROSSINGS.
- 1.11. INTERCEPTOR AND CUT-OFF DITCHES AND BOULEVARD SWALES MUST BE AS PER TYPICAL SECTION WHERE GRADE EXCEEDS 5.0% TRENCH INVERTS MUST BE RIP-RAP ARMoured ON GEOFABRIC. CHECK WEIRS/FILTER BERMS MUST BE INSTALLED AT MAXIMUM 4.0M O.C.
- 1.12. ALL SILT FENCING SHOWN MUST BE CONSTRUCTED IN ACCORDANCE WITH SILT FENCE DETAIL. DEVELOPER MUST INSTALL ADDITIONAL SILT FENCE WHERE SITE CONDITIONS DICTATE AND DOWN SLOPE OF ALL SPOIL PILES AND AS DIRECTED BY THE ESC DESIGNER.

- 1.13. ALL CATCH BASINS AND LAWN BASINS MUST HAVE UPSTREAM SEDIMENT TRAPS PRIOR TO AND AFTER PAVING AS DETAILED ON THE DRAWINGS.
- 1.14. ALL CATCH BASINS (CB) FILTERS MUST BE INSERTED INSIDE THE CBS, SECURED, AND NOT POSING ANY TRIPPING HAZARD (DONUT SHAPE FILTERS NOT PERMITTED ON CITY'S CBS). IT IS PROHIBITED TO PLACE ANY MATERIAL ON THE SURFACE OR BLOCK THE CB'S DRAINAGE.
- 1.15. EARTHWORKS, GRADING AND SERVICES INSTALLATION CONSTRUCTION OPERATIONS MUST BE TERMINATED DURING HEAVY RAINFALL WHEN SOIL DISTURBANCE IS SUBJECT TO EROSION AND RELEASE OF SEDIMENTS TO SURFACE RUNOFF.
- 1.16. IT IS PROHIBITED TO DISCHARGE CONCRETE TRUCK WASH WATER INTO THE WATER TREATMENT SYSTEM, CITY'S DRAINAGE SYSTEM OR ONTO THE STREET: RECIRCULATORY WASH SYSTEMS MUST BE USED FOR WASHING THE CONCRETE TRUCKS.
- 1.17. ALL TEMPORARY AND PERMANENT ESC PIPE WORK MUST BE FULLY GASKETED.
- 1.18. WHERE BUILDING CONSTRUCTION INTERFERES WITH CUTOFF TRENCHES AND SWALES, DEVELOPER MUST ARRANGE FOR DIVERSION OR ENCLOSURE OF THESE DRAINAGE FACILITIES TO PERMANENT STORM SEWER SYSTEM.
- 1.19. SAFETY FENCING MUST BE 1.8M HIGH CHAIN LINK.
- 1.20. THE DEVELOPER MUST PROVIDE AND MAINTAIN EFFICIENT TRAFFIC MANAGEMENT SYSTEMS, SIGNS, BARRICADES, AND FLAG PERSONS TO MAINTAIN ACCESS ON MUNICIPAL ROADS. ALL VEHICULAR AND PEDESTRIAN ACCESS ON PUBLIC RIGHTS-OF-WAY MUST REMAIN.
- 1.21. CONSTRUCTION VEHICLE STAGING ON RESIDENTIAL STREETS IS PROHIBITED.
- 1.22. ALL RIGHT-OF-WAY/COVENANT AREAS MUST BE KEPT FREE OF STOCKPILES AND SEDIMENT CONTROL MEASURES.
- 1.23. THE DEVELOPER MUST STOCKPILE ON-SITE AT VARIOUS STRATEGIC LOCATIONS ADEQUATE SUPPLIES OF ALL MATERIALS REQUIRED TO PROTECT THE CITY'S DRAINAGE SYSTEM FROM NON-COMPLIANT DISCHARGES AND ENABLE AN IMMEDIATE EMERGENCY RESPONSE TO CONTAIN POTENTIAL DOWNSTREAM CONTAMINATION.

## **2. PERFORMANCE STANDARD**

- 2.1. IT IS PROHIBITED TO DISCHARGE INTO THE CITY'S DRAINAGE SYSTEM DIRECTLY OR INDIRECTLY ANY WATER THAT DOES NOT CONTINUOUSLY AND AT ALL TIMES MEET OR EXCEED THE FOLLOWING WATER QUALITY CRITERIA:
  - PH MUST BE WITHIN **6.5 – 8.5**; AND
  - TURBIDITY MUST NOT EXCEED **50 NTU**.
- 2.2. COMPLIANCE WITH THE WATER QUALITY CRITERIA MUST BE MONITORED AT ALL POINTS OF DISCHARGE.
- 2.3. IF DURING ANY CONSTRUCTION WORK, WATER THAT DOES NOT MEET THE WATER QUALITY CRITERIA IS BEING RELEASED DIRECTLY OR INDIRECTLY INTO THE CITY'S DRAINAGE SYSTEM, OR OTHERWISE IMPEDES THE DRAINAGE SYSTEM, THE DEVELOPER MUST IMMEDIATELY NOTIFY THE CITY, AS WELL AS THE APPROPRIATE FEDERAL AND PROVINCIAL AGENCIES, AND CORRECT ANY DEFICIENCIES IN ESC WORKS IMMEDIATELY.

## **3. POST-TREATMENT QUALIFICATIONS**

- 3.1. ALL DISCHARGE POINTS FROM THE SITE INCLUDING DISCHARGES FROM THE WATER TREATMENT SYSTEM(S) MUST BE MONITORED CONTINUOUSLY, IN REAL-TIME. IT IS PROHIBITED TO PUMP OUT OR OTHERWISE DISCHARGE UNTREATED WATER FROM THE WORK SITE TO THE CITY'S STORM SEWER SYSTEM, WATERCOURSE, OR OTHER DRAINAGE SYSTEM IN SUCH A MANNER AS TO BYPASS THE INDEPENDENT REAL-TIME WATER MONITORING SYSTEM. REAL-TIME MONITORING SYSTEM MUST BE

POWERED ON DURING ALL DISCHARGES.

- 3.2. THE REAL-TIME DISCHARGE MONITORING MUST BE PERFORMED BY A QUALIFIED SERVICE PROVIDER THAT IS INDEPENDENT FROM THE WATER TREATMENT SYSTEM SUPPLIER AND ESC MONITOR (REFER TO ESC PERMIT APPLICATIONS APPENDIX A FOR LIST OF PRE-APPROVED VENDORS).
- 3.3. THE CITY MUST BE PROVIDED ACCESS TO THE REAL-TIME DATA INCLUDING NOTIFICATIONS WITHIN 48 HOURS OF INSTALLATION OF THE MONITORING SYSTEM AND NO LATER THAN THE DATE OF THE FIRST DISCHARGE TO THE DRAINAGE SYSTEM. PROVIDE ACCESS TO SCSMONITORINGREPORTS@BURNABY.CA, WATER.MONITORING@BURNABY.CA AND ANY ADDITIONAL CITY ACCOUNTS AS REQUIRED.
- 3.4. MINIMUM MONITORING REQUIREMENTS: PH, TURBIDITY, TEMPERATURE, FLOW RATE AND VOLUME OF DISCHARGE(S) WITH A MINIMUM ACQUISITION AND TRANSMISSION FREQUENCY OF 60 SECONDS, TO MINIMIZE THE VOLUME OF NON-COMPLIANT WATER DISCHARGED TO THE DRAINAGE SYSTEM.
- 3.5. THE REAL-TIME MONITORING SYSTEM MUST INCLUDE DISCHARGE SHUTOFF/REDIRECTION OF NON-COMPLIANT WATER BACK TO THE SITE TO ENSURE THAT THE QUALITY OF DISCHARGE MEETS THE CITY'S PERFORMANCE STANDARD.
- 3.6. THE CITY RESERVES THE RIGHT TO IMPOSE ADDITIONAL OR MORE STRINGENT REQUIREMENTS FOR PROJECTS POSING RISK TO THE RECEIVING ENVIRONMENT: E.G., BY MAKING THE WATER QUALITY REQUIREMENTS MORE STRINGENT AND/OR BY REDUCING THE DISCHARGE SHUTOFF ACTIVATION TIME TO MINIMIZE THE VOLUME OF NON-COMPLIANT DISCHARGE(S).
- 3.7. WATER TREATMENT AND INDEPENDENT REAL-TIME MONITORING SYSTEMS MUST BE CONNECTED TO THE SAME SOURCE OF POWER.
- 3.8. THE REAL-TIME MONITORING SYSTEM MUST REMAIN IN PLACE UNTIL THE WATER TREATMENT SYSTEM IS REMOVED.

#### **4. OPERATION AND MAINTENANCE**

- 4.1. ALL ESC FACILITIES MUST BE INSPECTED AND MAINTAINED DAILY UNTIL CONSTRUCTION IS COMPLETE, EXCEPT FOR THE FOLLOWING:
  - MAINTENANCE OF ESC FACILITIES SUCH AS WATER TREATMENT SYSTEM, INDEPENDENT REAL-TIME MONITORING SYSTEM, AND WHEEL WASH MUST OCCUR WITH THE APPROPRIATE FREQUENCY REQUIRED TO MEET THE CITY'S PERFORMANCE STANDARD CONTINUOUSLY AND AT ALL TIMES.
- 4.2. THE DEVELOPER/PERSONS RESPONSIBLE MUST CORRECT ANY DEFICIENCIES IN ESC WORKS IDENTIFIED BY THE ESC MONITOR IMMEDIATELY. IF THE DEVELOPER/PERSONS RESPONSIBLE FAIL TO CORRECT THE DEFICIENCIES, THE CITY WILL FINE THE DEVELOPER UNDER THE WATERCOURSE BYLAW 1988.
- 4.3. SEDIMENT FENCE/BARRIERS AND STORM DRAIN INLET PROTECTION MEASURES MUST BE INSPECTED AND REPAIRED DAILY, PRIOR TO EXPECTED RAIN EVENTS AND FOLLOWING ALL SRES OR PERIODS OF EXTENDED RAIN.
- 4.4. ACCUMULATED SEDIMENT GREATER THAN 30% OF THE ESC FACILITY'S CAPACITY MUST BE PROMPTLY REMOVED AND DISPOSED OFF ACCORDINGLY.
- 4.5. ROADWAYS AND ASPHALT OR CONCRETE SURFACES MUST BE KEPT CLEAN AND FREE OF SEDIMENTS AT THE END OF EACH DAY OR AS REQUIRED. IT IS PROHIBITED TO DEPOSIT OR PILE OUTSIDE OF THE PROPERTY BOUNDARIES SOIL, SAND OR OTHER MATERIAL WITH A HIGH SEDIMENT CONTENT.
- 4.6. WITHIN 24 HOURS OF SRE, THE DEVELOPER/PERSONS RESPONSIBLE MUST CLEAN OUT ALL ESC WORKS, AND ANY VISIBLE DAMAGE TO THE WORKS FROM RAINFALL MUST BE REPAIRED IMMEDIATELY. WHEN REMOVING SEDIMENT FROM ESC WORKS, SEDIMENT MUST BE PLACED WHERE IT WILL NOT ENTER THE DRAINAGE SYSTEM, AND WHERE IT WILL NOT RE-ENTER THE ESC WORKS.



## 5. MONITORING AND REPORTING

- 5.1. THE DEVELOPER MUST RETAIN AN ESC MONITOR TO UNDERTAKE ESC MONITORING AND REPORTING TO ENSURE ADHERENCE TO THE BURNABY WATERCOURSE BYLAW 1988 AND ESC PERMIT REQUIREMENTS DURING CONSTRUCTION.

THE ESC MONITOR MUST ASSUME RESPONSIBILITY FOR NOTING ALL ESC DEFICIENCIES IN THE MONITORING REPORT. IF A DEFICIENCY IS NOTED, THE ESC MONITOR MUST INCLUDE RECOMMENDATIONS FOR CORRECTIVE ACTIONS IN THE REPORT. IF A DEFICIENCY WITH HIGH POTENTIAL FOR SEDIMENT TRACKOUT, CONCRETE WASHOUT OR RELEASE/OVERFLOW OF NON-COMPLIANT WATER IS IDENTIFIED DURING AN INSPECTION, SITE MUST BE CONSIDERED NON-COMPLIANT.

- 5.2. ALL INSPECTIONS /MONITORING MUST BE CARRIED OUT BY ESC MONITOR WEEKLY DURING THE WET SEASON (OCTOBER 1<sup>ST</sup> TO APRIL 30<sup>TH</sup>) AND EVERY TWO WEEKS DURING THE DRY SEASON (MAY 1<sup>ST</sup> TO SEPTEMBER 30<sup>TH</sup>), AND WITHIN 24 HOURS OF EACH SRE ALL YEAR ROUND. IF MORE THAN TWO SRES IN ONE GIVEN WEEK (MONDAY THROUGH SUNDAY) ARE RECORDED, TWO SITE INSPECTIONS PER WEEK WILL BE DEEMED ACCEPTABLE, EXCEPT FOR WHEN A DEFICIENCY IS IDENTIFIED DURING AN INSPECTION.
- 5.3. ESC MONITORING MUST CONTINUE UNTIL CONSTRUCTION WORK, INCLUDING LANDSCAPING, IS COMPLETED.
- 5.4. TO REQUEST ECS PERMIT CLOSURE, A FINAL MONITORING REPORT SIGNED AND SEALED BY THE ESC DESIGNER MUST BE SUBMITTED TO THE CITY. THE FINAL REPORT MUST CONFIRM THAT ALL ESC MEASURES HAVE BEEN REMOVED FROM THE CITY PROPERTY AND ALL SEDIMENT HAS BEEN REMOVED FROM THE ROADWAYS.
- 5.5. GRAB SAMPLES FOR COMPLIANCE MONITORING MUST BE COLLECTED FROM A CLEARLY IDENTIFIED SAMPLE PORT LOCATED AT THE POINT OF WATER TREATMENT SYSTEM DISCHARGE AND ANALYZED FOR TURBIDITY, PH, AND TEMPERATURE USING INDUSTRY-STANDARD CALIBRATED FIELD MEASUREMENT DEVICES.
- 5.6. WEEKLY, EVERY TWO WEEKS AND POST-SRE ESC MONITORING MUST BE DOCUMENTED AND REPORTED TO THE CITY BY EMAILING TO [SCSMONITORINGREPORTS@BURNABY.CA](mailto:SCSMONITORINGREPORTS@BURNABY.CA) AS PER THE FOLLOWING REQUIREMENTS:
- NON-COMPLIANT SITES:
- THE ESC MONITOR MUST SUBMIT THE FIRST PAGE OF THE TEMPLATE INSPECTION REPORT TO THE CITY WITHIN 24 HOURS OF THE INSPECTION DATE.
  - THE COMPLETE REPORT MUST BE SUBMITTED WITHIN 48 HOURS OF THE INSPECTION DATE.
- COMPLIANT SITES:
- MONTHLY SUMMARY MUST BE SUBMITTED WITHIN 7 DAYS OF THE LAST DAY OF THE MONTH.

## 6. ALTERATIONS TO ESC WORKS AND DECOMMISSIONING

- 6.1. ALL ESC FACILITIES MUST REMAIN UNTIL CONSTRUCTION WORK INCLUDING LANDSCAPING IS COMPLETED.
- 6.2. ANY ALTERATIONS TO THE ESC WORKS INCLUDING REMOVAL OF THE ESC COMPONENTS MUST BE REVIEWED AND AUTHORIZED IN WRITING BY THE ESC DESIGNER BEFORE ALTERATIONS TAKE PLACE.
- 6.3. WHEEL WASH MUST REMAIN IN PLACE UNTIL THE ONSITE WORKS HAVE PROGRESSED TO A POINT WHERE THE WHEEL WASH IS NO LONGER REQUIRED, SUCH AS ONSITE PAVING AND INSTALLATION OF DRIVEWAYS. A WRITTEN NOTIFICATION MUST BE SUBMITTED TO THE CITY PRIOR TO THE REMOVAL OF THE WHEEL WASH. THE NOTIFICATION MUST BE PREPARED BY THE ESC MONITOR AND INCLUDE A DETAILED DESCRIPTION OF ANY REMAINING SOIL WORK AND PROPOSED BMPS IN LIEU OF THE WHEEL WASH.
- 6.4. ALL ORIGINAL WATER TREATMENT SYSTEM COMPONENTS (SUCH AS PH ADJUSTMENT, CHITOSAN

INJECTION, TANKS, SAND FILTER, AND REAL-TIME MONITORING SYSTEM MUST REMAIN IN PLACE UNTIL THE DEVELOPER IS ABLE TO DEMONSTRATE THAT THE UNTREATED STORMWATER MEETS THE CITY'S PERFORMANCE STANDARD AT LEAST 95% TIME (BY VOLUME, BASED ON THE REAL-TIME DATA) OVER A 4-WEEK PERIOD. THE 4-WEEK PERIOD IN QUESTION MUST INCLUDE AT LEAST ONE SRE.

- 6.5. UPON COMPLETION OF ON-SITE DEVELOPMENT AND WRITTEN AUTHORIZATION FROM THE ESC DESIGNER, THE DEVELOPER MUST REMOVE THE SILTATION FENCES AND ALL SEDIMENT TO DRAW DOWN TO APPROVED CONTAINMENT SYSTEM IN PRESENCE OF ESC MONITOR. ALL TEMPORARY INLETS/OUTLETS MUST BE REMOVED AND MANHOLES PLUGGED AND RE-BENCHED, AND THE WORK MUST BE REVIEWED AND ACCEPTED BY THE ESC DESIGNER.
- 6.6. DISTURBED AREAS MUST BE RESTORED AND FINISHED LANDSCAPE TREATMENT MUST BE APPLIED AS PER LANDSCAPE ARCHITECT'S SPECIFICATIONS.