



June 2013 (Rev01)

Rodgers Creek Development – Area 4 Environmental Management Plan



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Table of Contents

1.0	INTRODUCTION	1
1.1	PURPOSE OF THE ENVIRONMENTAL MANAGEMENT PLAN	1
1.2	PROJECT DESCRIPTION AND LOCATION	1
2.0	ENVIRONMENTAL MANAGEMENT MEASURES	3
2.1	PRELIMINARY CONSTRUCTION SCHEDULE	3
2.2	SITE PREPARATION	3
2.2.1	<i>Temporary Protective Fencing</i>	3
2.2.2	<i>Access, Delineation & Clearing</i>	3
2.2.3	<i>Pre-Clearing Bird Nesting Surveys</i>	4
2.2.4	<i>Fish/Amphibian Salvage</i>	5
2.2.5	<i>Temporary Channel Diversion</i>	5
2.3	EROSION AND SEDIMENT CONTROL	5
2.3.1	<i>Upland Construction Activities</i>	6
2.4	WASTE MANAGEMENT PLAN	6
2.4.1	<i>Recyclable Waste</i>	6
2.4.2	<i>Non-Recyclable Waste</i>	7
2.4.3	<i>Hazardous Waste</i>	7
2.4.4	<i>Burning</i>	7
2.4.5	<i>Portable Toilets</i>	7
2.4.6	<i>Animal Attractants</i>	7
2.5	CONCRETE MANAGEMENT PLAN	7
2.6	NOISE REDUCTION	8
2.7	WILDLIFE ENCOUNTERS.....	8
2.7.1	<i>Bear Safety Essentials</i>	9
2.8	EMERGENCY SPILL RESPONSE PLAN	9
3.0	ENVIRONMENTAL MONITORING.....	11
3.1	SITE STABILIZATION	11
3.2	DANGER TREE REMOVAL	12
3.3	TREE REPLACEMENT CRITERIA.....	12

Figures

FIGURE 1. RODGERS CREEK AREA 4 DEVELOPMENT MAP2

Appendices

APPENDIX 1 – WEBSTER ENGINEERING CLEARING, GRUBBING, EROSION AND SEDIMENT CONTROL PLAN

APPENDIX 2 – PROVINCIAL TREE REPLACEMENT CRITERIA

1.0 Introduction

British Pacific Properties Limited (BPP) is continuing with development in the Rodgers Creek Development Area, located in the District of West Vancouver, B.C. The Rodgers Creek development is comprised of six distinct areas totalling 87 ha (215.1 acres), and this Environmental Management Plan (EMP) has been prepared for the Area 4 development. Area 4 totals 9.4 ha (23.3 acres) of which 2 ha (5 acres) are owned by P. Rock Ltd. who are jointly developing the area with BPP.

1.1 Purpose of the Environmental Management Plan

BPP has commissioned Sartori Environmental Services (SES) to develop the following EMP for the proposed Area 4 development, as well as to act as an independent environmental monitor for the proposed development works. This EMP describes environmental protection measures and environmental guidance to be used to prevent and/or mitigate environmental impacts resulting from construction activities, and identifies project-specific considerations to be implemented.

1.2 Project Description and Location

Area 4 is situated north of Cypress Bowl Road between Tributary N and Westmount Creek, and is bounded by District-owned land to the west, Area 3 West to the north, Tributary N/Cypress Lane to the east and Cypress Bowl Road/Cypress Lane to the south. Five watercourses exist within the Area 4 boundaries (Tributary N, Tributary P, Pipe Creek, Tributary PP, and Tributary R). A large feature tree was identified in the riparian area on the east side of Tributary P.

Development within the Area 4 site will consist of single family and multi-family housing, associated roads, services, parks, trails, culvert crossing, and a single lane bridge crossing over Pipe Creek. All municipal servicing will be provided including water, sanitary and storm sewers, electrical and telecommunications and natural gas. Approximately 3.95 ha (9.8 acres) will be Park land.

Key objectives of the EMP are to:

- Identify streams and their ravines, with respect to fisheries and amphibian values;
- Provide guidance for working within environmentally sensitive areas; and,
- Ensure BPP's commitment to protecting the environment is communicated to construction contractors.



2.0 Environmental Management Measures

The following works-specific environmental protection measures were developed by SES in conjunction with BPP in attempt to have proposed works meet recommendations made in DFO's *Land Development Guidelines for the Protection of Aquatic Life* (DFO, 1993); MOE's *Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia* (MOE, 2006); and DFO's Operational Statement for the Construction of Clear Span Bridges (DFO, 2007; v3).

2.1 Preliminary Construction Schedule

Construction work commencement is anticipated in mid-2013, beginning with work on the Tributary R culvert, and Pipe Creek bridge crossing and associated access road works (these works are covered under a site specific Environmental Protection Plan under Development Permit 12-083). Detailed construction scheduling of the various components of the project will vary to some extent as determined by municipal approvals, weather conditions, and to some degree, the availability of contractors.

2.2 Site Preparation

Prior to delineating the clearing boundaries, a pre-construction meeting will be held with the project manager, construction supervisor, project engineer, the District's Environmental Protection Officer and the owners' environmental consultant, to ensure that site safety and environmental procedures are adhered to.

2.2.1 *Temporary Protective Fencing*

Prior to any site work, tree protective fencing (see Protective Fence Detail on Webster Engineering drawings) shall be installed along the boundaries of riparian areas and proposed Covenant and Park areas. No work shall take place within riparian areas or proposed Covenant and Park areas without the approval of the environmental monitor, the District's Environmental Protection Officer and the District's Manager of Parks (proposed Park areas only) unless noted otherwise on the approved development permit and servicing drawings. Special note should be taken of the Feature Tree within the Tributary P Covenant area on proposed Lot 27. Protective Fencing should follow the drip line of the feature tree to ensure that the roots are adequately protected. After initial clearing operations, the Feature Tree should be assessed by a certified arborist to determine if it is stable and does not pose a safety hazard for nearby development.

2.2.2 *Access, Delineation & Clearing*

Access into the Area 4 development site will utilize the recently installed intersection access road off of Cypress Bowl Road. Bridge construction access is presently available to the west side of the Pipe Creek Bridge and a temporary road is proposed for access to the east, off of Cypress Lane.

Clearing and grubbing activities will result in the greatest initial impact to the environment. The following are methods that will be used to minimize the potential impacts to the extent possible:

- The boundaries of the construction/clearing area will be clearly marked. Only the area within these boundaries will be disturbed.
- All contractor employees and sub-contractors will be briefed on the limits of construction and the locations of the marked Environmentally Sensitive Areas during orientation prior to their first day on site.
- Machinery will operate within these boundaries only. Cleared debris will be properly disposed of, and will not be pushed outside of the delimited areas.
- Sediment control structures will be installed downslope of all activities, to reduce the input of sediment to all watercourses prior to grubbing or stripping activities.
- Trees shall be felled away from all riparian areas and proposed Covenant and Park areas unless it poses a risk to human safety. If it is determined that a tree cannot be felled safely without going into a riparian area or proposed Covenant or Park area, the District's Environmental Protection Officer shall be notified and the environmental monitor shall be consulted on the methodology to minimize any damage to other trees or vegetation within the riparian areas and proposed Covenant and Park areas.
- Grub operations will be limited to favourable weather conditions. Should inclement weather be encountered, the site will be stabilized prior to work stoppage as directed in the ESC plan to prevent sediment from being mobilized and entering the adjacent watercourses. No machinery will enter the creek, and no clearing will occur within adjacent environmentally-sensitive areas.
- Organic topsoil will be stockpiled for use in progressive reclamation activities. Shrubs and herbs will be salvaged where possible to aid in revegetation. Coarse Woody Debris (CWD) will also be salvaged and stockpiled for future placement in revegetation areas.

Although existing vegetation is composed mostly of native species, invasive species such as Himalayan blackberry and Japanese knotweed are also present in the area. Cleared invasive vegetation will be trucked off site for proper disposal. Care will be taken when grubbing soils infected with invasive vegetation with rhizomes capable of fragmentation and regrowth (i.e. Japanese knotweed and Himalayan blackberry) to grub to sufficient depth to remove all subsurface plant material. Grubbed soils known to contain invasive plant material will be trucked off site for proper disposal.

2.2.3 *Pre-Clearing Bird Nesting Surveys*

Under the BC *Wildlife Act*, it is illegal to molest or destroy active bird nests not on current provincial exclusion lists. Concurrently, North American migratory birds are managed by the Canadian Wildlife Service (CWS) branch of Environment Canada (EC) under the *Migratory Birds Convention Act*. The CWS-recommended songbird nesting survey window for the proposed works area falls between March 15 and July 31.

If clearing of the Area 4 site coincides with the March 15 to July 31st window, SES will conduct pre-clearing surveys to identify active nests, and species, if present. In the event that an active nest not listed in provincial exclusion lists is discovered, a 15m buffer radius from the nest will be flagged in field, and no clearing works or machinery operations will be conducted within the radius until SES confirms that the nest is no longer active. Identified active nests of bird species listed on provincial *Wildlife Act*

exclusion lists (e.g. rock dove, north-western crow) will be managed in consultation with SES according to project requirements.

2.2.4 *Fish/Amphibian Salvage*

Fish presence in the proposed work area is not anticipated due to significant barriers to fish passage that occur downstream through the Highway 1 culvert (25% gradient through a perched culvert); however amphibian salvages will be performed prior to the commencement of instream work activities. Once the salvage has been performed in the works area, barrier fencing will be installed to preclude amphibian entrance to the immediate area. The salvage crew will comprise qualified environmental professionals, and will be responsible for obtaining necessary permits required by the BC *Wildlife Act* prior to conducting salvage activities.

2.2.5 *Temporary Channel Diversion*

Installation of culvert crossings will necessitate the installation of a channel diversion to dry the immediate work areas. The following mitigation measures are necessary to ensure water quality is maintained during the temporary flow diversion:

- Stage dewatering pumps and hoses in preparation for bypassing flows around the work area. The outlet of the dewatering hose should be placed in the channel downstream of the work area and be protected with an energy dissipation structure to prevent bank and channel scouring.
- Install a temporary sand bag and poly sheeting berm upstream of the work area and downstream of the staged diversion pumps. The berm should prevent water from seeping into the work area.
- Install a sump and berm at the downstream extent of the work area to collect all water seepage that may have entered the work area. All seepage water entering the active work area should be dewatered to a suitable vegetated area for infiltration and/or settlement area. If no suitable natural infiltration area exists, appropriately sized settlements areas should be constructed in consultation with the independent environmental monitor.

Periodic *in-situ* water quality measurements (e.g. pH and turbidity) will be performed during the excavation activities. Water meeting the BC Water Quality Guidelines for the Protection of Freshwater Aquatic Life (BCWQG) will be pumped back to the Creek. Water of insufficient quality under BCWQG will be pumped to nearby vegetated receiving areas pending SES approval or will require treatment prior to discharge.

2.3 **Erosion and Sediment Control**

Once clearing activities have been completed and construction of the roads and homes begins, it is anticipated that sediment control ponds or tanks and drainage ditching will be utilized in controlling runoff and treating it prior to discharge into large vegetated buffer areas and not directly into watercourses.

All stockpiles of materials will be tarped or covered with poly to minimize erosion and silt laden runoff. Once the road has been excavated to sub-grade, large 6" angular rock will be placed to minimize tracking and reduce the amount of vehicular traffic contact directly onto erodible materials.

Working during inclement weather conditions will be reviewed by the project manager in consultation with the environmental consultant and the contractor(s). Activities such as excavation and grubbing will not be undertaken if significant rainfall events are forecasted and the risk of creating large quantities of silt laden runoff is possible.

A Draft Area 4 erosion and sediment control plan has been prepared by Webster Engineering Ltd, and is presented in Appendix A. This plan should be viewed as the start point for construction and site-specific field adjustments will be implemented as construction progresses. In order for erosion and sediment controls to be effective they need to be appropriately designed, implemented, inspected and maintained. The following four principles will be used for erosion and sediment control within Area 4:

1. Expose the smallest practical area of land for the shortest possible time;
2. Apply "soil erosion" control practices as a first line of defense against silt laden runoff;
3. Apply "sediment control" practices as a perimeter protection to prevent off-site damage; and,
4. Implement a thorough maintenance and follow-up operation.

2.3.1 Upland Construction Activities

Construction of individual homes and site preparation of lots has the potential to have significant impact on storm water quality. Individual site erosion and sediment control procedures and prescriptions will be developed prior to excavation works on the lots, to ensure that water quality can be maintained during construction.

Site specific prescriptions and BMP's will be reviewed in the field by the environmental monitor during the pre-construction meeting and site inspections (see environmental monitoring below).

2.4 Waste Management Plan

Contractors working at the Project site shall adhere to applicable legislation with respect to the handling, transportation, and/or disposal of all materials related to the Area 4 construction (waste or otherwise). These regulations may include (but not limited to):

- *Hazardous Waste Regulation;*
- *Contaminated Sites Regulation;*
- *Spill Reporting Regulation;*
- *WorkSafeBC Occupational Health and Safety Regulation;* and,
- *Transportation of Dangerous Goods Regulation.*

2.4.1 Recyclable Waste

Recyclable waste such as cardboard, wood and approved plastic will be sorted out and stored in appropriate, clearly identified containers. Contractor(s) are responsible for the appropriate disposal of recyclable waste coming from the construction site.

2.4.2 *Non-Recyclable Waste*

Non-recyclable solid wastes generated during the project including general refuse, replacement air filters, construction debris, concrete, etc. and surplus oil requiring disposal off-site shall require approval from the local landfill operator prior to disposal. Only landfills authorized to accept the specific products requiring disposal shall be used.

2.4.3 *Hazardous Waste*

Absorbent materials or soils contaminated with oil (greater than 3% by weight) or any quantity of gasoline must be handled and transported as hazardous waste. Any contaminated soils will be excavated and hauled off-site to an authorized treatment/disposal area in accordance to the BC Hazardous Waste Regulations.

In the event that material believed to be contaminated or hazardous is discovered during excavation at the site, SES must be notified immediately. If the hazardous material is stable and does not pose an immediate threat, operations should be halted until SES determines the appropriate course of action for removal or neutralization of the hazardous material.

If the hazardous material poses an immediate threat and is unstable, then the spill response procedures outlined below should be immediately followed in order to contain the hazardous material.

2.4.4 *Burning*

No burning of any type is permitted at the construction site.

2.4.5 *Portable Toilets*

A portable toilet will be on site during all construction. This will be kept clean and periodically cleared of waste matter (trucked off site to a designated waste facility by a waste pump truck) as required.

2.4.6 *Animal Attractants*

Contractors will place all animal attractive wastes (*i.e.* food scraps) in animal proof containers, and will ensure that these wastes are removed on a regular basis from the site. No food wastes are to be disposed of on site.

2.5 **Concrete Management Plan**

Cast-in-place concrete works associated with construction of Area 4 include foundation walls, fence posts, footings, pools, abutment walls, and bridge deck pours. During these works, extra care will be taken to prevent the release of uncured concrete into water or nearby catch basin, as it is known to be toxic to the aquatic environment. Mitigation procedures will be implemented to reduce the potential for environmental damage when pouring concrete around water or during rain events.

In addition, the following conditions will be met:

- All concrete wastewater from cleaning or mixing is considered toxic, and will be prevented from entering any watercourse or catch basin for at least 48 hours to allow the water to reach neutral pH.
- Wash out of concrete trucks and equipment will be done away from the construction area in constructed settling areas (location yet to be determined) outside the riparian area of the stream.
- All waste concrete/concrete wastewater will be collected and disposed of at an approved facility.
- Freshly poured concrete will be covered immediately if rain is forecasted.
- If water is contaminated with concrete it will be contained using measures outlined in the Spill Response Plan and disposed of at an approved disposal facility.
- Carbon dioxide will be diffused through any plumes/spills into water via a soaker hose to help neutralize the pH effect that concrete has on potentially impacted waters. The carbon dioxide cylinder with the already attached soaker hose will be used to inject the carbon dioxide into the water. A CO₂ soaker hose will be readily available at the pour site during any concrete pour.
- Surplus concrete in rolling concrete mixers will be returned to the batch plant yard.

During all concrete pours near the stream channel, the contractor and the environmental monitor will inspect all forms for leakages. If such a situation should arise, the leakage will be immediately plugged utilizing tarps/catch nets and the event will be recorded.

2.6 Noise Reduction

Area 4 is located within a residential area and is therefore, the potential for noise levels during construction to be an environmental concern, particularly with respect to clearing, grubbing, and excavation work. The following general measures will minimize the potential for construction related noise and vibration effects:

- Construction activities will be limited to the times allowed under the District of West Vancouver Bylaws. Permitted construction hours are confirmed as follows:
 - 7:30am to 5:30pm weekdays
 - 8:00am to 5:00pm Saturday
 - No work on Sundays
- All equipment will be properly maintained to limit noise generation and fitted with functioning exhaust and muffler systems.
- Diesel generator(s) required to run overnight for submersible pump diversion works will be housed in insulated housings (*e.g.* “Whisper-Watt” type) and be fitted with functioning exhaust and muffler systems. Gasoline generators will not be utilized for overnight works.

2.7 Wildlife Encounters

As the works area is located within a forested area, wildlife encounters may occur. In order to prevent wildlife encounters (*e.g.* bears, coyotes, domestic dogs, etc.), animal attractants will be properly stored

for disposal. If significant or aggressive wildlife encounter(s) occur, construction staff should remove themselves from danger immediately and contact SES for further steps.

Wildlife encounters deemed dangerous with a high probability of repetition will be reported to the BC Conservation Service by SES.

2.7.1 *Bear Safety Essentials*

The following provides some basic safety essentials if a bear has been observed – Referenced from Safety Guide to Bears in the Wild (BC Environment, 1996)

- Respect all bears – they all can be dangerous;
- Never approach a bear;
- Never attempt to feed a bear;
- Be defensive - never surprise a bear;
- Learn about bears – anticipate and avoid encounters;
- Know what to do if you encounter a bear; and
- Each bear encounter is unique. No hard and fast rules can be applied when dealing with a potentially complex situation.

2.8 **Emergency Spill Response Plan**

Once a spill has occurred the primary objective will be to ensure health and safety, and to minimize environmental damage due to the spill. The order of priority when dealing with a spill will be people, environment, and property. A spill kit that will include tools and sorbent materials will be maintained near the work area and sorbents will also be available on each machine.

The response plan will be as follows:

1. Stop the Flow. Use common sense to ensure the safety of personnel in the area but act quickly.
 - Shut off machinery, pumps, valves etc.
 - Plug leaks.
 - Right containers.
2. No smoking, and no open flames, etc. as required.
3. Implement safety measures and ensure personnel have appropriate personal protective equipment.
4. If conditions permit, clean up the spill:
 - a. Immobilize the product with sorbents, earth, sand, booms, etc. Procedures will vary depending on the product spilled and the location of the spill. A spill kit will be maintained at each staging area.
 - b. For product spills and leaks on soil, liquid will be collected using sorbents and the soiled sorbent material will be transferred into a drum. The contaminated soil will then be excavated and also drummed. Drums of waste will be labelled to identify their contents and be stored at either of the staging areas prior to being hauled off site for disposal by a certified hauler.

- c. For product spills into the watercourse, a boom will be utilized when possible to contain the spill. Sorbent materials will be used to recover floating product. This procedure will be most effective if the spill occurs in water that is relatively still.
5. Report spills and obtain assistance immediately. Do not attempt to contain a large spill by yourself.
6. Call for assistance as required.
7. Contact the following:
 - o Environmental Consultant 604.987.5588 (Sartori Environmental Services).
 - o Government Notification for spills that reach reportable quantities, **Provincial Emergency Response Program (PEP) 24 hour hotline 1-800-663-3456.**

Spill reporting is mandatory as per the *Spill Reporting Regulation* under the *Waste Management Act*. The following are reporting thresholds:

Flammable Liquid, Class 3	100 litres
Corrosive Liquids, Class 5	5 kg or 5 litres
Oil	100 litres

The report shall include:

- Name and phone number of person reporting the spill
- Name and phone number of person causing the spill
- Location and time of the spill
- Type and quantity of the spill
- Cause and effect of the spill
- Details of action proposed or taken to contain and minimize impact
- Names of agencies on the scene
- Names of other persons or agencies advised
- Methods implemented to contain The Spill

As part of the EMP, the contractor(s) will ensure that all on-site personnel are aware of the environmental features associated with the project. During the pre-construction meeting, environmental sensitivities related to the project will be conveyed to the construction crew, as well as the proper use of spill kits and absorbent booms. Site-specific precautions and conditions will be conveyed to the construction foreman prior to construction and on an on-going basis.

Back-up procedures in the event that the primary protective measures fail will be initiated during the mobilization phase. These measures include:

- Storm drains in areas of high risk will be sealed with drain seals. This will prevent any oil/hydraulic spills to gain quick access to the creek.
- Oil boom and pads will be on site at all times.
- Any fuel or oil tanks stored on near the site will be placed on containment pads with sufficient capacity to contain the fuel.

The following is a list of protective equipment available in the development area at all times:

- A spill response kit that will include sorbent pads, three shovels, nylon rope, an axe, a roll of plastic, four 5-gallon buckets, and two empty drums will be kept in a designated area of the compound and clearly marked.
- An extra absorbent boom for use around the piers.
- Drip trays, which can be placed under leaking vehicles.
- A list of contact numbers, in case of a spill.

3.0 Environmental Monitoring

SES has been commissioned as an independent environmental monitor. SES has conducted monitoring of numerous instream works throughout Lower Mainland, and is known to all relevant local environmental regulatory agencies (DWV, DFO, MOE).

SES will inspect and monitor conditions in the vicinity of the development to ensure compliance with environmental permits and appropriate environmental regulations and Best Management Practices (BMP's). The frequency of inspections and monitoring will correspond to the environmental sensitivity of the construction activities, proximity to environmentally-sensitive areas and weather conditions.

Full-time monitoring will be conducted during all high risk construction activities to ensure compliance with the mitigation plan and municipal watercourse protection bylaws. Construction activities scheduled for full time monitoring include:

- Stripping of material within 15 metres of any watercourse;
- Direct instream works;
- Excavation related to the installation of culvert crossings;
- Concrete pours (pile filling, and superstructure pours);
- Installation of the rip rap blankets; and,
- Installation of the culvert sections and substrate placement within.

The monitor will have authority to halt or modify pre-construction, construction or restoration activities as conditions warrant. The monitor will inspect equipment, material storage, work areas and riparian areas, and collect data on turbidity and pH. In addition, the monitor will have sample containers on-hand to collect water samples for laboratory analysis if needed.

3.1 Site Stabilization

Erodible material stabilization is an ongoing task to ensure that cut slopes and stockpiles do not erode and create silt laden runoff. Typically BMP measures (*e.g.* polyethylene sheets, silt fencing, etc.) are used to minimize erosion or treat sediment on erodible material during periods of active construction. However, to achieve further long term stabilization, the following criteria will be used to hydro-seed exposed soils:

- During summer months – hydro-seeding will be conducted on all exposed soils if they are to be left for a period of four weeks or if drought conditions do not allow for hydro-seeding, all slopes exposed slopes will be covered.
- During spring/fall months – hydro-seeding will be conducted on all exposed soils if they are to be left for a period of three weeks, or otherwise be entirely covered.
- During winter months – hydro-seeding is not possible as seed will not germinate. All slopes to be covered as soon as possible upon being exposed.

The use of wood mulch can also be used to cover exposed slopes up to 2H:1V.

3.2 Danger Tree Removal

After initial clearing, a certified arborist shall assess trees along the edge of riparian areas and proposed Covenant and Park areas and identify any danger trees. No danger trees may be cut or removed without the approval of the District's:

- Environmental Protection Officer in proposed covenant areas, and
- Manager of Parks in proposed Park areas.

3.3 Tree Replacement Criteria

All areas cleared of danger trees within the riparian zone of a watercourse will be restored at the completion of works. Restoration will include installation of clean, locally-sourced topsoil and revegetation according the Provincial Tree Replacement Criteria (Appendix B). Key components of the vegetation restoration plan include:

- Prior to restoration works, a planting list including species-specific quantities and planting densities will be compiled or approved by the environmental monitor (SES), and will be submitted to the District for review;
- Following topsoil installation, exposed areas will be ground seeded with season-appropriate stock to promote immediate root growth and associated stabilization against erosion;
- Following ground seeding, biogeoclimatic-appropriate nursery stock native plants or locally source transplants will be installed in an attempt to expedite succession and reduce invasive plant intrusion;
- Recommendations for plant replacement and/or general restoration items (*e.g.* invasive species removal, watering, fertilization, *etc.*) will be made to BPP to ensure appropriate timing and ecological function; and,
- If insufficient space (due to bedrock, or existing vegetation is sufficiently dense) is available for planting of trees according the Provincial Tree Replacement Criteria, the replanting plan will be reviewed with the District's Manager of Parks.

APPENDIX A

WEBSTER ENGINEERING
EROSION AND SEDIMENT CONTROL PLAN

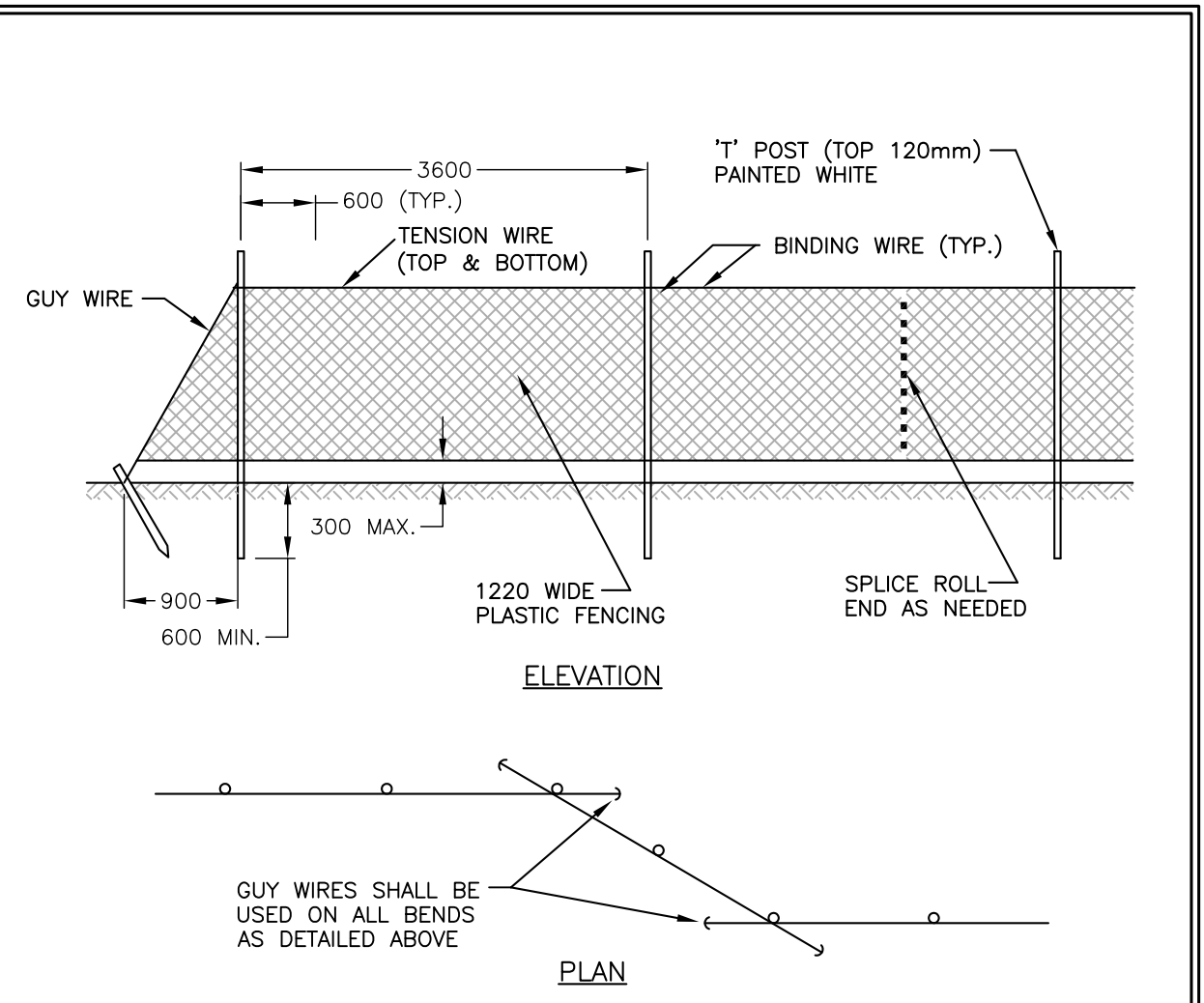
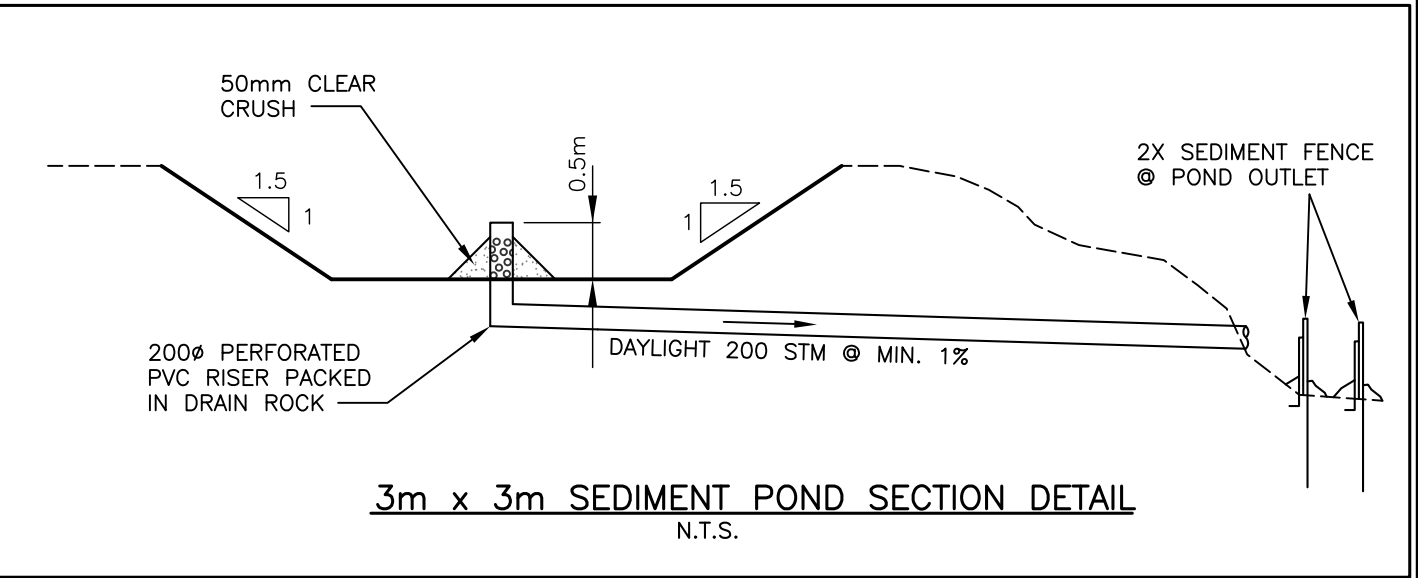
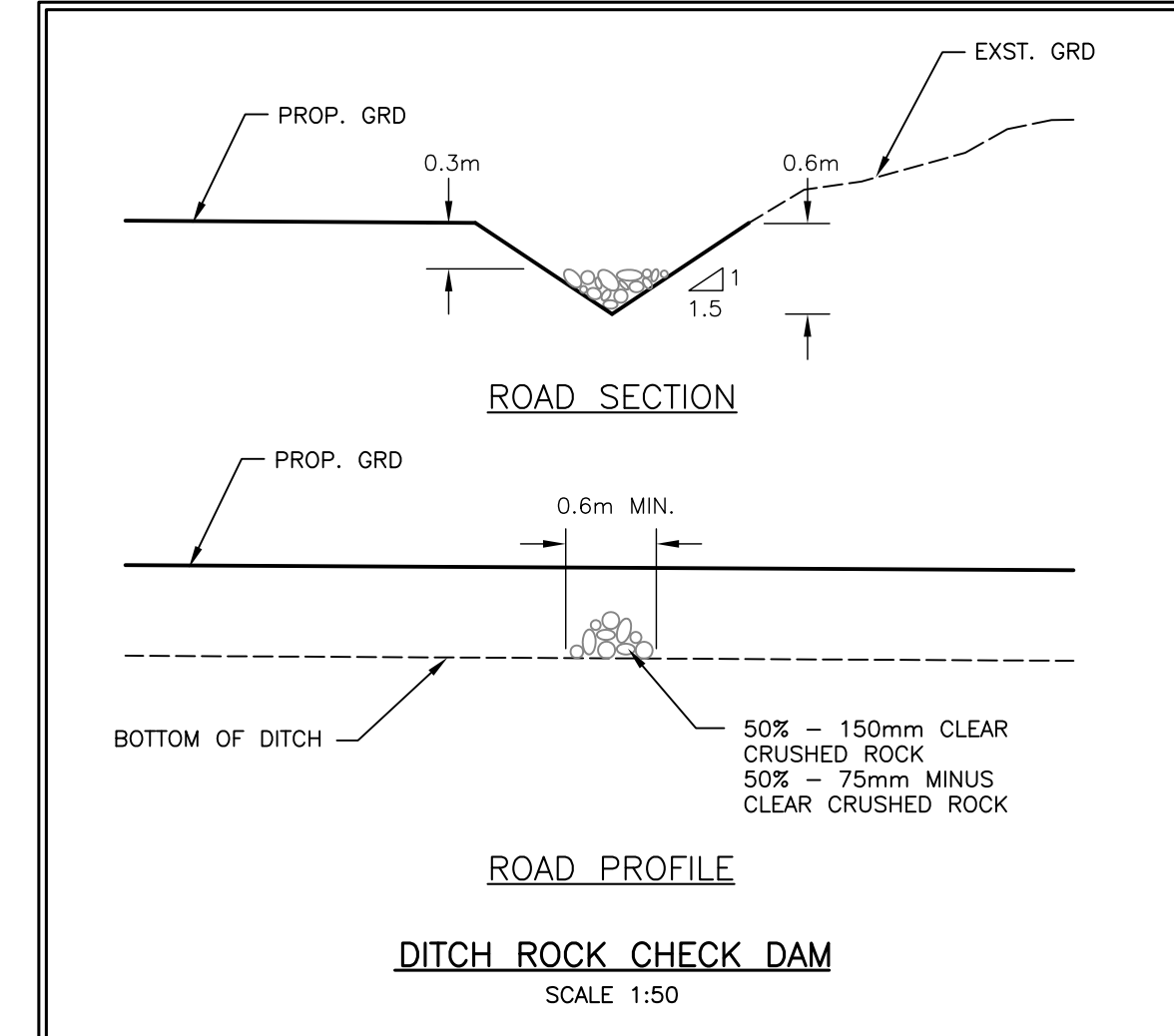
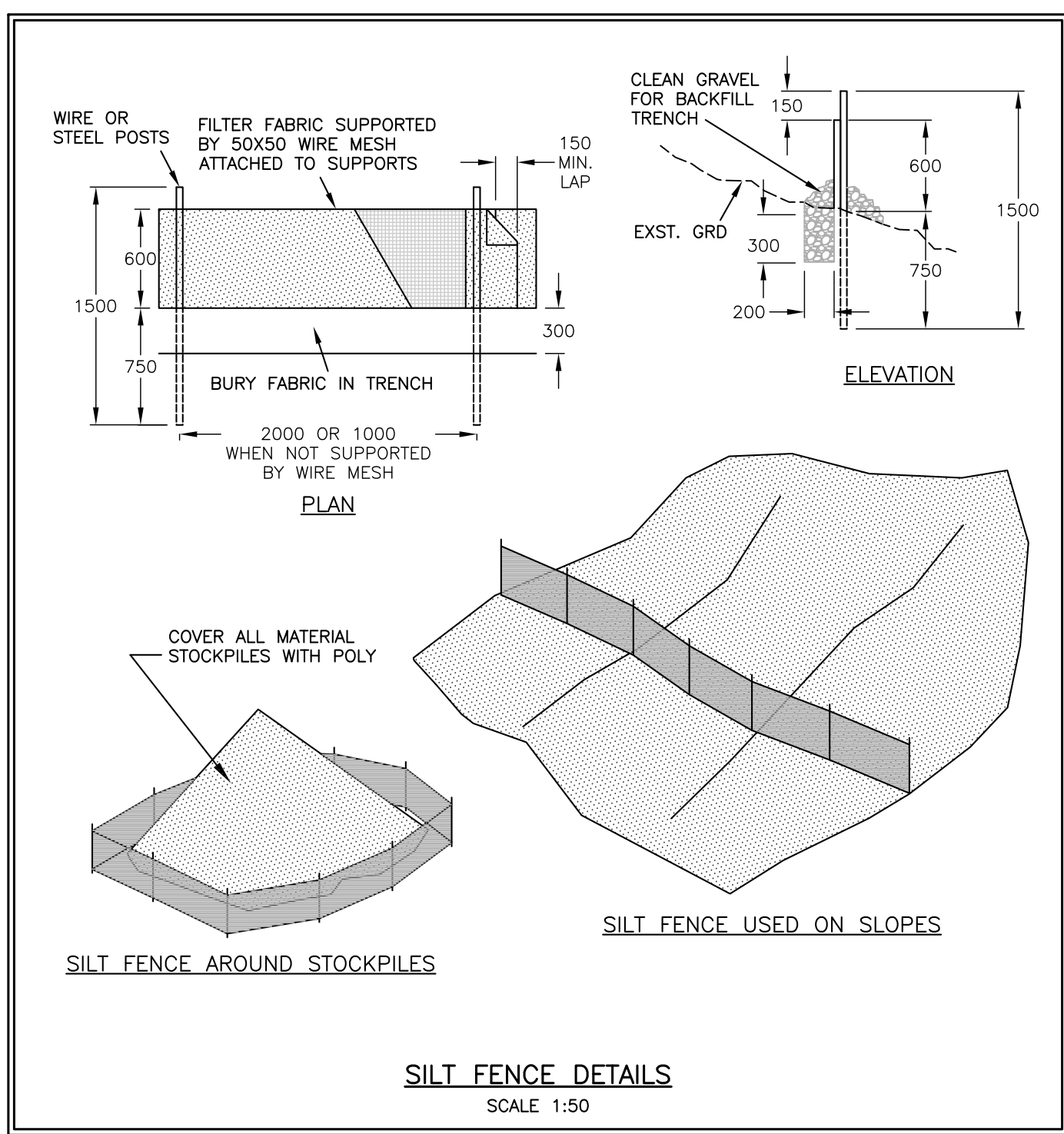
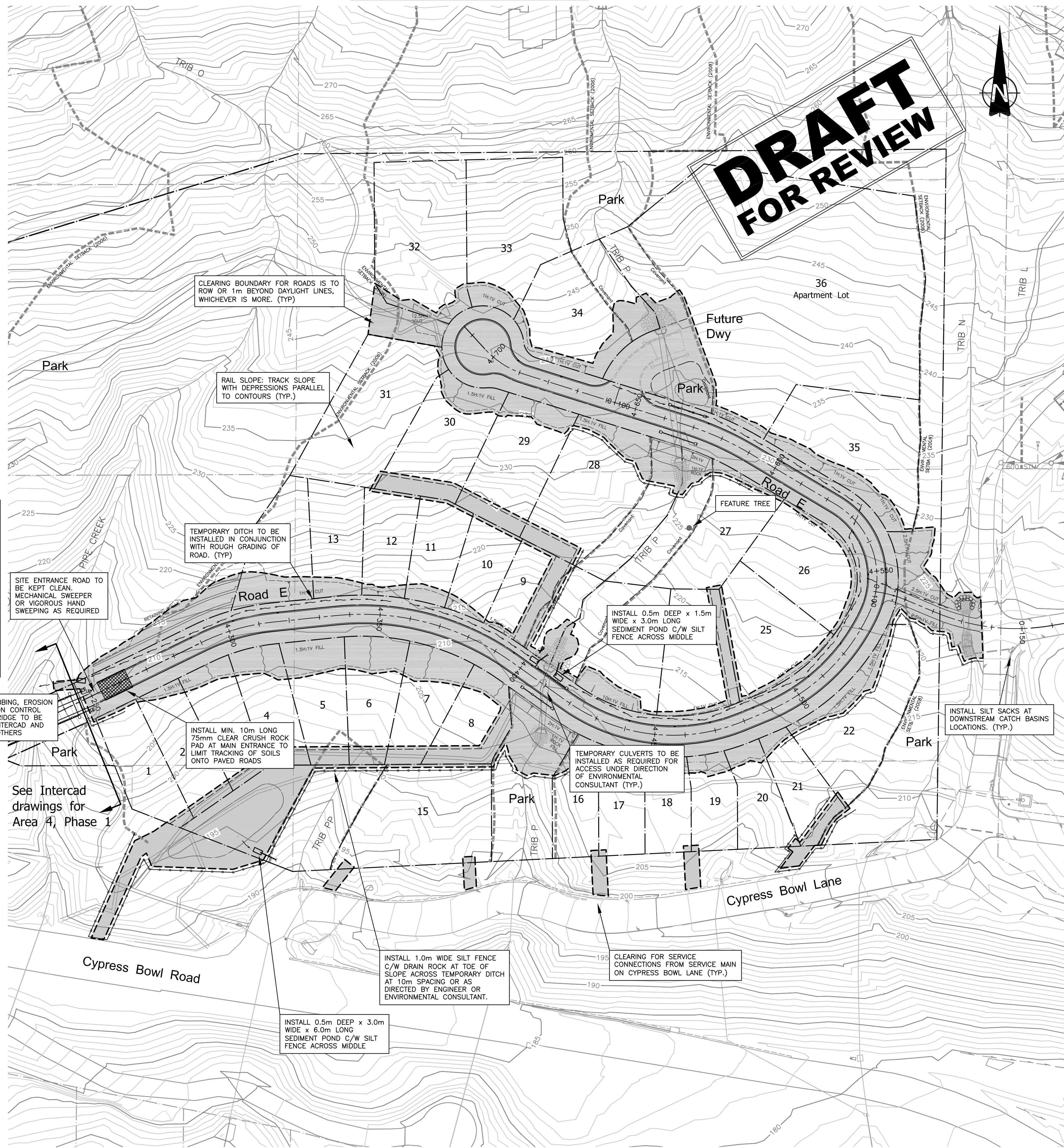
THE CONTRACTOR SHALL INSTALL TEMPORARY DITCHES AND CULVERTS AS NECESSARY TO SAFELY CONVEY RUNOFF TO EXISTING WATER COURSES. TEMPORARY DITCHES ARE TO BE INSTALLED WITH EROSION PROTECTION AND SEDIMENT CONTROL MEASURES SUCH AS ROCK-CHECK DAMS AND SEDIMENT PONDS. ROCK-CHECK DAMS ARE TO BE SPACED AS REQUIRED AND SEDIMENT PONDS INSTALLED WHERE TEMPORARY DITCHES DISCHARGE INTO EXISTING WATERCOURSES.

SEE DRAWING CU-1 FOR GENERAL NOTES

SEDIMENT CONTROL NOTES

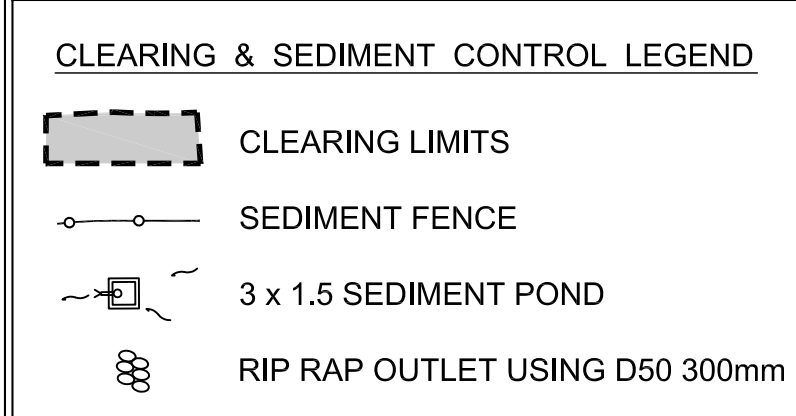
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING AND MAINTAINING A SILTATION AND EROSION CONTROL SYSTEM AS SHOWN ON THESE DRAWINGS AS WELL AS ANY ADDITIONAL TEMPORARY WORKS NECESSARY TO PREVENT SILT DISCHARGES TO THE STORM DRAINAGE SYSTEM AND WATERCOURSES.
2. THE CONTRACTOR SHALL TAKE ALL STEPS NECESSARY TO ENSURE THAT NO SILT IS DISCHARGED TO THE STORM DRAINAGE SYSTEM, ROADWAYS OR ADJACENT PROPERTIES DURING THE COURSE OF CONSTRUCTION. SILT SACKS TO BE INSTALLED AT EX. CB'S AS REQUIRED BY ENGINEER OR ENVIRONMENTAL MONITOR.
3. THE CONTRACTOR SHALL INSPECT THE SILTATION AND EROSION CONTROL WORKS DURING RAINFALL EVENTS AND UNDERTAKE ANY REMEDIAL WORK REQUIRED FOR FUNCTIONAL OPERATION.
4. AS CONSTRUCTION PROGRESSES AND INTERCEPTED FLOWS ARE REDUCED, THE SIZE OF THE SEDIMENT TRAP MAY BE REDUCED ACCORDINGLY AT THE DISCRETION OF THE ENGINEER AND THE MUNICIPALITY.
5. CONSTRUCTION AND MAINTENANCE OF THE SILTATION AND EROSION CONTROL SYSTEM SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE DEPARTMENT OF FISHERIES AND OCEANS/MINISTRY OF ENVIRONMENT, LANDS AND PARKS 'LAND DEVELOPMENT GUIDELINES FOR THE PROTECTION OF AQUATIC HABITAT' AND SECTION 01561 OF THE MASTER MUNICIPAL SPECIFICATIONS (MMS).
6. THE SUPPLY AND INSTALLATION OF SILT FENCES SHALL BE AS PER SECTION 3 AND FIGURE 3.3 OF DFO/MOELP'S LAND DEVELOPMENT GUIDELINES FOR THE PROTECTION OF AQUATIC HABITAT' AND SECTION 01561 OF THE MMS.
7. THE CONTRACTOR SHALL CLEAN OUT THE SEDIMENT TRAP ON A REGULAR BASIS TO ENSURE DEPTH OF SEDIMENT ACCUMULATION DOES NOT EXCEED 1/3 HEIGHT OF SILT FENCE OR 0.5m, WHICHEVER IS LESS.
8. THE CONTRACTOR SHALL CONSTRUCT ALL NECESSARY SILTATION AND EROSION CONTROL WORKS BEFORE COMMENCING ANY OTHER ON-SITE CONSTRUCTION OTHER THAN FALLING TREES.
9. ROCK-CHECK DAMS TO BE LOCATED IN FIELD AS REQUIRED BY ENGINEER OR ENVIRONMENTAL MONITOR.

DRAFT FOR REVIEW



OPERATION & MAINTENANCE SCHEDULE		
EROSION/SEDIMENT CONTROL BMP	MAINTENANCE ACTIVITY	FREQUENCY
CATCH BASIN SILT SACK	REPAIR & REPLACE DEGRADED FABRIC. REMOVE ACCUMULATED SEDIMENT & DEBRIS	ONCE A WEEK OR AS NEEDED. AND BOTH BEFORE & AFTER ANY SIGNIFICANT RAINFALL EVENT
TREE PROTECTION FENCING	REPAIR	ONCE A WEEK OR AS NEEDED.
ACCESS ROADS	SWEEP	DAILY AS REQUIRED
DITCH	REPAIR/CLEAN BERMS	ONCE A WEEK OR AS NEEDED. AND BOTH BEFORE & AFTER ANY SIGNIFICANT RAINFALL EVENT
SEDIMENT POND	REMOVE ACCUMULATED SEDIMENT	ONCE A WEEK OR AS NEEDED. AND BOTH BEFORE & AFTER ANY SIGNIFICANT RAINFALL EVENT
CLEAR CRUSH ROCK PAD	RENEW/REPLACE	AS REQUIRED

NOTE: SILT SACKS ARE ALSO TO BE INSTALLED IN PROPOSED CATCH BASINS ONCE INSTALLED



See InterCAD drawings for Area 4, Phase 1

no.	date	revision	chk'd	no.	date	revision	chk'd
1	JUN.19.13	GENERAL REVISION	PBB				

client
P. ROCK LTD. & BRITISH PACIFIC PROPERTIES LTD.

project
RODGERS CREEK - AREA 4 WEST VANCOUVER, BRITISH COLUMBIA

PROFESSIONAL ENGINEERS

WEBSTER ENGINEERING LTD.
LAND DEVELOPMENT CONSULTANTS

3745 DELBROOK AVENUE, NORTH VANCOUVER, B.C. V7N 3Z4 983-0458

designed by J.A.T.
drawn by P.B.B.
checked by P.M.W.
date FEB.23.11

CLEARING, GRUBBING, EROSION & SEDIMENTATION CONTROL PLAN

scales
hor: 1:750 vert: -

file no. **3247-A**

drawing no. **CE-1** rev. **1**

APPENDIX B

PROVINCIAL TREE REPLACEMENT CRITERIA

TREE REPLACEMENT CRITERIA:

The criteria below apply to the replacement of trees authorized for removal under the *Fisheries Act*, *Wildlife Act* or *Land Title Act* by BC Environment, Fish, Wildlife and Habitat Protection. Requests for authorization should be accompanied by a tree survey and replacement planting plans completed by a professionally certified environmental consultant and detailing numbers, sizes and species. Species suitable for replacement will be based on site specific conditions.

-
- 0 mm - 151 mm (6") dbh ♦ 2 replacement trees (min height 1.5 m), or, 4 shrubs (for up to 50% of trees being replaced in this range);
 - 152 mm - 304 mm (12") dbh 3 replacement trees (min height 1.5 m);
 - 305 mm - 456 mm (18") dbh 4 replacement trees (min height 2.0 m);
 - 457 mm - 609 mm (24") dbh 6 replacement trees (min height >* 2.0 m);
 - 610 mm - 914 mm (36") dbh 8 replacement trees (min height > 2.0 m).

Trees > 914 mm dbh (36") will require individual approval and replacement criteria prior to removal.

Every effort must be made to retain 20% of trees > 304 mm dbh (12") as wildlife snags at minimum height of 3 m.

- ♦ dbh = diameter breast height
- * > = greater than

For further information, please contact the following:

Ecosystem Planning & Protection
BC Environment, Lower Mainland Region
10470-152nd St.
Surrey BC V3R 0Y3
Phn: (604) 582-5235
Fax: (604) 582-5305
Web-site: <http://wlapwww.gov.bc.ca/sry>

THE GOVERNMENT OF BRITISH COLUMBIA IS AN "EMPLOYMENT EQUITY EMPLOYER"