



**City of Bellevue
Development Services Department
Land Use Staff Report**

Proposal Name: Washout Way Trail Repair and Construction

Proposal Address: 5803 Forest Drive SE

Proposal Description: The applicant requests a Critical Areas Land Use Permit to repair and restore a portion of a nature trail that failed due to a small landslide, to construct 22 feet of timber boardwalk supported by Diamond Pier footings, and to construct 150 feet of nature trail supported by Envirolok bagged erosion control system. The project also includes installation of native plantings.

File Number: 12-121501-LO

Applicant: Kevin Husemann, Bellevue Parks & Community Services Department

Decisions Included: Critical Areas Land Use Permit
(Process II. LUC 20.30P)

Planner: Kevin LeClair, Planner

**State Environmental Policy Act
Threshold Determination:** **Determination of Non-Significance**

Carol V. Helland, Environmental Coordinator
Development Services Department

Director's Decision: **Approval with Conditions**

Carol V. Helland, Land Use Director
Development Services Department

Application Date: August 8, 2012
Notice of Application Publication Date: September 6, 2012
Decision Publication Date: October 25, 2012
Project/SEPA Appeal Deadline: November 8, 2012

For information on how to appeal a proposal, visit Development Services Center at City Hall or call (425) 452-6800. Comments on State Environmental Policy Act (SEPA) Determinations can be made with or without appealing the proposal within the noted comment period for a SEPA Determination. Appeal of the Decision must be received in the City's Clerk's Office by 5 PM on the date noted for appeal of the decision.



DEVELOPMENT SERVICES DEPARTMENT
ENVIRONMENTAL COORDINATOR
450 100th Ave NE., P.O. BOX 90012
BELLEVUE, WA 98009-9012

DETERMINATION OF NON-SIGNIFICANCE

PROPONENT: Kevin Husemann, Bellevue Parks & Community Services Department

LOCATION OF PROPOSAL: 5803 Forest Drive (Forest Park No. III – Tract B)

NAME & DESCRIPTION OF PROPOSAL:

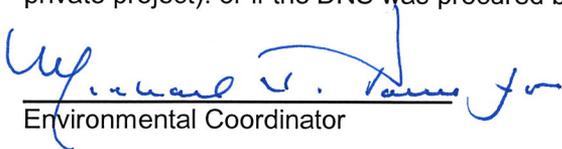
Lower Washout Way Trail Repair and Construction - Critical Areas Land Use Permit to repair and restore a portion of a nature trail that failed due to a small landslide, to construct 22 feet of timber boardwalk supported by Diamond Pier footings, and to construct 150 feet of nature trail supported by Envirolok bagged erosion control system. The project also includes installation of native plantings.

FILE NUMBER: 12-121501-LO

The Environmental Coordinator of the City of Bellevue has determined that this proposal does not have a probable significant adverse impact upon the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(C). This decision was made after the Bellevue Environmental Coordinator reviewed the completed environmental checklist and information filed with the Land Use Division of the Development Services Department. This information is available to the public on request.

- There is no comment period for this DNS. There is a 14-day appeal period. Only persons who submitted written comments before the DNS was issued may appeal the decision. A written appeal must be filed in the City Clerk's office by 5:00 p.m. on _____.
- This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS. There is a 14-day appeal period. Only persons who submitted written comments before the DNS was issued may appeal the decision. A written appeal must be filed in the City Clerk's Office by 5 p.m. on **November 8, 2012**.
- This DNS is issued under WAC 197-11-340(2) and is subject to a 14-day comment period from the date below. Comments must be submitted by 5 p.m. on _____. This DNS is also subject to appeal. A written appeal must be filed in the City Clerk's Office by 5 p.m. on _____.

This DNS may be withdrawn at any time if the proposal is modified so that it is likely to have significant adverse environmental impacts; if there is significant new information indicating, or on, a proposals probable significant adverse environmental impacts (unless a non-exempt license has been issued if the proposal is a private project); or if the DNS was procured by misrepresentation or lack of material disclosure.


Environmental Coordinator

October 25, 2012
Date

OTHERS TO RECEIVE THIS DOCUMENT:

- State Department of Fish and Wildlife
- State Department of Ecology,
- Army Corps of Engineers
- Attorney General
- Muckleshoot Indian Tribe

CONTENTS

I. Proposal Description	1
II. Site Description, Zoning, Land Use and Critical Areas	1
III. Consistency with Land Use Code Requirements:.....	4
IV. Public Notice and Comment.....	9
V. Summary of Technical Reviews	9
VI. State Environmental Policy Act (SEPA).....	9
VII. Changes to proposal as a result of City review.....	10
VIII. Decision Criteria.....	10
IX. Conclusion and Decision.....	12
X. Conditions of Approval	12

Attachments

1. Environmental Checklist
2. Site Plan

I. Proposal Description

Applicant is requesting Critical Areas Land Use Permit approval to repair and restore a portion of a nature trail that failed due to a small landslide, to construct 22 feet of timber boardwalk supported by Diamond Pier footings, and to construct 150 feet of nature trail supported by Envirolok bagged erosion control system. The project also includes installation of native plantings.

The project is located within a Type F stream critical area buffer and a steep slope critical area. Land Use Code (LUC) 20.25H.075 prescribes a 100-foot critical area buffer from the top-of-bank of Type F stream critical area buffers. LUC defines steep slope critical areas as slope of 40% or more, with a rise of 10 feet or more and 1000 square feet of contiguous area.

The proposal is characterized as a new or expanded City and public parks (trails), which is an allowed use per LUC 20.25H.055.C.3.g. The proposal is also required to demonstrate compliance with the performance standards for Type F streams and steep slopes contained in LUC 20.25H.080.A and 20.25H.125, respectively. Finally, the proposal is required to comply with the critical areas land use permit decision criteria in LUC 20.30P.140.



Figure 1: Existing failed trail

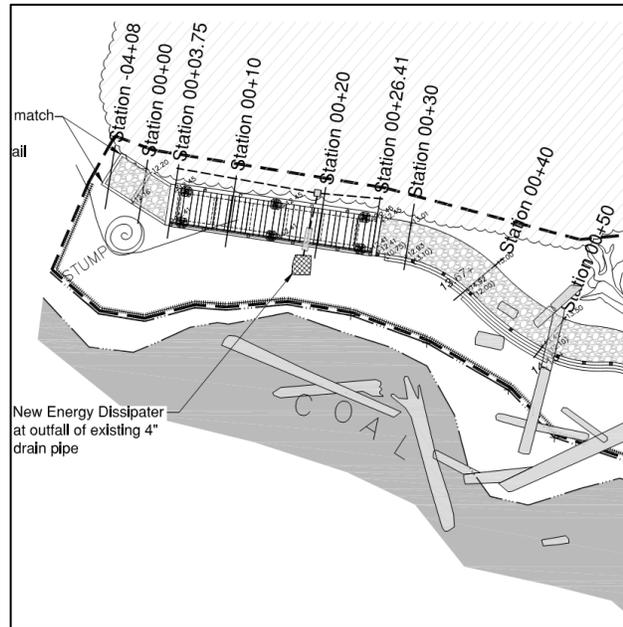


Figure 2: Portion of boardwalk and trail plan

II. Site Description, Zoning, Land Use and Critical Areas

A. Site Description

The project site is located within Tract B of the plat Forest Park No. 3. Tract B is a forested ravine on the south side of Forest Drive referred to as Forest Park – Lower Washout Way. It was set aside during the subdivision process for open space, drainage and utility purposes. The tract is adjacent to number of single-family residences within the plats of Forest Park No. 3 on the south and Forest Park on the north.

The tract contains a steep-sided ravine. The sides of the ravine are covered with a mixture of native and exotic plant species. The entire tract is dominated by bigleaf maple and western red cedars.

At the bottom of the ravine a stream flows from east to west. After passing the project area, the stream flows approximately 1,300 feet while dropping approximately 150 feet in elevation before its confluence with Coal Creek.

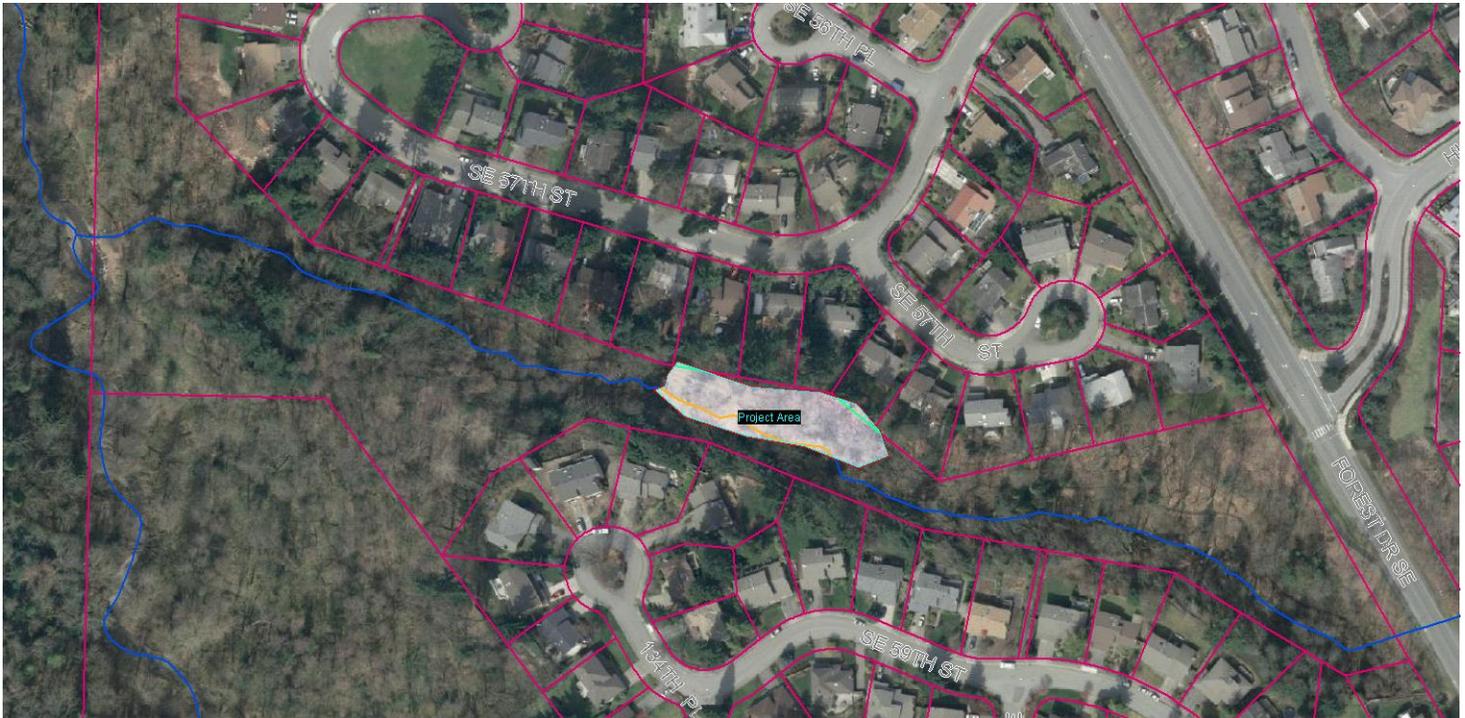


Figure 3: Aerial of Tract B with project area and Coal Creek tributary stream

B. Zoning

The property is zoned R-3.5 and is within the critical areas overlay district due to the presence of the stream and steep slopes.

C. Land Use Context

The project area is located within the Factoria Subarea of Bellevue's Comprehensive Plan and the Somerset neighborhood enhancement program (NEP) area. As mentioned above, the site, Tract B, was set aside during the subdivision process for open space, drainage, and utilities purposes. Since dedication, the City of Bellevue Parks & Community Services Department has constructed a network of interconnected nature trails that traverse this and other open spaces in the Subarea and NEP area.

D. Critical Areas Functions and Values

i. Streams and Riparian Areas

A healthy aquatic environment relies on a sustained, dynamic interaction between the stream and the adjacent riparian area. Riparian vegetation along stream banks

provides a buffer to help mitigate the impacts of urbanization. Riparian areas support healthy stream conditions.

Riparian vegetation, particularly forested riparian areas, affect water temperature by providing shade to reduce solar exposure and regulate high ambient air temperatures, slowing or preventing increases in water temperature.

Upland and wetland riparian areas retain sediments, nutrients, pesticides, pathogens, and other pollutants that may be present in runoff, protecting water quality in streams. The roots of riparian plants also hold soil and prevent erosion and sedimentation that may affect spawning success or other behaviors, such as feeding.

Stream riparian areas, or buffers, can be a significant factor in determining the quality of wildlife habitat. For example, buffers comprised of native vegetation with multi- canopy structure, snags, and down logs provide habitat for the greatest range of wildlife species. Vegetated riparian areas also provide a source of large woody debris that helps create and maintain diverse in-stream habitat, as well as create woody debris jams that store sediments and moderate flood velocities.

Sparsely vegetated or vegetated buffers with non-native species may not perform the needed functions of stream buffers. In cases where the buffer is not well vegetated, it is necessary to either increase the buffer width or require that the standard buffer width be restored or revegetated. Until the newly planted buffer is established the near term goals for buffer functions may not be attained.

Riparian areas often have shallow groundwater tables, as well as areas where groundwater and surface waters interact. Groundwater flows out of riparian wetlands, seeps, and springs to support stream baseflows. Surface water that flows into riparian areas during floods or as direct precipitation infiltrates into groundwater in riparian areas and is stored for later discharge to the stream.

ii. Geologic Hazard Areas

Geologic hazards pose a threat to the health and safety of citizens when commercial, residential, or industrial development is inappropriately sited in areas of significant hazard. Some geologic hazards can be reduced or mitigated by engineering, design, or modified construction practices. When technology cannot reduce risks to acceptable levels, building in geologically hazardous areas is best avoided.

Steep slopes may serve several other functions and possess other values for the City and its residents. Several of Bellevue's remaining large blocks of forest are located in steep slope areas, providing habitat for a variety of wildlife species and important linkages between habitat areas in the City. These steep slope areas also act as conduits for groundwater, which drains from hillsides to provides a

water source for the City's wetlands and stream systems. Vegetated steep slopes also provide a visual amenity in the City, providing a "green" backdrop for urbanized areas enhancing property values and buffering urban development.

III. Consistency with Land Use Code Requirements:

A. Zoning district dimensional requirements:

The site is located in the R-3.5 zoning district. No structures are proposed that are subject to the dimensional standards of the zoning district.

B. New or expanded city and public parks - trails LUC 20.25H.055.C.3.g.i:

i. Trail location and design shall result in the least impacts on the critical area or critical area buffer;

All work is located within the buffer of the existing Type F stream, the project proposes removal of portions of an existing trail that was damaged during a landslide. Parks trails in natural areas are allowed, but their presence within critical areas is subject to an analysis of alternatives that would result in less impact on the critical area or buffer.

Following the landslide, the Parks Department closed the damage trail until a solution could be found. Due to the number of trail users and the position of this trail as a link in the overall open space trail system, a "social" trail was created by trail users traversing the area on a path of least resistance closer to the stream critical area. The social trail contains bare soils that would exacerbate erosion and sedimentation in the stream buffer and steep slope. The proposed trail will be located where the social trail currently exists, and will remediate any erosion issues.

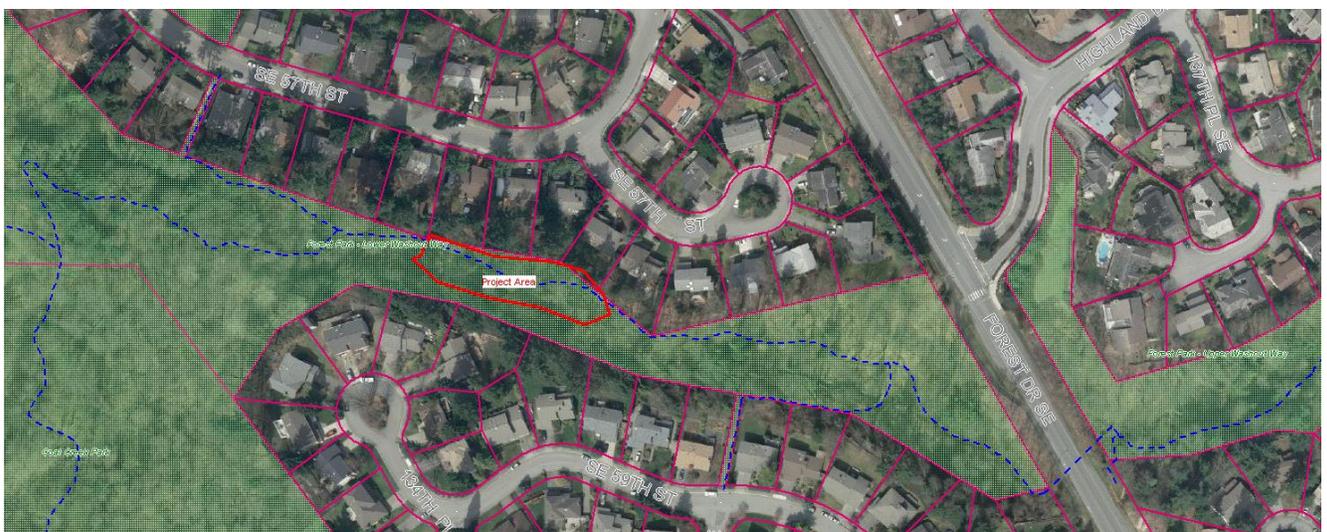


Figure 4: Open space trail system

The damaged trail was located up the slope, on steeper ground further from the stream, and adjacent to the private properties to the north. Moving the new trail to north is not feasible, because the area to the north is steeper than where the trail

used to be, and it is private property. Furthermore, a closure of this portion of trail is not feasible given it is a key link between the open space system to the east and the nature trails within Coal Creek Natural Area to the west. The importance of this connection is bolstered by the fact that there is a pedestrian tunnel approximately 800 feet to the east of the project area that was constructed specifically for the trail system.

ii. Trails shall be designed to complement and enhance the environmental, educational, and social functions and values of the critical area with trail design and construction focused on managing and controlling public access and limiting uncontrolled access;

The proposed trail has been designed to reduce the impact on the existing topography. The bagged material will be placed on the existing topography and secured in a similar method as block retaining walls and geo-grid fabric.

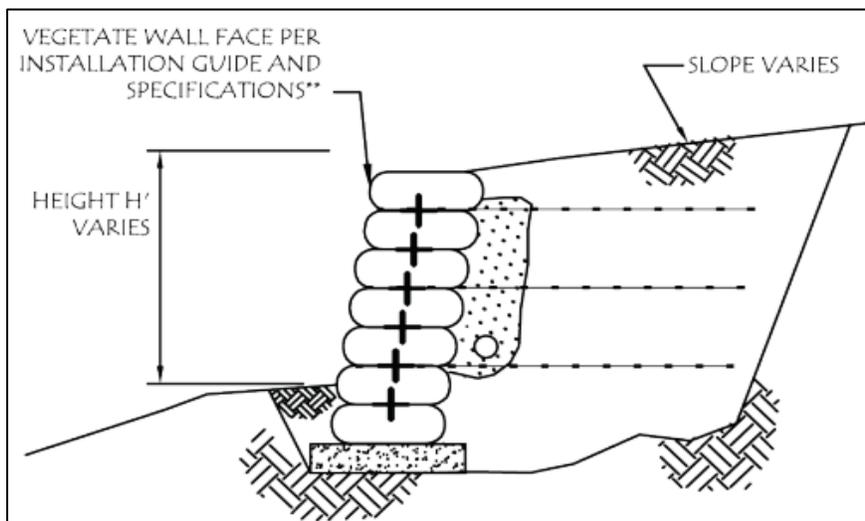


Figure 5: Envirolok wall system (typical x-section)

Social trails are generally created in a method that follows the path of least resistance and, as a result, often create unsustainable and degrading conditions. To reduce impact on the site, the proposed trail will be constructed where the existing social trail exists. Public access away from the trail will be restricted with dense native plantings and handrails on the downhill (stream) side. Railings are proposed for 100% of the new trail's length. The damaged portions of the existing path will be reclaimed and planted. Woody debris available within the project work area will be used to block access to those removed portions of the existing path.

iii. Trails shall be designed to avoid disturbance of significant trees and to limit disturbance of native understory vegetation;

One existing significant tree, Big Leaf Maple (*Acer macrophyllum*), a 18" DBH, is proposed to be removed. The base of the tree is hollow and rotting and is leaning as a result of the earlier slope failure. The tree is proposed to be cut down and cut into habitat logs for reclamation of the existing trail.

iv. Trails shall be designed to avoid disturbance of habitat used for salmonid rearing or spawning or by any species of local importance;

All proposed work related to the construction of the trail is outside the Ordinary

High Water Mark. The area of stream buffer between the stream and the trail will be planted with dense native vegetation.

v. The trail shall be the minimum width necessary to accommodate the intended function or objective;

Portions of the proposed trail are 3 feet wide and portions of the proposed trail are 4' wide. Site conditions, such as existing topography, and also the location of the Ordinary High Water Mark, dictate width of the proposed trail.

vi. All work shall be consistent with the City of Bellevue's "Environmental Best Management Practices" and all applicable City of Bellevue codes and standards, now or as hereafter amended;

The proposed work complies with City of Bellevue's "Environmental Best Management Practices". The proposed work area is limited to only those areas where the trail is in need of replacement. Access to the site will be over existing pedestrian pathways. Staging area for materials will be limited to an area easily accessible with truck and trailer. Further, the staging area will be returned to its pre-work condition. Any stormwater drains in the area will receive the drain sock to eliminate sedimentation during construction. Conditions post-construction will be same or better than pre-construction.

vii. The facility shall not significantly change or diminish overall aquatic area flow peaks, duration or volume or flood storage capacity, or hydroperiod;

Based on the design of the trail and boardwalk and the ecological function of the adjacent stream corridor, the proposed work is not expected to significantly change or diminish overall aquatic area flow peaks, duration or volume or flood storage capacity, or hydroperiod. The trail itself will be generally impervious and the boardwalk section will be above grade so surface water will readily be able to flow under it.

viii. Where feasible and consistent with any accessibility requirements, any trail shall be constructed of pervious materials;

All materials associated with the construction of the proposed trail are considered permeable. Backfill behind the wall is either cut soil from other areas within work area or gravel imported to the site. The Envirolok bagged retaining wall system is considered permeable. Further, materials to be placed inside Envirolok bags will be permeable and filled with on-site cut soil and gravel imported to the site.

ix. Crossings over and penetrations into wetlands and streams shall be generally perpendicular to the critical area, and shall be accomplished by bridging or other technique designed to minimize critical area disturbance considering the entire trail segment and function; and

No wetlands exist within or adjacent to the project area. No work is proposed within the stream or inside the Ordinary High Water Mark.

x. Areas of new permanent disturbance and all areas of temporary disturbance shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.210.

All of the proposed work, excluding the staging area, is within the 100-foot stream critical area buffer. LUC 20.25H.085.B requires a minimum of 1:1 buffer mitigation ratio. The total project area, excluding staging area is 2,875 square feet. The total area of impact, including boardwalk, trail, and Envirolok bagged slope retaining

system, is 880 square feet. The total restoration/enhancement area is 2,354 square feet. The buffer mitigation ratio is therefore, $2,354 / 880 = 2.67:1$.

C. Performance standards for streams LUC 20.25H.080.A:

Development on sites with a type S or F stream or associated critical area buffer shall incorporate the following performance standards in design of the development, as applicable:

i. Lights shall be directed away from the stream.

No lights are proposed.

ii. Activity that generates noise such as parking lots, generators, and residential uses shall be located away from the stream or any noise shall be minimized through use of design and insulation techniques.

Once completed, the proposed project will generate no noise.

iii. Toxic runoff from new impervious area shall be routed away from the stream.

There will be no toxic runoff generated from new impervious surface.

iv. Treated water may be allowed to enter the stream critical area buffer.

The completed project is not proposing to collect and treat any stormwater runoff.

v. The outer edge of the stream critical area buffer shall be planted with dense vegetation to limit pet or human use.

A complete mitigation and restoration plan has been submitted by the applicant. Since the project is entirely within the stream critical area buffer, the entire area between the trail and the stream bank will be planted with dense native vegetation. A key component of this planting is the installation of live stakes on the lower edge of the trail, which will limit pets or humans from leaving the trail and entering the stream.

vi. Use of pesticides, insecticides and fertilizers within 150 feet of the edge of the stream critical area buffer shall be in accordance with the City of Bellevue's "Environmental Best Management Practices," now or as hereafter amended.

The Parks & Community Services Department is the project applicant. No pesticides, insecticides, or non-organic fertilizers are proposed. Any maintenance to be completed will not include any pesticides or insecticides.

D. Performance standards for steep slopes LUC 20.25H.125:

In addition to generally applicable performance standards set forth in LUC 20.25H.055 and 20.25H.065, development within a landslide hazard or steep slope critical area or the critical area buffers of such hazards shall incorporate the following additional performance standards in design of the development, as applicable. The requirement for long-term slope stability shall exclude designs that require regular and periodic maintenance to maintain their level of function.

i. Structures and improvements shall minimize alterations to the natural contour of the slope, and foundations shall be tiered where possible to conform to existing topography;

The proposed trail and structures will be located generally along the existing contours and existing trail alignment.

ii. Structures and improvements shall be located to preserve the most critical portion of the site and its natural landforms and vegetation;

The new trail improvements will be located where the existing social trail has been created with foot traffic. In general, the trail is located along the least steep portions of the slope system.

iii. The proposed development shall not result in greater risk or a need for increased buffers on neighboring properties;

The applicant hired a geotechnical engineer from Stantec to review the proposed trail construction technique and the site characteristics. The consultant offered the opinion that if the trail is constructed as proposed, it will not result in greater risks to neighboring properties.

iv. The use of retaining walls that allow the maintenance of existing natural slope area is preferred over graded artificial slopes where graded slopes would result in increased disturbance as compared to use of retaining wall;

Short vegetated retaining walls will be utilized along the low side of the trail in many places. Due to the erosive potential of the soils on the site, the applicant's geotechnical engineer's opinion is that regraded and sloped fill slopes would not be feasible or advantageous.

v. Development shall be designed to minimize impervious surfaces within the critical area and critical area buffer;

The soft-surface trail and timber boardwalk are all considered impervious as they are constructed from pervious materials or provide adequate drainage through the structure to allow rainfall to penetrate the underlying soil at the same rate that existed before the project.

vi. Where change in grade outside the building footprint is necessary, the site retention system should be stepped and regrading should be designed to minimize topographic modification. On slopes in excess of 40 percent, grading for yard area may be disallowed where inconsistent with this criteria;

No building foundations are proposed. This standard does not apply.

vii. Building foundation walls shall be utilized as retaining walls rather than rockeries or retaining structures built separately and away from the building wherever feasible. Freestanding retaining devices are only permitted when they cannot be designed as structural elements of the building foundation;

No building foundations are proposed. The trail will be supported on retaining structures of Envirolok bags filled with soil and then planted.

viii. On slopes in excess of 40 percent, use of pole-type construction which conforms to the existing topography is required where feasible. If pole-type construction is not technically feasible, the structure must be tiered to conform to the existing topography and to minimize topographic modification;

The proposed boardwalk structure is using pole-type construction founded on Diamond Pier blocks anchored to the slope. This will minimize modification of the

topography.

ix. On slopes in excess of 40 percent, piled deck support structures are required where technically feasible for parking or garages over fill-based construction types; and

No parking or garage structures are proposed. This standard does not apply.

x. Areas of new permanent disturbance and all areas of temporary disturbance shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.210.

All of the proposed work, excluding the staging area, is within the 100-foot stream critical area buffer. LUC 20.25H.085.B requires a minimum of 1:1 buffer mitigation ratio. The total project area, excluding staging area is 2,875 square feet. The total area of impact, including boardwalk, trail, and Envirolok bagged slope retaining system, is 880 square feet. The total restoration/enhancement area is 2,354 square feet. The buffer mitigation ratio is therefore, $2,354 / 880 = 2.67:1$.

IV. Public Notice and Comment

Application Date:	August 8, 2012
Public Notice (500 feet):	September 6, 2012
Minimum Comment Period:	September 20, 2012

The Notice of Application for this project was published in the City of Bellevue weekly permit bulletin on September 6, 2012. It was mailed to property owners within 500 feet of the project site. No comments have been received from the public as of the writing of this staff report.

V. Summary of Technical Reviews

Clearing and Grading:

The Clearing and Grading Division of the Development Services Department has reviewed the proposed development for compliance with Clearing and Grading codes and standards. The Clearing and Grading staff found no issues with the proposed development.

VI. State Environmental Policy Act (SEPA)

The environmental review indicates no probability of significant adverse environmental impacts occurring as a result of the proposal. The Environmental Checklist submitted with the application adequately discloses expected environmental impacts associated with the project. The City codes and requirements, including the Clear and Grade Code, Utility Code, Land Use Code, Noise Ordinance, Building Code and other construction codes are expected to mitigate potential environmental impacts. Therefore, issuance of a Determination of Non-Significance (DNS) is the appropriate threshold determination under the State Environmental Policy Act (SEPA)

requirements.

A. Earth and Water

A temporary erosion and sedimentation control plan is included in the project plans, and addresses all requirements for restoring the site to its current condition as well as erosion and sedimentation management practices. Erosion and sediment control best management practices include the installation of silt fencing around the work area and covering exposed soils to prevent migration of soils to the adjacent stream. The applicant will also be required to submit information regarding the use of pesticides, insecticides, and fertilizers to avoid impacts to water resources. See Section X for a related condition of approval.

B. Animals

The project site is part of a larger natural area that contains quality habitat for fish, birds and mammals. The proposed trail is designed to snake through existing mature vegetation following the path of an existing social trail that has formed since the past trail failed in a landslide. One significant tree will be removed with this proposal. This tree is unstable as a result of the landslide and multiple internal defects. The tree will be removed and retained on-site for habitat and erosion control. The proposed mitigation and restoration plan includes increasing the plant quantities and diversity on the site, which is expected to enhance wildlife habitat in the project area.

C. Plants

Mitigation for temporary and permanent disturbance will be approved pursuant to an approved re-vegetation and monitoring plan. See Section X for related conditions of approval.

D. Noise

The site is adjacent to single-family residences whose residents are most sensitive to disturbance from noise during evening, late night and weekend hours when they are likely to be at home. Construction noise will be limited by the City's Noise Ordinance (Chapter 9.18 BCC) which regulates construction hours and noise levels. See Section X for a related condition of approval.

VII. Changes to proposal as a result of City review

No changes were made to the proposal as a result of city review.

VIII. Decision Criteria

A. Critical Areas Land Use Permit Decision Criteria 20.30P

The Director may approve or approve with modifications an application for a critical areas land use permit if:

- 1. The proposal obtains all other permits required by the Land Use Code;**

Finding: The applicant is required to obtain a building permit for the boardwalk and a clearing and grading permit for the trail work. The clearing and grading component of the project can be included within the building permit if the applicant chooses.

2. The proposal utilizes to the maximum extent possible the best available construction, design and development techniques which result in the least impact on the critical area and critical area buffer;

Finding: The applicant has proposed a design that was prepared by a licensed landscape architect and reviewed by a geotechnical engineer. The use of the Diamond Pier foundations for the boardwalk and the Envirolok bag wall for the trail are examples of the best available construction techniques that will minimize impacts to the critical area and critical area buffer. Furthermore, the applicant is proposing buffer mitigation and restoration plan that will increase native plant diversity and cover in the project area at a mitigation ratio of 2.67:1.

3. The proposal incorporates the performance standards of Part 20.25H to the maximum extent applicable, and;

Finding: As discussed in Section III of this report, the applicant has incorporated all of the applicable performance standards to the maximum extent feasible.

4. The proposal will be served by adequate public facilities including street, fire protection, and utilities; and;

Finding: The project area is currently served by adequate public facilities. The proposal will not change the need for public facilities.

5. The proposal includes a mitigation or restoration plan consistent with the requirements of LUC Section 20.25H.210; and

Finding: The applicant is proposing mitigation and restoration at a ratio of 2.67:1. The plan calls for dense native planting in all of the disturbed areas and in the area of the old, failed trail. The mitigation and restoration will be monitored in accordance with the Director's MITIGATION and RESTORATION MONITORING GUIDANCE.

6. The proposal complies with other applicable requirements of this code.

Finding: As discussed in Section III and V of this report, the proposal complies with all other applicable requirements of the Land Use Code.

IX. Conclusion and Decision

After conducting the various administrative reviews associated with this proposal, including Land Use Code consistency, SEPA, City Code and Standard compliance reviews, the Director of the Development Services Department does hereby **approve with conditions** the proposal to repair and construct approximately 175 feet of soft-surface trail and 20 feet of Diamond Pier support boardwalk within the stream critical area buffer and steep slope critical area at 5803 Forest Drive SE.

Note- Expiration of Approval: In accordance with LUC 20.30P.150 a Critical Areas Land Use Permit automatically expires and is void if the applicant fails to file for a Clearing and Grading Permit or other necessary development permits within one year of the effective date of the approval.

X. Conditions of Approval

The applicant shall comply with all applicable Bellevue City Codes and Ordinances including but not limited to:

<u>Applicable Ordinances</u>	<u>Contact Person</u>
Clearing and Grading Code- BCC 23.76	Tom McFarlane, 425-452-5207
Land Use Code- BCC 20.25H	Kevin LeClair, 425-452-2928
Noise Control- BCC 9.18	Kevin LeClair, 425-452-2928

The following conditions are imposed under the Bellevue City Code or SEPA authority referenced:

1. Rainy Season restrictions: Due to the proximity to a stream critical area, no clearing and grading activity may occur during the rainy season, which is defined as October 1 through April 30 without written authorization of the Development Services Department. Should approval be granted for work during the rainy season, extraordinary, increased erosion and sedimentation measures, representing the best available technology must be implemented prior to beginning or resuming site work.

Authority: Bellevue City Code 23.76.093.A,
Reviewer: Tom McFarlane, Clearing and Grading

2. Pesticides, Insecticides, and Fertilizers: The applicant must submit as part of the required Clearing and Grading Permit information regarding the use of pesticides, insecticides, and fertilizers in accordance with the City of Bellevue's "Environmental Best Management Practices".

Authority: Land Use Code 20.25H.220.H
Reviewer: Kevin LeClair, Land Use

3. Mitigation and Restoration for New Permanent Disturbance: A mitigation plan for all areas of permanent new disturbance is required to be submitted for review and approval by the City of Bellevue prior to issuance of the required development permit. The plan shall document the total area of permanent disturbance and area of new critical area buffer to satisfy a replacement ratio of one to one. At a minimum, the plan shall include the following selection of native plants and quantities:

RESTORATION PLANT SCHEDULE						
SHRUBS						
SYMBOL	SCIENTIFIC NAME	COMMON NAME	SIZE	SPACING	REMARKS	TOTAL QUANT.
⊕	<i>Cornus sericea</i>	Red Osier dogwood	1-gallon	As shown		12
⊗	<i>Symphoricarpos albus</i>	Snowberry	1-gallon	As shown	-	34
⊗	<i>Oemleria cerasiformis</i>	Indian Plum	1-gallon	As shown	-	8
⊗	<i>Polystichum munitum</i>	Sword Fern	1-gallon	As shown	-	13
⊗	<i>Oplopanax horridus</i>	Devil's Club	1-gallon	As shown	-	16
⊗	<i>Tiarella trifoliata</i>	Foam Flower	1-gallon	As shown	-	16
⊗	<i>Vaccinium ovatum</i>	Evergreen Huckleberry	1-gallon	As shown	-	12
⊗	<i>Rubus spectabilis</i>	Salmonberry	1-gallon	As shown	-	21
⊗	<i>Thuja plicata</i>	Western Red Cedar	1-gallon	As shown	-	10

TRANSPLANTED PLANTS

⊗	<i>Polystichum munitum</i>	Sword Fern	Symbol denotes new location			
GROUNDCOVERS, PERENNIALS and LIVE STAKES						
SYMBOL	SCIENTIFIC NAME	COMMON NAME	SIZE	SPACING	REMARKS	TOTAL QUANT.
⊗	<i>Oxalis oregana</i>	Redwood Sorrel	4" pot	12" o.c.	tri-spacing, container	63
⊗	<i>Asarum caudatum</i>	Wild Ginger	1 Gallon	18" o.c.	tri-spacing, container	76
⊗	<i>Dicentra formosa</i>	Bleeding Heart	1 Gallon	18" o.c.	tri-spacing, container	72
⊗	<i>Cornus sericea</i>	Red Osier Dogwood	live stake	bundle @ 36" o.c.	8-10 stakes per bundle	x

In order to ensure the mitigation plan successfully establishes, the mitigation shall meet the following performance standards for a period of five years following installation:

- Year 1: 100% survival of all installed plants & 0% invasive coverage
- Year 2: 90% survival of all installed plants & <10% invasive coverage
- Year 3: 85% survival of all installed plants, >35% native coverage & <10% invasive coverage.
- Year 4: >50% native coverage & <15% invasive coverage
- Year 5: >70% native coverage & <15% invasive coverage

A monitoring report meeting the minimum monitoring and reporting standards establish by the director shall be submitted annually to verify success.

Authority: Land Use Code 20.25H.220
 Reviewer: Kevin LeClair, Land Use

4. Noise Control: Noise related to construction is exempt from the provisions of BCC 9.18 between the hours of 7 am to 6 pm Monday through Friday and 9 am to 6 pm on Saturdays, except for Federal holidays and as further defined by the Bellevue City Code. Noise emanating from construction is prohibited on Sundays or legal holidays

unless expanded hours of operation are specifically authorized in advance. Requests for construction hour extension must be done in advance with submittal of a construction noise expanded exempt hours permit.

Authority: Bellevue City Code 9.18
Reviewer: Kevin LeClair, Land Use

5. Land Use Inspection: To ensure trail is constructed as designed and compliance with critical areas performance standards the required development permit shall include a #600 Land Use Inspection. This inspection shall take place before the permit is closed and the mitigation and restoration monitoring period begins.

Authority: Bellevue City Code 23.76
Reviewer: Kevin LeClair, Land Use

Reviewed under Bellevue file
12-121501-LO
By Kevin LeClair
kleclair@bellevuewa.gov
425-452-2928

WAC 197-11-960 Environmental checklist.

ENVIRONMENTAL CHECKLIST

Purpose of checklist:

The State Environmental Policy Act (SEPA), chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply." Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Use of checklist for nonproject proposals:

Complete this checklist for nonproject proposals, even though questions may be answered "does not apply." IN ADDITION, complete the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D).

For nonproject actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposal," "proposer," and "affected geographic area," respectively.

A. BACKGROUND

1. Name of proposed project, if applicable:

Washout Way Trail Repair and Restoration

2. Name of applicant:

**Kevin Husemann, Natural Resource Operations Supervisor
City of Bellevue, Parks & Community Services Department**

3. Address and phone number of applicant and contact person:

**450 110th Ave. NE
P.O. Box 90012
Bellevue, WA 98009
(T) 425-452-6885**

4. Date checklist prepared: **August 8, 2012**

5. Agency requesting checklist: **City of Bellevue**

6. Proposed timing or schedule (including phasing, if applicable):

Fall 2012

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. **No**

Received
AUG 08 2012
Permit Processing

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

Environmental Checklist, CSWPPP, Geotech Study, Mitigation/Restoration Plan Set

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

No

10. List any government approvals or permits that will be needed for your proposal, if known.

Critical Areas Land Use Permit

CSWPPP

Clear and Grade (Plan of existing and proposed grading & Development plans)

Building Permit (Site plan & Clearing/grading plan)

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

General Description:

Project includes site preparation, environmental protection, minor earthwork, removal of portions of existing social trail and damaged trail, construction of 22' of timber boardwalk with Diamond Pier footings, and construction of 150+ linear feet of Envirolok bagged erosion control system, restoration planting with native plants, and clean-up.

Work is characterized as new or expanded city park, an allowed use in critical areas and critical area buffers.

Acreage of site: **Proposed limit of work for construction is .066 acres (2,875 sf)**

Number of dwelling units/buildings to be demolished: **None**

Number of dwelling units/buildings to be constructed: **None**

Square footage of buildings to be demolished: **0 SF**

Square footage of buildings to be constructed: **0 SF**

Quantity of earth movement (in cubic yards): **<5 CY of cut and +/-20 cubic yards of fill**

Proposed land use: **No change to existing**

Design features, including building height, number of stories and proposed exterior materials:

150 LF of woodchip trail, supported by Envirolok erosion control system, with a timber railing. Maximum height of the proposed trail is 36 inches, with the average height being 24". A boardwalk is proposed. Uphill height will be maximum 12" above adjacent grade while the downhill height will be up to 6".

Other

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

Address of the parcel is
5803 Forest Drive SE.
Parcel # 2600120480

The site is located within the City of Bellevue's Coal Creek Park. An easement provides pedestrian access to the site from SE 57th St. (Directions below)

From the intersection of I-405 and I-90

- Travel on I-405 S
- Take exit 10 for Coal Creek Pkwy toward Factoria, 0.3 mi
- Slight left onto Coal Creek Pkwy SE, 1.1 mi
- Turn left onto Forest Dr SE, 0.5 mi
- Take the 3rd right onto 135th Pl SE, 449 ft
- Continue straight onto SE 57th St
- Easement access to Washout way will be on the left, approximately, 0.1 mi

Legal Description: FORESTPARK #3 OPEN AREA

Quarter: SW Section: 22 Township: 24 Range: 5



B. ENVIRONMENTAL ELEMENTS

1. **Earth**

- a. General description of the site (circle one): Flat, rolling, hilly, **steep slopes**, mountainous, other
- b. What is the steepest slope on the site (approximate percent slope)?

35%-45%, although those steep slopes are outside of the area where the proposed trail and boardwalk will be constructed. Installation of some plants and mulch will be located within those steep slopes. A small portion of the proposed work related to the boardwalk will be within those 35%-45% slopes.

REVIEWED
By Kevin LeClair at 8:49 am, Sep 04, 2012

- c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

See Geotech report.

Geotech report by Stantec is attached.

- d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

Slopes in the area have been known to slide, and are mapped as steep slopes in the city's online GIS maps. The previous trail, with its landscape timber framing, which was located higher up the slope than the proposed trail alignment, was destroyed by a landslide.

- e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

Near the area where the previous boardwalk was destroyed but still within the proposed project area, an informal social trail has been created by trail users. The proposed trail will replace this footpath. The Envirolok erosion control system will be constructed in a way where the bags follow the existing slope. Little or no excavation will be done in order to construct the proposed trail. The backfill material, to be placed behind Envirolok bags, will be imported crushed rock. The top-dressing for the path will be medium bark mulch.

- f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Erosion could occur as a result of the temporary construction activities: demolition of existing trail, installation of new Envirolok bags, construction of the proposed boardwalk, and installation of the new plant material.

Erosion will be controlled by the use of BMPs as required by Clearing and Grading Codes and Standards in BCC 23.76.

- g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

No new imperious surfaces are proposed.

- h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

The location of the proposed trail, which is aligned to the current social trail, is located closer to the bottom of the slope. This is to lessen the impact of the trail on the site. TESC measures, including coir fabric roll and filter fabric fence, will be in place during construction, to control against siltation of surrounding waters. The previous alignment of the trail, including all other areas within the project area, will be replanted with native vegetation. The new path will be constructed using Envirolok bags but the bags will be filled at their source and not at either the construction staging area or the project area. Two layers of mulch with a jute fabric layer in-between will be installed throughout the project area to eliminate existing exposed slopes,

reduce erosion and sedimentation, and increase infiltration. Construction will take place during wet season. As such, contractor will be required to reduce unstable and exposed slopes that might erode and cause sedimentation in the stream. The staging area for this project is located in an existing park that has no slopes that exit the staging area. Catch basin inserts to capture sediment will be installed in catch basins adjacent to staging area.

Approval to work during the rainy season will require special approval by the Clearing and Grading Reviewer and the Clearing and Grading Inspector.

Air

- a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Temporary construction dust, emissions from small construction equipment. Once project is complete, no emissions are expected. The project area is a few hundred feet away from the nearest street. The access is such that very little construction equipment, other than chain saw, post-hole digger, and other small equipment pieces, are likely to be able to access the site.

- b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

Vehicle emissions from nearby roadway may contribute minimal emissions, however these will not affect the proposal.

- c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Due to the distance from the nearest public road, the proposed design elements have been specified to largely eliminate emissions from large construction equipment. Trucks will be used to deliver materials to the staging area. If conditions exist during construction cause dust, contractor shall take measures to reduce dust.

3. **Water**

a. Surface:

- 1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Stream is classified as a Type F - "fish-bearing" stream.

Yes - a tributary of Coal Creek is adjacent to the project Limit of Work. This stream is perennial and flows year-round. This tributary eventually empties into Lake Washington.

- 2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Yes, construction of the new trail segment and restorations plantings will occur within 200 feet of the shoreline. No work will occur below Ordinary High Water. See attached plans.

- 3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

No filling or dredging will occur within the Ordinary High Water Mark of this Coal Creek tributary.

- 4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No.

- 5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No.

- 6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No.

b. Ground:

- 1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

No.

- 2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

Not Applicable.

c. Water runoff (including stormwater):

- 1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Surface runoff from existing open space will remain largely unchanged, as the new trail will be constructed of permeable materials. New restoration plantings along the eroded slope may improve the quality of surface runoff to the nearby creek.

- 2) Could waste materials enter ground or surface waters? If so, generally describe.

No. The project will not generate waste materials. Any construction materials leftover from construction will be removed from the site. Surface water will continue to infiltrate in-place over most of the site.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

Coir log and filter fabric fence will be installed on the downhill side of the project area. Notes on the drawing set dictate when the contractor is to remove any silt that has backfilled against the filter fabric fence.

4. **Plants**

a. Check or circle types of vegetation found on the site:

- deciduous tree: **alder, big leaf maple**, aspen, other
- evergreen tree: **fir, cedar**, pine, other
- shrubs **sword fern, tiarella**,
- grass
- pasture
- crop or grain
- wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
- water plants: water lily, eelgrass, milfoil, other
- other types of vegetation

As a condition of approval of the critical areas land use permit, all removed trees will be used on site within the stream critical area buffer as part of the mitigation and restoration effort.

b. What kind and amount of vegetation will be removed or altered?

One significant tree will be removed (18" caliper Big Leaf Maple), although its trunk has a large hole down near base as a result of rotting. One small-caliper vine maple will be removed. Additionally, one snag will be removed as it may create a dangerous situation once construction is complete. Several existing sword ferns conflict with the alignment of the proposed path. These will be dug up, heeled in, and transplanted as part of the proposed work.

c. List threatened or endangered species known to be on or near the site.

None are known.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Native vegetation will be used to restore the eroded slope on both sides of the new proposed trail alignment.

5. Animals

- a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: hawk, heron, eagle, songbirds, other:

mammals: deer, bear, elk, beaver, other:

fish: bass, **salmon**, trout, herring, shellfish, other:

- b. List any threatened or endangered species known to be on or near the site.

Coal Creek waters are mapped as Chinook Distribution by King County GIS, to a limit of just north of the proposed site. Coal Creek flows directly into Lake Washington.

The shores of Lake Washington are known to be a significant rearing habitat for juvenile Chinook salmon. Bull trout and steelhead are also present in the Lake Washington system.

- c. Is the site part of a migration route? If so, explain.

The site itself is not on a known migration route. However, the creek adjacent to the site is a tributary of Coal Creek, which is mapped as a distribution area.

- d. Proposed measures to preserve or enhance wildlife, if any:

Native vegetation planted along the shoreline should help improve habitat conditions along the slope. The vegetation may also help to stabilize soils in the area, and prevent further erosion. The majority of the project area is devoid of understory vegetation. The native plants proposed for installation would create a new understory layer.

6. Energy and natural resources

- a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

A generator will be used on-site during construction to operate small power tools. No on-going energy uses are included with this project. It is possible that battery-operated tools will be used. The contractor will decide.

- b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

- c. What kinds of energy conservation features are included in the plans of this proposal?

List other proposed measures to reduce or control energy impacts, if any:

No specific energy conservation methods or features have been considered as part of this project. If any exist, they are as a result of specifying materials that are easily transferable to the project area, which is a few hundred feet away from the nearest public road. As the trail is largely utilized by the neighborhood, energy impacts will be negligible after the project is completed.

7. Environmental health

- a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

There are no environmental health hazards associated with this trail construction and restoration action. Only very small construction equipment will be able to access the project area. Minor spills may occur. The contractor will be required to clean immediately those up.

- 1) Describe special emergency services that might be required.

Standard needs of a community open space (fire, police, emergency medical facilities)

- 2) Proposed measures to reduce or control environmental health hazards, if any:

CPTED (Crime prevention through environmental design) principles will be employed in design to reduce safety and problems.

b. Noise

- 1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Water flows and wildlife represent the majority of the noises that are observed on-site. Limited noise from traffic in adjacent neighborhoods may impact the site very occasionally.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Some minimal, temporary noise will be generated during construction. This will occur during approved work hours. Once installed, the space will generate minimal noise (eg. voices in conversation.) Noise levels are expected to be in-keeping with current levels at the site.

- 3) Proposed measures to reduce or control noise impacts, if any:
None.

Noise impacts will be minimized through the implementation of the allowed construction noise windows contained in BCC 9.18.

8. **Land and shoreline use**

- a. What is the current use of the site and adjacent properties?

This site is currently used as a nature trail, which is connected to the Coal Creek Park trail system. Residential neighborhoods are located immediately North and South of the creek's ravine. Coal Creek Park lies to the West of the site.

- b. Has the site been used for agriculture? If so, describe.

No.

- c. Describe any structures on the site.

None

- d. Will any structures be demolished? If so, what?

No.

- e. What is the current zoning classification of the site?

Single Family Residential

Zoning classification is R-3.5.

Comprehensive Plan designation is SF-M or single family medium density.

The existing open space trail use is compatible with this classification and designation.

- f. What is the current comprehensive plan designation of the site?

Park/Single-Family Medium Residential

- g. If applicable, what is the current shoreline master program designation of the site?

Not applicable

- h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

Steep slopes are mapped by both the City of Bellevue and King County's online GIS system.

- i. Approximately how many people would reside or work in the completed project?

None.

- j. Approximately how many people would the completed project displace?

None.

- k. Proposed measures to avoid or reduce displacement impacts, if any:

Not Applicable.

- l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

No changes to the existing site uses are proposed as a part of this project, which is will repair and existing trail.

9. Housing

- a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

None.

- b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None.

- c. Proposed measures to reduce or control housing impacts, if any:

Not Applicable.

10. Aesthetics

- a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The proposed boardwalk will be constructed within 12" of the existing slope directly beneath the finished boardwalk on the uphill side. The adjacent stream-side slope will be approximately 6' below the adjacent finished elevation of the boardwalk. The boardwalk will have a railing adjacent to the downhill side. The uphill side will have a kick-plate.

- b. What views in the immediate vicinity would be altered or obstructed?

This project is not expected to have a large impact on views, since the high-points are all above the proposed trail alignment. As trees planted at the site mature, views of the sky above the trail may be obscured by canopy coverage.

- c. Proposed measures to reduce or control aesthetic impacts, if any:

The damaged portions of the existing timber-edged trail will be removed.

11. Light and glare

- a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

None.

- b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

- c. What existing off-site sources of light or glare may affect your proposal?

None.

- d. Proposed measures to reduce or control light and glare impacts, if any:

None.

12. Recreation

- a. What designated and informal recreational opportunities are in the immediate vicinity?
Walking, running, hiking and wildlife viewing are all activities that are supported by this segment of trail, and the larger Coal Creek Natural Area trail system.

- b. Would the proposed project displace any existing recreational uses? If so, describe.
Access to the trail will be blocked only during construction activities.

- c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:
As this is a single lane path and the entire alignment of the proposed path will be re-constructed, no methods are proposed to allow users to safely use the trail during construction. Existing topography and proximity of the Ordinary High Water Mark do not allow the creation of a temporary trail.

13. Historic and cultural preservation

- a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.
None are known.

- b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.
None are known.

- c. Proposed measures to reduce or control impacts, if any:
None are known.

14. Transportation

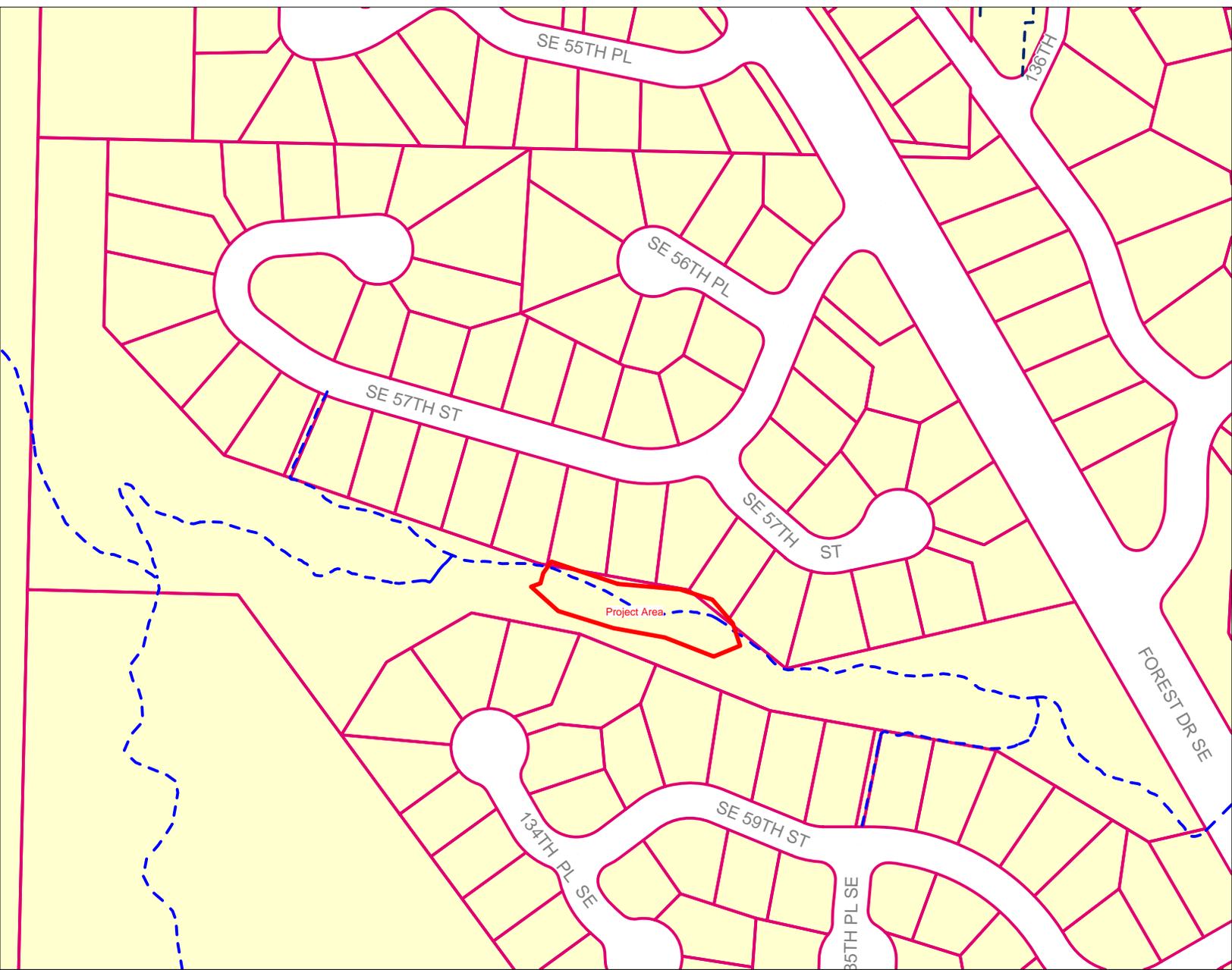
- a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.
The site is accessible via a pedestrian easement from SE 57th St. The closest trail head with parking is located near 5600 Coal Creek Parkway.

- b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?
The closest transit stop is located NE of the site at Forest Dr SE & Highland Dr.

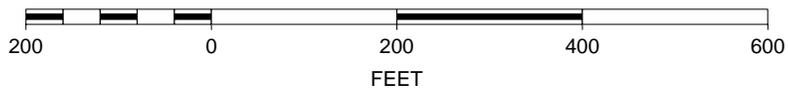
- c. How many parking spaces would the completed project have? How many would the project eliminate?
None.

- d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).
No.

Vicinity Map - 12-121501-LO - Washout Way Trail Repair and Construction



SCALE 1 : 2,477



Washout Way Trail Repair and Restoration

City of Bellevue, WA



EXISTING CONDITIONS

WASHOUT WAY TRAIL LOOKING EAST ALONG OLD TRAIL AND PROPOSED TRAIL ROUTE



PROJECT LOCATION

VICINITY MAP

NTS



CLEARING AND GRADING STANDARD NOTES:

- All clearing & grading construction must be in accordance with City of Bellevue (COB) Clearing & Grading Code; Clearing & Grading Erosion Control Standard Details (EC-1 through EC-23); Development Standards; Land Use Code; Uniform Building Code; permit conditions; and all other applicable codes, ordinances, and standards. The design elements within these plans have been reviewed according to these requirements. Any variance from adopted erosion control standards is not allowed unless specifically approved by the City of Bellevue Department of Planning & Community Development (PCD) prior to construction.
- A copy of the approved plans must be on-site during construction. The applicant is responsible for obtaining any other required or related permits prior to beginning construction.
- All locations of existing utilities have been established by field survey or obtained from available records and should, therefore, be considered only approximate and not necessarily complete. It is the sole responsibility of the contractor to independently verify the accuracy of all utility locations and to discover and avoid any other utilities not shown which may be affected by the implementation of this plan.
- The area to be cleared and graded must be flagged by the contractor and approved by the clearing & grading inspector prior to beginning any work on the site.
- A reinforced silt fence must be installed in accordance with COB EC-5 and located as shown on the approved plans or per the clearing & grading inspector, along slope contours and down slope from the building site.
- Clearing will be limited to the areas within the approved disturbance limits. Exposed soils must be covered at the end of each working day when working from October 1st through April 30th. From May 1st through September 30th, exposed soils must be covered at the end of each construction week and also at the threat of rain.
- Any excavated material removed from the construction site and deposited on property within the City limits must be done in compliance with a valid clearing & grading permit. Locations for the mobilization area and stockpiled material must be approved by the clearing & grading inspector at least 24 hours in advance of any stockpiling.
- To reduce the potential for erosion of exposed soils, or when rainy season construction is permitted, the following Best Management Practices (BMPs) are required: Preserve natural vegetation for as long as possible or as required by the clearing & grading inspector. Protect exposed soil using plastic (EC-14), erosion control blankets, straw or mulch (COB Guide to Mulch Materials, Rates, and Use Chart), or as directed by the clearing & grading inspector. Install catch basin inserts as required by the clearing & grading inspector or permit conditions of approval. Install a temporary sediment pond, a series of sedimentation tanks, temporary filter vaults, or other sediment control facilities. Installation of exposed aggregate surfaces requires a separate effluent collection pond on-site.
- Final site grading must direct drainage away from all building structures at a minimum 2% slope, per the Uniform Building Code, if applicable.
- The contractor must maintain a sweeper on-site during earthwork and immediately remove soil that has been tracked onto paved areas as result of construction.
- A public information sign listing 24-hour emergency phone numbers for the city and the contractor may be provided to the applicant at the time the clearing & grading permit is issued. The applicant must post the sign at the project site in full view of the public and the contractors, and it must remain posted until final sign-off by the clearing & grading inspector.
- Turbidity monitoring may be required as a condition of clearing & grading permit approval. If required, turbidity monitoring must be performed in accordance with the approved turbidity monitoring plan and as directed by the clearing & grading inspector. Monitoring must continue during site (earthwork) construction until the final sign-off by the clearing & grading inspector.
- Any project that is subject to Rainy Season Restrictions will not be allowed to perform clearing & grading activities without written approval from the PCD director. The rainy season extends from November 1st through April 30th, as defined in section 23.76.093A of the Clearing & Grading Code.

TRAIL REMOVAL NOTES:

- Existing social trail to be removed varies in width. See Existing Conditions this set.
- Limit negative impacts such as soil compaction, erosion, and sedimentation as required in the Western Washington Stormwater Manual.
- Existing Trail Removal and Site Enhancement: Scarify trail soil to a 2" depth before placing cut soil, and plants. Do not scarify where tree roots greater than 1/2" diameter occur. Where mechanized equipment cannot access areas to scarify existing trails the Contractor shall employ other means and methods such as hand tools (forks, hoe-dads, and pulaski) to scarify soil.
- Scarification shall begin at the point where the user foot path departs the edge of the proposed trail shoulder, thence 50 horizontal feet along the user foot path, where scarification ends. Other trail removal and site enhancement activities extend past this point.
- Plants that are being relocated in this project shall be heeled in and roots and rhizomes protected from drying out. Maintain an even moisture content in root masses and root balls.
- Install all plants transplanted at the same depth they were dug.
- All logs 6" DBH and larger shall be kept on site and used for trail removal and enhancement. Logs smaller than 6" DBH may be either disposed of off site or chipped on to areas identified to receive wood chips on site, as directed by the Owner.
- Remove or chip branches 3" diameter and greater, as measured from the branch collar, from logs used in the removal of existing user paths.
- Plant shrubs as directed in the field by the Owner.
- New plants will be planted within the work limits will be maintained for a period of 3 years. See Planting Plan this set for species, quantities, and locations.

GENERAL NOTES:

- All construction must be in accordance with the City of Bellevue's Development Standards; the City of Bellevue's Engineering and Utility Standards; the Bellevue City Code; the Uniform Building Codes; permit conditions; and all other applicable codes, ordinances, standards and policies. Applicable installation details are incorporated by reference to Bellevue's Engineering and Utilities published Standards. All applicable erosion control measures must be taken.
- A copy of the approved plans must be on-site whenever construction is in progress.
- The Contractor is responsible for obtaining any mechanical, electrical or other required permits prior to beginning construction.
- All locations of existing utilities have been established by field survey or obtained from available records and should, therefore, be considered approximate only and not necessarily complete. It is the sole responsibility of the contractor (1) to independently verify the accuracy of all utility locations and (2) to discover and avoid any other utilities not shown which may be affected by the implementation of this plan. Note that no existing utilities have been researched or verified in any areas between proposed work limits up to, and including, the staging area.
- Site shall be restored to better or equal condition in any areas affected by this work.
- Scheduling: All work shall be coordinated with Owner to achieve minimal disturbance to roadway operation.
- Contractor shall have proven experience in similar projects and be thoroughly familiar with City of Bellevue applicable standards and codes prior to commencement of work.
- This layout is diagrammatic. Contractor shall coordinate exact location of points of connection to existing systems with Owner prior to beginning any work.
- Prior to commencing work, the Contractor, the City's Inspectors and the Owner's Representatives shall meet on the site to review existing site conditions. Logistical items will be determined at the pre-construction meeting and subsequent construction meetings, including the specific locations and methods to be used for staging, trail closure locations and timing, fencing materials, and coordination of boardwalk and trail work with Western Wood Structure Bridge work (NIC). The Contractor is to coordinate with Owner's representative on all construction logistical items not explicitly described in the drawings and specifications.

PROJECT DESCRIPTION:

Contracted work includes: site preparation, environmental protection, minor earthwork, 22'+ length boardwalk bridging structure, approximately 150+ linear feet of Envirolok bagged retaining wall system, restoration planting, trail construction and removal, and site restoration. Project is to be implemented under Critical Areas Land Use Permit # ___-____-LO. For technical questions, call Barker Landscape Architects, (Nicolas) 206-783-2870.

CONTACTS:

Client: Bellevue Parks and Community Services Kevin Husemann and Geoff Bradley, Project Managers 450 110th Ave. NE, P.O. Box 90012 Bellevue, WA. 98009 tel: (425) 452-6885	Structural Engineer: Reid Middleton Contact: Paul Crocker, PE, SE 728 134th Street SW Suite 200 Everett, WA 98204 425-741-3800 (p) 425-741-3900 (f)
---	---

Landscape Architect:

Barker Landscape Architects
Contact: Nic Morin
1514 NW 52nd Street.
Seattle, WA 98107
phone 206-783-2870
fax 206-783-8312
nic@barkerla.com

LEGAL DESCRIPTION:

PORTION OF THE NORTHEAST QUARTER OF SECTION 4, TOWNSHIP 24 NORTH, RANGE 5 EAST, W.M., IN KING COUNTY, WASHINGTON.

DRAWING INDEX

- COVER
- EXISTING CONDITIONS
- TESC / DEMO PLAN
- GRADING / LAYOUT PLAN
- PLANTING
- BOARDWALK DETAILS
- ENVIROLOK DETAILS
- DETAILS
- PERFORMANCE STANDARDS



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8-1-12				PERMIT SUBMITTAL

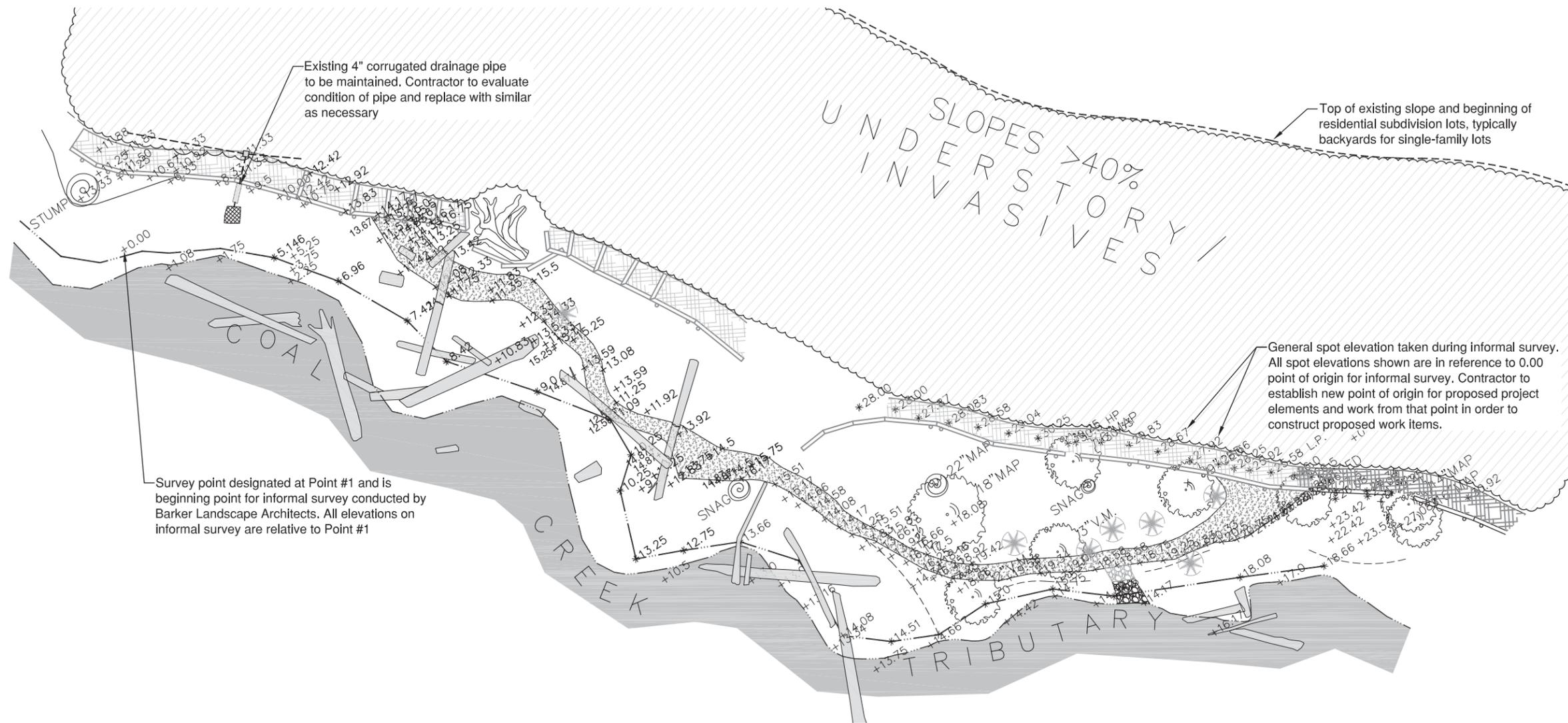
Approved By	
TRANSPORTATION DESIGN MANAGER	DATE
PROJECT MANAGER	DATE
	DATE

	<h1>City of Bellevue</h1>
--	---------------------------

	<p>BARKER LANDSCAPE ARCHITECTS 1514 NW 52nd St. Seattle, WA 98107 tel: 206.783.2870 fax: 206.783.3212</p>
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<h2>Washout Way Trail Repair & Restoration</h2>

<h2>COVER SHEET</h2>
SHT <u>1</u> OF <u>9</u>



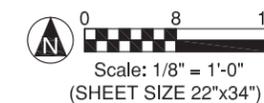
EXISTING CONDITIONS LEGEND	
	Top of Slope
	Spot Elevations
	Rootwad
	Peeler Pole Retaining Wall
	Existing Tree
	Wood Chip Trail
	Stream OHWM
	Social Trail
	Existing Understory Vegetation
	Large Woody Debris
	Existing Rip-Rap Armoring

EXISTING CONDITIONS

NOTE: INFORMATION DEPICTED IN THIS EXISTING CONDITIONS MAP IS NOT EXACT, AND DOES NOT CONSTITUTE A SURVEY BY A LICENSED SURVEYOR. IT IS MEANT TO CONVEY GENERAL SITE CONDITIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXISTING CONDITIONS ON SITE AND MAKING FIELD ADJUSTMENTS AS NECESSARY TO FIT ACTUAL SITE CONDITIONS.

NO COAL MINE HAZARD AREAS EXIST WITHIN THE PROJECT AREA. SOURCE: BELLEVUE ENVIRONMENTAL/CRITICAL AREA GIS MAP

PROJECT AREA DOES NOT LIE WITHIN FEMA 100-YEAR FLOODPLAIN. SOURCE: BELLEVUE ENVIRONMENTAL/CRITICAL AREA GIS MAP



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JV, NM, SW	DRAWN BY	8/7/12	DATE
JB	CHECKED BY	8/7/12	DATE



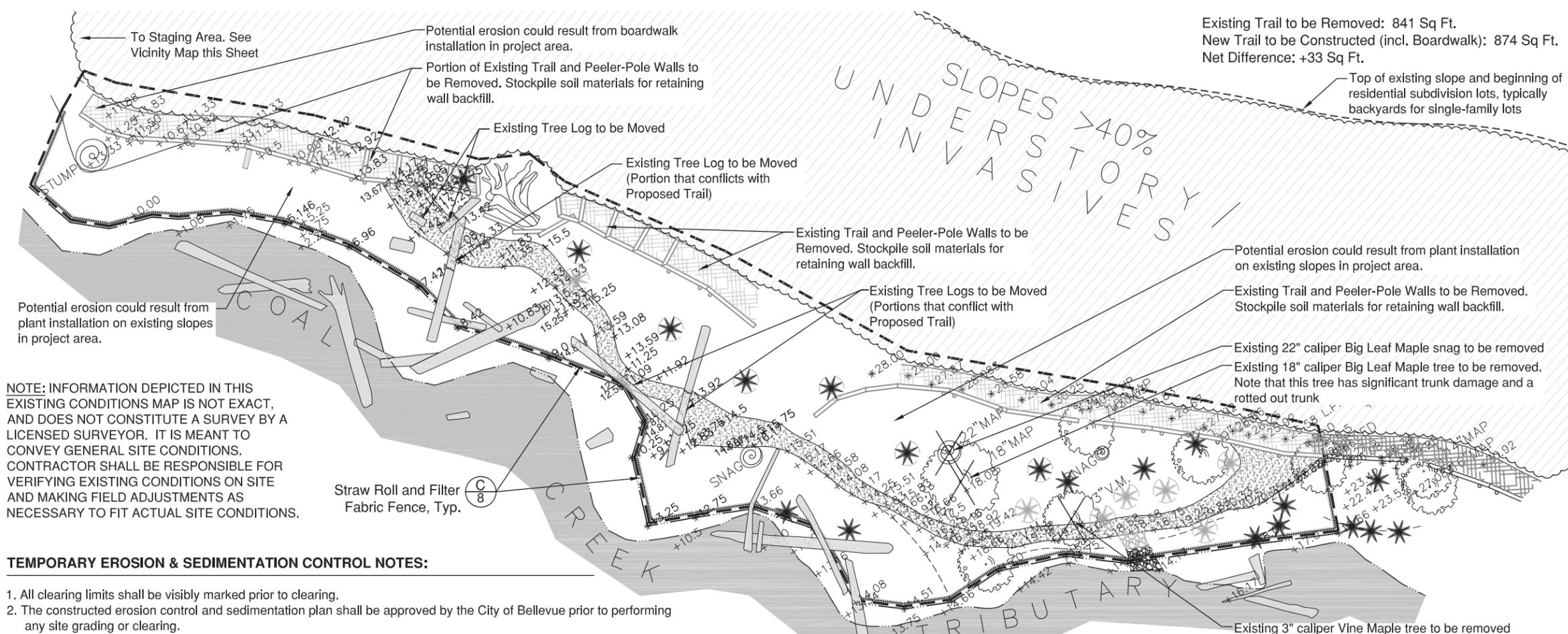
City of Bellevue



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fax: 206.783.3212

Washout Way Trail Repair & Restoration

EXISTING CONDITIONS



NOTE: INFORMATION DEPICTED IN THIS EXISTING CONDITIONS MAP IS NOT EXACT, AND DOES NOT CONSTITUTE A SURVEY BY A LICENSED SURVEYOR. IT IS MEANT TO CONVEY GENERAL SITE CONDITIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXISTING CONDITIONS ON SITE AND MAKING FIELD ADJUSTMENTS AS NECESSARY TO FIT ACTUAL SITE CONDITIONS.

TEMPORARY EROSION & SEDIMENTATION CONTROL NOTES:

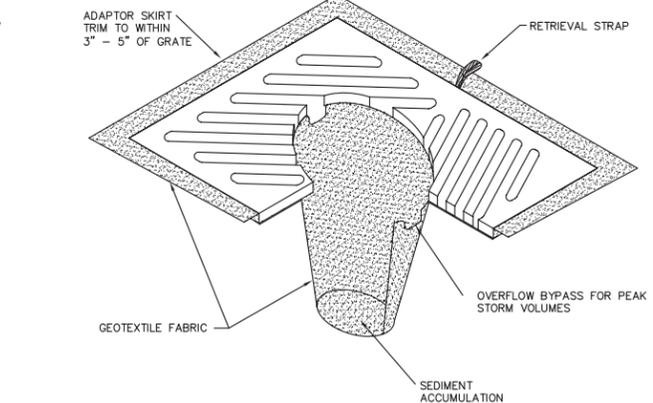
1. All clearing limits shall be visibly marked prior to clearing.
2. The constructed erosion control and sedimentation plan shall be approved by the City of Bellevue prior to performing any site grading or clearing.
3. The implementation of temporary erosion and sedimentation control (TESC) measures and the construction, maintenance, and replacement of these facilities is the responsibility of the contractor.
4. The TESC facilities must be constructed in conjunction with all construction activities and in such a manner as to ensure that sediment-laden water does not enter Coal Creek.
5. The TESC facilities shall be inspected daily by the contractor and maintained as necessary or as directed by the engineer to ensure continuous functioning.
6. Stabilized construction entrances shall be installed at the beginning of construction and maintained for the duration of the project. Additional measures may be required to insure that all paved areas are kept clean for the duration of the project.
7. All catch basins in the vicinity of construction shall be protected with filter fabric placed between the frame and grate or as directed by the engineer. Clean regularly; no more than 1 inch of sediment will be allowed to accumulate over filter fabric.
8. Any area stripped of vegetation where no further work is anticipated for a period of 15 days shall be immediately stabilized with approved TESC methods such as mulching, erosion blankets, plastic sheeting or as directed by the engineer.
9. All steep slope excavations greater than 2:1 shall be covered at the end of each working day.
10. All disturbed areas shall be covered with wood chip mulch and jute fabric per planting detail.
11. Any vegetation not in the construction area shall be left undisturbed.
12. Field-verify location of existing trees & boulders.
13. The TESC facilities are the minimum requirements for anticipated site conditions. During the construction period, these TESC facilities shall be upgraded by contractor as directed by the engineer for unexpected storm events.
14. All storm drain facilities within the project boundary are to be cleared of sediment and debris prior to final acceptance of the project.
15. All significant existing trees to be protected and preserved. Tree protection fencing for all trees is not feasible due to site terrain / vegetation density.

GENERAL NOTES:

1. Depicted Coal Creek alignment is approximate, and is based on best available information. Coal Creek's actual alignment is in flux and may differ slightly from that on plans.
2. Orientation of trail on overall map may not correspond exactly to orientation of trail on site, due to level of accuracy of informal survey data received from City of Bellevue GIS.
3. Proposed trail alignment is to be field verified and adjusted as necessary to preserve all significant trees. Notify Landscape Architect and owner if proposed trail alignment conflicts with any significant trees.
4. Locations, grades and alignments of existing and proposed trail depicted on plans are not exact and are based on an informal survey conducted by Barker Landscape Architects, and are intended to convey the general design intent of traversing the steep topography, routing the trail around previous slide locations, and conforming to the existing topography. All grades and proposed trail alignments are to be field verified by contractor. Field adjustment of proposed trail alignment and boardwalk locations may be necessary to avoid removal of existing trees. Contractor to coordinate all field adjustments with Owner.

TESC / DEMOLITION PLAN LEGEND

- Limit of Work/Limits of Clearing & Grading
- Existing Ordinary High Water Mark
- Estimated Top of Slope
- +18.58
+11.85
⊙ Existing Woody Debris to Remain
- Existing Tree Trunk to be Retained
- Existing Tree Trunk to be Relocated. Tree Trunks to be Field-Located as Directed by Landscape Architect or Owner's Representative
- Coir Log and Filter Fabric Fence. See detail this set
- Existing Native Shrub to remain
- Existing Native Shrub to be Stockpiled for Future Use within Project Area
- Existing Tree to Remain
- Existing Tree to be Removed. Woody debris to be used on site
- Existing Social Trail to be Removed
- Existing Rip-Rap Armoring to be Retained (Outside Work Limits)
- Existing Rip-Rap Armoring to be Removed (Inside Work Limits)
- Existing Peeler-Pole Retaining Wall and Trail to be Retained
- Existing Peeler-Pole Retaining Wall and Trail to be Removed



- NOTES
1. INSERT SHALL BE INSTALLED PRIOR TO CLEARING AND GRADING ACTIVITY, OR UPON PLACEMENT OF A NEW CATCH BASIN.
 2. SEDIMENT SHALL BE REMOVED FROM THE UNIT WHEN IT BECOMES HALF FULL.
 3. SEDIMENT REMOVAL SHALL BE ACCOMPLISHED BY REMOVING THE INSERT, EMPTYING, AND RE-INSERTING IT INTO THE CATCH BASIN.

A CATCH BASIN INSERT NTS

TESC / DEMO PLAN

Temporary Construction Fence around Staging Area

Envirolok bags will be filled off-site and delivered directly to the construction staging area and then transported to project area

Project Staging area for materials and deliveries. Location of CSWPPP, Construction log, and contact list for pollution prevention contact list

Path for Construction Materials and Access to Project Area



Post Section of Temporary Construction Fence at both ends of project area to block pedestrian passage

STAGING AREA - VICINITY MAP

NOT TO SCALE



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8-1-12				PERMIT SUBMITTAL

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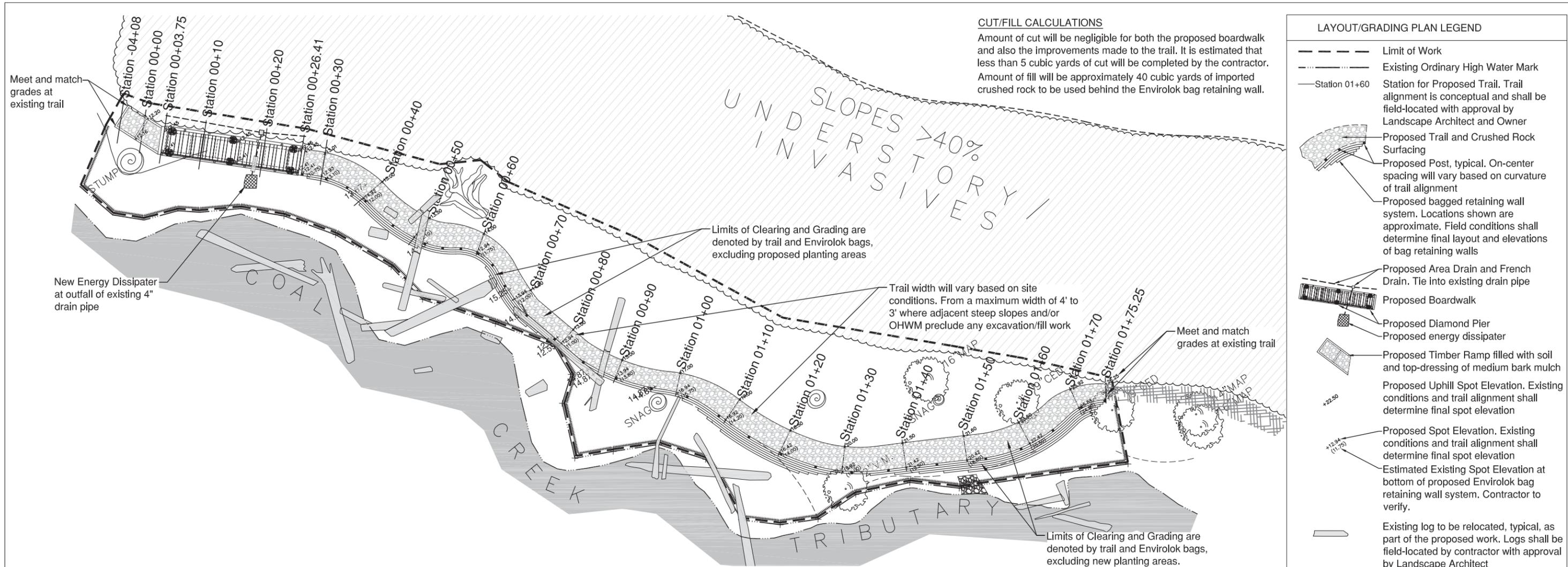
City of Bellevue



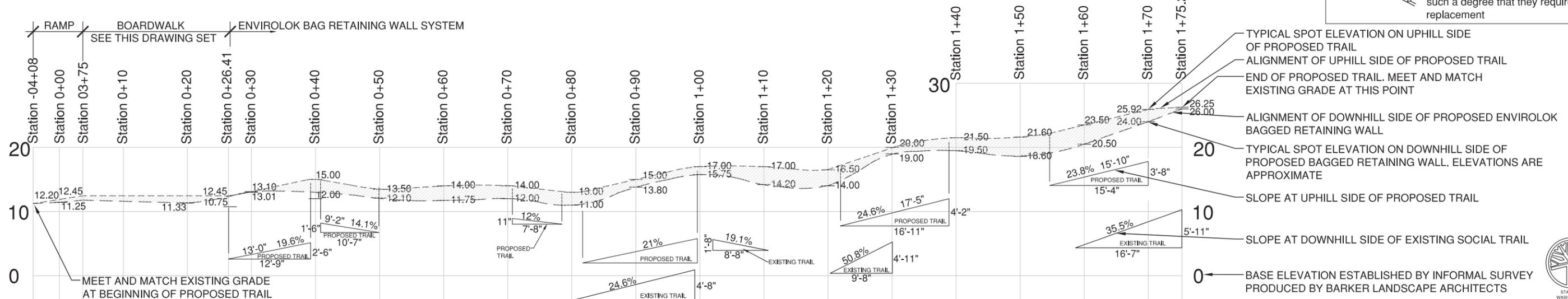
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1514 NW 52nd St.
Seattle, WA 98107
tel: 206.783.2870
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Washout Way Trail Repair & Restoration

TESC / DEMOLITION



LAYOUT / GRADING PLAN



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Washout Way Trail Repair & Restoration



PLANTING PLAN LEGEND	
---	Limit of Work
~ ~ ~	Existing Ordinary High Water Mark
⊕	Spot Elevation, Typical
⊗	Existing Woody Debris to Remain
⊖	Existing Tree Trunk. See Specific Notes this Plan for Tree Trunks to be Moved as part of this Project. Tree Trunks to be Field-Located as Directed by Landscape Architect or Owner's Representative
⊛	New Location for Transplanted Plant
⊙	Existing Tree to Remain

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Portion of Existing Trail Alignment to Remain. No Proposed Work

TOTAL PROPOSED PLANTING AREA WITHIN PROJECT: 2,400 Sq Ft.
 TOTAL PROPOSED IMPACT AREA: 3,889 Sq Ft.
 PERCENTAGE OF PLANTED AREA/IMPACT AREA: 61.7%

MITIGATION PLANTING / RESTORATION PLAN



MITIGATION PLANTING CALCULATIONS:

-Coal Creek is classified, per City of Bellevue (COB) standards, as a Class F stream. As such, in this undeveloped area, Coal Creek has a 100' buffer and an additional 20' structure setback. All of the proposed work, excluding the staging area, is within the 100' buffer and within the 20' structure setback. COB 20.25H.085.B requires a minimum of 1:1 buffer mitigation ratio.

Total project area, excluding staging area: 2,875 square feet,
 Total impact area, including boardwalk, trail, and Envirolok bagged slope retaining system: 880 square feet,
 Total new planting area: 2,354 square feet,
 Replacement ratio: 2,354 / 880 = 2.67:1

RESTORATION PLANT SCHEDULE

SHRUBS						
SYMBOL	SCIENTIFIC NAME	COMMON NAME	SIZE	SPACING	REMARKS	TOTAL QUANT.
⊕	<i>Cornus sericea</i>	Red Osler dogwood	1-gallon	As shown		12
⊗	<i>Symphoricarpos albus</i>	Snowberry	1-gallon	As shown		34
⊗	<i>Oemleria cerasiformis</i>	Indian Plum	1-gallon	As shown		8
⊗	<i>Polystichum munitum</i>	Sword Fern	1-gallon	As shown		13
⊗	<i>Oplopanax horridus</i>	Devil's Club	1-gallon	As shown		16
⊗	<i>Tiarella trifoliata</i>	Foam Flower	1-gallon	As shown		16
⊗	<i>Vaccinium ovatum</i>	Evergreen Huckleberry	1-gallon	As shown		12
⊗	<i>Rubus spectabilis</i>	Salmonberry	1-gallon	As shown		21
⊗	<i>Thuja plicata</i>	Western Red Cedar	1-gallon	As shown		10

TRANSPLANTED PLANTS

⊛	<i>Polystichum munitum</i>	Sword Fern	Symbol denotes new location			
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GROUNDCOVERS, PERENNIALS and LIVE STAKES

SYMBOL	SCIENTIFIC NAME	COMMON NAME	SIZE	SPACING	REMARKS	TOTAL QUANT.
⊗	<i>Oxalis oregana</i>	Redwood Sorrel	4" pot	12" o.c.	tri-spacing, container	63
⊗	<i>Asarum caudatum</i>	Wild Ginger	1 Gallon	18" o.c.	tri-spacing, container	76
⊗	<i>Dicentra formosa</i>	Bleeding Heart	1 Gallon	18" o.c.	tri-spacing, container	72
⊗	<i>Cornus sericea</i>	Red Osler Dogwood	live stake	bundle @ 36" o.c.	8-10 stakes per bundle	x

GENERAL PLANTING NOTES:

- Plant selection shall be consistent with the Bellevue Land Use Code, Section 20.20.520, Landscape Development.
- Plants shall be selected and sited to produce a hardy and drought-resistant landscape area. Selection shall consider soil type and depth, the amount of maintenance required, spacing, exposure to sun and wind, the slope and contours of the site, and compatibility with existing native vegetation preserved on the site. Preservation of existing vegetation is strongly encouraged.
- Prohibited materials. Plants listed as prohibited in the Bellevue Land Use Code are prohibited in required landscape areas. Additionally, there are other plants that may not be used if identified in Bellevue Land Use Code as potentially damaging to sidewalks, roads, underground utilities, drainage improvements, foundations, or when not provided with enough growing space.
- All plants shall conform to American Association of Nurserymen (AAN) grades and standards as published in the "American Standard for Nursery Stock" manual.
- Plants shall meet the minimum size standards established in other sections of Bellevue Land use Code, Section 20.20.520 Landscape Development.
- Multiple-stemmed trees may be permitted as an option to single-stemmed trees for required landscaping provided that such multiple-stemmed trees are at least ten (10) feet in height and that they are approved by the Planning Official prior to installation.
- Soils in planting areas shall have adequate porosity to allow root growth. Soils which have been compacted shall be loosened to increase aeration to a minimum depth of twenty-four (24) inches or to the depth of the largest plant root ball, whichever is greater. After soil preparation is completed, motorized vehicles shall be kept off to prevent excessive compaction and underground pipe damage. The organic content of soils in any landscape area shall be as necessary to provide adequate nutrient and moisture-retention levels for the establishment of plantings. See Bellevue Clearing and Grading Development Standards for mulch requirements.
- Required plantings, except areas of established ground cover, shall be covered with three inches or more of wood chip mulch to minimize evaporation and runoff.
- All mulches used in planter beds shall be kept at least six (6) inches away from the trunks of shrubs and trees.
- All required landscaped areas, particularly trees and shrubs, must be protected from potential damage by adjacent uses and development, including parking and storage areas. Protective devices such as bollards, wheel stops, trunk guards, root guards, etc., may be required in some situations.

LAKE WASHINGTON
 WATER ELEVATION
 = 16.87 (2/23/2012)

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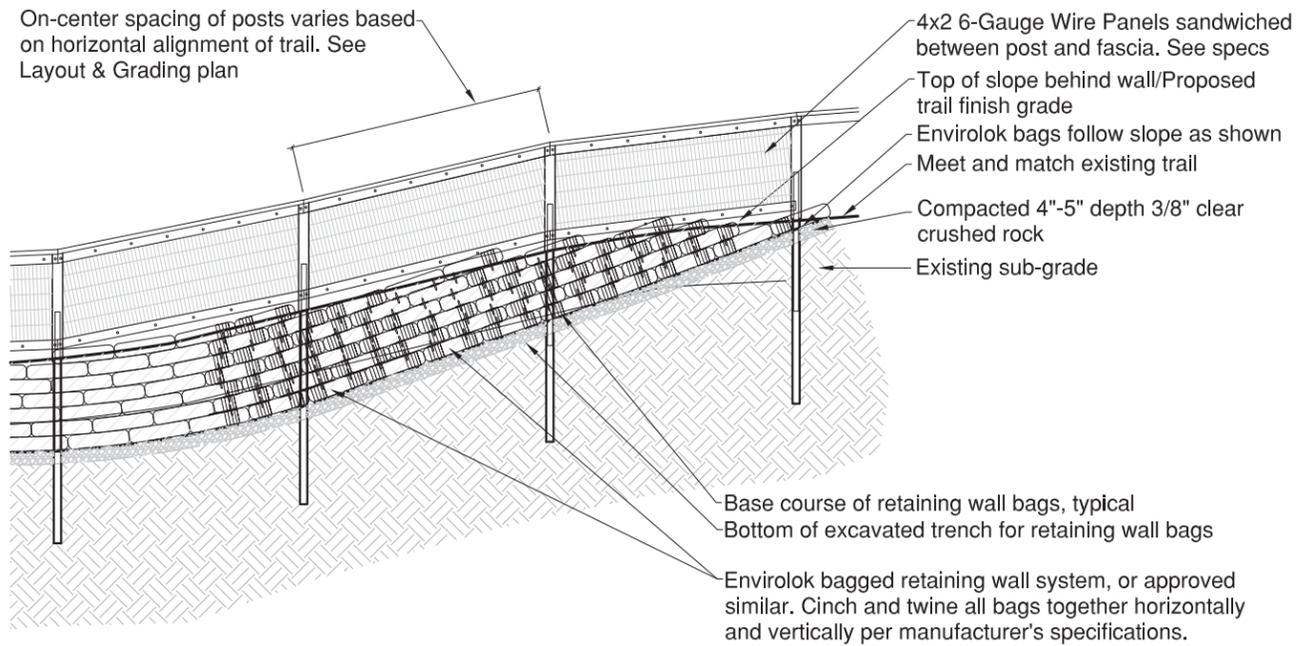
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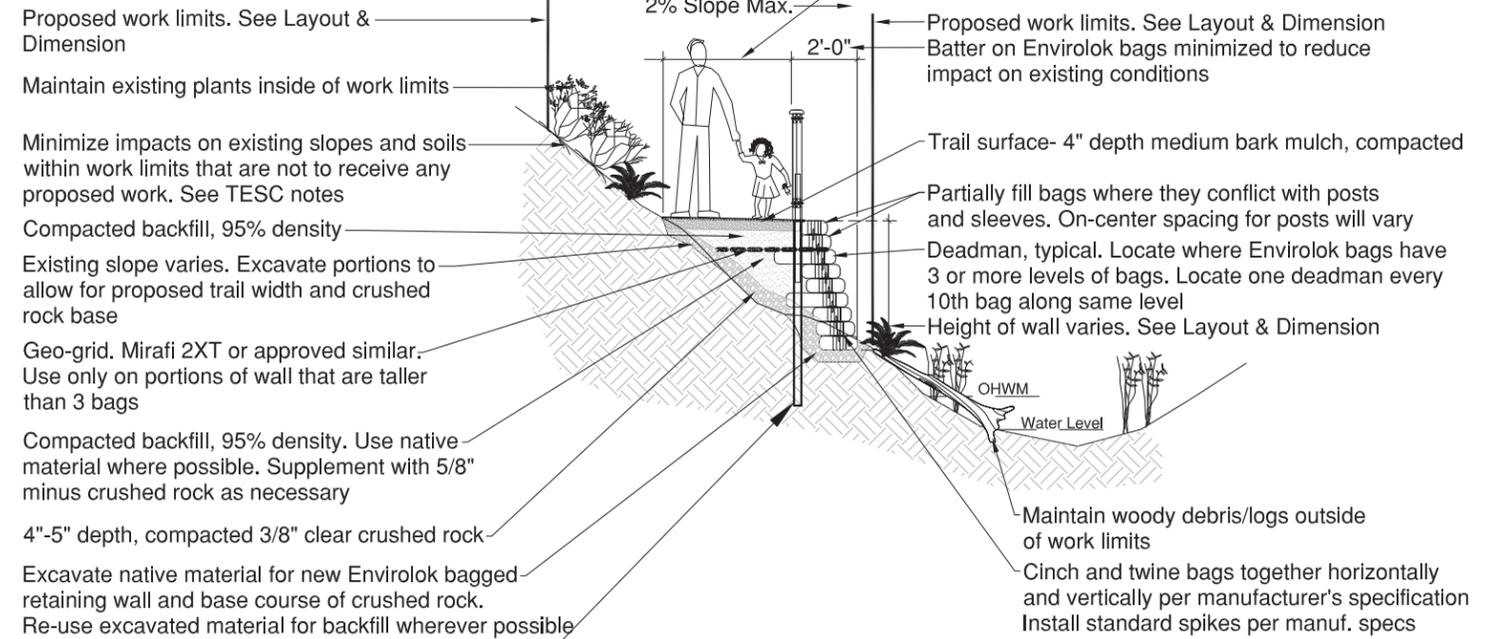
Washout Way Trail Repair & Restoration

PLANTING PLAN

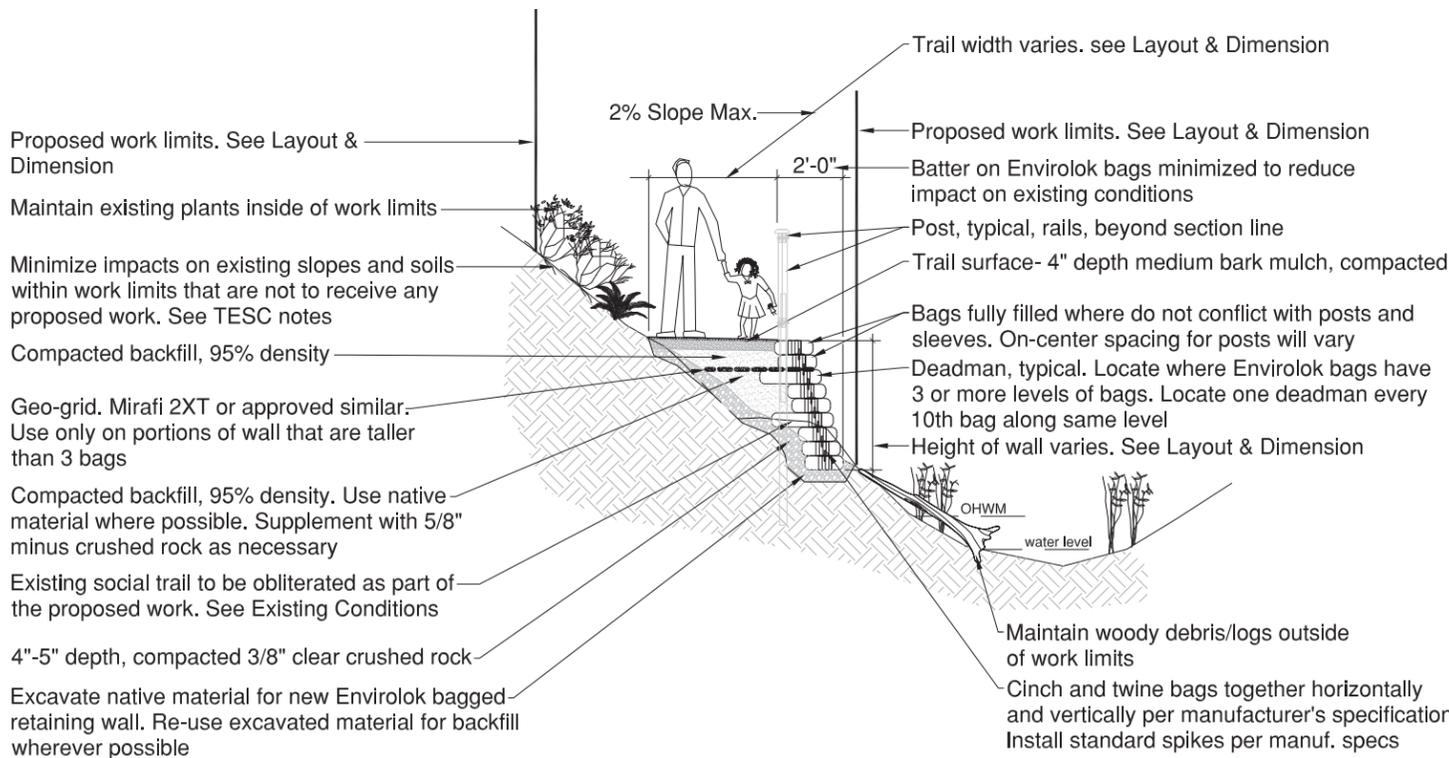




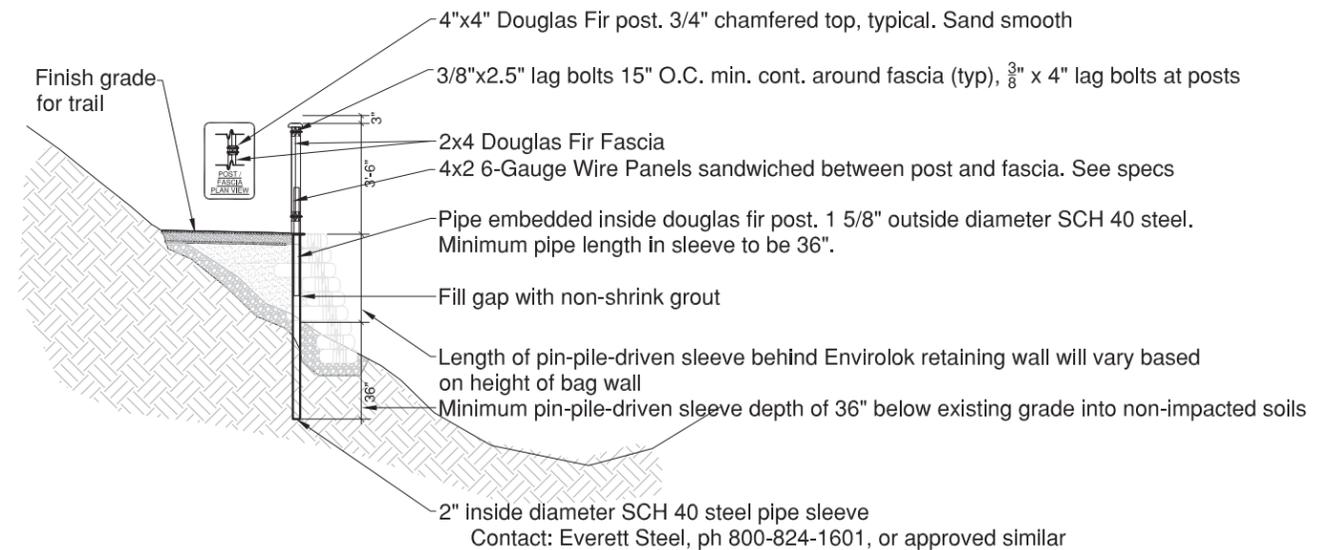
A RETAINING WALL - ELEVATION
SCALE: NTS



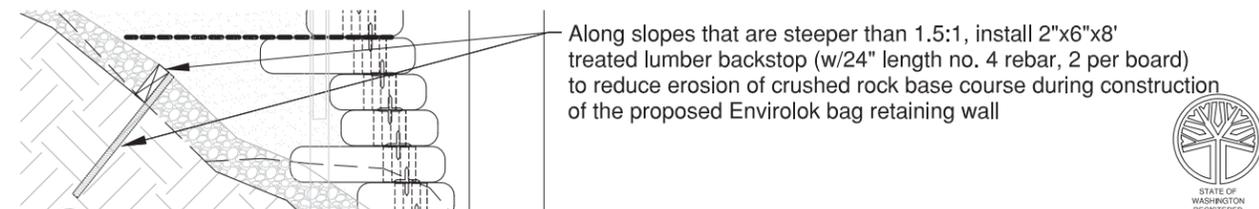
B RETAINING WALL - POST & RAIL TRANSITION
SCALE: NTS



C RETAINING WALL - POST & RAIL TRANSITION WHERE POSTS DO NOT CONFLICT WITH BAGS
SCALE: NTS



D RETAINING WALL - POST DETAIL
SCALE: NTS



E BACKSTOP FOR GRAVEL DETAIL
SCALE: NTS

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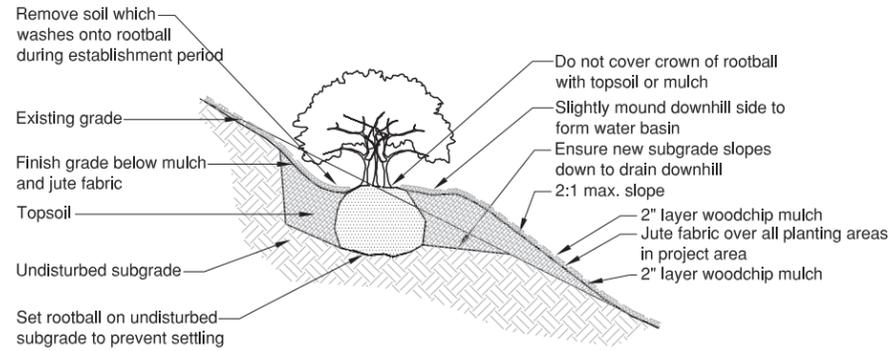


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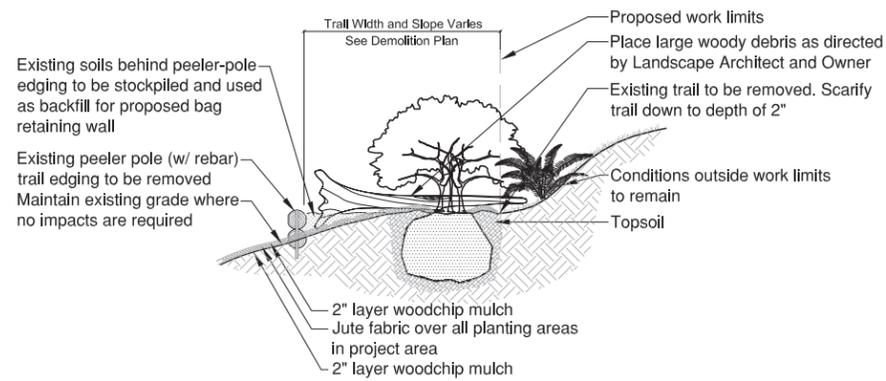
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WALL DETAILS

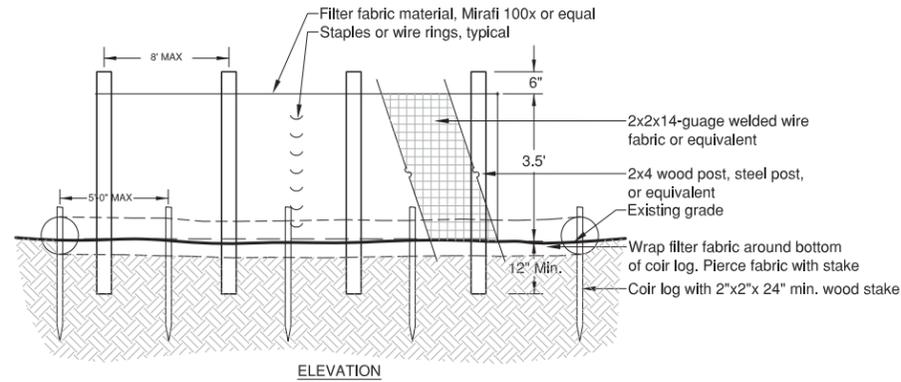
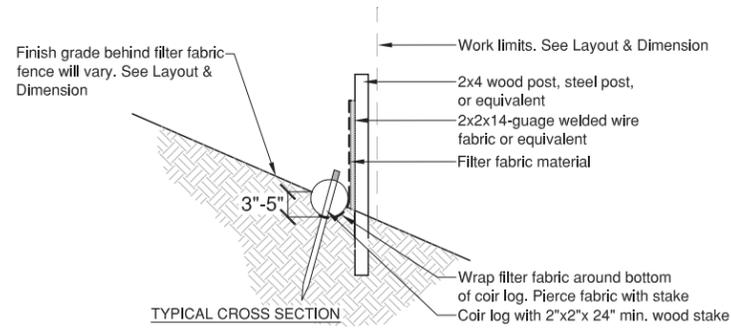




A HILLSIDE PLANTING DETAIL
SCALE: NTS

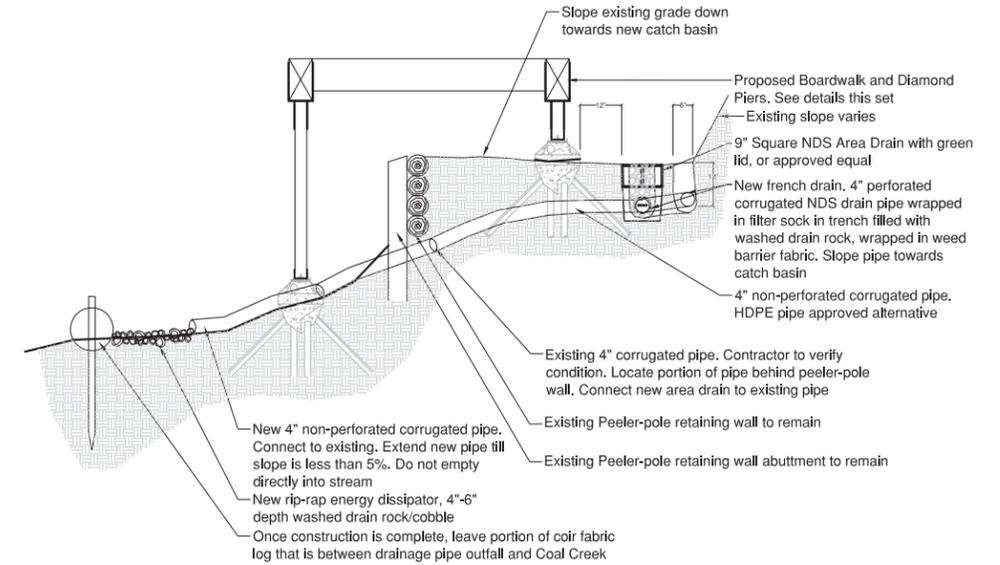


B TRAIL ABANDONMENT DETAIL
SCALE: NTS



- NOTES**
1. Prefab fence allowed if reinforced and approved by the city clearing and grading inspector.
 2. Fence shall not be installed on slopes steeper than 2:1.
 3. Joints in filter fabric shall be overlapped 6 inches at post.
 4. Use staples, wire rings, or equivalent to attach fabric to fence.
 5. Remove sediment when it reaches 1/3 fence height.
 6. Location of fencing shall be as shown on approved plans or as directed by the city.

C STRAW ROLL and FILTER FABRIC FENCE
SCALE: NTS



F NEW CATCH BASIN, DRAIN PIPE, AND ENERGY DISSIPATER
SCALE: NTS

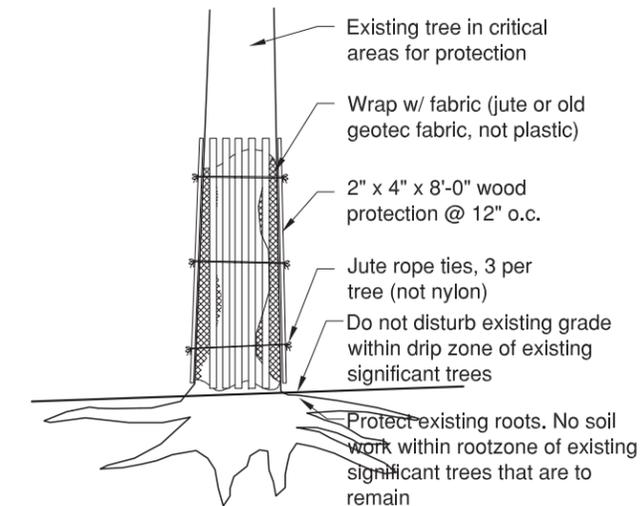
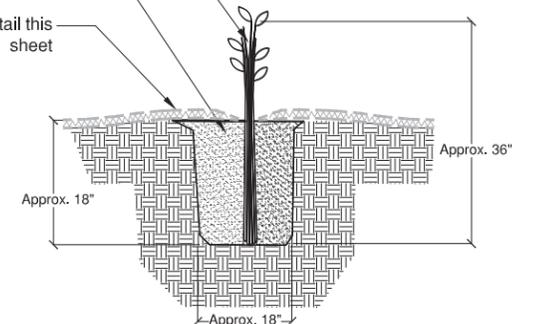
Bundle of live stakes, min. 1/4" diameter, minimum 8-10 per bunch, bury 2/3 of stake (1/3 to remain exposed), branch tip to point outwards. See planting plan

Backfill with native soil, remove all rocks and debris over 1" DIA. and 2" in any dimension.

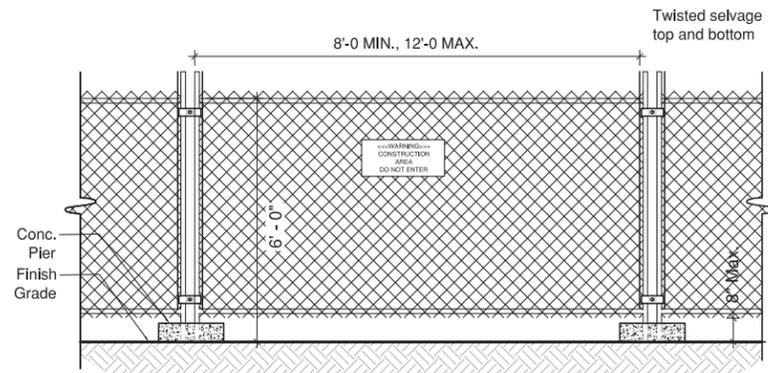
Mulch per planting detail this sheet

Contractor to plant live stakes immediately upon delivery or within 24 hours. If planting does not occur within 24 hours, store in cool, moist conditions at site or staging area

G LIVE STAKE PLANTING
SCALE: NTS



D SIGNIFICANT TREE PROTECTION DETAIL
SCALE: NTS



- Notes:**
1. Chain link fabric to be min. 11 gauge, galvanized. No rusted or excessively malformed fabric.
 2. Fence bases shall be of sufficient weight and/or spread to adequately support each panel.
 3. Panel-to-panel connections shall be made at a min. Two locations per connection unless otherwise approved.
 4. Provide construction warning signage 50' o.c. Along fencing installation.

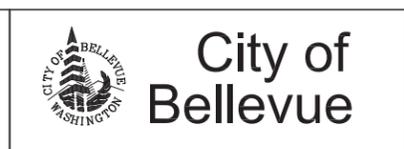
E TEMPORARY CONSTRUCTION FENCE
SCALE: NTS

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Washout Way Trail Repair & Restoration



TRAILS:

20.25H.055 Uses and development allowed within critical areas – Performance standards.

g. New and Expanded City and Public Parks.

i. Trails. New nonmotorized trails within the critical area or critical area buffer must meet following standards:

(A) Trail location and design shall result in the least impacts on the critical area or critical area buffer;

-While all work is located within the buffer of the existing Type F stream, this project proposes removal of portions of existing trail that have been damaged beyond repair and creation of new trail. As a result of the damaged trail, a "social" trail has been created by trail users. The proposed trail will be located where the social trail currently exists. Much of the existing grade and social trail is exposed to rainfall that causes erosion and sedimentation into the creek. The proposed work includes planting of native plants to increase the amount of stream corridor habitat. A top-dressing of wood mulch will be installed to further reduce erosion.

(B) Trails shall be designed to compliment and enhance the environmental, educational, and social functions and values of the critical area with trail design and construction focused on managing and controlling public access and limiting uncontrolled access;

-The proposed trail has been specifically designed to reduce the impact on the existing topography. The bagged material will be placed on the existing topography and secured in a similar method as block retaining walls and geo-grid fabric. Social trails are generally created in a method that follows the path of least resistance and the safest route. To reduce impact on the site, the proposed trail will be constructed where the existing social trail exists. Construction details for the trail and bagged slope retaining system show that public access away from the trail will be restricted. On the downhill side, there is railing proposed for 100% of the length. Generally, uphill of the trail is too steep for pedestrian traffic. Further, damaged portions of the existing path will be removed and planted. Woody debris available within the project work area will be used to block access to those removed portions of the existing path.

(C) Trails shall be designed to avoid disturbance of significant trees and to limit disturbance of native understory vegetation;

-Currently, one existing significant tree is proposed to be removed. A Big Leaf Maple (Acer macrophyllum), a 18" caliper. Its current condition is such that portions of the trunk down near the base are hollowed out and rotting. Further, there is evidence that the tree is leaning as a result of slope destabilization. This tree is proposed to be cut down and cut into logs suitable for habitat and also blocking portions of the existing trail that will be removed and replanted. Very little native understory vegetation exists. Any native shrubs that are in the alignment of the proposed path will be dug up, healed in within the work area, and re-planted in the work area once work on the proposed trail is complete. Contractor is required to provide supplemental irrigation to increase viability of transplanted plant material.

(D) Trails shall be designed to avoid disturbance of habitat used for salmonid rearing or spawning or by any species of local importance;

-All proposed work related to the construction of the trail is outside the Ordinary High Water Mark.

(E) The trail shall be the minimum width necessary to accommodate the intended function or objective;

-Portions of the proposed trail are 3' width, portions of the proposed trail are 4' width. Site conditions, such as existing topography, and also the location of the Ordinary High Water Mark, dictate width of the proposed trail.

(F) All work shall be consistent with the City of Bellevue's "Environmental Best Management Practices" and all applicable City of Bellevue codes and standards, now or as hereafter amended;

-The proposed work complies with City of Bellevue's "Environmental Best Management Practices". The proposed work area is limited to only those areas where the trail is in need of replacement. Access to the site will be over existing pedestrian pathways. Staging area for materials will be limited to an area easily accessible with truck and trailer. Further, the staging area will be returned to its pre-work condition. Any stormwater drains in the area will receive the drain sock to eliminate sedimentation during construction. Conditions post-construction will be same or better than pre-construction.

(G) The facility shall not significantly change or diminish overall aquatic area flow peaks, duration or volume or flood storage capacity, or hydroperiod;

-Proposed work will not significantly change or diminish overall aquatic area flow peaks, duration or volume or flood storage capacity, or hydroperiod.

(H) Where feasible and consistent with any accessibility requirements, any trail shall be constructed of pervious materials;

-All materials associated with the construction of the proposed trail are considered permeable. Backfill behind the wall is either cut soil from other areas within work area or gravel imported to the site. The Envirolok bagged retaining wall system is considered permeable. Further, materials to be placed inside Envirolok bags will be permeable- cut soil and gravel imported to the site.

(I) Crossings over and penetrations into wetlands and streams shall be generally perpendicular to the critical area, and shall be accomplished by bridging or other technique designed to minimize critical area disturbance considering the entire trail segment and function; and

-No wetlands exist within or adjacent to the project area. No work is proposed within the stream or inside the Ordinary High Water Mark.

(J) Areas of new permanent disturbance and all areas of temporary disturbance shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC .

-Coal Creek is classified, per City of Bellevue (COB) standards, as a Class F stream. As such, in this undeveloped area, Coal Creek has a 100' buffer and an additional 20' structure setback. All of the proposed work, excluding the staging area, is within the 100' buffer and within the 20' structure setback. COB 20.25H.085.B requires a minimum of 1:1 buffer mitigation ratio.

Total project area, excluding staging area: 2,875 square feet,
 Total impact area, including boardwalk, trail, and Envirolok bagged slope retaining system: 880 square feet,
 Total new planting area: 2,354 square feet,
 Replacement ratio: 2,354 / 880 = 2.67:1

STREAMS

20.25H.080 Performance standards.

g. New and Expanded City and Public Parks.

A. General.

Development on sites with a type S or F stream or associated critical area buffer shall incorporate the following performance standards in design of the development, as applicable:

1. Lights shall be directed away from the stream.

-No lights are proposed.

2. Activity that generates noise such as parking lots, generators, and residential uses shall be located away from the stream or any noise shall be minimized through use of design and insulation techniques.

-Once completed, proposed project shall generate no inherent noises.

3. Toxic runoff from new impervious area shall be routed away from the stream.

-There will be no toxic runoff. All materials proposed are generally inert and do not contain chemicals nor excrete toxic runoff.

4. Treated water may be allowed to enter the stream critical area buffer.

-Proposed project does not require treatment of stormwater.

5. The outer edge of the stream critical area buffer shall be planted with dense vegetation to limit pet or human use.

-All proposed work is within the stream critical area buffer. Proposed work includes removal of existing non-native weedy species and revegetation with native plants. See Planting Plan.

6. Use of pesticides, insecticides and fertilizers within 150 feet of the edge of the stream critical area buffer shall be in accordance with the City of Bellevue's "Environmental Best Management Practices".

-No pesticides, insecticides, or non-organic fertilizers are proposed. Any maintenance to be completed will not include any pesticides or insecticides.

GEOLOGY

20.25H.125 Performance standards - Landslide Hazards and Steep Slopes.

1. Structures and improvements shall minimize alterations to the natural contour of the slope, and foundations shall be tiered where possible to conform to existing topography.

-The proposed trail and structures will be located generally along the existing contours and existing trail alignment.

2. Structures and improvements shall be located to preserve the most critical portion of the site and its natural landforms and vegetation.

-The new trail improvements will be generally located where the existing path has been created through foot traffic. In general, the trail is located along the least steep portions of the slope system.

3. The proposed development shall not result in greater risk or a need for increased buffers on neighboring properties.

-The proposed development is fully within Coal Creek Park, and, if constructed as proposed (and verified), will not result in greater risks to neighboring properties.

4. The use of retaining walls that allow the maintenance of existing natural slope area is preferred over graded artificial slopes where grades slopes would result in increased disturbance as compared to use of retaining wall.

-Short vegetated retaining walls will be utilized along the low side of the trail in many places. Regraded and sloped fill slopes would not be feasible or advantageous.

5. Development shall be designed to minimize impervious surfaces within the critical area and critical area buffer.

-Refer to Barker Landscape Architects for this response.

6. Where change in grade outside the building footprint is necessary, the site retention system should be stepped and regarding should be designed to minimize topographic modification. On slopes in excess of 40 percent, grading for yard area may be disallowed where inconsistent with this criteria.

-Not applicable.

7. Building foundation walls shall be utilized as retaining walls rather than rockeries or retaining structures built separately and away from the building wherever feasible. Freestanding retaining devices are permitted when they cannot be designed as structural elements of the building foundation.

-Not applicable. No building foundations, so short retaining walls are necessary locally.

8. On slopes in excess of 40 percent, use of pole-type construction which conforms to the existing topography is required where feasible. If pole-type construction is not technically feasible, the structure must be tiered to conform to the existing topography and to minimize topographic modification.

-Not applicable. Local steel rods associated with pier foundation elements may be utilized for bridge construction.

9. On slopes in excess of 40 percent, piled deck support structures are required where technically feasible for parking or garages over fill-based construction types.

-Not applicable.

10. Areas of new permanent disturbance and all areas of temporary disturbance shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.210.

-See Barker Landscape Architects for response.

NO.	DATE	BY	APPR.	REVISIONS
	8-1-12			PERMIT SUBMITTAL

Approved By

TRANSPORTATION DESIGN MANAGER DATE

PROJECT MANAGER DATE

JV, JB 8/7/12
 DESIGNED BY DATE

JV, NM, SW 8/7/12
 DRAWN BY DATE

JB 8/7/12
 CHECKED BY DATE



Washout Way Trail Repair & Restoration

PERFORMANCE STANDARDS





Stantec

Stantec Consulting Services, Inc.
12034 – 134th Place NE, Suite 102
Redmond, Washington 98052

August 6, 2012

Mr. Nic Morin
Barker Landscape Architects
1514 NW 52nd Street
Seattle, WA 98107

RE: Limited Geotechnical Recommendations
Proposed Trail Repairs
Coal Creek Trail – Washout Way
Bellevue, Washington

Dear Mr. Morin,

At your request and authorization, we have prepared this letter report to discuss our findings and recommendations regarding trail redevelopment for a portion of the Coal Creek Trail System in Bellevue, Washington. Areas of the existing trail have been damaged and destroyed by landslide activity and erosion. A senior engineering geologist visited the site on July 27, 2012 to conduct the field exploration phase of our evaluation.

SITE LOCATION AND DESCRIPTION

Site Location

The site consists of a portion of the Coal Creek Trail System known as Washout Way, which is located south of SE 57th Street in Bellevue, Washington (Figure 1). The site includes the area shown on the Site Plan in Figure 2, which is an approximately 175 feet long section of the Washout Way trail in Coal Creek Park.

Trail Conditions

The portion of the trail described as the site in the text of this report extends generally east to west and includes previously constructed trail sections as well as alternate paths that negotiate the damaged/destroyed portions of the trail. The trail is 2 to 4 feet wide and varies from unimproved soil, mud, roots, cobbles; as well as improved trail with log step systems and several inches of crushed rock.

An existing log wall is located at approximately 0+5 to 0+20. The wall is approximately 6 feet tall and has vertical and lateral supports. There is a noticeable bulge in the wall and runoff and/or groundwater flows into the fill behind the wall from a shallow ravine upslope. Water and wet/loose soils and debris were observed below the wall area.

A large stump and multiple logs are located at a portion of the log steps at 0+50 to 0+60. The debris is part of a landslide or landslides that destroyed the log lined trail within this section. Surface water flows below and within the landslide debris.

Stantec

August 6, 2012
Washout Way
Page 2 of 10

Reference: Limited Geotechnical Recommendations

The remaining portions of the trail negotiates around trees, stumps, snags, and up steep slopes until it joins the main and unaffected portion of the trail beyond the site (near Station 1+80).

Site Slopes

The current trail alignment varies in slope magnitude from nearly level to about 50 percent locally (newly created foot paths). A very steep slope extends the length of the site, sloping downward toward the south and a tributary stream of Coal Creek. The trail extends along the base and lower-middle sections of the slope. The slope varies in magnitude from approximately 80 to 175 percent with local near-vertical areas. The overall height of the slope ranges from about 20 to 35 feet.

Local steep slope areas extend along the upslope and downslope sides of the existing trail within the site. Locally, 5 to 8 feet tall, near vertical cuts in colluvium and landslide debris exist at or around stations 0+60, 1+20 to 1+40 below the trail. Areas with steep slopes (1/2H:1V to 3/4H:1V (horizontal to vertical)) that extend above the trail are present along most of the alignment. These slopes are not vegetated in areas that have recently had landslide activity and ivy covers many of the other slope areas.

Existing Drainage

Existing drainage pipes were observed extending downslope from several of the residence along SE 57th Street. Some drains were extended toward the stream; which we understand from discussions with the City of Bellevue Parks Department, was performed by their personnel. Drainage patterns follow existing shallow ravines and channels down along the steep slope and into the tributary stream below the site.

Vegetation

The site and adjacent areas are vegetated with Cedar, Alder, Maple, Hemlock, and Fir trees; as well as ferns, grasses, blackberries, and other herbaceous vegetation. The site area is encompassed within Coal Creek Park which is bordered by residential developments and area roadways.

Proposed Construction

The proposed construction includes a wood framed bridge, Envirolok™ walls, and new trail alignments. The bridge will be wood-framed and extend from approximately Stations 0+00 to 0+27. It will be supported on native soils and/or Diamond Piers™ placed and driven into underlying existing soils.

Envirolok™ walls will be up to 3 feet tall and will be constructed along various portions of the new trail alignment. Both Diamond Piers™ and Envirolok™ are proprietary designed structural elements. Local excavations on the order of 2 feet or less and minor grading work (cut/fill) is anticipated as part of the trail, wall, and bridge construction.

Stantec

August 6, 2012
Washout Way
Page 3 of 10

Reference: Limited Geotechnical Recommendations

The trail will generally be 3 to 4 feet wide and we understand that the bridge will be supported by a combination of existing grades (with or without concrete or gravel footings/slabs/pads) and Diamond Piers™. We discussed the potential of a full span bridge over the existing log wall (27 feet) with the structural engineer (Reid Middleton). Based on our discussion, we understand that this is not feasible using typical dimensional lumber and that some support will be necessary within the bridge span. Therefore, a combination of Diamond Piers™ and/or shallow foundation support on soils or concrete will be utilized.

GEOLOGIC SETTING AND SOILS

The site lies within the eastern portion of the Puget Lowland, near the foothills of the Cascade Mountains. The lowland is part of a regional north-south trending trough that extends from southwestern British Columbia to near Eugene, Oregon. North of Olympia, Washington, this lowland is glacially carved, with a depositional and erosional history including at least four separate glacial advances/retreats. The Puget Lowland is bounded to the west by the Olympic Mountains and to the east by the Cascade Range. The lowland is filled with glacial and nonglacial sediments consisting of interbedded gravel, sand, silt, till, and peat lenses. Near the foothills of the Cascade Mountains, areas of Tertiary Bedrock are exposed. These materials include sandstone, siltstone, conglomerate, and shale which were locally mined for coal. These rocks are in varying stages of weathering.

The Geologic Map of King County, indicates that the site is underlain by Vashon Glacial Till. Vashon Glacial Till is typically characterized by an unsorted, non-stratified mixture of clay, silt, sand, gravel, cobbles and boulders in variable quantities. These materials are typically dense and relatively impermeable. The poor sorting reflects the mixing of the materials as these sediments were overridden and incorporated by the glacial ice.

Based on our observations and limited excavation work, the following geologic and soil units are also present within the site:

- Relatively thin deposits of alluvium within the stream bed
- Colluvium derived from glacial till along many slope faces; also consistent with weathered glacial till locally. Generally less than 2 feet in thickness
- Landslide deposits and/or mass wastage deposits along steep slope faces, within lower portions of ravines, and along the base of steep slopes

Field Investigation and Soil Profiles

A limited field investigation included shallow hand excavations located at strategic locations along the proposed trail alignment and at the presumed location of foundation elements for the proposed bridge. A ½ inch diameter steel rod was used to probe existing soils along slope faces and along the trail alignment. The soils encountered in hand excavations were continuously examined and visually classified in accordance with the Unified Soil Classification System (USCS).

Reference: Limited Geotechnical Recommendations

In general, the soils encountered include loose to medium dense fill materials, loose landslide debris consisting of silty-sand with variable amounts of gravel and organic debris, and loose to dense glacial till (weathered to unweathered). These materials were encountered along trail surfaces and slope areas and extended to varying depths. A site specific geologic map with geologic hazard and hazard risks can be prepared upon request.

Groundwater and Surface Water

We observed areas of surface water in several channels along the steep slope face within the site area. It is unknown if the water is from spring activity upslope, from adjacent residences, or from other sources. Water was flowing over the trail in several areas as shown on the site plan and in other areas, were controlled within drain pipes. It is our opinion that surface and/or groundwater flows from upslope areas will continue to flow and will be a major contributing cause of future landslide activity at the site.

GEOLOGIC HAZARDS

The King County lmap system does not indicate that the site is located in an area with landslide, erosion, seismic, or coal mine hazards. The following sections describe our site-specific observations and general conclusions regarding the presence of geologic hazards.

Landslide Hazard

It is our opinion that area slopes with magnitudes greater than about 40 percent and vertical relief of at least 10 feet can qualify as landslide hazard areas depending on the soil characteristics, density, as well as other factors. It is our opinion that the entire site area is located within a Landslide Hazard Area due to the magnitude of the site slopes (80 to 175 percent or more), vertical relief of over 10 feet for steep slope areas, surface and shallow groundwater conditions, and presence of landslide debris (active and older landslide activity).

The removal of native vegetation should be limited, to the greatest extent possible (outside areas designated for trail and structural development) and landscaping and other permanent erosion control features should be in place to reduce adverse impacts to neighboring and down slope properties resulting from erosion. Vegetation should not be removed from steeper slope areas without protection of exposed soils. Surface water should not be allowed to flow over slope surfaces (as feasible). Based on our knowledge of the project, very limited removal of vegetation will be performed.

Stantec

August 6, 2012
Washout Way
Page 5 of 10

Reference: Limited Geotechnical Recommendations

Erosion Hazard

The Natural Resources Conservation Services (NRCS) maps for King County indicate that the site is underlain by Alderwood and Kitsap Soils (AkF). These soils have a "Severe" to "Very Severe" erosion potential in a disturbed state due to the steepness of the area slopes.

It has been our experience that soil erosion potential can be minimized through landscaping and surface water runoff control. Typically erosion of exposed soils will be most noticeable during periods of rainfall and may be controlled by the use of normal temporary erosion control measures, i.e., silt fences, hay bales, mulching, control ditches or diversion trenching, and contour furrowing. Erosion control measures should be in place before the onset of wet weather. Under no circumstances should surface water be allowed to flow over the steep slope areas located north and/or above project site or into the tributary stream downslope and south of the site.

Seismic Hazard

The native soils encountered in the hand borings were generally medium dense below a highly weathered zone. The overall soil profile corresponds to a soil profile Site Class *D* as defined by Table 1613.5.2 of the 2009 International Building Code (2009 IBC). A Site Class *D* applies to a profile consisting of medium dense/stiff to very dense soils within the upper 100 feet.

We referenced the U.S. Geological Survey (USGS) Earthquake Hazards Program Website to obtain values for S_s , S_t , F_a , and F_v if they are needed for the design of the bridge. The USGS website includes the most updated published data on seismic conditions. The site specific seismic design parameters and adjusted maximum spectral response acceleration parameters are as follows:

PGA	(Peak Ground Acceleration, in percent of g)
31.85	(10% Probability of Exceedence in 50 years)
64.25	(2% Probability of Exceedence in 50 years)
S_s	144.20% of g
S_t	49.20% of g
F_A	1.00
F_V	1.51

Additional seismic considerations include liquefaction potential and amplification of ground motions by soft soil deposits. The liquefaction potential is highest for loose sand with a high groundwater table. Our scope of work did not include liquefaction analyses; however, based on our hand borings and knowledge of the area geology, we do not expect significant settlement or effects from liquefaction.

Reference: Limited Geotechnical Recommendations

CONCLUSIONS AND RECOMMENDATIONS

General

The proposed bridge may be supported on dense native soils, approved fill materials, and/or Diamond Piers™ as needed. Due to the length of the bridge, center support will likely be necessary. Therefore, in the event of a landslide and failure of the underlying wood wall, the bridge structure may be adversely affected and damaged.

Areas of proposed Envirolok™ walls appear suitable along the low sides of many portions of the proposed trail re-alignment. We recommend that all loose soils be removed to the level of medium dense or firmer native glacial till prior to wall construction. Additional recommendations for wall construction can be found in subsequent report sections.

It is our opinion that the entire site is located within an erosion and landslide hazard area. The proposed construction will not mitigate landslide hazards but if performed with standard care and to engineering standards, should not increase the likelihood of landslide activity.

We recommend that a Stantec geologist or engineer observe construction of the walls and placement of the bridge foundation elements.

Comments Pertaining to City of Bellevue Municipal Code, Section 20.25H.125 Performance Standards – Landslide Hazards and Steep Slopes

- A. *Structures and improvements shall minimize alterations to the natural contour of the slope, and foundations shall be tiered where possible to conform to existing topography.*

The proposed trail and structures will be located generally along the existing contours and existing trail alignment.

- B. *Structures and improvements shall be located to preserve the most critical portion of the site and its natural landforms and vegetation.*

The new trail improvements will be generally located where the existing path has been created through foot traffic. In general, the trail is located along the least steep portions of the slope system.

- C. *The proposed development shall not result in greater risk or a need for increased buffers on neighboring properties.*

The proposed development is fully within Coal Creek Park, and; if constructed as proposed (and verified), will not result in greater risks to neighboring properties.

- D. *The use of retaining walls that allow the maintenance of existing natural slope area is preferred over graded artificial slopes where graded slopes would result in increased disturbance as compared to use of retaining wall.*

Short vegetated retaining walls will be utilized along the low side of the trail in many places. Re-graded and sloped fill slopes would not be feasible or advantageous.

Reference: Limited Geotechnical Recommendations

- E. Development shall be designed to minimize impervious surfaces within the critical area and critical area buffer.*

Refer to Barker Landscape Architects for this response.

- F. Where change in grade outside the building footprint is necessary, the site retention system should be stepped and regrading should be designed to minimize topographic modification. On slopes in excess of 40 percent, grading for yard area may be disallowed where inconsistent with this criteria.*

Not applicable.

- G. Building foundation walls shall be utilized as retaining walls rather than rockeries or retaining structures built separately and away from the building wherever feasible. Freestanding retaining devices are only permitted when they cannot be designed as structural elements of the building foundation.*

Not applicable. No building foundations, so short retaining walls are necessary locally.

- H. On slopes in excess of 40 percent, use of pole-type construction which conforms to the existing topography is required where feasible. If pole-type construction is not technically feasible, the structure must be tiered to conform to the existing topography and to minimize topographic modification.*

Not applicable. Local steel rods associated with pier foundation elements may be utilized for bridge construction.

- I. On slopes in excess of 40 percent, piled deck support structures are required where technically feasible for parking or garages over fill-based construction types.*

Not applicable.

- J. Areas of new permanent disturbance and all areas of temporary disturbance shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.210.*

See Barker Landscaping for response.

Soil Parameters and Bridge Construction

The observed soils in our hand borings in the area of the proposed bridge were typical of glacial till and fill material used as fill for the trail and/or colluvium from glacial till. Based on our experience with these materials and the observed conditions in our hand borings, the following average soil parameters may be used in foundation design at the locations indicated:

Station 0+00

Unit Weight – 115 pounds per cubic foot (pcf); Friction Angle – 36 degrees; Cohesion – 250 pounds per square foot (psf)

Stantec

August 6, 2012
Washout Way
Page 8 of 10

Reference: Limited Geotechnical Recommendations

Station 0+10 to 0+15

Unit Weight – 105 pcf; Friction Angle – 22 degrees; Cohesion – 0 psf

Station 0+27

Unit Weight – 110 pcf; Friction Angle – 28 degrees; Cohesion – 0 psf

Based on our discussions, we understand that it is not feasible to span the entire 27 feet using dimensional lumber with support at the two ends of the bridge. The central portion of the bridge area is underlain by fill and/or older landslide/colluvial materials to a depth of approximately 6 feet. In this area, there is an existing log wall that is bulging and overturning near the top. We observed water emanating from between logs and at the base of the wall. It is our opinion that the wall will fail at some point in the future and that the material behind the wall laterally to the dense core soils of the existing slope system will slide or slough away. This type of failure would like cause damage to the bridge and its foundation elements.

It may be necessary for the piers to extend through the fill materials and be embedded into the underlying dense till (as verified in the field by Stantec) to provide adequate bearing. The presence of the piers within the backfill material/debris should not adversely affect the existing wall system, but will also not necessarily stabilize the existing materials.

Our explorations and observations indicate that the west end of the proposed bridge location is underlain by dense glacial till. These materials appear suitable to provide support for this end of the bridge and may not necessarily require pier foundations.

The east end of the bridge is underlain by about 2 feet of fill and/or colluvium. Diamond Piers™ should be considered at this location to provide adequate vertical and lateral support. If the east end is supported on the near surface soils, we recommend that any loose soils be removed and replaced with clean angular rock (3/4 – 2 inches in size) and that we verify the subgrade prior to bridge placement.

Wall Considerations

The Envirolok™ wall systems are designed and constructed by others. In general, all retaining and most landscaping walls should have the following elements:

- Drainage systems to prevent buildup of hydrostatic pressure
- A firm base within an excavated keyway
- Backfill consisting of structural fill placed and compacted according to design specifications
- A series of benches cut into sloping native soils behind the wall
- Additional design elements depending on the specific situation

We recommend placing an approximate 4 inch thick layer of clean angular rock (3/4 to 2 inches in diameter) over the face of steep slope areas where fill will be placed and short walls will be constructed. This will aid in allowing surface water to flow more easily to the base of the wall where it can be removed through a lateral

Reference: Limited Geotechnical Recommendations

drain behind the wall or through the base of the wall through outlet pipes, weep holes, or a minimum 6" thick base zone of clean angular rock.

We also recommend that any loose soils be removed from the wall keyway prior to wall construction. The slope areas behind the walls should be benched to reduce the effect of existing slide planes. Vertical and horizontal cuts should range from about 6 to 18 inches.

Walls should be set back from slopes greater than 50 percent in magnitude a distance of at least one half the height of the slope. Stantec can provide specific setback recommendations at specific locations for the soil and slope conditions that are present. Backfill specifications (type and compaction) are to be provided by the wall manufacturer.

Erosion Control

Erosion and sediment control (ESC) is used to minimize the transportation of sediment to wetlands, streams, lakes, drainage systems, and adjacent properties. Erosion and sediment control measures should be taken and these measures should be in general accordance with local regulations. As a minimum, the following basic recommendations should be incorporated into the design of the erosion and sediment control features of the site:

- 1) Phase the soil, grading, utility, and other work, requiring excavation or the disturbance of the site soils, to take place during the dry season (generally May through September). However, provided precautions are taken using Best Management Practices (BMP's), limited grading activities can be undertaken during the wet season (generally October through April). It should be noted that this typically increases the overall cost of the project.
- 2) All site work should be completed and stabilized as quickly as possible.
- 3) Additional perimeter erosion and sediment control features may be required to reduce the possibility of sediment entering the surface water. This may include additional silt fences, silt fences with a higher Apparent Opening Size (AOS), construction of a berm, or other filtration systems.
- 4) Any runoff generated by dewatering discharge should be treated through construction of a sediment trap if there is sufficient space. If space is limited other filtration methods will need to be incorporated.
- 5) Vegetation should be re-established in landscaped and slope areas prior to the onset of wet weather (typically October through April).

Limitations

Earthwork construction is characterized by the presence of a calculated risk that soil and groundwater conditions have been fully revealed by the original investigation. This risk is derived from the practical necessity of basing interpretations and design conclusions on limited sampling of the earth. The recommendations made in this report are based on the assumption that soil conditions do not vary

Reference: Limited Geotechnical Recommendations

significantly from those disclosed during our field investigation. If any variations or undesirable conditions are encountered during construction, Stantec should be notified so that supplemental recommendations can be made.

Diamond Piers™ and Envirolok™ walls are being utilized at the direction of the project architect. We are not affiliated with, or endorse these systems in any way. The recommendations in this report are in addition to these systems' design documents, which we have not reviewed or approved. The engineering, implementation, and performance of these systems are left to the respective companies. Stantec does not warranty these products or systems or their performance at this site. We have, to standard engineering standards, provided recommendations that are typical with this type of development with all parties understanding that risks associated with landslide activity will not mitigated.

The conclusions of this report are based on the information provided regarding the proposed construction. If the proposed construction is relocated or redesigned, the conclusions in this report may not be valid. Stantec should be notified of any changes so that the recommendations can be reviewed and reevaluated.

This report is a limited soils investigation report with the purpose of evaluating the soil conditions with regard to soil parameters for use in bridge and wall design by others. The scope of our services did not include any environmental site assessment for the presence or absence of hazardous and/or toxic materials in the soil, groundwater or atmosphere, geotechnical analyses, detailed geologic analyses, or the presence of wetlands. Any statements, or absence of statements, in this report or on any hand boring log, regarding odors, unusual or suspicious items, or conditions observed are strictly for descriptive purposes and are not intended to convey engineering judgment regarding potential hazardous and/or toxic assessments.

The information presented herein is based upon professional interpretation utilizing standard practices and a degree of conservatism deemed proper for this project. We emphasize that this report is valid for this project as outlined above, and should not be used for any other site.

Sincerely,

Stantec Consulting Services, Inc.



Phil Haberman, P.G., P.E.G.
Senior Engineering Geologist

PH/jv

