APPENDIX A3
Construction Stormwater Pollution Prevention
Additional Standards and Specifications for Local Regulations and Practices

APPENDIX CONTENTS AND FIGURES:

What is an alternate materials, methods, or modifications application process?

It is a permitted use of alternate materials or methods of construction not specifically prescribed in the IBC, IMC, UPC, NEC, WAC 51-11 (Energy Code), WAC 51-13 (Ventilation and Indoor Air Quality Code) or City of Bellevue Construction Code. Modifications to code requirements are allowed only when there are significant difficulties encountered making it impractical to carry out the prescriptive provisions of the applicable code. The proposed alternate materials, methods, or modifications may be permitted where the equivalent objectives prescribed by the code can be achieved by establishing and maintaining effective fire and life safety, structural integrity, strength, fire resistance, sanitation, and/or equipment suitability. (BCC 23.05.080 (H-M) / BCC 23.05.040)

What is not acceptable under the alternate materials and methods application process?

The use of alternative materials, methods of construction, or modifications will not avoid compliance with the objectives or intention of the code section, rule, or ordinance. An application will not be granted if the alternative material, methods, or modifications would reduce the levels of fire and life safety, structural integrity, strength, fire resistance, sanitation, and/or equipment suitability required by the code.
What does an acceptable alternate materials, methods, or modifications application cover?
If use of alternative materials or methods of construction is granted, it is site specific and shall be limited to the particular case(s) covered in the application and will not be applicable to future installations or equipment, unless specifically allowed by the building official. The application approval may be revoked for cause.

What if the alternate materials, methods, or modifications application is denied?

When an alternate materials, methods, or modifications application is denied, an appeal may be directed to the Hearing Examiner as provided in BCC 23.05.160. Interim acceptance of the installation, pending outcome of an appeal, will be at the discretion of the Building Official and must be in writing.
Who may apply for use of alternate materials and/or methods of construction?
Only the owner, owner's agent, or the contractor may apply to use alternate materials, methods of construction or modifications. Applications must be in writing.

Who grants the use of alternate materials and/or methods of construction?

The use of alternate materials, methods of construction, or modifications is granted only by the City of Bellevue Building Official upon written request, under authority of . (BCC 23.05.080 (H-M) / BCC 23.05.040).
(City of Bellevue Ordinance 5528)

Applications are to be mailed to:

Gregory H. Schrader
City of Bellevue Building Official
450 – 110th Avenue NE
Bellevue, Washington 98004

City of Bellevue

Alternate Materials, Methods, or Modifications Request Form

For Department Use Only

Date Received	Date Received	Date Reviewed	Date Completed	Approval: ☐ Yes ☐ No

Project Name:			Permit Number:	Application Date
Project Address:			Property Owner	
Contact Person	Title:		Address	
Address			City, State Zip	
Phone Number:	Fax Number	E-mail	Phone Number	Fax Number:

Type of Project: ☐Building ☐Electrical ☐Mechanical ☐Plumbing ☐Clear & Grade

Type of Request: ☐Alternate Materials ☐Alternate Methods ☐Modification of Code or Standard

Has the installation been made? ☐Yes ☐No	Has a violation been noted? ☐Yes ☐No	Date:	Inspector/Plans Examiner:
Applicable Code/Standard: ☐IBC ☐IRC ☐IMC ☐UPC ☐COB CC ☐Other:			
Specific Code, Section, Rule or Standard:			

Statement of Problem(s): _____

City of Bellevue

Alternate Materials, Methods, or Modifications Request Form

Alternate Proposal: (Attach additional pages, plans, drawings, technical reports, descriptions, etc to support proposal)

I certify that I am the owner or owner's agent and have the authority to request the above stated alternate materials, methods of construction, or modification in building code requirements. I understand that this request is subject to review and may be approved or denied in part or in whole. The city of "Bellevue's decision will be in writing and will be specific to this request, unless otherwise noted, and is based solely on the facts included with this request.

Signature	Title	Date
Print Name		

For Department Use Only

Reviewed By: Comments:	Date:	Recommendation: ☐Approve ☐Deny
Reviewed By: Comments:	Date:	Recommendation: ☐Approve ☐Deny
Reviewed By: Comments:	Date:	Recommendation: ☐Approve ☐Deny
Reviewed By: Comments:	Date:	Recommendation: ☐Approve ☐Deny

Final Review: Comments/Conditions:	Date:	Final Status: ☐Approve ☐Denied

Construction Stormwater Pollution Prevention Plan (CSWPPP)
Short Form for Small Construction Projects

The Bellevue Clearing and Grading Code (BCC 23.76.090) allows a simpler CSWPPP, consisting of a checklist (short form) and a site plan, on sites with land disturbing activities totaling less than 7,000 square feet and grading less than 100 cubic yards.. The purpose of the short form is to outline the actions that will be implemented on smaller construction sites as part of the construction activity to reduce or eliminate discharge of sediment and other pollutants into receiving waters.

Background Information

Property Owner: _____

Contact Person: _____
All questions and correspondence will be directed to the individual listed as contact person.

Address of Contact Person: _____

Phone Number: _____

Project Title: _____

Site Address: _____

Parcel Number: _____

Give an accurate, brief description of the proposed project's scope and nature:

16. General description: _____

_____

_____

_____

2. Area of site (square feet or acres): _____
3. Proposed area of land disturbance (square feet or acres): _____
4. Proposed quantity of excavation (cubic yards): _____
5. Proposed quantity of fill (cubic yards): _____
6. Square footage of buildings to be constructed: _____
7. Description of adjacent areas which may be affected by site disturbance (i.e. streams, lakes, wetlands, residential areas, roads) _____

_____

_____

8. Description of critical areas that are on or adjacent to the site. _____

_____

_____

9. Describe potential erosion problems on site. _____

_____

_____

Required Elements - Construction Stormwater Pollution Prevention Plan

Check BMPs to be used for each element. If site conditions render an element unnecessary, check "other" and describe why it is not needed.

1. Mark Clearing Limits
   - □ Preserve existing vegetation – BMP C 101
   - □ High Visibility Plastic or Metal Fence – BMP C103
   - □ Stake and Wire Fence – BMP C104
   - □ Tree Protection During Construction – BMP T101
   - □ Other _____

2. Establish Construction Access
   - □ Stabilized Construction Entrance – BMP C105
   - □ Wheel Wash – BMP C106
   - □ Construction Road/Parking Area Stabilization – BMP C107
   - □ Other _____

3. Control Flow Rates
   - □ Sediment trap – BMP C240
   - □ Other _____

4. Install Sediment Controls
   - □ Vegetated strip – BMP C234
   - □ Silt Fence – BMP C233
   - □ Straw wattles – BMP C235
   - □ Other _____

5. Stabilize Soils
   - □ Mulching – BMP C121
   - □ Plastic Covering – BMP C123
   - □ Topsoiling – BMP C125
   - □ Sodding – BMP C124
   - □ Nets & blankets – BMP C122
   - □ Temporary & Permanent Seeding – BMP C120
   - □ Small project construction stormwater pollution prevention BMP C180
   - □ Other _____

6. Protect Slopes
   - □ Temporary & permanent seeding – BMP C120
   - □ Plastic covering – BMP C123
   - □ Interceptor dike and swale – BMP C200
   - □ Nets & blankets – BMP C122
   - □ Other _____

7. Protect Drain Inlets
   - □ Storm drain inlet protection – BMP C220
   - □ Other _____

8. Stabilize Channels and Outlets
   - □ Channel lining – BMP C202
   - □ Outlet protection – BMP C209
   - □ Other _____

9. Control Pollutants

- □ Concrete Handling – BMP C151
- □ Sawcutting and Surfacing Pollution Prevention – C152
- □ Material Delivery, Storage Containment – C153
- □ Other _____

10. Control De-Watering
    - □ Level Spreader – BMP C206
    - □ Infiltration (Provide details)
    - □ Discharge to sanitary sewer (METRO and Bellevue Utilities permits required)
    - □ Other _____
11. Maintain BMPs
    - □ Maintain and repair in accordance with BMP specifications
    - □ Other _____
12. Manage the Project
    - □ Phase construction – describe _____

      _____

      _____
    - □ Limit work to the dry season _____

      _____
    - □ Inspect and monitor all BMPs _____

      _____
    - □ Pollution prevention contact list – attach a list to be posed at job site _____

      _____
    - □ Reporting and recordkeeping – Attach inspection forms and site log _____

      _____
    - □ Other _____

      _____

      _____

Site Plan

Attach a site plan (minimum 11" x 17") that includes the following:

a. Legal description of subject property.
b. North Arrow
c. Property boundaries
d. Boundaries of existing vegetation, e.g. tree lines, pasture areas, etc.
e. Identify and label areas of potential erosion problems.
f. Identify any on-site or adjacent surface waters, critical areas and associated buffers.
g. Identify FEMA base flood boundaries and Shoreline Management boundaries (if applicable)
h. Show existing and proposed contours.
i. Delineate areas that are to be cleared and graded.
j. Indicate location of BMPs and other required CSWPPP elements.
k. Name and phone number of person(s) responsible for preparation and maintenance of the CSWPPP.

What are Turbidity and pH?
Turbidity is the clarity of water expressed as nephelometric turbidity units (NTU's) and is measured with a calibrated turbidity meter (turbidimeter). The level of turbidity is determined by measuring the amount of light that passes through a standard sample of the water. **pH is** a measure of the acidity or basicity of a solution and is measured using a calibrated pH meter.

Code Authority:
The Clearing and Grading Code (BCC 23.76.160) permits the Development Services Department Director to require performance monitoring to determine compliance with State Surface Water Quality Standards (WAC 173.201A-200).

State Surface Water Quality Standards (WAC 173.201A-200).
The standard for turbidity is:

> Not to exceed 5 NTU over upstream turbidity when upstream turbidity is 50 NTU or less; and
> Not to exceed 10% above upstream turbidity when upstream turbidity is greater than 50 NTU.

For construction turbidity monitoring, turbidity benchmarks of 25 and 250 NTU are used. It is presumed that turbidity of 25 NTU or less is not likely to cause an exceedance of state water quality standards under most conditions, and BMPs are thought to be functioning well. Turbidity readings above 25 NTU indicate BMPs are not functioning properly, and action must be taken to correct problems. If the turbidity benchmark of 250 NTU is exceeded, there is a much higher risk of exceeding standards. In this event, immediate corrective actions must be taken, and Washington State Department of Ecology (Ecology) must be notified within 24 hours (425-649-7000).

The standard range for pH is:

> 6.5 to 8.5 with a human caused variation within that range of less than 0.2 units.

The benchmark value for pH is 8.5 standard units. Any time sampling indicates that pH is 8.5 or greater, the high pH water (8.5 or above) must be prevented from entering the storm drainage system or surface waters, and, if necessary, the high pH water must be adjusted or neutralized.

Turbidity & pH Monitoring Plan Requirements:
An acceptable turbidity & pH monitoring plan will include the following elements:

1. Project Description – This section of the plan shall identify the purpose of the site clearing and grading, include a discussion of the extent of site disturbance required for the proposal, any proposed phasing of the project, the extent of concrete work, and/or cement treatment, and a brief description of the Temporary Erosion and Sediment Control (TESC) Plan.
2. Drainage Analysis – This section, at a minimum, shall include a discussion of: i) the general topography; ii) existing drainage patterns on-site including existing drainage features (i.e. wetlands, streams, ditches, catch basins, pipes, ponds etc.); and iii) location of protected areas (i.e. steep slopes, wetlands, riparian corridors and shorelines).
3. Monitoring Locations – Sampling is required at all discharge points where stormwater (or authorized non-stormwater) is discharged off-site, before it mixes with the storm drainage system or receiving waters. All sampling point(s) shall be identified on the CSWPPP site plan and be clearly marked in the field with a flag, tape, paint, stake or other visible marker. Background turbidity and pH must be measured in the waterway that receives runoff from the sites(s) at a location up-gradient or outside

the influence of discharge from the construction site. Background turbidity and pH must be measured each time discharge turbidity is measured.

4. Turbidity & pH Monitoring Data Sheet – Include in the monitoring plan an example data sheet to record daily monitoring data. An example Data Sheet is attached to these requirements, which may be used directly, or as a reference to develop a project specific data sheet. Project specific data sheets shall include all of the information on the example sheet, but may provide additional information.

5. Third Party Monitor - The plan must identify a qualified, professional monitoring company that will be responsible for providing turbidity & pH monitoring. The company may not be affiliated with any party with a vested interest in the project. The individual(s) who will be conducting the monitoring must be a certified erosion and sediment control lead (CESCL).

6. Field Testing Methods – Turbidity & pH monitoring equipment must be specified in the monitoring plan, and shall comply with the requirements of the EPA and provide immediate results in the field.

7. Frequency of Monitoring – During the Dry Season (May 1 – September 30) sampling shall be performed no less than one sample weekly. Additional samples shall be taken during or immediately after each rainfall event. No more than one sample will be required in a day if the test indicates that turbidity complies with allowable levels. If the test indicates that turbidity is in excess of the standard or turbid water is observed coming from the site after the initial sample is taken, additional samples may be required. Sampling during the Rainy Season (October 1 – April 30) must be done daily.

8. Reporting Requirements – Sampling data sheets shall be delivered, e-mailed, or faxed to the City of Bellevue Clearing and Grading Inspector the same day they are taken (e-mail address: clearandgradereview@bellevuewa.gov; FAX # (425) 452-7930). Delivery of data sheets must be arranged with the inspector prior to collection of the data.

9. Exceeding Turbidity Benchmarks – Upon determination of turbidity levels in excess of the 25 NTU benchmark (26 to 249 NTU); the CESCL must immediately notify the contractor. The contractor must make all necessary efforts to correct the condition(s) on site that is (are) causing, or contributing to, the excess turbidity. It is the responsibility of the contractor to determine the most appropriate measures and implement them immediately, although they may solicit input from the inspector, the CESCL, or any other outside resource. The CESCL must make the appropriate revisions to the CSWPPP

   Upon determination that turbidity levels exceed the 250 NTU benchmark, the CESCL must immediately notify the contractor and the Clearing and Grading Inspector. The Clearing and Grading Inspector will forward the information to the Bellevue Clearing and Grading Supervisor who will notify Ecology within 24 hours. Immediate corrective actions must be taken by the contractor to correct the problems. The CESCL must continue to sample discharge daily until Turbidity is <25 NTU or the discharge is eliminated. The clearing and grading inspector has the authority to require additional TESC measures and/or issue a Stop Work order to mitigate water quality concerns.

10. Exceeding pH Benchmark - Any time sampling indicates that pH of discharge water is 8.5 or greater, the high pH water must be prevented from entering storm drainage system or surface waters. If necessary, adjust or neutralize the high pH water using an appropriate treatment BMP such as CO_2 sparging or dry ice. Written approval from Ecology must be obtained before using any form of chemical treatment other than CO_2 sparging or dry ice.

11. Termination of Monitoring Services - Upon termination of monitoring services, the third party monitoring company shall submit a final report to the Clearing and Grading Inspector. The report shall indicate the reason for termination of services, a summary of turbidity and pH data obtained throughout the project, final turbidity and pH levels, and any outstanding issues that have not been fully addressed.

Turbidity & pH Monitoring Data Sheet

Project Name Permit Number

Site Address

Name of CESCL Phone Number

Name of Monitoring Company

Date & Time of Sample

Weather Conditions

Sampling Location	Turbidity Reading (NTU)	Turbidity Above Benchmark? (Y/N)	pH Reading	pH Above Benchmark? (Y/N)	Contractor Notified of results? (Y/N)

Corrective Measures Taken By Contractor (if turbidity increase is above standard):

Other Comments:

STANDARDS FOR PLANS AND DRAWINGS

10/1/2009

The Bellevue standards for plans and drawings are necessary for clarity, for readability, and for permanent storage. Please follow these standards as you prepare your illustrations. If you have any questions concerning your application, please visit or call Development Services (425-452-6800) between 8 a.m. and 4 p.m., Monday through Friday (Wednesday, 10 to 4). Assistance for the hearing impaired: Dial 711 (Telecommunications Relay Service).

Refer to Utility Engineering Standards, Chapter 2, for plan requirements for Water, Sewer and Storm Drainage.

Sets of Plans -- Submit plan sets grouped with like sheets together (e.g., architectural, landscape, civil, etc.). You may staple multiple sheets within like sets (e.g., civil sheets C1, C2, & C3).

Combining Plans -- Plan types cannot be combined. If you have any questions about combining plans, contact the appropriate permitting authority in the Permit Center (e.g., Building or Development Services).

Type of Paper for Plans -- Relatively heavy, blueprint quality, standard drafting paper, or copy bond. Tissue paper, graph paper, poster board, cardboard, and similar materials cannot be accepted.

Paper Size -- For most plans, select one of the following sizes: 18" x 24", 24" x 36", or 30" x 42". For Short Plats. Final Plats. Binding Site Plans and Boundary Line Adjustments, 18" x 24". For Sign Permits, 8 1/2" x 11" or 8 1/2" x 14", Sign Master Plan. 11 x 17. For small building projects, 18" x 24" will be accepted as long as the detail is sufficient and readable.

Be consistent; do not mix sizes of drawings (exception: maps for recording). Do not attach information with clips, tape, glue, or staples.

Title Block -- Put title information on all sheets except the cover sheet.

Provide the following: project name; drawing title; sheet number and revision column; project address; and name, address, and phone number of the preparer.

Drawing Quality -- The drawing should be easy to read, with all lines and letters dark enough to provide good contrast with the paper.

Brown line prints, pencil drawings (including corrections or alterations), and microfilm copies of plans cannot be accepted.

Scale -- Be consistent, and indicate your scale using a bar symbol (for plan reproduction integrity).

All site drawings are to be in a scale of 1" = 10', 1" = 20', or 1" = 30'. Plats, Short Plats, and Boundary Line Adjustments may be drawn at a smaller scale, such as 1" = 50', 1" = 60', or 1" = 100'.

Architectural building plans and elevations are to be 1/8" = 1' or 1/4" = 1', with 1/16" = 1' or 1/20" = 1' for larger structures.

In certain cases, staff may approve use of a smaller scale before plan preparation.

North Arrow -- Include on all site and site-related drawings.

Vicinity Map -- Include on the site plan.

The vicinity map covers the project site and surrounding streets and property within a minimum of 600' of the site.

Copies of a city map can be made from the Street Atlas in the Self-Help area of the Permit Center.

Making Copies of Plans -- Blue line or black line prints and photocopies are acceptable. Brown line prints cannot be accepted.

GEOTECHNICAL REPORTING REQUIREMENTS

A geotechnical engineering report is required for all Clearing and Grading Permit applications submitted to the City of Bellevue. The geotechnical report must have been completed less than five years before the date of application and must pertain to the site and project described in the application. A geotechnical report older than 5 years or one for a different project on the same site may be accepted if the Geotechnical Engineer provides an addendum updating the report, or a letter stating the report is applicable to the site and the project that is currently proposed. Geotechnical report requirements may be waived for single-family permits if the applicant can demonstrate, to the satisfaction of the City of Bellevue, that soil or groundwater conditions at or near the site pose little or no risk for the project and that no on-site stormwater management practices are required for the project.

It is the responsibility of the Geotechnical Engineer to determine the actual scope of investigation, analysis, and reporting necessary to meet the Standard of Practice with respect to the project and its geotechnical requirements. The report must be signed and sealed by the Geotechnical Engineer.

The attached report outline describes the basic elements the City of Bellevue requires in each geotechnical report. The thoroughness of each element will greatly depend on the nature and complexity of the project and site conditions. For example, a report for a single family residence on a glacial till site without groundwater issues warrants a short, simple report, while a high-rise structure with a deep excavation on an alluvial site warrants a longer, much more detailed report. All elements should be included in detail unless they are clearly not applicable. For example, slope stability could be excluded if there are no slopes on the site or surrounding area, or shoring and retaining walls could be excluded if there are no requirements for temporary or permanent soil or rock retention.

GEOTECHNICAL REPORT OUTLINE

SUMMARY

The summary presents the major conclusions and their basis. This section should be included in all lengthy or complex reports.

1.0 INTRODUCTION

The introduction sets the stage for the entire report and should be contained in the following sections:

1.1 OVERVIEW

- Introduce the formal project name and state the location.
- Briefly describe current or previous work used to form the basis for the conclusions and recommendations contained in the report.

1.2 BACKGROUND

- Provide a description of the project's history if it is important to help understand why the study was performed.

- List other reports completed for the site or adjacent sites and note whether any environmental site assessments or other environmental work has been completed.
- Provide a general description and give dimensions of the project including the general nature of the proposed development, e.g. grading, retaining walls, structures, construction materials, and utilities. Also, include proposed finish floor elevations, maximum depth of cut or fill, foundation and floor loads, etc.
- Describe all other details of the project, which were assumed or relied upon to develop the conclusions and recommendations contained in the report.

1.3 PURPOSE AND SCOPE OF SERVICES

- State succinctly the primary purpose for the geotechnical engineering services.
- Summarize the scope of geotechnical engineering services that form the basis for the conclusions and recommendations contained in the report.
- Indicate any limitations to the scope of geotechnical engineering services provided, particularly if the scope represents a departure from service typically provided on similar projects.

1.4 INVESTIGATIONS SUMMARY

- Describe the dates, general nature, and extent of the geotechnical investigation. This section should include data research, borings, test pits, geophysics, physical laboratory testing, chemical testing, field instrumentation or testing, infiltration testing, etc.
- If the investigation was complex, present a complete and detailed explanation and results in the form of an appendix.

1.5 REPORT OVERVIEW

- Introduce and describe other sections of the report, directing the reader to critical sections, if appropriate.
- Identify and describe all attachments and appendices.

2.0 SITE CONDITIONS

The Site conditions shall describe all site features relevant to the study and the geotechnical engineering conclusions and recommendations. Terminology should be clear and consistent, and continue to be consistent through the entire report.

2.1 LOCATION AND SURFACE CONDITIONS

- Present the project's specific address, location and cross streets.
- Generally describe the site and adjoining properties, and indicate their current use.
- Describe surface elevation, topography and drainage. Clearly reference all elevation to City of Bellevue NAVD88 datum.
- Identify all current structures, subsurface utilities, wells, manmade fills, and other surface features.
- Describe vegetation, topsoil, paving, and other surface coverings.
- Describe any indications of historic geological processes or hazards on or near the site (e.g., slop instability, landslides, liquefaction, flooding, etc.)
- Describe any indications of surface releases or other contamination, or potential contamination sources.
- Describe any planned changes to the surface conditions described above which will take place after the investigation.

2.2 GEOLOGIC SETTING

- Provide an overview of regional geology, local stratigraphy, groundwater occurrence, etc.

2.3 SUBSURFACE SOIL CONDITIONS

- Describe each soil or geologic unit encountered by their classification and group units with respect to the properties that are most relevant to the conclusions and recommendations. Give each unit group a unique, clear, common title and consistently refer to this unit by its given title throughout the report.
- Provide the results of field soil infiltration tests for on-site stormwater management.
- Provide important results of the laboratory physical property testing and its indications of soil behavior.
- Avoid detailed descriptions of the sequence of units found in individual borings; rather, focus on variations in the units across the site, if appropriate. Refer the reader to the exploration logs for details.
- Describe any expected changes in subsurface conditions that may occur with time after the investigation.

2.4 GROUNDWATER CONDITIONS

- Describe the nature and occurrence of groundwater.
- Provide and opinion on likely seasonal variations in groundwater levels or flows, and the possibility for changes from those encountered at the time of exploration.
- Show groundwater levels on soil logs.

2.5 SUBSURFACE CONTAMINATION

- Describe the nature and extent of soil and/or groundwater contamination as revealed by the explorations. Reference any applicable Environmental Assessments if performed.
- Provide important results of the analytical laboratory testing and indications about contamination distribution and concentration.
- Indicate limitations of knowledge on the nature and extent of contamination.
- Discuss possible changes that may occur in these conditions over time.

3.0 DISCUSSION AND CONCLUSIONS

The Discussion and Conclusions should set out major geotechnical issues and alternative for the project, along with the Geotechnical Engineer's conclusions, in a succinct and clear manner. This section shall clearly describe the logic and reasoning supporting the recommended approach, or alternative approaches. Specific recommendations shall be very limited in this section; they should be presented in a separate Recommendations section.

Discussions and conclusions should:

- Build on information described in the previous sections.
- Use consistent terminology to describe project features, soils, and construction materials.
- Explain any apparent inconsistencies in the data or investigations.
- Clearly describe any limitations or restrictions to the conclusions and recommendations.

3.1 SLOPE STABILITY

- Summarize data and analysis used to evaluate slope stability.

- Provide an opinion regarding the risk of instability on the site or adjacent properties currently, during construction, and after the project is completed.
- Describe how design and construction recommendations will reduce or eliminate the risk of instability.

- Discuss any construction or post-construction measures necessary to verify slope stability.

3.2 SEISMIC CONSIDERATIONS

- Provide an opinion on the expected level of ground motion during a major earthquake. For seismic analyses, acceleration factors should be estimated based on a peak ground acceleration with a 10 percent of probability of exceedance in 50 years (i.e. a 475-year return period). Alternatively, a site-specific seismic study can be conducted to determine an appropriate peak ground acceleration.
- Describe any seismic risks associated with an earthquake such as liquefaction, lateral spreading, landslides, or flooding.
- Describe how design and construction recommendations will reduce or eliminate the impact of seismic risks

3.3 SITE WORK

- Describe what is anticipated for site grading and earthwork and provide an opinion on the proper sequence and approach to accomplish the site work.
- Describe key issues which will impact proper earthwork, including short term slope stability, on-site and import fill materials, groundwater and drainage, rainfall and moisture sensitive soils, and erosion.
- Describe how these issues should be addressed during construction, including dewatering, temporary retaining structures, and erosion control.
- Include specific recommendations for on-site erosion control based on erosivity of site soil and presence of groundwater, surface water, and slopes.
- Include statements regarding the importance of construction monitoring by a geotechnical engineering firm.

3.4 INFILTRATION

- Describe which of 4 methods allowed in the Utility Engineering Standards (Storm chapter D4-06.7) was used to determine infiltration rates.
- Summarize data and analysis used to evaluate site suitability for infiltration facilities.
- Show location(s) of any infiltration tests on the site plan, and call out areas with infiltration rates suitable for infiltration facilities on the site plan.
- Estimate infiltration rates in inches per hour at depths sufficient to include those elevations up to the required depth (up to five feet) below proposed infiltration facilities and in areas deemed unsuitable for infiltration.
- Provide an opinion on the risk of onsite and downslope flooding or erosion that may result from infiltration facilities in any soils suitable for infiltration.
- Describe how design and construction recommendations will reduce or eliminate the risk of facility failure, erosion and flooding.

3.5 RETAINING STRUCTURES

- If temporary retaining systems are necessary, provide an opinion as to the most appropriate type of temporary retaining systems or systems.
- Summarize the data and analysis used to evaluate permanent retaining systems.

- If permanent refining systems are necessary, provide an opinion on the most appropriate permanent retaining system or systems and describe their expected performance with respect to stability and deflection.
- If reinforced soil slopes or reinforced soil backfill are to be used, clearly define all limitations on backfill materials, reinforcement, and drainage.
- If rockeries, modular block walls, or other non-structural slope protection systems are expected, describe the limitations on such systems.
- Emphasize any aspects or site work, particularly with respect to native soil materials, backfill, and drainage, which could impact performance of the retaining structures.
- Include statements regarding the importance of construction monitoring by a geotechnical engineering firm.

3.6 ROCKERIES & MODULAR BLOCK WALLS

- Emphasize that rockeries and modular small block walls are not retaining walls or structures.
- Indicate that the primary function of a rockery or block wall is to protect the slope face by preventing soil erosion and sloughing. Rockeries and block walls should be considered maintenance items that will require periodic inspection and repair. Thus, rockeries and block walls should be located so that they can be reached by a contractor if repairs become necessary.
- Discuss what type of inspection and testing may be required during rockery or block wall construction.

3.7 FOUNDATION SUPPORT

- Summarize the data and analysis used to evaluate foundation systems.
- Provide an opinion on the most appropriate foundation system and alternatives, along with the expected level of performance with respect to load capacity and settlement.
- Emphasize any aspects of site work that could impact the performance of foundations.
- Include statements regarding the importance of construction monitoring by a geotechnical engineering firm.

4.0 RECOMMENDATIONS

The Recommendations should present all detailed geotechnical engineering recommendations for design and construction in a clear and logical sequence. For each item covered in the recommendations sections, present the following:

- Specific design recommendations along with their limitations, factors of safety, minimum dimensions, and effect of expected variations in actual conditions.
- Specific construction recommendations including definitions, materials, execution, monitoring, testing, or other quality control measures, and any other construction requirements to support the design recommendations.
- Responsibility for seeing that each recommendation is met, such as owner, geotechnical engineer, other design consultants, or contractor. The ultimate responsibility is held by the owner of the project; however, all design parties have shared responsibility. Construction responsibilities are directly related to the contractor.

4.1 SITE GRADING AND EARTHWORK

- Provide specific design recommendations for 1) depth of stripping, 2) soil excavation limits and slopes, 3) depth and lateral limits of over-excavation to remove unsuitable materials, 4) preload fills, 5) location and thickness of particular fill material or compaction requirements 6) maximum

temporary and permanent slopes, 7) permanent surface and subsurface drainage systems, and 8) permanent erosion controls.

- Provide specific construction recommendations for 1) clearing, 2) on-site and/or import fill materials, 3) excavation and compaction equipment, 4) fill material moisture conditioning, placement, and compaction, 5) proof-rolling, in-place density testing, and other quality control measures, 6) temporary seepage and drainage control measures, 7) permanent surface or subsurface drainage system installation (as appropriate), 8) temporary slope protection and erosion control measures, and 9) protection of infiltration facilities (including bioretention and pervious pavement) from compaction and from sediment contamination during construction.
- All design and construction methodologies should be specific and identifiable; no generalized or vague statements are acceptable.

4.2 TEMPORARY SHORING AND RETAINING WALLS

- Provide specific design recommendations for 1) active and passive earth pressures, 2) surcharge pressures, 3) bearing capacity, 4) minimum or maximum dimensions and depth of penetration, 5) lateral support, 6) wall or backfill drainage systems, and 7) any other appropriate structural details.
- If appropriate, provide specific design recommendations for tie-back anchors including 1) anchor inclination, 2) no load zones, 3) minimum anchor length, 4) anchor bond zone, 5) anchor adhesions, and 6) corrosion protection.
- Provide specific construction recommendations for 1) installation, 2) on-site and/or import backfill materials, 3) backfill material moisture conditioning, placement, and compaction, 4) in place density testing or other control measures, and 5) seepage and drainage control.
- If appropriate, provide construction recommendations for tie-back anchors including 1) anchor installation methods, 2) anchor testing, and 3) monitoring.

4.3 ROCKERIES

- Provide recommendations as outlined in the Associated Rockery Contractors (ARC) Standard Rock Wall Construction Guidelines (December 1992).
- The geotechnical engineer should provide direct input to the design of the rockeries and provide construction monitoring and testing as appropriate. Specific design parameters may include: Rock quality, density, frequency of testing, slopes, keyways, surcharges, drainage, rock sizes, face inclination, and surface drainage.

4.4 REINFORCED SOIL STRUCTURES

- Geogrid or geotextile fabric may be used to reinforce a fill. Reinforcement results in a more stable slope and helps reduce the risk of significant long-term maintenance. If reinforced slopes are used, the geotechnical engineer should specify, at a minimum, the fill soil materials, vertical spacing of the reinforcement, the specific type of reinforcement and the distance to which it must extend into the fill, the amount of overlap at reinforcement joints, and the construction sequence. Additional design parameters will be required for each specific site.

4.5 STRUCTURE AND FOUNDATIONS

- Provide seismic design recommendations for 1) Building Code soil type and Site Coefficients, and 2) any specific recommendations to reduce the risk of damage due to earthquakes.
- Spread footing foundations--provide design recommendations for 1) bearing soils, 2) bearing capacity, 3) minimum footing depths and widths for both interior and exterior footings, 4) lateral load resistance, and 5) foundation drainage systems.

- Mat foundations-provide design recommendations for 1) bearing soils, 2) bearing capacity, 3) modulus of subgrade reaction, 4) minimum dimensions, and 5) lateral load resistance.
- Pile foundations-provide design recommendations for 1) type of pile, 2) means of support (end of friction), 3) minimum dimensions and depths, 4) allowable vertical and uplift capacity, 5) allowable lateral loads and deflections, and 6) group effects and minimum spacing.
- Spread footing or mat foundations-provide construction recommendations for 1) foundation subgrade preparation and protection, 2) verification of bearing capacity, and 3) installation of foundation drainage system.
- Pile foundations-provide construction recommendations for 1) pile driving equipment, 2) pile installation, 3) pile load tests or verification piles, and 4) monitoring and testing during pile installation.

4.6 FLOORS

- Slab-on-Grade Floors-provide design recommendations for 1) slab base rock thickness, 2) capillary break, 3) vapor barrier, and 4) floor system drainage.
- Supported Wood Floors-provide design recommendations for 1) vapor barrier, and 2) crawl space drainage.
- Slab-on-Grade Floors-provide construction recommendations for 1) subgrade preparation, 2) slab base rock placement and compaction, 3) capillary break and vapor barrier installation, and 4) floor drainage system installation (if appropriate).

4.7 PAVEMENTS

- Provide design recommendations for 1) pavement design section, and 2) pavement drainage.
- Provide construction recommendations for 1) pavement subgrade preparation and verification, and 2) pavement base and subbase materials, placement, and compaction.

4.8 UTILITIES

- Provide construction recommendations for 1) utility excavation, 2) bedding material placement, and 3) backfill material, placement, and compaction.
- Provide construction recommendations for subgrade preparation, monitoring and inspection during infiltration facility (including bioretention and pervious pavement) installation, where applicable.

4.9 DRAINAGE

- Recommend provisions for subsurface drainage at walls, floors, and footings.
- Evaluate permanent and temporary surface and subsurface drainage for both walls and floors if applicable. Provide approximate flow rates in gallons per minute and pipe sizes if required by design.
- Recommend locations suitable for infiltration facilities, if any.

4.10 HAZARDS

- Present additional information if natural or man-made hazards exist on the property. Hazards in the categories of wetlands, streams and flood hazard, erosion, landslide, seismic, and coal mine hazards can be found in various City and King County resources. Recommendations should be general and further studies may be required.

REPORT FIGURES AND ILLUSTRATIONS

1. VICINITY MAP

Include a Vicinity or Location Map that presents adequate street and/or other physical references to allow clear identification of the project location. This map may be an individual figure or be included on the Site Plan.

2. SITE PLAN

Show the project boundaries, property lines, existing features and the proposed development and structures. A north arrow and scale should be included along with all subsurface exploration locations. The accuracy of exploration locations should be indicated on the Site Plan or in the report.

3. EXPLORATION LOGS

Include logs of all explorations describing soil units encountered, soil classification, density or stiffness, moisture conditions, groundwater levels, stratigraphic sequence, common geologic unit name, and other descriptive information.

4. LABORATORY TEST DATA

Include figures or tables of laboratory test results if presentation of all the data, in the text, would require more than a simple paragraph to supplement the data provided in the exploration logs.

5. CROSS SECTIONS

Include cross sections to visually present all but the simplest subsurface conditions.

6. TYPICAL DETAILS

Include figures, graphs, and other visual aids to clearly present detailed recommendations. Provide design details (stamped by a professional engineer) on drawings such as: rockeries, reinforced earth, interceptor trenches, wall and footing drains, utility backfill, and other details used for a particular design.

STANDARDS FOR SLOPE STABILITY ANALYSES

STUDY REQUIREMENTS

The geotechnical engineer should review and evaluate the stability of natural, temporary, and permanently constructed slopes on or adjacent to the property to be developed. Such review should, at a minimum, include:

- Review of published geologic data referencing or including the site.
- Review of previous studies of the site performed by geotechnical engineers.
- Reconnaissance of the site for signs of slope instability.

Where such review, in the opinion of the engineer of the City, indicates that the stability of the slopes are reduced by the proposed development, or that the natural slopes may have a factor of safety of less than 2.0 in the static case or 1.5 in a dynamic (seismic) case, then the geotechnical engineer shall perform additional, more detailed review and evaluation of the stability of the slope. Such additional review and evaluation should, at a minimum, include:

- Drilling and sampling of test borings to a depth necessary for the evaluation of slip surfaces with factors of safety lower that the above criteria, or to at least 15 feet or 10 percent of the slope height (whichever is less) beyond the most critical slip surface for the design.
- Laboratory shear testing of soil samples which are representative of all significant zones or layers of soil and/or rock through which the potential slip surfaces pass.
- Performing a limit equilibrium analyses or other approved analyses of all significant critical slip surfaces associated with the slope. Approved analyses may be conducted by a computer program if the methodology and assumptions are clearly delineated and the name, version number, and solution methodology of the program are clearly presented in the report. For pseudo-static seismic analyses, the acceleration factor must be based on a peak ground acceleration with a 10 percent of probability of exceedance in 50 years (i.e. a 475-year return period). Alternatively, a site-specific seismic study can be conducted to determine an appropriate maximum horizontal acceleration. All analyses should include a cross section of the slope(s) and critical slip surfaces.
- Other analyses as required by the City.

DESIGN REQUIREMENTS

For a limit equilibrium analysis, design factors for safety of slopes will be no less than the following:

	Temporary Slope	**Permanent Slope**	
		Low Threat Upon Failure[1]	High Threat Upon Failure[2]
Static	1.25	1.40	1.50
Dynamic	1.05	1.10	1.15

The analysis should consider the impacts of groundwater in the modeling of soil strength and density parameters, and in other ways considered appropriate by the engineer. A conservative wet season analysis should be sued for permanent slopes and those temporary slopes which will be conducted anytime between October 1 and May 31.

Alternative analyses may be proposed by the Geotechnical Engineer and accepted by the City, if they are based upon accepted and published methodologies which evaluate static and dynamic loading cases, and the consequences of the type of slope failure under consideration. Other design requirements remain the same.

1. Permanent slopes termed "Low Threat Upon Failure" are those slopes whose failure will not impact buildings or other structures inhabited by humans.

2. Permanent slopes termed "High Threat Upon Failure" are those slopes whose failure will impact or have a reasonable engineering probability or impacting buildings or other structures inhabited by humans.

BMP T101: Tree Protection Requirements

Purpose

The section identifies management practices to employ at construction sites to guarantee successful tree and vegetation protection before, during, and through a lifetime of site use and maintenance. The City of Bellevue regulates and manages tree retention during development through the Land Use Code and the Clearing and Grading Code. Trees and vegetation are preserved for several reasons:

- To sustain both the function and value of vegetation assets
- To enhance public safety by carefully maintaining the health of onsite vegetation and to reduce liability
- To contain costs associated with site restoration
- To reduce or avoid soil compaction and degradation
- To avoid physical injury to existing trees
- To avoid root injury to trees and other vegetation
- To protect soils and hydraulic integrity of the entire site
- To protect existing irrigation, utilities and underground drainage
- To prevent sediment-laden and/or polluted runoff from entering drainage systems and water bodies (streams, wetlands, lakes).

Definitions

Critical Root Zone (CRZ) - The circular area around the base of a tree calculated as the distance to the furthest extent to the tree's dripline.

Development Project - Any construction activity including demolition, grading, drainage improvements, new construction of main house or accessory structures, added square footage to existing main house or accessory structures, site preparation and landscaping.

Diameter at Breast Height (DBH) - The diameter of the tree trunk at four and one-half feet (or 54 inches) above natural grade level. The diameter may be calculated by using the following formula: DBH= circumference at 4.5-feet x 3.14. To determine the DBH of multi-trunk trees or measuring trees on slopes, consult the current Guide for Plant Appraisal, published by the Council of Tree and Landscape Appraisers.

Drip line - The circular area around the base of a tree measured by the furthest lateral extent of the foliage.

Project Arborist - A qualified professional who is qualified to evaluate trees such as a Certified Arborist, a Registered Consulting Arborist, a Licensed Landscape Architect or a Certified Forester. The project arborist is responsible for decisions related to vegetation on site before, during and after construction.

Project Manager - The person assigned to the construction project by the department or the contractor who is responsible for managing the overall project. Project management duties include schedule, budget, and related logistics, including construction site management.

Tree Protection Site Plan (Base Map) - A set of drawings that show existing site conditions and proposed landscape improvements, including trees to be removed, relocated or to be retained. Site plans shall include the following minimum information that may affect trees:

A. Surveyed location, species, size, drip line area of significant (including trees located on neighboring property that overhang the project site) and Street Trees within 30-feet of the project site.

B. Paving, concrete, trenching or grade change located within the **Tree Protection Zone (TPZ).**

C. Existing and proposed utility pathways.

D. Surface and subsurface drainage and aeration systems to be used.

E. Walls, tree wells, retaining walls and grade change barriers, both temporary and permanent.

F. Landscaping, irrigation and lighting within TPZ of trees.

G. All of the final approved site plan sheets shall reference tree protection instructions.

Significant Tree - A healthy evergreen or deciduous tree, eight inches in diameter or greater at four feet above existing grade. (Land Use Code 20.50.046)

Street Tree - means any tree growing within the street right-of-way, outside of private property.

Tree Appraisal - means a method of determining the monetary value of a tree as it relates to the real estate value of the property, neighborhood, or community.

Tree Protection Plan (TPP) - A plan prepared by a certified arborist that outlines measures to protect and preserve trees.

Tree Protection Zone (TPZ) - The circular area around a tree calculated as 1.5 feet of radius for every inch of DBH, or no less than 6 feet, whichever is greater that is required to be protected with a fenced enclosure.

Tree Protection Fencing - A temporary enclosure erected around a tree to be protected at the boundary of the tree protection zone. Tree protection fencing should consist of six 6 foot high chain link fence, mounted on two inch diameter metal posts, driven into the ground to a depth of at least 2-feet at no more than 10-foot spacing.

Warning Sign - A warning sign shall be prominently displayed on each fence. The sign shall be a minimum of 8.5 x 11-inches and clearly state: “WARNING – Tree Protection Zone - This fence shall not be removed and any injury to this or these trees is subject to penalty according to BCC 14.06.100.”

Conditions of Use

Trees and vegetation can be impacted during construction in many ways and often times the damage is not seen for several months or even years after the construction is completed. Proper tree protection can benefit not only the tree by reducing stress during construction but also the developer and property owner by reducing long term costs associated with future maintenance. The cost of

removing a tree killed by construction after development is usually greater than the cost of protecting the tree during construction.

Common types of tree injuries that occur during construction may include:

- Mechanical injury to roots, trunk or branches
- Compaction of soil by storing of materials or equipment, which degrades the functioning of roots, inhibits the development of new roots and restricts drainage.
- Changes in existing grade which can cut or suffocate roots
- Alteration of the water table - either raising or lowering
- Changes in drainage patterns that promotes erosion or excessive accumulation of runoff
- Sterile soil conditions associated with stripping off topsoil
- Damage to roots from dumping of liquids or rinsing of construction equipment

Not all damage occurs to trees and vegetation during the actual construction of buildings or structures. Trees are often damage during the landscaping phase after the heavy equipment and workers have left. Installing irrigation, applying topsoil and turf installation also causes damage to trees. All construction-related impacts can produce long-term maintenance problems that can be avoided by following the BMPs set forth in the remainder of this chapter.

Planning & Permitting Phase

- Inventory and evaluate all existing trees on the site and trees immediately adjacent with driplines or expected root zones extending onto the project site. The inventory and evaluation shall include, but not be limited to the following information:
  - Tree species
  - Tree size in DBH and canopy spread
  - Tree condition or observed defects
  - Tree numbers that are included in an inventory table
  - A calculation of the total diameter inches of significant trees on the site along with an indication of the interior or perimeter location of the tree, if applicable to the proposed development type and tree retention.
  - Tree map showing the location of the existing significant trees on the site with numbers corresponding to the tree inventory table.
- **Submit a Tree Protection Plan (TPP)** prepared by a Project Arborist that includes the following information:
  - Location of and description all significant trees that will remain on the project site per LUC 20.20.900
  - Illustration of the Tree Protection Zone (TPZ) for each tree is a radius of 1.5 feet for every inch of DBH or a minimum of 6 feet, whichever is greater.

- The TPZ will regularly exceed the Critical Root Zone (CRZ), which is the outer edge of the tree's canopy, or drip line. The reduction of TPZ closer to the TPZ must be accompanied by mitigating measures and be approved in writing by the City of Bellevue. The TPZ may not be smaller than the CRZ.
- Description of expected tree protection techniques that will be used on the project as per the Land Use Code and the Clearing and Grading Code All tree removal and pruning needed to make room for future structures and construction equipment should also be drawn on the base map
- A timetable for project meetings with the Project Team including a pre-construction meeting and the schedule for the Project Arborist monitoring.
- Calculation of appraisal amounts to be collected by the City as an assurance device in the form of a deposit equal to the tree appraisal value of all protected trees as determined under the methods described in the Guide for Establishing Value of Trees and Other Plants, published by the International Society of Arboriculture.

Pre-Construction Site Preparation Phase

- Stage equipment away from trees and vegetation to be retained so that existing plants and their roots are protected.
- Fence off with chain link or construction fencing all entry and exit routes. When planning routes, avoid utility access corridors.
- Protect irrigation and drainage systems shall from damage unless plans call for renovation of such systems.
- Stake and/or flag clearing limits and tree protection to be verified and approved by the City's clearing and grading inspector at the required preconstruction meeting.
- Project Arborist will supervise and verify the following tree protection measures are in place and comply with the approved TPP:
  - A 6" layer of coarse mulch or woodchips is to be placed beneath the Tree Protection Zone (TPZ) of the protected trees. Mulch is to be kept 12" from the trunk.
  - Trees that have been identified in the site inventory as posing a health or safety risk may be removed or pruned by no more than one-third, subject to approval of the required permit by the City of Bellevue. Pruning of existing limbs and roots shall occur under the direction of the Project Arborist.
  - Tree Protection Fencing of 6' chain link fencing shall be installed around the TPZ of protected tree(s). The fencing can be moved within the TPZ if authorized by the Clearing and Grading Inspector and the Project Arborist but not closer than 2' from the trunk of any tree. Fence posts shall be 1.5" in diameter and are to be driven 2' into the ground. The distance between posts shall not be more than 10'.
  - Tree protection fencing shall have a warning signs prominently installed on each fence at 20-foot intervals. The sign shall be a minimum 8.5-

inches x 11-inches and clearly state: “WARNING - Tree Protection Zone”

- Movable barriers of chain link fencing secured to cement blocks may be substituted for “fixed” fencing if the Project Arborist and City Staff agree that the fencing will have to be moved to accommodate certain phases of construction. The builder may not move the fence without authorization from the Project Arborist and City Staff.
- Should temporary access into the TPZ be approved, an additional 3” layer of gravel and ¾” plywood shall be placed over the CRZ.

Construction Phase

During the Construction phase, ensure the TPP is being followed and report any conflicts or deviations to the City of Bellevue Clearing and Grading Inspector. Monitor construction activities that require encroachment within the TPZ, such as grading or trenching.

Avoid the following conditions:

1. Allowing run off or spillage of damaging materials into the approved TPZ.

2. Storing construction materials or portable toilets, stockpiling of soil, or parking or driving vehicles within the TPZ.

3. Cutting, breaking, skinning, or bruising roots, branches, or trunks without first obtaining authorization from the Project Arborist.

4. Discharging exhaust into foliage.

5. Securing cable, chain, or rope to trees or shrubs.

6. Trenching, digging, tunneling or otherwise excavating within the CRZ or TPZ of the tree(s) without first obtaining authorization from the Project Arborist.

Periodically inspect during construction - at four-week intervals - to assess and monitor the effectiveness of the TPP and provide recommendations for any additional care or treatment. More frequent may be required based on the TPP.

The following activities should be observed and inspected by the project arborist during the construction phase to ensure compliance with the approved TPP:

1. Only excavation by hand or compressed air shall be allowed within the TPZ of trees. Machine trenching shall not be allowed.

2. In order to avoid injury to tree roots, when a trenching machine is being used outside of the TPZ of trees, and roots are encountered smaller than 2”, the wall of the trench adjacent to the trees shall be hand trimmed, making clear, clean cuts through the roots. All damaged, torn and cut roots shall be given a clean cut to remove ragged edges, which promote decay. Trenches shall be filled within 24 hours, but where this is not possible, the side of the trench adjacent to the trees shall be kept shaded with four layers of dampened, untreated burlap, wetted as frequently as necessary to keep the burlap wet. Roots 2” or larger, when encountered, shall be reported immediately to the Project Arborist, who will decide whether the Contractor may cut the root as mentioned above or shall excavate by hand or with compressed air under the root. All exposed roots are to be protected with dampened burlap.

3. Route pipes outside of the TPZ of a protected tree to avoid conflict with roots. Where it is not possible to reroute pipes or trenches, bore or tunnel beneath

the TPZ of the tree. The boring shall take place not less than 3' below the surface of the soil in order to avoid encountering "feeder" roots. All boring equipment must be staged outside of the TPZ.

4. All grade changes adjacent to the TPZ of a significant tree shall be supervised by the Project Arborist. Cuts or Fills of soil that are adjacent to the TPZ will have a retaining wall system designed in consultation with the Project Arborist and approved in writing by City Staff.

5. Any damage due to construction activities shall be reported to the Project Arborist and City Staff within six hours so that remedial action can be taken.

6. The Project Arborist shall be responsible for the preservation of the designated trees. Should the builder fail to follow the tree protection specifications, it shall be the responsibility of the Project Arborist to report the matter to City Staff as an issue of non-compliance.

Post-Construction

The Post-Construction Phase begins when the equipment leaves and the new tenants move in. Important follow-up monitoring of the protected trees will help ensure their survival and identify signs of early stress.

The applicant shall arrange with the Project Arborist for the long-term care and monitoring of preserved trees by complying with the following conditions:

1. Complete post-construction tree maintenance, including pruning, mulching, fertilization, irrigation, and soil aeration where necessary.

2. Remove, by hand, all soil and root protection material such as wood chips, gravel and plywood.

3. Provide for remediation of compacted soil by methods such as aeration or vertical mulching.

4. Apply at least 1 inch of water per week by deep watering in the absence of adequate rainfall.

5. Fertilize trees with slow released phosphorus, potassium, calcium, magnesium, and other macro- and micro-nutrients as indicated by a soil test, but wait at least one year to apply any nitrogen.

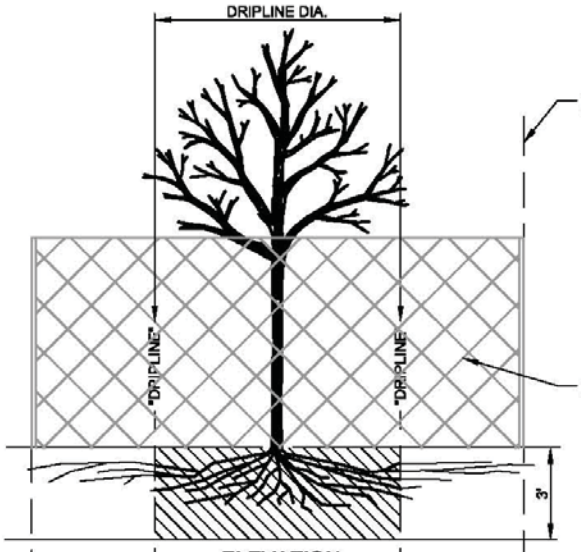
6. Fertilize lightly with slow release nitrogen after 1 year, and then make annual light nitrogen applications for the next 3 to 5 years.

7. Inspect trees annually for at least 3 and up to 5 years after construction to look for changes in condition and signs of insects or disease, and to determine maintenance needs.

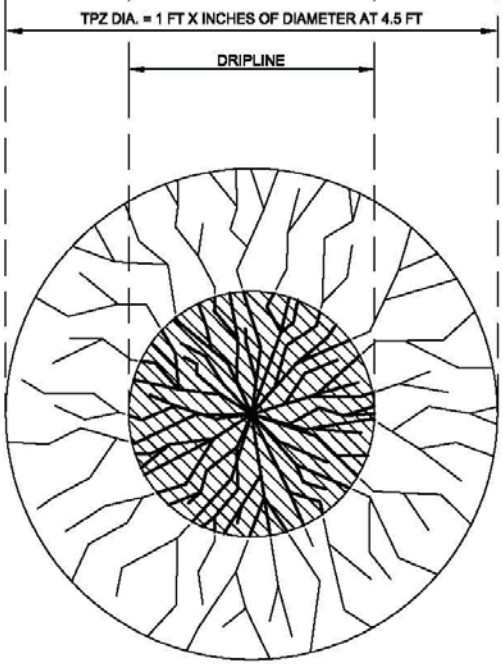
8. Remove trees that are badly damaged or are in irreversible decline as determined by the Project Arborist and City Staff.

9. Continue to protect not only the large, established trees on the site but also those newly planted in the landscape as per LUC 20.20.520.K.

10. Provide annual inspection reports to the City.



ELEVATION



PLAN VIEW

Tree Protection Zone (TPZ)

- Extends from tree trunk to 1 foot for every inch of trunk diameter measured at 4.5 feet above grade or 6' whichever is greater.
- Protective fencing to remain installed at all times.
- Working within TPZ restricted to City approved personnel and supervised by Project Arborist.
- No storage of equipment or materials within TPZ, or washing of equipment in or within 10' of TPZ.

Tree Protection Fencing

- Minimum 6' chain link fencing installed completely around TPZ consistent with Site Plan. See Tree Protection Detail TP-2.
- Fencing shall have 1.5" steel posts to be driven 2' into the ground no more than 10' apart.
- Tree protection signs shall be posted on fencing no more than 20' apart.
- Apply a 4-6" layer of wood chips 12" from tree trunk.

Dripline

- Extends from trunk to outer canopy edge - Drip Line.
- Absolutely no storage of equipment or materials within Dripline.
- Access restricted based on City approval and Project Arborist supervision required.
- No trenching within Dripline; tunneling must have approval from City.

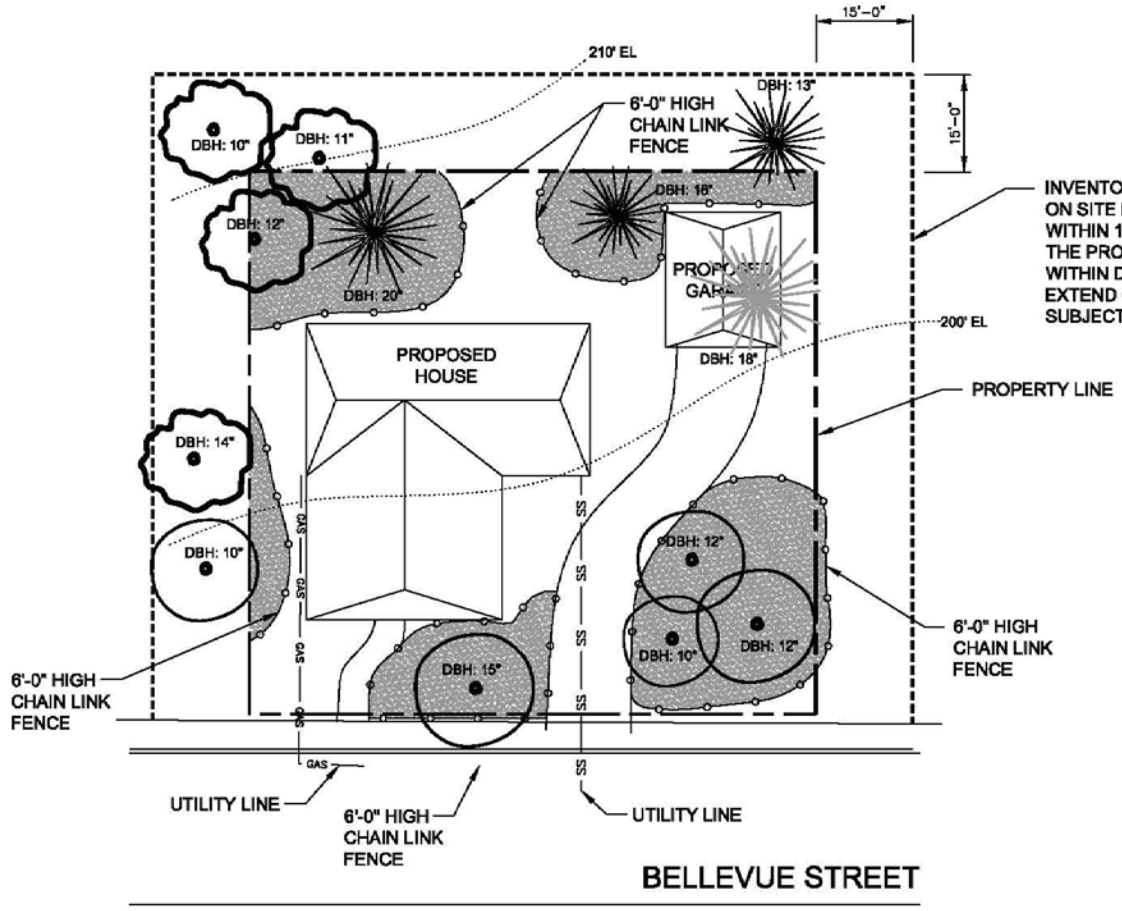
Root Protection In Tree Protection Zone

- Use/access into TPZ shall be upon approval from City and supervised by Project Arborist.
- Additional layer of 3" gravel and ¾" plywood shall cover Dripline when authorized work being performed in TPZ.
- All wood chips, gravel and plywood to be removed by hand upon project completion.

DRAWING NUMBER	TP-1
SCALE	NONE
REVISION DATE	1/10
DEPARTMENT	ALL

TREE PROTECTION PROCEDURES DURING CONSTRUCTION

City of Bellevue



INVENTORY AND DEPICT, ON SITE PLAN, ALL TREES WITHIN 15 FEET BEYOND THE PROPERTY LINE OR WITHIN DRIP LINES THAT EXTEND ONTO THE SUBJECT PROPERTY.

PROPERTY LINE

6'-0" HIGH CHAIN LINK FENCE

Legend

- *Acer macrophyllum* (bigleaf maple)
- *Fraxinus latifolia* (Oregon white ash)
- *Pseudotsuga menziesii* (Douglas-fir)
- *Existing tree to be removed*

Arborist: Johnny Appleseed
Contact: 425-452-4188

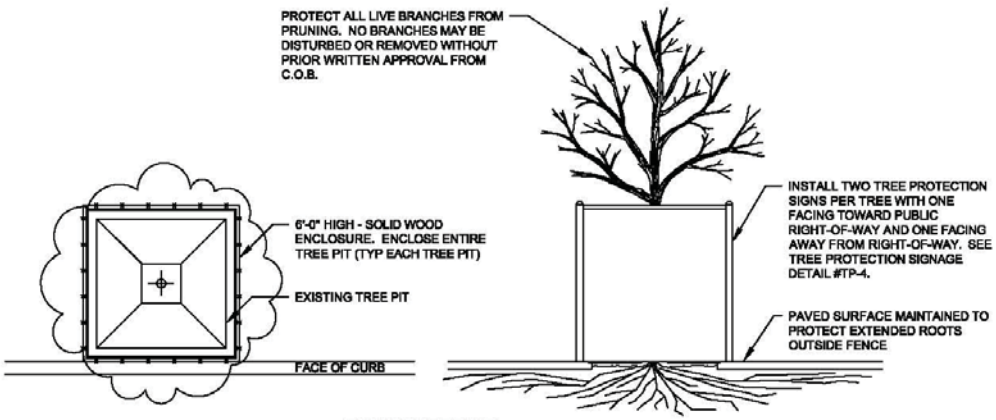
General Notes

1. 6'-0" HIGH CHAIN LINK FENCE IS PLACED 1.5 FEET PER INCH DBH AND DEFINES THETREE PROTECTION ZONE (TPZ).
2. STAKES WILL BE 1.5" IN DIAMETER, DRIVEN INTO GROUND 2' AND PLACED NO FURTHER THAN 10 FEET APART.
3. TREE PROTECTION SIGNAGE SHALL BE INSTALLED AT INTERVALS NO LESS THAN 20' APART. SEE TREE PROTECTION SIGNAGE DETAIL # TP-4.

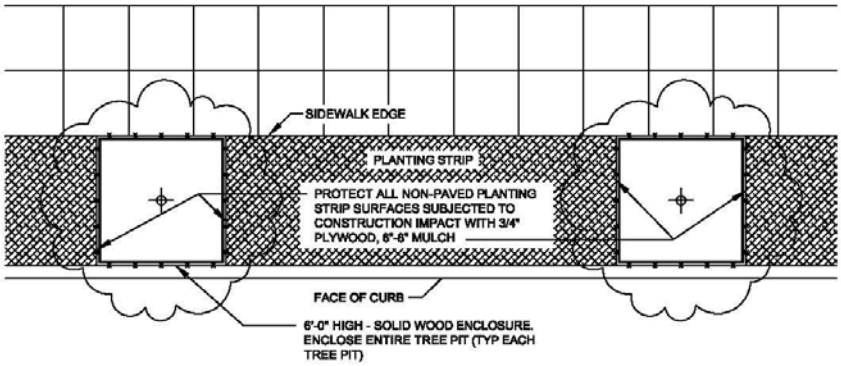
City of Bellevue

TREE PROTECTION SITE PLAN

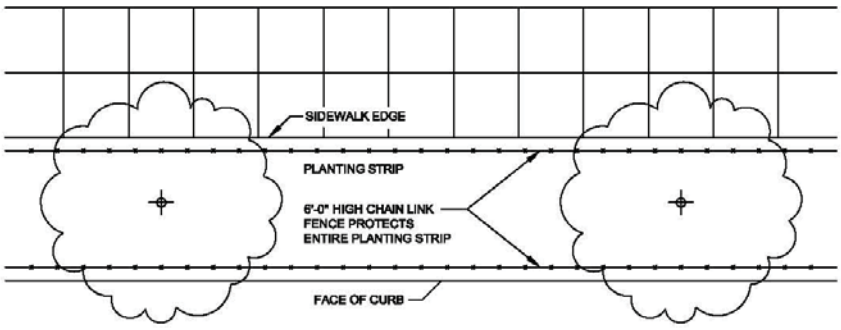
DRAWING NUMBER	TP–2
SCALE	NONE
REVISION DATE	1/10
DEPARTMENT	ALL



TREE IN TREE PIT



TREE IN PLANTING STRIP-OPTION 1



TREE IN PLANTING STRIP-OPTION 2

NOTE:
DURING CURB REPLACEMENT, ROOTS WITHIN 6 INCHES OF DEPTH FROM BOTTOM OF CURB SHALL BE CUT WITH A CLEAN, SHARP SAW. ROOTS GREATER THAN 6 INCHES DEEP SHALL BE PRESERVED, UNLESS SPECIFICALLY DIRECTED BY C.O.B.

DRAWING NUMBER	TP-3
SCALE	NONE
REVISION DATE	1/10
DEPARTMENT	ALL

TREE PROTECTION STANDARD

City of Bellevue

Instructions for Completing Site Inspection Form

The site inspection form (provided below) must include the following as a minimum:

1. Inspection time and date
2. Name and phone number of the erosion & sediment control (ESC) specialist
3. Weather information
4. A summary or list of all BMPs that have been implemented, including observations of all erosion and sediment control structures and practices.
5. The following must be noted:
   a. Locations of BMPs inspected,
   b. Locations of BMPs that need maintenance,
   c. The reason maintenance is needed,
   d. Locations of BMPs that failed to operate as designed or intended, and
   e. Locations where additional or different BMPs are needed, and the reason(s) why
6. A description of stormwater discharged from the site. The ESC specialist must note the presence of suspended sediment, turbid water, discoloration, and/or oil sheen, as applicable.
7. Any water quality monitoring performed during inspection
8. General comments and notes, including a brief description of any BMP repairs, maintenance or installations made as a result of the inspection.
9. A statement that, in the judgment of the person conducting the site inspection, the site is either in compliance or out of compliance with the terms and conditions of the CSWPPP and the permit. If the site inspection dictates that the site is out of compliance, the inspection report must include a summary of the remedial actions required to bring the site back into compliance, as well as a schedule of implementation.
10. Name, title, and signature of the person conducting the site inspection; and the following statement: “I certify that this report is true, accurate, and complete, to the best of my knowledge and belief”.

Site Inspection Form

General Information

Project Name: _____

ESC Specialist Name: _____ **Phone #:** _____

Title: _____ **CESCL#:** _____

Date: _____ Time: _____

Inspection Type: ☐ After a rain event ☐ Turbidity benchmark exceedance

☐ Weekly ☐ Other

Weather: _____

_____

Precipitation: Since last inspection _____ In last 24 hours _____

Description of General Site Conditions: _____

_____

_____

Inspection of BMPs

Element 1: Mark Clearing Limits

BMP: _____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 2: Establish Construction Access

BMP: _____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 3: Control Flow Rates

BMP: _____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP: _____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 4: Install Sediment Controls

BMP: _____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP: _____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP: _____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP: ____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 5: Stabilize Soils

BMP: ____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP: ____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP: ____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP: ____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 6: Protect Slopes

BMP: _____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP: _____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 7: Protect Drain Inlets

BMP: _____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP: _____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 8: Stabilize Channels and Outlets

BMP: _____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP: _____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 9: Control Pollutants

BMP: _____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP: _____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 10: Control Dewatering

BMP: _____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP: _____

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Stormwater Discharges from the Site

	Observed?		Problem/Corrective Action
	Y	N	
Location			
Turbidity			
Discoloration			
Sheen			
Location			
Turbidity			
Discoloration			
Sheen			

I certify that this report is true, accurate, and complete, to the best of my knowledge and belief.

Signature of ESC Specialist

Date

CONSTRUCTION EMERGENCY CONTACT SHEET

Date _____

Project Name: _____

Project Address: _____

Type of Work: _____

Developer: _____

Contact:_____ Office: _____ 24-hr: _____

General Contractor: _____

Contact:_____ Office: _____ 24-hr: _____

Utilities Sub-Contractor: _____

President/Owner: _____

Office: _____ Home: _____ 24-hr : _____

Project Manager: _____

Office: _____ Home: _____ 24-hr : _____

Superintendent: _____

Office: _____ Home: _____ 24-hr : _____

Foreman: _____

Office: _____ Home: _____ 24-hr : _____

Erosion Control Lead: _____

Office: _____ Home: _____ 24-hr : _____

City of Bellevue Inspectors

Clearing & Grading Inspector: _____

Office: (425) 452-_____

Building Inspector: _____

Office: (425) 452-_____

INJURY or FIRE– Call 911

Project Location or Address (If no address, describe the location of the construction access so that it can be relayed to emergency responders)

SPILL (Any hazardous materials including diesel fuel, gasoline, hydraulic fluid that enters the storm drain system or receiving waters)

- Call Washington State Department of Ecology (24 hrs) 425-649-7000
- Call Utilities Operations & Maintenance 425-452-7840
- Call Clearing & Grading Inspector or 425-452-4570

FISH KILL OR DISTRESS

- Call Washington Department of Fish and Wildlife Area Habitat Biologist, Larry Fisher 425-313-5683
- Call Clearing & Grading Inspector or 425-452-4570

WATER QUALITY IMPACTS (Site stormwater runoff turbidity exceeds 250 ntu)

- Call Washington State Department of Ecology (24 hrs) 425-649-7000
- Call Clearing & Grading Inspector or 425-452-4570

ARCHAEOLOGICAL FINDS

- Call Clearing & Grading Inspector or 425-452-4570
- Call Army Corps of Engineers, Seattle office, Lyz Ellis, 206-764-3634 (This is all you need to do under the permit)
  Or if there is no response and there is a need for immediate help, call
  Dr. Whitlam at the Washington State Office of Historic and Archaeological Program (OHAP), 360-407-0771