

Apopei Short Plat
Kirkland # PRE14-00265

**Targeted Drainage Design
Report**

Property Location:
5555 116th Avenue N.E.
Kirkland, Washington

August 25, 2014



Prepared for:

Mr. & Mrs Caurelian Apopei

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INTRODUCTION

This report has been prepared at the request of Mr. Caurelian Apopei in support of a 2-lot short plat. The subject property is located at 5555 116th Ave NE, Kirkland, in King County WA. (Tax Parcel No. 172505909009)

The City of Kirkland has adopted the 2009 King County Surface Water Design Manual (KCSWM), which is supplemented by City of Kirkland's Surface Water Regulations. This report addresses the City's SWDM requirements and the core requirements 1 through 7 (Section 1.2.1 - 1.2.7) and Special Requirements of the 2009 King County Surface Water Design Manual (KCSWM) per requirements of the City of Kent for project approval.

TIR SECTION 1: PROJECT OVERVIEW

The total site is 0.60 acres in size and will be sub-divided into two lots. Lot 1, has an existing single family dwelling which will remain. Lot 2, will contain a new single-family dwelling. In order to accommodate the new SFD, the existing shed and parts of the existing driveway paving will be removed. Other on-site improvements include new parking and driveway access off of 116th Ave NE (**Figure 1: Site Location & Vicinity Map**)

The project proposes to provide full dispersal of the stormwater runoff from the site improvements on the new lot per Appendix C Section C.2.1.8 "Native Vegetative Landscape"

Existing Hydrology

Currently the site contains a residential home on an existing lot which is 0.60 acres in size. All runoff from the site currently flows west onto I-405 where it is intercepted by the drainage system located on the freeway.

The existing site cover is lawn, parking with a few trees located along the property lines. All site runoff is conveyed south in the I-405 storm system for a distance of over 1/4 quarter of a mile where it eventually discharges into a stream south of the site. It then continues in this stream channel for over 3/4 quarters of a mile. The site soils are a gravelly sandy loam, consistent with Alderwood series and not suitable for infiltration.

Developed Hydrology

Once developed the 0.60 acre site will be split into two residential lots. Lot 1, with the existing home, will remain essentially the same with the exception of removal of some of the paving currently encroaching onto Lot 2. Lot 2 will contain a new home along with a new driveway access and parking. All the runoff from these proposed improvements will be dispersed per Appendix C.

The total new impervious area is under 5,000 ft.² total, which is under the 10,000 sf threshold requiring a Full Drainage Design Report. Since the total PGIS area is well under the 5,000 ft.² threshold, no water quality is required.

TIR SECTION 2: CONDITIONS AND REQUIREMENTS SUMMARY

Preliminary approval was granted for the project by the City of Kirkland. In a letter dated February 28, 2014, the conditions of this preliminary approval were outlined in this letter as follows:

- A new driveway access is required off of 116th Ave NE to Serve Lot 2.
- The project must evaluate the feasibility of infiltration and other storm water low impact development facilities.
- The preparation of Small Project Type II engineering plans conforming to Public Works Policy titled “Engineering Plans” is require including grading and drainage, temporary erosion control plan and best management practices for storm water pollution control.
- The core requirements 1 through 7 of 2009 KCSWM Design Manual are required to be addressed for the subject storm drainage improvements.

TIR SECTION 3: OFFSITE ANALYSIS

A “**Level 1 Downstream Analysis**” which includes a field inspection of the property and surrounding area was performed on August 20, 2014. The weather was clear and warm. (Refer to **Figure 4: “Downstream Analysis Map”**)

The project site is located in the Juanita Creek Basin and the downstream area was walked to determine the downstream conveyance, and note any capacity, erosion or flooding problems downstream.

Segment 1: On-site

Currently the site contains a residential home on an existing lot, which is 0.60 acres in size. The existing site cover is lawn, parking with a few trees located along the property lines. The site is basically flat with gentle slopes that drain from east to west with 116th intercepting any off-site runoff from the east. Therefore, the total off-site area draining onto the site is 0.00 acres and limited to the site itself.

All runoff from the site currently flows west and onto I-405 , where it is intercepted by the drainage system serving the freeway.

Segment 2: I-405 to Un-named Stream

Runoff leaves the site at the along the west side of the property where it is intercepted by storm system on I-405. All site runoff is conveyed south in this storm system for a distance of 1,700-ft before discharging into the un-named stream locate just east of the freeway. From here the drainage continues flowing south in this un-named stream for a distance of over 2,500 ft. The stream channel was well defined and heavily vegetated.

The storm system running along I-405 contained ditches and storm pipes which were not accessible to inspection. However, there did not appear to be any issues along I-405 stretch.

The stream channel was heavily vegetated with very limited access. However, there did not appear to be any capacity or overtopping of the stream or any other issues along this stretch pf the downstream.

This ends the downstream analysis. A distance of over ¾ mile was covered..

Conclusions of Downstream Analysis:

A review of the drainage course shows that there were no issues noted. In addition, the project proposes to mitigate the impact of the development by providing full dispersal. Therefore, the development should have little if any impact on the existing natural drainage course since there will be minimum runoff leaving the site. (Refer to TIR Section IV).

Review of Resources

Basin Plan

The property belongs to the Juanita Drainage Basin.

- None known

Basin Reconnaissance Summary Reports

- N/A

Critical Drainage Area

- Property not affected

Floodplain/Floodway Maps

FEMA FIRM Map

- Not affected.

Sensitive Areas Folio

- Wetlands Property: Property not affected.
- 100-Year Floodplains: Property not affected.
- Erosion Hazard Areas: Property not affected.
- Landslide Hazard Areas: Property not affected.
- Seismic Hazard Area: Property not affected.
- Migrating Rivers Studies: Property not affected.

Evidence of Existing and Predicted Problems

Lack of capacity or constrictions in the existing drainage system.

- On-site: No evidence of any problem.
- Off-site: Adequate capacity of the storm system on 132nd Ave NE.

Overtopping, Scouring, Bank, Sloughing of Sedimentation

- On-site: None
- Off-site: No indications of overtopping noted.

Flooding etc.

- None Noted

Significant Destruction of Aquatic Habitat or Organisms

- Not applicable

TIR SECTION 4: FLOW CONTROL AND WATER QUALITY ANALYSIS AND DESIGN

The site is 0.60 acres in size. The site soils are a gravelly sandy loam, consistent with Alderwood series and not suitable for infiltration. Figure C.1.3.A “*Flowchart for Determining Application of Flow Control BMP’s*” qualifies for dispersal of the site runoff. Therefore, the site proposes to use Full Dispersal BMP’s per Section C.2.4 Appendix C of the 2009 Surface Water Design Manual to accommodate the runoff of the new development. Since the total PGIS area is well below the 5,000 sf threshold, water quality is not required. (Per 2009 KCSWDM).

Full dispersion The project proposes to provide full dispersal of the stormwater runoff from the site improvements on the new lot per Appendix C Section C.2.1.8 “Native Vegetative Landscape” This will require modifying the existing soils with approved native plants and amended soils and then provide a 100-foot flow path from the downspouts to rear property line before discharging to the I-405 right of way. (See **Figure 4: Developed Site Plan**)

WATER QUALITY FACILITY

The total Pollution Generating Impervious Surface (PGIS) is under 5,000 sf, therefore the site improvements are exempt for water quality.

TIR SECTION 5: CONVEYANCE SYSTEM ANALYSIS AND DESIGN

The site does not contain any pipes or ditches. All impervious area runoff is directed over to the infiltration trenches for infiltration. Therefore, no conveyance calculations are required.

TIR SECTION 6: SPECIAL REPORTS AND STUDIES

- None

TIR SECTION 7: OTHER PERMITS

- Building permits required by the City

TIR SECTION 8: EROSION/SEDIMENTATION CONTROL ANALYSIS AND DESIGN

The site is 0.60 acres in size and will only required minimal erosion protection. The proposed project erosion and sedimentation control plans will include the following measures to limit adverse impact upon off-site drainage system:

- < Limited Construction Season
- < Construction Entrance Pad
- < Catch Basin Protection
- < Filter fabric fences
- < Limits of Clearing

THE 12 ELEMENTS OF A CONSTRUCTION SWPPP

1. **Preserve Vegetation/Mark Clearing Limits:** The clearing limits are indicated on the plan sheet. Furthermore, clearing and grading will be limited to only areas that need to be disturbed for grading/construction of the site and frontage improvements. Construction will require regarding the entire site. Field marking the clearing limits shall be completed prior to clearing and grading activities.
BMP's: Preserve Natural Vegetation (VEG)
(Not Applicable)
2. **Establish Construction Access:** Access to the construction site shall be limited to the residential rock construction entrance. The rock construction entrance shall be installed off of NE 136th Place to provide access to the construction vehicle/equipment staging and employee parking areas.
BMP's: Rock construction entrance (CE)
3. **Control of Flow Rates:** Storm water detention: No detention is proposed for the site since the work should be completed in a short period of time.
BMP's None Proposed
4. **Installation of Sediment Controls:** Sediment control will be provided through a combination of filtration through the surround on-site vegetation, or filter fence if required. ,
BMP's: Silt Fence (SF), Inlet Protection (IP)
5. **Soils Stabilization:** Temporary and permanent soil stabilization will be provided. Temporary stabilization will be provided through the application of straw and/or plastic sheeting to exposed, worked earth. From October 1 until April 30, no exposed soil may remain exposed and unworked for more than two days; after May 1, no exposed soil may remain exposed and unworked for more than seven days.
BMP's: Straw Covering, Plastic Sheeting, Final Landscaping(as required)
6. **Slope Protection:** There are no slopes on the site. However, stoke piles shall be protected from erosion through cover and prevention of concentrated surface runoff flows.
BMP's: Plastic Sheeting, (as required)

7. **Protection of Permanent Drain Inlets:** Inlet protection will be provided for all catch basins.
BMP's: Inlet Protection (IP).
8. **Stabilization of Channels and Outlets:** All channel slopes shall be constructed and protected against erosion in accordance with City code.
BMP's: None required
9. **Pollutant Control:** Pollutants shall be controlled through the on-site BMP's proposed above.
10. **Dewatering Control:** De-watering: Interception of the water table is not expected to occur. And should ground water flows be encountered, the water will be filter for any sediment and the clean water flows will be pumped to the nearest catch basin..
BMP's: filter and pump.
11. **BMP Maintenance:** All BMP's and SWPPP elements shall be inspected daily and maintained as required.
12. **Project Management:** The project shall be managed in a cooperative effort by the project manager, contractor, engineer, and the city inspector. During the construction process, if unforeseen issues arise that cannot be resolved on site, construction activity (other than SWPPP maintenance) shall be halted and the owner's representative and the project engineer are to be contacted and informed of the situation. The Erosion Control Leed is Richard Deccio P.E. 206-390-8374

**TIR SECTION 9: BOND QUANTITIES WORKSHEET,
RETENTION / DETENTION FACILITY SUMMARY SHEET AND
DECLARATION OF COVENANT**

Bond Quantities Worksheet: N/A

Retention/Detention Facility Summary sheet and Declaration of Covenant: N/A

TIR SECTION 10: MAINTENANCE AND OPERATIONS MANUAL

Maintenance of all proposed drainage facilities is the responsibility of the property owner.

The maintenance requirements are according to 2009 KCSWM Appendix A, "Privately Maintained Drainage Facilities" and include:

- Amended soils (See Native Vegetation Landscape Requirements)

Grounds (Landscaping)

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Weeds (Non-poisonous)	Weeds growing in more than 20% of the landscaped area (trees and shrubs only).	Weeds present in less than 5% of the landscaped area.
	Safety Hazard	Any presence of poison ivy or other poisonous vegetation.	No poisonous vegetation present in a landscaped area.
	Trash or Litter	Paper, can, bottles, totaling more than 1 cubic foot within a landscaped area (trees and shrubs only) of 1,000 square feet.	Area clear of litter.
Trees and Shrubs	Damage	Limbs or parts of trees or shrubs that are split or broken which affect more than 25% of the total foliage of the tree or shrub.	Trees and shrubs with less than 5% of the total foliage with split or broken limbs.
		Trees or shrubs that have been blown down or knocked over.	Trees or shrub in place free of injury.
		Trees or shrubs which are not adequately supported or are leaning over, causing exposure of the roots.	Tree or shrub in place and adequately supported; remove any dead or diseased trees.

Appendix A

List of Figures:

Figure 1: Site Plan & Vicinity Map

Figure 2: Existing Site Conditions

Figure 3: Developed Site Conditions

Figure 4: Downstream Analysis Map

Native Vegetation Landscape Requirements

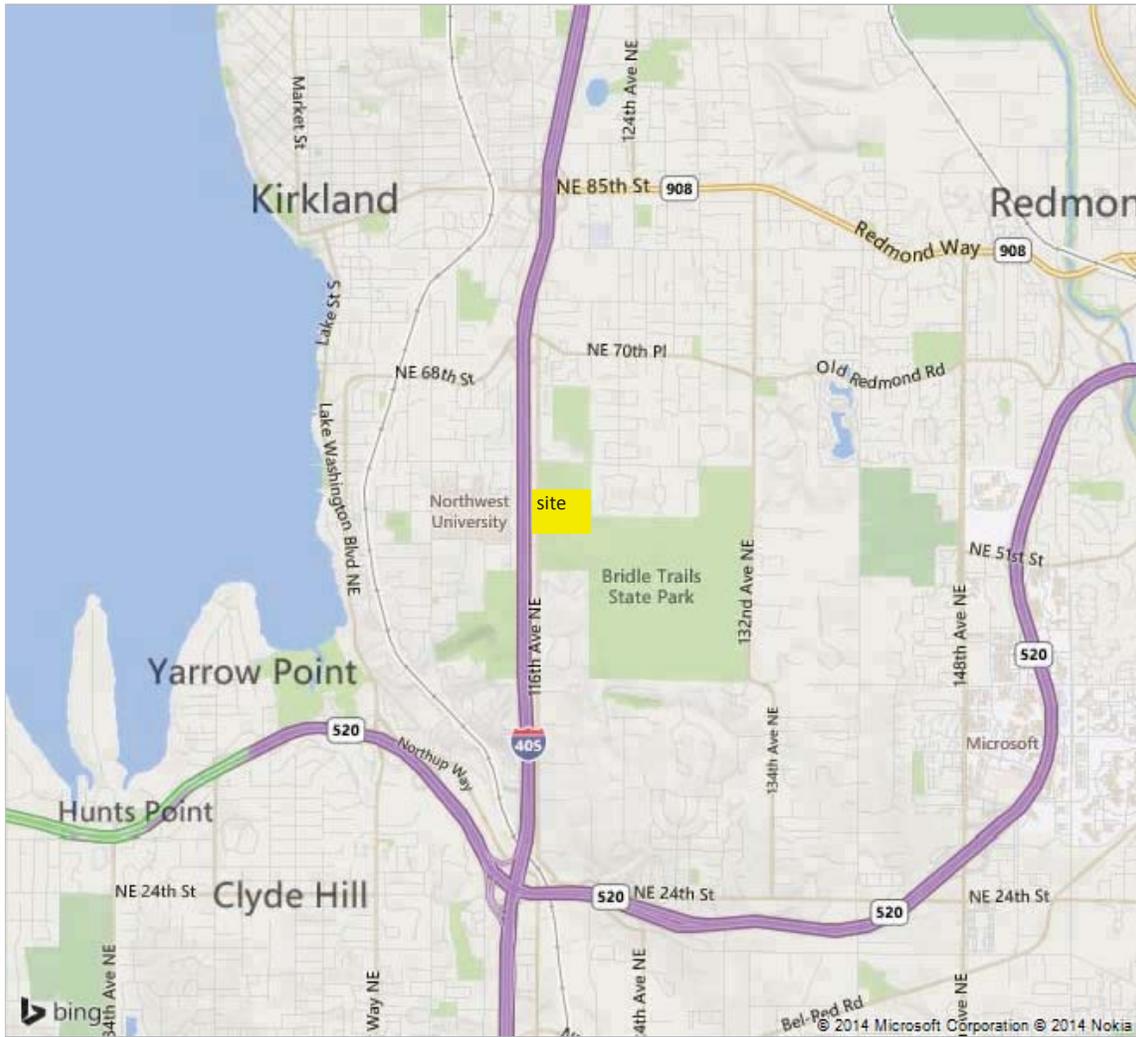


FIGURE 1 VICINITY MAP

iMAP



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FIGURE 4 DOWNSTREAM

