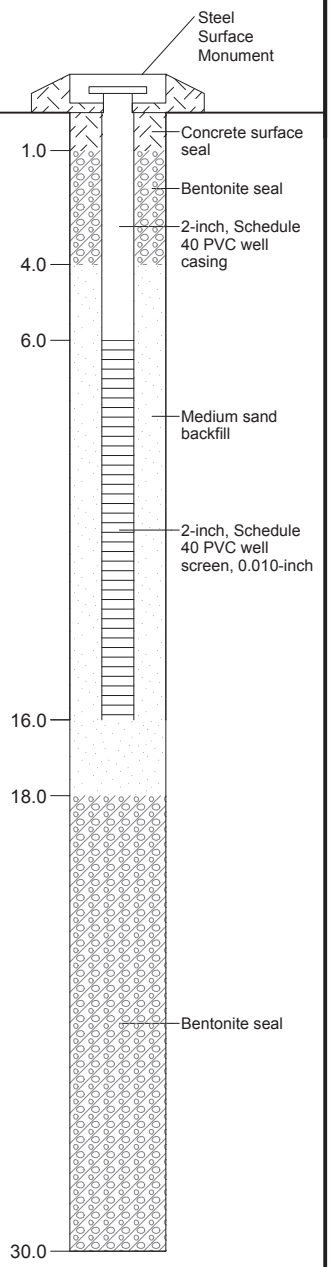
Drilled Start 6/22/2015 End 6/22/2015	Total Depth (ft) 31.5	Logged By MWR Checked By HRP	Driller Geologic Drill Exploration, Inc.	Drilling Method Hollow-stem Auger	
Hammer Data Auto 140 (lbs) / 30 (in) Drop		Drilling Equipment Deidrich D 50 Track Rig	DOE Well I.D.: BIJ 519 A 2 (in) well was installed on 6/22/2015 to a depth of 16 (ft).		
Surface Elevation (ft) Vertical Datum 32		Top of Casing Elevation (ft)	Groundwater		
Latitude Longitude		Horizontal Datum Geographic	Date Measured 6/23/2015	Depth to Water (ft) 9.9	Elevation (ft) 22.1

Notes: Auger Data: 3¼-inch I.D. , 6¼-inch O.D.

FIELD DATA

Elevation (feet)	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample Sample Name Testing	Water Level	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)
	0					AC	2.5" asphalt concrete pavement		
						SM	Brown silty fine to medium sand with gravel (medium dense, moist) (fill)		
30						SM	Tan silty fine sand (loose, moist) (fill?)		
		12	6	1					
	5	12	5	2 MC		SP-SM	Tan fine to medium sand with silt (loose, moist) (fill?)	12	
25						SM	Tan silty fine to medium sand with lenses of silt (medium dense, wet) (recessional outwash)	31	44
		14	18	3 %F					
	10	18	23	4 SA	▼			36	21
20									
	15	18	22	5 MC			(1 foot of heave encountered before sampling)	29	
15						ML	Gray-brown sandy silt with lenses of sand (very stiff to hard, wet) (transitional deposits)		
	20	18	33	6					
10						SP	Brown fine to medium sand (medium dense, wet)		
	25	18	20	7					
5						ML	Gray silt with lenses of silty sand and trace organic matter (hard, wet)		
	30	18	42	8					

WELL LOG



Note: See Figure A-1 for explanation of symbols.

Log of Boring B-2

GEOENGINEERS

Project: Rose Point Lift Station Upgrade
Project Location: Kirkland, Washington
Project Number: 0231-087-00

Figure A-3
Sheet 1 of 1

Redmond: Date:7/7/15 Path:C:\USERS\KJANC\DESKTOP\0023108700.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_GEOTECH_WELL

Drilled Start 6/22/2015 End 6/22/2015	Total Depth (ft) 51.5	Logged By MWR Checked By HRP	Driller Geologic Drill Exploration, Inc.	Drilling Method Hollow-stem Auger	
Surface Elevation (ft) Vertical Datum 55		Hammer Data Auto 140 (lbs) / 30 (in) Drop		Drilling Equipment Deidrich D 50 Track Rig	
Latitude Longitude		System Datum Geographic		Groundwater Date Measured / Depth to Water (ft) / Elevation (ft) See Remarks	
Notes: Auger Data: 3¼-inch I.D. , 6¼-inch O.D.					

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name / Testing	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0								SOD	Sod and topsoil, 12 inches thick			
									SM	Brown silty fine to medium sand with occasional gravel (medium dense, moist) (fill)			
			16	16		1							
50	5		16	32*		2			SM	Orange brown silty fine to medium sand with occasional gravel (medium dense, moist) (recessional outwash?)			*Gravel in sampler - blowcount overstated
									SP-SM	Light brown fine to medium sand with silt (medium dense, moist)			
45	10		18	14		3							
									ML	Gray brown with iron staining sandy silt (stiff, moist to wet) (transitional deposits)			
									ML	Gray silt with trace organic matter (hard, moist)			
40	15		18	36		4 MC					37		
									ML	Orange and brown silt with sand and gravel (hard, moist)			
									SM	Light brown silty fine sand (dense, moist)			
35	20		18	38		5 MC					23		
									ML	Light brown silt with lenses of silty sand (very stiff, moist)			
30	25		18	21		6							
									SM	Gray brown silty fine to medium sand with silt and sand lenses (medium dense, moist to wet)			
25	30		18	27		7 %F					25	38	

Notes: See Figure A-1 for explanation of symbols.

Log of Boring B-3

GEOENGINEERS

Project: Rose Point Lift Station Upgrade
Project Location: Kirkland, Washington
Project Number: 0231-087-00

Figure A-4
Sheet 1 of 2

Redmond: Date:7/24/15 Path:C:\USERS\KJANCI\DESKTOP\0023108700.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_GEOTECH_STANDARD

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample: Sample Name / Testing	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
							SP-SM	Orange brown fine to medium sand with silt (dense, wet)			
20	35	18	56	8 / MC			ML	Light gray brown silt with sand and occasional sand lenses (hard, wet)	27		Groundwater seepage observed at 35 feet during drilling
							SM	Orange brown silty fine to medium sand with lenses of silt (dense, wet)			
15	40	18	47	9							
							ML	Orange brown and gray silt with sand and occasional sand lenses (hard, moist to wet)			
10	45	18	48	10							
							SP	Gray/brown fine to medium sand (very dense, wet)			2 feet of heave encountered before sampling
5	50	17	50/5"	11			ML	Gray sandy silt with trace organic matter (hard, moist)			

Notes: See Figure A-1 for explanation of symbols.

Log of Boring B-3 (continued)

GEOENGINEERS

Project: Rose Point Lift Station Upgrade
Project Location: Kirkland, Washington
Project Number: 0231-087-00

Figure A-4
Sheet 2 of 2

Redmond: Date:7/24/15 Path:C:\USERS\KJANCI\DESKTOP\0023108700.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_GEOTECH_STANDARD

Date Excavated: 6/22/2015 Logged By: MWR

Equipment: Hand Auger Total Depth (ft) 5.5

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
					TS		Sod and topsoil, 12 inches thick		
35	1	X	1						Probe (P) = 12-16"
					SM		Dark brown silty fine to medium sand with occasional gravel, roots and organic matter (loose, moist)		
34	2	X	2 / MC		SM		Brown silty fine to medium sand with lenses of silt and occasional gravel (medium dense, moist) (recessional outwash)	10	P = 3-4"
33	3	X	3		SM		Light orange brown silty fine to medium sand (medium dense, moist) (transitional deposits)		
32	4								
31	5	X	4 / MC		ML		Orange brown and tan silt with sand (very stiff, moist)	34	

Approximate ground surface elevation: Elevation 36 feet
Hand Auger completed at 5.5 feet
No groundwater seepage observed
Moderate caving observed at 1.5 to 3 feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the hand auger logs are based on an average of measurements across the hand auger and should be considered accurate to 0.5 foot.

Log of Hand Auger HA-1

GeoEngineers

Project: Rose Point Lift Station Upgrade
Project Location: Kirkland, Washington
Project Number: 0231-087-00

Figure A-5
Sheet 1 of 1

Redmond: Date:7/7/15 Path:C:\USERS\KJANC\DESKTOP\0023108700.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 6/22/2015
Equipment: Hand Auger
Logged By: MWR
Total Depth (ft) 3.5

Elevation (feet)	Depth (feet)	SAMPLE Testing Sample	SAMPLE Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
					SOD		4 inches sod		Probe (P) = 6"
		X	1		SM		Dark brown silty fine to medium sand with gravel and organic matter (rootlets) (loose, moist) (topsoil)		P = 3-4"
35	1	X	2		SM		Light brown silty fine to medium sand (loose to medium dense, moist) (fill?)		
34	2								P = 3-4"
33	3	X	3						

Approximate ground surface elevation: Elevation 36 feet
Hand Auger completed at 3.5 feet due to refusal on gravel or cobble
No groundwater seepage observed
Moderate caving observed at 1.5 to 3 feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the hand auger logs are based on an average of measurements across the hand auger and should be considered accurate to 0.5 foot.

Log of Hand Auger HA-2

GeoEngineers

Project: Rose Point Lift Station Upgrade
Project Location: Kirkland, Washington
Project Number: 0231-087-00

Figure A-6
Sheet 1 of 1

Redmond: Date:7/7/15 Path:C:\USERS\KJANC\DESKTOP\0023108700.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 6/23/2015 Logged By: MWR

Equipment: Hand Auger Total Depth (ft) 8.5

Elevation (feet)	Depth (feet)	SAMPLE Testing Sample	SAMPLE Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
					SOD		4 inches sod		Probe (P) = 4-5"
		X	1		SM		Brown silty fine to medium sand with organic matter (rootlets) (loose, dry) (topsoil)		P = 6-9"
37	1				SP-SM		Brown fine to medium sand with silt and organic matter (roots) (loose, dry) (fill)		
		X	2						P = 12+"
36	2								P = 2-3"
35	3	X	3		SP		Brown fine to medium sand (medium dense, moist) (recessional outwash)		Harder digging at 3 feet
34	4								
33	5	X	4						
32	6								
31	7								
30	8								

Approximate ground surface elevation: Elevation 38 feet
Hand Auger completed at 8.5 feet
No groundwater seepage observed
Moderate caving observed at 0.5 to 3 feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the hand auger logs are based on an average of measurements across the hand auger and should be considered accurate to 0.5 foot.

Log of Hand Auger HA-3

GEOENGINEERS

Project: Rose Point Lift Station Upgrade
Project Location: Kirkland, Washington
Project Number: 0231-087-00

Figure A-7
Sheet 1 of 1

Redmond: Date:7/7/15 Path:C:\USERS\KJANC\DESKTOP\0023108700.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 6/22/2015 Logged By: MWR

Equipment: Hand Auger Total Depth (ft) 8.5

Elevation (feet)	Depth (feet)	SAMPLE Testing Sample	SAMPLE Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
					SOD		4 inches sod		Probe (P) = 3-5"
		X	1		SM		Brown silty fine to medium sand with organic matter (rootlets) (medium dense, dry) (fill)		P = 2-3"
49	1								
48	2	X	2		SP-SM		Light brown fine to medium sand with silt (loose to medium dense, moist) (recessional outwash)		P = 4-6"
47	3								
46	4								
		X	3						
45	5								
44	6	X	4				Grades with occasional gravel		Harder digging at 6 feet
43	7								
					SP-SM		Brown fine to medium sand with silt (medium dense, moist)		
42	8	X	5						

Approximate ground surface elevation: Elevation 50 feet
Hand Auger completed at 8.5 feet
No groundwater seepage observed
Moderate caving observed at 0.5 to 2 feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the hand auger logs are based on an average of measurements across the hand auger and should be considered accurate to 0.5 foot.

Log of Hand Auger HA-4

GEOENGINEERS

Project: Rose Point Lift Station Upgrade
Project Location: Kirkland, Washington
Project Number: 0231-087-00

Figure A-8
Sheet 1 of 1

Redmond: Date:7/24/15 Path:C:\USERS\KJANCI\DESKTOP\0023108700.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 6/23/2015 Logged By: MWR
Equipment: Hand Auger Total Depth (ft) 6.5

Elevation (feet)	Depth (feet)	SAMPLE Testing Sample	SAMPLE Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
					SOD		2 inches sod		Probe (P) = 3-4"
		X	1		SM		Brown silty fine to medium sand with organic matter (roots) (loose, dry) (topsoil)		P = 3-6"
	1	X	2		SP-SM		Brown fine to medium sand with silt (loose, dry) (fill)		P = 6-8"
	2	X	3		SP		Brown fine to medium sand (medium dense, moist) (recessional outwash)		Harder digging at 2 feet P = 1-2"
	3								
	4	X	4						
	5								Harder digging at 5 feet
	6	X	5						

Approximate ground surface elevation: Elevation 53 feet
Hand Auger completed at 6.5 feet
No groundwater seepage observed
Moderate caving observed at 0.5 to 2 feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the hand auger logs are based on an average of measurements across the hand auger and should be considered accurate to 0.5 foot.

Log of Hand Auger HA-5

GEOENGINEERS

Project: Rose Point Lift Station Upgrade
Project Location: Kirkland, Washington
Project Number: 0231-087-00

Figure A-9
Sheet 1 of 1

Redmond: Date:7/7/15 Path:C:\USERS\KJANC\DESKTOP\0023108700.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

APPENDIX B
Laboratory Testing

APPENDIX B
LABORATORY TESTING

Soil samples obtained from the explorations were transported to our Redmond geotechnical laboratory and evaluated to confirm or modify field classifications, as well as to evaluate engineering properties of the soils. Representative samples were selected for laboratory testing that included moisture content tests, percent fines tests, and sieve analysis. The tests were conducted using test methods of the American Society for Testing and Materials (ASTM) or other applicable procedures.

Soil Classifications

All soil samples obtained from the explorations were visually classified in the field and/or in our laboratory using a system based on the Unified Soil Classification System (USCS) and ASTM classification methods. ASTM test method D 2488 was used to visually classify the soil samples, while ASTM D 2487 was used to classify the soils based on laboratory test results. These classification procedures are incorporated in the exploration logs presented as Figures A-2 through A-9 in Appendix A.

Moisture Content Tests

Moisture contents were measured using the ASTM D 2216 test method for several samples obtained from the explorations. The results of these tests are presented on the exploration logs (Appendix A) at the respective sample depths.

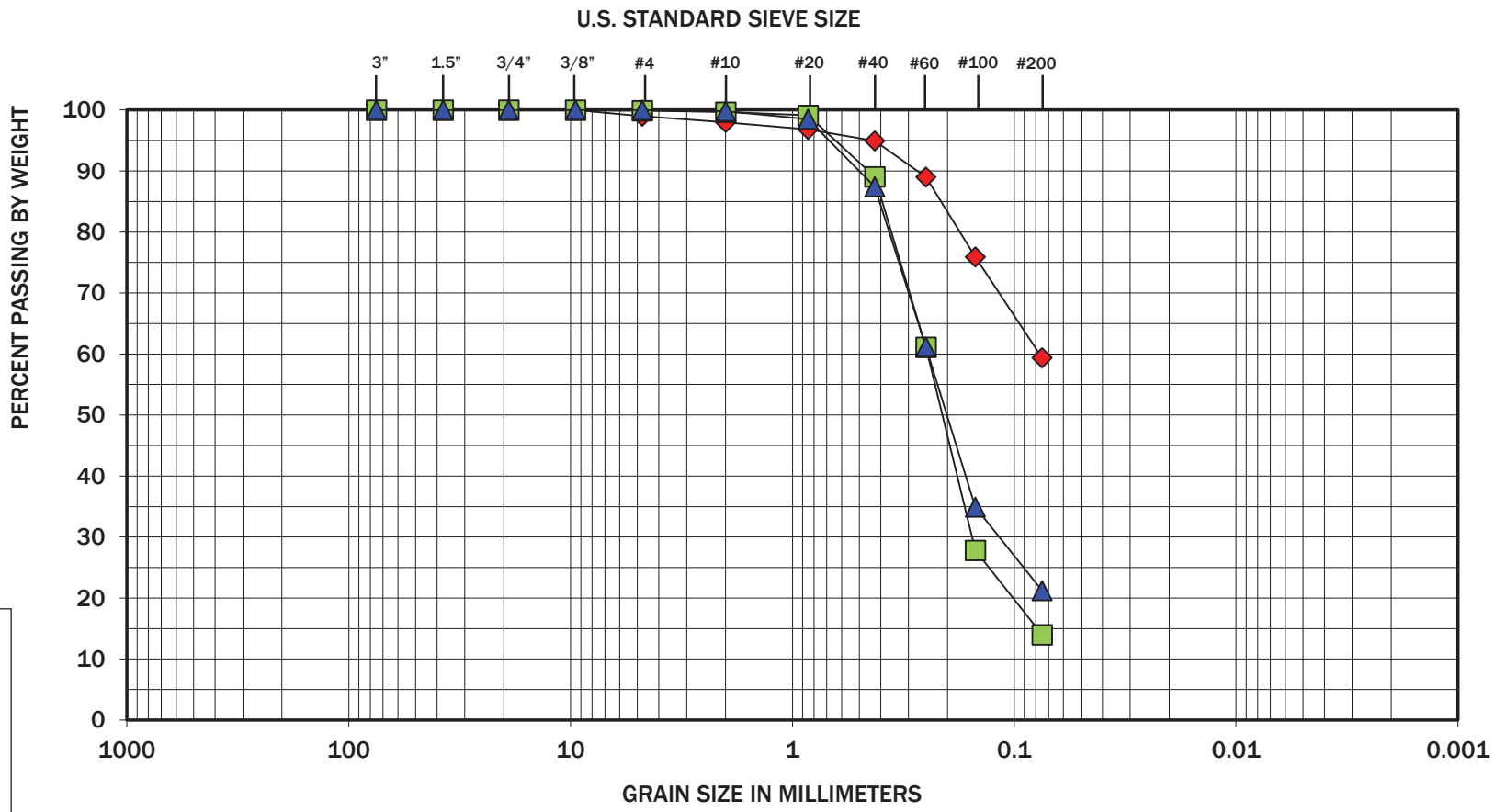
Percent Fines Tests

Tests to evaluate the percent fines (particles passing the No. 200 sieve) were completed on two soil samples using ASTM D 1140. The wet sieve method was used to determine the percentage of soil particles larger than the U.S. No. 200 sieve opening. The results of the percent fines tests are presented on the exploration logs (Figures A-2 through A-9) at the depths at which the samples were obtained.

Sieve Analysis

Sieve analyses were performed on three samples obtained from the borings. The analyses were conducted using the ASTM D 422 test method. The wet sieve analysis method was used to determine the percentage of soil greater than the U.S. No. 200 mesh sieve. The results of the sieve analyses were plotted, classified using the USCS, and presented on Figure B-1.

0231-087-00 Date Exported: 07/01/15



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Boring Number	Depth (feet)	Moisture (%)	Soil Description
◆	B-1	10	27.6	Sandy silt (ML)
■	B-1	15	25.2	Silty sand (SM)
▲	B-2	10	36	Silty sand (SM)

Note: This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations, or generated by separate operations or processes.

The grain size analysis results were obtained in general accordance with ASTM D 6913.

GEOENGINEERS

Rose Point Lift Station
Kirkland, WA

Sieve Analysis Results

Figure B-1

APPENDIX C
Report Limitations and Guidelines for Use

APPENDIX C
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

Read These Provisions Closely

It is important to recognize that the geoscience practices (geotechnical engineering, geology and environmental science) rely on professional judgment and opinion to a greater extent than other engineering and natural science disciplines, where more precise and/or readily observable data may exist. To help clients better understand how this difference pertains to our services, GeoEngineers includes the following explanatory "limitations" provisions in its reports. Please confer with GeoEngineers if you need to know more how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical Services are Performed for Specific Purposes, Persons and Projects

This report has been prepared for the City of Kirkland, Murray, Smith & Associates, Inc., and members of the design team for the project specifically identified in the report. The information contained herein is not applicable to other sites or projects.

GeoEngineers structures its services to meet the specific needs of its clients. No party other than the party to whom this report is addressed may rely on the product of our services unless we agree to such reliance in advance and in writing. Within the limitations of the agreed scope of services for the Project, and its schedule and budget, our services have been executed in accordance with our Agreement with the Client and generally accepted geotechnical practices in this area at the time this report was prepared. We do not authorize, and will not be responsible for, the use of this report for any purposes or projects other than those identified in the report.

A Geotechnical Engineering or Geologic Report is Based on A Unique Set of Project-Specific Factors

This report has been prepared for the Rose Point Lift Station Upgrade project in Kirkland, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

[1] Developed based on material provided by GBA, GeoProfessional Business Association; www.geoprofessional.org.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structures;
- elevation, configuration, location, orientation or weight of the proposed structures;
- composition of the design team; or
- project ownership.

If changes occur after the date of this report, GeoEngineers cannot be responsible for any consequences of such changes in relation to this report unless we have been given the opportunity to review our interpretations and recommendations. Based on that review, we can provide written modifications or confirmation, as appropriate.

Environmental Concerns Are Not Covered

Unless environmental services were specifically included in our scope of services, this report does not provide any environmental findings, conclusions, or recommendations, including but not limited to, the likelihood of encountering underground storage tanks or regulated contaminants.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by man-made events such as construction on or adjacent to the site, new information or technology that becomes available subsequent to the report date, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. If more than a few months have passed since issuance of our report or work product, or if any of the described events may have occurred, please contact GeoEngineers before applying this report for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Geotechnical and Geologic Findings Are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies the specific subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied its professional judgment to render an informed opinion about subsurface conditions at other locations. Actual subsurface conditions may differ, sometimes significantly, from the opinions presented in this report. Our report, conclusions and interpretations are not a warranty of the actual subsurface conditions.

Geotechnical Engineering Report Recommendations Are Not Final

We have developed the following recommendations based on data gathered from subsurface exploration(s). These explorations sample just a small percentage of a site to create a snapshot of the subsurface conditions elsewhere on the site. Such sampling on its own cannot provide a complete and accurate view of subsurface conditions for the entire site. Therefore, the recommendations included in this report are preliminary and should not be considered final. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers

cannot assume responsibility or liability for the recommendations in this report if we do not perform construction observation.

We recommend that you allow sufficient monitoring, testing and consultation during construction by GeoEngineers to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes if the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective means of managing the risks associated with unanticipated conditions. If another party performs field observation and confirms our expectations, the other party must take full responsibility for both the observations and recommendations. Please note, however, that another party would lack our project-specific knowledge and resources.

A Geotechnical Engineering or Geologic Report Could Be Subject to Misinterpretation

Misinterpretation of this report by members of the design team or by contractors can result in costly problems. GeoEngineers can help reduce the risks of misinterpretation by conferring with appropriate members of the design team after submitting the report, reviewing pertinent elements of the design team's plans and specifications, participating in pre-bid and preconstruction conferences, and providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final exploration logs based upon their interpretation of field logs and laboratory data. The logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Photographic or electronic reproduction is acceptable, but separating logs from the report can create a risk of misinterpretation.

Give Contractors a Complete Report and Guidance

To help reduce the risk of problems associated with unanticipated subsurface conditions, GeoEngineers recommends giving contractors the complete geotechnical engineering or geologic report, including these "Report Limitations and Guidelines for Use." When providing the report, you should preface it with a clearly written letter of transmittal that:

- advises contractors that the report was not prepared for purposes of bid development and that its accuracy is limited; and
- encourages contractors to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer.

Contractors Are Responsible for Site Safety on Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and adjacent properties.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants, and no conclusions or inferences should be drawn regarding Biological Pollutants as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria and viruses, and/or any of their byproducts.

A Client that desires these specialized services is advised to obtain them from a consultant who offers services in this specialized field.

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GeoEngineers

BACK TO NATURE DESIGN

Brooke K. Sullivan
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For Lisa Adolfson
Environmental Science Associates (ESA)
5309 Shilshole Ave NW
Seattle, WA 98107

March 25, 2016

RE: Arborist Report and Tree Retention Plan for Rose Point Lift Station Improvements

Dear Lisa,

Thank you for trusting Back To Nature Design LLC to provide you with arborist consulting services for proposed improvements to the Rose Point Lift Station located near the east shoreline of Lake Washington at 1805 10th Street West in Kirkland, Washington, in front of the Rose Point Community Club. We have prepared this letter to summarize our observations of seven significant trees located at the address in accordance with Chapter 95 – *Tree Management and Required Landscaping* of the City of Kirkland's Zoning Code (KZC). The seven significant trees include individual specimens of big leaf maple (*Acer Macrophyllum*).

Background

The existing Rose Point Lift Station is located at 1805 10th Street West in the public right-of-way, approximately 150 feet northwest of the intersection of 10th Street West and 18th Avenue West. The Rose Point Community Club Park abuts the lift station to the

west. The development proposal under review will include an expansion of the existing footprint of the pump station to the east side of 10th Street West, which will include the construction of a new control building, wet well, and valve vault. A soldier pile wall will also be constructed on the downslope side of the new structures to support the hillside and road to the east of the building.

Under current conditions there are six significant trees located in the immediate project area and one significant tree whose drip line extends into the project area from off-site (Appendix B). The footprint of the expanded pump station will extend into the dripline of all trees within the study area, and the six on-site trees are within the clearing and grading limits as identified on the preliminary construction drawings. The City of Kirkland requires an investigation as to the nature of the impacts the new development will likely have on the significant trees.

Assignment

Through Environmental Science Associates (ESA), Murray, Smith & Associates, Inc. (MSA) retained BTND to complete a site tree inventory, site plan and arborist report to support their proposed improvements to the existing Rose Point Lift Station located in Kirkland, WA. In addition to evaluating the general health and condition of the significant trees located on-site, I also reviewed the proposed building plan for the parcel to evaluate impact risks for the trees, evaluated neighboring vegetation, and reviewed relevant City of Kirkland development codes as part of this tree study.

Observations

On March 5, 2016, Certified Arborist Robert Bailey visited the project site with the proposed plans in order to evaluate tree health and condition, prepare a sketch map and record any relevant observations related to proposed development. The following is a description of the health and condition of on-site significant trees as observed during Robert's site visit.

Tree #1: Tree #1 is a multi-stem big leaf maple with one stem having a diameter at breast height (dbh) of 19.8 inches and the other stem having a dbh of 16.2 inches

(Attachment A: Photo 1). The 16.2 dbh stem also contains a 6.3 dbh offshoot. The tree looks to be in fair health for this species. However, the tree appears to have suffered some limb failures in the past. These past limb failures could be a signal of declining health and condition, though no evidence of major defects were observed at the time of the site visit. The drip line of Tree #1 extends into the building footprint for the proposed control building; is in close proximity to the location of the proposed soldier pile wall; and is within the path for proposed sewer venting pipes from the control building. This tree is being proposed for removal.

Tree #2: Tree #2 is a big leaf maple with a dbh of 55 inches and is located near the center of the parcel proposed for development (Attachment B). The tree appears to be in poor health for this species exhibited by excessive amounts of rot and decay as well as containing evidence of large limb failures (Attachment A: Photo 2). The drip line of Tree #2 extends into the building footprint for the proposed control building, wet well, and ventilation vault; is in close proximity to the location of the proposed soldier pile wall; and is within the path for proposed sewer venting pipes from the control building. This tree is being proposed for removal.

Tree #3: Tree #3 is a multi-stem big leaf maple with one stem having a dbh of 14.4 inches and the other stem having a dbh of 8.2 inches (Attachment A: Photo 3; Attachment B). The tree appears to be in fair health. The drip line of Tree #3 extends into areas slated for clearing and grading and may overlap proposed sewer venting pipes from the control building. The tree itself is within the limits of clearing and grading. This tree is being proposed for removal.

Tree #4: Tree #4 is a big leaf maple with a dbh of 14.2 inches and is located near the center of the parcel proposed for development (Attachment B). The tree appears to be in fair health (Attachment A: Photo 5). The drip line of Tree #4 extends into the building footprint for the proposed ventilation vault and soldier pile wall and the tree itself is within the limits of clearing and grading. This tree is being proposed for removal.

Tree #5: Tree #5 is a multi-stem big leaf maple with one stem having a diameter at breast height (dbh) of 10.2 inches and the other stem having a dbh of 10 inches (Attachment A: Photo 6; Attachment B). The tree appears to be in poor health with some

evidence of decay in the stem. The drip line of Tree #5 extends into the building footprint for the proposed ventilation vault and soldier pile wall and the tree itself is within the limits of clearing and grading. This tree is being proposed for removal.

Tree #6: Tree #6 is a big leaf maple with a dbh of 27.2 inches and is the most northerly of the on-site trees (Attachment B). The tree appears to be in fair health (Attachment A: Photo 7). The drip line of Tree #6 extends into the building footprint for the proposed valve vault, forcemain, and soldier pile wall, and the tree itself is within the limits of clearing and grading. This tree is being proposed for removal.

Tree #1A: Tree #1A is a big leaf maple with a dbh of approximately 22 inches (Attachment A: Photo 7). This tree is located off-site; however, the drip line for the tree extends slightly into the clearing and grading limits for the project (Attachment B). This tree is being proposed for retention with protection measures installed and implemented as required.

There are no other trees (other than Tree#1A) on any of the neighboring properties that have canopies encroaching or overhanging the property line into this property.

Discussion

Regulatory Considerations

KZC, Chapter 95 - Tree Management and Required Landscaping, regulates significant trees in Kirkland. The code defines a significant tree as any tree greater than 6-inches in diameter at breast height (dbh), measured 4.5 feet above ground. Significant trees should be retained onsite whenever possible as they provide a number of ecosystem services that benefit both people and wildlife. Trees with a high retention value should be retained and protected to all extents practicable, and trees with a moderate retention value should be retained and protected if feasible. A tree with a low retention value tree is one that is either (1) not viable or (2) is in an area where removal is unavoidable due to anticipated development activity.

Trees #1, #1A, #2, #3, #4, #5, and #6 meet the definition of significant trees as set out in KZC Chapter 95.10 - *Definitions*. Based on information collected during the site visit,

and also based upon my professional experience and opinion, one of the trees should be considered trees with moderate retention value (Tree #1A) and six trees (tree #1, #2, #3, #4, #5, and #6) should be considered trees with low retention value. Tree #2 is not viable and is located in an area where removal is unavoidable. Trees #1, #3, #4, #5, and #6 are only in areas where removal is unavoidable but are otherwise in fair condition.

Health and Condition

In general, all trees are in poor to fair health and condition, with some defects including the historic limb failures on Tree #1 and topping of Tree #6. Some of these defects could be signs of significant problems for the trees later on. Specifically, topped trees pose a higher risk of failure than trees that have not had their tops removed. Tree #2 is currently in poor health and condition with observations of severe rot and decay and significant limb failure and could be removed based solely on its current condition and threat posed to safety.

Design Considerations

A review of the design plans provided by MSA in relation to the observations made during the site visit indicate that the proposed design will require the removal of six significant trees (Trees #1, #2, #3, #4, #5, and #6) on the property. Retaining the trees through construction is unlikely to be successful given the current plan. A moderate level of care will need to be taken during construction to ensure that adequate protection is provided for Tree #1A, primarily due to the close proximity of proposed construction activities to the critical root zone of the tree.

Tree Protection

Providing protection for the on-site tree that will be retained through construction is critical for the long-term survival of the tree, and to minimize the potential for causing indirect damage to the tree that may take several years to manifest before obvious signs of deteriorating health and condition are evident. Providing protection for the critical root zone provides the minimum necessary protection to promote structural stability of the tree into the future. As a rule of thumb, minimum protection for the critical root zone of a tree includes the dripline area of a tree plus 5-feet in radius around the tree. Protecting the feeder root zones of trees ensures adequate protection of the critical root zone and protection of the long-term supply of water and nutrients to the tree. The feeder root

zone around a tree is the distance as measured from the trunk in all directions that is equal to one foot for every inch of the trees diameter as measured 4.5 feet from grade. For example, Tree #1A has a diameter or dbh of 27.2 inches and would thus have a corresponding feeder root zone extending 27.2 feet in all directions from the trunk of the tree. Critical and feeder root zones of the trees should be protected to the maximum extent possible to ensure structural and physiological health of the trees in to the future. In this case, the tree protection fencing can be installed along the south/southwest edge of the project boundary outside the clearing limits. This will ensure that equipment and other construction materials are not staged in this area (Attachment B).

Conclusions

With the exception of Tree #2, all on-site significant trees are in fair existing condition with no reason to suspect any may pose an elevated risk of failure. Still, six trees (Tree #1, #2, #3, #4, #5, and #6) will need to be removed as a result of the current design plans. Tree protection measures include tree protection fencing that will sufficiently preserve the remaining tree (Tree #1A) through construction and into the future. As tree removal is recommended, maintaining tree density requirements in accordance with KZC 95.33 would typically be required; however, since the proposed project is within a public right-of-way, the requirement to meet tree density requirements does not apply.

Recommendations

BTND recommends that the client remove Trees #1, #2, #3, #4, #5, and #6 and protect Tree #1A. This tree is likely to be successfully retained through construction and into the future given that adequate protection are provided to the critical and feeder root zones of each tree with some necessary modifications prior to any other construction activities occurring on-site.

Tree #1: Tree #1 has a critical root zone of approximately 21 feet. The design, as proposed, would construct a control building to the west and vent pipes to the north of Tree #1 and within the critical root zone of the tree. In addition, the proposed soldier pile retaining wall would be constructed within three feet of the trunk of Tree #1. BTND recommends Tree #1 be removed prior to construction.

Tree #2: Tree #2 has a critical root zone of approximately 55 feet and similar to Tree #1, the proposed design includes construction of a new control building, ventilation vault, ventilation piping, valve vault, and soldier pile retaining wall that will encroach into the critical root zone of Tree #2. As designed, the proposed retaining wall is located less than two feet from the trunk of Tree #2. BTND recommends Tree #2 be removed prior to construction.

Tree #3: Tree number #3 has a critical root zone of approximately 15 feet. The proposed soldier pile retaining wall and ventilation piping are located within the critical root zone of Tree #3. The proposed retaining wall also comes within 10 feet of the trunk of Tree #3. BTND recommends Tree #3 be removed prior to construction.

Trees #4 and #5 have critical root zones of 14 and 10 feet, respectively. The proposed retaining wall, ventilation vault, and ventilation piping are all within the critical root zone for these trees. The proposed retaining wall will come within approximately two feet of both trunks of Tree#4 and Tree#5. BTND recommends Trees #4 and Tree#5 be removed prior to construction.

Tree #6: Tree number #6 has a critical root zone of approximately 27 feet. The proposed soldier pile retaining wall, ventilation vault, valve vault, and force main piping are located within the critical root zone of Tree #6. Tree#6 is in the direct path for the proposed soldier pile retaining wall. BTND recommends Tree #6 be removed prior to construction.

Tree #1A: Tree#1A has a feeder root zone of approximately 22 feet. The south edge of the proposed retaining wall will slightly encroach into the feeder root zone of Tree #1A; however, with the application of appropriate protection measures, Tree #1A can be retained through construction. BTND recommends that the contractor conduct a preemptive root prune along the south edge of the proposed retaining wall (within 6-inches maximum) using a hand held spade only. If roots greater than one-inch in diameter are encountered during these activities, a Certified Arborist should be consulted to ensure that cutting larger roots would not irreparably harm the tree. A six-foot tall chain link fence should be installed along the entire southwest project boundary

running parallel with clearing and grading limit from 10th Street W to 10th Street W. Since the tree protection area is entirely outside of the limit of work and upon approval by the planning authority at the City of Kirkland, it may be possible to request using 4-foot high-visibility orange fencing in place of the chain link fence. Where possible, at a minimum, maintain the fence approximately 12 feet from the tree trunk to protect the critical root zone. Typically, a two-inch mulch layer should also be applied to the ground surface within the critical root zone of the tree, with care taken to keep the mulch 3-inches away from the tree's buttress. However, and because the limits of clearing and grading are at the very edge of the critical root zone, high visibility orange fencing located along the clearing and grading boundary (along undeveloped side of clearing and grading boundary at south end of project) should be sufficient to protect the critical root zone of the tree. The tree should also be watered once per week to a depth of one-inch during the dry season and fertilizer, if needed, may be applied at the recommendations of the Project Arborist.

Limitations

Within the limitations of schedule, budget, and scope-of-work, this arborist report was prepared in accordance with generally accepted arboricultural practices, including the technical guidelines and criteria in effect at the time this report was prepared. The results and conclusions of this report represent the authors' best professional judgment, based upon information provided by the project proponent in addition to that obtained during the course of the study. No other warranties are expressed or implied.

Thank you for the opportunity to assist in your exploration of tree protection needs for the City of Kirkland's Rose Point Lift Station Improvement project. I can be reached at brooke@backtonaturedesign.com or 206-664-1688 if you have any further questions or comments.

Regards,

Brooke K. Sullivan
Registered Consulting Arborist, Seattle, WA

Attachment A
Photos

Photo 1: *Acer macrophyllum (Tree #1)*.

Photo 2: *Acer macrophyllum* (Tree #2).

Photo 3: *Acer macrophyllum* (Tree #3).

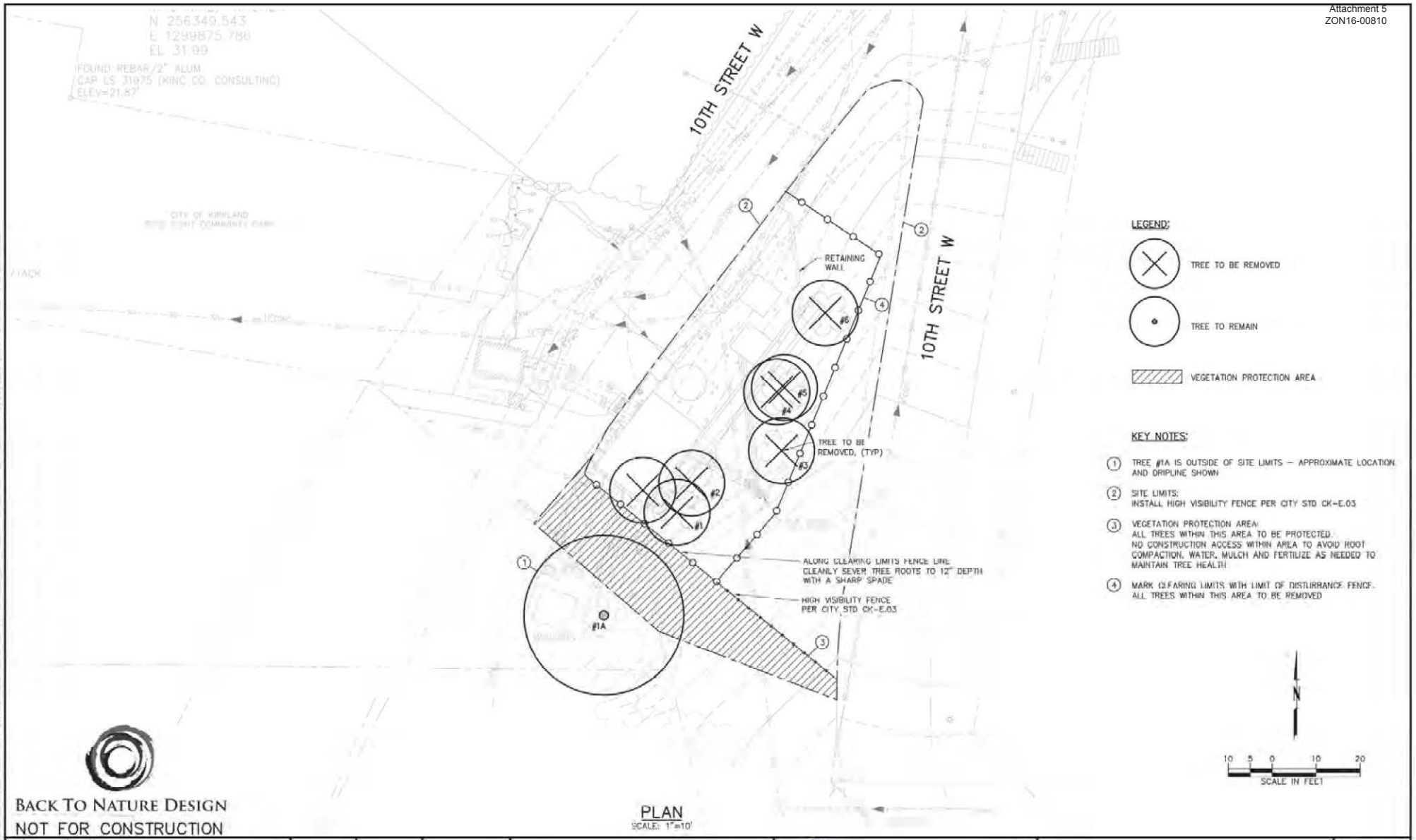
Photo 4: *Acer macrophyllum* (Tree #3 and #4).

Photo 5: *Acer macrophyllum* (Tree #5).

Photo 6: *Acer macrophyllum* (Tree #6).

Photo 6: *Acer macrophyllum* (Trees 1A, 1, and 2).

Attachment B
Tree Protection Plan and Details



NO.	DATE	BY	REVISION

NOTICE
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

BMC DESIGNED
HCM/BAW DRAWN
BMC CHECKED

PRELIMINARY ONLY
DO NOT USE FOR CONSTRUCTION
MARCH 2016
MURRAY, SMITH & ASSOCIATES, INC.

MSA Murray, Smith & Associates, Inc. Engineers/Planners
2707 Colby avenue, Suite 1110 Everett, Washington 98201-3566 PHONE 425.252.9860 FAX 425.252.8863

CITY OF KIRKLAND, WASHINGTON
ROSE POINT LIFT STATION IMPROVEMENTS

TREE RETENTION PLAN

PROJECT NO.: 19-1880.203 | SCALE: AS SHOWN | DATE: MARCH 2016

SHEET L-1
V of V

Attachment B: Rose Point Lift Station – Shoreline Code Analysis

Updated February 28, 2017

Kirkland Zoning Code – Shoreline Management Chapter 83	Project Compliance Analysis
83.170 Shoreline Environments, Permitted and Prohibited Uses and Activities Chart Residential – L Utility transmission facility – Substantial Development - This use may be allowed provided there is no other feasible route or location. Must be underground unless not feasible.	The proposed new lift station is in close proximity to the existing station that was built in 1987. The existing station must stay in operation during construction of the new lift station, to convey sewage. There are no feasible alternatives to this location due to the substantial amount of conveyance infrastructure in the area.
83.180 Shoreline Development Standards Residential – L Minimum Lot Size - N/A Shoreline Setback - R-L (B) 30% of the average parcel depth but not less than 30 ft. and not required to be greater than 60 ft. Maximum Lot Coverage – R-L – 50% Maximum Height of Structure – R-L – 25' above ABE	Minimum lot size, shoreline setback, and vegetation requirements will be met. The project is not located within the shoreline setback.
83.240 Utilities 1. General a. See KZC 83.360 for avoiding and minimizing impacts when locating, designing, constructing and operating the use. b. Whenever feasible, utility facilities shall be located outside the shorelines jurisdiction. Whenever these facilities must be placed in a shoreline area, the location	1. General a. The project has been sited and designed to avoid and minimize impacts to the greatest extent practicable. Refer to 83.360 below for further discussion. b. The new Rose Point Lift Station must be located in close proximity to the existing infrastructure within existing right-of-way. The location will not adversely impact shoreline ecological functions or obstruct scenic views.

Attachment B: Rose Point Lift Station – Shoreline Code Analysis

Updated February 28, 2017

Kirkland Zoning Code – Shoreline Management Chapter 83	Project Compliance Analysis
shall be chosen so as not to adversely impact shoreline ecological functions or obstruct scenic views. c. Utilities shall be located in existing rights-of-way and utility corridors wherever feasible. d. New utilities shall not be located waterward of the OHWM or in the Natural shoreline environment, unless it is demonstrated that no feasible alternative exists. e. Utility lines, pipes, conduits, cables, meters, vaults, and similar infrastructure and appurtenances shall be placed underground consistent with the standards of the serving utility to the maximum extent feasible. f. Proposals for new utilities or new utility corridors in the shorelines jurisdiction must fully substantiate the infeasibility of existing routes or alternative locations outside of the shorelines jurisdiction. g. Utilities that are accessory and incidental to a shoreline use shall be reviewed under the provisions of the use to which they are accessory. h. Utilities shall provide screening of facilities from the lake and adjacent properties in a manner that is compatible with the surrounding environment. The City will determine the type of screening on a case-by-case basis. i. Utility development shall, through coordination with local government agencies, provide for compatible, multiple uses of sites and rights-of-way. Such uses include shoreline access points, trail systems and other forms of	c. The proposed project site is within an existing public right-of-way. d. The project would be located landward of the OHWM. e. Utility lines, pipes, conduits, cables, meters, vaults, and similar infrastructure would be placed underground to the maximum extent possible. f. The proposed new lift station is in close proximity to the existing station that was built in 1987. The existing station must stay in operation during construction of the new lift station, to convey sewage. There are no feasible alternatives to this location due to the substantial amount of conveyance infrastructure in the area. g. N/A h. The above-ground facility has been designed to blend with the surrounding architecture and has been discussed with adjacent residences – all approve of the proposed design. i. The project will be constructed within existing right-of-way and complies with this requirement.

Attachment B: Rose Point Lift Station – Shoreline Code Analysis

Updated February 28, 2017

Kirkland Zoning Code – Shoreline Management Chapter 83	Project Compliance Analysis
recreation and transportation, providing such uses will not unduly interfere with utility operations, or endanger public health and safety. 2. Construction and Maintenance a. All shoreline areas disturbed by utility construction and maintenance shall be replanted and stabilized with approved vegetation by seeding, mulching, or other effective means immediately upon completion of the construction or maintenance activity. Such vegetation shall be maintained until established. b. Clearing of vegetation within utility corridors shall be the minimum necessary for installation, infrastructure maintenance and public safety. c. Construction of pipelines placed under aquatic areas shall be placed in a sleeve in order to avoid the need for excavation in the event of a failure in the future. d. Construction located near wetlands and streams shall use native soil plugs, collars or other techniques to prevent potential dewatering impacts. e. See KZC 83.480 for conducting maintenance activities that minimize impacts. 3. Utility Production and Processing Facilities –	2: Construction and Maintenance a. All shoreline areas disturbed by utility construction and maintenance would be replanted and stabilized upon completion of the construction or maintenance activity. b. Minimal clearing of vegetation would occur. c. No new pipelines would be placed under aquatic areas. d. There would be no construction near wetlands or streams. e. Maintenance activities would be conducted in accordance with KZC 83.480. 3: Not applicable. The proposed lift station is a transmission facility.

Attachment B: Rose Point Lift Station – Shoreline Code Analysis

Updated February 28, 2017

Kirkland Zoning Code – Shoreline Management Chapter 83	Project Compliance Analysis
4. Utility Transmission Facilities a. Transmission facilities shall be located outside shorelines jurisdiction where feasible, and when necessarily located within shoreline areas, shall assure no net loss of shoreline ecological functions. b. Pipelines transporting hazardous substances or other substances harmful to aquatic life or water quality are prohibited, unless it is demonstrated that no feasible alternative exists. c. Sanitary sewers shall be separated from storm sewers.	a. No feasible alternative location exists. The project must be located in proximity to existing infrastructure (per 1-F). b. Existing sanitary sewer is located outside of the OHWM. Facility replaces existing infrastructure that is at the end of its service life. Selected location provides additional separation distance from the shoreline by locating the facility farther landward than currently existing facility. c. Required by design guidelines. No combined facilities are to be constructed.

Attachment B: Rose Point Lift Station – Shoreline Code Analysis

Updated February 28, 2017

83.360 No Net Loss Standard and Mitigation Sequencing 1. Mitigation Analysis – In order to assure that development activities contribute to meeting the no net loss provisions by avoiding, minimizing, and mitigating for adverse impacts to ecological functions or ecosystem-wide processes, an applicant required to complete a mitigation analysis pursuant to subsection (1) of this section shall utilize the following mitigation sequencing guidelines that appear in order of preference, during the design, construction and operation of the proposal: a. Avoiding the impact altogether by not taking a certain action or parts of an action; b. Minimizing impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology or by taking affirmative steps to avoid or reduce impacts; c. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment; d. Reducing or eliminating the impact over time by preservation and maintenance operations; e. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments; and f. Monitoring the impact and the compensation projects and taking appropriate corrective measures. Failure to demonstrate that the mitigation sequencing standards have been met may result in permit denial. The City may request necessary studies by qualified professionals to determine compliance with this standard and mitigation sequencing.	1. a. The new Rose Point Lift Station must be located in close proximity to the existing infrastructure within existing right-of-way. The proposed new lift station is in close proximity to the existing station that was built in 1987. The existing station must stay in operation during construction of the new lift station, to convey sewage. There are no feasible alternatives to this location due to the substantial amount of conveyance infrastructure already present in the area. There will be no in-water work, and the project will not impact any wetlands or streams. (Station is at end of service life – must replace.) b. The location will not adversely impact shoreline ecological functions or ecosystem-wide processes. The proposed project site would be located further landward of the OHWM than the existing station, and will be located within an existing public right-of-way, in an area that is largely developed, and avoids removal of existing landscaping to the greatest extent feasible. (Above ground footprint is smallest practical lot for operations & maintenance.) c. Six large big leaf maple trees will need to be removed as a result of this project, along with shrubs, grass and weeds along a slope. In addition, noxious weeds (Himalayan blackberry, English ivy) will be removed from the project site. A landscaping mitigation plan will be prepared and approved through permitting process to replace disturbed areas with native plants and shrubs. d. One large big leaf maple tree will be preserved during construction. No additional vegetation will be removed over time. Utility lines, pipes, conduits, cables, meters, vaults, and similar infrastructure would be placed underground to the maximum extent possible.

Attachment B: Rose Point Lift Station – Shoreline Code Analysis

Updated February 28, 2017

Kirkland Zoning Code – Shoreline Management Chapter 83	Project Compliance Analysis
	e. A landscaping mitigation plan will be prepared to replace disturbed areas containing non-native weeds and shrubs with native plants and shrubs, enhancing habitat in the immediate vicinity by the removal of noxious weeds (Himalayan blackberry, English ivy). f. Plant survivability will be monitored in accordance with Kirkland code requirements, and plants will be replaced as needed to meet survivability requirements.
83.400 Tree Management and Vegetation in Shoreline Setback 1. Tree Retention - The following provisions shall apply to significant trees located within the shorelines jurisdiction, in addition to the provisions contained in Chapter 95 KZC. Provisions contained in Chapter 95 KZC that are not addressed in this section continue to apply. To maintain the ecological functions that trees provide to the shoreline environment, significant trees shall be retained or, if removed, the loss of shoreline ecological functions shall be mitigated for, subject to the following standards: a. Development Activity – For tree removal in the shoreline setback when development activity is proposed or in progress.	The project is not located within the shoreline set-back. An Arborist Report and Tree Retention Plan has been prepared for this project. Six significant trees would need to be removed because they are located within the clearing and grading limits for the project. The proposed project would be located in the public right-of-way. Therefore, it is excluded from tree density requirements stipulated in KZC 95.33. A landscape plan is being prepared for this project in accordance with City of Kirkland requirements. Plants and shrubs will be planted in the disturbed areas of the site in accordance with Roadway Policy R-15. There are no sidewalks or curbs on 10th

Attachment B: Rose Point Lift Station – Shoreline Code Analysis

Updated February 28, 2017

Kirkland Zoning Code – Shoreline Management Chapter 83	Project Compliance Analysis
83.470 Lighting 1. Exceptions – a. The following development activities are exempt from the submittal and lighting standards established in this section: 1) Emergency lighting required for public safety; 2) Lighting for public rights-of-way;	The project will only contain safety illumination for the door. (One emergency-use only floodlight will be installed above door.)

Attachment B: Rose Point Lift Station – Shoreline Code Analysis

Updated February 28, 2017

83.480 Water Quality, Stormwater, and Nonpoint Pollution 1. General – Shoreline development and use shall incorporate all known, available, and reasonable methods of prevention, control, and treatment to protect and maintain surface and/or ground water quantity and quality in accordance with Chapter 15.52 KMC and other applicable laws 2. Submittal Requirements - All proposals for development activity or land surface modification located within the shorelines jurisdiction shall submit for approval a storm water plan with their application and/or request, unless exempted by the Public Works Official. The storm water plan shall include the following: a. Provisions for temporary erosion control measures; and b. Provisions for storm water detention, water quality treatment and storm water conveyance facilities, in accordance with the City's adopted surface water design manual in effect at the time of permit application. 3. Standards - a. Shoreline development shall comply with the standards established in the City's adopted surface water design manual in effect at the time of permit application. b. Shoreline uses and activities shall apply Best Management Practices (BMPs) to minimize any increase in surface runoff and to control, treat and release surface water runoff so that receiving properties, wetlands or streams, and Lake Washington are not adversely affected, consistent with the City's adopted surface water design manual. All types of BMPs require regular maintenance to continue to function as intended. Low Impact Development techniques shall be	1: The project will comply with these requirements. 2: a. Project will comply with the standards established in the City's adopted surface water design manual in effect at the time of permit application. b. Prior to construction, a Stormwater Pollution Prevention Plan (SWPPP) would be completed. This would include a description of erosion control measures, as well as methods for: (1) collecting and conveying right-of-way storm drainage, and (2) restoring, repairing, improving and/or relocating any public storm drainage impact. 3: a. Design will comply with adopted surface water design manual in effect at the time of permitting approval. b. Design will comply with adopted surface water design manual in effect at the time of permitting approval. All appropriate/required BMP's will be adopted in the design. c. No new outfalls/discharges are proposed. d. Design will comply with adopted surface water design manual in effect at the time of permitting approval. All appropriate/required BMP's will be adopted in the design. e. A Spill Prevention, Control and Countermeasure Plan would be developed and implemented by the Contractor in order to protect land and water resources. f. N/A

Attachment B: Rose Point Lift Station – Shoreline Code Analysis

Updated February 28, 2017

considered and implemented to the greatest extent practicable, consistent with the City's adopted surface water design manual. c. New outfalls or discharge pipes to Lake Washington shall be avoided, where feasible. If a new outfall or discharge pipe is demonstrated to be necessary, it shall be designed so that the outfall and energy dissipation pad is installed above the OHWM. d. In addition to providing storm water quality treatment facilities as required in this section and the City's Surface Water Master Plan, the developer and/or property owner shall provide source control BMPs designed to treat or prevent storm water pollution arising from specific activities expected to occur on the site. e. No release of oils, hydraulic fluids, fuels, paints, solvents or other hazardous materials shall be permitted into Lake Washington. If water quality problems occur, including equipment leaks or spills, work operations shall cease immediately and the Public Works Department and other agencies with jurisdiction shall be contacted immediately to coordinate spill containment and cleanup plans. It shall be the responsibility of property owners to fund and implement the approved spill containment and cleanup plans and to complete the work by the deadline established in the plans. f. All materials that come into contact with water shall be constructed of untreated wood, cured concrete, steel or other approved nontoxic materials. Materials used for overwater decking or other structural components that may come into contact with water shall comply with regulations of responsible agencies (i.e., Washington State Department of	

Attachment B: Rose Point Lift Station – Shoreline Code Analysis

Updated February 28, 2017

Fish and Wildlife or Department of Ecology) to avoid discharge of pollutants.	
83.520 Geologically Hazardous Areas 1. General - Uses, developments, activities and shoreline modifications within geologically hazardous areas must be limited to prevent significant adverse impacts to property or public improvements and/or result in a net loss of ecological functions and ecosystem-wide processes.	No alternative locations are available for the lift station, and some stabilization (a retaining wall) would be required for protection. A geotechnical report was prepared for the project as part of the Rose Point Lift Station Improvements engineering report. The geotechnical report contains information specified in the KZC.

Attachment B: Rose Point Lift Station – Shoreline Code Analysis

Updated February 28, 2017

83.540 Archaeological and Historic Resources 1. General – Uses, developments and activities on sites of historic or archeological significance or sites containing items of historic or archeological significance must not unreasonably disrupt or destroy the historic or archeological resource. 2 Standards - a. Permits submitted for land surface modification or development activity in areas documented by the Washington State Office of Archaeology and Historic Preservation to contain archaeological resources shall include a site inspection and a draft written report prepared by a qualified professional archaeologist, approved by the City, prior to the issuance of a permit. b. Shoreline permits shall contain provisions that require developers to immediately stop work and notify the City if any potential archaeological resources are uncovered during land surface modification or development activity. In such cases, the developer shall be required to provide for a site inspection and evaluation by a qualified professional archaeologist, approved by the City, to ensure that all feasible valuable archaeological data is properly handled. c. If identified historical or archaeological resources are present, site planning and access to such areas shall be designed and managed to give maximum protection to the resource and surrounding environment. d. Interpretative signs, historical markers and other similar exhibits providing information about historical and archaeological features and natural areas shall be provided when appropriate.	The project will comply with these requirements. Prior to any ground disturbing activities, a sub-surface cultural resources survey will be conducted by a professional archaeologist for the project in order to identify the presence of any cultural resources. Depending on the results of the survey, a project-specific archaeological inadvertent discovery plan (IDP) may be created or archaeological monitoring during construction of the project may occur. In addition to following the IDP, the City will comply with state laws requiring the protection of cultural resources and human remains (RCW 27.53, RCW 27.44, RCW 68.50, and RCW 68.60). The City will temporarily halt work in the immediate vicinity of the identified resources and notify the City, Department of Archaeology and Historic Preservation (DAHP), and affected Tribes to negotiate mitigation and/or avoidance measures. Standards a – g are to be complied with during design and construction. Full-time construction inspection will be provided and personnel and contractor will be instructed on proper procedures to follow in the event of an inadvertent discovery. All permit provisions will be complied with and highlighted in plans and specification as needed/appropriate.

Attachment B: Rose Point Lift Station – Shoreline Code Analysis

Updated February 28, 2017

e. In the event that unforeseen factors constituting an emergency as defined in RCW 90.58.030 that necessitate rapid action to retrieve or preserve artifacts or data identified above, the project may be exempted from the permit requirement of these regulations. The City shall notify the State Department of Ecology, the State Attorney General's Office and the State Historic Preservation Office of such a waiver in a timely manner. f. Archaeological sites are subject to Chapter 27.44 RCW (Indian Graves and Records) and Chapter 27.53 RCW (Archaeological Sites and Records) and shall comply with Chapter 25-48 WAC or its successor as well as the provisions of this chapter. g. Proposed changes to historical properties that are registered on the State or National Historic Register are subject to review under the National and State Registers' review process.	

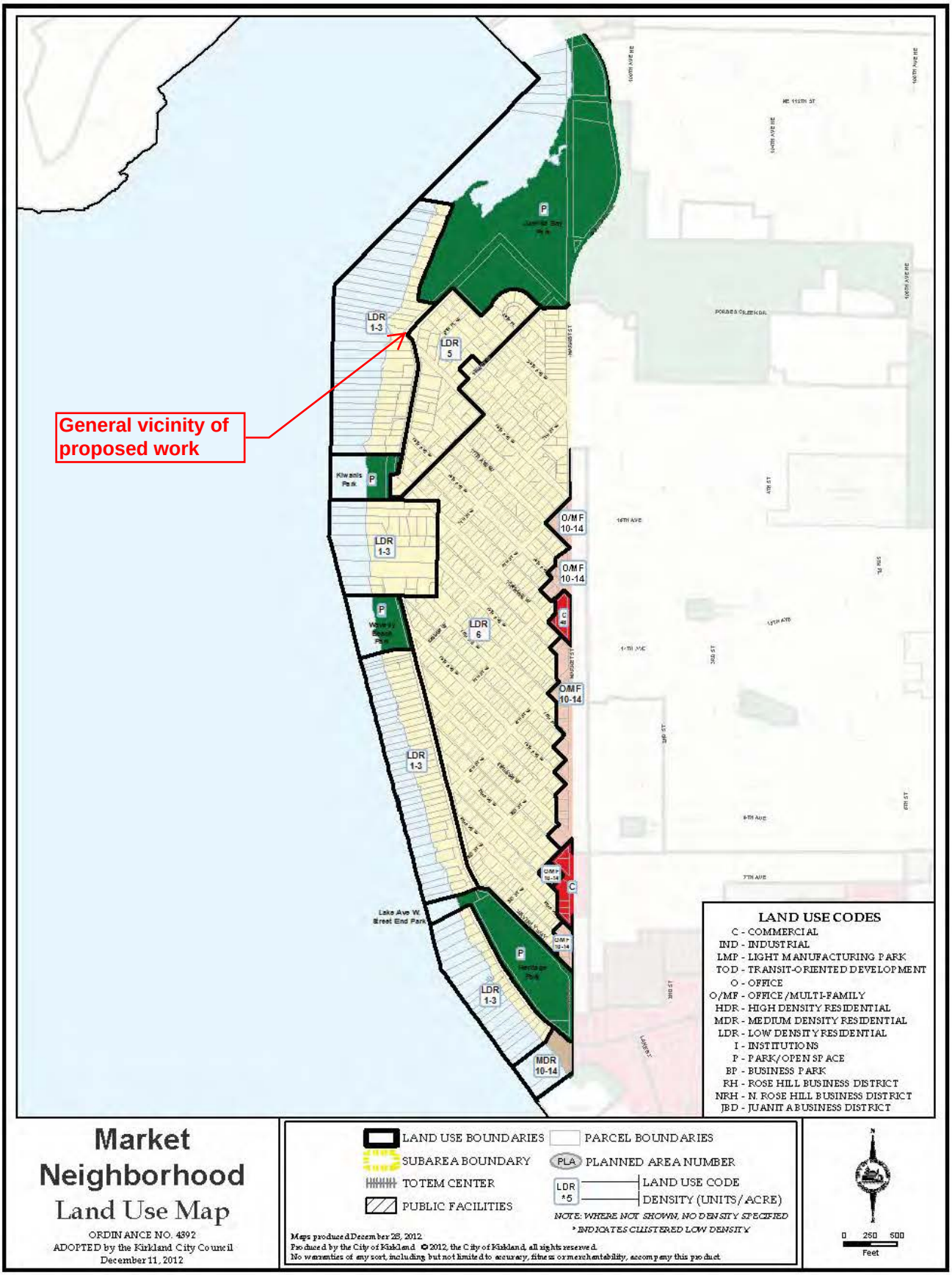


Figure M-4: Market Neighborhood Land Use