



MEMORANDUM

To: Planning Commission
Houghton Community Council

From: Stacey Rush, Senior Surface Water Engineer
Jenny Gaus, Surface Water Engineering Supervisor
Rob Jammerman, Development Engineering Manager
Kathy Brown, Public Works Director
Paul Stewart, Deputy Director
Dorian Collins, Senior Planner
Deborah Powers, Urban Forester

Date: September 20, 2016

Subject: DRAFT AMENDMENTS TO THE KIRKLAND ZONING CODE TO INCORPORATE STORMWATER LOW IMPACT DEVELOPMENT (LID) PRINCIPLES AND TO ADDRESS NPDES STORMWATER PERMIT REQUIREMENTS (File No. CAM16-02154)

RECOMMENDATION:

It is recommended that the Planning Commission and Houghton Community Council (HCC) review the proposed code changes and provide feedback to staff.

Staff will bring back the proposed code changes for consideration at a joint public hearing on October 24, 2016. While the Planning Commission and HCC will be making a formal recommendation on the Zoning Code changes, comments on the other proposed standards are appropriate as well.

BACKGROUND

1. Introduction and Summary

1. A What is LID and Why Should Kirkland Consider It?

Stormwater picks up pollutants from hard surfaces such as roadways and parking lots and conveys them to the nearest stream or lake. Stormwater is the largest source of pollution to Puget Sound (Puget Sound Partnership, 2009). Recent experiments with untreated stormwater show it can be deadly to salmon, and it can contain a toxic mix of metals, oil, nutrients, and even pharmaceuticals ([Seattle Times, October 8, 2015](#) ; [Solving Stormwater](#)). In addition, stormwater pollution can lead to swimming beach closures and fouled water for boaters. Current stormwater science, including a modeling study conducted on the Juanita Creek Watershed (King County, 2012) suggests that the use of Low Impact Development (LID) can improve outcomes for water quality and for fish.

LID is the collective term of using design principles and facilities to slow and clean stormwater runoff through contact with soils and vegetation. Taken together, LID principles and facilities mimic the hydrologic properties of a forest. Examples of LID design principles include site layout that reduces impervious surface and preserves trees and native vegetation. In Kirkland, City zoning, municipal codes, pre-approved plans and policies provide this guidance on site design principles.

LID facilities deliberately disperse runoff through vegetation and infiltrate into native soils via bioretention (rain gardens) and permeable paving materials. LID facilities are part of a suite of controls that development/redevelopment projects must provide as noted in the City's surface water design requirements.

LID design principles create and allow space for use of LID facilities. LID facilities have been shown to clean and slow the flow of stormwater, and thus are likely to improve water quality and salmon habitat conditions. Protection of water quality and salmon habitat provides fishable, swimmable waters for the enjoyment of Kirkland's citizens, and reduces liability from impacts to Tribal fishing rights, Federal Clean Water Act violations, and "takings" under the Federal Endangered Species Act. Stormwater design requirements that emphasize the use of LID principles and practices for development projects will complement city efforts to manage stormwater that include planning for and construction of facilities to treat runoff from existing development (retrofit facilities), pollution source control, education and outreach, and maintenance of the public stormwater system.

1. B Why Should Kirkland Require and Facilitate Use of LID?

In addition to providing environmental benefits, Kirkland must facilitate the use of LID design principles and require LID facilities in order to comply with State and Federal requirements. Kirkland is one of at least 80 cities and portions of 5 counties covered by the Western Washington Phase II Municipal Stormwater Permit (also known as the National Pollutant Discharge Elimination System Permit, or NPDES Permit) administered through the Washington State Department of Ecology. The NPDES Permit requires the City take action in six areas to improve the quality of stormwater, including Controlling Runoff from New Development, Redevelopment and Construction Sites (see [NPDES Permit](#) section S5.C.4 for details).

In order to comply with the NPDES Permit, Kirkland must "...review, revise and make effective their local development-related codes, rules, standards, or other enforceable documents to incorporate and require low impact development (LID) principles and LID BMPs....The intent of the revisions shall be to make LID the preferred and commonly-used approach to site development..." In other words, the intent is to review the zoning code, municipal code, and pre-approved plans and policies to make sure they facilitate the use of LID design principles to the degree possible. For NPDES Permit compliance, this work must be complete by December 31, 2016 (non-compliance puts the City at risk of fines and other penalties). Examples of the types of items that can impact the use of LID include:

- Required street widths and materials
- Landscaping requirements
- Requirements or allowances for clustering buildings
- Requirements for the amount and layout of parking areas

Examples of ways that code could encourage the use of LID facilities include allowing LID facilities to be placed in required landscaping in parking lots, allowing the use of permeable paving surfaces on public streets, and requiring greater open space with new development which could increase the retention of healthy, significant trees and native vegetation.

The proposed LID code changes described below will support an associated project, the implementation of updated **surface water design regulations** that require LID facilities, which must also be adopted by December 31, 2016 (see [September 20th Council packet](#)). In addition, the **critical areas ordinance update** project (Chapter 90 KZC drainage basins) is a separate process occurring simultaneously, and staff is conducting an integrated review of all three projects to identify potential conflicts and synergies between the LID code revisions, adoption of new surface water design manual, and the critical areas ordinance update.

In general, Kirkland codes already facilitate the use of LID principles and facilities. For example, Kirkland code has required “skinny” streets since 1995, which create less impervious surface area. Staff revised codes in 2008 to remove barriers to LID, and implemented the LID code (KZC Chapter 114) which offered incentives for applicants to include LID principles and facilities in their designs. The existing cottage housing and LID chapters of the Zoning Code (KZC Chapters 113 and 114) allow clustering of houses which helps to preserve trees and native vegetation.

2. Process for Code Review

City staff scoped the project, developed a work plan (Attachment A), assembled a team with members from multiple departments, and began working on this project in 2015. Staff identified the specific topics involving LID, and reviewed the related existing codes and standards to identify potential gaps between current codes and [LID code guidance](#) provided by Washington State Department of Ecology.

The team produced a “gap analysis” document (Attachment B), which includes the documents reviewed and discussion of potential manners in which City codes, pre-approved plans and policies could further facilitate the use of LID. The team identified potential alterations to zoning codes, municipal codes, and Public Works (PW) pre-approved plans and policies that would fill identified gaps. Items identified as potential gaps along with the proposed changes to address the gaps are listed in Table 13 (Attachment C).

3. Key Issues: Low Impact Development as the Preferred and Commonly-Used Approach to Site Development

Revisions to zoning and municipal codes include changes to the Tree Management and Required Landscaping code (KZC Chapter 95), Low Impact Development code (KZC Chapter 114), Miscellaneous Use Development and Performance Standards code (KZC Chapter 115), and Streets and Sidewalks code (KMC Chapter 19). There are also multiple changes to the PW pre-approved plans and policies. These are standard plans and policies used for new and redevelopment throughout Kirkland; and contain seven sections: sanitary sewer, water, roadways, erosion control, storm drainage, LID storm, and traffic signals. All changes are listed on the Proposed LID Code Review Amendments (Attachment D).

3. A. Proposed Revisions to KZC Chapter 95, Tree Management and Required Landscaping.

Currently the City requires tree retention with development to maintain its 40% canopy goal and to work towards a healthy, sustainable urban forest. To emphasize the connection between LID and trees, vegetation and soil, along with offering guidance in soil/vegetation preservation and restoration, additional language in KZC 95 was needed. An LID approach emphasizes the preservation of conifers due to a greater ability of conifers to intercept rainfall during the winter months in Western Washington.

In addition, the proposed revisions will result in greater consistency between City codes and policies (Attachment E contains KZC 95 redlined changes):

Proposed Amendments

- 95.33 Revise Tree Credit Table to give extra tree credits for the retention of conifers.
- 95.34 Revise code to reflect Best Available Science/Best Management Practices (BMPs); refer to Public Works (PW) Pre-Approved Plans.
- 95.40 Revise code to include preference for native species.
- 95.41 Revise code to include preference for native species.
- 95.44 Revise code to specify LID facilities count towards landscape requirements, but keep tree requirement.
- 95.45 Revise code to specify that LID facilities count towards landscape requirements; reference PW Pre-Approved Plans.
- 95.50 Revise code for consistency with surface water design manual and to reflect Best Available Science/BMPs; revise soil compaction density requirements; reference PW Pre-Approved Plans; specify "soil" in restoration code.

3. B. Proposed Revisions to KZC 115.90, Calculating Lot Coverage.

For every piece of property in the city, the Zoning Code establishes the percentage of lot coverage allowed, and requires that any area not included in this percentage must be devoted to open space. "Lot coverage" is the area of all structures and pavement and any other impervious surface on the subject property. The following definitions are useful in understanding these terms:

- **Maximum lot coverage** is defined as, "the maximum percentage of the surface of the subject property that may be covered with materials which will not allow for the percolation of water into the underlying soils".
- **Open space** is defined as, "vegetated and pervious land not covered by buildings, roadways, sidewalks, driveways, parking areas, plazas, terraces, swimming pools, patios, decks, or other similar impervious or semi-impervious surface".

Section [115.90](#) of the Zoning Code provides guidance as to surfaces on a property that may be either exceptions or exemptions to the calculation of lot coverage. The *exceptions* are intended to address unique situations (such as an access easement that is not included in the lot size calculation), or areas on a property that are generally found to provide percolation similar to what would be provided with a typical pervious condition. The *exemptions* listed include surfaces such as permeable pavement (non-grassed) and grassed modular grid pavement, which are surfaces found to provide partial cleansing and percolation benefits. This section of the Zoning Code states that the exemptions are to be calculated at a ratio of 50% of the total

area covered, and that the exempted area may not equal more than 10% of the total lot area. This section is intended to provide an incentive for development to choose LID techniques.

Proposed Amendments

- Section 115.90.2.d: Since rockeries and retaining walls surrounded by turf or landscape disperse water on site, they should be exempt from the calculation of lot coverage. While this condition has been acknowledged in the review of development proposals to some extent, an amendment to this section to clarify the circumstances under which these features are exempt is needed (see Attachment F).
- Section 115.90.e: In some circumstances, easements must be placed on private property to accommodate an adjacent public sidewalk. An exception to lot coverage should be provided for the private property owner to ensure that the easement does not burden the property with additional lot coverage (see Attachment F).
- Section 115.90.3: Since the objective of the proposed amendments is to make LID the preferred and commonly-used approach to site development, staff recommends that the incentives for the use of alternative surfaces in the calculation of lot coverage be removed. This change would ensure that the regulations are consistent with the new design manual, and support the use of LID design principles to the greatest extent possible (see Attachment F).

Discussion – Regulate open space rather than impervious surface?

The City's surface water design manual provides the standards for the installation of impervious surfaces and the treatment of resulting stormwater. Nevertheless, the presence of standards in the Zoning Code related to exceptions and exemptions to lot coverage restrictions results in the evaluation of these surfaces as well.

While the goal of the lot coverage standards contained in the Zoning Code may have originally been to address both stormwater issues and the community's desire for open space, the application of the standards may be somewhat superfluous as they relate to stormwater, since those requirements are handled through the City's surface water requirements.

An alternative approach to ensuring that the desired amount of open space is retained with development would be to instead establish a minimum percentage of a subject property that must meet the "Open Space" definition. Section 95.41 of the Zoning Code, [Supplemental Plantings](#), provides standards for the portion of a property that is not covered by a building or other improvement, in a critical area, or committed to some specific purpose. Within these areas, living plant material must cover 80% of the area within two years. This section could provide guidance for the "open space" area, and provide sufficient flexibility for the presence of rockeries, retaining walls and other non-plant materials that could be allowed to occupy the portion of the open space area not covered by living plant material.

In an evaluation of recent development projects, planners found that this alternative approach of using a calculation of open space rather than lot coverage produced similar results. The

advantage of this approach would be to eliminate the frequent subjective decisions that must be made regarding which features in landscaping are more appropriately considered "lot coverage" versus "open space". For example, artificial turf is considered 100% impervious if it is installed with under drains, but it is considered 100% pervious if no under drains are used. However, artificial turf does not meet the definition of "open space" because it is not a vegetated surface. This approach could provide more clarity in regulation and tie the regulations more clearly to the objectives of the Zoning Code.

Staff recommends shifting to regulating the percentage of open space on a property rather than the percentage of impervious surface. Do the Commission and Council agree? Is additional information needed on this topic?

3. C. Proposed Revisions to KZC Chapter 114, Low Impact Development.

The creation of the LID code (KZC 114) to offer incentives for the use of LID facilities in 2008 was an innovative way to promote LID facilities at a time when they were not required as part of traditional development. Now that LID principles and facilities are required under the new surface water design manual, it is necessary to remove the stormwater incentives from this code. Staff proposes revising the code instead of removal because it provides incentives for other beneficial items (such as requiring 40% common open space, clustering of houses, retention of native and undisturbed vegetation and planting of additional native conifers and plants). Staff is evaluating existing projects to determine whether changes to the review process for one or more 2/3 unit homes might be appropriate. Options for consideration will be presented at the hearing.

Staff is recommending the proposed edits to KZC 114 as noted in Attachment G. Do the Commission and Council agree?

3. D. Proposed Revisions to KMC 19.12.130, Specifications.

KMC Chapter 19 contains code specifications that refer to the 1977 edition of the American Public Works Association, Standard Specifications for Municipal Public Works Construction. This reference is no longer used, as Kirkland PW has their own pre-approved plans and policies containing current specifications. This code change is necessary to reflect the most current specifications, and to be consistent with KZC 110.65 which refers to PW pre-approved plans and policies. Proposed edits to KMC 19.12.130 are located in Attachment H.

Does the Commission or Council have any questions or comments on this?

3. E. Proposed Revisions to Public Works Pre-Approved Plans and Policies.

The Public Works Department develops standard plans and policies used for new and redevelopment throughout Kirkland, containing seven sections: sanitary sewer, water, roadways, erosion control, storm drainage, LID storm, and traffic signals. Although there is already a stormwater LID section, revisions were identified to facilitate the use of LID principles and facilities. These policies and procedures are updated on an annual basis, and the revisions identified in this project (Attachment D) will occur in early 2017.

Does the Commission or Council have any questions on this?

4. Outreach Process

Coordination and public outreach for the LID code revision project has the goals of informing city staff and elected officials, the development community, and the public, and gathering input on the proposed code changes.

Public outreach process for zoning code revisions includes presentations to Planning Commission, HCC, Kirkland Council and internal coordination committees, a project website, open houses for the general public and developers, and email updates via the Developers listserv, email newsletters and press releases. Staff has started items from the outreach plan, and more will continue over the next few months. Current and future outreach efforts are listed below:

- Kirkland Council briefing in conjunction with the surface water design manual 7/05/16
- LID code revision project website
- Email notification to Developers' Forum
- Email notification to Neighborhoods
- Open House for the Community on 10/24/16
- Public Hearing 10/24/16
- Kirkland Council 11/15/16
- Kirkland Council action on 12/13/16

5. Timeline and Next Steps

A timeline for adoption of the 2016 LID Code Revision Project is attached (Attachment I). The public hearing is scheduled for October 24, 2016. Staff will go to Kirkland Council in November for a briefing and again in December with an ordinance to adopt the zoning and municipal code changes. The effective date of the code changes will be set at January 1, 2017 in order to comply with the NPDES Permit. Staff will be updating the PW pre-approved plans with details and policies associated with the 2016 code changes.

Below is a table with highlights from the timeline:

Item	Audience	Date
Joint Study Session	Planning Commission and Houghton Community Council	9/29/16
Council Committee	Parks/Public Works/Human Resources Council Committee	10/05/16
Council Committee	Planning/Economic Development Council Committee	10/10/16
Open House	General Public	10/24/16
Joint Public Hearing	Planning Commission, Houghton Community Council, and General Public	10/24/16
Kirkland Council Meeting	Kirkland Council	11/15/16
Kirkland Council Meeting	Kirkland Council	12/16/16

HCC Meeting	Houghton Community Council	12/19/16 OR 1/23/17
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- Attachment A – Work Plan for LID Code Revision Project
- Attachment B – Gap Analysis for LID Code Revision Project
- Attachment C – Table 13: Items Identified During Gap Analysis
- Attachment D – LID Code Review - Proposed Amendments
- Attachment E – KZC 95 with redlined edits
- Attachment F – KZC 115.90 with redlined edits
- Attachment G – KZC 114 with redlined edits
- Attachment H – KMC 19.12.130 with redlined edits
- Attachment I – Timeline for LID Code Review Project



2015/2016 STORMWATER LOW IMPACT DEVELOPMENT CODE REVIEW PROJECT

Project Summary

Along with other jurisdictions, City of Kirkland staff are required to revise our development codes and standards to make stormwater low impact development (LID) the preferred and commonly-used approach to site development. Specifically, we are required to review, revise, and make effective our development-related codes, rules, standards, and other enforceable documents to incorporate stormwater LID principles and BMPs (measures to minimize impervious surface, minimize loss of vegetation, and minimize stormwater runoff). This code update is required through our current National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit (per section S5.C.4.f.i and ii, see detail on next page).

This entire process will take around 12-18 months. Surface water staff will lead this project, but it will require a significant amount of city staff time from the following other departments:

- Planning and Community Development (especially planner staff time since this project is revising zoning codes)
- Public Works
- Fire and Building
- Parks
- City Attorney's Office
- City Manager's Office

The following is available to facilitate this project:

1. 2015/2016 SW LID Code Review Work Plan – including team members, project timeline, and table of code topics to address.
2. Integrating LID into Local Codes: A Guidebook for Local Governments (Puget Sound Partnership, July 2012), available at the following website:
http://www.psp.wa.gov/LID_manual.php
3. Low Impact Development Code Update and Integration Toolkit (WA Dept. of Ecology, July 2014), available at the following website:
<http://www.wastormwatercenter.org/lidcodeintegration/>

The following text is from our 2013-2018 NPDES Western WA Phase II Municipal Stormwater Permit (section S5.C.4.f.i and ii):

No later than December 31, 2016, Permittees shall review, revise, and make effective their local development-related codes, rules, standards, or other enforceable documents to incorporate and require LID principles and LID BMPs.

The intent of the revisions shall be to make LID the preferred and commonly-used approach to site development. The revisions shall be designed to minimize impervious surfaces, native vegetation loss and stormwater runoff in all types of development situations. Permittees shall conduct a similar review and revision process, and consider the range of issues, outlined in the following document: Integrating LID into Local Codes: A Guidebook for Local Governments (Puget Sound Partnership, 2012).

...each Permittee shall submit a summary of the results of the review and revision process above with the annual report due no later than March 31, 2017. This summary shall include, at a minimum, a list of the participants (job title, brief job description, and department represented), the codes, rules, standards, and other enforceable documents reviewed, and the revisions made to those documents which incorporate and require LID principles and LID BMPs. The summary shall include existing requirements for LID principles and LID BMPs in development-related codes. The summary shall be organized as follows:

- a) Measures to minimize impervious surfaces;*
- b) Measures to minimize loss of native vegetation; and*
- c) Other measures to minimize stormwater runoff.*

STORMWATER LOW IMPACT DEVELOPMENT CODE REVIEW PROJECT

2015/2016 WORK PLAN

Assemble the Project Team (see Table A.1)

1. Identify team members.
2. Include staff from Public Works (Development Engineering, Operations & Maintenance, and Capital Improvement Program), Planning & Building, Fire, Parks, and City Attorney's Office. Consider City Manager's Office, Planning Commission, Councils, and external stakeholders (like developers' forum, neighborhood groups, environmental groups, special districts, etc.).
3. Develop project timeline (see Table A.2).
4. Meeting schedule. Meetings will be scheduled several weeks in advance, based on staff and room availability.

Identify Topics to Address (see Table B.1).

1. Landscaping, Native Vegetation, and Street Landscaping
2. Site Planning and Assessment
3. Hard and Impervious Surfaces
4. Bulk and Dimensional Considerations
5. Subdivision and Planned Unit Development
6. Critical Areas and Shoreline Management
7. Clearing and Grading
8. Streets and Roads
9. Healthy Soils
10. Parking
11. Design Guidelines and Standards
12. Stormwater Management and Maintenance

Review Existing Codes and Standards (Gap Analysis)

1. Identify codes relating to the specific topics.
2. Identify existing codes and standards already meeting criteria.
3. Identify gaps in existing codes and standards.
4. Identify codes/standards that currently offer incentives for stormwater LID. Since LID will be required, the incentives may need to be removed.

Review the following documents:

- PCD Comprehensive Plan
- Zoning Code (check Holmes Point & Houghton areas for differences)
- Municipal Code
- Shoreline Management Plan
- Subdivision code/standard documents
- Public Works Pre-Approved Plans
- CIP Engineering and Street Standards (WSDOT/other)
- ROW Tree Inventory

Amend Existing Codes/Standards and Develop New Codes/Standards (fill the gaps)

1. Propose amendments to existing codes and standards.
2. Propose new codes and standards.
3. Internal review, revisions, and approval.

Public Review and Adoption Process

1. Public review and approval.
2. Planning Commission review and approval.
3. Council review and approval (Kirkland and Houghton).
4. Adopt and Implement by December 31, 2016.

Ensure Successful Implementation

1. Develop and implement training plan of new and revised codes and standards for:
 - City staff
 - Applicants, engineers, contractors (through Developers Forum)
 - Property Owners
 - General Public

WORK PLAN

Table A.1 Project Team

Internal Team Members

Project Team Lead: Stacey Rush

Department	Subject/Expertise	Employee
Planning & Building	Policy, Urban Forester	*Deborah Powers
	Policy & development review	*Dorian Collins
	Policy, critical areas	Teresa Swan
	Policy, critical areas	Joan Lieberman-Brill
	Policy, Manager	Jeremy McMahan
	Engineering, inspection and review	Tom Jensen
	Policy, Deputy Director	*Paul Stewart
PW	Engineering, stormwater	*Stacey Rush
	Policy, stormwater	*Anne Dettelbach
	Policy & engineering, stormwater	*Jenny Gaus
	Private development engineering	John Burkhalter
	Capital streets/road engineering	Capital staff
	O&M, public facilities, inspections	Erin Devoto
	Construction inspection	Tom Chriest
	Engineering Manager	*Rob Jammerman
Fire	Emergency response access, street widths and layouts, etc.	Grace Steuart
Parks	Parks	staff
CAO	Legal	staff
Planning Commission	Policy	n/a
Houghton Council	Policy	n/a
Kirkland Council	Policy	n/a
PW/CMO	Public Outreach	Kathy Cummings

*Primary staff for this project

External Stakeholders

- Developers Forum (Private Developers, Engineers, Property Owners)
- Neighborhood Groups
- Environmental groups
- Special Districts

Table A.2 NPDES Stormwater LID Code Review Timeline	2015							2016												2017			
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	
Assemble the Project Team																							
Develop work plan	█	█	█	Completed																			
Develop meeting schedule			█	█	█	Completed																	
Identify/Understand Topics to Address	█	█	█	█	Completed																		
Review Existing Codes and Standards																							
Identify codes relating to the specific topics			█	█	█	█	█	█	█	█	█	█	█	█	Completed								
Identify existing codes and standards meeting criteria				█	█	█	█	█	█	█	█	█	█	█	Completed								
Identify gaps in existing codes and standards					█	█	█	█	█	█	█	█	█	Completed									
Amend Existing Codes, Develop New Codes																							
Propose amendments to existing codes and standards											█	█	█	█	█	█	█						
Propose new codes and standards											█	█	█	█	█	█							
Internal review, revisions, and approval												█	█	█	█								
Public Review and Adoption Process																							
SEPA process																		█	█	█			
Public review and approval																		█	█	█			
Planning Commission review and approval																		█	█	█			
Council review and approval																		█	█	█			
	Adopt and Implement by Dec 31, 2016																						
Ensure Successful Implementation																					█	█	█
Develop and implement training plan for: city staff, engineers, developers, contractors, property owners, general public																					█	█	█

2015/2016 NPDES Stormwater LID Code Review											
Table B.1 Code Topics to Address		Code and Standard Documents to Review									
Goal:	Revise codes with the following: (1) Measures to minimize impervious surfaces (2) Measures to minimize loss of native vegetation (3) Other measures to minimize stormwater runoff	Kirkland Zoning Code	Zoning Code specific to Houghton	Zoning Code specific to Holmes Pt.	Kirkland Municipal Code	PCD Comp. Plan	Shoreline Mgmt Plan	Sudivision Code/standard documents	PW Pre-Approved Plans	CIP Eng & Street Standards (WSDOT/other)	Other (ROW Tree Inventory)
Review codes and standards that include the following topics:											
Table 1. Landscaping, Native Vegetation, and Street Landscaping - PW and PCD											
tree preservation/retention		Separate tables were created for each topic - see Gap Analysis Table									
screening (site, parking, perimeter)											
landscape requirements for street frontages											
landscape requirements for parking lots											
minimize disturbance areas											
utility setbacks for trees											
public safety (site limits at intersections, hazard trees)											
tree and landscape installation and maintenance											
Table 2. Site Planning and Assessment - PW and PCD											
minimize site grading, preserve natural watercourses, preserve native vegetation and soils											
Building locations											
parking area locations											
stormwater BMP/facility locations											
critical areas											
clustering housing											
special districts											
location of existing utilities											
street use improvements											
emergency access											
Table 3. Hard and Impervious Surfaces - PW											
"Hard surfaces" are permeable pavements, impervious surfaces, or vegetated roofs											
maximum impervious surface allowances											
shared driveways											
minimum driveway width											
use of permeable pavement for driveways											
two-track driveway design											
Table 4. Bulk and Dimensional Considerations - PCD											
Look for flexibility in increasing heights, reducing setbacks, clustering structures, minimizing footprint, conserving existing vegetation											
building setbacks, lot setbacks											
height limits											
maximum square footage											
floor to area ratios											
clustering											
stormwater facility setbacks											

Table B.1 Code Topics to Address (continued)		Code and Standard Documents to Review									
Goal:	Revise codes with the following: (1) Measures to minimize impervious surfaces (2) Measures to minimize loss of native vegetation (3) Other measures to minimize stormwater runoff	Kirkland Zoning Code	Zoning Code specific to Houghton	Zoning Code specific to Holmes Pt.	Kirkland Municipal Code	PCD Comp. Plan	Shoreline Mgmt Plan	Sudivision code/standard documents	PW Pre-Approved Plans	CIP Eng & Street Standards (WSDOT/other)	Other (ROW Tree Inventory)
Table 5. Subdivision and Planned Unit Development - PCD											
	individual open space requirements	<i>Separate tables were created for each topic - see Gap Analysis Table</i>									
	passive vs. active open space requirements (consider LID BMPs in passive areas)										
	opportunities for performance based designs (PUDs)										
	incentives - cluster development in exchange for increased open space										
Table 6. Critical Areas and Shoreline Management - PCD											
	allowance of LID BMPs in critical areas/shorelines only when compatible										
Table 7. Clearing and Grading - PW											
	Protect existing infiltration/ minimize compaction										
	conserve native vegetation/soils										
	construction sequencing/phasing										
Table 8. Streets and Roads - PW											
	travel lane widths										
	ROW widths										
	use of permeable pavement for streets and roads										
	placement of utilities under paved areas in the ROW										
	required truck turn around area										
	sidewalk widths										
	sidewalk slope										
	minimum cul-de-sac radius										
	alternatives to cul-de-sacs										
	special districts										
Table 9. Healthy Soils											
	protecting and restoring healthy soil (KZC 95.5 Installation standards for required plantings)										
	compost amendments										
	compaction										
	geology										
	high landslide areas										
	hydrology/water table										
Table 10. Parking											
	minimum/maximum parking ratios										
	use of permeable pavement for parking lots (parking stalls, drive aisles)										
	parking stall dimensions										
	driving aisle dimensions										
	off-street parking regulations										
	integrate storm LID BMPS (bioretention) into landscape islands										

Table B.1 Code Topics to Address (continued)		Code and Standard Documents to Review									
Goal:	Revise codes with the following: (1) Measures to minimize impervious surfaces (2) Measures to minimize loss of native vegetation (3) Other measures to minimize stormwater runoff	Kirkland Zoning Code	Zoning Code specific to Houghton	Zoning Code specific to Holmes Pt.	Kirkland Municipal Code	PCD Comp. Plan	Shoreline Mgmt Plan	Sudivision code/standard documents	PW Pre- Approved Plans	CIP Eng & Street Standards (WSDOT/other)	Other (ROW Tree Inventory)
Table 11. Design Guidelines and Standards											
	trees and bioretention	<i>Separate tables were created for each topic - see Gap Analysis</i>									
	continuous curb requirements										
	curb radii										
	ADA										
	restrictions in high urban areas (downtown)										
	Pre-Approved Plans										
Table 12. Stormwater Management and Maintenance - PW											
	process to determine public or private maint responsibility										
	<i>For Privately maintained facilities:</i>										
	mechanism to preserve and maintain facility (tract, easement, covenant, title)										
	maintenance specifications in place										
	mechanism for access, inspection, enforcement process										
	education plan, signage										
	<i>For Publicly maintained facilities:</i>										
	mechanism to preserve and maintain facility (public ROW, tract, easements)										
	maintenance specifications in place										
	mechanism for access, inspection, enforcement process										
	education plan, signage										



Overview of Potential LID Code and/or Policy Gaps

The Stormwater Low Impact Development (LID) Code Review Project is being implemented to meet the City of Kirkland's obligations under its Municipal Stormwater Permit. The goal of the project is to identify where potential code and/or policy changes are needed to make stormwater LID the preferred and commonly used approach to site development in Kirkland.

This document represents the code and policy analysis performed by City staff. The Tables listed below were created to address the following development topics:

Table 1: Landscaping, Native Vegetation, and Street Landscaping

Table 2: Site Planning and Assessment

Table 3: Hard and Impervious Surfaces

Table 4: Bulk and Dimensional Considerations

Table 5: Subdivision and Planned Unit Development

Table 6: Critical Areas and Shoreline Management

Table 7: Clearing and Grading

Table 8: Streets and Roads

Table 9: Healthy Soils

Table 10: Parking

Table 11: Design Guidelines and Standards

Table 12: Stormwater Management and Maintenance

Within each topic table, staff compared Kirkland's current regulations to a set of recommended LID principles and Best Management Practices (BMPs). The "Summary of Gap" column explains if a gap was found (or no gap). The next column describes either why no revision is needed, or what action will be considered to address a gap. Rows highlighted in gray are items staff determined warranted further consideration for change. Kirkland is not required to change everything highlighted in this initial analysis. A deeper analysis of highlighted items will be undertaken before changes are recommended to our Planning Commission, Houghton Council, and Kirkland City Council.

Table 1. Gap Analysis for Topic: Landscaping, Native Vegetation, and Street Landscaping								
Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Tree preservation/retention								
Kirkland Zoning Code, relating to Tree retention with <u>Development Activity</u>	KZC 95.33 Tree Density Requirement	Min tree density is 30 tree credits per acre, use tree credit table.	<i>Place greater emphasis on conifer preservation</i>	Consider a different system for retaining and replacing trees. Consider modifying Tree Credit table to look at area of native vegetation (or % of site in native veg) in addition to number/size of trees and to give extra points for use of conifers of a similar size as deciduous trees.	Modify existing Tree Credit Table to give more credit for conifers (place more emphasis on conifers).		X	
Kirkland Zoning Code, relating to Tree removal on <u>Private Property</u>	KZC 95.23 Tree Removal Not Associated with Development Activity	1-Tree density requirement is 6/acre. Allows removal of 2 significant trees per 12 months (except critical area/buffers). Additional tree removals must meet hazard/nuisance criteria. Replacements req'd only with last 2 trees on property. Significant tree= min 6" diam 4.5' from ground height. 2-Only hazard/nuisance trees may be removed in critical areas; 1:1 replacements required.	<i>Retain and replace native vegetation, place greater emphasis on conifer preservation, include strategies to orient retained vegetation and open space to disconnect impervious surfaces.</i>	No Gap. Chapter 95 revision in 2017/2018 will: 1- Consider a trigger for tree replacement prior to last 2 trees on property. Consider # of overall tree removals allowed proportionate to size of property. 2-Consider restoration area in addition or increase replacement ratio.	No Revision - Existing code meets minimum requirement to retain and replace native vegetation		X	
Kirkland Zoning Code, relating to Tree removal on <u>Private Property</u>	KZC 83.400 Tree Management & Vegetation in Shoreline Setback	Tree removals require like-for-like replacement depending on size. >24" dbh removal not allowed unless hazard or nuisance.	<i>> 12" dbh tree requires additional prescribed vegetation in defined area.</i>	No Gap	No Revision - Any changes must be reviewed by Ecology		X	
Kirkland Zoning Code, relating to Tree removal on <u>Public Property</u>	KZC 95.23 Tree Removal Not Associated with Development Activity	Permit required. Only hazard/nuisance ROW trees may be removed. 1:1 replacement required for street tree removal.	<i>Retain and replace native vegetation</i>	No Gap	No Revision - Existing code requires retention and replacement of trees already required.		X	
Kirkland Zoning Code, relating to Tree retention with <u>Development Activity</u>	KZC 95.30 Tree Retention Associated with Development Activity	Tree Retention Plan based on tree retention value.	<i>Retain and replace native vegetation</i>	No Gap. Chapter 95 revision in 2017/2018 will consider changing from minimum # of individual trees to a minimum % area.	No Revision - Existing code meets minimum requirement to retain and replace native vegetation		X	
Kirkland Zoning Code, relating to Tree retention with <u>Development Activity</u>	KZC 83.400 Tree Management & Vegetation in Shoreline Setback	Tree removals require like-for-like replacement depending on size. >24" dbh removal not allowed unless hazard or nuisance.	<i>> 12" dbh tree requires additional prescribed vegetation in defined area.</i>	No Gap	No Revision - Any change must be reviewed by Ecology		X	
	KZC 95.32 Incentives and Variations to Development Standards	Incentives and variations are allowed in the site design to retain trees with a high retention value (for example, variations in parking areas and access, minor adjustments to location of building footprints, walkways, easements, utilities, etc.).	<i>Retain and replace native vegetation, place greater emphasis on conifer preservation, include strategies to orient retained vegetation and open space to disconnect impervious surfaces.</i>	No Gap	No Revision - code allows process for proposal for variation in site design to retain native vegetation.		X	
	KZC 114 Low Impact Development	Current code incentivizes protected area of trees/native vegetation, includes minimum 40% open space required, maintains existing native vegetation in open space.		No Gap	No Revision - Current code incentivizes protected area of trees/native vegetation, includes minimum 40% open space required, maintains existing native vegetation in open space.		X	
Tree preservation/retention								
Kirkland Zoning Code, relating to Tree retention with <u>Development Activity</u>	KZC 70 Holmes Point Overlay	Current Code limits the amount of impervious lot coverage, therefore an increased amount of native vegetation is saved (see lot coverage table).	<i>Retain and replace native vegetation, place greater emphasis on conifer preservation, include strategies to orient retained vegetation and open space to disconnect impervious surfaces.</i>	No Gap	No Revision needed - Current Code limits the amount of impervious lot coverage, therefore an increased amount of native vegetation is saved (see lot coverage table).		X	
		Current Code requires 25% of total lot area (min) designated as Protected Natural Area (PNA)		No Gap	No Revision - Current Code requires 25% of total lot area (min) designated as Protected Natural Area (PNA)		X	
		Current Code requires all significant trees to be retained.		No Gap	No Revision - Current Code requires all significant trees to be retained.		X	
Kirkland Municipal Code	KMC 1.12.100 Code Enforcement, Special provisions relating to enforcement of tree regulations	Restoration plan required, fines assessed per tree for unauthorized tree removal (\$100 to \$1,000). If intentional violation, fines can be based on the city-appraised tree value.	<i>Are there regulatory controls over tree clearance and removal?</i>	No Gap	No Revision - Current code requires restoration plan and gives the city ability to assess fines.		X	

Table 1. Gap Analysis for Topic: Landscaping, Native Vegetation, and Street Landscaping (continued)

Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Screening								
Kirkland Zoning Code	KZC 95.40 Required Landscaping, KZC 95.41 Supplemental Plantings	95.40, Item 2. Use of Significant Existing Vegetation, 95.41, Item 2a. Standards for Supplemental	<i>Can the screening requirements be revised to include provisions for retaining native vegetation and replanting?</i>	Consider code modifications to include preference for native species, and expansion of the Kirkland Native Plant List.	Modify code to add preference for native species. Revise Kirkland Native Plant List.		X	
Kirkland Zoning Code	KZC 95.42 Minimum Land Use Buffer Requirements	95.42 Item 1 and Item 2 (applicable to Standard 1 and Standard 2)	<i>Consider allowing vegetation in LID facilities to count towards site, parking, or perimeter screening requirements.</i>	Consider code modifications to include language allowing vegetation in LID facilities to count towards perimeter, site and parking screening requirements.	No Revision - bioretention does not provide enough perimeter, site, or parking screening. Bioretention can still be used to meet stormwater requirements, but vegetation screening requirements are in addition to those requirements.		X	
Landscape requirements for street frontages								
Kirkland Zoning Code	KZC 95.40 Required Landscaping	Variance and incentive process is in place to encourage retention of existing vegetation, landscaping is required along street frontages and between sidewalk and parking.	<i>Include other landscaping between the sidewalk and the street. Allow vegetation in LID facilities to count towards open space or landscape requirements.</i>	No Gap	No Revision - Development Tree plans include Right-of-Way trees. Efforts are made to retain trees wherever feasible. City requires landscaping to be installed in landscape strips and any excess areas in the ROW.	X		
	KZC 110	Requires landscaping and ground cover in the Right-of-Way.		No Gap	No Revision - code requires landscaping and ground cover in ROW (and standards allow groundcover other than turf grass).	X		
Kirkland Public Works Pre-Approved Plans	Policy R-10, Street Tree Selection list	Current policy allows for trees in LID facilities to be counted towards street tree requirements.		No Gap	No Revision - Current policy allows for trees in LID facilities to be counted towards street tree requirements.	X		
Kirkland Public Works Pre-Approved Plans	Policy R-10, Street Tree Selection list	Current policy requires street trees, and allows other approved vegetation in addition to those trees (like LID facilities).		No Gap	No Revision - Current policy allows other approved vegetation in addition to street trees (like LID facilities containing trees).	X		
Landscape requirements for parking lots								
Kirkland Zoning Code	KZC 95.44 Internal Parking Lot Landscaping Requirements	Requires min 1 tree (per 25sf) and other groundcover (per parking stall)	<i>Include minimum tree canopy, native vegetation, and allow vegetation in LID facilities to count towards open space or landscape requirements.</i>	Lacks language to allow LID facilities to count towards landscape requirements.	Modify code to specify that LID facilities count towards landscape requirements, but keep tree requirement. Reference COK PW Pre-Approved Plans.		X	X
Kirkland Zoning Code	KZC 95.45 Perimeter Landscape Buffering for Driving and Parking Areas	5' wide strip, Right-of Way of trees and live groundcover	<i>Include minimum tree canopy, native vegetation, and allow vegetation in LID facilities to count towards open space or landscape requirements.</i>	Lacks language to allow LID facilities to count towards landscape requirements	Modify code to specify that LID facilities count towards landscape requirements. Reference COK PW Pre-Approved Plans. Additional language regarding natives could be considered in a subsequent city code review.			X
Kirkland Public Works Pre-Approved Plans	Bioretention Details Plan No. CK-L.01,L.02, L.03, L.04	Existing Bioretention standard details can be used in parking lots.	<i>Allow vegetation in LID facilities to count towards open space or landscape requirements.</i>	No Gap	No Revision - current details for LID facilities can be used in parking lots.			X
Additional Sub-Topics to Consider (Beyond Ecology Focus Sheets)								
utility setbacks for trees								
COK PW Pre-Approved Plans	General Section	Not addressed in current code. Current process is utility plan comes in, PCD and PW review and come to an agreement. Handled on a case-by-case basis, with understanding trees are saved whenever possible.	<i>Retain native vegetation</i>	"Understanding" is not identified in a written policy, consider creating a written policy for the Pre-Approved Plans.	Establish new Policy in Pre-Approved Plans regarding utility setbacks for trees; also include street improvements. Specify trees should be saved whenever possible.		X	
public safety (site limits at intersections, hazard trees)								
Kirkland Zoning Code	KZC 95.20 Exemptions: (1)Emergency Tree Removal, (2)Utility Maintenance	Tree removal allowed for public safety.	<i>Retain native vegetation, good soil</i>	No Gap	No Revision		X	
	KZC 95.23.5.d. Removal of Hazard or Nuisance Trees	Tree Risk Assessment Report required.		No Gap	No Revision		X	

Table 1. Gap Analysis for Topic: Landscaping, Native Vegetation, and Street Landscaping (continued)

Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
tree and landscape installation and maintenance								
Kirkland Zoning Code	KZC 95.50 Installation Standards for Required Plantings	Soil specs, Kirkland Plant List	<i>Retain native vegetation, good soil</i>	No Gap	No Revision - Existing code requires good soils, avoid compaction, and mulch.			X
	KZC 95.51 Tree and Landscape Maintenance Requirements	Soil specs, Kirkland Plant List		No Gap	No Revision - Existing code requires good soils, avoid compaction, and mulch.			X
Kirkland Public Works Pre-Approved Plans	Policy R-10, Street Tree Selection list	Includes native vegetation appropriate to our area.		No Gap	No Revision - Existing policy includes native vegetation appropriate to our area.			X
	Tree Planting Details R.48, R.48A	Tree Planting Details require amended soil per Ecology BMP T5.13.		No Gap	No Revision - Existing standard requires amended soil per Ecology BMP T5.13.			X

Table 2: Gap Analysis for Topic: Site Planning and Assessment

Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Building Locations								
Kirkland Zoning Code	KZC 90 Drainage Basins	Existing regulations allow reductions in side and rear yards.	-locate buildings away from critical areas, -preserve soils with good infiltration	No Gap	No Revision - Chapter 90 allows reductions in side and rear yards, and encourages clustering to locate buildings away from critical areas.		X	
Kirkland Zoning Code	KZC 90 Drainage Basins	Code requires buildings be set back from critical areas and their buffers including wetlands, streams and steep slopes/landslide hazard areas.	-locate buildings away from critical areas, -preserve soils with good infiltration	Consider preserving soils with good infiltration.	No Revision needed. New Storm Manual to be adopted 12/2016 will require infiltration if feasible so that will preserve good soils for infiltration.		X	
	KZC 114 Low Impact Development	Code requires open space		Consider requiring open space to be located in area with good infiltrative soils.	No Revision needed. Open space typically used for dispersion or infiltration of runoff, so already set aside in area with good infiltrative soils.			X
Parking area locations								
Kirkland Zoning Code	KZC 90 Drainage Basins	Parking areas may not be located in critical areas or buffers.	Locate parking areas to minimize site grading, preserve natural watercourses, native vegetation and soils.	No Gap. Current CAO revision increased critical areas and buffers. Code revision proposes to allow parking areas within 10-foot wide buffer setback, but this is still further from critical area because buffer was increased.	No Revision - existing code prohibits parking in critical areas or buffers; locates parking areas to minimize site grading, preserve natural watercourses, native vegetation and soils.		X	
Kirkland Zoning Code	KZC 15	Requirement is to provide two parking stalls per dwelling unit.	Incentive to require parking within garages	No Gap	No Revision - Small front yard setback encourages shorter driveways and garages already.	X		X
			Encourage parking near entrance to site to reduce long driveways	No Gap	No Revision - Urban development minimizes driveway lengths already.	X		X
Stormwater BMP/facility locations								
2009 King County Surface Water Design Manual & Kirkland Public Works Pre-Approved Plans	KCSWDM Section 5.2.1 & COK Policies L-1 and L-2.	All projects with > 2,000sf impervious area are required to assess the feasibility of dispersion and infiltration. At a minimum, an impervious area equivalent to 10% of the site must be routed to an approved LID BMP.	Codes to require infiltration in areas with good soil.	Assess feasibility of infiltration on all projects.	No Revision - New Stormwater Design Manual to be adopted 12/2016 will require development to infiltrate in areas with good soil.			X
2009 King County Surface Water Design Manual	Section 1.2.1	All projects are required to discharge at the natural location. Gravity conveyance of storm is preferred over pumping, so it is more practical to locate a storm facility in the natural drainage path.	Code to prioritize location of storm facility.	No Gap	No Revision - Current adopted stormwater design manual requires discharge at the natural location.			X
Additional Sub-Topics to Consider (Beyond Ecology Focus Sheets)								
Clustering Housing								
Kirkland Municipal Code	KMC 22.28.040 Lot Averaging	Lot averaging is permitted; additional lot averaging may be considered through a review process.	Are there any codes that require buildings/utilities/streets to be placed in areas that are less conducive to infiltration?	Consider requirements on building placement.	No Revision - New Stormwater Design Manual to be adopted 12/2016 will require infiltration as feasible which will facilitate buildings/utilities/streets to be located in areas that are less conducive to infiltration.			X
Location of Existing Utilities								
Kirkland Zoning Code	No Code	Gravity dictates location of utilities more than soil type	Any requirement to place utilities in areas less conducive to infiltration?	No Gap	No Revision - Gravity dictates location more than soil type.			X

Table 3. Gap Analysis for Topic: Hard and Impervious Surfaces

Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Maximum impervious surface allowances								
Kirkland Zoning Code	Various Chapters in KZC, dependent on zones	Impervious surface lot coverage based off land use: MF - 60-70% lot coverage, SF 50%, Commercial - 80-90% lot coverage. Recently changed the lot coverage in Totem Lake Area to be calculated by zoning and not land use.	-Does code include maximum impervious surface limits for different land use types? -Can maximum impervious areas be reduced in residential areas?	No Gap. Lot coverage in Totem Lake Area is generally 70-85%, even though calculated by zoning and not land use.	No Revision - maximum impervious surface limits are primarily based off of land use. Residential areas already contain the lowest lot coverage allowance at 50%.	X		X
Kirkland Zoning Code	KZC 114 Low Impact Development	Encourages minimizing impervious surface, allows clustering, reduced lot size, and consolidated open space if storm LID BMPs are used.	-Does code include maximum impervious surface limits for different land use types? -Can maximum impervious areas be reduced in residential areas?	Review incentives under this code, modify so not offering incentives for required items once new storm design manual is adopted 12/2016.	To be determined	X		X
	KZC 115.90 Calculating lot coverage	Pervious pavement and other items receive 50% credit towards maximum impervious lot coverage.		Consider removing 50% lot coverage incentive items since new storm design manual to be adopted 12/2016 will require pervious surfaces if feasible.	Remove lot coverage exemption items in KZC 115.90.3 (a) permeable pavement, (b) grassed modular grid pavement, and (d) pervious surfaces in compliance with the stormwater design manual.	X		X
	KZC 115.90 Calculating lot coverage	Rockerries/retaining walls count towards impervious area lot coverage.		Rockerries/retaining walls are difficult for staff to measure and verify, often installed later, and if vegetation is on both sides then runoff is dispersed. Consider removing rockerries/retaining walls from impervious area lot coverage calculations when not integral to a structure, or located elsewhere on lot where runoff is dispersed.	Add the following Exception to lot coverage: <i>d. Rockerries and retaining walls, unless integral to an adjacent structure (like a patio, building, or parking area).</i>	X		X
	KZC 115.90 Calculating lot coverage	Synthetic turf (e.g., Astroturf) on residential properties counts towards impervious area for lot coverage because it does not meet the "open space" definition in KZC 5.10.610.		Code language may be unclear to applicants - is Astroturf impervious or pervious? Revise code to clearly state how synthetic lawn surface is counted regarding lot coverage. Consider counting 100% towards lot coverage (not "vegetated open space" so not exempt from lot coverage).	To be determined	X		X
Kirkland Zoning Code	KZC 55	CBD and Totem Lake Urban Center - 100% maximum impervious coverage allowed.	-Does code include maximum impervious surface limits for different land use types? -Can maximum impervious areas be reduced in residential areas?	No Gap	No Revision - Code allows high % impervious and encourages infill in these small business districts. Stormwater management can be provided in underground facilities. LID is not typically feasible in Totem Lake Urban Ctr due to high groundwater/poor soils.	X		X
	KZC 70 Holmes Point Overlay	Code limits the amount of impervious lot coverage (see lot coverage table).		No Gap	No Revision - Existing code limits the impervious surface area allowed (less than other areas of the city) and requires open space with development.	X		X
	KZC 83 Shoreline Management	Code limits the amount of impervious lot coverage and requires pervious pavement in setbacks.		No Gap	No Revision - Existing code limits impervious surface area.	X		X
Kirkland Comprehensive Plan	E 1.13, 1.15, 1.16;	General policies to encourage less impervious surface area.		No Gap	No Revision - Existing policies encourage less impervious surface area.	X		X
Kirkland Zoning Code	Various chapters, depending on commercial zone	Commercial - 80-90% lot coverage, no limit on pollution generating impervious surface area.	Can a limit be designated for pollution generating impervious?	Could be considered in future zoning code changes.	No Revision - Current high land values push parking garages, which automatically create less PGIS flowing to storm system.	X		X

Table 3. Gap Analysis for Topic: Hard and Impervious Surfaces (continued)

Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Shared driveways								
Kirkland Zoning Code	KZC 105	Language for required easements between commercial and multi-family for shared access and for connectivity.	<i>Can shared driveways be allowed for multiple SFR, MF, and commercial?</i>	No Gap	No Revision - Current code includes language for required easements for shared access.	X		X
Kirkland Public Works Pre-Approved Plans	Policy R-4, (II.1.d)	Whenever practical, consolidation of driveways of adjoining properties is encouraged. Therefore, in conjunction with approval of development the City may request developers to provide access and circulation easement to an adjacent owner where joint access is reasonable to serve future development.		No Gap	No Revision - Current policy allows and encourages shared driveways for SFR. This is dependent on size and shape of lots, and is market driven.	X		X
		Always required with commercial and Multi-family.		No Gap	No Revision - Current policy requires shared driveways for commercial and multi-family	X		X
Minimum driveway width								
Kirkland Public Works Pre-Approved Plans	Policy R-4, Section II.5	Single family: 10' for one-way, 20' for two-way. Multi-Family/Non-Residential: 12-15' for one-way, 20-24' for two-way. If medians, traffic islands and turn lanes are used in driveway, greater width shall be considered.	<i>Can the minimum width be reduced to 9' (one lane), 18' (two lanes) or 16' (shared)? Any safety issues?</i>	No Gap	No Revision - Current code is already reduced at 10' and 20' width. Reductions to 9', 18' are currently considered on a case by case basis. Requiring the narrower driveways has been considered, but this pushes parking into the street, which has a negative impact on available neighborhood parking.	X		X
Use of permeable pavement for driveways								
Kirkland Municipal Code	KMC 19.12.130 Specifications	Specifications for street and curb cutting, refers to 1977 Edition of "Standard Specifications for Municipal Works Construction"	<i>Allow alternative surfaces for driveways.</i>	Consider changing reference to same as KZC 110.65 Engineering Standards (Pre-Approved Plans). See <i>same change on Table 8.</i>	Revise text to refer to KZC 110.65 Engineering Standards.	X		X
Kirkland Zoning Code	KZC 105.100	Driveway materials must match or exceed the adjacent road. Pervious surfaces can be used in compliance with the adopted stormwater design manual.	<i>Allow alternative surfaces for driveways.</i>	No Gap	No Revisions - current code allows for pervious pavement driveways.	X		X
Kirkland Public Works Pre-Approved Plans	Driveway Policy R-4, (II.1.g)	Driveway materials must match or exceed the adjacent road. Pervious surfaces can be used in compliance with the adopted stormwater design manual.		No Gap	No Revisions - current policy allows for pervious pavement driveways.	X		X
	Plans No. CK-L.07, L.08, L.09	Driveway details for: Pervious Concrete, Porous Asphalt, and Permeable Pavers.		No Gap	No Revisions - current code allows for pervious pavement driveways.	X		X
2009 King County Surface Water Design Manual	Section C.2.6	Permeable Pavement section including: porous concrete, porous asphalt, unit pavers with a gravel bed, and grassed modular grid systems.		No Gap	No Revisions - current storm design manual (and manual to be adopted 12/2016) allows for pervious pavement driveways.	X		X
Use of permeable pavement for driveways (continued)								
Kirkland Comprehensive Plan	U-4.4	Encourages use of permeable pavement, and lists practices.	<i>Can code be revised to include incentive?</i>	No Gap	No Revision - Current code encourages use of permeable pavement, incentives offered under other codes (50% credit to lot coverage and 50% flow control credit).	X		X
2009 King County Surface Water Design Manual	Section C.2.6	Pervious pavement is counted as 50% impervious (instead of 100%), provides a flow control credit as incentive.		No Gap	No Revision - Current design manual counts pervious pavement as 50% impervious (instead of 100%), provides a flow control credit as an incentive. New storm design manual ato be adopted in 12/2016 requires pervious pavement as feasible.	X		X

Table 3. Gap Analysis for Topic: Hard and Impervious Surfaces (continued)

Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Two-track driveway design								
Kirkland Public Works Pre-Approved Plans	Driveyway Policy R-4, Section I.8	Two-track driveway design is allowed for single family residential through modification process (approved on a case-by-case basis). Not allowed for multi-family or commercial access.	<i>Is two-track driveway design allowed?</i>	No Gap	No Revision - Two-track driveway design is allowed for SFR through the modification process (approved on a case-by-case basis). Traffic volume is too high to allow this on multi-family or commercial properties.	X		X
Additional Sub-Topics to Consider (Beyond Ecology Focus Sheets)								
Vegetative Roofs								
Kirkland Zoning Code	KZC 115.90 Calculating lot coverage	Vegetated roofs are allowed, is not exempt from impervious lot coverage.	<i>Are vegetated roofs allowed or incentivized?</i>	No Revision	No Revision - Current code allows vegetated roofs. New storm design manual to be adopted 12/2016 removes 50% pervious credit.	X		X
2009 King County Surface Water Design Manual	Section 5.2.2	Vegetated Roofs are allowed, and receive 50% pervious credit as incentive. Vegetated roofs are tracked along with other stormwater BMPs.		No Revision	No Revision - Current design manual counts vegetated roofs as 50% impervious (instead of 100%), provides a flow control credit as an incentive. New storm design manual to be adopted 12/2016 removes 50% pervious credit.	X		X

Table 4: Gap Analysis for Topic: Bulk and Dimensional Considerations

Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Building setbacks, lot setbacks								
Kirkland Zoning Code	KZC 15	Refer to Density/Dimensions Table	<i>Consider reducing setback distances.</i>	No Gap	No Revision - Because Kirkland has adopted narrow street standards, it is important to provide off-street parking for residents, so reducing driveway length is counter productive.	X		X
	KZC 15	Refer to Density/Dimensions Table	<i>Consider reducing frontage area requirements in open space residential developments.</i>	No Gap	No Revision - Kirkland has small lots that already minimize frontage improvement requirements.	X		X
	KZC 15	Current code allows irregular lot shapes.	<i>Consider allowing irregular lot shapes.</i>	No Gap	No Revision - Current code allows irregular lot shapes.	X		X
Height limits								
Kirkland Zoning Code	KZC 15	Refer to Density/Dimension Table. Maximum height restriction currently cannot be increased.	<i>Consider increasing maximum building height restriction if a project reduces the footprint below maximum lot coverage.</i>	No Gap	No Revision - City has given height bonuses in areas with high % lot coverage, but not in residential areas.	X		X
Maximum square footage								
2009 King County Surface Water Design Manual	Section 5.2	A covenant for reduced lot coverage is a current option to meet flow control requirements. Since land value is high, projects typically build out to the maximum allowable lot coverage.	<i>Consider revising code to incentivize or encourage minimizing building footprints.</i>	No Gap	No Revision - Reduced lot coverage (reduced footprint) is currently an option to meet flow control standards (incentive).	X		X
Kirkland Zoning Code	KZC 70 Holmes Point Overlay	Code restricts impervious square footage to lower than other areas in Kirkland		No Gap	No Revision - Current code restricts impervious square footage to lower than other areas in Kirkland.	X		X
	KZC 114 Low Impact Development	Code offers incentive to provide reduced impervious footprints and increased open space.		No Gap	No Revision - Current code offers incentive to provide reduced impervious footprints and increased open space.	X		X
Clustering								
Kirkland Zoning Code	KZC113	Cottage housing is currently allowed	<i>Consider allowing cluster development designs, with no special permit or zoning variance.</i>	No Gap	No revision - Current code allows cottage housing.	X		X
Kirkland Zoning Code	PUD Subdivision	Clustered housing is currently allowed. When developments are proposed using the flexibility in Chap 114 (LID), no PUD is required.	<i>Consider allowing cluster development designs, with no special permit or zoning variance.</i>	No Gap	No Revision - Current code provides options and a process for clustering in single family and multi-family zones.	X		X
	KZC 114 Low Impact Development	Encourages clustering of houses, offers incentives	<i>Allow cluster development designs.</i>	No Gap	No Revision - Current code encourages clustering of houses.	X		X
Additional Sub-Topics to Consider (Beyond Ecology Focus Sheet)								
Stormwater facility setbacks								
2009 King County Surface Water Design Manual	Sections 5 and 6	Setbacks vary for different facility types, and Kirkland is flexible on a case-by-case basis. Minimum setbacks are required for maintenance access and functionality (e.g. infiltration systems). Kirkland does not require additional an setback from the easement for a stormwater facility.	<i>Consider reducing setbacks from stormwater facilities.</i>	No Gap	No Revision - Setbacks vary for different facility types, and Kirkland is flexible on a case-by-case basis. Minimum setbacks are required for maintenance access and functionality (e.g. infiltration systems). Kirkland does not require an additional setback from the easement for a stormwater facility.	X		X

Table 5: Gap Analysis for Topic: Subdivision and Planned Unit Development

Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Individual open space requirements								
Kirkland Zoning Code	KZC 70 Holmes Point Overlay (HPO)	Open space is required, and is required to be kept in natural condition.	<i>Consider requiring open space managed in the natural condition. Can this be increased? Required to be consolidated into larger units?</i>	No Gap	No Revision - Code already requires open space in Holmes Point area, and for it to be kept in natural condition.		X	X
	Native Growth Protection Easement	Open space is required to be kept in natural condition.		No Gap	No Revision - Open space is required to be kept in natural condition.		X	X
	KZC 114 Low Impact Development	Open space is required, and is required to be kept in natural condition.		No Gap	No Revision - This code already requires open space, and for it to be kept in natural condition.		X	X
	Clustered Housing Section (KZC 113)	Requirement to provide open space, but not to preserve it in natural condition.		Consider changing to require natural condition of open space.	No Revision - the purpose of open space in cottage development is to provide shared recreational/gathering space since individual lots are small and don't provide this. Space should not be required to be left in natural condition since it must be conducive to recreation/gathering.		X	X
Neighborhood Plan	Finn Hill Neighborhood Plan; Potential KZC 70 change	Finn Hill Neighborhood Plan is currently under revision (2016).	<i>Consider requiring open space managed in the natural condition.</i>	Open space requirements are currently being considered while Neighborhood Plan is under revision (expanding HPO to Finn Hill).	No Revision at this time - Code change to be determined by outcome of Neighborhood Plan, under revision in 2016.		X	X
Passive vs. active open space requirements (consider LID BMPs in passive areas)								
Kirkland Zoning Code	KZC 114 Low Impact Development	Code includes allowable and prohibited uses for open space, minimal amount can be structures, LID BMPs like bioretention are allowed in open space.	<i>Define allowable and prohibited uses, consider allowing LID BMPs like bioretention in open space.</i>	No Gap	No Revision - Code includes allowable and prohibited uses for open space, and LID BMPs like bioretention are allowed.			X
	KZC 70 Holmes Point Overlay	Code includes allowable and prohibited uses for open space, LID BMPs like bioretention are not allowed in open space (must be native vegetation).		No Gap	No Revision - Code includes allowable and prohibited uses for open space, but open space must contain native vegetation in a natural setting. LID BMPs like bioretention are not allowed because that would require maintenance work in the open space.			X
	Native Growth Protection Easement	Open space is required to be kept in natural condition		No Gap	No Revision - NGPE open space is required to be kept in natural condition, so LID BMPs are not appropriate or allowed			X
	Native Growth Protection Easement	Active recreation not allowed in open space	<i>Consider active recreation in open space.</i>	No Gap	No Revision - this is not applicable to COK, we don't have large subdivisions with large areas set aside that could be used for dual purposes.			X
Opportunities for performance based designs (PUDs)								
Kirkland Zoning Code	KZC 125 Planned Unit Development	PUDs are not required for high density areas.	<i>Are PUDs required for high density areas, city centers?</i>	No Gap	No Revision - Kirkland does not need a requirement for PUDs in high density areas.			X
		Code specifies native vegetation and maximum impervious surface standards.	<i>Specify native vegetation and maximum impervious surface standards.</i>	No Gap	No Revision - Code already specifies native vegetation and maximum impervious surface standards.	X	X	X

Table 6: Gap Analysis for Topic: Critical Areas and Shoreline Management

Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Wetlands								
Kirkland Zoning Code, Chapter 90 - Drainage Basins	KZC 90.45 (4) Water Quality Facilities	WQ facilities allowed within outer one-half (1/2) of wetland buffer (with conditions).	<i>Are LID BMPs allowed within or adjacent to buffers? Can native vegetation associated with LID BMPs be used to meet buffer enhancement requirements?</i>	Consider specifying the type of WQ facility/LID BMP allowed under current CAO update.	This may be revised. KZC Chapter 90 currently under revision to be consistent with Best Available Science (BAS).			X
		WQ facilities allowed elsewhere within wetland buffer if proposed by public agency (with additional conditions).		Consider changes under current CAO update.	This may be revised. KZC Chapter 90 currently under revision to be consistent with Best Available Science (BAS).			X
	KZC 90.45 Wetland Buffers and Setbacks	LID BMPs not mentioned in code.		Consider specifying the type of WQ facility/LID BMPs allowed under current CAO update. Options to consider are: Infiltration, Dispersion, Bioretention, and Permeable Pavement. Rainwater Harvesting and Vegetated Roof not likely because this would involve structures in buffer or setback.	This may be revised. KZC Chapter 90 currently under revision to be consistent with Best Available Science (BAS).			X
Kirkland Zoning Code, Chapter 90 - Drainage Basins	KZC 90.45 Wetland Buffers and Setbacks	Allowable and Prohibited uses defined.	<i>Are allowable and prohibited uses defined?</i>	No Gap	No Revision - Allowable and Prohibited uses in wetland buffers and setbacks are already defined.			X
	KZC 90.65 Wetland Restoration, refers to KZC 95.50(11) Mitigation and Restoration Plantings in Critical Areas/Buffers	Approved plants are in Kirkland Plant List, which is produced by the City's Natural Resource Management Team.	<i>Can native vegetation associated with LID BMPs be used to meet buffer enhancement requirements?</i>	Consider adding Stormwater Bioretention Areas and associated plants as allowable within Critical Area Buffers (for buffer enhancement). See Ecology guidance from SEA.	No Revision - This is not recommended under Ecology wetland guidance.			X
Streams								
Kirkland Zoning Code, Chapter 90 - Drainage Basins	KZC 90.90 (3) Storm Water Outfalls	Piped stormwater outfalls/dispersion allowed within stream buffer and setback (with conditions).	<i>Are LID BMPs allowed within or adjacent to buffers? Can native vegetation associated with LID BMPs be used to meet buffer enhancement requirements?</i>	Consider changes under current CAO update.	This may be revised. KZC Chapter 90 currently under revision to be consistent with Best Available Science (BAS).			X
	KZC 90.90 (4) Water Quality Facilities	WQ facilities allowed within outer one-half (1/2) of stream buffer (with conditions).		Consider specifying the type of WQ facility/LID BMP allowed under current CAO update.	This may be revised. KZC Chapter 90 currently under revision to be consistent with Best Available Science (BAS).			X
		WQ facilities allowed elsewhere within stream buffer if proposed by public agency (with additional conditions).		Consider changes under current CAO update.	This may be revised. KZC Chapter 90 currently under revision to be consistent with Best Available Science (BAS).			X
	KZC 90.90 Stream Buffers and Setbacks	LID BMPs not mentioned.		Consider including language to specify LID BMPs under current CAO update. Options to consider are: Infiltration, Dispersion, Bioretention, and Permeable Pavement. Rainwater Harvesting and Vegetated Roof not likely because this would involve structures in buffer or setback.	This may be revised. KZC Chapter 90 currently under revision to be consistent with Best Available Science (BAS).			X
Kirkland Zoning Code, Chapter 90 - Drainage Basins	KZC 90.90 Stream Buffers and Setbacks	Allowable and Prohibited uses defined.	<i>Are allowable and prohibited uses defined?</i>	No Gap	No Revision - Allowable and Prohibited uses in stream buffer and setbacks are already defined.			X

Table 7: Gap Analysis for Topic: Clearing and Grading								
Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Protect existing infiltration/minimize compaction								
Kirkland Zoning Code	KZC 95.30	No speculative grading - can only clear and grade to the extent necessary for approved access and utility improvements. Prior to individual building permit approval, can only clear for homes if short plat/subdivision was approved with an Integrated Development Plan (IDP).	<i>Include provisions to minimize site disturbance and protect native vegetation and soils (minimize compaction).</i>	No Gap	No Revision - Code does not allow speculative grading; cannot clear for houses when only working on the road portion. This minimizes site disturbance, protects existing infiltration areas, and prevents compaction.		X	
Kirkland Municipal Code	KMC 29.24.010 Land Surface Modification	Municipal code does not include provisions for minimizing site disturbance or protecting native vegetation and soils.		Consider adding provisions for minimizing site disturbance and protecting native vegetation and soils.	No revision - Zoning code and design standard address actions to protect existing infiltration and minimize compaction.		X	
Kirkland Public Works Pre-Approved Plans	Erosion Plan Note 27	Area to be used for infiltration must be surrounded by silt fence prior to construction and until final stabilization.		No Gap	No Revision - Note 27 requires the area used for infiltration to be surrounded by silt fence prior to construction and until final stabilization.		X	
Conserve native vegetation/soils								
Kirkland Zoning Code	KZC 5	No definition for native vegetation.	<i>Define native vegetation, including minimum tree density, minimum retention requirements, protecting native vegetation areas, replanting requirements, soil amendment standards, management plan specifications, and maintenance requirements.</i>	Consider adding a definition for "native vegetation"	Consider using/modifying the definition in the Ecology NPDES Municipal Stormwater permit for Western WA (see page 70/74).		X	
Kirkland Zoning Code	KZC 95	Tree density table	<i>In "native vegetation" definition or other code section, include: minimum tree density, minimum retention requirements, protect native vegetation areas, replanting requirements, soil amendment standards, management plan specifications, and maintenance requirements.</i>	Consider modifying tree density table (see Table 1 Topic Landscaping, Native Vegetation).	No Revision needed here - Changes to be considered under the Landscaping, Native Vegetation, and Street Landscaping (Table 1).		X	
	KZC 95 Tree Management and Required Landscaping	Permit is required for tree removal, Tree Retention Plan is required for development activity.	<i>Regulation to require or encourage preservation of natural vegetation.</i>	No Gap	No Revision - Code protects native vegetation by requiring a permit for tree removal, and requiring a Tree Retention Plan with development activity.		X	
	KZC 85 Geologically Hazardous Areas	Code provides slope protection by defining landslide/erosion/seismic hazard areas, and requiring geotechnical report as needed.	<i>Conserve native soils</i>	No Gap	No Revision - Code conserves native soils by requiring slope protection and a geotechnical report as needed for development activity.		X	
	KZC 95.30	No speculative grading - can only clear and grade to the extent necessary for approved access and utility improvements. Prior to individual building permit approval, can only clear for homes if short plat/subdivision was approved with an IDP.	<i>Prohibit or limit wholesale clearing/mass grading of sites.</i>	No Gap	No Revision - Kirkland protects existing infiltration areas and prevents compaction per current code.		X	
	KZC 70 Holmes Point Overlay	Open space kept in natural conditions is required.	<i>Requirement to set aside an undeveloped portion of site, and specific native vegetation retention standards based on land use and density.</i>	No Gap	No Revision - Code requires open space set aside in undeveloped condition with native vegetation.		X	
	KZC 95.5	Maintenance of invasives in sensitive areas could be enforced with existing code.		No Gap	No Revision - Kirkland has a prohibited plant list providing a higher level of control.		X	
Kirkland Municipal Code	KMC 29.24.010 Land Surface Modification	Item (d) requires marking the limit of grading with temporary fence and signage. Item (e) requires protective tree fencing.	<i>Regulation to require or encourage preservation of natural vegetation.</i>	Consider adding provisions to require or encourage preservation of natural vegetation (beyond items d and e).	No Revision - Zoning code and design standard also address preservation of natural vegetation.		X	

Table 7: Gap Analysis for Topic: Clearing and Grading (continued)

Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Conserve native vegetation/soils								
Kirkland Municipal Code	KMC 15.52.010 Surface Water Utility	Surface Water Utility on property tax statement is based on actual impervious area (for commercial and multi-family). Less impervious = Lower utility cost. King County assessment is lowered for critical areas.	<i>Are there any incentives to landowners/developers to conserve land?</i>	No Gap	No Revision - Incentive already exists to conserve land; since utility cost is based on actual impervious area.	X	X	
2009 King County Surface Water Design Manual	Chapter 5 Flow Control	Stormwater control based on impervious area, stormwater credits given for infiltration and dispersion BMPs. Lower cost for flow control if section of land is not developed.		No Gap	No Revision - Incentive already exists to conserve land; utility cost is based on actual impervious area.	X	X	
Kirkland Public Works Pre-Approved Plans	Policy D.10 Addendum to 2009 KCSWDM, section 1.2.5.1	Amended Soil (per BMP T5.13) is required for all landscaped areas on all project sites 1 acre or larger, and recommended for sites < 1 acre.	<i>Conserve native soils and vegetation</i>	No Gap	No Revision - Existing standard requires soil amendment on larger projects. New Storm manual to be adopted 12/2016 will require amended soil on all qualifying projects.			X
	Erosion Control Section, E.12 Soil Amendment Notes for BMP T5.13	Detailed notes designed for the contractor to use when amending soils.		No Gap	No Revision - Existing standard provides notes to contractor on soil amendment.			X
	Erosion Control Section, E.1-E.12	This section includes BMPs to provide tree and slope protection during clearing and grading activities.		No Gap	No Revision - Existing standards include BMPs to provide tree and slope protection during clearing and grading.		X	
Construction sequencing/phasing								
Kirkland Municipal Code	KMC 15.52.060 Design and construction standards and requirements	Code requires construction projects to follow COK standard plans (pre-approved plans).	<i>Include in code, methods for effective construction sequencing to minimize site disturbance and soil compaction.</i>	No Gap	No Revision - Existing code requires the use of Kirkland Pre-Approved Plans, which includes construction sequencing/phasing.			X
	KMC 29.24.010 Land Surface Modification	Code does not refer to construction sequence.		Consider adding provisions to require construction sequencing or phasing.	No revision - construction sequence addressed elsewhere in code.			X
Kirkland Zoning Code	KZC 95.50	Code states after soil preparation is completed, motorized vehicles shall be kept off to prevent excessive compaction and underground pipe damage.		No Gap	No Revision - Existing code requires vehicles to be kept off amended soil to minimize site disturbance and soil compaction.			X
COK PW Pre-Approved Plans	Erosion Control Plan Notes	Requirements for construction sequencing/phasing is included in the plan notes for all projects (except single family infill).	<i>In engineering and street standards, outline construction sequencing and practices for protecting pervious areas and LID BMPs during construction.</i>	No Gap	No Revision - Existing plan notes contain requirements for construction sequencing/phasing.			X
	Erosion Plan Note 27	Area to be used for infiltration must be surrounded by silt fence prior to construction and until final stabilization.		No Gap	No Revision - Note 27 requires the area used for infiltration to be surrounded by silt fence prior to construction and until final stabilization.			X
Kirkland Municipal Code	KMC 15.52.060 Design and construction standards and requirements	Code does not limit clearing to just the building footprint.	<i>Consider revising code to limit clearing to the building footprint and area needed for maneuvering machinery.</i>	No Gap	No Revision - It is not realistically feasible to limit clearing to an area a little larger than the building footprint.			X

Table 8: Gap Analysis for Topic: Streets and Roads

Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Travel lane widths								
Kirkland Zoning Code	KZC 110.25	Current regulations include narrow travel lane widths (10') see link	<i>Minimize travel lane widths - 10'</i>	No Gap	No Revision - Existing code is already at suggested minimum narrow travel lane width.	X		
	KZC 110.27	Current regulation includes narrow alley width (12') see link		No Gap	No Revision - Existing code includes 12' minimum alley width, which is less than suggested minimum for each travel lane.	X		
	KZC 110.30, 110.35, 110.38	Neighborhood Access Streets, R-20, R-24, R-28, include minimum street widths from 20' to 28'.		No Gap	No Revision - Existing code includes minimum street widths.	X		
	KZC 110.40	Collector Streets include minimum lane width of 11'.		No Gap	No Revision - Existing code includes minimum street widths feasible for street type designation.	X		
ROW widths								
Kirkland Zoning Code	KZC 110.30, 110.35	Neighborhood Access Streets, R-20, R-24, include minimum ROW at 30'.	<i>Minimize ROW width or include flexibility for LID considerations.</i>	No Gap	No Revision - Existing code includes a minimum ROW. Reducing ROW further would inhibit the ability to install LID in ROW.	X		
	KZC 110.38	Neighborhood Access Streets R-28, include minimum ROW at 40'.		No Gap	No Revision - Existing code includes a minimum ROW. Reducing ROW further would inhibit the ability to install LID in ROW.	X		
	KZC 110.40	Collector Streets include minimum ROW at 60'.		No Gap	No Revision - Existing code includes a minimum ROW. Reducing ROW further would inhibit the ability to install LID in ROW.	X		
	KZC 110.65 Engineering Standards	Design standards allow sidewalks on one side of street only on a case-by-case basis.	<i>Allow sidewalks on one side of street only in low-density residential areas.</i>	No Gap	No Revision - Changes to design standards are allowed on a case-by-case basis.	X		
	KZC 110.65 Engineering Standards	Design standards allow streets with no sidewalks or other alternatives on a case-by-case basis.	<i>Allow alternate pedestrian networks (e.g., trails through common areas) be substituted for sidewalks.</i>	No Gap	No Revision - Changes to design standards are allowed on a case-by-case basis.	X		
Use of permeable pavement for streets and roads								
Kirkland Public Works Pre-Approved Plans	Pre-Approved Plans, Design Criteria	Permeable pavement is allowed for private streets, and allowed on a case-by-case basis for public streets (no written policy).	<i>Can permeable pavement be used for road shoulders, parking lanes, and emergency parking areas?</i>	Consider adding a written policy to the Pre-Approved Plans.	Develop written policy on when permeable pavement will be used on private and public streets and alleys; including when to use for travel lanes, road shoulders, parking lanes, and emergency parking areas. Include requirements dictated by new storm design manual.	X		
		Plans do not include a standard detail for permeable streets.		Consider adding standard details for permeable streets to the Pre-Approved Plans.	Develop standard details for pervious pavement streets, private and public.	X		
Kirkland Municipal Code	KMC 19.12.130 Specifications	Specifications for street and curb cutting, refers to 1977 Edition of "Standard Specifications for Municipal Public Works Construction".		Consider changing reference to same as KZC 110.65 Engineering Standards (Pre-Approved Plans). See same change on Table 3.	Revise text reference to KZC 110.65 Engineering Standards	X		
Kirkland Zoning Code	KZC 110.65 Engineering Standards	Permeable pavement is allowed for private streets, and allowed on a case-by-case basis for public streets.	<i>Can permeable pavement be used for road shoulders, parking lanes, and emergency parking areas?</i>	No Gap	No Revision - Code refers to Kirkland Pre-Approved Plans, and those will be revised (see above).	X		
Placement of utilities under paved areas in the ROW								
Kirkland Zoning Code	KZC 110.65 Engineering Standards	Utilities are allowed under roadways, no language stating utilities cannot be under road.	<i>Does code allow utilities to be placed under the paved section of ROW?</i>	No Gap	No Revision - current code allows utilities to be placed under paved ROW.	X		
Required truck turn around area								
Kirkland Zoning Code	KZC 110	Kirkland has the smallest cul-de-sac diameters, reduced from 90ft to 70ft diameter in 1995.	<i>Is the minimum street section necessary for safe access and emergency response being used?</i>	No Gap	No Revision - Kirkland has the smallest allowable cul-de-sac diameters, reduced from 90ft to 70ft diameter in 1995 (smallest amount allowed by fire department).	X		

Table 8: Gap Analysis for Topic: Streets and Roads (continued)

Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Sidewalk widths								
Kirkland Zoning Code	KZC 110.30, 110.35, 110.38, 110.40	Neighborhood Access Streets, R-20, R-24, R-28, & Collector Streets include minimum sidewalk at 5'.	<i>Consider reduction to minimum sidewalk widths.</i>	No Gap	No Revision - Existing code includes minimum sidewalk width at 5'.	X		
	KZC 110.52	Sidewalks in Design Districts use Pedestrian-Oriented Street Standards, with minimum sidewalk widths of 8'.		No Gap	No Revision - Existing code includes minimum sidewalk width of 8' needed for heavy pedestrian use on commercial streets.	X		
Kirkland Public Works Pre-Approved Plans	Plan CK-R.23	5' minimum	<i>Consider reduction to minimum sidewalk width in areas where LID BMPs are present.</i>	No Gap	No Revision - Smaller width not needed if permeable pavement is used, or sloped towards bioretention area.			X
Permeable pavement for sidewalks & sidewalk slope								
Kirkland Municipal Code	KMC 19.20.030	Code identifies maintenance of sidewalk is the responsibility of abutting property owner (this includes repairs if need is caused by abutting property owner).	<i>Allow permeable pavement for sidewalks</i>	Consider Revision. New Storm Design Manual adopted 12/2016 will require either pervious pavement sidewalks or adjacent bioretention areas. Current city staff allocation is not adequate to take on maintenance of all sidewalks and bioretention areas. Recent maintenance standards recommend pressure washer and vacuum system "calibrated to not dislodge wearing course aggregate".	To be determined	X		
Kirkland Public Works Pre-Approved Plans	Policy R-15	List of permitted groundcover species in public Right-of-Way landscape strip. Policy states maintenance is the responsibility of the adjacent property owner.	<i>New storm design manual will require bioretention area instead of standard landscape strip if traditional impervious sidewalk is used instead of pervious pavement.</i>	Consider Revision. New Storm Design Manual to be adopted 12/2106 will require either pervious pavement sidewalks or traditional sidewalks draining to a bioretention area.	To be determined			X
	Plan CK-R.23	Design standard is 2% max slope towards road. ROW includes a landscape strip between sidewalk and road, so sidewalk slopes towards landscape strip.	<i>Allow sidewalk slope toward landscape strip, LID BMP, or other.</i>	Consider Revision. New Storm Design Manual adopted 12/2016 will require either pervious pavement sidewalks or traditional sidewalks draining to a bioretention area.	Modify design standard to show sidewalk draining to landscape strip/bioretention/road; depending on requirements in new storm design manual.			X
Kirkland Zoning Code	KZC 110	Landscape strips are required on all streets other than alleys.	<i>New storm design manual will require bioretention area instead of standard landscape strip if traditional impervious sidewalk is used instead of pervious pavement.</i>	No Gap	No Revision - existing code requires landscape strip on all streets; landscape strip details (like bioretention) are referenced in Kirkland Pre-Approved Plans.			X
Kirkland Zoning Code	KZC 110.65 Engineering Standards	Code allows permeable pavement to be used for sidewalks.	<i>Allow permeable pavement for sidewalks</i>	No Gap	No Revision - Code refers to Kirkland Pre-Approved Plans, and those already allow permeable pavement sidewalks.	X		
Permeable pavement for sidewalks & sidewalk slope								
Kirkland Public Works Pre-Approved Plans	Plan CK-L.06	Pervious concrete allowed for public sidewalks (required when sidewalk is within wetland and stream buffers).	<i>Allow permeable pavement for sidewalks</i>	No Gap	No Revision - Design standard allows permeable pavement for sidewalks.	X		
Minimum cul-de-sac radius								
Kirkland Public Works Pre-Approved Plans	Plan CK-R.15	Plan includes R=35' for cul-de-sacs.	<i>Allow minimum Radius of 35'</i>	No Gap	No Revision - Standard is already at minimum 35' radius recommended.	X		
		Center Islands are allowed.	<i>Require or encourage landscape islands?</i>	No Gap	No Revision - Center islands are allowed, but they require more ROW so are less popular to developers, and require plant maintenance.	X		
Alternatives to cul-de-sacs(turn-around)								
Kirkland Public Works Pre-Approved Plans	Plan CK-R.16	Plan includes 60' x 20' turnaround.	<i>Allow 60' x 20' T-shaped turn-around, and loop road as option.</i>	No Gap	No Revision - Design standard is already at minimum size recommended for turnaround.	X		

Table 9: Gap Analysis for Topic: Healthy Soils							Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.				
Protecting and restoring healthy soils									
Kirkland Zoning Code	KZC 95.34 and KZC 95.50.4	KZC 95.34 implies protection of existing soil (w/ trees). KZC 95.50 intends to address soil restoration		Does not refer to PW Pre-Approved Plans. KZC 95.50. Consider removing soil compaction density reference, etc.	Revise code to reflect BAS/BMPs, refer to PW Pre-Approved Plans, specify 'soil' in 95.34 (protection) and 95.50 (restoration).			X	
Kirkland Public Works Pre-Approved Plans	Policy D-2, D-3	TESC Plan is required for all development.	<i>Is there a soil management plan in place that identifies soil protection zones and describes quantities of compost amendment? Are protection areas required to be fenced?</i>	Require a separate Soil Management Plan document for all LSM permits, and for multi-family and commercial BLD permits. Document is tool for staff to help verify amended soil requirement is met.	Revise Pre-Approved Plans (2017) to include a soil management plan document (like King County's document).			X	
	Details R.48, R.48A	Tree planting details		Currently considering revisions to include adequate soil volume.	Revise Pre-Approved Plans (2017) to include adequate soil volume.			X	
2009 King County Surface Water Design Manual		TESC Plan is required for all development. KC starting requiring a Soil Management Plan around 2011. It was not in 2009 KC Manual.	<i>Is there a soil management plan in place that identifies soil protection zones and describes quantities of compost amendment? Are protection areas required to be fenced?</i>	New SW design manual to be adopted by 12/2016. KC manual requires a soil management plan.	No Revision - will be included with adoption of new SW Design Manual by 12/2016.			X	
Kirkland Municipal Code	KMC 15.52.060, KMC 15.04.340	Codes refer to 2009 KCSWDM and PW Pre-Approved Plans		No Gap	Codes will be updated with adoption of new SW Design Manual (12/2016).			X	
Kirkland Zoning Code	KZC 70 Holmes Point Overlay	Required to set aside 25% protected open space.		No Gap	No Revision - current code requires 25% area set aside, which meets intent of protecting native soils.			X	
Compost amendments									
Kirkland Zoning Code	KZC 95.50.4 Installation Standards for Required Plantings	Item 4 intends to address soil amendments with plant installation.	<i>Does code require amendment of disturbed soil? Are there incentives for compost on small projects?</i>	Item 4 is vague; does not use industry standard soil specs, does not state soil quality shall comply with requirements of the PW Pre-Approved Plans. Update re: soil compaction density, amendments, etc. Should link to pending soil req'ments.	Modify code to add requirement for compost amendments per Ecology BMP T5.13 (since amended soil will be required for all landscaping under new SW Design Manual, to be adopted 12/2016).			X	
Kirkland Public Works Pre-Approved Plans	Plan No. CK-E.12	Soil Amendment Notes for using BMP T5.13		Worked soil depth of 12" may not be adequate, consider increasing to 18".	Consider increasing worked soil depth from 12" to 18".			X	
Kirkland Public Works Pre-Approved Plans	Policy D-10, 1.2.5.1	Amended Soil (BMP T5.13) required for all landscaped areas on all project sites 1 acre or larger, recommended on smaller sites.	<i>Does code require amendment of disturbed soil? Are there incentives for compost on small projects?</i>	No Gap	No Revision - current policy requires amended soil for projects 1 acre or larger. Adoption of new SW manual will require amended soil on all projects.			X	
Compaction									
Kirkland Zoning Code	KZC 95.50.4	After soil preparation is completed, motorized vehicles shall be kept off to prevent excessive compaction and underground pipe damage.	<i>Can the code be revised to include different types of equipment for clearing and grading to minimize compaction? Are there any limits or restrictions on clearing, grading, and soil disturbance outside the bldg footprint?</i>	No Gap	No Revision - code requires contractor to keep motor vehicles off soil to prevent excessive compaction.			X	
	KZC 95.34	Existing soils out to drip line of trees are required to be retained and protected with tree fencing. No limits on type of equipment used.		No Gap	No Revision - code requires contractor to protect soils around trees out to the drip line to prevent excessive compaction.			X	
Kirkland Public Works Pre-Approved Plans	Erosion Control Plan Note 27	Any area to be used for infiltration or permeable pavement (including a 5-foot buffer) must be protected with fencing prior to construction and until final stabilization of site to prevent soil compaction and siltation by construction activities.	<i>Consider requiring contractor to re-establish permeability of soils that have been compacted by construction vehicles.</i>	No Gap	No revision - current standard requires contractor to protect the soil of areas to be used for infiltration. If infiltration facility does not function after installation, the contractor is required to restore the permeability of the soils.			X	
Kirkland Municipal Code	KMC 15.52.060 Design and Construction Standards and Requirements	KMC refers to 2009 KCSWDM, which requires performance testing on bioretention or infiltration facilities. If facility fails this testing, soil permeability must be re-established. This is required and enforced through building/development permit.	<i>Consider requiring contractor to re-establish permeability of soils that have been compacted by construction vehicles.</i>	No Gap	No Revision - code refers to adopted SW Design Manual which requires contractor to re-establish permeability of soils that have been compacted during construction.			X	

Table 10: Gap Analysis for Topic: Parking							Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.				
Minimum/maximum parking ratios									
KZC Use Zone Charts	Multifamily parking - all zones - Adopted 9/1/2015	1.2 stalls per studio, 1.3 per 1 bedroom unit, 1.6 per 2 bedroom, 1.8 per 3 bedroom. Guest parking calculated at 10% of total required spaces.	Consider reducing min # of spaces due to shared parking, proximity to transit, car sharing, etc. and/or setting a max # to reduce imperv. area.	No Gap	No Revision - current code reduced parking areas for multi-family development, adopted 9/1/2015.	X			
KZC Chapter 105 and KZC Use Zone Charts	Standard Parking Ratios	Parking ratios are: 1) provided as minimums for each use in each zone or 2) evaluated on a case-by-case basis per Section 105.103, based on the actual parking demand on existing uses similar to the proposed use.	Consider reducing minimum # of spaces due to shared parking, proximity to tyransit, car sharing, etc. and/or setting a maximum # to reduce impervious area.	No Gap	No Revision - current code includes a maximum parking standard, which is a technique suggested for Urban Centers/areas with close proximity to transit. Section 105.103 provides for modifications to allow a reduction in required parking and reductions in stalls for shared parking if a study shows that the proposed stalls will be sufficient to fully serve the use(s).	X			
	Restaurant/Tavern - most zones	1 stall/100 square feet of gross floor area							
	Retail - most zones	1 stall/300 square feet of gross floor area							
	Office - most zones	1 stall/300 square feet of gross floor area							
	Single family	2 stalls/dwelling unit							
KZC Use Zone Charts and KZC Chapter 55	Shopping Centers/Mixed Use	TL 2 (Totem Lake Mall) - case by case basis to allow flexibility and reduced parking. TL 5 (Totem Square) - case by case (with MF parking as noted above)	Consider reducing minimum # of spaces due to shared parking, proximity to tyransit, car sharing, etc. and/or setting a maximum # to reduce impervious area.	No Gap	No Revision - current code includes flexibility in parking requirements, which is a technique used in Urban Centers and other areas with close proximity to transit. Section 105.103 provides for modifications to allow a reduction in required parking and reductions in stalls for shared parking if a study shows the proposed stalls will be sufficient to fully serve the use(s). In areas with higher land values, developers often choose to use land for leasable space rather than excess surface parking. Code allows flexibility, but goal is for no excess parking.	X			
	Urban Center: Office Use and mixed use	TL 1A (office) Case by case due to proximity to transit center. TL 1B (mixed use) Case by case for non-residential and other use in mixed use		No Gap					
Permeable pavement use for parking lots (parking stalls, drive aisles)									
Kirkland Public Works Pre-Approved Plans	Permeable pavement	No standard detail yet for permeable pavement parking lot.	Allow permeable pavement for parking areas, parking lanes, and/or parking spaces.	Consider adding a standard detail for porous asphalt/perVIOUS concrete parking lot.	Add a detail for permeable pavement parking lot to 2017 Update to Pre-Approved Plans	X			
Kirkland Zoning Code	Section 105.100	Parking area and driveway must be surfaced with material comparable or superior to r-o-w providing direct vehicle access. Pervious surface (such as pervious concrete or asphalt, or modular grid pavement) can be used per KMC 15.52.060. Grassed modular pavement may be used for emergency access areas that are not used in regular permanent circulation and parking areas.	Allow permeable pavement for parking areas, parking lanes, and/or parking spaces. Consider offering an incentive for spillover or other infrequently used parking areas to be permeable.	No Gap	No Revision - zoning code already allows permeable pavement for parking lots.	X			
2009 King County Surface Water Design Manual	Chapter 5	Permeable pavement/infiltration allowed for flow control for parking lots (stalls and drive aisles).		No Gap	No Revision - current storm design manual allows permeable pavement for parking lots.	X			
Parking stall dimensions									
Kirkland Zoning Code	Chapter 180 - Plates 1-4	Standard Stall: 8.5'x18.5', Compact Stall: 8'x16'	Minimum for Standard Stall: 9.5'x19'	No Gap	No revision - zoning code contains standard stall size of 8.5'x18.5', which is already below target of 9.5'x19'.	X			
Kirkland Zoning Code	Section 105.65	Up to 50% of required parking spaces may be designated for compact cars.	Is there a fixed % of stalls assigned to compact cars(15%-35%)?	No Gap	No revision - zoning code contains standard of 50% required parking spaces designated for compact cars, which is already below target of 35%.	X			
Driving aisle dimensions									
Kirkland Zoning Code	Chapter 180	17' and 24' depending on one or two way and compacts.	Is the driving aisle wider than required by Fire Dept? Can one-way aisles be used in conjunction with angled parking stalls instead of two-way aisles?	No Gap	No revision - zoning code contains narrowest driving aisle width allowed by Fire Dept, and one-way aisles can be used in conjunction with angled parking stalls.	X			

Table 10: Gap Analysis for Topic: Parking (continued)								
Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Off-street parking regulations								
Kirkland Zoning Code	KZC 105.103	Existing KZC provisions allow for modifications from parking requirements (number of stalls, location, etc.), if a parking study shows that the proposed modification will fully serve the use.	<i>Consider mechanisms to reduce parking requirements (like shared parking, proximity to transit, car share, etc.).</i>	No Gap	No revision - existing Zoning Code provisions already allow for modifications.	X		
	KZC use Zone Charts	Is allowed, no incentive offered	<i>Consider incentives for structured or tuck under parking.</i>	No Gap	No revision - taller height limits in business districts (Totem Lake, Yarrow Bay) already encourage structured parking to allow for more development on site.	X		
Additional Sub-Topics to Consider (Beyond Ecology Focus Sheets)								
Integrate storm LID BMPs (bioretention) into landscape islands								
Kirkland Zoning Code	KZC 95.44 Internal Parking Lot Landscaping Requirements	Requires min 1 tree, and LID facilities count towards landscape requirements.	<i>Allow vegetation in LID Facilities to count towards open space or landscape requirements.</i>	No Gap	No Revision - zoning code already allows LID facilities to count towards landscape requirements.			X
Kirkland Public Works Pre-Approved Plans	Plan No. CK-L.01, L.02, L.03, L.04	Existing Bioretention standard details can be used in parking lots.		No Gap	No Revision - existing bioretention standard detail can be used in parking lots.			X

Table 11: Gap Analysis for Topic: Design Guidelines and Standards

Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Trees and bioretention								
Kirkland Zoning Code	KZC 95.50.5a Installation Standards for Required Plantings	Code refers to PW Pre-Approved Plans, which includes Kirkland Street Tree Selection List of tree species.	<i>Are specific street tree species included in the design guidelines and standards? Are they flexible to allow alternative tree species compatible with bioretention designs?</i>	No Gap	No Revision - code references PW Policy R-10, which includes Kirkland Street Tree Selection List.			X
Kirkland Public Works Pre-Approved Plans	Policy R-10 Street Tree Selection List, and Planting and Pruning Procedures	Policy provides a variety of recommended tree species on the tree list; contains some flexibility for different tree species on a case-by-case basis.	<i>Are specific street tree species included in the design guidelines and standards? Are they flexible to allow alternative tree species compatible with bioretention designs?</i>	Expand Kirkland Street Tree Selection List to include tree species compatible with bioretention designs.	Modify policy by expanding Kirkland Street Tree Selection List to include tree species compatible with bioretention designs.			X
Continuous curb requirements								
Kirkland Zoning Code	KZC 110.65 Engineering Standards	Code refers to Kirkland Pre-Approved Plans	<i>Are conventional curbs and gutters required? Can the requirements be adjusted to allow the use of curb cuts (breaks that allow runoff to flow into bioretention cells) or "invisible" curbs (flush with the road surface)?</i>	No Gap	No Revision - code refers to Kirkland Pre-Approved Plans which allows for flexibility on a case-by-case basis.			X
Kirkland Public Works Pre-Approved Plans	CK-R.17 Concrete Curb and Gutter	Standard includes typical curb requirements, but includes flexibility on a case-by-case basis.		No Gap	No Revision - Curb and gutter requirements are already flexible to allow curb cuts and flush curbs on a case-by case basis. For example, curb cuts to bioretention areas were installed at Garden Gate subdivision (along 112th Ave NE), and flush curbs were installed on Park Lane.			X
Kirkland Municipal Code	KMC 19.20 Sidewalks, Curbs and Gutters - Construction and Maintenance	Code refers to RCW 35.68, 35.69, 35.70		No Gap	No Revision - code refers to RCW.			X
Curb radii								
Kirkland Zoning Code	KZC 110.65 Engineering Standards	Code refers to Kirkland Pre-Approved Plans	<i>Are minimum curb radii requirements specified for street intersections or pedestrian bulbs? Can curb radii requirements be reduced to provide additional space for LID BMPs?</i>	No Gap	No Revision - code refers to Kirkland Pre-Approved Plans which allows for flexibility on a case-by-case basis.			X
Kirkland Public Works Pre-Approved Plans	CK-R.24 Curb Radius Standards	Standard curb radius ranges between 25' to 35', depending on street designation (neighborhood access to collector to arterial). Note 3 allows for radii down to 15' when curb bulbs are used.		No Gap	No Revision - Standard already has allowance for lower curb radii (down to 15') when curb bulbs are used.			X

Table 12: Gap Analysis for Topic: Stormwater Management and Maintenance

Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Process to determine public or private maintenance responsibility								
Kirkland Municipal Code	KMC 15.52.120 Operation and maintenance of storm water facilities	1. Single Family Residential development is primarily publicly maintained. 2. Multi-family and Commercial development are privately maintained.	<i>Is there an established process/policy to determine responsibility of stormwater maintenance?</i>	No Gap	No Revision - Current code specifies which party has responsibility for maintenance of stormwater facilities.			X
Kirkland Standard Operating Procedures	D-2. Maintenance of Residential Stormwater Facilities	SOP D-2 provides clarification on publicly maintained residential facilities.		No Gap	No Revision - Standard Operating Procedure supports municipal code and provides additional clarification on publicly maintained residential facilities.			X
Privately Maintained Stormwater Facilities								
Private Maint - mechanism to preserve and maintain facility (tract, easement, covenant, title)								
Kirkland Municipal Code	KMC 15.52.120 Operation and maintenance of storm water facilities	Any modification of an existing drainage facility must be approved and permitted by the City.	<i>Does the code require private stormwater facilities be located in a tract/easement?</i>	No Gap	No Revision - Current code is adequate to preserve and maintain private stormwater facilities; requires City permit and approval for any modification to existing drainage facility.			X
		Any person or persons holding title to a nonresidential property for which storm water facilities have been required by the city of Kirkland shall be responsible for the continual operation, maintenance, and repair of said storm water facilities in accordance with the criteria set forth in Appendix A of the 2009 King County Surface Water Design Manual and the City of Kirkland Addendum to the 2009 King County Surface Water Design Manual.	<i>Does the code require a maintenance covenant or other legal agreements for private stormwater facilities?</i>	No Gap	No Revision - Current code is adequate to preserve and maintain private stormwater facilities; requires private party to maintain existing drainage facility per adopted City standards.			X
Kirkland Public Works Pre-Approved Plans	Policy D-7. Private Maintenance Agreement for a Stormwater Facility Including LID Facility	Policy includes maintenance agreement to be signed by private party to ensure private maintenance.	<i>Does the code require a maintenance covenant or other legal agreements for private stormwater facilities?</i>	No Gap	No Revision - policy contains a private maintenance agreement to be signed by private party acknowledging they agree to maintenance standards.			X
Private Maint - maintenance specifications in place								
Kirkland Municipal Code	KMC 15.52.120	Section e, 1, refers to 2009 King County Surface Water Design Manual.	<i>Does the adopted stormwater manual outline maintenance standards and/or procedures?</i>	No Gap	No Revision - 2009 KCSWDM outlines maintenance standards for stormwater facilities. New stormwater design manual to be adopted Dec 31, 2016 will include maintenance standards.			X
Kirkland Public Works Pre-Approved Plans	Policy D-7. Private Maintenance Agreement for a Stormwater Facility Including LID Facility	Maintenance agreement signed by private party includes maintenance standards for stormwater facilities.		No Gap	No Revision - policy contains a private maintenance agreement signed by private party that includes maintenance standards for stormwater facilities.			X
Private Maint - mechanism for access, inspection, enforcement process								
Kirkland Municipal Code	KMC 15.52	15.52.130 allows inspection. 15.52.120 requires maintenance and repairs. 15.52.140 enforcement under KMC 1.12.	<i>Does the code allow access to inspect, maintain, repair and enforcement of the facility if a private property owner fails to maintain the facility?</i>	No Gap	No Revision - current codes allow for the City to access, inspect, sample, and enforce maintenance and repairs as needed.			X
	KMC 1.12	KMC 1.12 includes fines and penalties determined using an enforcement penalty matrix.	<i>Does the code include reimbursement for any City maintenance activities conducted on a private facility?</i>	No Gap	No Revision - current codes includes fines and penalties determined using an enforcement penalty matrix. Code allows reimbursement for the cost if the City has to maintain a private facility.			X
	KMC 15.52	No reduction in stormwater fee as incentive for property owners the meet maintenance requirements.	<i>Are incentives (reduction in stormwater fees) provided for private property owners that meet their maintenance requirements?</i>	No Gap	No Revision - incentive for maintenance is not needed at this time; Kirkland achieves compliance through education, inspections, and by providing technical assistance to property owners.			X

Table 12: Gap Analysis for Topic: Stormwater Management and Maintenance (continued)							Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.				
Private Maint - education plan, signage									
Kirkland Municipal Code	KMC 15.52	Kirkland has an ongoing Private Maintenance Program, where city staff work with commercial and multifamily property owners to ensure they understand the stormwater facilities and structures on their property and the maintenance requirements. Staff inspect all sites on an annual or bi-annual basis, and follow up to ensure systems are adequately maintained.	<i>Is there an education plan, signage, or other process used to inform private property owners of the required maintenance?</i>	No Gap	No Revision - Kirkland has an ongoing Private Maintenance Program, where city staff work with commercial and multifamily property owners to ensure they understand the stormwater facilities and structures on their property and the maintenance requirements. Staff inspect all sites on an annual or bi-annual basis, and follow up to ensure systems are adequately maintained.			X	
Kirkland Public Works Pre-Approved Plans	Policy D-7. Private Maintenance Agreement for a Stormwater Facility Including LID Facility	For new single family residential systems that will be privately maintained, property owners sign a private maintenance agreement, recorded with King County. The agreement includes the facility type, location, and all maintenance requirements.		No Gap	No Revision - For new single family residential systems that will be privately maintained, property owners sign a private maintenance agreement, recorded with King County. The agreement includes the facility type, location, and all maintenance requirements.			X	
Publicly Maintained Stormwater Facilities									
Public Maint - mechanism to preserve and maintain facility (public Right-of-Way, tract, easement)									
Kirkland Municipal Code	KMC 15.52	Kirkland takes maintenance responsibility for all elements of the storm drainage system beginning at the first catch basin within the public Right-of-Way.	<i>Does the code require public stormwater facilities be located in public ROW or a public easement?</i>	No Gap	No Revision -Kirkland assumes maintenance responsibility for all parts of the storm drainage system within the ROW (starting at first catch basin), and within easements or tracts dedicated to the City.			X	
Public Maint - maintenance specifications in place									
Kirkland Municipal Code	KMC 15.52.120	Section e, 1, refers to 2009 King County Surface Water Design Manual.	<i>Does the adopted stormwater manual outline maintenance standards and/or procedures?</i>	No Gap	No Revision - 2009 KCSWDM outlines maintenance standards for stormwater facilities. New stormwater design manual to be adopted 12/2016 will include maintenance standards.			X	
Public Maint - mechanism for access and inspection									
Kirkland Municipal Code	KMC 15.52	Facilities serving single-family residential developments must be in ROW, easements or tracts dedicated to the City.	<i>Does the code allow access to inspect, maintain, and repair stormwater facilities?</i>	No Gap	No Revision - code is adequate to provide City access, inspection, and maintenance as needed.			X	
Public Maint - education plan, signage									
Kirkland Municipal Code	KMC 15.52	Publicly maintained ponds require education signage per the 2009 King County Surface Water Design Manual. KMC refers to surface water design manual.	<i>Is there an education plan, signage, or other process used to inform the public about maintenance of stormwater facilities?</i>	No Gap	No Revision - code refers to the adopted storm design manual, which requires signage on publicly maintained ponds.			X	
Kirkland Public Works Pre-Approved Plans or Standard Operating Procedure (SOP)	Kirkland Public Works Pre-Approved Plans or Standard Operating Procedure	Informal policy for when signage is used on facilities other than ponds; primarily if located in high visibility public areas. There is not a written Policy on when stormwater education signage is required. City website contains educational information on publicly maintained facilities.	<i>Is there an education plan, signage, or other process used to inform the public about maintenance of stormwater facilities?</i>	Consider writing a policy or standard operating procedure on when educational signage is used on storm facilities/BMPs.	Adopt a sign standard to provide public education on LID stormwater facilities (function and maintenance). Add to next PW Pre-Approved Plans or SOP update in 2017.			X	

Table 13. Items Identified from Gap Analysis to Consider for Revision						Revised:9/14/16		
Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Table 1. Topic: Landscaping, Native Vegetation, and Street Landscaping								
Tree preservation/retention								
Kirkland Zoning Code, relating to Tree retention with Development Activity	KZC 95.33 Tree Density Requirement	Min tree density is 30 tree credits per acre, use tree credit table.	Place greater emphasis on conifer preservation	Consider a different system for retaining and replacing trees. Consider modifying Tree Credit table to look at area of native vegetation (or % of site in native veg) in addition to number/size of trees and to give extra points for use of conifers of a similar size as deciduous trees.	Modify existing Tree Credit Table to give more credit for conifers (place more emphasis on conifers).		X	
Screening								
Kirkland Zoning Code	KZC 95.40 Required Landscaping, KZC 95.41 Supplemental Plantings	95.40, Item 2. Use of Significant Existing Vegetation, 95.41, Item 2a. Standards for Supplemental	Can the screening requirements be revised to include provisions for retaining native vegetation and replanting?	Consider code modifications to include preference for native species, and expansion of the Kirkland Native Plant List.	Modify code to add preference for native species. Revise Kirkland Native Plant List.		X	
Landscape requirements for parking lots								
Kirkland Zoning Code	KZC 95.44 Internal Parking Lot Landscaping Requirements	Requires min 1 tree (per 25sf) and other groundcover (per parking stall)	Include minimum tree canopy, native vegetation, and allow vegetation in LID facilities to count towards open space or landscape requirements.	Lacks language to allow LID facilities to count towards landscape requirements.	Modify code to specify that LID facilities count towards landscape requirements, but keep tree requirement. Reference COK PW Pre-Approved Plans.		X	X
Kirkland Zoning Code	KZC 95.45 Perimeter Landscape Buffering for Driving and Parking Areas	5' wide strip, ROW of trees and live groundcover	Include minimum tree canopy, native vegetation, and allow vegetation in LID facilities to count towards open space or landscape requirements.	Lacks language to allow LID facilities to count towards landscape requirements	Modify code to specify that LID facilities count towards landscape requirements. Reference COK PW Pre-Approved Plans. Additional language regarding natives could be considered in a subsequent city code review.			X
utility setbacks for trees								
Kirkland Public Works Pre-Approved Plans	General Section	Not addressed in current code. Current process is utility plan comes in, PCD and PW review and come to an agreement. Handled on a case-by-case basis, with the understanding that trees to be saved whenever possible.	Retain native vegetation	"Understanding" is not identified in a written policy, consider creating a written policy for the Pre-Approved Plans.	Establish new Policy in Pre-Approved Plans regarding utility setbacks for trees; also include street improvements. Specify trees should be saved whenever possible.		X	
Table 3. Topic: Hard and Impervious Surfaces								
Maximum impervious surface allowances								
Kirkland Zoning Code	KZC 114 Low Impact Development	Encourages minimizing impervious surface, allows clustering, reduced lot size, and consolidated open space with storm LID BMPs.	-Does code include maximum impervious surface limits for different land use types? -Can maximum impervious areas be reduced in residential areas?	Review incentives under this code, modify so not offering incentives for required items once new storm design manual is adopted 12/2016.	Modify code to remove stormwater incentives since storm LID is required under new manual.	X		X
	KZC 115.90 Calculating lot coverage	Pervious pavement and other items receive 50% credit towards maximum impervious lot coverage.		Consider removing 50% lot coverage incentive items since new storm design manual to be adopted 12/2016 will require pervious surfaces if feasible.	Remove three lot coverage exemption items in KZC 115.90.3: (a) permeable pavement, (b) grassed modular grid pavement, and (d) pervious surfaces in compliance with the stormwater design manual.	X		X
	KZC 115.90 Calculating lot coverage	Rockeries/retaining walls count towards impervious area lot coverage.		Rockeries/retaining walls are difficult for staff to measure and verify, often installed later, and if vegetation is on both sides then runoff is dispersed. Consider removing rockeries/retaining walls from impervious area lot coverage calculations when not integral to a structure, or located elsewhere on lot where runoff is dispersed.	Add the following Exception to lot coverage: d. Rockeries and retaining walls, unless integral to an adjacent structure (like a patio, building, or parking area).	X		X
	KZC 115.90 Calculating lot coverage	Synthetic turf (e.g., Astroturf) on residential properties counts towards impervious area for lot coverage because it does not meet the "open space" definition in KZC 5.10.610.		Code language may be unclear to applicants, whether synthetic turf is impervious or pervious. Revise code to clearly state how synthetic lawn surface is counted regarding lot coverage. Consider counting 100% towards lot coverage since it is not "vegetated open space".	Planning Commission to determine policy for use of synthetic turf in Kirkland; appearance (material preference) and function (porosity).	X		X
Use of permeable pavement for driveways								
Kirkland Municipal Code	KMC 19.12.130 Specifications	Specifications for street and curb cutting, refers to 1977 Edition of "Standard Specifications for Municipal Works Construction"	Allow alternative surfaces for driveways.	Consider changing reference to same as KZC 110.65 Engineering Standards (Pre-Approved Plans). See same change on Table 8.	Revise text reference to KZC 110.65 Engineering Standards.	X		X

Table 13. Items Identified from Gap Analysis to Consider for Revision (continued)						Revised:9/14/16		
Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Table 6: Gap Analysis for Topic: Critical Areas and Shoreline Management								
Wetlands								
Kirkland Zoning Code, Chapter 90 - Drainage Basins	KZC 90.45 (4) Water Quality Facilities	WQ facilities allowed within outer one-half (1/2) of wetland buffer (with conditions).	<p><i>Are LID BMPs allowed within or adjacent to buffers?</i></p> <p><i>Can native vegetation associated with LID BMPs be used to meet buffer enhancement requirements?</i></p>	Consider specifying the type of WQ facility/LID BMP allowed under current CAO update.	KZC Chapter 90 currently under revision to be consistent with Best Available Science (BAS). <i>Update 9/2016: KZC 90 revised: water quality and LID facilities are not allowed within wetland buffers (except dispersion flow path).</i>			X
		WQ facilities allowed elsewhere within wetland buffer if proposed by public agency (with additional conditions).		Consider changes under current CAO update.				X
	KZC 90.45 Wetland Buffers and Setbacks	LID BMPs not mentioned in code.		Consider specifying the type of WQ facility/LID BMPs allowed under current CAO update. Options to consider are: Infiltration, Dispersion, Bioretention, and Permeable Pavement. Rainwater Harvesting and Vegetated Roof not likely because this would involve structures in buffer or setback.	This may be revised. KZC Chapter 90 currently under revision to be consistent with Best Available Science (BAS). <i>Update 9/2016: KZC 90.140 revised: bioretention such as rain gardens, and dispersion techniques that result in sheet flow such as level spreaders, dispersion trenches, splash blocks and similar techniques may extend no more than 9' into structure setback from critical area buffer.</i>			X
Streams								
Kirkland Zoning Code, Chapter 90 - Drainage Basins	KZC 90.90 (3) Storm Water Outfalls	Piped stormwater outfalls allowed within stream buffer and setback (with conditions).	<p><i>Are LID BMPs allowed within or adjacent to buffers?</i></p> <p><i>Can native vegetation associated with LID BMPs be used to meet buffer enhancement requirements?</i></p>	Consider changes under current CAO update.	This may be revised. KZC Chapter 90 currently under revision to be consistent with Best Available Science (BAS). <i>Update 9/2016: KZC 90 revised: storm water outfall section removed.</i>			X
		KZC 90.90 (4) Water Quality Facilities		WQ facilities allowed within outer one-half (1/2) of buffer (with conditions).	Consider specifying the type of WQ facility/LID BMP allowed under current CAO update.	KZC Chapter 90 currently under revision to be consistent with Best Available Science (BAS). <i>Update 9/2016: KZC 90 revised: water quality and LID facilities are not allowed within steam buffers (except dispersion flow path).</i>		
	WQ facilities allowed elsewhere within buffer if proposed by public agency (with additional conditions).			Consider changes under current CAO update.				X
		KZC 90.90 Stream Buffers and Setbacks		LID BMPs not mentioned.		Consider including language to specify LID BMPs under current CAO update. Options to consider are: Infiltration, Dispersion, Bioretention, and Permeable Pavement. Rainwater Harvesting and Vegetated Roof not likely because this would involve structures in buffer or setback.	This may be revised. KZC Chapter 90 currently under revision to be consistent with Best Available Science (BAS). <i>Update 9/2016: KZC 90.140 revised: bioretention such as rain gardens, and dispersion techniques that result in sheet flow such as level spreaders, dispersion trenches, splash blocks and similar techniques may extend no more than 9' into structure setback from critical area buffer.</i>	
Table 7: Gap Analysis for Topic: Clearing and Grading								
Conserve native vegetation/soils								
Kirkland Zoning Code	KZC 90 (KZC 5)	No definition for native vegetation.	<p><i>Define native vegetation, including minimum tree density, minimum retention requirements, protecting native vegetation areas, replanting requirements, soil amendment standards, management plan specifications, and maintenance requirements.</i></p>	Consider adding a definition for "native vegetation"	Definition for native vegetation added through current CAO Chapter 90 update (2016). Used definition in the Ecology NPDES Municipal Stormwater permit for Western WA.		X	

Table 13. Items Identified from Gap Analysis to Consider for Revision (continued)						Revised:9/14/16			
Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff	
Table 8: Gap Analysis for Topic: Streets and Roads									
Use of permeable pavement for streets and roads									
Kirkland Public Works Pre-Approved Plans	Pre-Approved Plans, Design Criteria	Permeable pavement is allowed for private streets, and allowed on a case-by-case basis for public streets (no written policy).	<i>Can permeable pavement be used for road shoulders, parking lanes, and emergency parking areas?</i>	Consider adding a written policy to the Pre-Approved Plans.	Develop written policy on when permeable pavement will be used on private and public streets and alleys; including when to use for travel lanes, road shoulders, parking lanes, and emergency parking areas. Include requirements dictated by new storm design manual.	X			
		Plans do not include a standard detail for permeable streets.		Consider adding standard details for permeable streets to the Pre-Approved Plans.	Develop standard details for pervious pavement streets, private and public.	X			
Kirkland Municipal Code	KMC 19.12.130 Specifications	Specifications for street and curb cutting, refers to 1977 Edition of "Standard Specifications for Municipal Public Works Construction".			Consider changing reference to same as KZC 110.65 Engineering Standards (Pre-Approved Plans). <i>See same change on Table 3.</i>	Revise text reference to KZC 110.65 Engineering Standards.	X		
Permeable pavement for sidewalks & sidewalk slope									
Kirkland Municipal Code	KMC 19.20.030	Code identifies maintenance of sidewalk is the responsibility of abutting property owner (this includes repairs if need is caused by abutting property owner).	<i>Allow permeable pavement for sidewalks</i>	Consider Revision. New Storm Design Manual adopted 12/2016 will require either pervious pavement sidewalks or adjacent bioretention areas: Homeowners may not have the appropriate tools/equipment/knowledge to maintain pervious pavement. Current city staff allocation is not adequate to take on maintenance of all sidewalks and bioretention areas. Recent maintenance standards recommend pressure washer and vacuum system "calibrated to not dislodge wearing course aggregate".	No revision needed for existing municipal code. Existing code allows permeable concrete sidewalks.	X			
Kirkland Public Works Pre-Approved Plans	Policy R-15	List of permitted groundcover in public landscape strip, and policy states maintenance is the responsibility of the adjacent property owner.	<i>New storm design manual will require bioretention area instead of standard landscape strip if traditional impervious sidewalk is used instead of pervious pavement.</i>	Consider Revision. New Storm Design Manual to be adopted 12/2106 will require either pervious pavement sidewalks or traditional sidewalks draining to a bioretention area.	No revision to policy at this time: current policy does not prevent LID.			X	
	Plan CK-R.23	Design standard is 2% max slope towards road. ROW includes a landscape strip between sidewalk and road, so sidewalk slopes towards landscape strip.	<i>Allow sidewalk slope toward landscape strip, LID BMP, or other.</i>	Consider Revision. New Storm Design Manual adopted 12/2016 will require either pervious pavement sidewalks or traditional sidewalks draining to a bioretention area.	Modify design standard to show sidewalk draining to landscape strip/bioretention/road; depending on requirements in new storm design manual.			X	
Table 9: Gap Analysis for Topic: Healthy Soils									
Protecting and restoring healthy soils									
Kirkland Zoning Code	KZC 95.34 and KZC 95.50.4	KZC 95.34 implies protection of existing soil (w/ trees). KZC 95.50 intends to address soil restoration	<i>Is there a soil management plan in place that identifies soil protection zones and describes quantities of compost amendment? Are protection areas required to be fenced?</i>	Does not refer to PW Pre-Approved Plans. KZC 95.50. Consider removing soil compaction density reference, etc.	Revise code to reflect BAS/BMPs, refer to PW Pre-Approved Plans, specify 'soil' in 95.34 (protection) and 95.50 (restoration).			X	
Kirkland Public Works Pre-Approved Plans	Policy D-2, D-3	TESC Plan is required for all development. No separate document for soil management required.			Revise in next update to Pre-Approved Plans (2017). Require a separate Soil Management Plan document for all LSM permits, and for multi-family and commercial BLD permits. Document is tool for staff to help verify amended soil requirement is met.	Revise Pre-Approved Plans (2017) to include a soil management plan document (like King County's document).			X
	Details R.48, R.48A	Tree planting details			Currently considering revisions to include adequate soil volume.	Revise Pre-Approved Plans (2017) to include adequate soil volume.			X
Compost amendments									
Kirkland Zoning Code	KZC 95.50.4 Installation Standards for Required Plantings	Item 4 intends to address soil amendments with plant installation.	<i>Does code require amendment of disturbed soil? Are there incentives for compost on small projects?</i>	Item 4 is vague: does not use industry standard soil specs, does not state soil quality shall comply with requirements of the PW Pre-Approved Plans. Update re: soil compaction density, amendments, etc. Link to pending soil req'ments.	Modify code to add requirement for compost amendments per Ecology BMP T5.13 (since amended soil will be required for all landscaping under new SW Design Manual, to be adopted 12/2016).			X	
Kirkland Public Works Pre-Approved Plans	Plan No. CK-E.12	Soil Amendment Notes for using BMP T5.13		Worked soil depth of 12" may not be adequate, consider increasing to 18".	Consider increasing worked soil depth from 12" to 18".			X	

Table 13. Items Identified from Gap Analysis to Consider for Revision (continued)						Revised:9/14/16		
Document	Section Reference	Current Regulation - key components	LID Code Consideration	Summary of Gap	Describe/Note How Revision(s) made meets Permit requirements, OR if No revision(s) made to this document, explain why.	Measures to minimize impervious surfaces	Measures to minimize loss of native vegetation	Measures to minimize stormwater runoff
Table 10: Gap Analysis for Topic: Parking								
Permeable pavement use for parking lots (parking stalls, drive aisles)								
Kirkland Public Works Pre-Approved Plans	Permeable pavement	No standard detail yet for permeable pavement parking lot.	<i>Allow permeable pavement for parking areas, parking lanes, and/or parking spaces.</i>	Consider adding a standard detail for porous asphalt/pervious concrete parking lot.	Add a detail for permeable pavement parking lot to 2017 Update to Pre-Approved Plans	X		
Table 11: Gap Analysis for Topic: Design Guidelines and Standards								
Trees and bioretention								
Kirkland Public Works Pre-Approved Plans	Policy R-10 Street Tree Selection List, and Planting and Pruning Procedures	Policy provides a variety of recommended tree species on the tree list; contains some flexibility for different tree species on a case-by-case basis.	<i>Are specific street tree species included in the design guidelines and standards? Are they flexible to allow alternative tree species compatible with bioretention designs?</i>	Expand Kirkland Street Tree Selection List to include tree species compatible with bioretention designs.	Modify policy by expanding Kirkland Street Tree Selection List to include tree species compatible with bioretention designs.			X
Table 12: Gap Analysis for Topic: Stormwater Management and Maintenance								
Publicly Maintained Stormwater Facilities - education plan, signage								
Kirkland Public Works Pre-Approved Plans or Standard Operating Procedure	Kirkland Public Works Pre-Approved Plans or Standard Operating Procedure	Informal policy for when signage is used on facilities other than ponds; primarily if located in high visibility public areas. There is not a written Policy on when stormwater education signage is required. City website contains educational information on publicly maintained facilities.	<i>Is there an education plan, signage, or other process used to inform the public about maintenance of stormwater facilities?</i>	Consider writing a policy or standard operating procedure on when educational signage is used on storm facilities/BMPs.	Adopt a sign standard to provide public education on LID stormwater facilities (function and maintenance). Add to next PW Pre-Approved Plans or SOP update in 2017.			X

LID Code Review Proposed Amendments				
Kirkland Zoning Code				
Code Section	Revision	Purpose	Amendment Project	Staff Notes
KZC 95.33	Revise Tree Credit table to give extra points for use of conifers of a similar size as deciduous trees.	To retain and replace native vegetation.	KZC LID Code Update 2016	Deb modified Tree Credit Table to give 1.5time credit preference for conifers. From Gap Analysis Table 1.
KZC 95.34	Revise code to reflect BAS/BMPs; and specify 'soil' in 95.34.	For code to reflect the Best Available Science, and consistency with PW Pre-Approved Plans.	KZC LID Code Update 2016	Deb revised text. From Gap Analysis Table 9.
KZC 95.40	Revise code to include preference for native species (item 2) and soil, and expansion of the Kirkland Native Plant List.	To retain and replace native vegetation.	KZC LID Code Update 2016	Deb revised code text, will revise Kirkland Plant List later. From Gap Analysis Table 1.
KZC 95.41	Revise code to include preference for native species (item 2a).	To retain and replace native vegetation.	KZC LID Code Update 2016	Deb revised code text. From Gap Analysis Table 1.
KZC 95.44	Revise code to specify that LID facilities count towards landscape requirements, but keep tree requirement. Reference PW Pre-Approved Plans.	To allow applicant greater flexibility and options for landscape requirements in parking lots.	KZC LID Code Update 2016	Deb revised code text. From Gap Analysis Table 1.
KZC 95.45	Revise code to specify that LID facilities count towards landscape requirements. Reference PW Pre-Approved Plans. Additional language regarding natives could be considered in a subsequent city code review.	To allow applicant greater flexibility and options for landscape requirements in parking lots.	KZC LID Code Update 2016	Deb revised code text. From Gap Analysis Table 1.
KZC 95.50.4	Revise code for consistency with Storm Design Manual and to reflect BAS/BMPs. Revise soil compaction density requirements, refer to PW Pre-Approved Plans, and specify 'soil' in 95.50 (restoration).	Existing code is vague; does not use industry standard soil specs, consistency with PW Pre-Approved Plans and new storm design manual, and to reflect Best Available Science.	KZC LID Code Update 2016	Deb/Stacey revised code text. From Gap Analysis Table 9.
KZC 115.90	Remove three lot coverage exemption items in KZC 115.90.3 (a) permeable pavement, (b) grassed modular grid pavement, and (d) pervious surfaces in compliance with the stormwater design manual.	Revision needed for consistency with new storm design manual to be adopted 12/2016; permeable pavement is required so should not be exempt from lot coverage. Grassed grid pavement is not allowed on residential driveways (cannot support daily use).	KZC LID Code Update 2016	Dorian revised text. From Gap Analysis Table 3.
KZC 115.90	Add the following Exception to lot coverage: d. Rockeries and retaining walls, unless integral to an adjacent structure (like a patio, building, or parking area). Also add sidewalk if located in easement (to accommodate bioretention area between sidewalk and road).	Rockeries/retaining walls surrounded by turf or landscape disperse on site. Individual rockeries throughout a site are difficult for staff to measure accurately.	KZC LID Code Update 2016	Dorian/Stacey revised text. From Gap Analysis Table 3.

Kirkland Zoning Code				
Code Section	Revision	Purpose	Amendment Project	Staff Notes
KZC 115.90	Clarify exemptions from lot coverage. Code language may be unclear to applicants. Clarify features that are allowed in "open space". Review Supplemental Planting section in Chapter 95. Note – stormwater regulations consider artificial turf as 100% impervious if it is installed with under drains. If under drains are not installed, the artificial surface is 100% pervious.	Current code language may be unclear to applicants, and challenges in reviewing development proposals exist related to items that may be located in open space (including how artificial turf should be viewed).	KZC LID Code Update 2016	Planning Commission to discuss potential exemptions from lot coverage, and possible shift to requiring minimum open space rather than maximum impervious surface. From Gap Analysis Table 3.
KZC 114	Revise code to remove stormwater incentives (modify so not offering incentives for stormwater LID that will be required once new storm design manual is adopted 12/2016), added conifer preference, added 80% cover in 2 years for required open space, and consider reducing the approval process.	Incentives were written into code several years ago to encourage LID. New storm design manual to be adopted 12/2016 requires LID so modifications are needed to code not offer incentives for required items.	KZC LID Code Update 2016	Stacey/David revised text. From Gap Analysis Table 3.
KZ Chapter 90	Add definition for "Native Vegetation".	Consistency with Ecology NPDES Municipal Stormwater Permit	CAO Revision 2016	Joan added to definitions in CAO Revision.
Kirkland Municipal Code				
Code Section	Revision	Purpose	Amendment Project	Staff Notes
KMC 19.12.130	Specifications for street and curb cutting, refers to 1977 Edition of "Standard Specifications for Municipal Works Construction".	For consistency, change reference to same as KZC 110.65 Engineering Standards (which refers to PW Pre-Approved Plans).	KMC Update 2016	Stacey will revise text. From Gap Analysis Tables 3 and 8.
Kirkland Public Works Pre-Approved Plans				
Code Section	Revision	Purpose	Amendment Project	Staff Notes
PW Pre-Approved Plans, General Policy	Establish new Policy in Pre-Approved Plans regarding utility setbacks for trees; also include street improvements. Specify trees should be saved whenever possible.	To retain native vegetation.	PW Pre-Approved Plans 2017	PW Development staff to write policy. From Gap Analysis Table 1.
Pre-Approved Plans, Roadway Policy	Develop written policy on when permeable pavement will be used on private and public streets and alleys; including when to use for travel lanes, road shoulders, parking lanes, and emergency parking areas. Include requirements dictated by new storm design manual.	LID (including permeable pavement) is required as feasible under the new storm design manual to be adopted 12/2016.	PW Pre-Approved Plans 2017	PW Development staff to write policy. From Gap Analysis Table 8.
Pre-Approved Plans, Road Detail	Develop standard details for pervious pavement streets, private and public.	LID (including permeable pavement) is required as feasible under the new storm design manual to be adopted 12/2016.	PW Pre-Approved Plans 2017	PW development staff to prepare details. From Gap Analysis Table 8.

Kirkland Public Works Pre-Approved Plans				
Code Section	Revision	Purpose	Amendment Project	Staff Notes
Pre-Approved Plans, Detail R.23	Modify design standard to show sidewalk draining to landscape strip/bioretenion/road; depending on requirements in new storm design manual.	New Storm Design Manual adopted 12/2016 will require either pervious pavement sidewalks or traditional sidewalks draining to a bioretention area.	PW Pre-Approved Plans 2017	PW development staff to modify detail. From Gap Analysis Table 8.
Pre-Approved Plans, Storm Policies D-2, D-3	Require a separate Soil Management Plan document for all LSM permits, and for multi-family and commercial BLD permits.	Soil Management Plan is required by new storm design manual to be adopted 12/2016, and will help staff during construction.	PW Pre-Approved Plans 2017	PW Development staff to add document. From Gap Analysis Table 9.
Pre-Approved Plans, Road Detail	Develop standard details for permeable pavement parking lots (porous asphalt and pervious concrete).	LID (including permeable pavement) is required as feasible under the new storm design manual to be adopted 12/2016.	PW Pre-Approved Plans 2017	PW Development staff to add standard details. From Gap Analysis Table 10.
Pre-Approved Plans or Standard Operating Procedure	Create a policy and/or standard operating procedure stating when educational signage is used on stormwater facilities/BMPs.	To create a consistent policy on when educational signage is used on stormwater facilities/BMPs, and to include materials cost in project budgets.	PW Pre-Approved Plans 2017	PW Development staff to adopt a sign standard and update PW Pre-Approved Plans or SOPs. From Gap Analysis Table 12.
Pre-Approved Plans, Road Details R.48,R.48 A	Add note requiring adequate soil volume in existing tree planting details.	To restore healthy soil and help new plants thrive.	PW Pre-Approved Plans 2017	Deb to revise standard detail. From Gap Analysis Table 9.
Pre-Approved Plans, Erosion Detail E.12	On Soil Amendment Notes, increase worked soil depth from 12" to 18".	To restore healthy soil.	PW Pre-Approved Plans 2017	Deb to revise standard detail. From Gap Analysis Table 9.
Pre-Approved Plans, Road Policy R-10	Modify policy by expanding Kirkland Street Tree Selection List to include tree species compatible with bioretention designs.	To allow applicant greater flexibility with more options for street trees, and to allow bioretention facilities in the public row to include trees.	PW Pre-Approved Plans 2017	Deb to revise street tree list. From Gap Analysis Table 11.

Chapter 95 – TREE MANAGEMENT AND REQUIRED LANDSCAPING

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.05 Purpose and Intent

1. Trees and other vegetation are important elements of the physical environment. They are integral to Kirkland's community character and protect public health, safety and general welfare. Protecting, enhancing, and maintaining healthy trees and vegetation are key community values. Comprehensive Plan Policy NE-3.1 describes working towards achieving a City-wide tree canopy coverage of 40 percent. The many benefits of healthy trees and vegetation contribute to Kirkland's quality of life by:

- a. Minimizing the adverse impacts of land disturbing activities and impervious surfaces such as runoff, soil erosion, land instability, sedimentation and pollution of waterways, thus reducing the public and private costs for storm water control/treatment and utility maintenance;
- b. Improving the air quality by absorbing air pollutants, mitigating the urban heat island effect, assimilating carbon dioxide and generating oxygen, and decreasing the impacts of climate change;
- c. Reducing the effects of excessive noise pollution;
- d. Providing cost-effective protection from severe weather conditions with cooling effects in the summer months and insulating effects in winter;
- e. Providing visual relief and screening buffers;
- f. Providing recreational benefits;
- g. Providing habitat, cover, food supply and corridors for a diversity of fish and wildlife; and
- h. Providing economic benefit by enhancing local property values and contributing to the region's natural beauty, aesthetic character, and livability of the community.

2. Tree and vegetation removal in urban areas has resulted in the loss to the public of these beneficial functions. The purpose of this chapter is to establish a process and standards to provide for the protection, preservation, replacement, proper maintenance, and use of significant trees, associated vegetation, and woodlands located in the City of Kirkland.

The intent of this chapter is to:

- a. Maintain and enhance canopy coverage provided by trees for their functions as identified in KZC 95.05(1);
- b. Preserve and enhance the City of Kirkland's environmental, economic, and community character with mature landscapes;
- c. Promote site planning, building, and development practices that work to avoid removal or destruction of trees and vegetation, that avoid unnecessary disturbance to the City's natural vegetation, and that provide landscaping to buffer the effects of built and paved areas;
- d. Mitigate the consequences of required tree removal in land development through on- and off-site tree replacement with the goals of halting net loss and enhancing Kirkland's tree canopy to achieve an overall healthy tree canopy cover of 40 percent City-wide over time;
- e. Encourage tree retention efforts by providing flexibility with respect to certain other development requirements;
- f. Implement the goals and objectives of the City's Comprehensive Plan;
- g. Implement the goals and objectives of the State Environmental Policy Act (SEPA); and
- h. Manage trees and other vegetation in a manner consistent with the City's Natural Resource Management Plan.

- i. Preserve and protect street trees, trees in public parks and trees on other City property.

(Ord. 4238 § 2, 2010; Ord. 4010 § 2, 2005)

.10 Definitions

The following definitions shall apply throughout this chapter unless the context clearly indicates otherwise. Definitions that apply throughout this code are also located in Chapter 5 KZC.

1. Caliper – The American Association of Nurserymen standard for trunk measurement of nursery stock. Caliper of the trunk shall be the trunk diameter measured six (6) inches above the ground for up to and including 4-inch caliper size and 12 inches above the ground for larger sizes.
2. Critical Root Zone – The area surrounding a tree at a distance from the trunk, which is equal to one (1) foot for every inch of trunk diameter measured at 4.5 feet from grade or otherwise determined by a qualified professional (example: one (1) foot radius per one (1) inch DBH).
3. Crown – The area of a tree containing leaf- or needle-bearing branches.
4. Diameter at Breast Height (DBH) – The diameter or thickness of a tree trunk measured at 4.5 feet from the ground. DBH is also known as Diameter at Standard Height (DSH).
5. Dripline – The distance from the tree trunk, that is equal to the furthest extent of the tree's crown.
6. Grove – A group of three (3) or more significant trees with overlapping or touching crowns.
7. Hazard Tree – A tree that meets all the following criteria:
 - a. A tree with a combination of structural defects and/or disease which makes it subject to a high probability of failure;
 - b. Is in proximity to moderate to high frequency targets (persons or property that can be damaged by tree failure); and
 - c. The hazard condition of the tree cannot be lessened with reasonable and proper arboricultural practices nor can the target be removed.
8. Impact – A condition or activity that affects a part of a tree including the trunk, branches, and critical root zone.
9. Limit of Disturbance – The boundary between the protected area around a tree and the allowable site disturbance as determined by a qualified professional measured in feet from the trunk.
10. Nuisance Tree – A tree that meets either of the following criteria:
 - a. Is causing obvious physical damage to private or public structures, including but not limited to: sidewalk, curb, road, driveway, parking lot, building foundation, or roof; or
 - b. Has sustained damage from past maintenance practices.

The problems associated with the tree must be such that they cannot be corrected by reasonable practices including but not limited to: pruning of the crown or roots of the tree, bracing, and/or cabling to reconstruct a healthy crown.
11. Public Works Official – Designee of the Public Works Director.
12. Qualified Professional – An individual with relevant education and training in arboriculture or urban forestry, having two (2) or more of the following credentials:
 - International Society of Arboriculture (ISA) Certified Arborist;

- Tree Risk Assessor Certification (TRACE) as established by the Pacific Northwest Chapter of ISA (or equivalent);
- American Society of Consulting Arborists (ASCA) registered Consulting Arborist;
- Society of American Foresters (SAF) Certified Forester for Forest Management Plans;

For tree retention associated with a development permit, a qualified professional must have, in addition to the above credentials, a minimum of three (3) years' experience working directly with the protection of trees during construction and have experience with the likelihood of tree survival after construction. A qualified professional must also be able to prescribe appropriate measures for the preservation of trees during land development.

13. Retention Value – The Planning Official's designation of a tree based on information provided by a qualified professional that is one (1) of the following:

a. High, a viable tree, located within required yards and/or required landscape areas. Tree retention efforts shall be directed to the following trees if they are determined to be healthy and windfirm by a qualified professional, and provided the trees can be safely retained when pursuing alternatives to development standards pursuant to KZC 95.32:

- 1) Specimen trees;
- 2) Tree groves and associated vegetation that are to be set aside as preserved groves pursuant to KZC 95.51(3);
- 3) Trees on slopes of at least 10 percent; or
- 4) Trees that are a part of a grove that extends into adjacent property, such as in a public park, open space, sensitive area buffer or otherwise preserved group of trees on adjacent private property. If significant trees must be removed in these situations, an adequate buffer of trees may be required to be retained or planted on the edge of the remaining grove to help stabilize;

b. Moderate, a viable tree that is to be retained if feasible; or

c. Low, a tree that is either (1) not viable or (2) is in an area where removal is unavoidable due to the anticipated development activity.

14. Significant Tree – A tree that is at least six (6) inches in diameter at breast height (DBH) as measured at 4.5 feet from the ground.

15. Significantly Wooded Site – A subject property that has a number of significant trees with crowns that cover at least 40 percent of the property.

16. Site Disturbance – Any development, construction, or related operation that could alter the subject property, including, but not limited to, soil compaction, tree or tree stump removal, road, driveway or building construction, installation of utilities, or grading.

17. Specimen Tree – A viable tree that is considered in very good to excellent health and free of major defects, as determined by the City's Urban Forester.

18. Street Tree – A tree located within the public right-of-way; provided, that if the trunk of the tree straddles the boundary line of the public right-of-way and the abutting property, it shall be considered to be on the abutting property and subject to the provisions of this chapter.

19. Tree Removal – The removal of a tree, through either direct or indirect actions, including but not limited to: (1) clearing, damaging or poisoning resulting in an unhealthy or dead tree; (2) removal of at

least half of the live crown; or (3) damage to roots or trunk that is likely to destroy the tree's structural integrity.

20. **Viable Tree** – A significant tree that a qualified professional has determined to be in good health, with a low risk of failure due to structural defects, is windfirm if isolated or remains as part of a grove, and is a species that is suitable for its location.

21. **Wildlife Snag** – The remaining trunk of a tree that is intentionally reduced in height and usually stripped of its live branches.

22. **Windfirm** – A condition of a tree in which it withstands average peak local wind speeds and gusts.

(Ord. 4238 § 2, 2010; Ord. 4193 § 1, 2009; Ord. 4010 § 2, 2005)

.20 Exemptions

The following activities are exempt from the provisions of this chapter:

1. **Emergency Tree Removal.** Any tree that poses an imminent threat to life or property may be removed. The City must be notified within seven (7) days of the emergency tree removal with evidence of the threat for removing the tree to be considered exempt from this chapter. If the Planning Official determines that the emergency tree removal was not warranted or if the removed tree was required by a development permit, the Planning Official may require that the party obtain a permit and/or require that replacement trees and vegetation be replanted as mitigation.

2. **Utility Maintenance.** Trees may be removed by the City or utility provider in situations involving interruption of services provided by a utility only if pruning cannot solve utility service problems. Utility maintenance shall conform to a City-approved Utility Vegetation Management Plan.

3. **Commercial Nurseries or Tree Farms.** A nursery or tree farm owner may remove trees that are being grown to be sold as Christmas or landscape trees.

(Ord. 4238 § 2, 2010; Ord. 4010 § 2, 2005)

.21 Tree Pruning

1. **Tree Pruning of Street Trees.** It is the responsibility of the abutting property owner to maintain street trees abutting their property, which may include pruning, watering, and mulching. In order to prune, trim, modify, or alter a street tree, the abutting property owner shall apply for a permit by filing a written application with the City. Pruning shall conform to the most recent version of the American National Standards Institute (ANSI) A300 Part 1 – 2001 pruning standards or as outlined in an approved Utility Vegetation Management Plan. The City reserves the right to have City or utility crews perform routine pruning and maintenance of street trees.

2. **Tree Pruning on Private Property.** A permit is not required to prune trees on private property. Pruning which results in the removal of at least half of the live crown will be considered tree removal and subject to the provisions in KZC 95.23.

Tree topping is not allowed. If a tree required by this chapter is smaller than six (6) inches in diameter and is topped, it must be replaced pursuant to the standards in Chapter 1.12 KMC. If a tree six (6) inches or larger in diameter is topped, the owner must have a qualified professional develop and implement a 5-year restoration pruning program.

(Ord. 4281 § 1, 2011; Ord. 4238 § 2, 2010)

.23 Tree Removal – Not Associated with Development Activity

1. **Introduction.** Tree and vegetation removal in urban areas has resulted in the loss of beneficial functions provided by trees to the public. The majority of tree canopy within the City of Kirkland is on private property. The purpose of this section is to establish a process and standards to slow the loss of

tree canopy on private property, contributing towards the City's canopy goals and a more sustainable urban forest.

2. Permit Required for Removal of Trees on Private Property or City Right-of-Way. It is unlawful for any person (other than City crews) to remove, prune, trim, modify, alter or damage a tree in a public park or on any other City property.

No person, directly or indirectly, shall remove any significant tree on any property within the City, or any tree in the public right-of-way, without first obtaining a tree removal permit as provided in this chapter, unless the activity is exempted in KZC 95.20 and subsection (5) of this section.

3. Tree Removal Permit Application Form. The Planning and Building Department and Public Works Department shall establish and maintain a tree removal permit application form to allow property owners to request City review of tree removal for compliance with applicable City regulations. The tree removal application form shall include at a minimum the following:

- a. A site plan showing the approximate location of significant trees, their size (DBH) and their species, along with the location of structures, driveways, access ways and easements.
- b. For required replacement trees, a planting plan showing location, size and species of the new trees in accordance to standards set forth in KZC 95.33(3).

4. Tree Removal Permit Application Procedure and Appeals.

- a. Applicants requesting to remove trees must submit a completed permit application on a form provided by the City. The City shall review the application within 21 calendar days and either approve, approve with conditions or modifications, deny the application or request additional information. Any decision to deny the application shall be in writing along with the reasons for the denial and the appeal process.
- b. The decision of the Planning Official is appealable using the applicable appeal provisions of Chapter 145 KZC.
- c. Time Limit. The removal shall be completed within one (1) year from the date of permit approval.

5. Tree Removal Allowances.

a. Except in the Holmes Point Overlay zone, any private property owner of developed property may remove up to two (2) significant trees from their property within a 12-month period without having to apply for a tree removal permit; provided, that:

- 1) There is no active application for development activity for the site;
- 2) The trees were not required to be retained or planted as a condition of previous development activity; and
- 3) All of the additional standards for tree removal and tree removal permits as described in subsections (5)(b) through (e) of this section are met.

The Planning and Building Department shall establish and maintain a tree removal request form. The form may be used by property owners to request Department review of tree removal for compliance with applicable City regulations.

b. Tree Retention and Replacement Requirements.

- 1) Tree Retention. For single-family homes, cottages, carriage units, two/three-unit homes, two (2) trees shall be required to remain on the subject property.

2) Tree Replacement.

- a) For every significant tree that is removed and is not required to remain based on subsection (5)(b)(1) of this section, the City encourages the planting of a tree that is appropriate to the site.
 - b) If a tree removal request is for one (1) or both of the trees required to remain, a tree removal permit and one-for-one replacement is required. The replacement tree shall be six (6) feet tall for a conifer and 2-inch caliper for deciduous or broad-leaf evergreen tree.
 - c) For all other uses not listed in subsection (5)(b)(1) of this section, a tree removal permit is required and the required tree replacement will be based on the required landscaping standards in KZC 95.40 through 95.45.
- c. Shoreline Jurisdiction. Properties located within the City's shoreline jurisdiction are subject to additional tree removal and replacement standards if the tree(s) to be removed are located within the required shoreline setback. See Chapter 83 KZC for additional standards.
- d. Removal of Hazard or Nuisance Trees. Any private property owner seeking to remove any number of significant trees which are a hazard or nuisance from developed or undeveloped property or the public right-of-way shall first obtain approval of a tree removal permit and meet the requirements of this subsection.
- 1) Tree Risk Assessment. If the nuisance or hazard condition is not obvious, a tree risk assessment prepared by a qualified professional explaining how the tree(s) meet the definition of a nuisance or hazard tree is required. Removal of nuisance or hazard trees does not count toward the tree removal limit if the nuisance or hazard is supported by a report prepared by a qualified professional and approved by the City.
 - 2) Trees in Critical Areas or Critical Areas Buffers. For hazard or nuisance trees in (a) easements dedicated to ensure the protection of vegetation; (b) critical areas; or (c) critical area buffers, a planting plan is required to mitigate the removal of the hazard or nuisance tree. The priority action is to create a "snag" or wildlife tree with the subject tree. If creation of a snag is not feasible, then the felled tree shall be left in place unless the Planning Official permits its removal in writing.

The intent of preserving vegetation in and near streams and wetlands and in geologically hazardous areas is to support the functions of healthy sensitive areas and sensitive area buffers (see Chapter 90 KZC) and/or avoid disturbance of geologically hazardous areas (see Chapter 85 KZC).

The removal of any tree in a critical area or native growth protective easement will require the planting of a native tree of a minimum of six (6) feet in height in close proximity to where the removed tree was located. Selection of native species and timing of installation shall be coordinated with the Planning Official.
 - 3) The removal of any tree in the Holmes Point Overlay Zone requires the planting of a native tree of a minimum of six (6) feet in height in close proximity to where the removed tree was located. Selection of native species and timing of installation shall be approved by the Planning Official.
 - 4) Street Trees. Street trees may only be removed if determined to be a hazard or nuisance. If the removal request is for street trees, the Public Works Official may consider whether the tree(s) are now, or may be in the future, part of the City's plans for the right-of-way. The City shall require a one-for-one tree replacement in a suitable location.
- e. Forest Management Plan.

- 1) A Forest Management Plan must be submitted for developed, significantly wooded sites (over 40 percent canopy coverage) of at least 35,000 square feet in size in which removal of more than two (2) trees is requested and is not exempt under KZC 95.20. A Forest Management Plan must be developed by a qualified professional and shall include the following:
 - a) A site plan depicting the location of all significant trees (a survey identifying tree locations is not required) with a numbering system of the trees (with corresponding tags on trees in the field). The site plan shall include size (DBH), species, and condition of each tree;
 - b) Identification of trees to be removed, including reasons for their removal and a description of low impact removal techniques pursuant to subsection (5)(e)(2) of this section;
 - c) A reforestation plan that includes location, size, species, and timing of installation;
- 2) The following Forest Management Plan standards shall apply:
 - a) Trees to remain should be dominant or co-dominant in the stand, healthy and windfirm.
 - b) No removal of trees from critical areas and their buffers, unless otherwise permitted by this chapter.
 - c) No removal of specimen trees, unless otherwise permitted by this chapter.
 - d) No removal of healthy trees that would cause trees on adjacent properties to become hazardous.
 - e) The reforestation plan ensures perpetuity of the wooded areas. The size of planted trees for reforestation shall be a minimum of three (3) feet tall.
 - f) Logging operations shall be conducted so as to expose the smallest practical area of soil to erosion for the least possible time. To control erosion, native shrubs, ground cover and stumps shall be retained where feasible. Where not feasible, appropriate erosion control measures to be approved by the City shall be implemented.
 - g) Removal of tree debris shall be done pursuant to Kirkland Fire Department standards.
 - h) Recommended maintenance prescription for retained trees with a specific timeline for such management.

(Ord. 4491 § 3, 2015; Ord. 4437 § 1, 2014; Ord. 4408 § 1, 2013; Ord. 4372 § 1, 2012; Ord. 4238 § 2, 2010)

.25 Sustainable Site Development

All activities regulated by this chapter shall be performed in compliance with the applicable standards contained in this chapter, unless the applicant demonstrates that alternate measures or procedures will be equal or superior to the provisions of this chapter in accomplishing the purpose and intent of this chapter as described in KZC 95.05.

Applicants requesting alternative compliance shall submit a site assessment report prepared by a qualified professional detailing how the proposed alternative measures will be equal or superior to the benefits provided by the established trees to be removed. Qualifying projects shall implement sustainable site development strategies throughout the construction process as well as contain measurable performance standards for the techniques used. Examples of sustainable site development include building placement with minimal site impact, habitat protection, water conservation, heat island reduction, storm water flow runoff control and water quality, and utilization of the site's natural services such as solar and wind. Requests to use alternative measures and procedures shall be reviewed by the Planning Official, who may approve, approve with conditions, or deny the request.

(Ord. 4238 § 2, 2010; Ord. 4010 § 2, 2005)

.30 Tree Retention Associated with Development Activity

1. Introduction. The City's objective is to retain as many viable trees as possible on a developing site while still allowing the development proposal to move forward in a timely manner. To that end, the City requires approval of a tree retention plan in conjunction with all development permits resulting in site disturbance and for any tree removal on developed sites not exempted by KZC 95.20. This section includes provisions that allow development standards to be modified in order to retain viable significant trees.

In order to make better decisions about tree retention, particularly during all stages of development, tree retention plans will require specific information about the existing trees before removal is allowed. Specific tree retention plan review standards provided in this section establish tree retention priorities, incentives, and variations to development standards in order to facilitate preservation of viable trees.

A minimum tree density approach is being used to retain as many viable trees as possible with new development activity. The requirement to meet a minimum tree density applies to new single-family homes, cottages, carriage units, two/three-unit homes, and new residential subdivisions and short subdivisions. If such a site falls below the minimum density with existing trees, supplemental planting is required. A tree density for existing trees to be retained is calculated to see if new trees are required in order to meet the minimum density for the entire site. Supplemental tree location priority is set as well as minimum size of supplemental trees to meet the required tree density.

The importance of effective protection of retained trees during construction is emphasized with specific protection standards in the last part of this section. These standards must be adhered to and included on demolition, grading and building plans as necessary.

Properties within jurisdiction of the Shoreline Management Act are subject to additional tree retention and protection regulations as set forth in Chapter 83 KZC.

Properties within the Holmes Point Overlay zone are subject to additional tree retention and protection regulations as set forth in Chapter 70 KZC.

2. Tree Retention Plan Required. An applicant for a development permit must submit a tree retention plan that complies with this section. A qualified professional may be required to prepare certain components of a tree retention plan at the applicant's expense. If proposed development activities call for more than one (1) tree retention plan component, the more stringent tree retention plan component shall apply; provided, that the Planning Official may require a combination of tree plan components based on the nature of the proposed development activities. If the proposed activity is not clearly identified in this chapter, the Planning Official shall determine the appropriate tree retention plan requirements.

The chart in subsection (5) of this section sets forth the tree retention plan requirements for development activities and associated tree removal. Applicants for development are encouraged to confer with City staff as early in the design process as possible so that the applicable tree planting and retention concepts can be incorporated into the design of the subject property. The Planning Official may waive a component of the tree retention plan if the Planning Official determines that the information is not necessary.

3. Tree Retention Plan Review. Any proposed development of the subject property requiring approval through a building permit, land surface modification permit, and/or demolition permit, or Design Review, Process I, IIA or IIB, described in Chapters 142, 145, 150 and 152 KZC respectively, shall include a tree retention plan to be considered as part of that process.

Based on the tree retention plan information submitted by the applicant and the Planning Official's evaluation of the trees relative to the proposed development on the subject property, the Planning

Official shall designate each tree as having a high, moderate, or low retention value as defined in KZC 95.10, Definitions, for application towards the regulations in this chapter.

4. Tree Retention Plan Components. The tree retention plan shall contain the following information as specified in the chart in subsection (5) of this section, unless waived by the Planning Official:
- a. A tree inventory containing the following:
 - 1) A numbering system of all existing significant trees on the subject property (with corresponding tags on trees); the inventory must also include significant trees on adjacent property with driplines extending over the subject property line;
 - 2) Limits of disturbance (LOD) of all existing significant trees (including approximate LOD of off-site trees with overhanging driplines);
 - 3) Size (DBH);
 - 4) Proposed tree status (trees to be removed or retained);
 - 5) Brief general health or condition rating of these trees (i.e.: poor, fair, good, excellent, etc.);
 - 6) Tree type or species.
 - b. A site plan depicting the following:
 - 1) Location of all proposed improvements, including building footprint, access, utilities, applicable setbacks, buffers, and required landscaped areas clearly identified. If a short plat or subdivision is being proposed and the location of all proposed improvements cannot be established, a phased tree retention plan review is required as described in subsection (6)(a) of this section;
 - 2) Accurate location of significant trees on the subject property (surveyed locations may be required). The site plan must also include the approximate trunk location and critical root zone of significant trees that are on adjacent property with driplines extending over the subject property line;
 - 3) Trees labeled corresponding to the tree inventory numbering system;
 - 4) Location of tree protection measures;
 - 5) Indicate limits of disturbance drawn to scale around all trees potentially impacted by site disturbances resulting from grading, demolition, or construction activities (including approximate LOD of off-site trees with overhanging driplines);
 - 6) Proposed tree status (trees to be removed or retained) noted by an 'X' or by ghosting out;
 - 7) Proposed locations of any supplemental trees and any required trees in order to meet tree density or minimum number of trees as outlined in KZC 95.33.
 - c. An arborist report containing the following:
 - 1) A complete description of each tree's health, condition, and viability;
 - 2) A description of the method(s) used to determine the limits of disturbance (i.e., critical root zone, root plate diameter, or a case-by-case basis description for individual trees);

3) Any special instructions specifically outlining any work proposed within the limits of the disturbance protection area (i.e., hand-digging, tunneling, root pruning, any grade changes, clearing, monitoring, and aftercare);

4) For trees not viable for retention, a description of the reason(s) for removal based on poor health, high risk of failure due to structure, defects, unavoidable isolation (windfirmness), or unsuitability of species, etc., and for which no reasonable alternative action is possible must be given (pruning, cabling, etc.);

5) Describe the impact of necessary tree removal to the remaining trees, including those in a grove or on adjacent properties;

6) For development applications, a discussion of timing and installation of tree protection measures that must include fencing and be in accordance with the tree protection standards as outlined in KZC 95.34; and

7) The suggested location and species of supplemental trees to be used when required. The report shall include planting and maintenance specifications pursuant to KZC 95.50 and 95.51.

5. Tree Retention Plan. The applicant shall submit a Tree Retention Plan that includes the components identified in the following chart based on the proposed development activity.

TREE RETENTION PLAN

Development Activity	Minor ⁽¹⁾⁽³⁾ – Single-Family, or two attached, detached, or stacked dwelling units, and related demolition and land surface modification applications	Major ⁽²⁾⁽³⁾ Single-Family, or two attached, detached, or stacked dwelling units, and related demolition and land surface modification applications	Multifamily, Commercial, any other use other than residential, and related demolition and land surface modification applications	Short Plat, Subdivisions, cottages, carriage units, two/three-unit homes, and related demolition and land surface modification applications (see KZC 95.30(6)(a), Phased Review, for additional standards)
Required Components				
TREE INVENTORY AS DESCRIBED IN KZC 95.30(4)(a) FOR:				
All significant trees on the subject property		X	X	X
Significant trees potentially impacted by proposed development activity	X			
SITE PLAN AS DESCRIBED IN KZC 95.30(4)(b) TO INCLUDE:				
Surveyed tree locations if required by the Planning Official		X	X	
Surveyed tree locations				X
A final landscape plan showing retained trees			X	
REQUIREMENTS IN KZC 95.30(4)(c) SHALL BE PREPARED BY A QUALIFIED PROFESSIONAL				

Development Activity	Minor ⁽¹⁾⁽³⁾ – Single-Family, or two attached, detached, or stacked dwelling units, and related demolition and land surface modification applications	Major ⁽²⁾⁽³⁾ Single-Family, or two attached, detached, or stacked dwelling units, and related demolition and land surface modification applications	Multifamily, Commercial, any other use other than residential, and related demolition and land surface modification applications	Short Plat, Subdivisions, cottages, carriage units, two/three-unit homes, and related demolition and land surface modification applications (see KZC 95.30(6)(a), Phased Review, for additional standards)
Required Components				
AND APPLY TO:				
Significant trees within required yards or within 10 feet of any side property line		X		
Significant trees potentially impacted by proposed development activity as determined by the Planning Official			X	
Proposed removal of trees with a high retention value in required landscaping areas			X	
All significant trees				X
TREE RETENTION STANDARDS				
Applicant is encouraged to retain viable trees	X ⁽⁴⁾			
Retain and protect trees with a high retention value to the maximum extent possible		X ⁽⁴⁾	X ⁽⁴⁾	X ⁽⁴⁾
Retain and protect trees with a moderate retention value if feasible		X	X	X
Preservation and maintenance agreements pursuant to KZC 95.51 are required for all remaining trees on the subject property	X	X	X	X ⁽⁵⁾
TREE DENSITY				
Tree density requirements shall apply as required in KZC 95.33		X		X
A minimum of two trees must be on the lot following the requirement set forth in KZC 95.33(4)	X			

Development Activity	Minor ⁽¹⁾⁽³⁾ – Single-Family, or two attached, detached, or stacked dwelling units, and related demolition and land surface modification applications	Major ⁽²⁾⁽³⁾ Single-Family, or two attached, detached, or stacked dwelling units, and related demolition and land surface modification applications	Multifamily, Commercial, any other use other than residential, and related demolition and land surface modification applications	Short Plat, Subdivisions, cottages, carriage units, two/three-unit homes, and related demolition and land surface modification applications (see KZC 95.30(6)(a), Phased Review, for additional standards)
Required Components				
LANDSCAPING				
Preserved trees in required landscaping areas shall apply toward required landscaping requirements			X	

(1) Applicable when new development, redevelopment, or development in which the total square footage of the proposed improvements is less than 50 percent of the total square footage of the existing improvements on the subject property.

(2) Applicable when new development, redevelopment, or development in which the total square footage of the proposed improvements is more than 50 percent of the total square footage of the existing improvements on the subject property.

(3) For lots created through a short subdivision, subdivision, or planned unit development with an approved Tree Retention Plan, the applicant must comply with the Tree Retention Plan approved with the short subdivision, subdivision, or planned unit development unless subsection (6)(a) of this section, Phased Review, applies.

(4) To retain trees with a high retention value, the applicant shall pursue, where feasible, applicable variations in the development standards of this code as outlined in KZC 95.32.

(5) Prior to short plat or subdivision recording.

6. Additional Tree Retention Plan Standards for Short Plat and Subdivisions.

a. Phased Review.

1) If during the short plat or subdivision review process the location of all proposed improvements, including the building footprint, utilities, and access, was not able to be established, the applicant may submit a Tree Retention Plan that addresses trees only affected by the known improvements at the time of application. Tree removal shall be limited to those affected areas.

2) A new Tree Retention Plan shall be required at each subsequent phase of the project as more information about the location of the proposed improvements is known subject to all of the requirements in KZC 95.30.

b. Modifications to Tree Retention Plan for Short Plats and Subdivisions. A Tree Retention Plan modification request shall contain information as determined by the Planning Official based on the

requirements in subsection (5) of this section, Tree Retention Plan. The fee for processing a modification request shall be established by City ordinance.

For Tree Retention Plans approved during the short plat or subdivision review process that established the location of all proposed improvements, including the building footprint, utilities, and access, a modification to the Tree Retention Plan may be approved as follows:

- 1) **Modification – General.** The Planning Official may approve minor modifications to the approved Tree Retention Plan in which the minimum tree density credits associated with trees identified for retention are not decreased.
- 2) **Modification Prior to Tree Removal.** The Planning Official may approve a modification request to decrease the minimum number of tree density credits associated with trees previously identified for retention if:
 - a) Trees inventoried in the original Tree Retention Plan have not yet been removed; and
 - b) The Planning Official shall not approve or deny a modification pursuant to this section without first providing notice of the modification request consistent with the noticing requirements for the short plat.
- 3) **Modification after Tree Removal.** A modification request is required to decrease the minimum number of tree density credits associated with trees previously identified for retention after which trees inventoried in the original Tree Retention Plan have already been removed. Such a request may be approved by the Hearing Examiner only if the following are met:
 - a) The need for the modification was not known and could not reasonably have been known before the tree retention plan was approved;
 - b) The modification is necessary because of special circumstances which are not the result of actions by the applicant regarding the size, shape, topography, or other physical limitations of the subject property relative to the location of proposed and/or existing improvements on or adjacent to the subject property;
 - c) There is no practicable or feasible alternative development proposal that results in fewer additional tree removals;
 - d) The Hearing Examiner shall not approve or deny a modification pursuant to this section without the Planning Official first providing notice of the modification request consistent with the noticing requirements for the short plat and providing opportunity for comments for consideration by the Hearing Examiner; and
 - e) Said comment period shall not be less than 14 calendar days.

(Ord. 4437 § 1, 2014; Ord. 4252 § 1, 2010; Ord. 4238 § 2, 2010; Ord. 4010 § 2, 2005)

.32 Incentives and Variations to Development Standards

In order to retain trees, the applicant should pursue provisions in Kirkland's codes that allow development standards to be modified. Examples include but are not limited to number of parking stalls, right-of-way improvements, lot size reduction under Chapter 22.28 KMC, lot line placement when subdividing property under KMC Title 22, Planned Unit Developments, and required landscaping, including buffers for lands use and parking/driving areas.

Requirements of the Kirkland Zoning Code may be modified by the Planning Official as outlined below when such modifications would further the purpose and intent of this chapter as set forth in KZC 95.05 and would involve trees with a high or moderate retention value.

1. Common Recreational Open Space. Reductions or variations of the area, width, or composition of required common recreational open space may be granted.
2. Parking Areas and Access. Variations in parking lot design and/or access driveway requirements may be granted when the Public Works and Planning Officials both determine the variations to be consistent with the intent of City policies and codes.
3. Required Yards. Initially, the applicant shall pursue options for placement of required yards as permitted by other sections of this code, such as selecting one (1) front required yard in the RSX zone and adjusting side yards in any zone to meet the 15-foot total as needed for each structure on the site. The Planning Official may also reduce the front, side or rear required yards; provided, that:
 - a. No required side yard shall be less than five (5) feet; and
 - b. The required front yard shall not be reduced by more than five (5) feet in residential zones. There shall not be an additional five (5) feet of reduction beyond the allowance provided for covered entry porches;
 - c. Rear yards that are not directly adjacent to another parcel's rear yard but that are adjacent to an access easement or tract may be reduced by five (5) feet;
 - d. No required yard shall be reduced by more than five (5) feet in residential zones.
4. Storm Water. Requirements pertaining to stormwater may be varied if approved by the Public Works Official under KMC 15.52.060.
5. Additional Variations. In addition to the variations described above, the Planning Official is authorized to require site plan alterations to retain trees with a high retention value. Such alterations include minor adjustments to the location of building footprints, adjustments to the location of driveways and access ways, or adjustment to the location of walkways, easements or utilities. The Planning Official and the applicant shall work in good faith to find reasonable solutions.

(Ord. 4350 § 1, 2012; Ord. 4238 § 2, 2010)

.33 Tree Density Requirement

The required minimum tree density is 30 tree credits per acre for single-family homes, cottages, carriage units, two/three-unit homes, short plats, and/or subdivisions and associated demolition and land surface modification. For individual lots in a short subdivision or subdivision with an approved Tree Retention Plan, the tree density shall be calculated for each lot within the short plat or subdivision. The tree density may consist of existing trees pursuant to the tree's retention value, supplemental trees or a combination of existing and supplemental trees pursuant to subsection (2) of this section. Existing trees transplanted to an area on the same site shall not count toward the required density unless approved by the Urban Forester based on transplant specifications provided by a qualified professional that will ensure a good probability for survival.

1. Tree Density Calculation. For the purpose of calculating required minimum tree density, public right-of-way, areas to be dedicated as public right-of-way, and vehicular access easements not included as lot area with the approved short plat shall be excluded from the area used for calculation of tree density.

Tree density calculation for existing individual trees:

- a. Diameter breast height (DBH) of the tree shall be measured in inches.
- b. The tree credit value that corresponds with DBH shall be found in Table 95.33.1. Existing native conifers (or other conifer species as approved by the Urban Forester) shall count 1.5 times credits for retention.

Table 95.33.1

Tree Density for Existing Significant Trees

(Credits per minimum diameter – DBH)

DBH	Tree Credits	DBH	Tree Credits	DBH	Tree Credits
3 – 5"	0.5				
6 – 10"	1	24"	8	38"	15
12"	2	26"	9	40"	16
14"	3	28"	10	42"	17
16"	4	30"	11	44"	18
18"	5	32"	12	46"	19
20"	6	34"	13	48"	20
22"	7	36"	14	50"	21

Example: a 7,200-square-foot lot would need five (5) tree credits ($7,200/43,560 = 0.165 \times 30 = (4.9)$ or five (5)). The tree density for the lot could be met by retaining ~~with~~ one (1) existing 16-inch deciduous tree and one (1) existing 6-inch deciduous tree on site. The same 7,200 square-foot-lot would exceed the required five (5) tree credits by retaining one (1) existing 16-inch conifer.

2. Supplemental Trees Planted to Meet Minimum Density Requirement. For sites and activities requiring a minimum tree density and where the existing trees to be retained do not meet the minimum tree density requirement, supplemental trees shall be planted to achieve the required minimum tree density.
3. Tree Location. In designing a development and in meeting the required minimum tree density, the trees shall be planted in the following order of priority:
 - a. On-Site. The preferred locations for new trees are:
 - 1) In preserved groves, critical areas or their buffers.
 - 2) Adjacent to storm water facilities as approved by Public Works under KMC 15.52.060.
 - 3) Entrance landscaping, traffic islands and other common areas in residential subdivisions.
 - 4) Site perimeter – The area of the subject property that is within 10 feet from the property line.
 - 5) On individual residential building lots.
 - b. Off-Site. When room is unavailable for planting the required trees on site, then they may be planted at another approved location in the City.
 - c. City Forestry Account. When the Planning Official determines on-site and off-site locations are unavailable, then the applicant shall pay an amount of money approximating the current market value of the supplemental trees into the City forestry account.

4. Minimum Size and Tree Density Value for Supplemental Trees. The required minimum size of the supplemental tree worth one (1) tree credit shall be six (6) feet tall for Thuja/Arborvitae or four (4) feet tall for native or other a conifers and 2-inch caliper for deciduous or broad-leaf evergreen tree. Additional credits may be awarded for larger supplemental trees. The installation and maintenance shall be pursuant to KZC 95.50 and 95.51 respectively.

(Ord. 4238 § 2, 2010)

.34 Tree & Soil Protection during Development Activity

Prior to development activity or initiating tree removal on the site, vegetated areas, ~~and~~ individual trees, ~~and soil~~ to be preserved shall be protected from potentially damaging activities pursuant to the following standards:

1. Placing Materials near Trees. No person may conduct any activity within the protected area of any tree designated to remain, including, but not limited to, operating or parking equipment, placing solvents, storing building material or ~~stockpiling any materials~~~~soil deposits~~, or dumping concrete washout or other chemicals. During construction, no person shall attach any object to any tree designated for protection.

2. Protective Barrier. Before development, land clearing, filling or any land alteration, the applicant shall:

a. Erect and maintain readily visible temporary protective tree fencing along the limits of disturbance which completely surrounds the protected area of all retained trees, ~~or~~ groups of trees, ~~vegetation and native soil~~. Fences shall be constructed of chain link and be at least six (6) feet high, unless other type of fencing is authorized by the Planning Official.

b. Install highly visible signs spaced no further than 15 feet along the entirety of the protective tree fence. Said sign must be approved by the Planning Official and shall state at a minimum "Tree & Soil Protection Area, Entrance Prohibited" and provide the City phone number for code enforcement to report violations.

c. Prohibit excavation or compaction of ~~soil~~~~earth~~ or other potentially damaging activities within the barriers; provided, that the Planning Official may allow such activities approved by a qualified professional and under the supervision of a qualified professional retained and paid for by the applicant.

d. Maintain the protective barriers in place for the duration of the project until the Planning Official authorizes their removal.

e. Ensure that any approved landscaping done in the protected zone subsequent to the removal of the barriers shall be accomplished with ~~light~~ machinery from outside the protected zone or by hand labor.

f. In addition to the above, the Planning Official may require the following:

1) If equipment is authorized to operate within the ~~protected~~~~critical-root~~ zone, ~~cover~~ the soil and areas adjoining the critical root zone of a tree must be covered with mulch to a depth of at least six (6) inches, or with plywood, steel plates or similar material in order to protect roots and soil from damage caused by heavy equipment.

2) Minimize root damage by hand-excavating a 2-foot-deep trench, at edge of critical root zone, to cleanly sever the roots of trees to be retained. Never rip or shred roots with heavy equipment.

3) Corrective pruning performed on protected trees in order to avoid damage from machinery or building activity.

4) Maintenance of trees throughout construction period by watering and fertilizing.

3. Grade.
 - a. The grade shall not be elevated or reduced within the critical root zone of trees to be preserved without the Planning Official's authorization based on recommendations from a qualified professional. The Planning Official may allow coverage of up to one-half (1/2) of the area of the tree's critical root zone with light soils (no clay) to the minimum depth necessary to carry out grading or landscaping plans, if it will not imperil the survival of the tree. Aeration devices may be required to ensure the tree's survival.
 - b. If the grade adjacent to a preserved tree is raised such that it could slough or erode into the tree's critical root zone, it shall be permanently stabilized to prevent soil erosion and suffocation of the roots.
 - c. The applicant shall not install an impervious surface within the critical root zone of any tree to be retained without the authorization of the Planning Official. The Planning Official may require specific construction methods and/or use of aeration devices to ensure the tree's survival and to minimize the potential for root-induced damage to the impervious surface.
 - d. To the greatest extent practical, utility trenches shall be located outside of the critical root zone of trees to be retained. The Planning Official may require that utilities be tunneled under the roots of trees to be retained if the Planning Official determines that trenching would significantly reduce the chances of the tree's survival.
 - e. Trees and other vegetation to be retained shall be protected from erosion and sedimentation. Clearing operations shall be conducted so as to expose the smallest practical area of soil to erosion for the least possible time. To control erosion, it is encouraged that shrubs, ground cover and stumps be maintained on the individual lots, where feasible.
4. Directional Felling. Directional felling of trees shall be used to avoid damage to trees designated for retention.
5. Additional Requirements. The Planning Official may require additional tree protection measures that are consistent with accepted urban forestry industry practices.

(Ord. 4238 § 2, 2010)

.40 Required Landscaping

1. User Guide. Chapters 15 through 56 KZC containing the use zone charts or development standards tables assign a landscaping category to each use in each zone. This category is either "A," "B," "C," "D," or "E." If you do not know which landscaping category applies to the subject property, you should consult the appropriate use zone chart or development standards table.

Requirements pertaining to each landscaping category are located throughout this chapter, except that Landscaping Category E is not subject to this section.

Landscape Categories A, B, C, D, and E may be subject to additional related requirements in the following other chapters:

- a. Various use zone charts or development standards tables, in Chapters 15 through 56 KZC, establish additional or special buffering requirements for some uses in some zones.
- b. Chapter 85 KZC, Geologically Hazardous Areas, addresses the retention of vegetation on steep slopes.
- c. Chapter 90 KZC, Drainage Basins, addresses vegetation within sensitive areas and sensitive area buffers.

- d. Chapter 110 KZC and Chapter 19.36 KMC address vegetation within rights-of-way, except for the I-405 and SR-520 rights-of-way, and the Cross Kirkland Corridor railbanked rail corridor or the Eastside Rail Corridor.
 - e. KZC 115.135, Sight Distance at Intersections, which may limit the placement of landscaping in some areas.
 - f. Chapter 22 KMC addresses trees in subdivisions.
2. Use of Significant Existing Vegetation.
- a. General. The applicant shall apply subsection KZC 95.30(3), Tree Retention Plan Procedure, and KZC 95.32, Incentives and Variations to Development Standards, to retain existing native trees, and vegetation and soil in areas subject to the landscaping standards of this section. The Planning Official shall give substantial weight to the retained native trees and vegetation when determining the applicant's compliance with this section.
 - b. Supplement. The City may require the applicant to plant trees, shrubs, and groundcover according to the requirements of this section to supplement the existing vegetation in order to provide a buffer at least as effective as the required buffer.
 - c. Protection Techniques. The applicant shall use the protection techniques described in KZC 95.34 to ensure the protection of significant existing vegetation and soil.
3. Landscape Plan Required. In addition to the Tree Retention Plan required pursuant to KZC 95.30, application materials shall clearly depict the quantity, location, species, and size of plant materials proposed to comply with the requirements of this section, and shall address the plant installation and maintenance requirements set forth in KZC 95.50 and 95.51. Plant materials shall be identified with both their scientific and common names. Any required irrigation system must also be shown.

(Ord. 4476 § 3, 2015; Ord. 4408 § 1, 2013; Ord. 4238 § 2, 2010; Ord. 4121 § 1, 2008; Ord. 4097 § 1, 2007; Ord. 4037 § 1, 2006; Ord. 4030 § 1, 2006; Ord. 4010 § 2, 2005)

.41 Supplemental Plantings

- 1. General. The applicant shall provide the supplemental landscaping specified in subsection (2) of this section in any area of the subject property that:
 - a. Is not covered with a building, vehicle circulation area or other improvement; and
 - b. Is not a critical area, critical area buffer, or in an area to be planted with required landscaping; and
 - c. Is not committed to and being used for some specific purpose.
- 2. Standards. The applicant shall provide the following at a minimum:
 - a. Living plant material which will cover 80 percent of the area to be landscaped within two (2) years. If the material to be used does not spread over time, the applicant shall re-plant the entire area involved immediately. Any area that will not be covered with living plant material must be covered with nonliving groundcover. Preference is given to using native plant species. See Kirkland Native Tree/Plant Lists.
 - b. One (1) tree for each 1,000 square feet of area to be landscaped. At the time of planting, deciduous trees must be at least two (2) inches in caliper and coniferous trees must be at least five (5) feet in height.

c. If a development requires approval through Process I, IIA or IIB as described in Chapters 145, 150 and 152 KZC, respectively, the City may require additional vegetation to be planted along a building facade if:

- 1) The building facade is more than 25 feet high or more than 50 feet long; or
- 2) Additional landscaping is necessary to provide a visual break in the facade.

d. In RHBD varieties of rose shrubs or ground cover along with other plant materials shall be included in the on-site landscaping.

e. If development is subject to Design Review as described in Chapter 142 KZC, the City will review plant choice and specific plant location as part of the Design Review approval. The City may also require or permit modification to the required plant size as part of Design Review approval.

(Ord. 4238 § 2, 2010)

.42 Minimum Land Use Buffer Requirements

The applicant shall comply with the provisions specified in the following chart and with all other applicable provisions of this chapter. Land use buffer requirements may apply to the subject property, depending on what permitted use exists on the adjoining property or, if no permitted use exists, depending on the zone that the adjoining property is in.

LANDSCAPING CATEGORY	ADJOINING PROPERTY	*Public park or low density residential use or if no permitted use exists on the adjoining property then a low density zone.	Medium or high density residential use or if no permitted use exists on the adjoining property then a medium density or high density zone.	Institutional or office use or if no permitted use exists on the adjoining property then an institutional or office zone.	A commercial use or an industrial use or if no permitted use exists on the adjoining property then a commercial or industrial zone.
A		Must comply with subsection (1) (Buffering Standard 1)	Must comply with subsection (1) (Buffering Standard 1)	Must comply with subsection (2) (Buffering Standard 2)	
B		Must comply with subsection (1) (Buffering Standard 1)	Must comply with subsection (1) (Buffering Standard 1)		
C		Must comply with subsection (1) (Buffering Standard 1)	Must comply with subsection (2) (Buffering Standard 2)		
D		Must comply with subsection (2) (Buffering Standard 2)			
E					

LANDSCAPING CATEGORY	ADJOINING PROPERTY	*Public park or low density residential use or if no permitted use exists on the adjoining property then a low density zone.	Medium or high density residential use or if no permitted use exists on the adjoining property then a medium density or high density zone.	Institutional or office use or if no permitted use exists on the adjoining property then an institutional or office zone.	A commercial use or an industrial use or if no permitted use exists on the adjoining property then a commercial or industrial zone.
Footnotes:		*If the adjoining property is zoned Central Business District, Juanita Business District, North Rose Hill Business District, Rose Hill Business District, Business District Core or is located in TL 5, this section KZC 95.42 does not apply.			

This chart establishes which buffering standard applies in a particular case. The following subsections establish the specific requirement for each standard:

1. For standard 1, the applicant shall provide a 15-foot-wide landscaped strip with a 6-foot-high solid screening fence or wall. Except for public utilities, the fence or wall must be placed on the outside edge of the land use buffer or on the property line when adjacent to private property. For public utilities, the fence or wall may be placed either on the outside or inside edge of the landscaping strip. A fence or wall is not required when the land use buffer is adjacent and parallel to a public right-of-way that is improved for vehicular use. See KZC 115.40 for additional fence standards. The land use buffer must be planted as follows:

- a. Trees planted at the rate of one (1) tree per 20 linear feet of land use buffer, with deciduous trees of two and one-half (2-1/2) inch caliper, minimum, and/or coniferous trees eight (8) feet in height, minimum. At least 70 percent of trees shall be evergreen. The trees shall be distributed evenly throughout the buffer, spaced no more than 20 feet apart on center.
- b. Large shrubs or a mix of shrubs planted to attain coverage of at least 60 percent of the land use buffer area within two (2) years, planted at the following sizes and spacing, depending on type:
 - 1) Low shrub – (mature size under three (3) feet tall), 1- or 2-gallon pot or balled and burlapped equivalent;
 - 2) Medium shrub – (mature size from three (3) to six (6) feet tall), 2- or 3-gallon pot or balled and burlapped equivalent;
 - 3) Large shrub – (mature size over six (6) feet tall), 5-gallon pot or balled and burlapped equivalent.
- c. Living ground covers planted from either 4-inch pot with 12-inch spacing or 1-gallon pot with 18-inch spacing to cover within two (2) years 60 percent of the land use buffer not needed for viability of the shrubs or trees.

2. For standard 2, the applicant shall provide a 5-foot-wide landscaped strip with a 6-foot-high solid screening fence or wall. Except for public utilities, the fence or wall must be placed on the outside edge of the land use buffer or on the property line when adjacent to private property. For public utilities, the fence or wall may be placed either on the outside or inside edge of the landscaping strip. A fence or wall is not required when the land use buffer is adjacent and parallel to a public right-of-way that is improved for

vehicular use. See KZC 115.40 for additional fence standards. The landscaped strip must be planted as follows:

- a. One (1) row of trees planted no more than 10 feet apart on center along the entire length of the buffer, with deciduous trees of 2-inch caliper, minimum, and/or coniferous trees at least six (6) feet in height, minimum. At least 50 percent of the required trees shall be evergreen.
 - b. Living ground covers planted from either 4-inch pot with 12-inch spacing or 1-gallon pot with 18-inch spacing to cover within two (2) years 60 percent of the land use buffer not needed for viability of the trees.
3. Plant Standards. All plant materials used shall meet the most recent American Association of Nurserymen Standards for nursery stock: ANSI Z60.1.
 4. Location of the Land Use Buffer. The applicant shall provide the required buffer along the entire common border between the subject property and the adjoining property.
 5. Multiple Buffering Requirement. If the subject property borders more than one (1) adjoining property along the same property line, the applicant shall provide a gradual transition between different land use buffers. This transition must occur totally within the area which has the less stringent buffering requirement. The specific design of the transition must be approved by the City.
 6. Adjoining Property Containing Several Uses. If the adjoining property contains several permitted uses, the applicant may provide the least stringent land use buffer required for any of these uses.
 7. Subject Property Containing Several Uses. If the subject property contains more than one (1) use, the applicant shall comply with the land use buffering requirement that pertains to the use within the most stringent landscaping category that abuts the property to be buffered.
 8. Subject Property Containing School. If the subject property is occupied by a school, land use buffers are not required along property lines adjacent to a street.
 9. Encroachment into Land Use Buffer. Typical incidental extensions of structures such as chimneys, bay windows, greenhouse windows, cornices, eaves, awnings, and canopies may be permitted in land use buffers as set forth in KZC 115.115(3)(d); provided, that:
 - a. Buffer planting standards are met; and
 - b. Required plantings will be able to attain full size and form typical to their species.

(Ord. 4495 § 2, 2015; Ord. 4238 § 2, 2010)

.43 Outdoor Use, Activity, and Storage

Outdoor use, activity, and storage (KZC 115.105(2)) must comply with required land use buffers for the primary use, except that the following outdoor uses and activities, when located in commercial or industrial zones, are exempt from KZC 115.105(2)(c)(1) and (2)(c)(2) as stated below:

1. That portion of an outdoor use, activity, or storage area which abuts another outdoor use, activity, or storage area which is located on property zoned for commercial or industrial use.
2. Outdoor use, activity, and storage areas which are located adjacent to a fence or structure which is a minimum of six (6) feet above finished grade, and do not extend outward from the fence or structure more than five (5) feet; provided, that the total horizontal dimensions of these areas shall not exceed 50 percent of the length of the facade or fence (see Plate 11).
3. If there is an improved path or sidewalk in front of the outdoor storage area, the outdoor use, activity or storage area may extend beyond five (5) feet if a clearly defined walking path at least three (3) feet in width is maintained and there is adequate pedestrian access to and from the primary use. The total

horizontal dimension of these areas shall not exceed 50 percent of the length of the facade of the structure or fence (see Plate 11).

4. Outdoor dining areas.

5. That portion of an outdoor display of vehicles for sale or lease which is adjacent to a public right-of-way that is improved for vehicular use; provided, that it meets the buffering standards for driving and parking areas in KZC 95.45(1); and provided further, that the exemptions of KZC 95.45(2) do not apply unless it is fully enclosed within or under a building, or is on top of a building and is at least one (1) story above finished grade.

6. Outdoor Christmas tree lots and fireworks stands if these uses will not exceed 30 days, and outdoor amusement rides, carnivals and circuses, and parking lot sales which are ancillary to the indoor sale of the same goods and services, if these uses will not exceed seven (7) days.

(Ord. 4238 § 2, 2010)

.44 Internal Parking Lot Landscaping Requirements

The following internal parking lot landscape standards apply to each parking lot or portion thereof containing more than eight (8) parking stalls.

1. The parking lot must contain 25 square feet of landscaped area per parking stall planted as follows:

a. The applicant shall arrange the required landscaping throughout the parking lot to provide landscape islands or peninsulas to separate groups of parking spaces (generally every eight (8) stalls) from one another and each row of spaces from any adjacent driveway that runs perpendicular to the row. This island or peninsula must be surrounded by a 6-inch-high vertical curb and be of similar dimensions as the adjacent parking stalls. Gaps in curbs are allowed for stormwater runoff to enter landscape island.

b. Landscaping shall be installed pursuant to the following standards:

1) At least one (1) deciduous tree, two (2) inches in caliper, or a coniferous tree five (5) feet in height.

2) Groundcover shall be selected and planted to achieve 60 percent coverage within two (2) years.

3) Natural drainage landscapes (such as rain gardens, bio-infiltration swales and bioretention planters) are allowed when designed in compliance with the stormwater design manual adopted in KMC 15.52.060. Internal parking lot landscaping requirements for trees still apply. Refer to ~~Public Works Pre-Approved Plans-X~~.

c. Exception. The requirements of this subsection do not apply to any area that is fully enclosed within or under a building.

2. Rooftop Parking Landscaping. For a driving or parking area on the top level of a structure that is not within the CBD zone or within any zone that requires design regulation compliance, one

(1) planter that is 30 inches deep and five (5) feet square must be provided for every eight (8) stalls on the top level of the structure. Each planter must contain a small tree or large shrub suited to the size of the container and the specific site conditions, including desiccating winds, and is clustered with other planters near driving ramps or stairways to maximize visual effect.

3. If development is subject to Design Review as described in Chapter 142 KZC, the City will review the parking area design, plant choice and specific plant location as part of the Design Review approval.

The City may also require or permit modification to the required landscaping and design of the parking area as part of Design Review approval.

(Ord. 4350 § 1, 2012; Ord. 4238 § 2, 2010)

.45 Perimeter Landscape Buffering for Driving and Parking Areas

1. Perimeter Buffering – General. Except as specified in subsection (2) of this section, the applicant shall buffer all parking areas and driveways from abutting rights-of-way and from adjacent property with a 5-foot-wide strip along the perimeter of the parking areas and driveways planted as follows (see Figure 95.45.A):

- a. One (1) row of trees, two (2) inches in caliper and planted 30 feet on center along the entire length of the strip.
- b. Living groundcover planted to attain coverage of at least 60 percent of the strip area within two (2) years.

c. Natural drainage landscapes (such as rain gardens, bio-infiltration swales and bioretention planters) are allowed when designed in compliance with the stormwater design manual adopted in KMC 15.52.060. Perimeter landscape buffering requirements for trees in driving and parking areas still apply. Refer to Public Works Pre-Approved Plans-X.

2. Exception. The requirements of this section do not apply to any parking area that:

- a. Is fully enclosed within or under a building; or
- b. Is on top of a building and is at least one (1) story above finished grade; or
- c. Serves detached dwelling units exclusively; or
- d. Is within any zone that requires design regulation compliance. See below for Design District requirements.

3. Design Districts. If subject to Design Review, each side of a parking lot that abuts a street, through-block pathway or public park must be screened from that street, through-block pathway or public park by using one (1) or a combination of the following methods (see Figures 95.45.A, B, and C):

- a. By providing a landscape strip at least five (5) feet wide planted consistent with subsection (1) of this section, or in combination with the following. In the RHBD Regional Center (see KZC Figure 92.05.A) a 10-foot perimeter landscape strip along NE 85th Street is required planted consistent with subsection (1) of this section.
- b. The hedge or wall must extend at least two (2) feet, six (6) inches, and not more than three (3) feet above the ground directly below it.
- c. The wall may be constructed of masonry or concrete, if consistent with the provisions of KZC 92.35(1)(g), in building material, color and detail, or of wood if the design and materials match the building on the subject property.
- d. In JBD zones:
 - 1) If the street is a pedestrian-oriented street, the wall may also include a continuous trellis or grillwork, at least five (5) feet in height above the ground, placed on top of or in front of the wall and planted with climbing vines. The trellis or grillwork may be constructed of masonry, steel, cast iron and/or wood.

- 2) If the wall abuts a pedestrian-oriented street, the requirements of this subsection may be fulfilled by providing pedestrian weather protection along at least 80 percent of the frontage of the subject property.
- e. If development is subject to Design Review as described in Chapter 142 KZC, the City will review plant choice and specific plant location as part of the Design Review approval. The City may also require or permit modification to the required plant size as part of Design Review approval.
4. Overlapping Requirements. If buffering is required in KZC 95.42, Land Use Buffering Standards, and by this subsection, the applicant shall utilize the more stringent buffering requirement.

Perimeter Parking Lot Landscaping

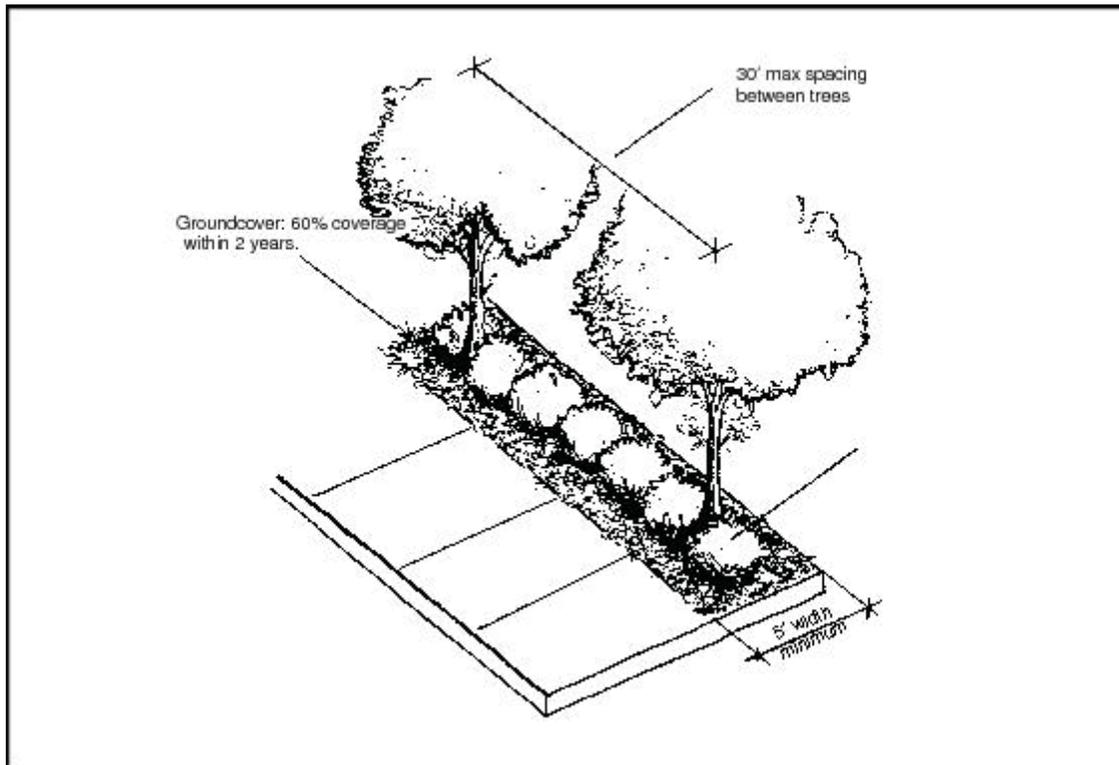


FIGURE 95.45.A

Perimeter Parking – Examples of Various Screen Wall Designs

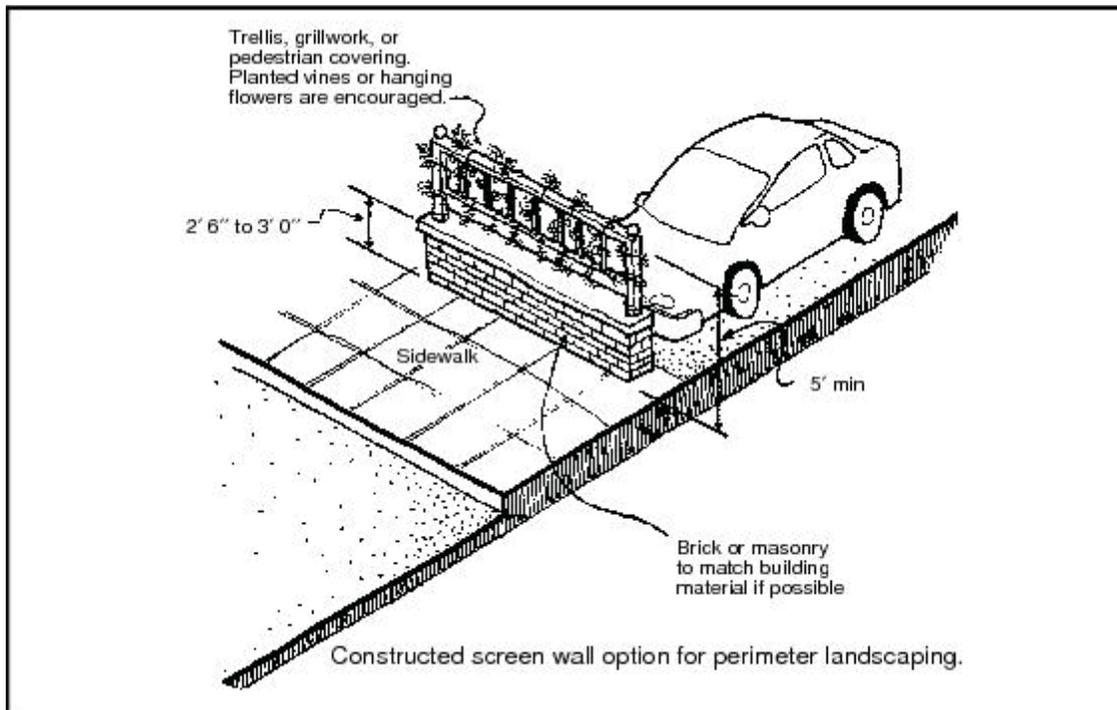


FIGURE 95.45.B

Perimeter Parking – Examples of Various Screen Wall Designs

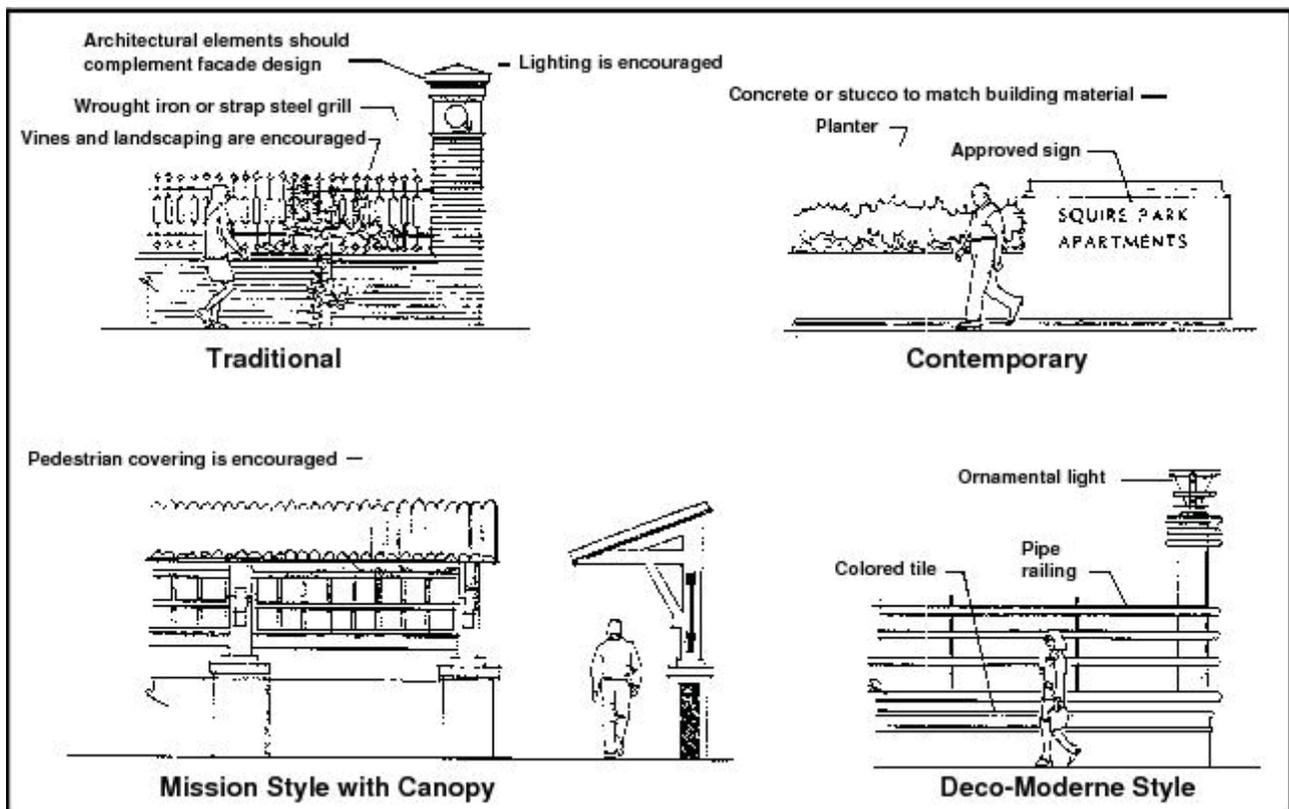


FIGURE 95.45.C

(Ord. 4238 § 2, 2010; Ord. 4010 § 2, 2005)

.46 Modifications to Landscaping Standards

1. Modification to Land Use Buffer Requirements. The applicant may request a modification of the requirements of the buffering standards in KZC 95.42. The Planning Official may approve a modification if:

- a. The owner of the adjoining property agrees to this in writing; and
- b. The existing topography or other characteristics of the subject property or the adjoining property, or the distance of development from the neighboring property decreases or eliminates the need for buffering; or
- c. The modification will be more beneficial to the adjoining property than the required buffer by causing less impairment of view or sunlight; or
- d. The Planning Official determines that it is reasonable to anticipate that the adjoining property will be redeveloped in the foreseeable future to a use that would require no, or a less intensive, buffer; or
- e. The location of pre-existing improvements on the adjoining site eliminates the need or benefit of the required landscape buffer.

2. Modifications to General Landscaping Requirements.

a. Authority to Grant and Duration. If the proposed development of the subject property requires approval through Design Review or Process I, IIA, or IIB, described in Chapters 142, 145, 150, and 152 KZC, respectively, a request for a modification will be considered as part of that process under the provisions of this section. The City must find that the applicant meets the applicable criteria listed in subsections (2)(b) and (2)(c) of this section. If granted under Design Review or Process I, IIA, or IIB, the modification is binding on the City for all development permits issued for that development under the building code within five (5) years of the granting of the modification.

If the above does not apply, the Planning Official may grant a modification in writing under the provisions of this section.

b. Internal Parking Lot Landscaping Modifications. For a modification to the internal parking lot landscaping requirements in KZC 95.44, the landscape requirements may be modified if:

- 1) The modification will produce a landscaping design in the parking area comparable or superior to that which would result from adherence to the adopted standard; or
- 2) The modification will result in increased retention of significant existing vegetation; or
- 3) The purpose of the modification is to accommodate low impact development techniques as approved by the Planning Official.

c. Perimeter parking lot and driveway landscaping. For a modification to the perimeter landscaping for parking lots and driveways, the buffering requirements for parking areas and driveways may be modified if:

- 1) The existing topography of or adjacent to the subject property decreases or eliminates the need for visual screening; or
- 2) The modification will be of more benefit to the adjoining property by causing less impairment of view or sunlight; or

- 3) The modification will provide a visual screen that is comparable or superior to the buffer required by KZC 95.45; or
- 4) The modification eliminates the portion of the buffer that would divide a shared parking area serving two (2) or more adjacent uses, but provides the buffer around the perimeter of the shared parking area.

(Ord. 4238 § 2, 2010)

.47 Nonconforming Landscaping and Buffers

1. The landscaping requirements of KZC 95.41, Supplemental Plantings, KZC 95.43 Outdoor Use and Storage, KZC 95.44, Internal Parking Lot Landscaping, and KZC 95.45, Perimeter Landscape Buffering for Driving and Parking Areas, must be brought into conformance as much as is feasible, based on available land area, in either of the following situations:

- a. An increase of at least 10 percent in gross floor area of any structure; or
- b. An alteration to any structure, the cost of which exceeds 50 percent of the replacement cost of the structure.

2. Land use buffers must be brought into conformance with KZC 95.42 in either of the following situations:

- a. An increase in gross floor area of any structure (the requirement to provide conforming buffers applies only where new gross floor area impacts adjoining property); or
- b. A change in use on the subject property and the new use requires larger buffers than the former use.

(Ord. 4238 § 2, 2010)

.50 Installation Standards for Required Plantings

All required trees, ~~and~~ landscaping and soil shall be installed according to sound horticultural practices in a manner designed to encourage quick establishment and healthy plant growth. All required landscaping shall be installed in the ground and not in above-ground containers, except for landscaping required on the top floor of a structure.

When an applicant proposes to locate a subterranean structure under required landscaping that appears to be at grade, the applicant will: (1) provide site-specific documentation prepared by a qualified expert to establish that the design will adequately support the long-term viability of the required landscaping; and (2) enter into an agreement with the City, in a form acceptable to the City Attorney, indemnifying the City from any damage resulting from development activity on the subject property which is related to the physical condition of the property. The applicant shall record this agreement with the King County Recorder's Office.

1. Compliance. It is the applicant's responsibility to show that the proposed landscaping complies with the regulations of this chapter.
2. Timing. All landscaping shall be installed prior to the issuance of a certificate of occupancy, except that the installation of any required tree or landscaping may be deferred during the summer months to the next planting season, but never for more than six (6) months. Deferred installation shall be secured with a performance bond pursuant to Chapter 175 KZC prior to the issuance of a certificate of occupancy.
3. Grading. Berms shall not exceed a slope of two (2) horizontal feet to one (1) vertical foot (2:1).
4. Soil Specifications. Soils in planting areas shall have soil quality equivalent to WA State Dept. of Ecology BMP T5.13-adequate porosity to allow root growth. ~~Soils which have been compacted to a density greater than one and three-tenths (1.3) grams per cubic centimeters shall be loosened to increase~~

~~eration to a minimum depth of 24 inches or to the depth of the largest plant root ball, whichever is greater. Imported topsoils shall be tilled into existing soils to prevent a distinct soil interface from forming. After soil preparation is completed, motorized vehicles shall be kept off to prevent excessive compaction and underground pipe damage.~~ The soil quality in any landscape area shall comply with the soil quality requirements of the Public Works Pre-Approved Plans. See subsection (9) of this section for mulch requirements.

5. Plant Selection.

- a. Plant selection shall be consistent with the Kirkland Plant List, which is produced by the City's Natural Resource Management Team and available in the Planning and Building Department.
- b. Plants shall be selected and sited to produce a hardy and drought-resistant landscape area. Selection shall consider soil type and depth, the amount of maintenance required, spacing, exposure to sun and wind, the slope and contours of the site, and compatibility with existing native vegetation preserved on the site. Preservation of existing vegetation is strongly encouraged.
- c. Prohibited Materials. Plants listed as prohibited in the Kirkland Plant List are prohibited in required landscape areas. Additionally, there are other plants that may not be used if identified in the Kirkland Plant List as potentially damaging to sidewalks, roads, underground utilities, drainage improvements, foundations, or when not provided with enough growing space.
- d. All plants shall conform to American Association of Nurserymen (AAN) grades and standards as published in the "American Standard for Nursery Stock" manual.
- e. Plants shall meet the minimum size standards established in other sections of the KZC.
- f. Multiple-stemmed trees may be permitted as an option to single-stemmed trees for required landscaping provided that such multiple-stemmed trees are at least 10 feet in height and that they are approved by the Planning Official prior to installation.

6. Fertilization. All fertilizer applications to turf or trees and shrubs shall follow Washington State University, National Arborist Association or other accepted agronomic or horticultural standards.

7. Irrigation. The intent of this standard is to ensure that plants will survive the critical establishment period when they are most vulnerable due to lack of watering. All required plantings must provide an irrigation system, using either Option 1, 2, or 3 or a combination of those options. For each option irrigation shall be designed to conserve water by using the best practical management techniques available. These techniques may include, but not be limited to: drip irrigation to minimize evaporation loss, moisture sensors to prevent irrigation during rainy periods, automatic controllers to insure proper duration of watering, sprinkler head selection and spacing designed to minimize overspray, and separate zones for turf and shrubs and for full sun exposure and shady areas to meet watering needs of different sections of the landscape.

Exceptions, as approved by the Planning Official, to the irrigation requirement may be approved xeriscape (i.e., low water usage plantings), plantings approved for low impact development techniques, established indigenous plant material, or landscapes where natural appearance is acceptable or desirable to the City. However, those exceptions will require temporary irrigation (Option 2 and/or 3) until established.

- a. Option 1. A permanent built-in irrigation system with an automatic controller designed and certified by a licensed landscape architect as part of the landscape plan.
- b. Option 2. An irrigation system designed and certified by a licensed landscape architect as part of the landscape plan, which provides sufficient water to ensure that the plants will become established. The system does not have to be permanent if the plants chosen can survive adequately on their own, once established.

- c. Option 3. Irrigation by hand. If the applicant chooses this option, an inspection will be required one (1) year after final inspection to ensure that the landscaping has become established.
8. Drainage. All landscapes shall have adequate drainage, either through natural percolation or through an installed drainage system. A percolation rate of one-half (1/2) inch of water per hour is acceptable.
9. Mulch.
- a. Required plantings, except turf or areas of established ground cover, shall be covered with two (2) inches or more of organic mulch to minimize evaporation and runoff. Mulch shall consist of materials such as yard waste, sawdust, and/or manure that are fully composted.
- b. All mulches used in planter beds shall be kept at least six (6) inches away from the trunks of shrubs and trees.
10. Protection. All required landscaped areas, particularly trees and shrubs, must be protected from potential damage by adjacent uses and development, including parking and storage areas. Protective devices such as bollards, wheel stops, trunk guards, root guards, etc., may be required in some situations.
11. Mitigation and Restoration Plantings in Critical Areas and Critical Area Buffers. Plants intended to mitigate for the loss of natural resource values are subject to the following requirements in addition to the other landscaping requirements found in KZC 95.40 through 95.45. Where these requirements conflict with other requirements of this chapter, these requirements take precedence. Refer to Chapters 85 and 90 KZC for additional requirements for these areas.
- a. Plant Source. Plant materials must be native and selected from the Kirkland Plant List. Seed source must be as local as possible, and plants must be nursery propagated unless transplanted from on-site areas approved for disturbance. These requirements must be included in the Mitigation Plan specifications.
- b. Installation. Plant materials must be supported only when necessary due to extreme winds at the planting site. Where support is necessary, stakes, guy wires, or other measures must be removed as soon as the plant can support itself, usually after the first growing season. All fertilizer applications to turf or trees and shrubs shall follow Washington State University, National Arborist Association or other accepted agronomic or horticultural standards.
- c. Fertilizer Applications. Fertilizers shall be applied in such a manner as to prevent its entry into waterways and wetlands and minimize its entry into storm drains. No applications shall be made within 50 feet of a waterway or wetland, or a required buffer as established by the City codes (such as Chapter 90 KZC) or Kirkland Shoreline Master Program (SMP, KMC Title 24), whichever is greater, unless specifically authorized in an approved mitigation plan or otherwise authorized in writing by the Planning Official.

(Ord. 4491 §§ 3, 11, 2015; Ord. 4350 § 1, 2012; Ord. 4238 § 2, 2010; Ord. 4010 § 2, 2005)

.51 Tree and Landscape Maintenance Requirements

The following maintenance requirements apply to all trees, including street trees, and other vegetation required to be planted or preserved by the City:

1. Responsibility for Regular Maintenance. Required trees and vegetation, fences, walls, and other landscape elements shall be considered as elements of the project in the same manner as parking, building materials, and other site details. The applicant, landowner, or successors in interest shall be responsible for the regular maintenance of required landscaping elements. Plants that die must be

replaced in kind. It is also the responsibility of the property owner to maintain street trees abutting their property pursuant to KZC 95.21.

2. Maintenance Duration. Maintenance shall be ensured in the following manner except as set forth in subsections (3), (4) and (5) of this section:
 - a. All required landscaping shall be maintained throughout the life of the development. Prior to issuance of a certificate of occupancy, the proponent shall provide a final as-built landscape plan and an agreement to maintain and replace all landscaping that is required by the City.
 - b. Any existing tree or other existing vegetation designated for preservation in a tree retention plan shall be maintained for a period of five (5) years following issuance of the certificate of occupancy for the individual lot or development. After five (5) years, all trees on the property are subject to KZC 95.23 unless:
 - 1) The tree and associated vegetation are in a grove that is protected pursuant to subsection (3) of this section; or
 - 2) The tree or vegetation is considered to be a public benefit related to approval of a planned unit development; or
 - 3) The tree or vegetation was retained to partially or fully meet requirements of KZC 95.40 through 95.45, required landscaping.
3. Maintenance of Preserved Grove. Any applicant who has a grove of trees identified for preservation on an approved Tree Retention Plan pursuant to KZC 95.30(2) shall provide prior to occupancy the legal instrument acceptable to the City to ensure preservation of the grove and associated vegetation in perpetuity, except that the agreement may be extinguished if the Planning Official determines that preservation is no longer appropriate.
4. Maintenance in Holmes Point Overlay Zone. Vegetation in designated Protected Natural Areas in the Holmes Point Overlay Zone is to be protected in perpetuity pursuant to KZC 70.15(8)(a). Significant trees in the remainder of the lot shall be protected in perpetuity pursuant to KZC 70.15(8)(b).
5. Maintenance of Critical Area and Critical Area Buffers. In critical areas and their buffers, native vegetation is not to be removed without City approval pursuant to KZC 95.23(5)(d). However, it is the responsibility of the property owner to maintain critical areas and their buffers by removing nonnative, invasive, and noxious plants in a manner that will not harm critical areas or their buffers. See also subsection (7) of this section and Chapters 85 and 90 KZC for additional requirements for trees and other vegetation within critical areas and critical area buffers.
6. Nonnative Invasive and Noxious Plants. It is the responsibility of the property owner to remove nonnative invasive plants and noxious plants from the vicinity of any tree or other vegetation that the City has required to be planted or protected. Removal must be performed in a manner that will not harm the tree or other vegetation that the City has required to be planted or protected.
7. Pesticides, Herbicides, and Fertilizer. The use of plant material requiring excessive pesticide or herbicide applications to be kept healthy and attractive is discouraged. Pesticide, herbicide, and fertilizer applications shall be made in a manner that will prevent their unintended entry into waterways, wetlands, and storm drains. No application shall be made within 50 feet of a waterway or wetland or a required buffer as established by City codes, whichever is greater, unless done so by a State certified applicator with approval of the Planning Official, and is specifically authorized in an approved mitigation plan or otherwise authorized in writing by the Planning Official.
8. Landscape Plans and Utility Plans. Landscape plans and utility plans shall be coordinated. In general, the placement of trees and large shrubs should adjust to the location of required utility routes

both above and below ground. Location of plants shall be based on the plant's mature size both above and below ground. See the Kirkland Plant List for additional standards.

(Ord. 4437 § 1, 2014; Ord. 4238 § 2, 2010)

.52 Prohibited Vegetation

Plants listed as prohibited in the Kirkland Plant List shall not be planted in the City or required to be retained.

For landscaping not required under this chapter, this prohibition shall become effective on February 14, 2008. The City may require removal of prohibited vegetation if installed after this date. Residents and property owners are encouraged to remove pre-existing prohibited vegetation whenever practicable.

(Ord. 4450 § 1, 2014; Ord. 4238 § 2, 2010; Ord. 4121 § 1, 2008)

.55 Enforcement and Penalties

Upon determination that there has been a violation of any provision of this chapter, the City may pursue code enforcement and penalties in accordance with the provisions of Chapter 1.12 KMC, Code Enforcement.

(Ord. 4286 § 1, 2011; Ord. 4281 § 1, 2011; Ord. 4238 § 2, 2010; Ord. 4010 § 2, 2005)

.57 City Forestry Account

1. Funding Sources. All civil penalties received under this chapter and all money received pursuant to KZC 95.33(3)(c) shall be used for the purposes set forth in this section. In addition, the following sources may be used for the purposes set forth in this section:

- a. Agreed upon restoration payments imposed under KZC 95.55 or settlements in lieu of penalties;
- b. Sale of trees or wood from City property where the proceeds from such sale have not been dedicated to another purpose;
- c. Donations and grants for tree purposes;
- d. Sale of seedlings by the City; and
- e. Other monies allocated by the City Council.

2. Funding Purposes. The City shall use money received pursuant to this section for the following purposes:

- a. Acquiring, maintaining, and preserving wooded areas within the City;
- b. Planting and maintaining trees within the City;
- c. Establishment of a holding public tree nursery;
- d. Urban forestry education;
- e. Implementation of a tree canopy monitoring program; or
- f. Other purposes relating to trees as determined by the City Council.

(Ord. 4238 § 2, 2010)

115.90 Calculating Lot Coverage

1. General – The area of all structures and pavement and any other impervious surface on the subject property will be calculated as a percentage of total lot area. If the subject property contains more than one (1) use, the maximum lot coverage requirements for the predominant use will apply to the entire development. Lot area not calculated under lot coverage must be devoted to open space as defined in KZC [5.10.610](#).

2. Exceptions

- a. An access easement or tract that is not included in the calculation of lot size will not be used in calculating lot coverage for any lot it serves or crosses.
- b. Pervious areas below eaves, balconies, and other cantilevered portions of buildings.
- c. Landscaped areas at least two (2) feet wide and 40 square feet in area located over subterranean structures if the Planning Official determines, based on site-specific information submitted by the proponent and prepared by a qualified expert, soil and depth conditions in the landscaped area will provide cleansing and percolation similar to that provided by existing site conditions.
- d. Rockerries and retaining walls, unless located adjacent to or within twelve (12) inches of another impervious surface such as a patio, building or parking area.
- e. Public sidewalk if located within a public easement on private property.

~~3. Exemptions – The following exemptions will be calculated at a ratio of 50 percent of the total area covered. Exempted area shall not exceed an area equal to 10 percent of the total lot area. Installation of exempted surfaces shall be done in accordance with the current adopted stormwater design manual.~~

- ~~a. Permeable pavement (non-grassed).~~
- ~~b. Grassed modular grid pavement.~~
- ~~c. Open grid decking over pervious area.~~
- ~~d. Pervious surfaces in compliance with the stormwater design manual adopted in KMC [15.52.060](#).~~

(Ord. 4350 § 1, 2012; Ord. 4252 § 1, 2010; Ord. 4121 § 1, 2008; Ord. 4097 § 1, 2007; Ord. 4072 § 1, 2007;
Ord. 3814 § 1, 2001)

KZC 114 Low Impact Development with Proposed 2016 Edits

Chapter 114 – LOW IMPACT DEVELOPMENT

Sections:

- [114.05](#) User Guide
- [114.10](#) Voluntary Provisions and Intent
- [114.15](#) Parameters for Low Impact Development
- [114.20](#) Design Standards and Guidelines
- [114.25](#) Review Process
- [114.30](#) Additional Standards
- [114.35](#) Required Application Documentation

114.05 User Guide

This chapter provides standards for an alternative type of site development that ensures low impact development (LID) ~~principles~~~~facilities~~ are utilized to ~~reduce environmental impacts~~~~manage stormwater~~ on project sites in specified low density zones. If you are interested in proposing detached dwelling units or two (2) unit homes that reduce environmental impacts or you wish to participate in the City's decision on a project including this type of site development, you should read this chapter.

(Ord. 4350 § 1, 2012)

114.10 Voluntary Provisions and Intent

The provisions of this chapter are available as alternatives to the development of typical lots in low density zones. In the event of a conflict between the standards in this chapter and the standards in Chapters [15](#), [17](#) or [18](#) KZC, the standards in this chapter shall control except for the standards in Chapters [83](#) and [141](#) KZC.

The goal of LID is to conserve and use existing natural site features, to integrate small-scale stormwater controls, and to prevent measurable harm to streams, lakes, wetlands, and other natural aquatic systems from development sites by maintaining a more hydrologically functional landscape. LID may not be applicable to every project due to topography, high groundwater, or other site specific conditions.

The LID requirements in this code do not exempt an applicant from stormwater flow control and water quality treatment development requirements. LID facilities ~~are part of~~~~can be counted toward~~ those requirements, and

in some cases may ~~be all that is required. meet the requirements without traditional stormwater facilities (pipes and vaults).~~

The purpose of this chapter is to allow flexibility, establish the development guidelines, requirements and standards for LID low impact development projects. Because all projects are required to use ~~some form of LID principle techniques~~ and facilities/best management practices (BMPs) as feasible, the use of LID techniques does not necessarily fulfill all the requirements for a LID project. This chapter is intended to fulfill the following purposes:

- ~~3~~4. Manage stormwater through a land development strategy that emphasizes conservation and use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely mimic predevelopment hydrologic conditions.
- ~~1~~2. Encourage creative and coordinated site planning, the conservation of natural conditions and features, the use of appropriate new technologies and techniques, and the efficient layout of streets, utility networks and other public improvements.
- ~~4~~3. Minimize impervious surfaces.
- ~~2~~4. Encourage the creation or preservation of permanent forested open space.
5. Encourage development of residential environments that are harmonious with on-site and off-site natural and built environments.
6. Further the goals and the implementation of the policies of the Comprehensive Plan.

(Ord. 4350 § 1, 2012)

114.15 Parameters for Low Impact Development

These standards and incentives address the portion of the project site utilizing the LID principles stormwater techniques and facilities to meet applicable stormwater requirements. The remainder of the project site must comply with underlying zoning and ~~conventional~~ stormwater development regulations requirements. Please refer to KZC [114.30](#) and [114.35](#) for additional requirements related to these standards.

- | | |
|--|---|
| | <ul style="list-style-type: none"> • <u>Detached dwelling units</u>. |
|--|---|

Permitted Housing Types	<ul style="list-style-type: none"> • <u>Accessory dwelling units.</u> • 2/3 unit homes.
Minimum <u>Lot Size</u>	<ul style="list-style-type: none"> • Individual <u>lot sizes</u> must be at least 50% of the minimum <u>lot size</u> for the underlying zone.
Minimum Number of Lots	<ul style="list-style-type: none"> • 4 lots.
Maximum Density	<ul style="list-style-type: none"> • As defined in underlying zone's <u>Use Zone</u> Chart or Density/Dimensions Table. • Bonus density is calculated by multiplying number of lots or units by 0.10. If a fraction of 0.5 or higher is obtained then round to the next whole number.
<u>Low Impact Development</u>	<ul style="list-style-type: none"> • <u>LID principles and facilities/BMPstechniques</u> must be employed to control stormwater runoff generated from <u>50%-of</u> all hard surfaces <u>as feasible</u>. This includes all vehicular and pedestrian access. <u>LID facilities/BMPs</u> must be designed according to Public Works stormwater <u>development regulations</u> as stated in Chapter <u>15.52</u> KMC.
Locations	<p>Allowed in low density <u>residential zones</u> with the exception of the following: PLA 16, PLA 3C, RSA 1, RSA 8, or the RS 35 and RSX 35 zones in the Bridle Trails neighborhood north and northeast of the Bridle Trails State Park, and the Holmes Point Overlay zone. Any property or portion of a property with shoreline jurisdiction must meet the regulations found in Chapter <u>83</u> KZC, including minimum <u>lot size</u> or units per acre and lot coverage.</p>
Review Process	<ul style="list-style-type: none"> • Short plats shall be reviewed under KMC <u>22.20.015</u> and subdivisions shall be reviewed under KMC <u>22.12.015</u>. • Condominium projects shall be reviewed under KZC 145, Process I.
Parking Requirements	<ul style="list-style-type: none"> • 2 stalls per <u>detached dwelling unit</u>. • 1 stall per <u>accessory dwelling unit</u>. • 1.5 stalls per unit in multi-unit home, rounded to next whole number. • See KZC <u>105.20</u> for guest parking requirements. • Parking pad width required in KZC <u>105.47</u> may be reduced to 10 feet. • Parking pad may be counted in required parking. • Tandem parking is allowed where stalls are shared by the same <u>dwelling unit</u>. • Shared garages in separate tract are allowed.

	<ul style="list-style-type: none"> All required parking must be provided on the <u>LID</u> project site.
Development Type	<ul style="list-style-type: none"> Subdivision. Condominium.
Minimum <u>Required Yards</u> (from exterior <u>property lines</u>)	<ul style="list-style-type: none"> 20 feet for all front yards. 10 feet for all other <u>required yards</u>.
Minimum <u>Required Yards</u> (from internal <u>property lines</u>)	<ul style="list-style-type: none"> Front: 10 feet. Option: Required front yard can be reduced to 5 feet, if required rear yard is increased by same amount of front yard reduction. Side and rear: 5 feet. Zero lot line for 2/3 unit homes between internal units.
Front Porches	<ul style="list-style-type: none"> Must comply with KZC 115.115(3)(n), except that front entry porches may extend to within 5 feet of the interior required front yard.
Garage Setbacks	<ul style="list-style-type: none"> Must comply with KZC 115.43, except that attached garages on <u>front facade of dwelling unit</u> facing internal front <u>property line</u> must be set back 18 feet from internal front <u>property line</u>.
Lot Coverage (all impervious surfaces)	<ul style="list-style-type: none"> <u>Maximum lot coverage</u> is the <u>maximum lot coverage</u> percentage of the underlying zone and may be aggregated.
Required Common <u>Open Space</u> (RCOS)	<ul style="list-style-type: none"> Minimum of 40%. <u>Must preserve Native</u> and undisturbed vegetation is preferred. Allowance of 1% of required common <u>open space</u> for shelters or other recreational structures. Paths connecting and within required common <u>open space</u> to development must be pervious. Landscape greenbelt <u>easement</u> is required to protect and keep required common <u>open space</u> undeveloped in perpetuity.
Maximum Floor Area ^{1,2}	<ul style="list-style-type: none"> Maximum floor area is 50% of the minimum <u>lot size</u> of the underlying zone.

Footnotes:

1. The maximum floor area for LID projects does not apply within the disapproval jurisdiction of Houghton.
2. The maximum floor area for LID projects in RS 35 and RSX 35 zones is 20 percent of the minimum lot size of the underlying zone.

(Ord. 4476 § 3, 2015; Ord. 4437 § 1, 2014; Ord. 4350 § 1, 2012)

114.20 Design Standards and Guidelines

1. Required Low Impact Development Stormwater Principles and Facilities/BMPs – Low impact development (LID) stormwater facilities shall be designed to control stormwater runoff from 50 percent of all hard surfaces created within the LID portion of the project site. This includes all vehicular and pedestrian access. LID facilities/BMPs shall be designed according to Public Works stormwater development regulations, as stated in KMC 15.52.060. The maintenance of LID facilities shall be maintained in accordance with requirements in KMC 15.52.120. The proposed site design shall incorporate the use of LID strategies to meet stormwater management standards. LID is a set of techniques that mimic natural watershed hydrology by slowing, evaporating/transpiring, and filtering water, which allows water to soak into the ground closer to its source. The design should seek to meet the following objectives:
 - a. Preservation of natural hydrology.
 - b. Reduced impervious surfaces.
 - c. Treatment of stormwater in numerous small, decentralized structures.
 - d. Use of natural topography for drainage ways and storage areas.
 - e. Preservation of portions of the site in undisturbed, natural conditions.
 - f. Restoration of disturbed sites.
 - g. Reduction of the use of piped systems. Whenever possible, site design shall use multifunctional open drainage systems such as rain gardens, vegetated swales or filter strips that also help to fulfill landscaping and open space requirements.

2. Required Common Open Space – Required common open space shall support and enhance the project's LID stormwater facilities/BMPs; secondarily to provide a sense of openness, visual relief, and community for low impact development projects.

a. The minimum percentage for required common open space is 40 percent and is calculated using the size of the LID portion of the project site. Wetland and streams shall not be included in the calculation. The required common open space must be located outside of wetlands and streams, and may be developed and maintained to provide for passive recreational activities for the residents of the development as allowed in Chapter 90 KZC.

b. Conventional surface-stormwater management facilities such as vaults and tanks shall not be located/limited within required common open space areas unless there is no other feasible alternative placement for stormwater facilities and shall be placed underground at a depth to sufficiently allow landscaping to be planted on top of them. Low impact development (LID) facilities/BMPs/features are permitted, provided they do not adversely impact access to or use of the required common open space for passive recreation. Neither conventional nor LID stormwater facilities can result in the removal of healthy native trees, unless a positive net benefit can be shown and there is no other alternative for the placement of stormwater facilities. The Public Works Director must approve locating conventional stormwater facilities within the required common open space.

c. Existing native vegetation, forest litter and understory shall be preserved to the extent possible in order to reduce flow velocities and encourage sheet flow on the site. Invasive species, such as Himalayan blackberry, must be removed and replaced with native conifers and plants (see Kirkland Native Tree and -Plant List). Undisturbed native vegetation and soil shall be protected from compaction during construction. A Native Tree and Plant Plan that achieves 80% coverage within two (2) years must be included with the applicant's submittal.

d. If no existing native vegetation, then applicant may propose a restoration plan to achieve 80% coverage within two (2) years that shall include all native conifer and plant species (see Kirkland Native Tree and Plant List). No new lawn is permitted and all improvements installed must be of pervious materials.

- e. Vegetation installed in required common open space areas shall be designed to allow for access and use of the space by all residents, and to facilitate maintenance needs. However, existing mature trees should be retained.

(Ord. 4437 § 1, 2014; Ord. 4350 § 1, 2012)

114.25 Review Process

1. Approval Process – Low Impact Development Projects

a. The City will review and process an application for a LID project concurrent with and through the same process as the underlying subdivision proposal (Process I, Chapter 145 KZC for short plats; Process IIA, Chapter 150 KZC for subdivisions). However, public notice for LID projects shall be as set forth under the provisions of Chapter 150 KZC (Process IIA). A Process I and site plan review will be required for projects that use a condominium ownership structure and do not subdivide the property into individually platted lots.

b. Lapse of Approval – Unless otherwise specified in the decision granting Process I approval, the applicant must begin construction or submit to the City a complete building permit application for development of the subject property consistent with the Process I approval within four (4) years after the final decision granting the Process I approval or that decision becomes void. The applicant must substantially complete construction consistent with the Process I approval and complete all conditions listed in the Process I approval decision within six (6) years after the final decision on the Process I approval or the decision becomes void. “Final decision” means the final decision of the Planning Director.

2. Approval Process – 2/3 Unit Homes – The City will review and process a LID project application that includes a 2/3 unit home with an additional land use process as follows:

- a. One 2/3 unit home requires a Planning Official ~~Process I~~ review.
- b. More than one 2/3 unit home requires a Process ~~IIA~~ review.

3. Approval Process – Requests for Modifications to Standards

a. Minor Modifications – Applicants may request minor modifications to the general parameters and design standards set forth in this chapter. The Planning Director under a

Process I, Chapter [145](#) KZC or Hearing Examiner under Process IIA, Chapter [150](#) KZC may modify the requirements if all of the following criteria are met:

- 1) The site is constrained due to unusual shape, topography, easements or sensitive areas; and
- 2) The modification is consistent with the objectives of this chapter; and
- 3) The modification will not result in a development that is less compatible with neighboring land uses.

(Ord. 4350 § 1, 2012)

114.30 Additional Standards

1. The City's approval of a low impact development project does not constitute approval of a subdivision or short plat. An applicant wishing to subdivide in connection with a development under this chapter shall seek approval to do so concurrently with the approval process under this chapter.
2. To the extent there is a conflict between the standards set forth in this chapter and Title 22 of the Kirkland Municipal Code, the standards set forth in this chapter shall control.

(Ord. 4350 § 1, 2012)

114.35 Required Application Documentation

1. Site assessment documents to be submitted with application include:
 - a. Survey prepared by a registered land surveyor or civil engineer.
 - b. Location of all existing and proposed lot lines and easements.
 - c. Location of all sensitive areas, including lakes, streams, wetlands, flood hazard areas, and steep slope/erosion hazard areas.
 - d. Landscape plan showing existing and proposed trees and other vegetation. The plan must show that the Required Common Open Space to be restored or augmented will be planted with Native Conifers and native plants to achieve 80% coverage within two (2) years.
2. Soil report prepared by a licensed civil engineer, geotechnical engineer, or engineering geologist.

3. Stormwater drainage report/technical information report.

(Ord. 4350 § 1, 2012)

KMC 19.12.130 Street and Curb Cutting Specifications with Proposed 2016 Edits

**Chapter 19.12
STREET AND CURB CUTTING**

19.12.130 Specifications.

The Public Works Director is directed to develop and keep current full engineering pre-approved plans and policies for all improvements in the right-of-way. The applicant shall comply with these standards and specifications for all improvements in the right-of-way. These standards and specifications are available for public inspection and copying in the Public Works Department during regular business hours or at www.kirklandwa.gov.

~~All work shall conform to the requirements of "Standard Specifications for Municipal Public Works Construction," 1977 Edition, prepared by Washington State Chapter, American Public Works Association, copies of which are on file with the city and available to the general public.~~

~~Exception: Only Standard Plan No. 10—concrete driveways—type D, alternate 1 or 2, on page VII—11 of the above standards are permitted for driveways. A specific alternate may be required by the public service department after the preconstruction inspection.~~

(Ord. 2606 § 1 (part), 1981; Ord. 2127 § 4(A), 1970)

