



# Memo

Date: Wednesday, March 18, 2015

Project: Kitsap County Code & SDM Update

To: Patty Charnas and Scott Diener, Department of Community Development; Jon Brand and Jeff Shea, Kitsap County Roads Department

From: Robin Kirschbaum and Jonathan Brown, HDR

Subject: DRAFT Kitsap County Road Standards Review

Kitsap County (County) is updating its codes, standards and related guidance to meet requirements of the National Pollutant Discharge Elimination System (NPDES) Western Washington Phase II Municipal Stormwater Permit (permit), updated in 2012 and effective August 1, 2013 through July 31, 2018. The permit was modified by the Washington State Department of Ecology (Ecology) on December 17, 2014 and the modified permit became effective as of January 16, 2015.

As a Phase II permittee, the County is required to review and update its development codes and standards to make Low Impact Development (LID) the preferred and commonly used approach to stormwater management for new and redevelopment, including roadway projects. The County's Department of Community Development (DCD) retained HDR to assist with revising codes, design standards, and the County's Stormwater Design Manual (SDM) to comply with the new permit requirements.

This memorandum presents recommendations for County staff to consider and incorporate as appropriate into their on-going update of the 2007 *Kitsap County Road Standards*. The following sections of this memorandum discuss considerations and recommendations regarding:

- Private road standards;
- Permeable pavement applications;
- Maintenance requirements & responsibilities;
- Permeable pavement construction and inspection;
- Updated street trees list;
- Design submittal requirements; and
- Coordination with the Kitsap County *Green Streets Program*.

Enclosed with this memorandum are:

- Proposed redlined markups of the 2007 Road Standards, including comments from Landscape Architect review of the County's current approved street tree list;
- Example permeable pavement inspection checklists from the City of Bellevue; and
- Example private road standards from several Phase II jurisdictions in the Puget Sound area.



## Private Road Standards

Standards for private road construction are needed, as the majority of new roads being constructed in Kitsap County are private roads. These private roads are used for fire and emergency access and serve as important utility easements. Guidance on roadway geometry, pull-out zones, and minimum pavement section and subgrade would provide consistent access for Kitsap residents. Further, guidance on incorporating LID into private roadway planning, design, and construction would help meet permit requirements.

From discussions with the Kitsap County Roads department during a February 10, 2015 meeting with Roads, DCD, and HDR, we understand that private roads are governed by DCD and the Fire Marshall, not by the Roads department. Thus, the 2007 Kitsap County *Road Standards* do not address private roads, and the on-going update of those standards by the Roads department will also not include those roads. Rather, the Roads department expects that private road standards would be addressed in Kitsap County Code (KCC) Titles 11 (Roads, Highways, and Bridges) and 16 (Land Division and Subdevelopment), as well as possibly in the *Stormwater Design Manual*, being updated by HDR.

### Recommendations

We recommend that the County develop new private road standards and that those be included or referenced, as appropriate, in the next revision of Title 11 and 16 redlines, as well as the *Stormwater Design Manual*.

## Permeable Pavement Applications

Permeable pavement types include porous asphalt, pervious concrete, permeable interlocking concrete pavements, and gird pavements. Many of these types are applicable in a wide variety of uses, but some limitations may apply.

### Recommendations

We recommend that the County develop a table indicating allowable permeable pavement types for various applications, both for public right-of-way installations (to be included in the updated Road Standards, by Roads department) and private installations (to be included in Title 11 and 16 updates, by HDR). We included a recommended “Typical Permeable Pavement Applications” table for public installations in Section 3.6 of the Road Standards redlined-markups (enclosed with this memorandum). For quick reference, the table is also copied below:



**Table 1 - Typical Permeable Pavement Applications for Public Roadways**

Application	Residential street or collector	Arterials	Shoulder/on-street parking
Porous Asphalt	Yes	Limited to-date	Yes
Pervious Concrete	Yes	No	Yes
Permeable Interlocking Concrete Pavements	Yes	No	Yes
Grid Pavements	No	No	No

**Source:** Modified from Table 6.3.1 from the *Low Impact Development Technical Guidance Manual for Puget Sound*, December 2012, Washington State University Extension and Puget Sound Partnership. Modified by addition of “Shoulder/on-street parking” column.

The summary of permeable pavement applications in private developments (Table 2) was based on Table 6.3.1 from the 2012 *Low Impact Development Technical Guidance Manual for Puget Sound*. These applications should be considered for the Title 11 and 16 code updates, to be completed by HDR. See also the section below on “Maintenance Requirements & Responsibilities” for important related discussion.

**Table 2 - Typical Permeable Pavement Applications for Private Developments**

Application	Residential walk/patio	Residential driveway	Commercial pedestrian plaza	Emergency access lane or overflow parking	Parking lot or travel lanes
Porous Asphalt	Yes	Yes	Yes	Yes	Yes
Pervious Concrete	Yes	Yes	Yes	Yes	Yes
Permeable Interlocking Concrete Pavements	Yes	Yes	Yes	Yes	Yes
Grid Pavements	Yes	Yes	Yes	Yes	No



## Maintenance Requirements & Responsibilities

As discussed during a February 10, 2015 meeting between HDR and County DCD and Road department staff, LID facilities in the roadway (i.e., bioretention and permeable pavement) are considered by Roads to be stormwater management facilities. Coordination among Roads, Clear Water Kitsap Stormwater Division (Stormwater Division) and DCD departments is needed to agree on operation and maintenance (O&M) requirements and responsibilities for stormwater facilities located in both public and private roadways.

### Recommendations

We recommend conducting a series of meetings between County Roads, the Stormwater Division, and DCD to discuss and agree on maintenance requirements and responsibilities for stormwater facilities in both public and private roadways. The following agenda items, at minimum, should be agreed on during these meeting(s):

- Adopt the 2013 Ecology LID O&M Guidance document for definition of O&M activities and frequencies for LID facilities;
- Responsibility of various departments for long-term O&M and inter-agency agreements, if needed;
- Homeowner Association responsibility for long-term O&M of private stormwater facilities, including but not limited to bioretention and permeable pavements in private roads and subdivisions.
- How the Stormwater Division would be reimbursed for maintenance activities if needed by the department (i.e., due to lack of Homeowner Association performance or other reasons).
- Organization of standards updates among various updates in progress, including the *Kitsap Road Standards* (by the Roads department) and the *Stormwater Design Manual (SDM)* (by HDR). For example, should LID standard design details be included in the Roadway Standards, the SDM, or both?

### Example O&M materials enclosed for reference

Example inspection and operation and maintenance (O&M) documents are enclosed with this memorandum for reference:

- *Western Washington Low Impact Development (LID) Operations and Maintenance (O&M)*, Washington State Department of Ecology Water Quality Program; and
- *Private Natural Drainage Practices Maintenance Inspection – Pervious/Porous Pavements*, City of Bellevue.

## Permeable Pavement Construction and Inspection

Proper installation of permeable pavement is essential for long-term successful performance. Thus, it is equally important to make information, training, and other tools available as needed to promote success with permeable pavement projects.

### Recommendations

We recommend that the County incorporate installation, inspection, and acceptance procedures in the updated *Road Standards*, as well as train their construction management staff on those procedures for LID



roadway facilities. We also recommend that the County develop inspection checklists to standardize the process for both public and private projects.

#### Example permeable pavement materials enclosed for reference

The following example documents are enclosed with this memorandum to provide relevant reference materials:

- *Low Impact Development Technical Guidance Manual for Puget Sound*, Washington State University Extension and Puget Sound Partnership (refer to Section 6.3: Permeable Pavement);
- *Client Assistance Memo 2215: Permeable Pavement in the Right-of-Way*, Seattle Department of Transportation;
- *Client Assistance Memo 533: Green Stormwater Infrastructure (GSI) on Private Property - Permeable Pavement Surfaces and Facilities*, Seattle Department of Planning and Development; and
- *Permeable Pavement – Public ROW Construction Inspection Checklist*, Seattle Department of Transportation.

## **Updated Street Trees List**

HDR's Landscape Architect (LA) reviewed and provided hand marked-up redlines to the County's current approved street trees list found in Appendix A of the Road Standards. Our LA also reviewed the street tree list included in the County's *Green Streets Plan*.

#### Recommendations

We recommend that the County engage Jenny Morgan from DCD in the review of our street tree list markups, for potential inclusion in the updated *Road Standards*.

#### Example materials enclosed for reference

See HDR's enclosed redline mark-ups of the current approved street tree list in Appendix A of the Roadway Standards.

## **Design Submittal Requirements**

Per Chapter 1.2.4(7) of the SDM, County road improvement plans must meet the submittal requirements in the *Road Standards* and KCC Title 11. During the February 10, 2015 meeting with Road and DCD department staff, Jenifer Lawrence of DCD indicated that enforcement of this requirement has been difficult.

#### Recommendations

We recommend that the County:

- Develop a design submittal checklist for private developers, to be referenced in the Title 16 updates; and/or
- Train County reviewers on the topic of submittal requirements and review/acceptance procedures.



## Coordination with the *Green Streets Plan*

In 2014, Kitsap County developed the Kitsap County *Green Streets Plan* to improve the process for green streets development as a strategy for improving water quality and corridor functionality, while maintaining roadway safety requirements.

### Recommendations

Our redlined mark-ups of the 2007 Road Standards provides the following recommendations for consistency with the *Green Streets Plan*:

- Provide clarification on allowed types of permeable pavement for various applications;
- Create a new subsection under Section 3.8 – Clear Zone and Roadside Features for LID facilities to identify LID facility types appropriate for the roadside;
- Develop a new, stand-alone Kitsap County Roadside Bioretention Plant List that coordinates the street trees list in Appendix A of the *Road Standards* and the *Green Streets Plan* Plant list, as well as any other bioretention plant list available that could apply to Kitsap County (for example, Appendix 1 of the *Low Impact Development Technical Guidance Manual for Puget Sound*); and
- Provide guidance for private road design, construction, and maintenance.

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