AECOM
Seattle Columbia Center
701 Fifth Avenue, Suite 1100
Seattle, WA 98104
www.aecom.com

206.674.4200 tel
206.674.4242 fax

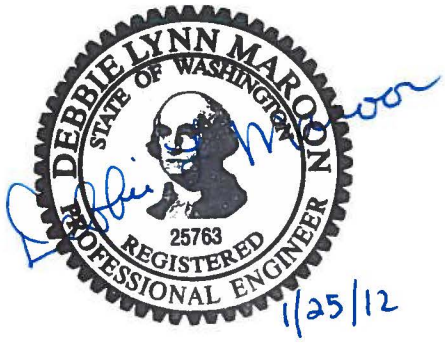
Technical Memorandum

To: Rachel E. Speer, P.E.
Assistance Public Works Director
City of Woodinville

Subject: Sammamish Bridge (No. 202/35) Replacement Project
Stormwater Design

From: Debbie Maroon, P.E., AECOM

Date: January 25, 2012



Design and Analysis Methodology

According to the 1999 Edition of the *Woodinville Transportation Infrastructure Standards and Specifications,* all drainage systems within the City must be designed in accordance with the latest version of the *King County Surface Water Design Manual* (KCSWDM).

The KCSWDM lists a series of 8 "Core Requirements" and 5 "Special Requirements" that may apply to a project. During final design it will be necessary to look at each of the core requirements and special requirements and determine if and how they apply to the project. Of these core and special requirements Core Requirement # 3: Flow Control and Core Requirement #8: Water Quality, normally have the greatest impact on the design of a project.

Per Core Requirement #3: Flow Control - all proposed projects, including redevelopment projects, must provide onsite flow control facilities or flow control BMPs or both to mitigate the impacts of storm and surface water runoff generated by new impervious surface, new pervious surface and replaced impervious surface.

There are exemptions from Core Requirement #3. This project will use the "Direct Discharge Exemption", which exempts a project from flow control if the area drains to certain major receiving waters and if it meets certain criteria as outlined in the Manual. The project meets these requirements and therefore, no flow control is required.

Per Core Requirement #8: Water Quality - all proposed projects, including redevelopment projects, must provide water quality (WQ) facilities to treat the runoff from those new and replaced pollution-generating surfaces. During the final design phase the amount of new and replaced pollution-generating surfaces will be determined and sizing of the water quality facilities will be done to satisfy this requirement. The method of water quality treatment is described in the next section.

Description of Drainage Improvements

While the drainage from the project site all enters the Sammamish River it does so from two different directions. There is a high point located approximately 800 feet east of the intersection of Woodinville-Redmond Road and NE 175th Street. Drainage from this high point to the west drains to a low point near the intersection of NE 175th Street and 128th Place NE while drainage from the high point to the east drains to the intersection of NE 175th Street and 131st Avenue NE.

Drainage from the west half of the project will be intercepted and treated in a new drainage system to be constructed in the roadway. The system proposed for water quality treatment for this westerly portion of the project is the Filterra® Bioretention System.

Equivalent areas of new impervious and replaced impervious area will be treated west of the bridge to account for the new impervious area east of the bridge. This is allowed per the KCSWDM.

In 2009, this treatment system received a "General Use Level Designation" from the Department of Ecology; thereby, approving it for use in the State of Washington. The Filterra system combines landscape plants with an engineered filtration media to effectively capture and remove stormwater runoff pollutants, such as trash and debris, oils and grease, sediments, nutrients, metals and bacteria prior to the runoff being discharged from the site.

Drainage from the east half of the project will be intercepted in a new drainage system to be constructed in the roadway; however, no new water quality treatment facilities are proposed since this new system will discharge to an existing system that already contains provisions for water quality treatment.

Maintenance Program

The majority of the proposed storm drainage system is just like the drainage systems throughout the City and the maintenance requirements for the system would be the same. However, the Filterra® system would require a different type of maintenance from the normal drainage system.

In order for the Filterra® system to work properly annual maintenance and proper watering is required. The annual maintenance normally consists of one spring visit that aims to clean up after winter loads that may include salts and sands and a fall visit to remove excessive leaf litter. Included with the purchase price of the units is a 1 year maintenance plan which does not include watering. The City would need to provide watering as necessary for the plants to get established and grow. Filterra® has a list of plants that meet the requirements for their units and these plants may or not be on the City's approved street tree list. If ones can be found that meet Filterra's® requirements and that are on the City's list they will be used.

Extended maintenance contracts are available at extra cost upon request. In addition, Filterra has developed a training DVD which covers all aspects of the maintenance steps needed to meet their specifications. Along with the instructional DVD, Filterra field crew representatives are available to

perform on-site maintenance training and answer any questions that the City maintenance crew may have.

Maintenance of the Filterra® units is simple. Normally it takes less than 30 minutes to maintain 1 unit and it can be done by one person with no special tools required. The steps for maintaining the system are:

1. Do a visual inspection of the Filterra® unit and surrounding areas.
2. Remove tree grate and erosion control stones.
3. Remove debris, trash and mulch from the unit.
4. Trim plants if necessary.
5. Replace mulch – normally 4-5 bags of mulch is sufficient.
6. Clean area around the Filterra® unit.
7. Complete paperwork documenting the health of the system and maintenance performed.