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January 22, 2019

City of Mercer Island
Development Services Group
9611 SE 36th Street
Mercer Island, WA 98040

Subject: Response to Public Comments: City of Mercer Island Permit SEP18-021
Project Name: Four Season East Mercer Way SFR
Project Address: 4634 E. Mercer Way

Reference: Litchfield Engineering Plans; Dated January 22, 2019
Date: January 22, 2019

Ms. Proebsting:

This letter is intended to provide a response to drainage related comments received by the City of Mercer Island during the processing and review of SEPA application 18-021 for the subject project. Minor revisions to the civil engineering plans were also completed to address the comments.

Project Overview:

The proposed work involves the construction of a new single family home on a vacant lot. The new single family home will be constructed on the mid portion of the 0.49 acre property. The property is bordered to the east by the Petrie property which is located adjacent to Lake Washington (TPN 755870-0006); to the south by the Brotherton property (TPN 182405-9030); to the west by the Shrikhande property (TPN 755870-0004); and to the north by the Yuen property (TPN 755870-0020). Access to the future home site is from a private road that also provides access to 12 other developed properties. The private road connects to East Mercer Way. The property is Parcel B of Sandy Beach Plat Number 76-12-036 Recording Number 770106-0821.

Existing Drainage Description:

As is typical of many undeveloped properties on Mercer Island, the Four Season property is characterized by moderate to steep slopes, evergreen/deciduous trees, and thick undergrowth. Based on the localized topography, the property drains primarily to the east but also to the northeast and southeast. Surface drainage presently migrates across thick heavily vegetated slopes. The runoff either infiltrates naturally into the ground or sheet flows across developed property before entering Lake Washington. A natural water course borders the property along its' southern property line and has been defined and delineated as a Type 3 stream corridor. This stream corridor conveys the tributary upstream drainage across the southern boundary of the Four Season property, across the Petrie property, and then into Lake Washington. It should be noted that the water course shows no clear definition typical of an open channel with side slopes.

Developed Drainage System:

All hard surfaces from roof areas, patios, walkways, and the access driveway will be collected, conveyed, and discharged directly to Lake Washington in a high-density polyethylene (HDPE) tight-line pipe. Roof downspouts, footing drains, area drains, and trench drains will all be collected on-site via underground piping and conveyed via an at grade HDPE tight-line. Given the elevation of the project's access driveway a pump system will be utilized to control surface drainage from this area. The pump system will be an alternating duplex system (i.e. two pumps) and be provided with safeguards to notify the property owner in the event of a pump failure. To insure that the pumps operate at all times, including during a power outage, a standby generator will be integrated into the project development.

The HDPE conveyance pipe will be anchored to the ground at several locations along its' alignment. Beyond the Four Season property boundary the piping will be placed within a 5' recorded drainage easement (K.C. Rec. No. 7701060821).

Surface Water Quantity & Controlled Discharge

Surface drainage from the water course tributary basin would technically be considered intermittent. Periods during the wetter months, or extreme storm events, channel flow can be observed. During the summer months the open channel is dry. The Four Seasons development will not increase the natural drainage that can be periodically observed within the water course. Since all drainage from the developed site will be tight-lined to Lake Washington, an actual decrease in channel flow from the Four Season property will be realized.

To insure that channel flow remains unrestricted the outfall pipe will be elevated where it crosses the stream channel. The actual location of the elevated crossing will be field located at the time of construction by the project field biologist. No reduction in the channel capacity will occur as a result of the Four Seasons development.

The pipe will be anchored along its' planned alignment (within the drainage easement) to Lake Washington. The point of discharge, and end of the pipe, will be into a constructed concrete channel. The outfall (i.e. end of the pipe) will be located 9' from the existing bulkhead and the concrete outfall structure will be rock-lined, 3' wide, 18" high, and 10' long. The discharge pipe will be anchored to the outfall structure. A cap will be placed over the concrete channel to insure the discharged water remains within the channel prior to discharge into the lake.

The King County Runoff Time Series (KCRTS) hydrologic model was utilized to calculate the 100-year storm event of 0.0071 CFS from the Four Seasons project. The capacity of a 6" HDPE pipe flowing full using Manning's formula is 0.86 CFS at a slope of 2.0%. Based on this analysis a factor of safety of 121 is provided for the Four Season's private tight-line system. A 6" pipe system is more than adequate to safely convey the developed drainage from the project site to Lake Washington.

Conclusion:

Drainage from the proposed project will be collected and conveyed in a tight-line system to Lake Washington. Although it is likely minor landscape areas may bypass the on-site collection points, these areas are expected to be insignificant to the project's overall drainage control. All

hard surfaces such as roof, patio, driveway, walks, etc. will be collected and safely discharged to the lake. Upon completion of the project drainage system and landscaping, no drainage related issues or problems are expected to result from development of the property as planned.

I am hopeful that the above will sufficiently address the concerns regarding the developed drainage from this project. I am hopeful the final review and project approval will be forthcoming in the near future. I thank you in advance for the time that you have committed to this project.

Sincerely,
Litchfield Engineering

Keith A. Litchfield, P.E.

Copy: Paul and Megan Maksimchuck, Four Season Homes
Steven Long, Studio 19 Architects

Attah: Litchfield Engineering Plans dated January 22, 2019