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Technical Memorandum

Prepared for: City of Lake Oswego
Project Title: Stormwater Review for Land Use Cases
BC Project No.: 149790
Subject: Response to written comments following DRC Hearing
LU 17-0065, Stormwater Review for Land Use
2-Parcel Minor Partition
Site Address: 1923 Mapleleaf Court
Applicant: Fieldstone Development

Date: May 3, 2018
To: Leslie Hamilton, AICP, Senior Planner
From: Alissa Maxwell, PE

**EXHIBIT
F-16**

LU 17-0065

Limitations:

This document was prepared solely for the City of Lake Oswego in accordance with professional standards at the time the services were performed and in accordance with the contract between Lake Oswego and Brown and Caldwell dated August 16, 2016. This document is governed by the specific scope of work authorized by Lake Oswego; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by Lake Oswego and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Overview

The summary below responds to written comments submitted to the Development Review Commission (DRC) following a hearing held on April 2, 2018 regarding a 2-Parcel Minor Partition at 1923 Mapleleaf Court. Written testimony was received from the applicant (LU 17-0065, Exhibit F12) and opponents (LU 17-0065 Exhibits G203 through G205). The following review comments are specific to the written testimony related to slope stability and the proposed drainage systems. The basis of this review is the stormwater management provisions of the Lake Oswego Municipal Code (LOC) and Lake Oswego Stormwater Management Manual (LOSWM).

Applicant Testimony

Written testimony was submitted by the applicant in the form of an addendum prepared by RSS. Response specific to the applicant’s testimony on the topic of slope stability is included in Table 1.

Table 1. Response to Applicant Written Testimony, LU 17-0065, Exhibit F-10		
Exhibit	Topic of Testimony	Response
F12	<p>Slope Stability</p> <p>The applicant submitted a slope stability analysis at the location of the rain garden. The analysis was prepared by a registered professional geotechnical engineer using the Simplified Bishop Method in the XSTABL software program. The analysis output shows factors of safety of 4.3 in static and 2.2 in seismic conditions, compared to the required factors of safety of 1.5 in static and 1.1 in seismic conditions.</p>	<p>The LOSWMM does not include guidelines for conducting a slope stability analysis. LOSWMM, Section 2.7.3 requires that developments in locations of potential severe erosion or landslide hazard must submit a report evaluating soil conditions and potential hazards. The applicant’s previous geotechnical report for this application met the criteria in LOSWMM Section 2.7.3.</p> <p>The addendum prepared by RSS includes the following statement: “It is my professional opinion as a licensed geotechnical engineer in the State of Oregon that this site is more than adequate to accommodate the designed and analyzed storm water by Theta Engineering.”</p>

Testimony Neither for Nor Against

No additional written testimony was submitted in this category.

Testimony Opposed

Written testimony was submitted by opponents related to several issues. Responses to the opponent testimony on the topic of slope stability are included in Table 2.

Table 2. Response to Opponent Written Testimony, LU 17-0065, Exhibits G203 through G205		
Exhibit	Topic of Testimony	Response
G203, Item 1 G204	<p>Necessity of Overflow Drywell</p> <p>The opponent letters indicate that the proposed drywell system is required because LOSWMM, Section 4.6.1 requires rain gardens to be designed with overflows that outlet to an approved discharge location.</p>	<p>The rain garden has been designed to fully manage the 10-year, 24-hour design storm, which would meet the requirements of the Stormwater Management Code and LOSWMM.</p> <p>The overflow for a rain garden can be provided through a variety of methods. The overflow could be an overland flow path that follows the natural drainage pattern, or it could be a piped overflow to a</p>



Table 2. Response to Opponent Written Testimony, LU 17-0065, Exhibits G203 through G205

Exhibit	Topic of Testimony	Response
		<p>conveyance system or secondary structure. In Lake Oswego, most infiltration facilities are designed with a surface spillway to serve as an overflow, which allows stormwater runoff exceeding the capacity of the facility to follow the natural drainage pattern.</p> <p>The preliminary design demonstrates feasibility for the rain garden to be designed with a surface spillway that allows overflow to follow the natural drainage pattern. The overflow drywells proposed at the north end of the lot are a redundant system and not necessary to meet the stormwater management requirements of the LOC and LOSWMM.</p>
G203, Item 2, 3, and 4 G204	<p>Slope Stability on Neighboring Properties The opponents request that RSS further investigate the impact of the proposed drainage system on neighboring (downslope) properties by performing a quantitative slope stability analysis. The opponent letters indicate that the appropriate factor of safety for the slope stability analysis should be 1.5 for static conditions and 1.1 for seismic conditions.</p>	<p>The applicant submitted a quantitative slope stability analysis at the location of the proposed rain garden (see Exhibit F12). Exhibit F12 does not include a slope stability analysis at the location of the overflow drywell system. The proposed overflow drywell system is not required to meet the stormwater management requirements of the LOC and LOSWMM.</p>
G203, Item 5	<p>Infiltration Rates The opponents outline the requirements for performing the pilot infiltration test (PIT) method for a more accurate assessment of site infiltration rates.</p>	<p>During this land use application process, the applicant must demonstrate the feasibility of their application. The applicant has provided hand auger infiltration test results to demonstrate the feasibility of infiltrating stormwater at this site. Final design will be based on more detailed information.</p> <p>The application is conditioned to provide a final design and final drainage report, in accordance with the Stormwater Management Code and LOSWMM. Section 3.4.3 of the LOSWMM requires the use of the PIT method to determine infiltration rates for final design.</p>
G203, Item 6	<p>Depth to Groundwater The opponents express concern that the applicant has not established the depth to seasonally high groundwater.</p>	<p>The applicant has documented the expected depth to groundwater and demonstrated that it is feasible to install an infiltration-based facility that meets the minimum separation requirements.</p>
G203, Item 7 G204	<p>Top Elevation of Drywell The opponents express concern that the overflow drywell will not meet the LOSWMM requirement that the top of the drywell be lower than the floor elevation of basements in immediately adjacent buildings.</p>	<p>The overflow drywell is a redundant system and not required to meet the stormwater management requirements of the LOC and LOSWMM.</p> <p>If the applicant chooses to include the drywell in final design, then the drywell would need to meet the requirements of LOSWMM, Section 4.6.4 (including the requirement that the top of the drywell shall be lower than the floor elevation of basements in immediately adjacent buildings).</p>
G204 G205	<p>Drywells on Steep Slopes The opponents indicate that the LOSWMM (4.6.4) prohibits drywells on slopes greater than 25%. The opponents state that the slope calculation should be measured across a larger portion of the property and account for slopes of neighboring properties.</p>	<p>LOSWMM Section 4.6.4 prohibits drywells on slopes of 25% or more. The applicant has submitted a slope analysis (Exhibit E10) and geotechnical report (Exhibit F6). Both documents indicate that the slope at the location of the drywell system is less than 25%. The applicant has also demonstrated feasibility to meet the stormwater management requirements of the LOC and LOSWMM, without use of the overflow drywell.</p>



Table 2. Response to Opponent Written Testimony, LU 17-0065, Exhibits G203 through G205

Exhibit	Topic of Testimony	Response
		<p>For the infiltration rain garden, LOSWMM, Section 3.4.3 requires a geotechnical report to determine appropriate locations of infiltration facilities on slopes that exceed 15% or are within 200 feet of a steep slope hazard area or landslide hazard area. The applicant has submitted a geotechnical report to support the placement of the proposed rain garden (See Exhibit F12).</p>

