Stormwater Memo

Hayden Bridge Tentative Subdivision

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A. Project Overview and Description

Drainage Report

This Storm Drainage Report has been prepared to evaluate the feasibility of providing adequate stormwater retention and meeting the Site Performance Standard specified in Springfield Development Code (SDC) 4.3.110(C)(2)(a), for a proposed subdivision located between the intersection of 19th Street and Hayden Bridge Road and the intersection of 20th Street and Otto Street in Springfield, Oregon. The project area consists of four tax lots: Tax Map 17-03-25-12, Tax Lots #2100, #7800, #8100, and #7900, comprising a total of 2.05 acres of private property.

The objective of this analysis is to determine the minimum stormwater facilities necessary to ensure that all impervious surfaces receive retention prior to discharge into the public stormwater system, in full compliance with the City of Springfield's stormwater management standards.

This report has been prepared in accordance with the requirements set forth in SDC 4.3.100. The following sections outline the assumptions, methodologies, and supporting data used to complete the stormwater retention feasibility assessment for the proposed subdivision.

B. Project Narrative

Existing Conditions

Topography

The project area consists of four tax lots, two of which are developed with single-family residences. The remaining two lots are undeveloped and characterized primarily by existing vegetation. The northerly residence is accessed via a gravel driveway; the southerly residence includes an asphalt and concrete driveway.

Elevation

The site exhibits relatively mild topographic variation. Overall, the ground surface slopes from east to west, with localized high and low points distributed across the approximately 2-acre area. Based on existing grades, site drainage generally flows toward 19th Street.

Existing Stormwater System

No private stormwater infrastructure currently exists on the site. Based on existing conditions, stormwater is presumed to infiltrate directly into on-site soils or surface drain to 19th Street. A public stormwater main is located adjacent to the westerly boundary of the property within 19th Street, providing a potential connection point for future improvements.

Soils

According to the USDA Web Soil Survey (WSS), the site is underlain predominantly by the Malabon–Urban Land Complex, classified as Hydrologic Soil Group (HSG) C. This soil is considered moderately well-drained, allowing water to infiltrate, but it exhibits slow to moderate permeability, which may influence the design of stormwater infiltration facilities. However, experience with similar soils indicates that infiltration characteristics generally improve 4- to 6-feet below grade and may be adequate for some stormwater

retention. A geotechnical investigation at selected locations will be conducted to verify subsurface permeability.

Well Head Time of Travel Zone

The project site is located within the 5-10 and 10-20 Time of Travel Zones of (TOTZ) of the City's Drinking Water Protection (DWP) Overlay. These zones correspond to areas with longer groundwater time-of-travel and therefore represent lower-risk portions of the wellhead protection area where potential contaminants would require many years to migrate to a public drinking water well.

Because this area is considered low susceptibility, SDC 3.3.200 does not impose additional or heightened stormwater treatment requirements for residential use beyond the standard City stormwater regulations.

Proposed Conditions

The northerly residence located on Tax Lot 2100 will remain. The southerly residence is scheduled for removal, and the remaining land will be incorporated into the proposed subdivision. The subdivision will include 19 new residential lots and two non-buildable lots, Lot A and Lot B, which will incorporate public utilities and private drive aisles to accommodate both private access and emergency vehicle circulation.

Although the northerly driveway will provide a connection to both 19th Street and 20th Street, private access will only be taken from 20th Street, while the connection on 19th Street will allow a secondary access for emergency access requirements. The southerly driveway will provide access exclusively from 20th Street.

Stormwater Description

All impervious surfaces within the development are proposed to drain to an onsite soakage trench located within Lot 16, near the westerly terminus of Lot B. An overflow system will be incorporated to convey excess runoff to the public storm system in 19th Street for storm events that exceed the assumed design infiltration capacity of 1.4-inches per hour.

Preliminary sizing assumptions indicate that, if a higher-permeability subsurface layer is present and capable of supporting a design infiltration rate of approximately 2-inches per hour, the required soakage trench would consist of a minimum surface area of roughly 1,000 square feet with a depth of 5.5-feet, which gives approximately 2,200 cubic feet of storage area.

Based on the conceptual layout, placement of the soakage trench beneath the shared access easement serving Lots 15 and 16, as well as within limited portions of the adjoining lot frontages, appears feasible. Final sizing will be dependent on the results of the geotechnical field investigation, including measured infiltration rates and the depth to water table. Should the measured infiltration rates be lower than those assumed in this preliminary analysis, the stormwater facility will be redesigned to ensure compliance with applicable city design standards and stormwater management requirements.

Runoff Curve Numbers

The runoff for the impervious areas has been calculated using the Autodesk Storm and Sanitary Analysis. The calculator determines runoff using the Santa Barbara Urban Hydrograph (SBUH) Method and NRCS 24-Hour Type 1A Hyetograph as outlined in SDC Apx DCB (F)(1). The facility capacity is based on the requirements and facility details found in SDC Apx DCB (F)(1) and SDC Apx DCD (A).

For analysis purposes, each basin of the property required the following information as input data for the computer model:

- Impervious Area (Ai): 1.10 acres
- Curve Number (CNi): 98
- Travel Time (Tc): 5 min
- Total Precipitation: 1.4-inches (water quality) and 5.18-inches (25-year)

C. Analysis

Figure 1 below shows the peak runoff rates, in cubic feet per second (cfs), for the proposed basin (Subbasin 1) and the existing basin (Subbasin 2).

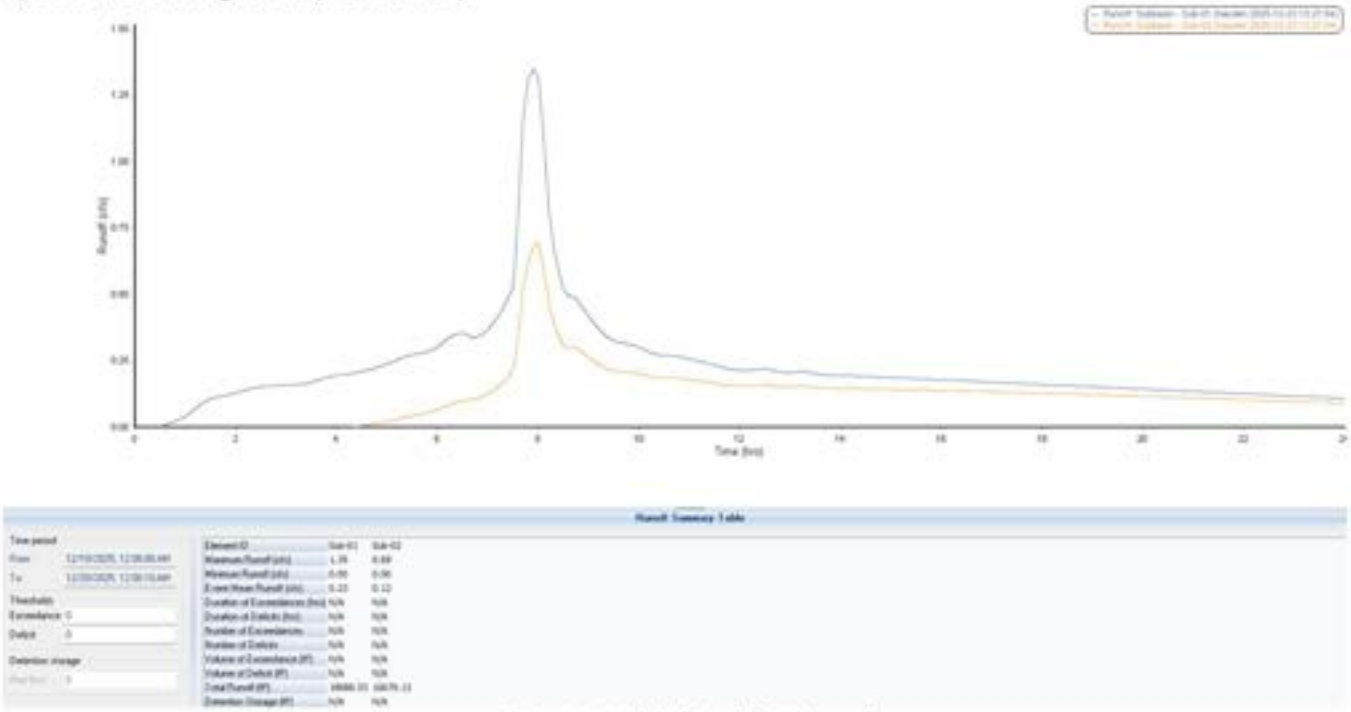

Figure 1. Modeled Runoff Hydrographs

Figure 2 below shows the modeled storage depth and exfiltration rate over time for the proposed soakage trench (Node Stor-o1) during the 25-year storm event. The upper plot shows the water depth (feet) versus time (hours) within the storage facility and the lower plot shows the exfiltration rate (cfs) versus time, representing the rate at which stored stormwater exists the facility.

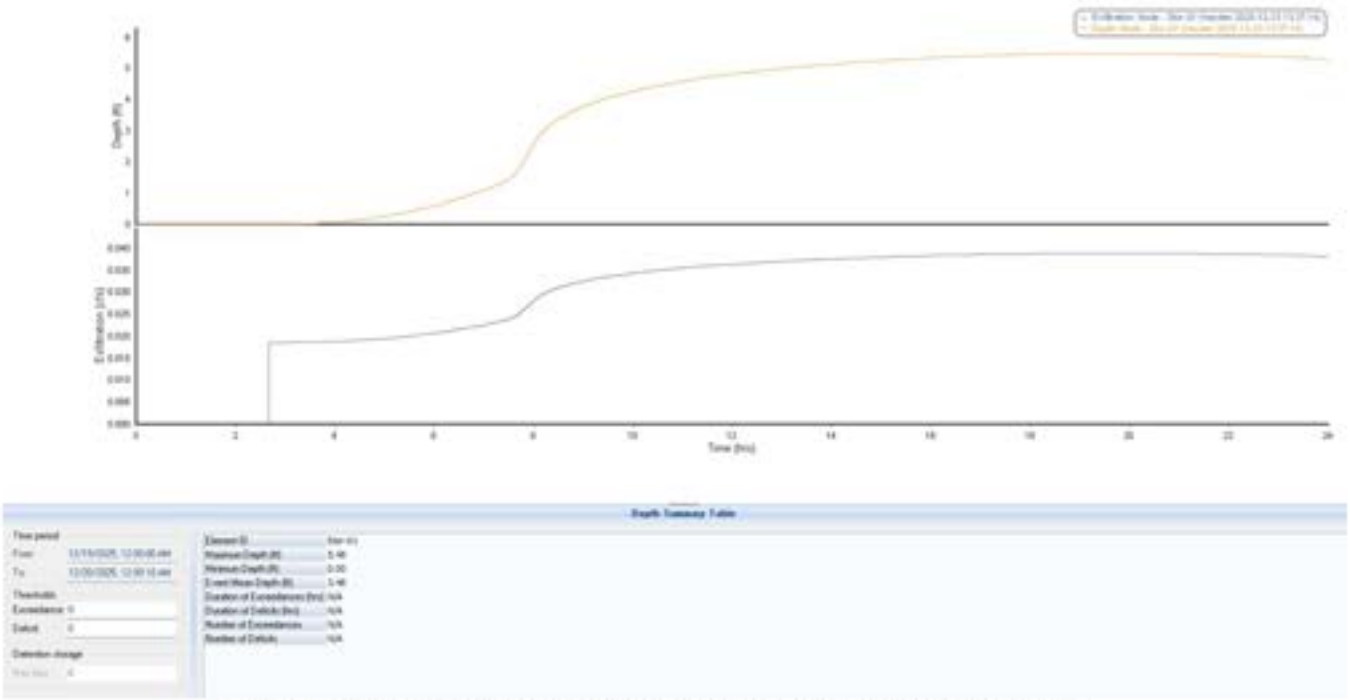

Figure 2. Storage Depth and Exfiltration Hydrographs for the Proposed Soakage Trench

D. Engineering Conclusions

Based on the requirements of the SDC and the assumption that no downstream deficiencies exist beyond the subject site, the proposed stormwater management approach demonstrates feasibility. Should downstream deficiencies be identified in the future, additional flow control will be evaluated and the stormwater system will be modified as necessary to comply with applicable requirements.