Reichhardt & Ebe
ENGINEERING INC

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CITY OF SUMAS

February 6, 2020

To: Rollin Harper
City of Sumas
From: Dale L. Buys, P.E.

RE: Sumas Concrete Products Culvert Analysis – Response to Comments #1

To: Mr. Harper:

Thank you for completing your review of the Sumas Concrete Products Culvert Analysis. Comments were received in a letter from Jean-Paul (J.P.) Slagle, PE at Freeland and Associates, Inc. dated February 3, 2020. The following are comments in plain text and responses to comments in red text:

1. [2/3/2020] Table III-2.3.2 – Runoff Curve Numbers for Selected Agricultural, Suburban, and Urban Areas within the 2014 Department of Ecology Stormwater Management Manual for Western Washington identifies curve number for a 24-hour duration storm and typical antecedent soil moisture condition (AMC II) preceding 24-hour storms. Antecedent soil moisture condition III (AMC III) represents a scenario that has heavy or light rainfall and low temperatures having occurred during the previous five days, such as the site photos presented. Modeling with an AMC III may be more appropriate.
   [2/6/2020] Table 1 on Page 2 of the evaluation has been updated from an AMC II to AMC III using Equation 5.5.8 from *Applied Hydrology* by Ven Te Chow, et al. McGraw Hill (1998).

2. [2/3/2020] Does the BNSF Railroad line intercept flows from areas south of Halverstick Road and convey them northeast to the project site?
   [2/6/2020] Per Google Earth the BNSF Railroad appeared to sit at a higher elevation than the surrounding area. It was assumed during analysis that any area south of the BNSF Railroad tracks would be conveyed south to other tributaries of Johnson Creek. The assumption has been added to Page 1 of the evaluation.

3. It would be helpful to locate the photos on a map so they can be referenced.
   [2/6/2020] A map with photo location callouts has been added to Appendix B of the evaluation.

4. Please show time of concentrations for each basin on a map.
   [2/6/2020] Time of concentration values were added to the Basin Map Exhibit in Appendix A of the evaluation.

5. Time of concentration calculations for Basin 2 and Basin 3 use 300 feet of sheet flow. Per USDA/NRCS Urban Hydrology for Small Watersheds TR55, the maximum sheet flow allowable is 300 feet.
   https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044171.pdf (TR55 Link)
   However, more recent studies presented in USDA/NRCS Part 630 Hydrology National Engineering Handbook identify that sheet flow falls far below the maximum 300 feet. See Table 15-2 for recommended lengths. The link is below for convenience.
   https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=27002.wba (Part 630 Link)
   [2/6/2020] Stormshed model in Appendix E has been updated to appropriate sheet flow values.

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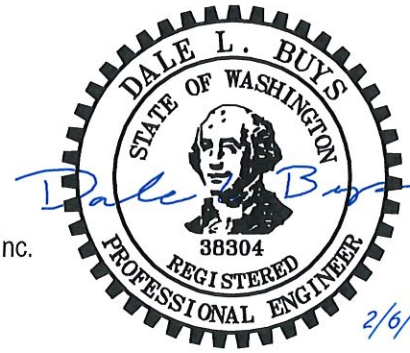
Let me know if we can be of further assistance in this matter.

Sincerely,



Dale L. Buys, P.E.
Reichhardt & Ebe Engineering, Inc.

2/6/20

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