CASCADE
ENGINEERING GROUP, P.S., INC.

MEMORANDUM

DATE: October 25, 2019

TO: **Mr. Randy Bishop – Governors Point LLC**

FROM: Aaron Jarnagin, P.E.

SUBJECT: **Governors Point – Roadside Barrier Evaluation**

PROJECT: RPAC0004

COPIES: Mr. Wayne Schwandt – Rimland Pacific

PROJECT DESCRIPTION

The Governor's Point development, which lies within Whatcom County, is proposed to consist of 16 single-family homes. The proposed project will upgrade approximately 6,800 ft of the existing gravel roads to an 18-ft wide paved surface with shoulders ranging from 1ft to 4ft. The project site consists of relatively steep, forested terrain with the existing gravel roads cut into side slopes ranging from 6H:1V to 1.5H:1V. The proposed access roads qualify as a "Rural – Minor Access" Road with an expected Average Daily Trip (ADT) count of less than 160. Design Speed for the improved roads is 25mph.

ROADSIDE SAFETY EVALUATION

Evaluation of roadside barriers was performed with design guidance from the *WSDOT Design Manual Chapter 1600: Roadside Safety (2019)* and *AASHTO Roadside Design Guide (2011).* WSDOT does not provide specific guidance for low speed (<40mph), low volume roads (<400 ADT). Per the WSDOT Manual, routes with ADT's under 400 are evaluated on a case-by-case basis. The *AASHTO Roadside Design Guide* provides roadside safety considerations for low volume roads, however these are general guidelines and do not provide specific guardrail warrants for low volume roads. In general, roadside barriers are less warranted for low-volume roads and similar to the WSDOT guidelines should be evaluated on a case-by-case basis.

In our evaluation, the guidelines to warrant guardrail consider two roadside conditions: embankment cross sections and fixed objects. As the proposed roads traverse through heavily wooded areas, trees located just outside the road shoulder are the primary roadside obstacle. Given the low speed (25mph) of the proposed roads, traffic barriers for roadside obstacles are not warranted as drivers in low speed situations are more likely to control their vehicle and avoid a roadside obstacle than in a high-speed situation. Additionally, due to the narrow shoulders of the proposed road section, installation of a guardrail would likely cause a greater

obstacle for a driver by narrowing the shoulder even further. A final consideration is the desire by the property owner to maintain as unobtrusive roadway as possible for the aesthetic enjoyment of individuals using the area as a future park.

When considering the need for guardrail relative to roadside embankments, the height of the embankment and side slope are the principle physical factors. As shown in Figure 5-1(b) of the *AASHTO Roadside Design Guide*, barriers are not normally considered for embankment hazards where the slope is less than 33% (3:1) as this slope is considered low hazard.

In this evaluation, locations with road foreslopes steeper than 2.5H:1V were identified as having steep slope hazards, specifically around curves. In order to reduce the probability of vehicles leaving the roadway in these locations, roadside delineators consisting of post mounted reflectors will be installed at 50ft spacing.

SUMMARY

Other than post-mounted reflectors described above, no other roadside barriers are proposed.