

Donna Howes, P.Eng., PTOE, FEC

Howes Technical Advantage Ltd.

927 Beaconsfield Road
North Vancouver, BC V7R 1S7

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Mr. Jamie Harper
Sterling Pacific Developments
Unit 14 - 636 Clyde Ave
West Vancouver, BC V7T 1E1

Dear Jamie

Re: Daffodil Development, West Vancouver, BC – Sightlines for Accesses

This letter is a response to the request from the District of West Vancouver (DWV) for a review of the sightlines at the driveway accesses at Westport Road and at Daffodil Avenue for the proposed Daffodil Development, District Lot 1374 in West Vancouver, BC. This review is intended to accompany the updated Creus Engineering Ltd. (Creus) design as part of the submission to DWV for approvals.

Understanding and Scope:

The access to the site is proposed via the existing driveway locations at Westport Road and at Daffodil Drive. These driveways currently provide access to one single family home which will continue in the future. As part of the rezoning application, the District has required that a sightline review be undertaken for the proposed upgraded accesses. Creus has completed a site plan with the driveway accesses (Reference **Attachment A**). A meeting was held with Creus to discuss the design and the sightlines.

DWV has requested the preparation of a road safety design report addressing the sightlines and safety of the proposed intersections with Daffodil Drive and Westport Road¹. A follow up meeting was held with DWV to discuss the ambient conditions of Westport Road.

Site Visit and Observations:

Site visits were undertaken in March and April 2020. Observations are listed below together with photographs. The measurements were taken on site as an approximate measure and were not surveyed. However, they have been verified with the Creus drawings.

Westport Road:

- This is a two-lane road with curbs on both sides and a width of approximately 7m.
- There is a sidewalk on the east side.
- The road curves both horizontally and vertically.
- The grade is approximately 8%.
- There are many driveway connections to this road both north and south of the site access.
- In this section of the roadway, the speed limit is 50km/h.

¹ Letter from DWV Ref 1050-20-13-003, dated August 10, 2020 – Section 2.iii.B.ii.d

Westport Road - Proposed Driveway:

- The existing location is shown in an aerial plan. See **Figure 1**.
- The proposed driveway will be aligned in roughly the same position as the existing driveway as in the Creus drawing and will be 6.5m wide.
- Geometry:
 - The intersection with Westport Road is located on the outside curve of the road.
 - Although the access point is adjacent to the railway right of way, the piers do not affect sightlines.
- Sightlines:
 - Looking left from driveway – sight distance is ~ 75m. See **Figure 2**
 - Looking right from driveway – sight distance is ~ 150m. See **Figure 3**



Figure 1: Existing Driveway on Westport Road – Aerial plan view (DWV GeoWeb)



Figure 2: Existing Driveway – Looking left



Figure 3: Existing Driveway – Looking right

Daffodil Drive:

- This is a two-lane road with a rural cross section.
- The road connects from Marine Drive and has a 90 degree turn at the access to the proposed development.
- The grade is relatively flat.
- The road is narrow with a width of approximately 5.1m with hedges on both sides.
- There are no sidewalks.
- Speed limit is 50km/h.

Daffodil Drive - Proposed Driveway Access:

- The existing location is shown in an aerial plan. See **Figure 4**.
- The proposed driveway will be located in the same position and aligned as in the Creus drawing and will be 6.5m wide.
- Geometry:
 - The intersection will operate as a three-way intersection as it does presently.
 - There is an existing driveway to Lot 5619 and this driveway will be located within the north leg of the intersection.
- Sightlines: The sightlines from the west leg looking south are affected by a large hedge which is located in the road right of way. There is limited sight distance currently. The north west corner of the intersection has some shrubs which restrict sightlines from the north leg looking east.
- Photographs of the intersection are referenced in **Figure 5, Figure 6, Figure 7, and Figure 8**.



Figure 4: Existing Driveway on Daffodil Drive – Aerial plan view (DWV GeoWeb)



Figure 5: Existing Driveway – Looking south



Figure 6: Daffodil Drive – Looking south



Figure 7: Daffodil Drive – Looking north



Figure 8: Daffodil Drive – Looking west

Assessment

This assessment summarizes the sightlines as observed on site, with a confirmation of the layout using the Creus design drawings provided, and the application of standard specifications.

The reference for this analysis is the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads². The TAC guideline reference is for Intersections with Stop Control on the Minor Road – Table 9.9.4 and Table 9.9.6.

Westport Road Driveway:

1. *Sightlines:*

- a. Vehicle exiting the driveway turning left: See **Figure 9**
 - i. The design intersection sight distance for a vehicle turning left is 105m.
 - ii. For a vehicle approaching from the south, the existing sightline is 150m which exceeds this standard.
 - iii. For a vehicle approaching from the north, the existing sightline is 75m which is 30m less than the standard.
- b. Vehicle exiting the driveway turning right:
 - i. The design intersection sight distance for a vehicle turning right is 90m. This only applies to vehicles approaching from the north.
 - ii. For a vehicle approaching from the north, the existing sightline is 75m which is 15m less than the standard.

² Transportation Association of Canada Geometric Design Guide for Canadian Road, June 2017, Chapter 9, Section 9.9

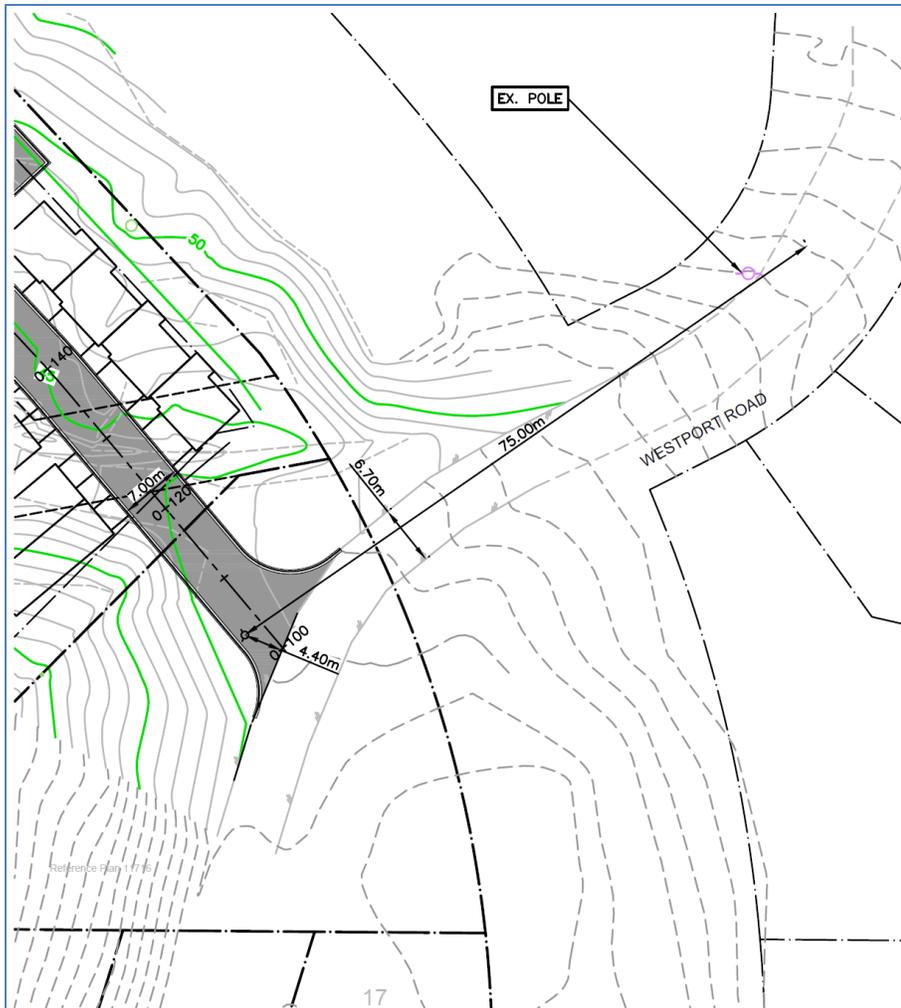


Figure 9: Westport Road Driveway - Intersection Sight Lines current design

2. Assessment:

- a. The current conditions of Westport Road point to a number of characteristics which are constrained by the topography and current geometry of the road. These include:
 - i. There are numerous accesses and road intersections along the length of Westport Road that do not meet the standard sightline guidelines.
 - ii. The radius of the centreline of Westport Road is 48m at the proposed driveway. Measurements taken of the road centreline of Westport Road, north of the driveway, show that there are tighter radii ranging from 30m to 46m which would indicate associated restricted sightlines. This is shown in **Figure 10**.
 - iii. DWV has been monitoring the speed on Westport Road and has implemented a dynamic interactive speed sign at 5654 Westport Road. This has a radar device and an LED display.
 - iv. South of the proposed driveway access, there is a 30km/h regulated playground speed limit which starts at Westport Ct, 250m south of the driveway.

- v. The current data³ obtained for the speed on Westport Road was collected at 5671 Westport Road. The results show an 85 percentile⁴ speed range of 45.1km/h to 46.9km/h for both directions at this location.
- b. The ambient conditions of Westport Road point to the fact that a driver, heading southbound on Westport Road, would have an expectation for changes in vertical and horizontal curvature on the alignment and that travel speeds would be slow as a result. There would also be the expectation for driveways accessing the road.

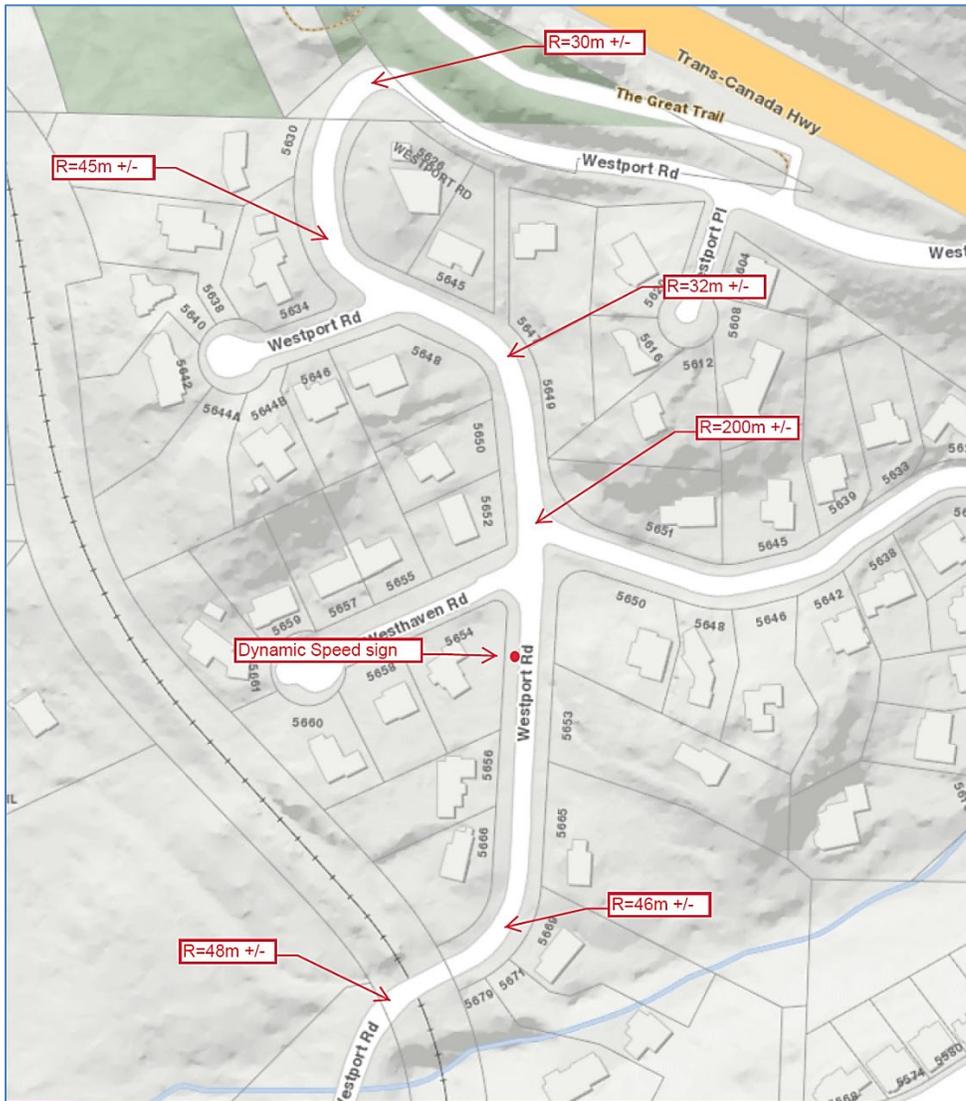


Figure 10: Westport Road – Centreline radii and Speed Sign Location

³ 24h Road Tube Count, September 2018

⁴ Speed that 85% of the vehicles are travelling at or slower, Traffic Engineering Handbook, 7th Edition, 2016, ITE.

3. *Sightline Mitigation Measures:*

- a. There is a need to mitigate the shorter sight distance to the north of the driveway. It is recommended that the following measures be included in the design:
 - i. Removal of shrubbery on the west shoulder on the frontage of Lot 5666 to improve the sightlines and visibility. It is recommended that this area be included in the regular boulevard maintenance by DWV.
 - ii. Installation of a “reverse curve warning sign” sign (WA-5R) with a speed advisory tab for 30km/h on the southbound approach in front of 5656 Westport Road. This will warn the driver of the tight reverse curve section approaching and of the recommended lower travel speed.
 - iii. Installation of the “hidden driveway” sign (WA-13) on the southbound approach at least 50m north of the driveway located just in advance of the hydro pole to warn the driver of the access.
 - iv. Installation of a streetlight at the driveway access be included in the design and placed to illuminate the driveway. This will improve visibility of the driveway at night.
- b. With these improvements listed above, the driveway sightlines will comply with the standards and provide a safer access point.

4. *Other Considerations:*

- a. **Suggested Driveway Improvement:** With the detailed design of the driveway, consideration should be given to locate the driveway as far south as possible with the current topography. In this way, a slight improvement of the sightlines can be achieved under the current ambient conditions. This will improve the safety of the intersection but is not required.
- b. **Reduction in the speed limit:** Discussions have taken place with DWV for a consideration of a speed limit reduction for Westport Road. This would better reflect the current road geometry and provide some continuity south to the 30km/h playground speed restrictions. This suggestion needs further review by DWV for the whole corridor and would need to include a full review of the road operation.

Daffodil Drive Access:

1. **Traffic Control:** It is proposed to implement a three way stop intersection. This will improve the sightline assessment.
2. **Driveways:** There is an existing driveway to Lot 5619 and this driveway will be located within the north leg of the intersection.
3. **Sightlines:**
 - a. Vehicle approaching the intersection northbound (on the south leg):
 - i. The design intersection stopping sight distance for a vehicle approaching the intersection is 20m for 20km/h and 35m for 30km/h.
 - ii. An improved sight triangle is needed for the south west corner of the intersection to allow for this sight distance. The existing hedge blocks sightlines for vehicles at the stop sign of the west leg to be able to see vehicles approaching from the south.
 - b. Vehicle approaching the intersection southbound (on the north leg):
 - i. The design intersection stopping sight distance for a vehicle approaching the intersection is 20m for 20km/h and 35m for 30km/h.
 - ii. In the north west corner of the intersection, sightlines are affected by the shrubbery in that area.

4. Mitigation measures:

- a. Some of the hedge will need to be removed in the south west corner of the intersection to allow for sightlines. The extent of the hedge removal is to be confirmed in the design.
- b. In the north west corner of the intersection, removal of some of the existing shrubbery will improve the sightlines in that area.
- c. Local road widening at the intersection may be required to allow for traffic manoeuvres. It is proposed that this is checked at the detailed design stage.

Conclusions

The proposed driveway on Westport Road will meet the standards for sightlines with the mitigation measures that include removing shrubbery from the west boulevard, installing a southbound curve warning sign (30km/h) and a hidden driveway sign. In addition, driveway illumination will improve visibility at night. It is suggested that the possibility to relocate the new driveway further south be explored with detailed design which would further improve sightlines.

The operation of the Westport Road corridor and the review of the regulation speed limit will need further review by DWV.

The proposed driveway at Daffodil Drive will need a three-way stop for traffic control. Mitigation measures for sightlines include the removal of shrubs in the north west corner and part of hedge in the south-west corner to improve sightlines.

Please advise if you require any further information.

Respectfully submitted,



Donna Howes, P.Eng., PTOE, FEC



Certified by Engineers and Geoscientists of BC

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