



November 9, 2020

Nautical Lands Contactors Inc.
700 Finley Avenue, Unit #4
Ajax, ON
L1S 3Z2

Attn: Peter Gregor, B. Tech, Arch. Sci., PMP
VP of Planning and Design

Re: Wellings of Picton, Phase 3
Sight Line Evaluation
Our File No. 180-4466

BELLEVILLE
(HEAD OFFICE)
1-71 Millenium Pkwy.
Belleville ON K8N 4Z5
Tel: 613-969-1111
info@jewelleng.ca

TOLL FREE
1-800-966-4338

KINGSTON
208-4 Cataraqui St.
Kingston ON K7K 1Z7
Tel: 613-389-7250
kingston@jewelleng.ca

MISSISSAUGA
200A-2155 Leanne Blvd.
Mississauga ON L5K 2K8
Tel: 905-855-1592
mississauga@jewelleng.ca

www.jewelleng.ca

Mr. Gregor:

It is understood that Nautical Lands Contractors Inc. (NLC) is proposing a townhouse development on County Rd 49 in Picton. The development will be located north of the Wellings of Picton condominium and the HJ McFarland Memorial Home. Through the review process, the County of Prince Edward (the County) has expressed concerns regarding sightlines at the proposed site entrance due to a horizontal/vertical curve north of the entrance on County Rd 49.

The development property has two (2) existing entrances into their site, one will be abandoned and the other will be upgraded. For the purposes of this review, the southern entrance will be denoted Entrance A and the northern entrance denoted Entrance B. Entrance A is located at the south limit of the property frontage and Entrance B is located in the middle of the property frontage and currently serves as the primary access point. In previous development site plans, Entrance B was maintained as the site access point. Sightlines at this entrance were evaluated as part of the Traffic Impact Statement dated February 27, 2019.

After discussion with the County and the Owner, the development site plan has been revised and Entrance A is now proposed as the site access point. The existing Entrance B would be abandoned/removed. Accordingly, a sightline evaluation for Entrance A was completed and the results of the review are detailed herein.



**Professional Engineers
Ontario**

Authorized by the Association of Professional Engineers
of Ontario to offer professional engineering services.



In order to facilitate the sightline evaluation, Jewell completed a field visit on November 3, 2020. Based on field measurements completed at the site visit, the sight distance available at Entrance A is approximately 125 m.

The sightlines at Entrance A were analyzed against the Transportation Association of Canada Geometric Design Guide for Canadian Roads (TAC Manual) guidelines.

The TAC Manual states:

- “Generally, the design of private or public access to roads should be treated in the same way as roadway intersection design.” (TAC 8.4)
- “A driver entering the road from an access should have an unobstructed view of the whole intersection and of a length of the intersecting road sufficient to allow collision free movement through the intersection. Both the horizontal sight triangle and the vertical alignment should be checked so that the minimum intersection sight distance is provided.” (TAC 8.4.6)
- “The minimum sight distance criterion for vehicles approaching an intersection, or travelling along a turning roadway, is stopping sight distance based on design speed. However, due to the relatively complex situations that drivers often encounter at intersections, it is desirable to provide more than the minimum stopping sight distance to enhance safety... Intersection sight distance is defined as the sight distance available from a point where vehicles are required to stop on the intersecting road, while drivers are looking left and right along the major roadway, before entering the intersection. The intersection sight distance is adequate when it allows the design vehicles to safely make all the maneuvers that are permitted by the layout...without significantly affecting vehicles travelling on the main roadway” (TAC 9.8)
- “Intersection sight distance criteria for stop-controlled intersections are longer than the minimum stopping sight distance to allow the intersection to operate smoothly. Minor road vehicle operators can wait until they can proceed safely without forcing a major road vehicle to slow to less than 70% of their initial speed.” (TAC 9.9.2.3)

Per the TAC Manual, the desired sight distance to be provided at the site entrance is the intersection sight distance. This would permit vehicles to exit the site without forcing vehicles on County Rd 49 to slow to less than 70% of their initial speed. The minimum sight distance to be provided at the site entrance is the stopping sight distance. This would ensure that vehicles on County Rd 49 have sufficient time to bring their vehicles to a stop if a vehicle exits the site.

As part of previous work completed in the Traffic Impact Statement dated February 27, 2019, Jewell completed a “reality check” of the key design factor - vehicle speed (the posted speed is 60 km/h). On Thursday February 28, 2019, a sample random spot speed survey was completed of the southbound traffic on County Rd 49, between 2:00 and 4:00 pm, whereby 56 vehicles were observed with an average speed of 65 km/h and range of 50 - 82 km/h, therefore a design speed of 70 km/h was selected for the sightline evaluation. However, it is understood that

there have been discussions with the County regarding reducing the speed limit in this area to 50km/h. Accordingly, a design speed of 60km/h was also investigated.

Calculating the desired sight distance - intersection sight distance - using the TAC Manual Chapter 9, Case B1 provides the intersection sight distance recommended for a left turn from a stop control on the minor road (which is the critical movement). Time gap and design speed of the major road are used in calculating the Intersection Sight Distance (ISD) as follows:

$$ISD = 0.278(V_{major})(T_g)$$

Where: ISD = intersection sight distance (m)
 V_{major} = design speed of the major road (km/h)
 T_g = time gap for minor road vehicle to enter the major road (s)

Entrance A is calculated using a time gap equal to a passenger car (7.5 s) since this entrance serves residential traffic. Thus, the following intersection sight distance is desired for left turning vehicles exiting the site at Entrance A:

- 146.0 m (rounded to 150 m) for a design speed of 70km/h (posted speed of 60km/h); or
- 125.1 m (rounded to 130 m) for a design speed of 60km/h (posted speed of 50km/h).

To determine if there is a safety concern, the stopping sight distance was investigated for Entrance A to determine if the minimum (rather than the desired) sight distance can be provided at the entrance. Stopping sight distance is the minimum distance required for a driver on County Road 49 to perceive a concern and bring the vehicle to a stop.

Per Chapter 2 of the TAC Manual, design speed, brake reaction time, and deceleration rate are used in calculating the minimum Stopping Sight Distance (SSD) as follows:

$$SSD = 0.278Vt + 0.039(V^2/a)$$

Where: SSD = stopping sight distance (m)
 V = design speed (km/h)
 t = brake reaction time (2.5 s)
 a = deceleration rate (3.4 m/s²)

The resulting stopping sight distance for a passenger car is 105m at a design speed of 70 km/h.

As noted previously, the sight distance available at Entrance A was determined to be approximately 125m. This meets the unrounded intersection sight distance requirement for a design speed of 60km/h (posted speed of 50km/h) but is less than the desired intersection sight distance for a 70km/h design speed (posted speed of 60km/h). Providing less than the desired intersection sight distance means that vehicles may not be able to exit the site without forcing southbound vehicles on County Road 49 to slow to less than 70% of their initial speed. It does not necessarily mean that there is a safety issue, rather there may be an operational impact on the major road (requiring drivers on County Road 49 to slow to less than 70% of their original speed). In this case, the sight distance available at Entrance A (125m) exceeds the minimum sight distance (stopping sight distance) for a 70km/h design speed (posted speed of 60km/h) of 105m.

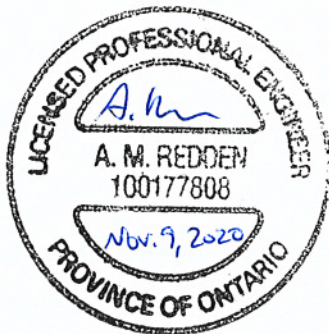
Thus, if County Road 49 remains posted as a 60km/h road, cars exiting the site at Entrance A may force southbound vehicles on County Rd 49 to slow to less than 70% of their initial speed but sufficient sight distance is provided to permit vehicles on County Rd 49 to stop if necessary, therefore no safety concerns are noted.

If the posted speed on County Road 49 north of the site is reduced to 50km/h, cars exiting the site at Entrance A will have sufficient sight distance to exit the site without forcing southbound vehicles on County Rd 49 to slow to less than 70% of their initial speed and sufficient sight distance is provided to permit vehicles on County Rd 49 to stop if necessary.

Therefore, minimum TAC requirements for the sight distance at Entrance A will be met regardless of whether the posted speed is adjusted or not. A Wa-13a "Intersection Sign (Controlled)" could be placed on County Rd 49 north of the entrance to increase safety and awareness of Entrance A for southbound vehicles if desired.

If you have any questions, please feel free to contact the undersigned.

Sincerely,



Amanda Redden, P.Eng.
Jewell Engineering Inc.