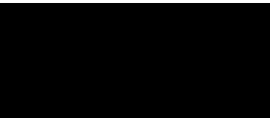


03 April 2023
Project: (230114)

Anthony Vacca



**RE: 8178 THOROLD STONE ROAD, NIAGARA FALLS
ACCESS REVIEW**

The property located at 8178 Thorold Stone Road is an existing residential dwelling with direct access provided to Thorold Stone Road.

The property owner proposes a rezoning and severance of a new single-family lot with the construction of an additional driveway connection to Thorold Stone Road. The driveway connections are proposed to be designed 3.0 metres in width spaced, approximately 1.6 metres (curb to curb) and 4.0 metres (centreline to centreline). Each lot will also have an on-site turnaround measuring 6.0 metres by 3.0 metres to avoid reversing onto Thorold Stone Road.

The site plan is appended to this letter.

This technical memorandum provides guidance and opinion regarding the proposed accesses arrangement.

Thorold Stone Road

Thorold Stone Road is an east-west arterial road under the Region of Niagara jurisdiction that is comprised of four travel lanes and a posted speed limit of 50 km/h. The roadway has no cycling lanes; however, sidewalks are provided on both the north and south sides of the road. The roadway is also identified with stopping prohibitions on both sides of the roadway.

Contrary to access management policies along arterial roadways, this section of Thorold Stone Road between Kalar Road and Brookdale Drive provides access to several single-family detached dwelling units, predominately along the south side of the road. As a result, driver expectations would not be impacted by adding a new driveway connection to Thorold Stone Road. Additionally, a review of the existing driveway connection to single-family lots along Thorold Stone Road confirms a similar spacing of 1.6 metres between driveways is provided (8166 and 8154 Thorold Stone Road).

Discussions with Niagara Region also confirm that even though no stopping restrictions are provided along Thorold Stone Road, a temporary lane occupancy permit can be obtained. This will facilitate the loading of supplies and equipment within the curb lane of Thorold Stone Road by either loading directly from the road or stopping and reversing into the site for construction purposes.

Access Review

To assist in determining the appropriateness of the access locations, the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads¹ was reviewed.

Corner Clearances at Major Intersections

TAC Chapter 8.8 (Corner Clearances at Major Intersection), Section 8.8.1 (General) states, "Corner clearance is the distance from an intersection to the nearest access upstream or downstream of it. Corner clearance is measured from the near curb of the cross roadway to the near edge of the access throat. It consists of three components: the curb return radius at the intersection, a length of tangent, and the curb return radius or flare dimension at the driveway. Inadequate corner clearance between accesses and intersections along a major road, such as a major arterial, can create operational issues."

TAC has been reviewed to determine sufficiency of the corner clearance from a major intersection. The suggested corner clearances, as stipulated by TAC, are as follows:

► Arterials

- 70 metres (curb radii to curb radii) downstream and upstream of a signalized-intersection.

The existing and proposed driveway connection to 8178 Thorold Stone Road will be located 90 metres (curb radii to curb radii) downstream of the major intersection of Thorold Stone Road and Kalar Road Line.

The existing and proposed driveway connections exceed the corner clearance guidelines stipulated by TAC.

Spacing Guidelines

As spacing criteria along arterial roadways for driveways is not described within TAC and the City of Niagara Falls and Niagara Region do not have access management guidelines, we have relied on the driveway spacing criteria along local and collector roadways as outlined by TAC given the proposed driveway can be considered low volume.

¹ Geometric Design Guide for Canadian Roads, Transportation Association of Canada, 2017



TAC Chapter 8.9 (Driveways), Section 8.9.8 (Spacing of Adjacent Driveways) states, “In addition to the corner clearance considerations described in Section 8.9.7, driveways are normally located in consideration of their physical relationships to existing or possible future driveways. The following three criteria need to be considered: minimum spacing between driveways, minimum offset to property line, maximum number of driveways based on property frontage.”

TAC suggests a minimum of 1.0-metre spacing is recommended between adjacent low-volume driveways for residential properties along local and collector roadways. A maximum of two driveways for frontages between 16 and 50 metres is permitted.

The proposed driveway connections are located away from the property line, exceed the driveway spacing guidelines, and meet the guidelines to permit two connections based on the size of the frontage to Thorold Stone Road, as stipulated by TAC. For low-volume roadways, such as locals and most collectors, the spatial relationship between driveways on opposite sides of the road is not a necessary design consideration. Similarly, this relationship does not impact traffic operations if one or both driveways are low volumes.

The existing and proposed driveway connections exceed the spacing guidelines stipulated by TAC.

Sight Distance

The section of Thorold Stone Road is located on a relatively flat pavement width with no discernable curve present. A design speed of 10 kilometres per hour over the posted or assumed speed is typically utilized for urban roadways.

Paradigm conducted a sight distance evaluation for the existing and proposed driveway connections to Thorold Stone Road, following the guidelines provided by TAC. Sight distance considerations are divided into; decision sight distance (DSD) and intersection sight distance (ISD).

- ▶ Decision Sight Distance (DSD) is the distance required for a vehicle approaching an intersection from either direction to perceive, react and select an appropriate speed and path, and initiate and complete the movement safely and efficiently to avoid the hazard. In this respect, DSD can be considered as the preferred visibility criterion for the safe operation of an unsignalized intersection.
- ▶ Intersection Sight Distance (ISD) is based on the time required for perception, reaction and completion of the desired critical exiting maneuver (typically, a left turn) once the driver on a minor street approach (or a driveway) decides to execute the maneuver. Calculations for ISD include the time to: (1) turn left and clear the near half of the intersection without conflicting with the vehicles approaching from the left; and (2) upon turning left, to accelerate to the operating speed on the roadway without causing approaching vehicles on the main road to unduly reduce their speed. In this context,



ISD can be considered as a desirable visibility criterion for the safe operation of an unsignalized intersection.



Table 1 summarizes the sight distance analysis for the proposed driveways.

TABLE 1: SIGHT DISTANCE REVIEW

Location	Sight Distance (m)			
	60 km/h Design Speed			
	DSD		ISD	
	TAC	Measured	TAC	Measured
East Driveway				
To/From the East	205	205+	130	130+
To/From the West	205	205+	110	110+
West Driveway				
To/From the East	205	205+	130	130+
To/From the West	205	205+	110	110+

 Meets or Exceeds TAC Guideline
 Does not meet TAC Guideline

The sight distance along Thorold Stone Road at the proposed and existing driveway connections to 8178 Thorold Stone Road exceeds the intersection sight distance and decision sight distance in both directions.

Operations

The existing and proposed single-family dwelling is estimated to generate approximately 18 daily trip ends². Design hour vehicle trips generated during the weekday AM and PM peak hours are estimated to be 2-3 trip ends. The low volume and low frequency of trips are not anticipated to be problematic to the operations along Thorold Stone Road.

Conclusions

The results indicate that the existing and proposed site driveways are supportable. In addition, the proposed driveway design provides an on-site turnaround area, thereby increasing the level of safety for entering and exiting the property by doing so through a forward motion and avoiding reversing onto Thorold Stone Road.

Based on our professional traffic operations experience, the proposed two points of access as part of the severance application to Thorold Stone Road do not create any remarkable impacts or differences with respect to traffic operations, design considerations, or traffic safety along the Thorold Stone Road corridor.

² Trip Generation Eleventh Edition, Institute of Transportation Engineers, Washington D.C., 2020



Yours very truly,

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