

March 1, 2017

County of Peterborough
310 Armour Road,
PETERBOROUGH, Ontario K9H 1Y6

Attention: Doug Saccoccia, P. Eng.
Assistant Manager, Engineering and Design

Dear Mr. Saccoccia:

Re: Revised Traffic Impact Statement (Level 1 Study)
Granite Ridge Subdivision Phase 2
Part Lots 8 and 9, Concession, geographic Township of Harvey
Municipality of Trent Lakes, County of Peterborough
Our File: P/N 06-2361

As you are aware, the Draft Plan for the Granite Ridge Subdivision has been revised to increase the number of lots from 32 to 34. In addition, the Municipality of Trent Lakes as requested some additional analysis relative to the various intersections. To address these issues, we are now providing this revised Level 1 Traffic Impact Study for your review.

1.0 Introduction

This report has been prepared in support of applications under the Planning Act to permit and regulate the development of a 19 hectare property for residential development in the community of Buckhorn. The lands are adjacent to the existing Granite Ridge Subdivision located south of Lakehurst Road/Peterborough County Road 37 east of Melody Bay Road. The proposed development will include 34 residential lots and private open space.

This report is intended to address the County of Peterborough's "Policy on Guidelines for the Preparation of Traffic Impact Studies", and specifically to address the requirements for a Traffic Impact Statement (Level 1 Study) as described in the guidelines.

Traffic generated by the development will travel to Lakehurst Road (County Road 37) by three separate routes. From the north side, Stabler's Way leads directly to Lakehurst Road through the existing Granite Ridge Phase 1 subdivision. The internal road will connect to Adam and Eve Road near the south-west corner of the development where vehicles can get to Melody Bay Road and then travel north to Lakehurst Road. The east end of the internal road will also connect to Adam and Even Road which allows access to Lakehurst Road within Buckhorn. Once drivers reach Lakehurst Road they can continue east to Buckhorn, County

Road 36 and County Road 23, or west toward Lakehurst. The site location and traffic context are shown on Figure 1.

2.0 County Road Access

County Road 37 (Lakehurst Road) through this area is paved with an asphalt wide of about 6.5 metres and roughly 2.4 metre wide gravel shoulders.

The County's Traffic Impact Study Guidelines require the available sight distances at the proposed County Road entrances to be evaluated. We note that the entrances for this proposed development will be from existing local roads, and not County Roads, so technically this requirement would not be applicable.

The available sight distances at the existing road entrances from County Road 37 were confirmed as follows:

Melody Bay Road: 483 metres to / from the west
 380 metres to / from the east

Stabler's Way: 694 metres to / from the west
 169 metres to / from the east

Adam and Eve Road: 100 metres to / from the west
 175 metres to / from the east

The posted speed limit on County Road 37 through this area is 50 km/hr, although it does change to 80 km/hr just west of Melody Bay Road. For a 50 km/hr posted speed limit, a design speed of 60 km/hr would be applicable, while for 80 km/hr a design speed of 100 km/hr would typically be used. The Ministry of Transportation's Geometric Design Guidelines require a minimum Stopping Sight Distance of 85 metres for 60 km/hr and 185 metres for 100 km/hr. The design speed of 100 km/hr should be applied for the sight distance to and from the west at Melody Bay Road, while a 60 km/hr design speed would be reasonable for the other locations. The available sight distance at the existing intersections is therefore acceptable as it exceeds the minimum requirements in every case.

The geometrics at all of the intersections all appear to be reasonable. There are no auxiliary turning lanes present, however there is an eastbound right-turn taper at Melody Bay Road.

We understand the intersection of Adam & Eve Road and County Road 37 was re-aligned in 2013 as part of a larger project which included the resurfacing of County Road 37 in this area. The work involved moving the intersection roughly 50 metres to the east so it is now located opposite William Street. This improvement would have eliminated the potential conflict between vehicles turning into and out of intersections that are offset.

The relocated Adam & Eve Road intersection is now at the east end of a small horizontal curve. While the sight distance to and from the west is adequate in our opinion, it could be improved by removing some vegetation that appears to be within the south side of the right-of-way, west of the intersection. Also, some signage could be installed to warn traffic approaching from the west about the existence of the intersection.

Staff from the County of Peterborough have advised that they have no records of vehicle collisions on County Road 37 in this area.

As a condition of approval, the County of Peterborough requires that the intersection of Stabler's Way and County Road 37 be paved with a minimum depth of 50 mm of HL8 base asphalt within the County right-of-way. The remaining asphalt would be done prior to full build-out of both phases of the subdivision. A permit will be required from the County prior to any work being undertaken within the road allowance.

3.0 Local Road Access and Internal Roads

Street 'A' is the main internal road which will connect to Adam and Eve Road at two locations. The westerly access will intersect with Adam and Eve Road about 100 metres east of Melody Bay Road, while the east access will intersect roughly 680 metres south of County Road 37. Adam and Eve Road is a paved road maintained by the Municipality of Trent Lakes. It has a posted speed limit of 40 km/hr, so a reasonable design speed would be 50 km/hr and the minimum stopping sight distance at 50 km/hr is 65 metres. The available sight distance at the two new intersections is estimated to exceed the minimum requirement for a 50 km/hr design speed and should actually be sufficient for at least a 60 km/hr design speed.

On the original Draft Plan that was submitted for approval, Street 'A' intersected with Adam and Eve Road at both locations on somewhat of an angle. The road alignment has now been revised so that it intersects with the existing road at about 90 degrees. Internally, the alignment of Street 'C' (Stabler's Way) at Street 'A' was also adjusted so it is approximately 90 degrees. Daylight triangles of about 6 metres x 6 metres are also provided at all of the intersections.

It is proposed that the access to Lots 1, 31 and 32 will be directly from Adam and Even Road. For Lot 1, it is recommended that the driveway be located toward the east side of the lot in order to maximize the distance from a sharp curve in the road and ensure that there is adequate sight distance. Similarly, the driveway for Lot 32 should be located as far north as reasonable possible in order to maximize the distance from a curve in Adam and Eve Road.

The right-of-way for the internal roadway will be 20 metres throughout the subdivision. We suggest that the roadway have a pavement width of 6.6 metres and 1.2 metre wide shoulders, although this can be confirmed at the detailed design stage. Items such as radii at the intersections and signage (if necessary) to recommend reduced speeds at horizontal curves can also be dealt with at the detailed design stage.

Street 'B' will terminate in a cul-de-sac, with a proposed asphalt radius of 14.05 metres. This was analyzed using AutoTurn to confirm that the radius is adequate for a heavy Single Unit Truck with a turning radius of 14.1 metres. A copy of the turning analysis is attached for reference.

4.0 Background Traffic

The most recent traffic count data on County Road 37 was provided by the County of Peterborough at a location west of Adam and Eve Road for 2014.

The summer 24 hour count was taken on Thursday, July 3rd 2014 and the total two-way volume was 3,273 vehicles. A peak hour volume of 319 vehicles per hour occurred from 12:00 to 1:00 p.m., which represents 9.7% of the total daily volume.

Based on discussions with staff from the County of Peterborough, an annual growth rate in the background traffic volumes of 2% was assumed. Based on this, the 2017 volume would be 6.1% higher than 2014, which results in a total daily volume of 3,473 vehicles and a peak hour volume of 338 vehicles.

Applying the 2% growth rate to a 5 year planning horizon at 2022, the increase from 2014 would be 17.17% which would result in a daily volume of about 3,835 vehicles and a peak hour volume of 374 vehicles.

Using methodology from the Highway Capacity Manual, we estimate the capacity of County Road 27 to be roughly 1,600 vehicles per hour in each direction. This means that in 2022 the road will be operating at about 11.7% capacity at the estimated volume of 374 vehicles per hour.

5.0 Traffic Generation and Distribution

According to the Institute of Transportation Engineers "Trip Generation" 9th Edition Volume 2, a single detached house in a suburban setting is predicted to generate about 9.52 vehicle trips per day on week days, 9.91 vehicle trips per day on Saturdays, and 1.02 vehicle trips in the weekday P.M. peak hour.

Therefore, the total trips generated from the development at full build out of 34 dwellings would be in the order of about 324 per day on a weekday and 35 in the weekday P.M. peak hour (64% entering, 36% leaving). The volume on a Saturday would be a bit higher at 336 trips. The weekday volume represents an increase of about 9.3% over the estimated daily traffic volume on Lakehurst Road for 2017. In 2022, it would increase the peak hourly traffic volume to about 409 vehicles per hour, which would be about 12.8% of the estimated road capacity of 3,200 vehicles per hour.

It is assumed that vehicles entering and exiting the development will be more or less equally divided between the three connecting roads. On this basis, about 11 vehicles per hour will enter and exit the site at each entrance.

At Lakehurst Road it is assumed that traffic from each connecting road will be split and that overall 75%, or 26 vehicles per hour, will travel to and from the east toward Buckhorn. The remaining 25% or 9 vehicles per hour will be going to and from the west toward Lakehurst.

6.0 Conclusions and Recommendations

The County of Peterborough "Policy on Guidelines for the Preparation of Traffic Impact Studies" requires a Level 2 Study for developments generating traffic of 50 to 100 vehicles per hour, and a Level 3 Study for more than 100 vehicles per hour. Given that the anticipated traffic volume for the Granite Ridge Phase 2 subdivision will be 35 vehicles per hour, no further study is required.

The sight distances that exist on County Road 27 at the intersections with Melody Bay Road, Stabler's Way and Adam and Eve Road exceed the minimum stopping sight distances prescribed by the Ministry of Transportation's Geometric Design Guidelines. The sight distance to the west of Adam and Eve Road, though adequate, could be improved somewhat by removing some vegetation from within the right-of-way. Signage could also be installed to advise approaching traffic of the existence of the intersection.

The available sight distances at the intersections of the internal Street 'A' with Adam and Eve Road also exceed the minimum stopping sight distance requirements. The radius of the cul-de-sac at the end of Street 'B' has been confirmed to be adequate for a Heavy Single Unit truck with a turning radius of 14.1 metres.

The traffic volume generated by the development of the subject lands is predicted to increase the 2017 daily traffic volume on County Road 27 by about 9.3%. In 2022 the peak hourly traffic on Lakehurst Road will increase by 35 vehicles trips to about 409, which is anticipated to have a minimal impact on the existing traffic conditions in the area. Lakehurst Road, County Road 37, at an estimate two-way capacity of about 3,200 vehicles per hour has more than adequate capacity to accommodate the increase in traffic anticipated from the proposed development.

It is recommended that the driveway from Adam and Even Road into Lot 1 be located as close as possible to the east side of the lot in order to maximize the available sight distance. Similarly, it is recommended that the driveway into Lot 32 be located as close as possible to the north side of that lot.

Should you have any questions in relation to this reporting letter, please contact the undersigned.

All of which is respectfully submitted,
SKELTON, BRUMWELL & ASSOCIATES INC.
per:

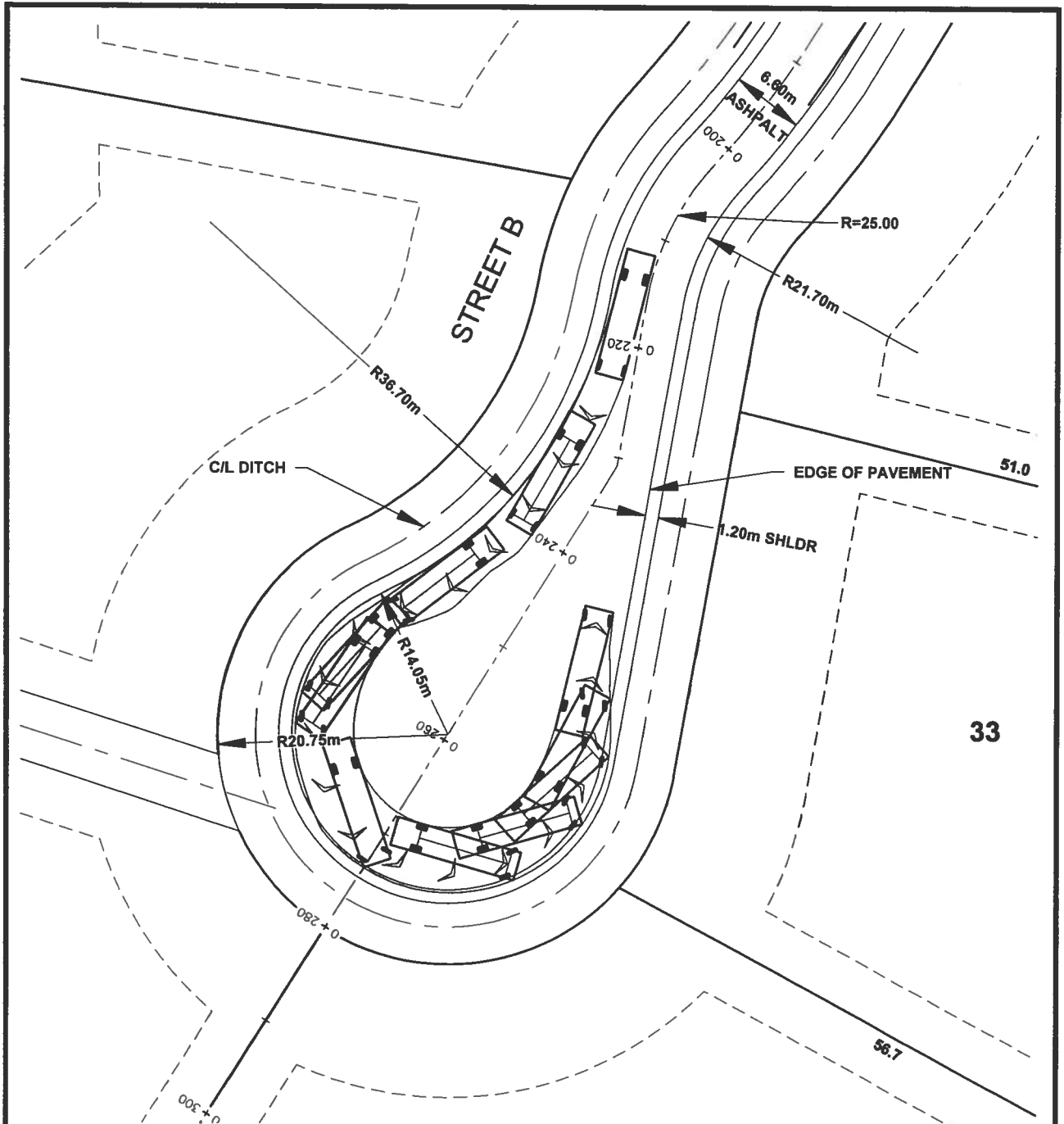

Scott W. Brumwell, P. Eng.
Vice President

SWB/lah
Attachment – Traffic Impact Study Figure 1

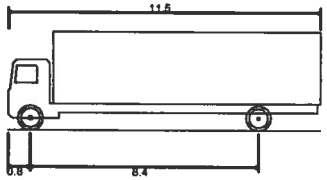
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cc: Kari Stevenson, Amanda Warren – Municipality of Trent Lakes

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HSU - Heavy Single Unit Truck
 Overall Length 11.500m
 Overall Width 2.600m
 Overall Body Height 3.650m
 Min Body Ground Clearance 0.445m
 Track Width 2.600m
 Lock-to-lock time 4.00s
 Curb to Curb Turning Radius 14.100m

GRANIT RIDGE SUBDIVISION PHASE 2 TRENT LAKES	
VEHICLE TURNING ANALYSIS STREET B CUL-DE-SAC	
1:500	
P/N 2361	FEB 2017
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