TRANSPORTATION CONSULTING

January 14, 2021

Rafat General Contractor Inc.
8850 George Bolton Parkway
Caledon, ON L7E 2Y4
c/o Blackthorn Development Corp.

Attention: Mr. Maurizio Rogato, B.U.R.Pl., M.C.I.P, R.P.P.
Principal

Re: Transportation Study
Proposed Open Storage & Parking Lot for industrial equipment
12423 Coleraine Drive & 0 Simpson Road, Town of Caledon, Peel Region

1.0 INTRODUCTION

CGE Transportation Consulting is pleased to submit this Transportation Study for a proposed development, located at 12423 Coleraine Drive & 0 Simpson Road, in the Town of Caledon. The location of the proposed development is illustrated in Figure 1. The proposed site plan is provided in Figure 2 in two consecutive sections as the site plan is too long to be clearly shown in one entity.

The proposed development is an open storage and parking lot for industrial equipment, trailers and service vehicles. The site will have very minimal and sporadic inbound and outbound truck/snow plow activities daily. There will be some employee parking/traffic during the day.

The property located at 12423 Coleraine Drive currently has an existing residential building, a barn and a separate structure. The existing residential building will be retained and it'll have its own access to Coleraine Drive, same as the current situation. Both properties have service vehicles and trailers parked on-site. The site accesses onto Simpson Road from both properties are currently fenced off and it will be opened once the access is constructed with proper curb cuts and radius.

The 12423 Coleraine Drive property will have two full movement accesses, one via Coleraine Drive and one via the Simpson Road extension to George Bolton Parkway. The 0 Simpson Road property will have one access onto Simpson Road that is located to the opposite side of the Coleraine Drive property.

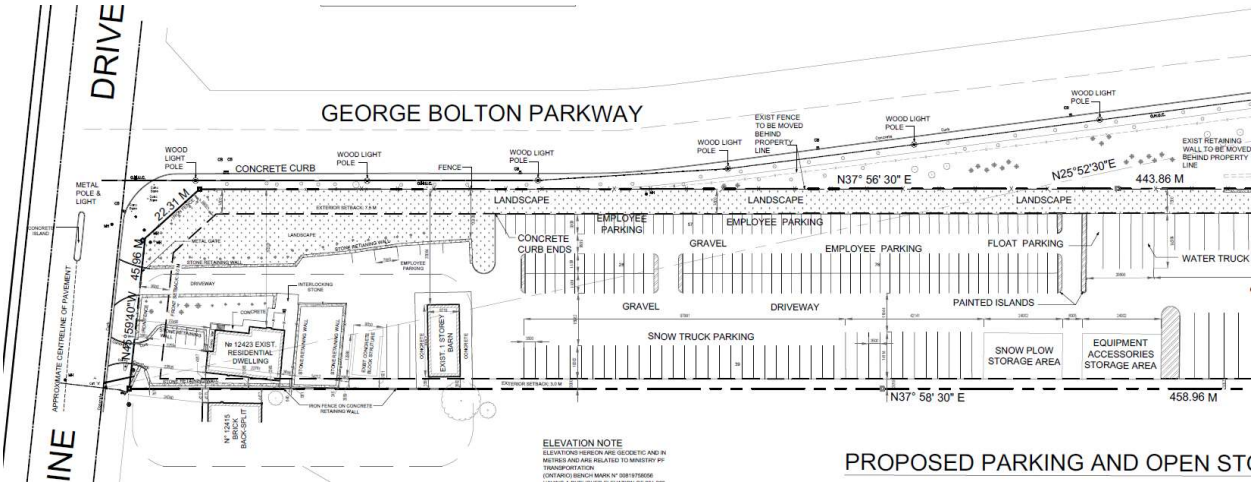
There will be no new structures added on-site. All existing structures will be retained and the vacant spaces will become parking lots of passenger and heavy vehicles.

Based on the information received, it is expected that the key component of the traffic study will be parking, on-site circulation, vehicular maneuvers within the parking lot as well as the operations of the site access, with respect to heavy vehicles. The traffic analysis for the external road intersections will be minimal.

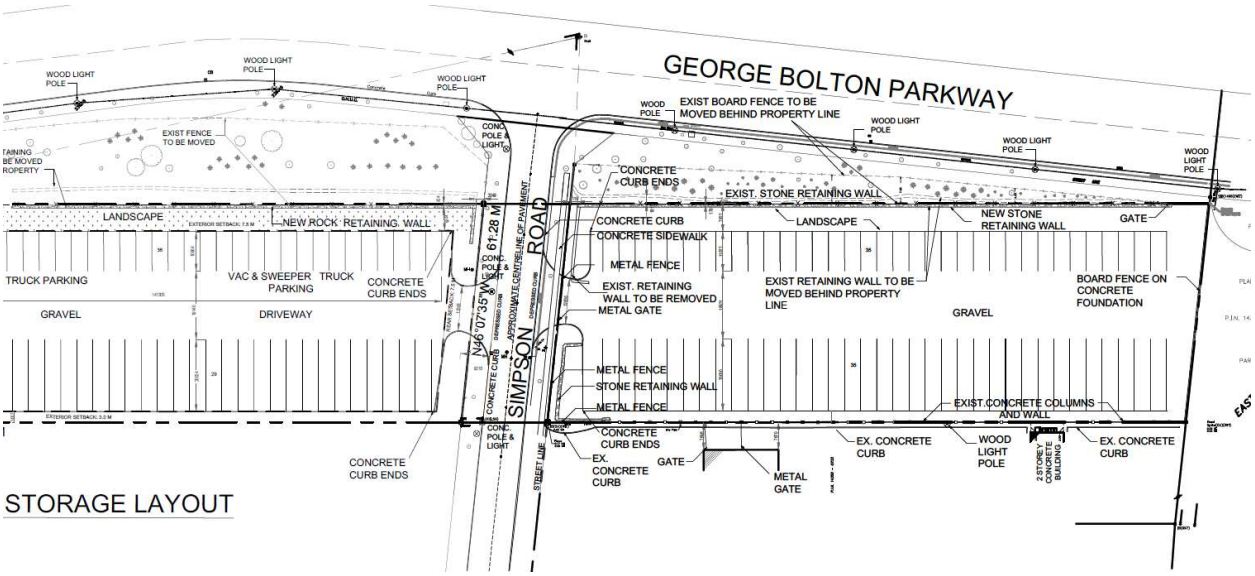
FIGURE 1 SITE LOCATION

FIGURE 2 SITE PLAN

SECTION A



SECTION B



As shown in the site plan, the site layout and parking arrangements are as follows:

- *The front portion of the lands are paved and the remaining lands are still gravel, however all heavy trucks and passenger cars are all parked at this location. The site is currently in operation with the configuration very similar to the site plan.*

- *The Existing Residential Dwelling is occupied by the Client and is a legally non-conforming use so it is part of the Site and Applications as an 'existing use'. It has its own parking spaces.*
- *The three parking spaces located to the front of the existing barn is for "tag along trailer parking".*
- *The Barn is being used as a 'garage' for car storage and the other building is a Salt Dome.*
- *The three (3) rows of parking located to the north portion of the Coleraine Drive property are for passenger cars only and there is a total of 159 spaces.*
- *The row of parking located to the south portion of the Coleraine Drive property are for snow truck parking only and there is a total of 40 spaces.*
- *There are two float parking spaces and three water truck parking spaces to the immediate east of the 159 passenger car spaces.*
- *There are snow plow storage area and equipment accessories storage area to the immediate east of the 40 snow-truck parking area.*
- *To the east of the water truck parking, there is a large empty space reserved for truck turn around within the site.*
- *Further east of the turnaround area, there are a total of 14 spaces reserved for vacuum and sweeper truck parking.*
- *To the east of the equipment storage area, there are 29 spaces identified as more equipment storage area.*
- *The property south of Simpson Road has a total of 25 parking spaces are they are identified as "Bin Storage".*
- *There is a total of 151 parking spaces for trucks/storage and 159 parking spaces for passenger cars.*

The key analysis of the transportation study is to determine if there are adequate on-site circulations for large trucks and trailers to maneuver within the site property, as well as at the Coleraine Drive site access.

2.0 EXISTING CONDITIONS

Coleraine Drive is a major arterial road under the jurisdictional control of Peel Region. It has four (4) general purpose lanes and it maintains a posted speed limit of 70 km/h in the vicinity of the subject site. The roadway is flat both horizontally and vertically.

There is a counting station setup by Peel Region on Coleraine Drive, 300 meters north of Mayfield Road. The most recent ATR data is provided by Peel Region and was collected in 2017.

The data set indicates that the 24-hour total traffic passing this counting station is 6221 vehicles. The peak hour data is approximately 600 vehicles distributed among the four through lanes in both directions. This 24-hour volumes are considered moderate for an arterial road. It is anticipated that there are many available gaps for truck movements at the Coleraine Drive site access.

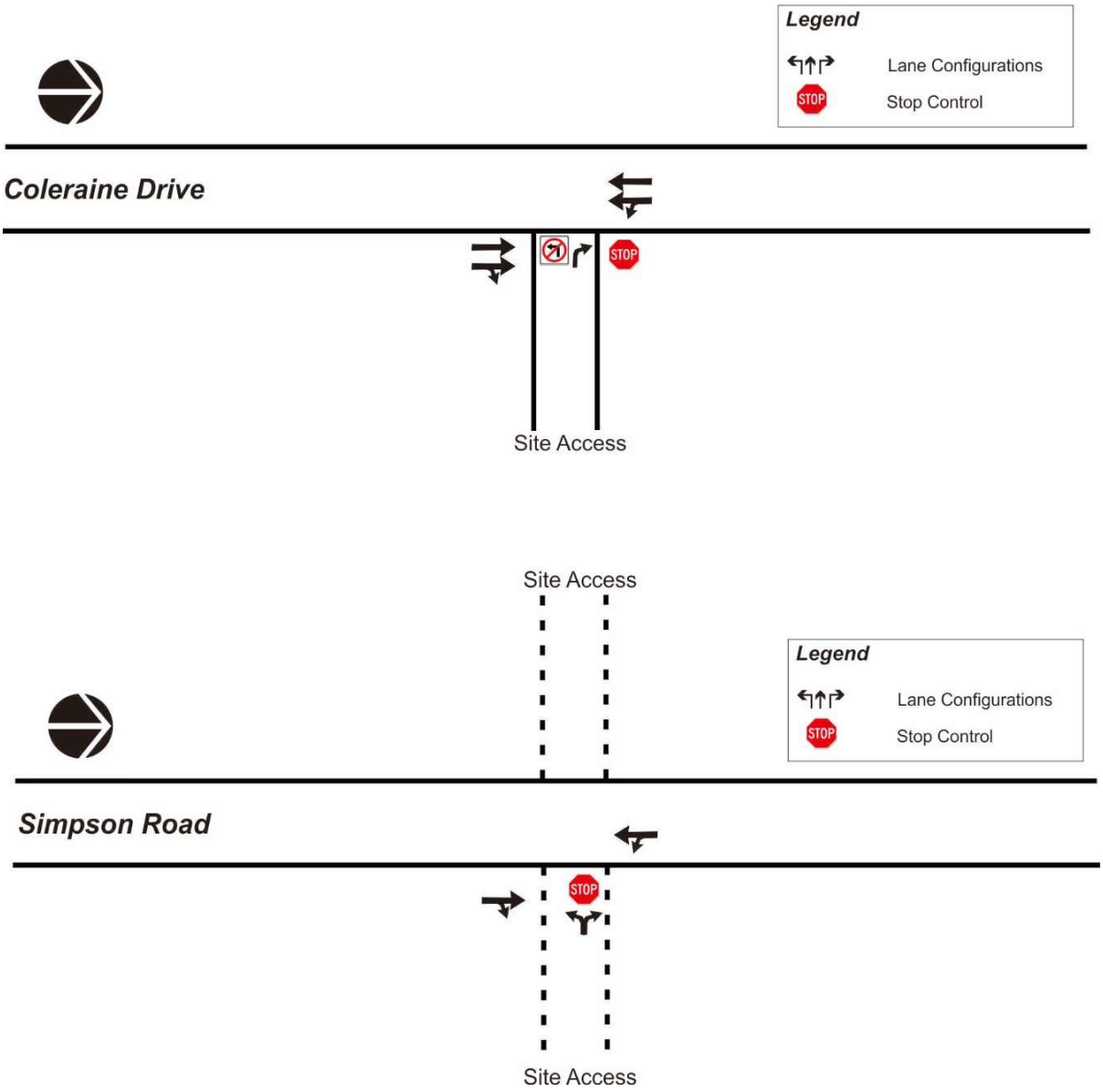
Simpson Road is a two-lane local road that carries only the local traffic. It is less than 1 kilometers in distance. Simpson Road starts at George Bolton Parkway and terminates just after Parr Boulevard. Traffic volumes on Simpson Road is minimal and there are many opportunities for truck turning movements at the Simpson Road site access.

Due to the low truck activities volumes at the site, it is not expected that auxiliary left turn or right turn lanes are required at the site.

There is an existing “No Left Turn” restriction sign at the Coleraine Drive site access which prohibits vehicles from making left turns onto Coleraine Drive.

The existing lane configuration for the Coleraine Drive access and Simpson Road access are shown in Figure 3. A copy of the ATR data is shown in **Appendix A.**

FIGURE 3 EXISTING TRAFFIC CONTROL & VOLUMES



3.0 SIGHTLINE ASSESSMENT

There are two terminologies that we should consider for the sight distances: 1) Stopping Sight Distance and 2) Decision Sight Distance or Intersection Sight Distance.

In simple terms, the stopping sight distance is the minimum distance that a vehicle can stop safely should an incident occur and decision sight distances gives drivers extra reaction time to make a stop at a comfortable pace should something happen unexpectedly. Decision sight distance is always desirable but stopping sight distance is adequate for safe maneuvers.

The posted speed limit on Coleraine Drive is 70 km per hour and the design speed is 90 km per hour. There is no posted speed limit on Simpson Road and we can assume the same design speed limit.

In accordance to the *Geometric Design Guide for Canadian Roads* - Chapter 9 Subsection 9.9.2.3, published by Transportation Association of Canada dated June 2017, the intersection sight distance (ISD) are calculated using the following equation:

$$ISD = 0.278\ V_{major}\ t_g$$

Where:

ISD =	intersection sight distance (length of the leg of sight triangle along the major road) (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)

3.1 Left Turn from Stop

In accordance to the Geometric Design Guide for Canadian Roads published by Transportation Association of Canada, the minimum sight distances for left turns from Stop are calculated based on the following formula:

- Single unit truck: 0.278 X 90 X 9.5 = 234 metres
- Combination truck (WB-19 and WB-20): 0.278 X 90 X 11.5 = 288 metres

3.2 Right Turn from Stop

The intersection sight distance for right turns is determined in the same manner as for left turns, except that the time gaps should be adjusted. Field observations indicate that drivers accept gaps that are slightly shorter than those accepted in making left turns.

In accordance to the Geometric Design Guide for Canadian Roads published by Transportation Association of Canada, the minimum sight distances for right turns from Stop are calculated based on the following formula:

- Single unit truck: 0.278 X 90 X 8.5 = 213 metres
- Combination truck (WB-19 and WB-20): 0.278 X 90 X 10.5 = 263 metres

TABLE 1 summarized the minimum sightline requirements and the proposed sightline distance.

TABLE 1 SIGHTLINE DISTANCE REVIEW

Intersection	Speed		Sightline		
	Posted	Design	Required	Provided	
				North	South
Coleraine Drive and Proposed Site Access	70 km/h	90 km/h	288m, 263m	> 700 m	> 700 m
Simpson Road and Propose	70 km/h	90 km/h	288m, 263m	70 m	>700 m

The sight line distance diagram is shown in Figure 4 and Figure 5. The sight line distance for right turns at the Coleraine Drive access has been met. No left turn is permitted at the Coleraine Drive access.

The sightline distance at the Simpson Road to the south is also met. The sight line distance to the north is only 70 meters to George Bolton Parkway, however the intersection is stop controlled and vehicles will slow down to a stop.

Vehicles exiting the Simpson Road site access should ensure that there are no southbound right turning vehicles at the George Bolton Parkway and Simpson Road intersection. There are no obstructions in both directions and volumes on Simpson Road is also quite minimal.

There are no vertical curvatures along both Coleraine Drive and Simpson Road for this section of the roadway.

FIGURE 4 SIGHT LINE DISTANCES ON COLERAINE DRIVE

FIGURE 5 SIGHT LINE DISTANCES ON SIMPSON ROAD

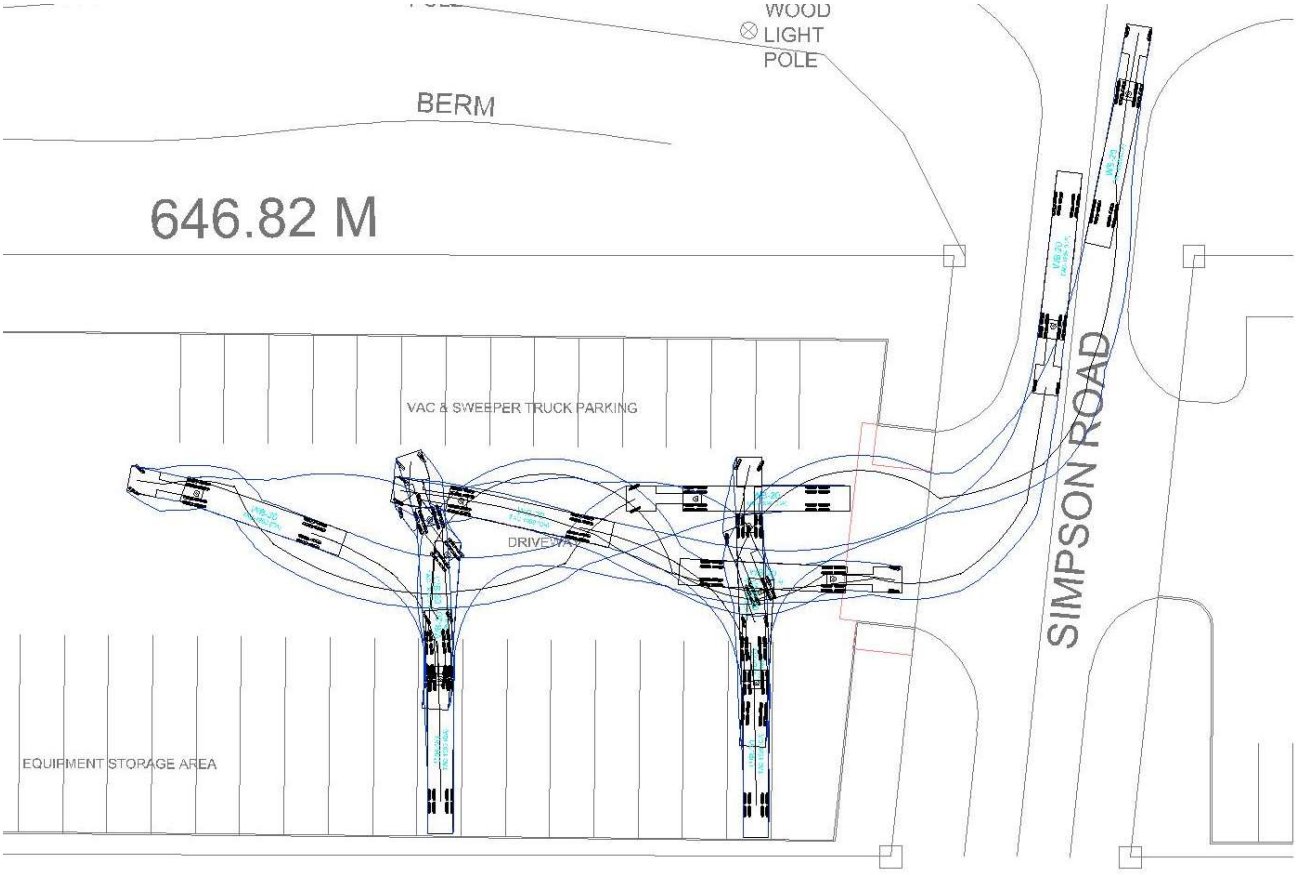
It is apparent that there are adequate sight distances in both direction along Coleraine Drive and Simpson Road.

4.0 On-Site Circulation

The subject site is mainly a parking lot for trucks and trailers. It is not expected that there are frequent daily activities at the site access. The key component of the transportation study is to determine if there are adequate on-site circulation to facilitate truck/trailer movements.

Several autoTURN diagrams have been carried out at the site access, and within the site to determine that the subject site can accommodate large trucks up to a length of 21.50 meters. We believe this truck size is the largest commercial truck available in the market. There are also smaller trucks at 19 meters and 14 meters being tested at the site.

Figure 5 AutoTURN diagram – WB20 truck



5.0 Conclusions

The key findings are summarized below:

- It is expected that trucks can find adequate gaps along Coleraine Drive and Simpson Road to ingress the site.
- There are sufficient sight distances in both northbound and southbound directions along Coleraine Drive and Simpson Road to accommodate inbound and outbound trucks/trailers.

- There are ample maneuvering spaces on-site for trucks as large as 21.5 meters in length.

Should you have any questions regarding this study, please do not hesitate to contact the undersigned.

Yours truly,

CGE TRANSPORTATION CONSULTING

Casey Ge, P.Eng.
President

Appendix A:

ATR Data, Coleraine Drive

ROAD_NAME	LOCATION	DIR	COUNT_TYPE	NUM_LAN	Y_2014_N	Y_2014_S	Y_2015_N	Y_2015_S	Y_2016_N	Y_2016_S	Y_2017_N	Y_2017_SW
COLERAINE DRIVE	1.0 KM NORTH OF HIGHWAY 50	NS	DIRECTIONAL	4	4660	4804	5022	5304	0	0		
COLERAINE DRIVE	0.8 KM SOUTH OF MAYFIELD RD	NS	DIRECTIONAL	4	3952	3778	4504	4499	3151	3628		
COLERAINE DRIVE	0.3 KM NORTH OF MAYFIELD RD.	NS	DIRECTIONAL	4	3780	4192	4670	4982	5466	5021	5172	6221
COLERAINE DRIVE	0.5 KM SOUTH OF HEALY RD.	NS	DIRECTIONAL	4	4991	5195	4995	6027	0	0		
COLERAINE DRIVE	0.1 KM NORTH OF HEALY RD.	NS	DIRECTIONAL	4	6574	5681	7097	5941	5001	5138	4975	6324
COLERAINE DRIVE	0.2 KM SOUTH OF MANCHESTER CRT	NS	DIRECTIONAL	4	0	0	0	0	5673	5822	5945	6210
COLERAINE DRIVE	0.15 KM SOUTH OF HARVEST MOON DR.	NS	DIRECTIONAL	4	0	0	0	0	6752	6545	6359	6905
COLERAINE DRIVE	0.1 KM NORTH OF DE ROSE AVE.	NS	DIRECTIONAL	4	0	0	0	0	4609	865	5508	4937
COLERAINE DRIVE	0.5 KM WEST OF HWY 50/Emil Kolb Pkwy Ro	NS	DIRECTIONAL	4	0	0	0	0	1905	1865	2939	2939