



BA Group

16-18 MILL STREET RESIDENTIAL DEVELOPMENT

Traffic Impact Study

Prepared For: AGK Multi-Res

December 15, 2020



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1.0 INTRODUCTION

BA Group is retained by AGK Multi-Res to provide a traffic impact study for the Official Plan Amendment and Zoning By-law Amendment at 16-18 Mill Street in Georgetown (Halton Hills) in Halton Region. The proposed development consists of a 52-unit apartment building with 6 stories and 2 parking levels

1.1 THE EXISTING SITE

16 and 18 Mill Street are located on the northwest side of Mill Street between Guelph Street and McNabb Street. The site is bounded by residential property on the southwest and northwest, and by greenspace and Silver Creek on the northeast.

The site location and context are shown in **Figure 1** and **Figure 2**, respectively.

The site is currently occupied by a 9-unit low-rise residential apartment building at 16 Mill Street and a triplex dwelling at 18 Mill Street. Each building is served by an access driveway. A parking lot wraps around the perimeter of the site. A sidewalk on the northwest side of Mill Street provides connections for pedestrians along the site boundary.

The Georgetown GO Station is located approximately 500 metre walking distance northeast of the site. Georgetown GO is designate an existing Major Transit Station in the Region Official Plan (ROP, Maps 1 and 3) and the Town has identified the GO station area at the top of its hierarchy of intensification areas.

The site is designated by the Official Plan (OP) and the Georgetown GO Station Area Secondary Plan as a Medium Density Residential Area and Greenlands. Under Zoning By-law 2010-0050, the site is zoned as Low Density Residential One.

The site is located within the Mill Street Corridor Precinct that is currently undergoing a neighbourhood study to identify opportunities for pedestrian, cyclist and road network improvements.

1.2 PROPOSED DEVELOPMENT

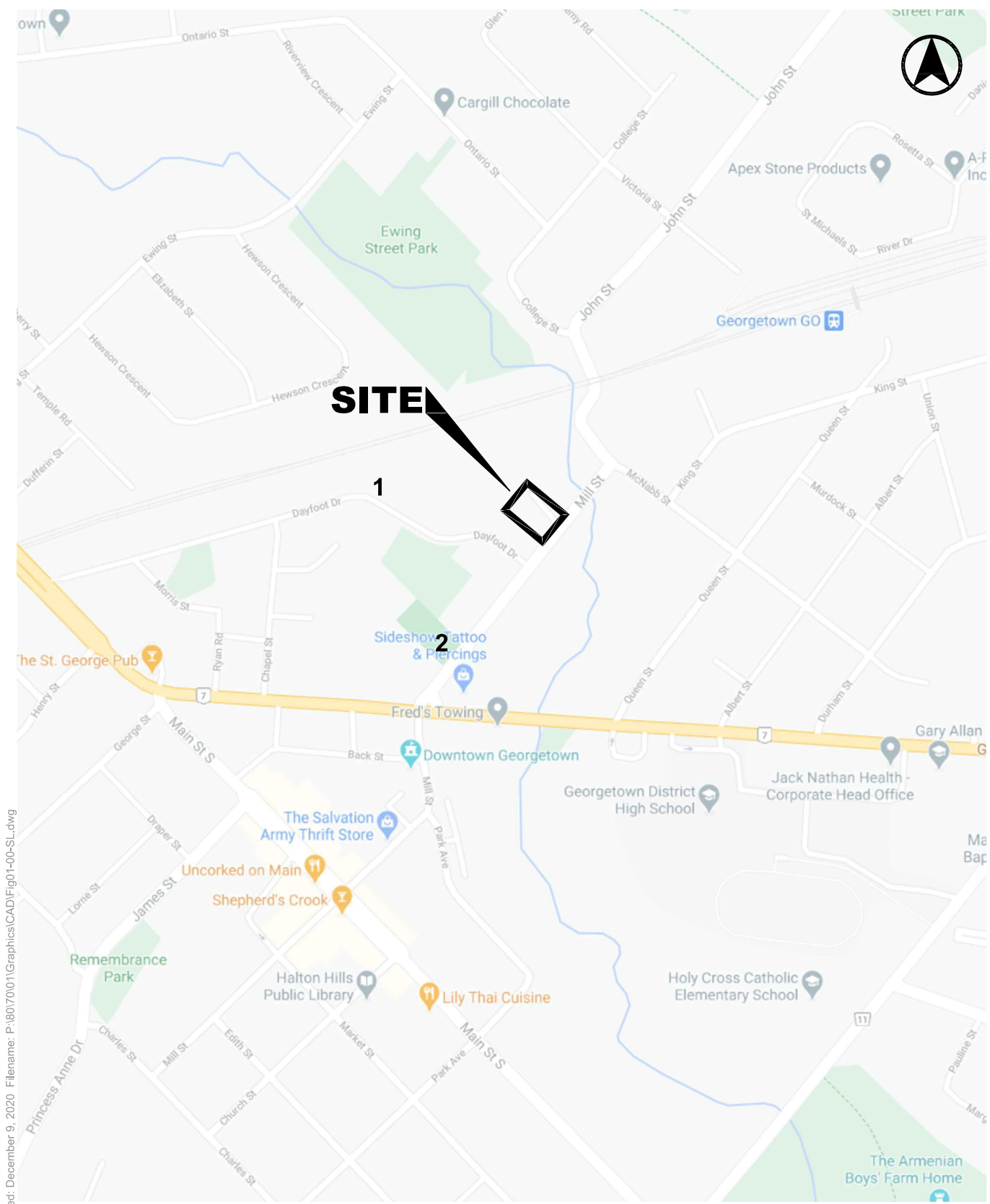
The proposed development consists of a 52-unit apartment building with 6 stories and 2 parking levels. The existing buildings on-site will be demolished to accommodate the proposed apartment building.

A total of 70 parking spaces are proposed for the site, 18 spaces at-grade and 26 spaces on each parking level. Five barrier free spaces will be provided on the site.

The proposed overall parking provision requires an amendment from the in-force Zoning By-law 2010-0050 from 91 parking spaces to 70 parking spaces.

The proposed site driveway is located at the existing driveway for 18 Mill Street and provides vehicle access to the site parking and loading areas from Mill Street.

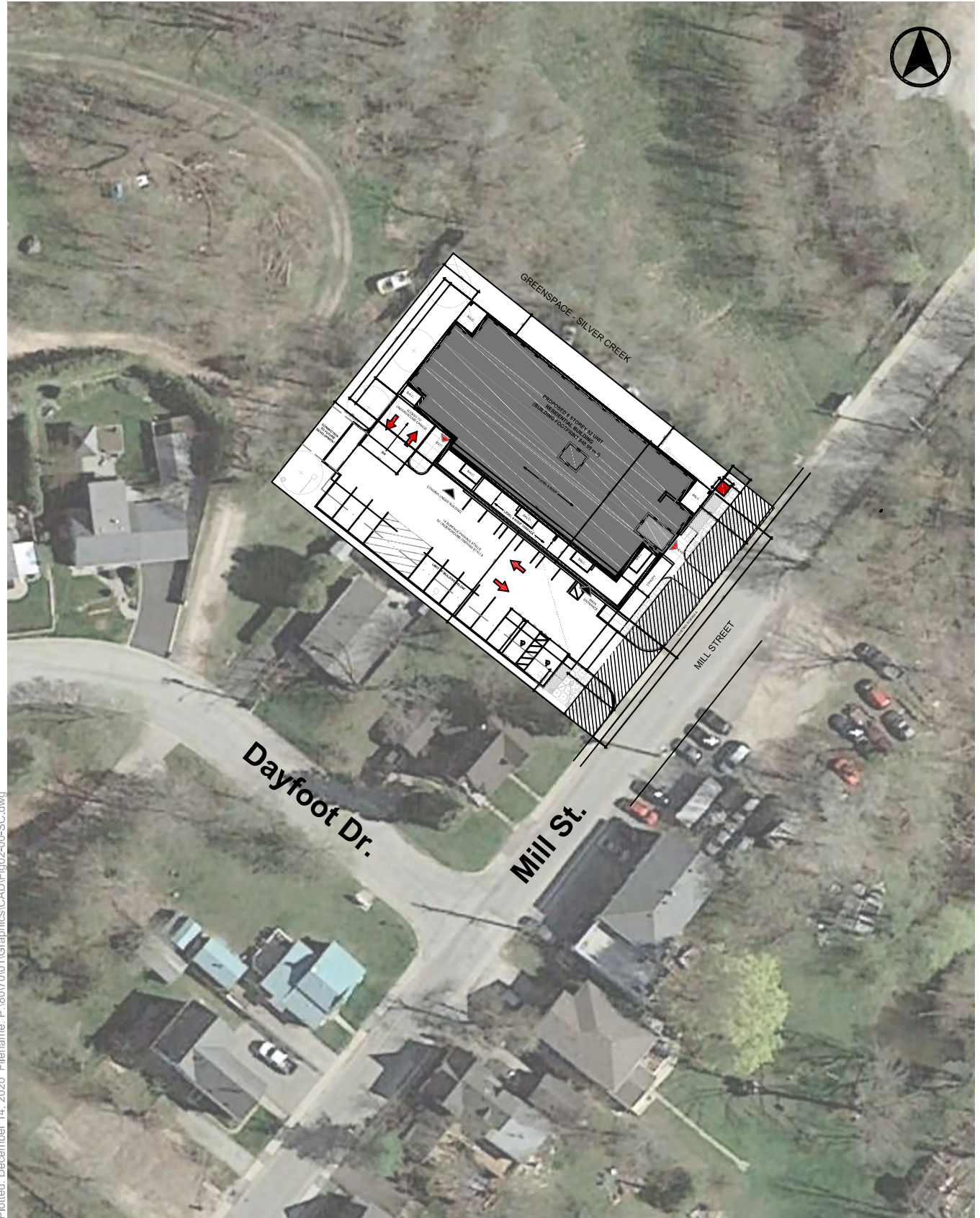
Through pre-consultation, a road widening of up to 5.0 metres was identified by Town staff along Mill Street which has been identified on the current site plan. The site plan is shown in **Figure 3** and **Appendix A**.



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Area Background Developments
 1 - 22 Dayfoot Dr
 2 - 42 Mill St.

FIGURE 1 SITE LOCATION



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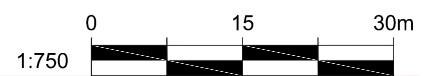
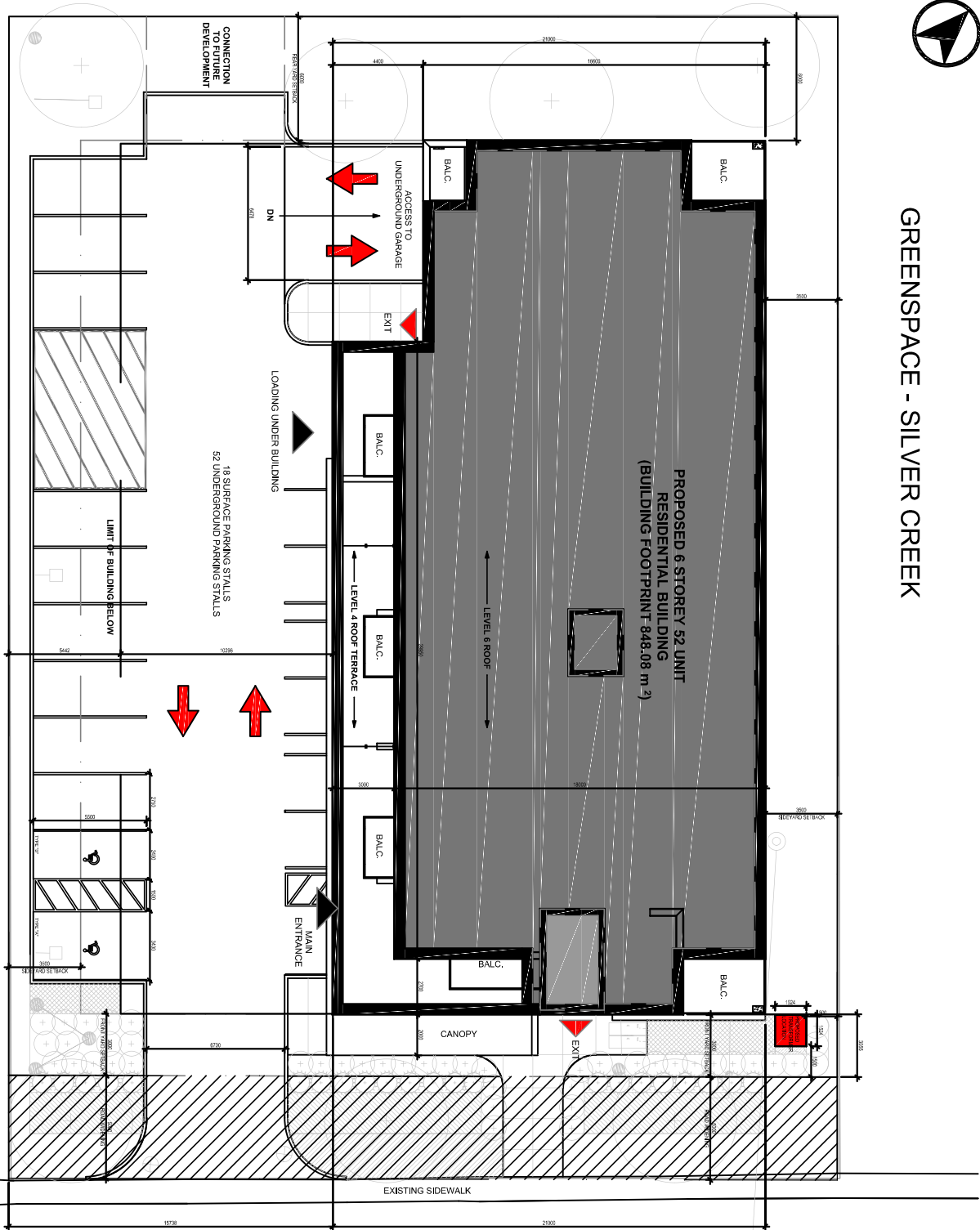


FIGURE 2 SITE CONTEXT



GREENSPACE - SILVER CREEK



MILL STREET

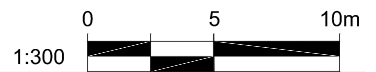


FIGURE 3 SITE PLAN

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2.0 TRANSPORTATION CONTEXT

2.1 ROAD NETWORK

Mill Street is a local two-lane road, aligned in the northeast-southwest direction. Mill Street extends from Charles Street in the south to McNabb St in the north.

Dayfoot Drive is a local two-lane road stretching from Mill Street to a cul-de-sac adjacent to Guelph Street. The intersection with Mill Street is a three-legged intersection with stop control on Dayfoot Drive.

Guelph Street (Hwy 7) is a major east-west road that connects Georgetown to Acton in the west and Brampton in the east. The Guelph Street & Mill Street intersection is signalized with pedestrian crossings on all four legs. Left turn lanes are provided for both directions on Guelph Street, in addition to a right turn channel to Mill Street on the westbound approach.

The site is located within the Mill Street Corridor Precinct that is currently undergoing a neighbourhood study to identify opportunities for pedestrian, cyclist and road network improvements. Through pre-consultation, a road widening of up to 5.0 metres was identified by Town staff along Mill Street which has been identified on the current site plan.

The existing lane configurations for the road network are shown in **Figure 4**.

2.2 TRANSIT NETWORK

The site is well served by the Georgetown GO station that is located within a 500 metre walking distance, providing frequent access Toronto and the GTA via the Kitchener GO line.

Guelph Street is served by GO bus routes 31 and 33, including the Guelph St @ Mill St stop located 100 m east of the intersection and a 400 m walk from the site.

There is no formal provision of local transit services in the vicinity of the site.

2.3 PEDESTRIAN AND CYCLING NETWORK

Sidewalks extend along Mill Street on both sides from Charles Street to Dayfoot Drive, where the east sidewalk ends and the west sidewalk continues onward to McNabb Street.

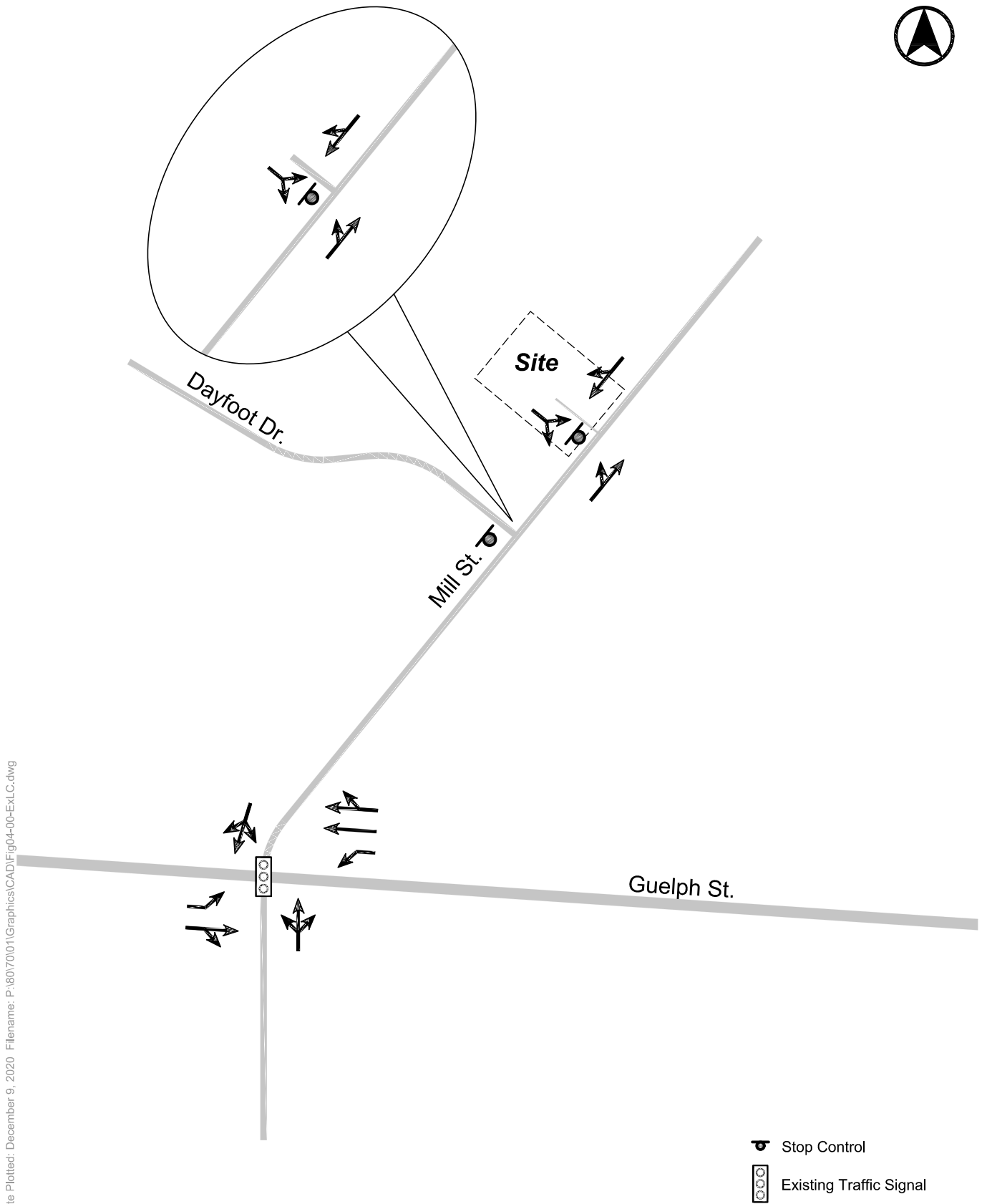
Sidewalks are provided on both sides of Guelph Street, with pedestrian crossing signals at the Mill Street intersection.

The site is located within the Mill Street Corridor Precinct that is currently undergoing a neighbourhood study to identify opportunities for pedestrian, cyclist and road network improvements.

The Halton Hills Active Transportation Master Plan (ATMP) was endorsed by Council on October 26, 2020 further identifies improvements to the active transportation network, including:

- a proposed On-Road Facility in the form of a Signed Bike Route with Sharrows along Mill Street. The ATMP identifies this facilities for Short Term (0-5 years) implementation
- a proposed Off-Road Facility along Silver Creek. The ATMP identifies this facilities for Long Term (10+ years) implementation.

Through pre-consultation, a road widening of up to 5.0 metres was identified by Town staff along Mill Street which has been identified on the current site plan.



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FIGURE 4 EXISTING LANE CONFIGURATION

3.0 PARKING CONSIDERATIONS

3.1 TOWN PARKING REQUIREMENTS

The Town of Halton Hills Zoning By-law 2010-0050 requires a vehicle parking supply rate of 1.5 residential spaces plus 0.25 visitor spaces for apartment dwelling units. The summary of required spaces, as applied to the current site statistics, is shown in **Table 1**.

TABLE 1 TOWN OF HALTON HILLS ZONING BY-LAW 2010-0050 CAR PARKING REQUIREMENTS

Use	Dwelling Units	Rate	Parking Spaces Required
Residential Spaces	52	1.5 spaces/unit	78 spaces
Visitor Spaces		0.25 spaces/unit	13 spaces
Total Required		1.75 spaces/unit	91 spaces

Notes:

1. Per Zoning By-Law 2010-0050 5.3.3 Where the minimum number of parking spaces is calculated on the basis of a rate or ratio, the required number of parking spaces shall be rounded to the next higher whole number.

Bicycle parking is not required for residential land uses under Zoning By-law 2010-0050. The by-law also does not specify minimum requirements for barrier free vehicle parking spaces.

The Accessibility for Ontarians with Disabilities Act (AODA) requires 3 parking spaces be provided as barrier free.

3.2 PROPOSED PARKING FACILITIES

The site is proposed to accommodate a total of 70 parking spaces, including 5 barrier free spaces.

This parking provision requires a variance from the zoning bylaw as the proposed provision of spaces is lower than the required rate.

The proposed vehicular parking rates for the current application are:

- 1.10 spaces per unit for residents¹
- 0.25 spaces per unit for visitors

This is equivalent to effectively providing 1.00 spaces per one-bed unit and 1.2 spaces per two-bed units. A summary of the proposed parking, by rate and unit type, is outlined in **Table 2**.

A rate of 0.25 spaces per unit is provided for visitors, consistent with the Halton Hills bylaw.

TABLE 2 PROPOSED PARKING PROVISIONS – BY UNIT TYPE

Use	Dwelling Units	Rate	Parking Spaces Provided
Residential Spaces	26 one-bed units 26 two-bed units	1.00 space per one-bed unit 1.20 spaces per two-bed unit	26 spaces <u>31 spaces¹</u> 57 res. spaces (1.1 sps/unit)
Visitor Spaces	52 total units	0.25 spaces per unit	13 visitor spaces
Total		1.35 space per unit	70 total spaces¹

Notes:

1. For the purpose of calculating proposed parking by unit type, the number of parking spaces for two-bed units (31.2) was rounded down.

The resident parking supply is 21 spaces less than the zoning bylaw requirements of 91 spaces.

The site parking provisions meet the zoning bylaw requirements for visitor parking

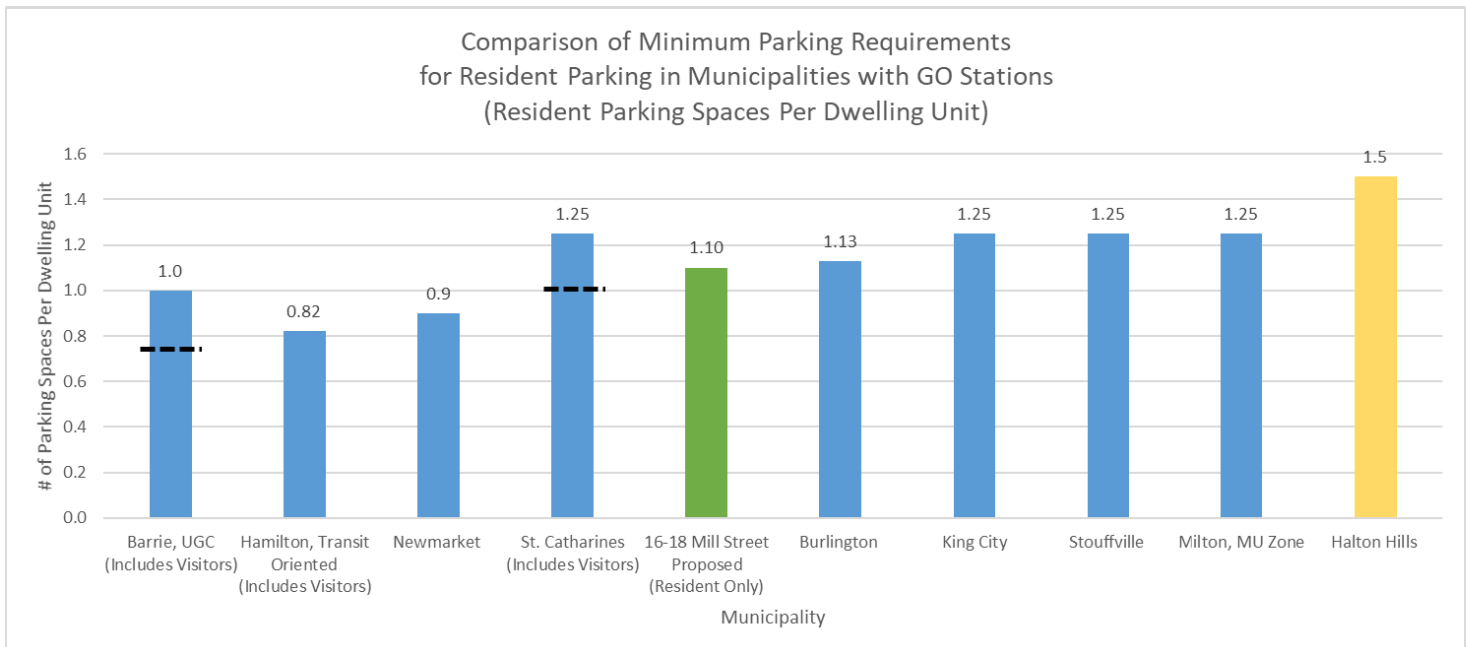
¹ For the purpose of calculating proposed parking by unit type, the number of parking spaces was rounded down.

3.3 COMPARABLE RESIDENTIAL PARKING BY-LAWS

BA Group reviewed parking rates from a number of municipalities where there is a comparable proximity to regional transit and active transportation, including proximity to a GO station, GO transit service distance to Union Station and/or frequencies similar to that of Georgetown GO along the Kitchener GO line. The Halton Hills zoning bylaw, site proposed parking variance and comparable bylaws are presented in the graph below.

Some of zoning bylaws reviewed identify rates for one-bed, two-bed, and three-bed dwelling types while others have a rate for all apartment dwelling units, regardless of unit type. For the purpose of providing a direct comparison, each bylaw rate has been presented as it would apply to the proposed 16-18 Mill development statistics for 26 one-bed units and 26 two-bed units.

Both Barrie and St. Catharines provide a combined required resident and visitor parking rate that includes an undefined number of visitor spaces. Visitor parking rates typically range between 0.10 and 0.25 spaces per unit across Ontario municipal bylaws for apartment dwelling units. A dashed line is represented in the graph for both Barrie and St. Catharines, to identify approximate resident parking allocation requirements.



The existing Halton Hills parking requirement of 1.5 resident spaces per unit exceeds the required rates observed in comparable municipalities. The resident parking requirements for apartment uses in Halton Hills do not differ based on location, unit type, or proximity to transit and active transportation.

The proposed parking requirement for 16-18 Mill Street represents a comparable requirement to the municipalities presented in the graph above and is representative of a parking supply in a transit oriented neighbourhood that is undergoing intensification. The effective rate for 16-18 Mill Street of 1.10 also reflects a representative rate for unit type mix, that supplies parking at a rate of 1.0 spaces per one-bed unit and 1.2 spaces per two-bed unit, respectively, for the site.

3.4 PARKING POLICIES

The Halton Region Official Plan (ROP) includes the following policies that are supportive area specific parking standards related to Major Transit Station Areas and Intensification Areas:

ROP Policy 81 (8) Encourage the Local Municipalities to adopt parking standards and policies within Intensification Areas to promote the use of active transportation and public transit.

ROP Policy 173 (21) e Require the Local Municipality to adopt parking policies in the Intensification Areas that would promote active transportation and the use of public transit.

The Town of Halton Hills Official Plan (OP) includes the following policies that are supportive of active transportation and parking standards specific to the Georgetown Station Secondary Plan:

OP Policy F6.7 The Town shall review off-street and on-street parking regulations to reflect evolving patterns of automobile use at the time of the preparation of the implementing Zoning By-law. Reduced parking requirements may be considered where sufficient public off-street and on-street parking facilities exist. In addition, parking requirements may be reduced if the uses on the lot each require parking at different times of the day. Opportunities for the sharing of parking in mixed use development will be considered during the review of a development application.

3.5 TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) strategies encompass a range of policies, tools, and programs designed to promote and facilitate the use of walking, cycling, public transit, telecommuting and carpooling as an alternative to single passenger vehicle travel. TDM strategies aim to reduce vehicle travel with the primary objective of:

- reducing demand on road infrastructure, thereby minimizing road and parking capital expenditures;
- increasing travel efficiency;
- reducing climate change emissions;
- improving air quality; and,
- improving overall health.

A TDM plan has been crafted to tailor to the future residents of the 16-18 Mill Street proposed development. The components of the proposed TDM plan are outlined below.

TABLE 3 PROPOSED TDM IMPLEMENTATION PLAN / TDM CHECKLIST

	Measure	Description
1	Reduced Vehicular Parking Supply	The reduction of parking supply (compared to the applicable requirements) is itself a TDM measure as it will force residents/visitors to consider alternative travel modes.
2	“Unbundle Parking”	This measure is also inherent to the reduced parking supply; since units are rentals, a sales program should be commenced which gives renters the option of leasing a parking space.
3	Visible Transit Information	The lobby of the building should have access to local and regional transit information to assist residents in taking transit.
4	Bicycle Parking	The proposed development shall meet the bicycle parking requirements of the site specific zoning by-law to support and encourage bicycle use to and from the site. Provide short-term bicycle parking in highly visible locations in close proximity to major entrance.
5	Transit Stop	The site is located within 500 metres of the Georgetown GO regional rail service. The site is providing a 5 metre widening along Mill Street that will allow to improve the active transportation facilities within the Mill Street Corridor Precinct. These measures will improve pedestrian and active transportation facilities and will make transit use more attractive and accessible.

3.6 PARKING RATIONALE SUMMARY

The proposed resident parking supply of 1.10 spaces per unit for 16-18 Mill Street is consistent with the range of required parking rates at comparable locations across Ontario for residential uses near a Major Transit Station area or along Transit Oriented Corridors.

Parking for the site can be ‘unbundled’ for apartment uses. Building management can lease and manage parking leases on an ongoing basis and adopt shared (unassigned) parking for residents within a ‘pool’ of parking. Sharing will maximize the efficiency of the site’s overall parking supply, and in turn will minimize parking supply excesses.

Resident parking is supplied at a rate of 1.0 spaces per one-bed unit and 1.2 spaces per two-bed units, ensuring a minimum of one parking space for each apartment unit – without oversupplying the amount of structured parking required to be built on site.

A rate of 0.25 spaces per unit is provided for visitors, consistent with the Halton Hills bylaw.

A bike parking rack will be provided next to the Main Entrance on Mill Street and a 5 metre widening along Mill Street will allow provision for an improved sidewalk and cycling facilities along Mill Street that will make active transportation and transit use more attractive and accessible.

4.0 TRAFFIC VOLUME PROJECTIONS

4.1 SCOPE

The study area for this site comprises of three intersections:

- Mill Street & Site Access;
- Mill Street & Dayfoot Drive;
- Mill Street & Guelph Street.

In accordance with Halton Region's TIS guidelines, a horizon period of 5 years was adopted for the future impact analysis. Traffic analysis was completed for the following scenarios during the weekday morning (AM) and afternoon (PM) peak hour:

- Existing Traffic Conditions
- 5-year Future Background Traffic Conditions (2025)
- 5-year Future Total Traffic Conditions (2025)

4.2 EXISTING TRAFFIC CONDITIONS

Existing peak hour traffic volumes at the site driveways have been established based on traffic counts provided by the Town and supplemented by counts undertaken by Spectrum Traffic Data on behalf of BA Group.

A summary of the counts undertaken is provided in **Table 4**. The corresponding turning movement counts are attached in **Appendix B**.

TABLE 4 EXISTING TRAFFIC DATA SOURCES

Intersection	Count Date	Count Times	Source
Guelph Street / Mill Street	Monday, November 5 th , 2018	7:00 AM-9:00 AM 11:00 AM-2:00 PM 3:00 PM-6:00 PM	Town
Guelph Street / Mill Street	Tuesday, November 3 rd , 2020	7:00 AM-9:00 AM 4:00 PM-6:00 PM	Spectrum Traffic Data
Mill St / Dayfoot Drive			

As the counts conducted by Spectrum were completed during the COVID-19 pandemic, it is anticipated that these counts reflect reduced traffic volumes compared to normal operations. To obtain a more accurate representation of existing conditions at Mill St / Dayfoot Dr, an adjustment factor was obtained by comparing the two-way volumes on the north leg of Guelph St / Mill St during the two count dates. The through volumes on Mill St were then balanced to obtain the final adopted volumes for existing conditions.

The adopted existing baseline area traffic volumes for the weekday AM and PM peak hour are provided in **Figure 5**.

4.2.1 Existing Site Trips

To remain conservative, it was assumed that the existing trips from the site were negligible and did not warrant removal from the background traffic volumes.

4.3 FUTURE BACKGROUND TRAFFIC VOLUMES

4.3.1 Background Development Growth

Two background developments were identified by the Town within the vicinity of the site, as summarized in **Table 5**.

TABLE 5 AREA BACKGROUND DEVELOPMENT

Location	Type	Development Description	Study	Status
42 Mill Street	Residential	Building 1: 6 storey condominium – 76 residential units	Report prepared by LEA Consulting Ltd (dated November 2016)	Under construction
	Residential	Building 2: 3-storey townhouses – 14 residential units		Under review
	Residential	Building 3: 5-storey condominium – 116 residential units		Under review
22 Dayfoot Drive	Residential	5-storey condominium – 82 residential units	N/A	Pre-consultation

Although a TIS was prepared for 42 Mill Street, a review of the study indicated substantial changes in the proposed development since the TIS was written. As the submitted study is now obsolete, a new trip generation analysis was completed for the development.

Background development trip generation rates were determined using the ITE Trip Generation Manual (10th Edition). The mode split characteristics for the proposed site are captured in the ITE rates associated with the specific land use. Both of the proposed developments are categorized under Land Use Code 221 – Multifamily Housing (Mid-Rise). The total vehicle trips generated from the background developments are summarized in **Table 6**.

TABLE 6 BACKGROUND DEVELOPMENT TRIP GENERATION

	Number of Units	AM Peak Hour			PM Peak Hour		
		In	Out	2 Way	In	Out	2 Way
Trip Rate Per Dwelling Unit	–	0.09	0.27	0.36	0.27	0.17	0.14
42 Mill Street – Vehicle Trips	206	20	55	75	56	36	92
22 Dayfoot Drive – Vehicle Trips	82	10	20	30	23	15	38
Total	288	30	75	105	79	51	130

4.3.2 Corridor Growth

Corridor growth rates for Mill Street and Guelph Street were estimated using seven traffic counts spanning a period between 2005 and 2018. As there was no discernible growth along either of the roads at this intersection, a growth of 0% was assumed.

The background developments identified above will contribute directly to growth not encompassed within the 0% assumption.

Detailed corridor growth analysis charts are attached in **Appendix C**.

4.3.3 Background Traffic Volumes

Background traffic volumes, inclusive of background development growth and corridor growth along Mill Street, are shown in **Figure 6**.

4.3.4 Future Background Traffic Volumes

The future background traffic volumes, determined by adding existing traffic volumes and background traffic volumes, are shown in **Figure 7**.

4.4 SITE TRAFFIC FORECASTS

4.4.1 Vehicle Trip Generation

The ITE Trip Generation Manual (10th Edition) was used to obtain a trip generation rate for the proposed development. The proposed development is categorized under Land Use Code 221 – Multifamily Housing (Mid-Rise).

Based on the rates outlined above, the traffic volumes projected to be generated by the proposed development in the AM and PM peak hours are summarized in **Table 7**.

TABLE 7 SITE VEHICLE TRIP GENERATION

	Number of Units	AM Peak Hour			PM Peak Hour		
		In	Out	2 Way	In	Out	2 Way
Trip Rate Per Dwelling Unit	–	0.09	0.27	0.36	0.27	0.17	0.14
Vehicle Trips	52	5	15	20	15	10	25

On the basis of the above, it is estimated that the proposed development will generate in the order of 20 and 25 two-way vehicle trips during the AM and PM peak hours respectively.

4.4.2 Vehicle Trip Distribution

Site generated traffic was assigned onto the area road network based on the trip distribution percentages summarized in **Table 8**. The distribution was determined through a TTS query for existing home-based vehicle trips in the area for the weekday peak periods.

TABLE 8 SITE TRAFFIC DISTRIBUTION

Street	Direction	AM Peak		PM Peak	
		Inbound	Outbound	Inbound	Outbound
Guelph St	East	60%	60%	60%	60%
	West	10%	10%	10%	10%
Mill Street	North	20%	15%	20%	15%
	South	10%	15%	10%	15%
Total		100%	100%	100%	100%

4.4.3 Site Traffic Volumes

The projected site traffic volumes are shown in **Figure 8**.

4.5 FUTURE TOTAL TRAFFIC VOLUMES

Future total traffic volumes are determined by adding the future background traffic volumes and the site traffic volumes and are shown in **Figure 9**.



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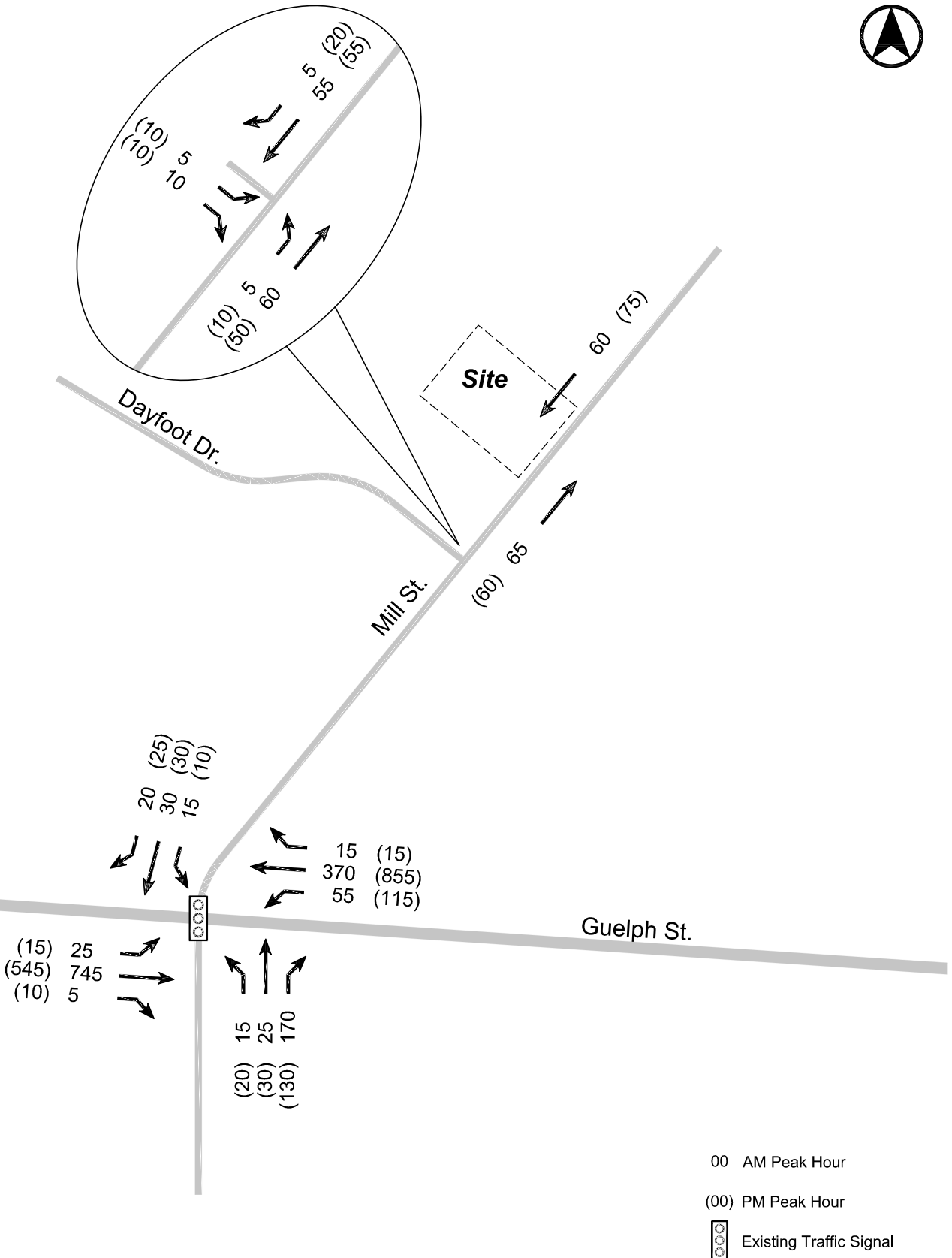
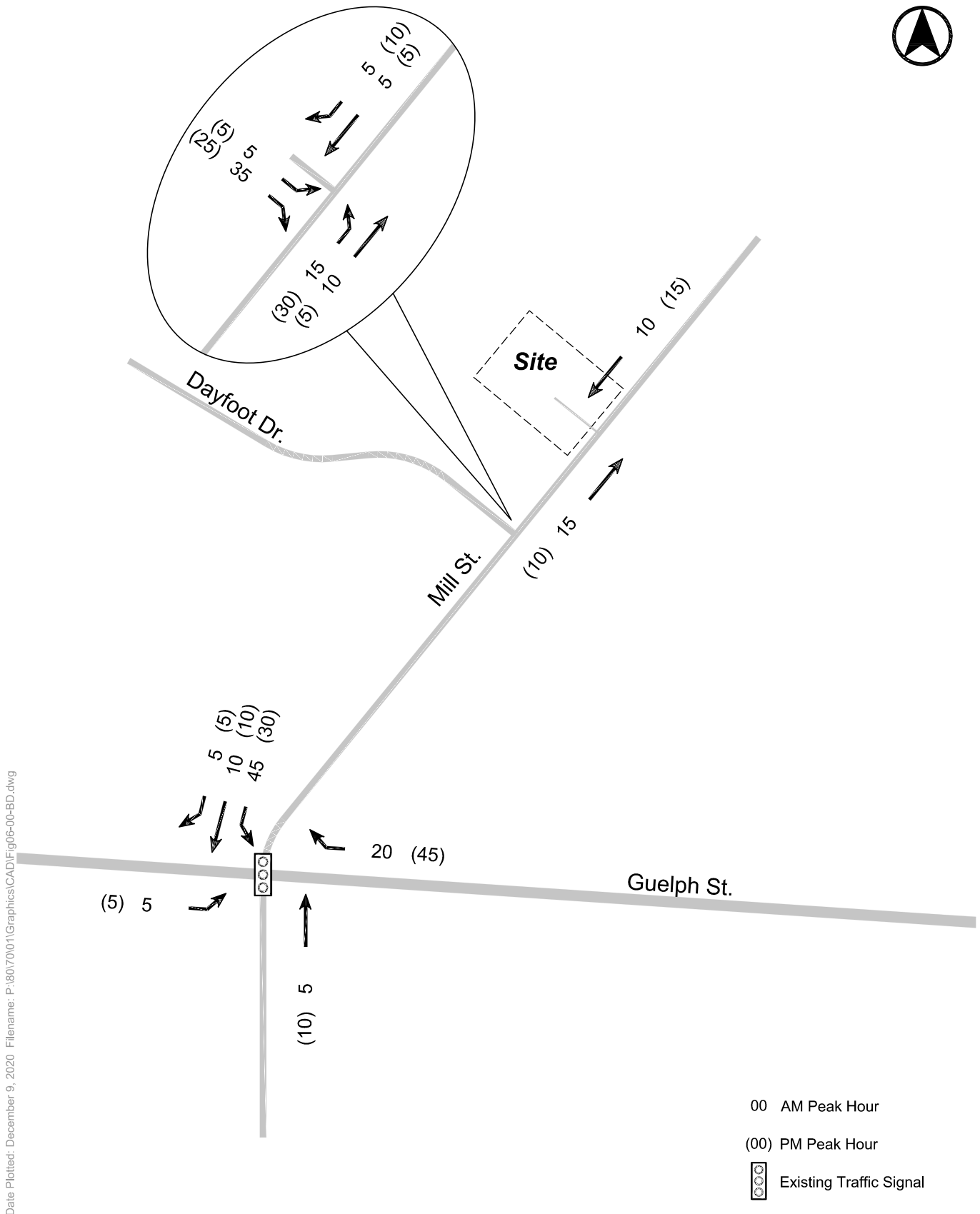


FIGURE 5 EXISTING TRAFFIC VOLUMES



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FIGURE 6 BACKGROUND DEVELOPMENT TRAFFIC VOLUMES



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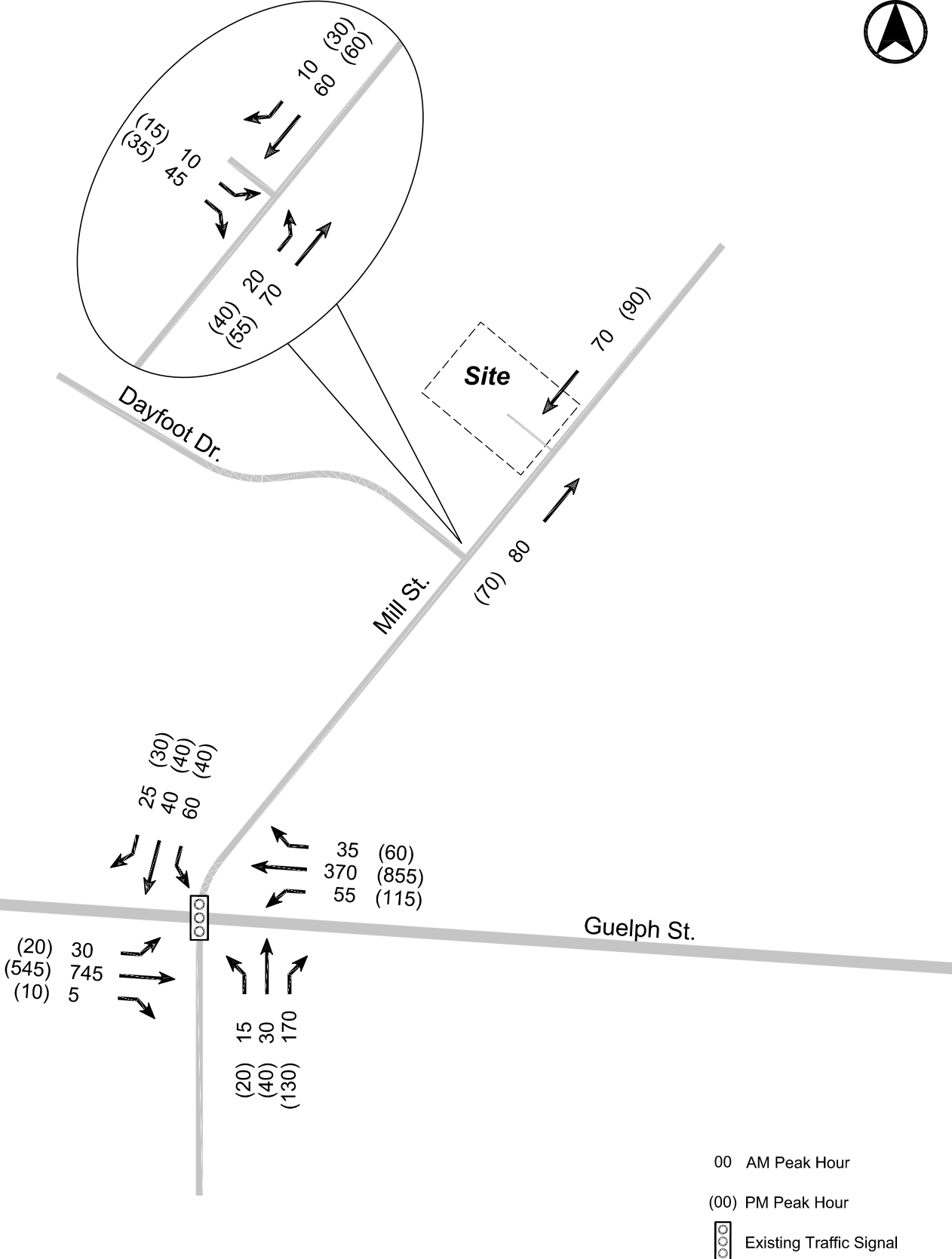


FIGURE 7 FUTURE BACKGROUND TRAFFIC VOLUMES



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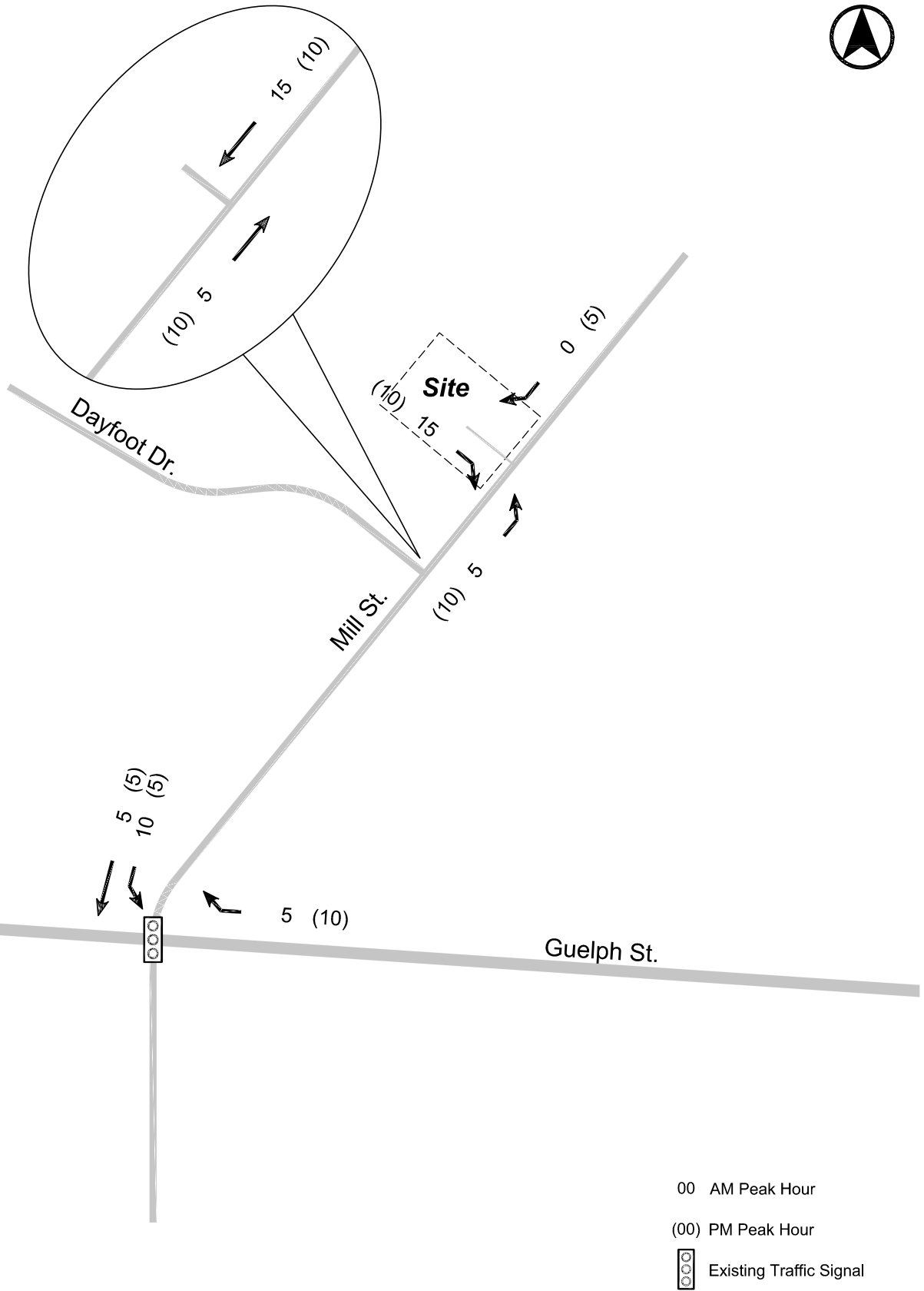


FIGURE 8 SITE TRAFFIC TRAFFIC VOLUMES



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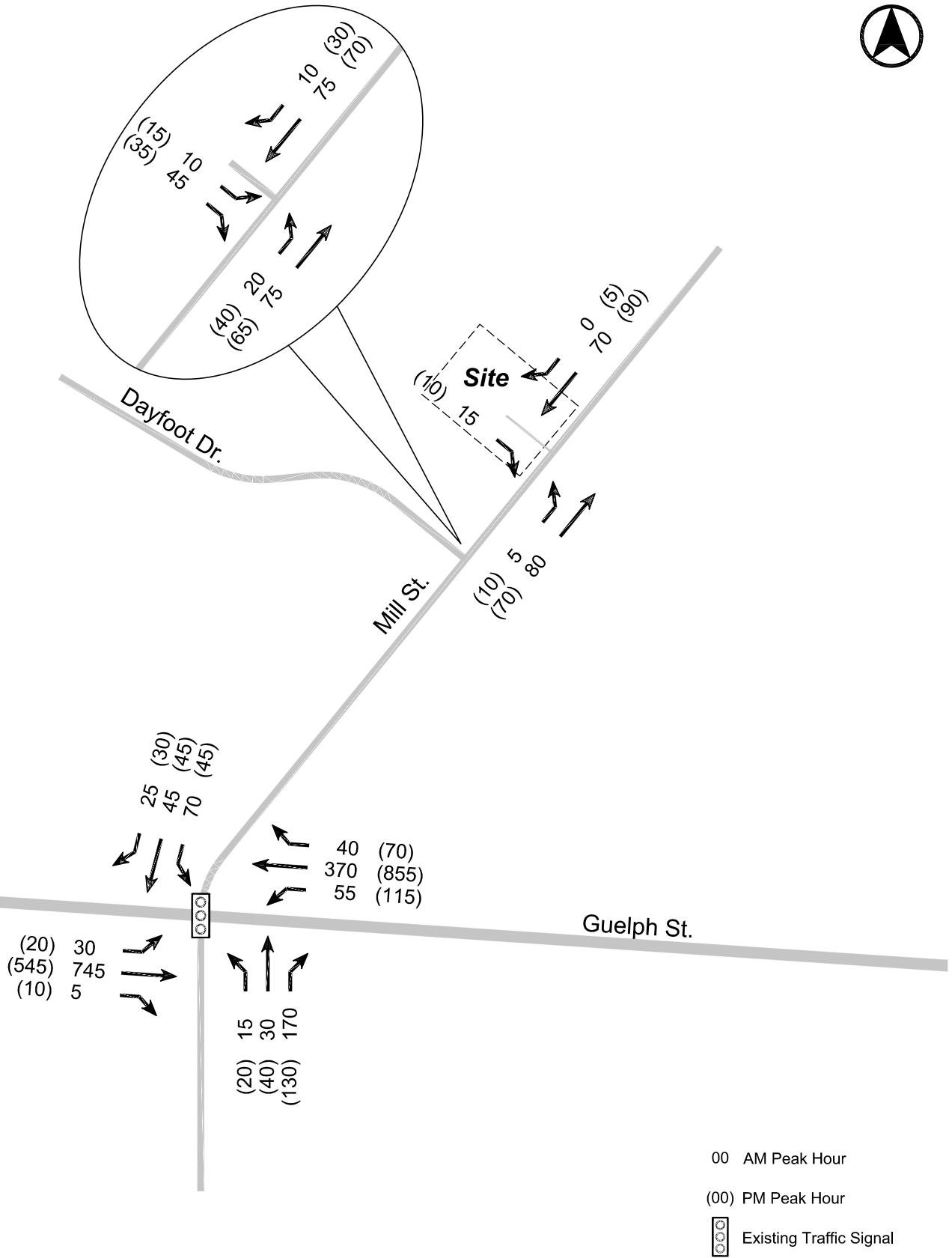


FIGURE 9 FUTURE TOTAL TRAFFIC VOLUMES

5.0 OPERATIONAL ANALYSIS

5.1 ANALYSIS METHODOLOGY

Synchro Version 11 and the Highway Capacity Manual (HCM) methodology were used to analyze the study area intersections.

For unsignalized intersections, level of service (LOS) characterizes operational conditions for key movements in terms of average delay experienced by vehicles attempting to complete a manoeuvre through the intersection. LOS 'A' represents a good level of service with short delays, while LOS 'F' represents a poor level of service with extended delays.

For signalized intersections, the volume to capacity ratio (V/C ratio) is an indicator of the capacity utilization for the key movements in the intersection. A V/C ratio of 1.0 indicates that certain governing traffic movements through the intersection are operating at or near maximum capacity.

Detailed analysis worksheets are attached in **Appendix D**.

5.2 ANALYSIS AND ASSUMPTIONS AND PARAMETERS

Synchro analysis were performed to conform to the requirements of the Halton Region Transportation Impact Studies Guidelines (January 2015).

The existing signal timing plan for the Guelph St / Mill Street intersection was provided by the Town and applied to all analysis scenarios.

A base saturation flow of 1,900 vehicles per hour per lane and a peak hour factor of 0.92 were assumed for all streets in the study area road network. Heavy vehicle percentages were calculated based on existing traffic volume data extracted from the traffic counts utilized in this study.

5.3 OPERATIONS

5.3.1 Signalized Intersection

A summary of the traffic capacity analysis for the existing signalized Guelph Street / Mill Street intersection is provided in **Table 9** and the 95th percentile queues for the intersection are shown in **Table 10**.

TABLE 9 PEAK HOUR ANALYSIS RESULTS: GUELPH ST / MILL ST

Lane Group	Existing		Future Background		Future Total	
	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS
EBL	0.05 (0.05)	A (A)	0.07 (0.08)	A (B)	0.07 (0.08)	A (A)
EBTR	0.73 (0.59)	B (B)	0.76 (0.63)	B (B)	0.78 (0.61)	B (B)
WBL	0.51 (0.56)	D (D)	0.51 (0.54)	D (C)	0.51 (0.56)	D (D)
WBTR	0.17 (0.38)	A (A)	0.19 (0.40)	A (A)	0.19 (0.40)	A (A)
NBLTR	0.28 (0.30)	C (C)	0.28 (0.35)	C (C)	0.27 (0.31)	C (C)
SBLTR	0.22 (0.18)	C (C)	0.69 (0.52)	D (C)	0.75 (0.52)	D (C)
Overall	0.65 (0.54)	B (B)	0.75 (0.60)	B (B)	0.77 (0.60)	B (B)

Notes:

1. xx (xx) – AM Peak (PM Peak)

TABLE 10 95TH PERCENTILE QUEUES: GUELPH ST / MILL ST

Lane Group	Existing Traffic	Future Background Traffic	Future Total Traffic
EBL	1.5 (1.0)	2.1 (1.6)	2.3 (1.6)
EBTR	81.4 (56.0)	92.6 (62.2)	97.7 (60.2)
WBL	9.0 (18.5)	9.0 (18.4)	9.0 (18.5)
WBTR	6.5 (22.5)	8.6 (24.3)	9.5 (22.6)
NBLTR	6.3 (8.1)	6.8 (9.9)	6.6 (9.3)
SBLTR	7.2 (6.4)	18.5 (14.5)	21.4 (16.5)

Notes:

1. xx (xx) – AM Peak (PM Peak)

5.3.2 Unsignalized Intersections

A summary of the traffic capacity analysis for the unsignalized intersections is provided in **Table 11**.

TABLE 11 PEAK HOUR ANALYSIS RESULTS: MILL ST / DAYFOOT DR

Lane Group	Existing		Future Background		Future Total	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Mill Street / Dayfoot Drive						
EBLR	8.9 (9.2)	A (A)	9.1 (9.5)	A (A)	9.2 (9.6)	A (A)
NBLT	0.6 (1.3)	A (A)	1.8 (3.3)	A (A)	1.7 (3.0)	A (A)
Mill Street / Site Access						
EBLR	-- (--)	-- (--)	-- (--)	-- (--)	8.7 (8.8)	A (A)
NBLT	-- (--)	-- (--)	-- (--)	-- (--)	0.4 (1.0)	A (A)

Notes:

1. xx (xx) – AM Peak (PM Peak)

Traffic operations are considered acceptable under both existing and future scenarios, considering the addition of area background traffic and site traffic. Existing and future queuing at Guelph Street / Mill Street can also be readily accommodated within the existing area road network and turning lane storage.

6.0 CONCLUSIONS

BA Group is retained by AGK Multi-Res GP Ltd to provide a traffic impact study for a 52 unit apartment building at 16-18 Mill Street in Georgetown (Halton Hills) located in Halton Region.

Existing Site and Transportation Context

1. The site is currently occupied by a 9-unit low-rise residential apartment building at 16 Mill Street and a triplex dwelling at 18 Mill Street
2. The Georgetown GO Station is located approximately 500 metre walking distance northeast of the site. Regional GO bus routes also operate within 500 metres of the site along Guelph Street at its intersection with Mill Street.
3. The site is designated by the Official Plan (OP) and the Georgetown GO Station Area Secondary Plan as a Medium Density Residential Area and Greenlands. Under Zoning By-law 2010-0050, the site is zoned as Low Density Residential One.
4. The site is located within the Mill Street Corridor Precinct that is currently undergoing a neighbourhood study to identify opportunities for pedestrian, cyclist and road network improvements.
5. Through pre-consultation, a road widening of up to 5.0 metres was identified by Town staff along Mill Street which has been identified and protected for on the current site plan.
6. The Halton Hills Active Transportation Master Plan (ATMP) was endorsed by Council on October 26, 2020 further identifies improvements to the active transportation network, including a proposed On-Road Facility in the form of a Signed Bike Route with Sharrows along Mill Street and a proposed Off-Road Facility along Silver Creek.

Proposed Development

7. The proposed development consists of a 52-unit apartment building with 6 stories and 2 below grade parking levels
8. A total of 70 parking spaces are proposed for the site, 18 spaces at-grade and 26 spaces on each parking level. Five barrier free spaces will be provided on the site.
9. The proposed overall parking provision requires an amendment from the in-force Zoning By-law 2010-0050 from 91 parking spaces to 70 parking spaces.
10. The proposed site driveway is located at the existing driveway for 18 Mill Street and provides vehicle access to the site parking and loading areas from Mill Street.
11. A bike parking rack will be provided next to the Main Entrance on Mill Street and a 5 metre widening along Mill Street will allow provision for an improved sidewalk and cycling facilities along Mill Street that will make active transportation and transit use more attractive and accessible.

Parking Considerations

12. The current application proposes to vary the required vehicle parking supply for the site to provide for 70 parking spaces for 52 apartment dwelling units, of which 57 (1.1 spaces per unit) will be provided for residents and 13 (0.25 spaces per unit) will be provided for visitors.
13. Resident parking is effectively supplied at a rate of 1.0 spaces per one-bed unit and 1.2 spaces per two-bed units, ensuring a minimum of one parking space for each apartment unit – without oversupplying the amount of structured parking required to be built on site.
14. Resident parking is consistent with the range of required parking rates at comparable locations across Ontario for residential uses near a similar Major Transit Station area or along Transit Oriented Corridors.
15. Parking for the site can be 'unbundled' for apartment uses. Building management can lease and manage parking leases on an ongoing basis and adopt shared (unassigned) parking for residents within a 'pool' of parking. Sharing will maximize the efficiency of the site's overall parking supply, and in turn will minimize parking supply excesses.
16. The rate of 0.25 spaces per unit provided for visitors is consistent with the Town of Halton Hills bylaw.

The proposed parking supply for the site is appropriate for the proposed apartment dwelling land use, one and two-bedroom dwelling unit types, transit and active transportation context, and TDM measures associated with not over-supplying parking on the site.

Traffic

17. Traffic operations have been reviewed for existing, future background, and future total conditions for existing (2020) and full buildout (2025).
18. Background traffic allowances were made for the proposed developments at 42 Mill Street and 22 Dayfoot Drive.
19. The site is estimated to generate 20 and 25 two-way vehicle trips during the morning and afternoon peak hours, respectively.

Site traffic volumes can be acceptably accommodated on the local area road network and site driveway under future background and future total conditions. No road network improvements are required to accommodate site traffic under future total conditions.

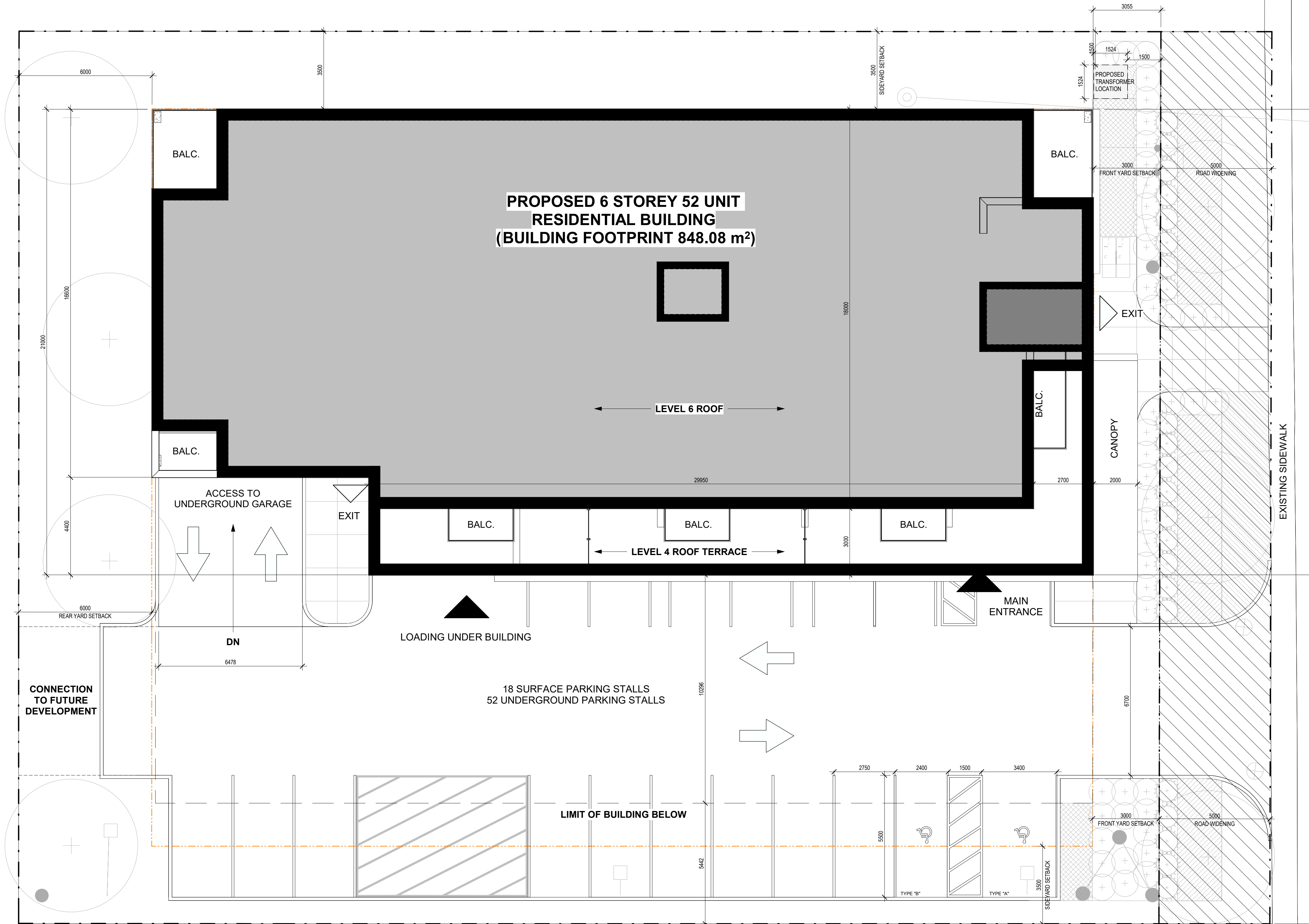
We trust the foregoing provides an appropriate presentation of our analysis, as well as a satisfactory discussion of all relevant results and their implications. Please do not hesitate to contact us directly should you require any further information and/or clarification.


BA Consulting Group Ltd.
Emily J. Ecker, P.Eng. Associate

APPENDIX A: Architectural Plans



GREENSPACE - SILVER CREEK



MILL STREET

1 SITE PLAN
1:100

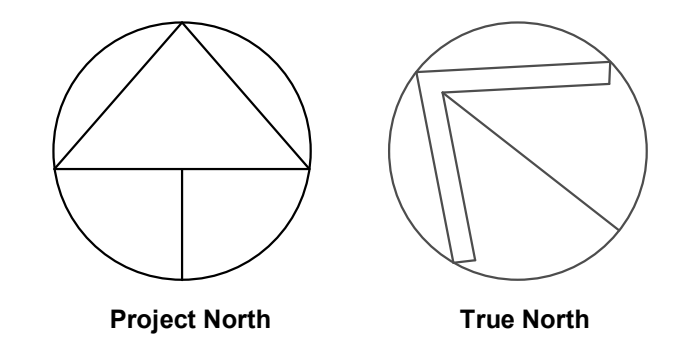
SITE DATA		
16 + 18 Mill Street, Georgetown, Ontario		
DATA	EXISTING ZONE	PROPOSED
EXISTING ZONING	ZONING - LDR1-2	
PROPOSED ZONING	ZONING - HDR - SPECIAL	
LOT AREA (m²) - PRE-ROAD WIDENING	2271.69 (m²)	
LOT AREA (m²) - POST-ROAD WIDENING	2070.51 (m²)	
MINIMUM LOT FRONTAGE (m)	11.0 (m)	40.23 (m)
FRONT YARD (m)	4.5 (m)	3.0 (m)
INTERIOR SIDE YARD (m)	7.5 (m)	3.5 (m)
EXTERIOR SIDE YARD (m)	6.0 (m)	6.0 (m)
REAR YARD (m)	7.5 (m)	6.0 (m)

BUILDING DATA		
DATA	REQUIRED	PROVIDED
TOTAL DENSITY (# of units)	100 (units per ha.)	52 (units)
BUILDING AREA (m²)	XX (m²)	848.08 (m²)
GROSS FLOOR AREA (m²)	XX (m²)	4,366.8 (m²)
FLOOR SPACE INDEX (FSI) INCLUDING BELOW GRADE	XX (m²)	GFA + P1 & P2 COMM. AND SERVICE/ LOT AREA + Z24
FLOOR SPACE INDEX (FSI) ABOVE GRADE ONLY	XX (m²)	GFA / LOT AREA + 2.11
NUMBER OF STOREYS	6 MAX.	6
BUILDING HEIGHT (m)	XX (m) MAX.	XX (m)
AMENITY AREA (m²)	XX (m²)	71.50 (m²)

LANDSCAPING DATA		
DATA	REQUIRED	PROVIDED
LANDSCAPE AREA (percentage)	XX (%)	26.5 (%)
LANDSCAPE AREA (m²)	XX (m²)	549.2 (m²)

VEHICLE PARKING DATA		
DATA	REQUIRED	PROVIDED
RESIDENTIAL PARKING	1.75 / unit = 93	1.32 / unit = 70
BARRIER FREE PARKING	5	5
VISITOR PARKING	0.X / units	XX
LOADING SPACE	NA	NA
TOTAL		XX

BICYCLE PARKING DATA		
DATA	REQUIRED	PROVIDED
RESIDENTIAL BICYCLE PARKING	NA	XX
COMMERCIAL BICYCLE PARKING	NA	XX
TOTAL		XX



- GENERAL NOTES**
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 - ALL CONTRACTORS AND SUB-CRONTACTORS SHALL HAVE A SET OF APPROVED CONSTRUCTION DOCUMENTS ON SITE AT ALL TIMES.
 - ALL DOCUMENTS REMAIN THE PROPERTY OF THE ARCHITECT. UNAUTHORIZED USE, MODIFICATION, AND/OR REPRODUCTION OF THESE DOCUMENTS IS PROHIBITED WITHOUT WRITTEN PERMISSION. THE CONTRACT DOCUMENTS WERE PREPARED BY THE CONSULTANT FOR THE ACCOUNT OF THE OWNER.
 - THE MATERIAL CONTAINED HEREIN REFLECTS THE CONSULTANT'S BEST JUDGEMENT IN LIGHT OF THE INFORMATION AVAILABLE TO HIM AT THE TIME OF PREPARATION. ANY USE WHICH A THIRD PARTY MAKES OF THE CONTRACT DOCUMENTS, OR ANY RELIANCE ON OR DECISIONS TO BE MADE BASED ON THEM ARE THE RESPONSIBILITY OF SUCH THIRD PARTIES.
 - THE CONSULTANT ACCEPTS NO RESPONSIBILITY FOR DAMAGES, IF ANY, SUFFERED BY ANY THIRD PARTY AS A RESULT OF DECISIONS MADE OR ACTIONS BASED ON THE CONTRACT DOCUMENTS.

No.	Date	Revision
3	2020-12-04	Consultant Coordination
2	2020-11-19	Consultant Coordination
1	2020-09-28	Consultant Coordination

Project No. 20052
 Project Date 2020-12-09
 Drawn by TJM
 Checked by MYV
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**16 & 18 MILL STREET,
GEORGETOWN
DEVELOPMENT**

SITE PLAN

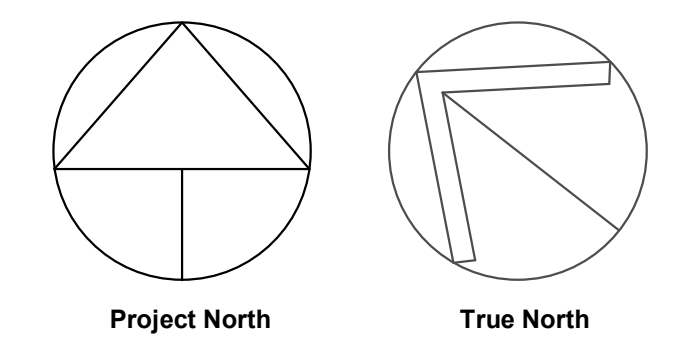
Drawing Scale As indicated
 Status

PRELIMINARY

COORDINATION
 Drawing No. Revision No.
A1.1 - r3

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AREA STATISTICS - LEVEL P1	
Name	Area
Common	
EXIT STAIR	18.35 m ²
ELEVATOR	8.31 m ²
ELEVATOR LOBBY	15.75 m ²
EXIT STAIR	15.74 m ²
STORAGE	38.29 m ²
	96.44 m²
Parking	
P1 PARKING LEVEL	1197.03 m²
	1197.03 m²
Services	
VESTIBULE	6.80 m ²
SERVICES	26.84 m ²
	33.64 m²
Grand total	1327.11 m²



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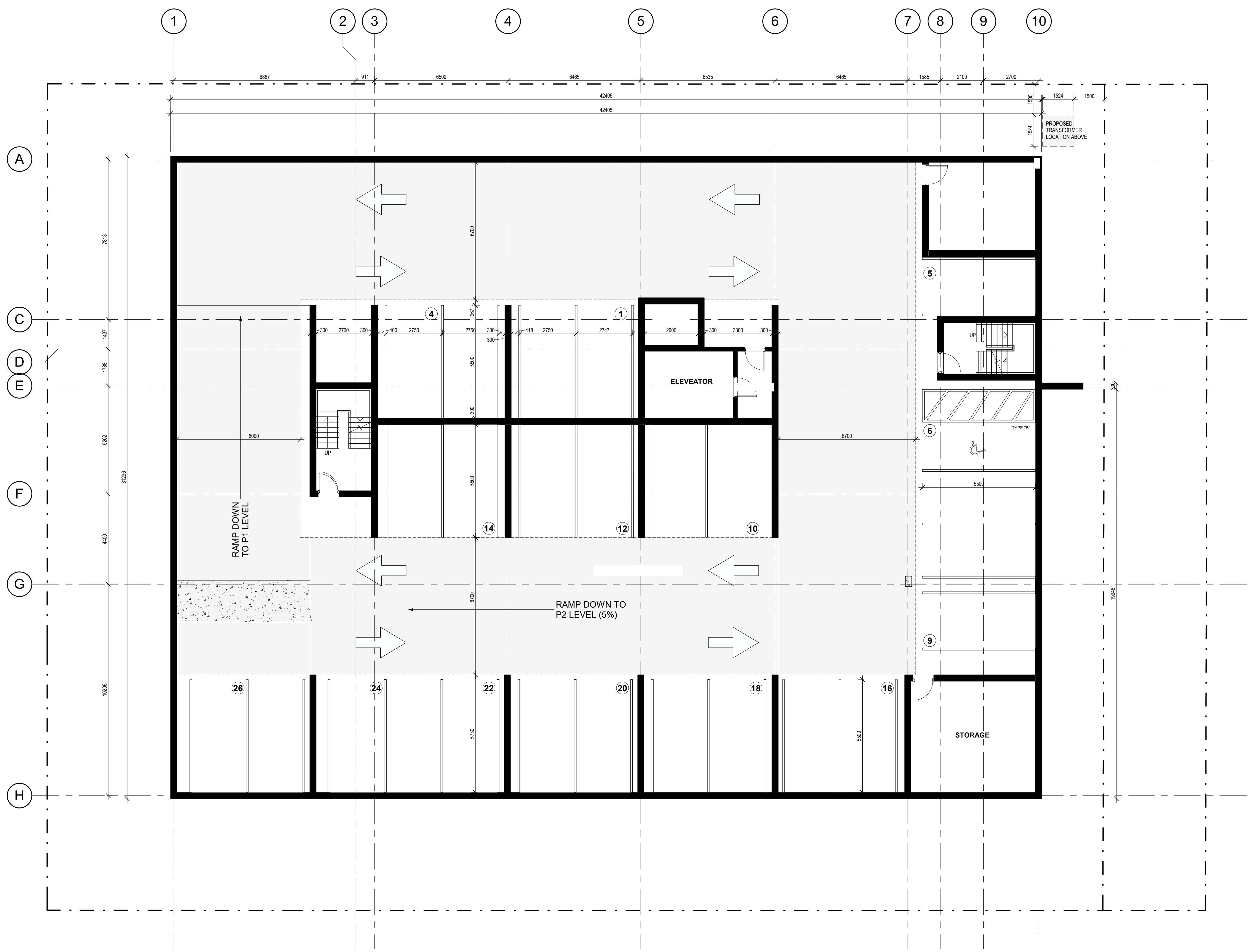
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	Project Date	2020-12-09
	Drawn by	TJM
	Checked by	MYV
	Plot Date / Time	2020-12-09 1:46:19 PM

**16 & 18 MILL STREET,
GEORGETOWN
DEVELOPMENT**

P1 LEVEL PARKING

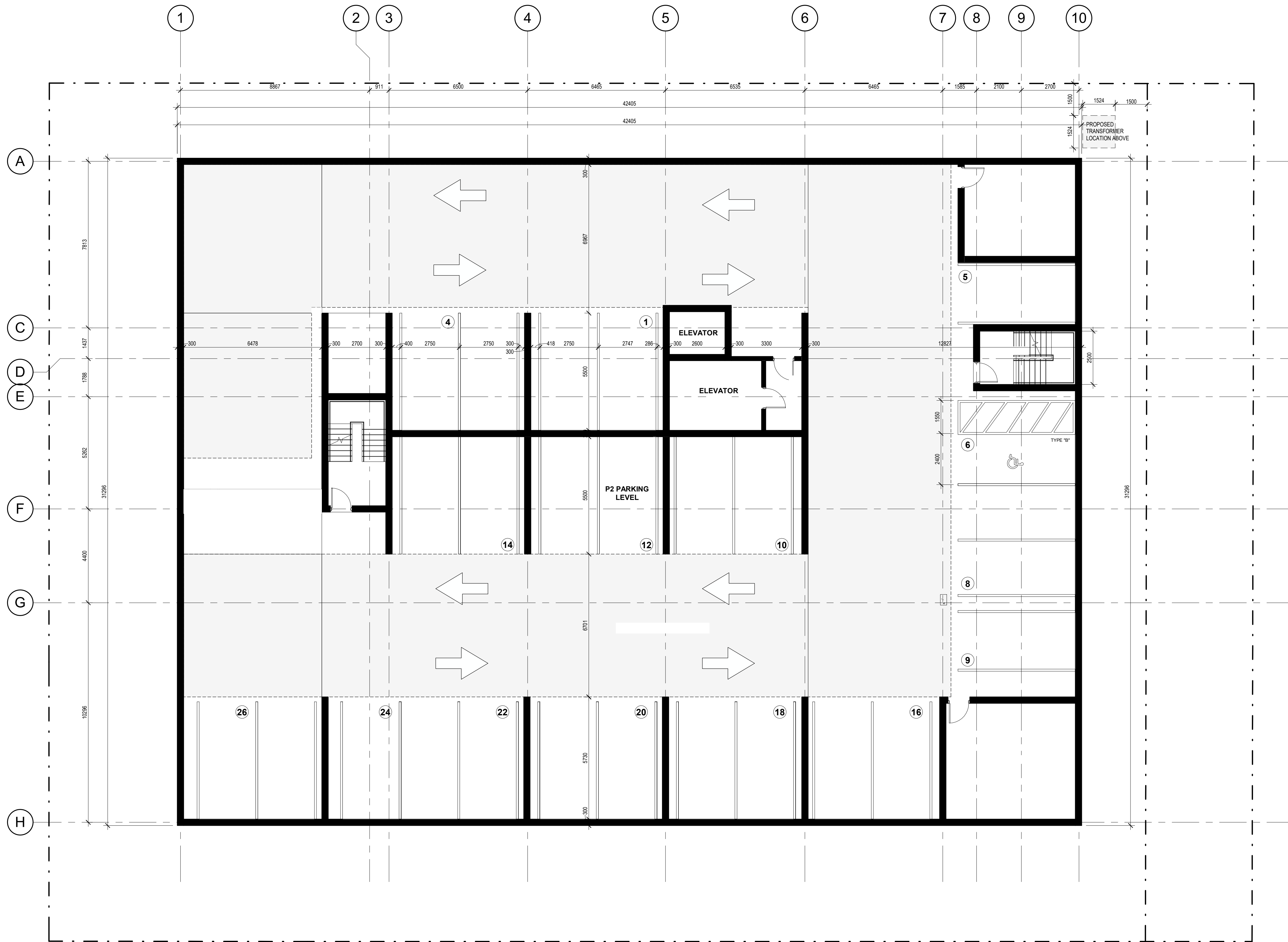
PRELIMINARY

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Drawing No. _____ Revision No. _____
A2.1 - r3



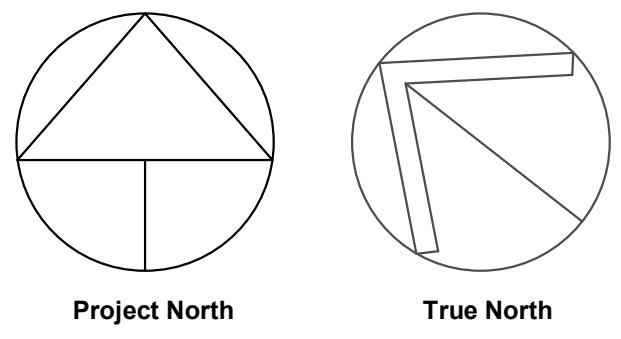
1 P1 PARKING LEVEL
1:100

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1 P2 PARKING LEVEL
1 : 100

AREA STATISTICS - LEVEL P2	
Name	Area
Common	
EXIT STAIR	18.35 m ²
ELEVATOR	8.31 m ²
ELEVATOR LOBBY	15.75 m ²
EXIT STAIR	15.74 m ²
STORAGE	38.29 m ²
	96.44 m²
Parking	
P2 PARKING LEVEL	1197.03 m ²
	1197.03 m²
Services	
VESTIBULE	6.80 m ²
SERVICES	26.84 m ²
	33.64 m²
Grand total	1327.11 m²



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1	2020-09-28	Consultant Coordination

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Project No: 20052
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**16 & 18 MILL STREET,
GEORGETOWN
DEVELOPMENT**

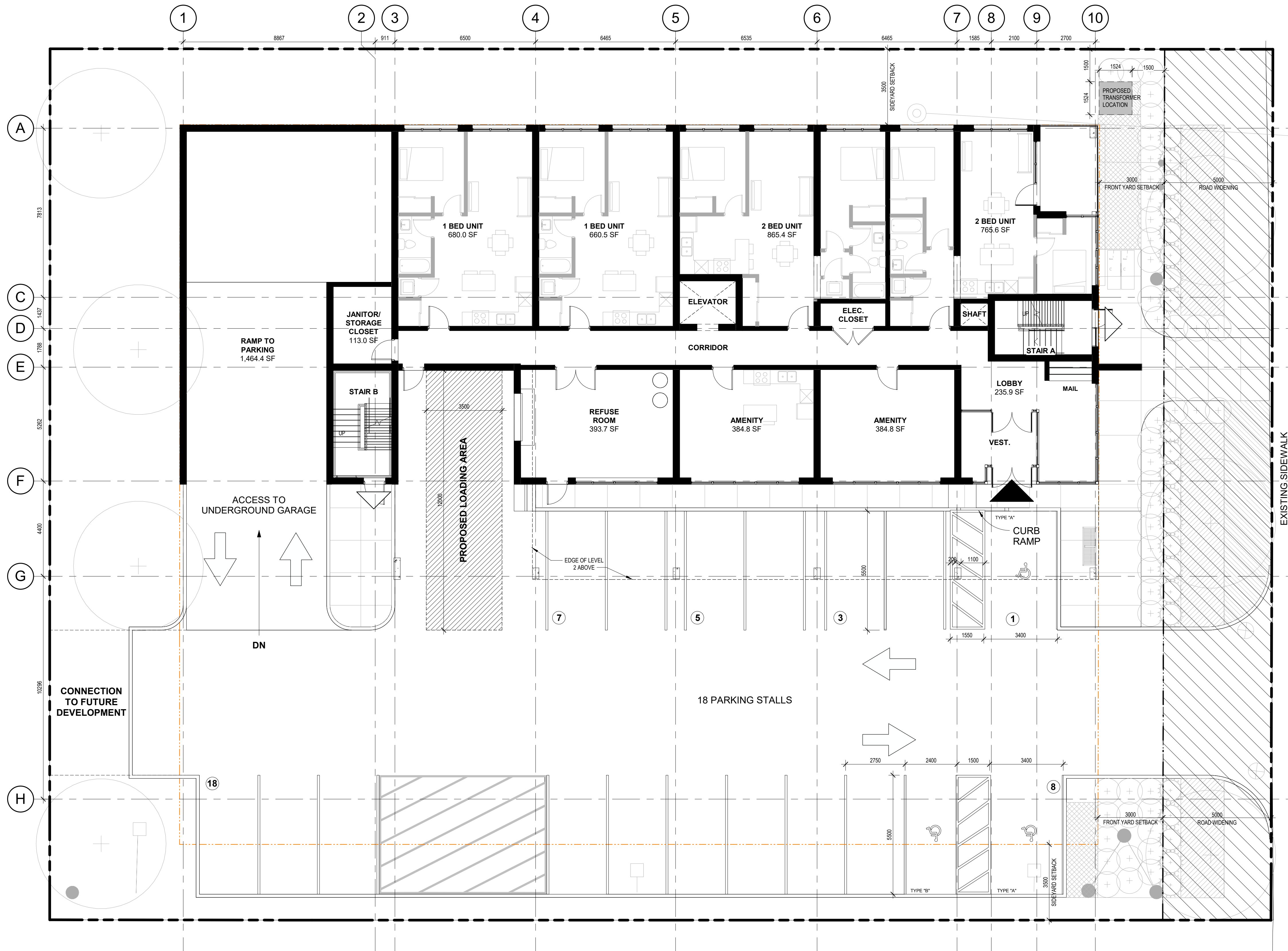
P2 LEVEL PARKING

PRELIMINARY

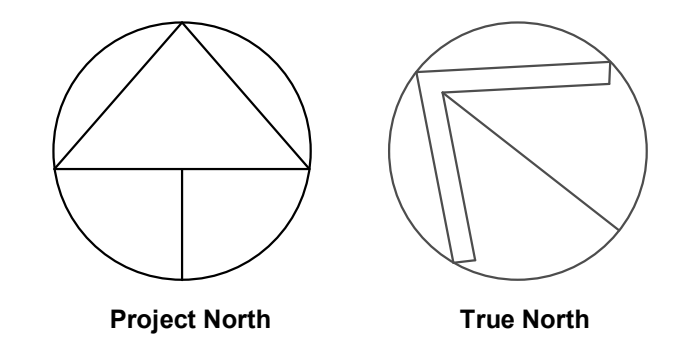
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Drawing No. _____
Revision No. _____

A2.2 - r3

GREENSPACE - SILVER CREEK



AREA STATISTICS - LEVEL 1	
Name	Area
Amenity	
AMENITY	35.75 m ²
AMENITY	35.75 m ²
	71.50 m ²
Common	
CORRIDOR	45.54 m ²
ELEVATOR	8.31 m ²
LOBBY	21.92 m ²
STAIR A	17.98 m ²
STAIR B	17.48 m ²
VEST.	10.79 m ²
	122.02 m ²
Parking	
RAMP TO PARKING	136.05 m ²
	136.05 m ²
Residential	
1 BED UNIT	61.36 m ²
1 BED UNIT	63.17 m ²
2 BED UNIT	71.13 m ²
2 BED UNIT	80.40 m ²
	276.06 m ²
Services	
ELEC. CLOSET	4.45 m ²
JANITOR/ STORAGE CLOSET	10.50 m ²
REFUSE ROOM	36.58 m ²
SHAFT	1.95 m ²
	53.47 m ²
Grand total	659.11 m²



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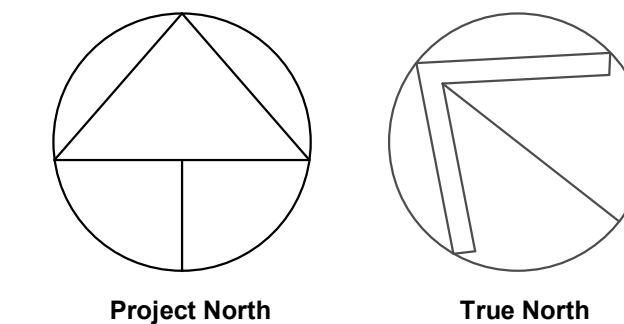
**16 & 18 MILL STREET,
 GEORGETOWN
 DEVELOPMENT**

LEVEL 1 FLOOR PLAN

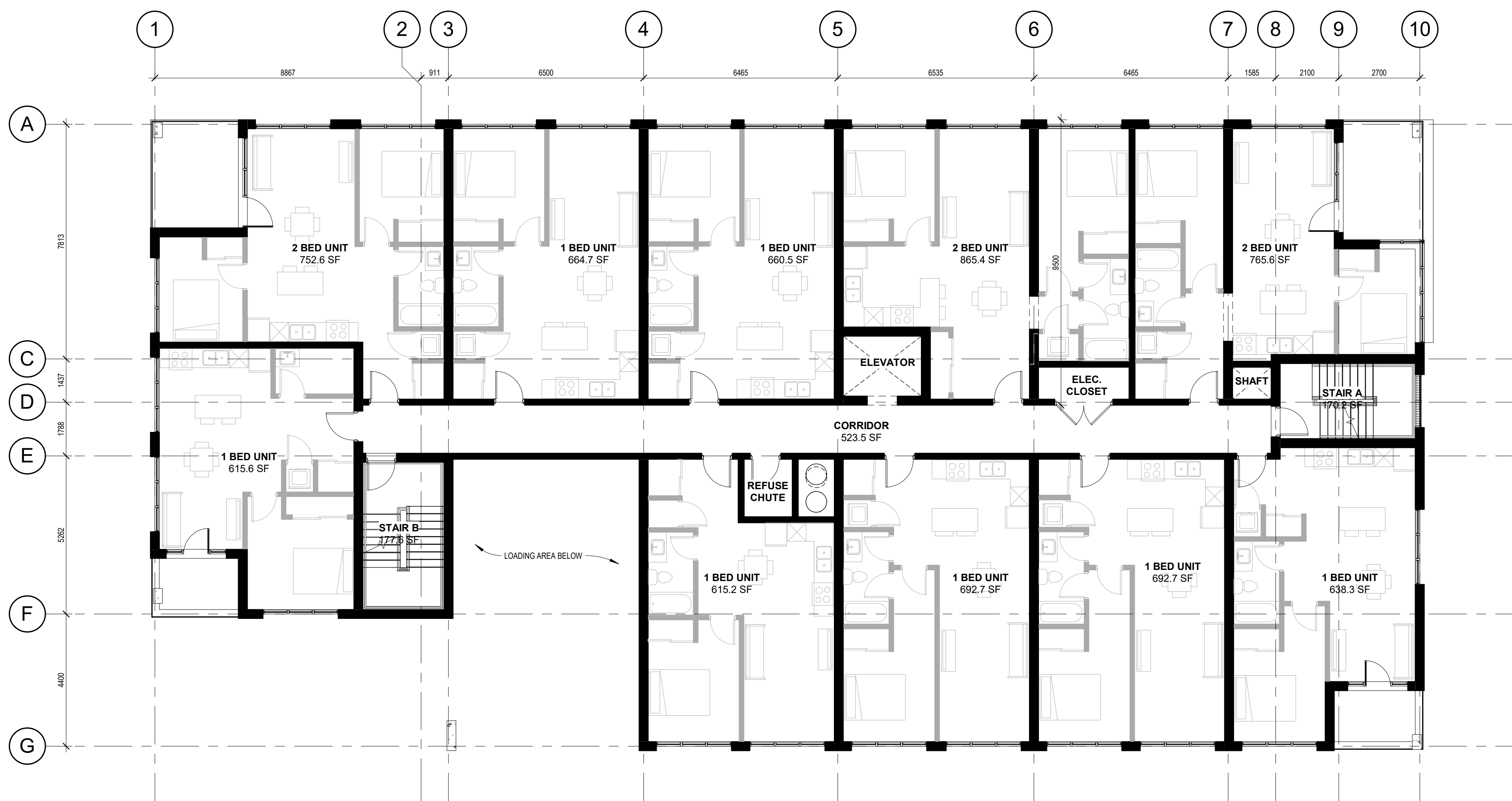
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 Status
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 Drawing No. Revision No.
A2.3 - r3

1 GROUND LEVEL PARKING
 1 : 100

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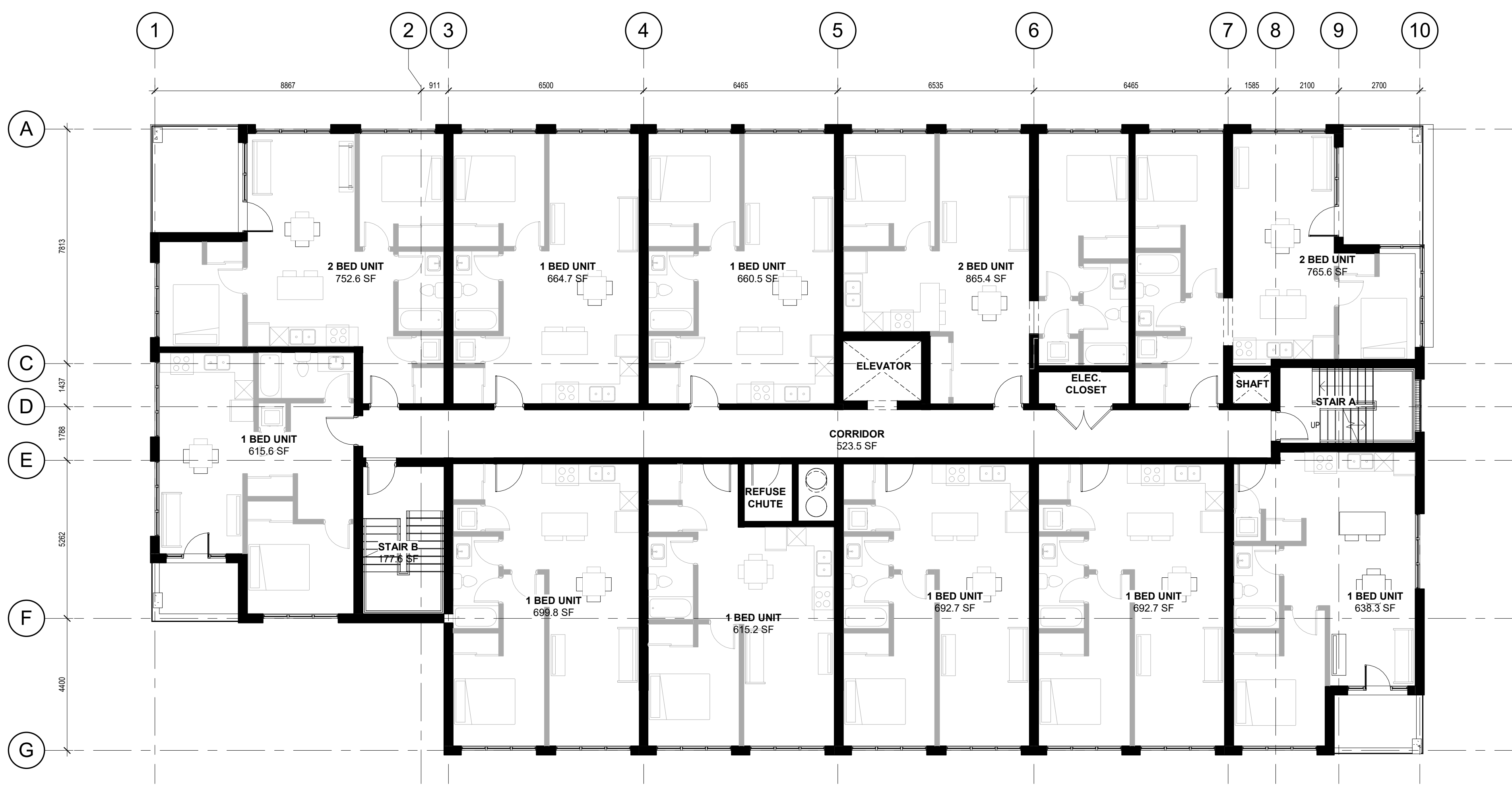


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1 LEVEL 2 FLOOR PLAN
1:100

AREA STATISTICS - LEVEL 2	
Name	Area
Common	
CORRIDOR	48.64 m ²
ELEVATOR	8.31 m ²
STAIR A	15.81 m ²
STAIR B	16.50 m ²
	89.26 m ²
Residential	
1 BED UNIT	57.16 m ²
1 BED UNIT	57.19 m ²
1 BED UNIT	59.30 m ²
1 BED UNIT	61.36 m ²
1 BED UNIT	61.75 m ²
1 BED UNIT	64.35 m ²
1 BED UNIT	64.35 m ²
2 BED UNIT	69.92 m ²
2 BED UNIT	71.13 m ²
2 BED UNIT	80.40 m ²
	646.90 m ²
Services	
ELEC. CLOSET	4.45 m ²
REFUSE CHUTE	7.19 m ²
SHAFT	1.95 m ²
	13.59 m ²
Grand total	749.76 m²



2 LEVEL 3 FLOOR PLAN
1:100

AREA STATISTICS - LEVEL 3	
Name	Area
Common	
CORRIDOR	48.64 m ²
ELEVATOR	8.31 m ²
STAIR A	15.81 m ²
STAIR B	16.50 m ²
	89.26 m ²
Residential	
1 BED UNIT	57.16 m ²
1 BED UNIT	57.19 m ²
1 BED UNIT	59.30 m ²
1 BED UNIT	61.36 m ²
1 BED UNIT	61.75 m ²
1 BED UNIT	64.35 m ²
1 BED UNIT	64.35 m ²
2 BED UNIT	69.92 m ²
2 BED UNIT	71.13 m ²
2 BED UNIT	80.40 m ²
	711.92 m ²
Services	
ELEC. CLOSET	4.45 m ²
REFUSE CHUTE	7.19 m ²
SHAFT	1.95 m ²
	13.59 m ²
Grand total	814.77 m²

No.	Date	Revision
3	2020-12-04	Consultant Coordination
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Project No: 20052
 Project Date: 2020-12-09
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**16 & 18 MILL STREET,
GEORGETOWN
DEVELOPMENT**

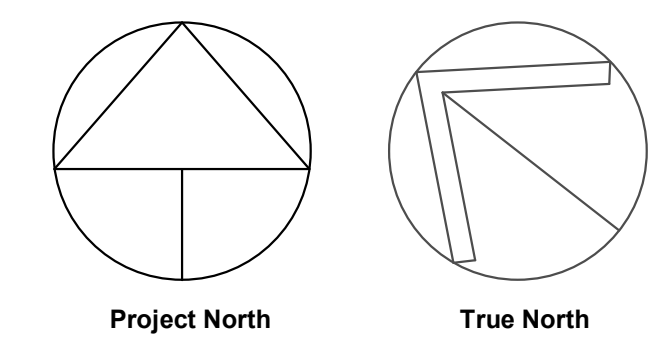
LEVEL 2-3 FLOOR PLAN

Drawing Scale: 1:100
 Status: COORDINATION
 Drawing No. _____ Revision No. _____

PRELIMINARY

A2.4 - r3

AREA STATISTICS - LEVEL 4	
Name	Area
Common	
CORRIDOR	48.64 m ²
ELEVATOR	8.31 m ²
STAIR	16.50 m ²
STAIR A	15.81 m ²
	89.26 m²
Residential	
1 BED UNIT	56.90 m ²
1 BED UNIT	61.36 m ²
1 BED UNIT	61.75 m ²
2 BED UNIT	60.08 m ²
2 BED UNIT	67.28 m ²
2 BED UNIT	69.92 m ²
2 BED UNIT	71.13 m ²
2 BED UNIT	71.52 m ²
2 BED UNIT	80.40 m ²
	600.33 m²
Services	
ELEC. CLOSET	4.45 m ²
REFUSE CHUTE	7.19 m ²
SHAFT	1.95 m ²
	13.59 m²
Grand total	703.18 m²



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 - THE MATERIAL CONTAINED HEREIN REFLECTS THE CONSULTANT'S BEST JUDGEMENT IN LIGHT OF THE INFORMATION AVAILABLE TO HIM AT THE TIME OF PREPARATION. ANY USE WHICH A THIRD PARTY MAKES OF THE CONTRACT DOCUMENTS, OR ANY RELIANCE ON OR DECISIONS TO BE MADE BASED ON THEM ARE THE RESPONSIBILITY OF SUCH THIRD PARTIES.
 - THE CONSULTANT ACCEPTS NO RESPONSIBILITY FOR DAMAGES, IF ANY, SUFFERED BY ANY THIRD PARTY AS A RESULT OF DECISIONS MADE OR ACTIONS BASED ON THE CONTRACT DOCUMENTS.

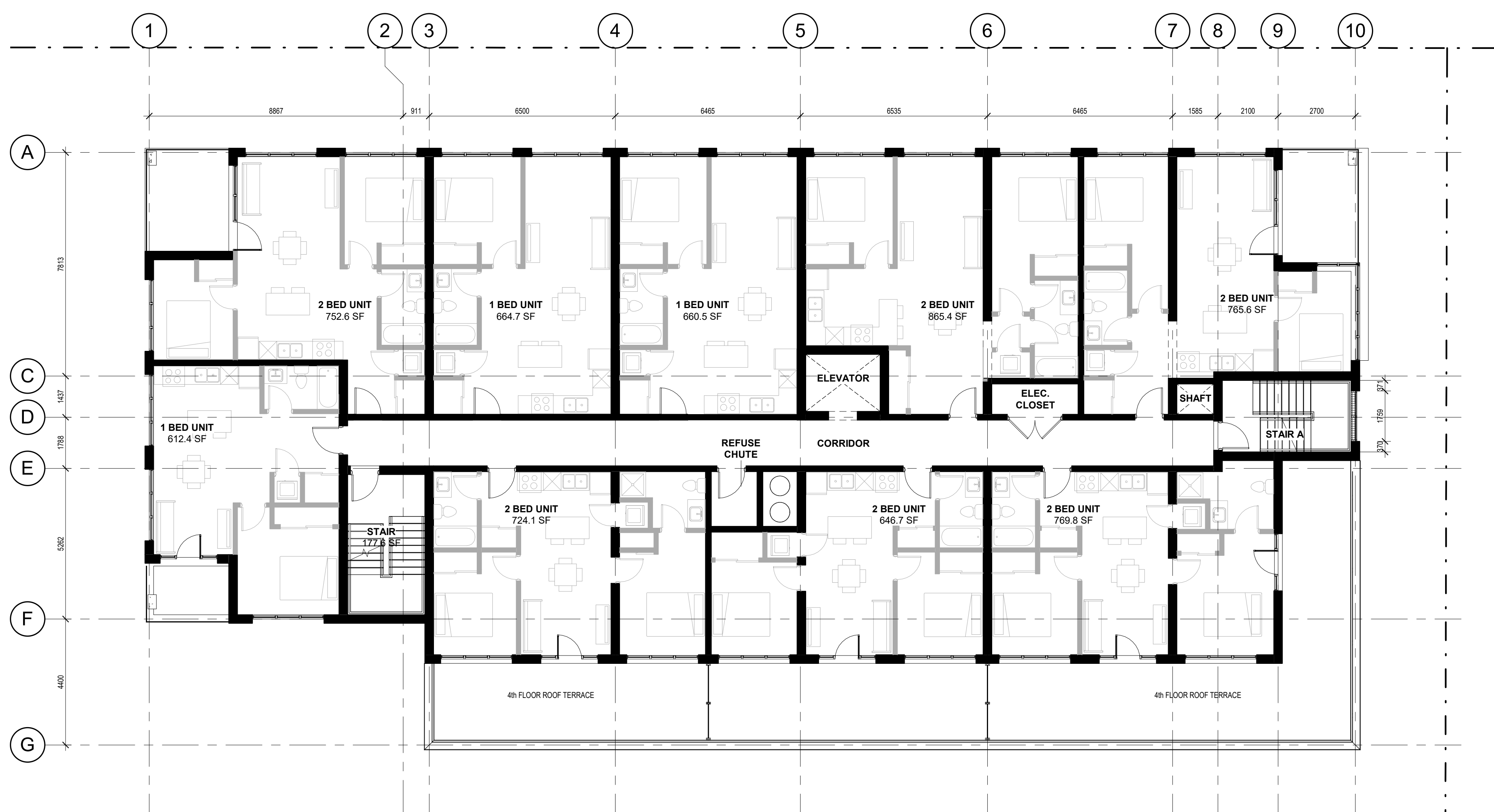
No.	Date	Revision
3	2020-12-04	Consultant Coordination
2	2020-11-19	Consultant Coordination
1	2020-09-28	Consultant Coordination

	Project No.	20052
	Project Date	2020-12-09
	Drawn by	TJM
	Checked by	MYV
	Plot Date / Time	2020-12-09 1:46:22 PM

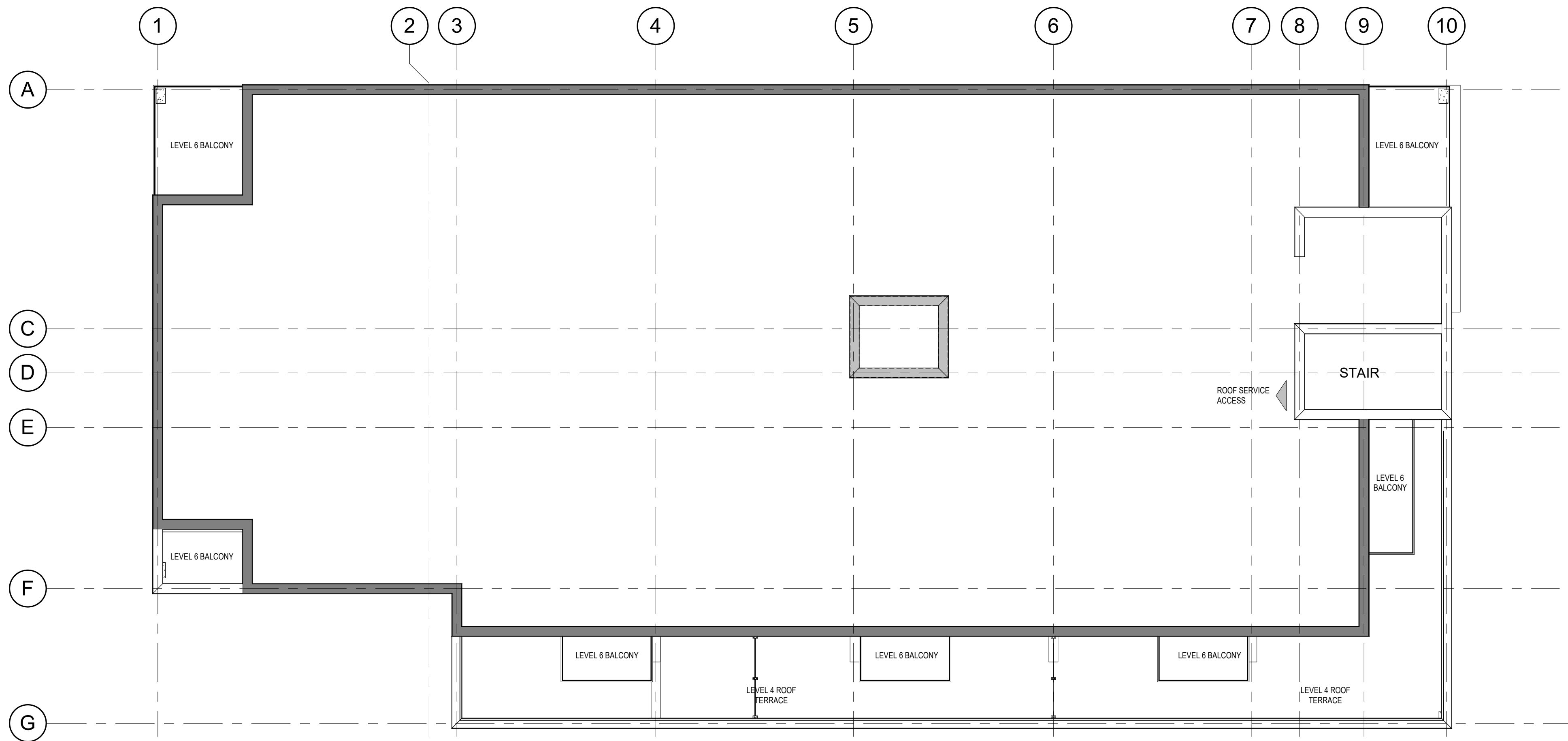
**16 & 18 MILL STREET,
GEORGETOWN
DEVELOPMENT**

LEVEL 4-5 FLOOR PLAN

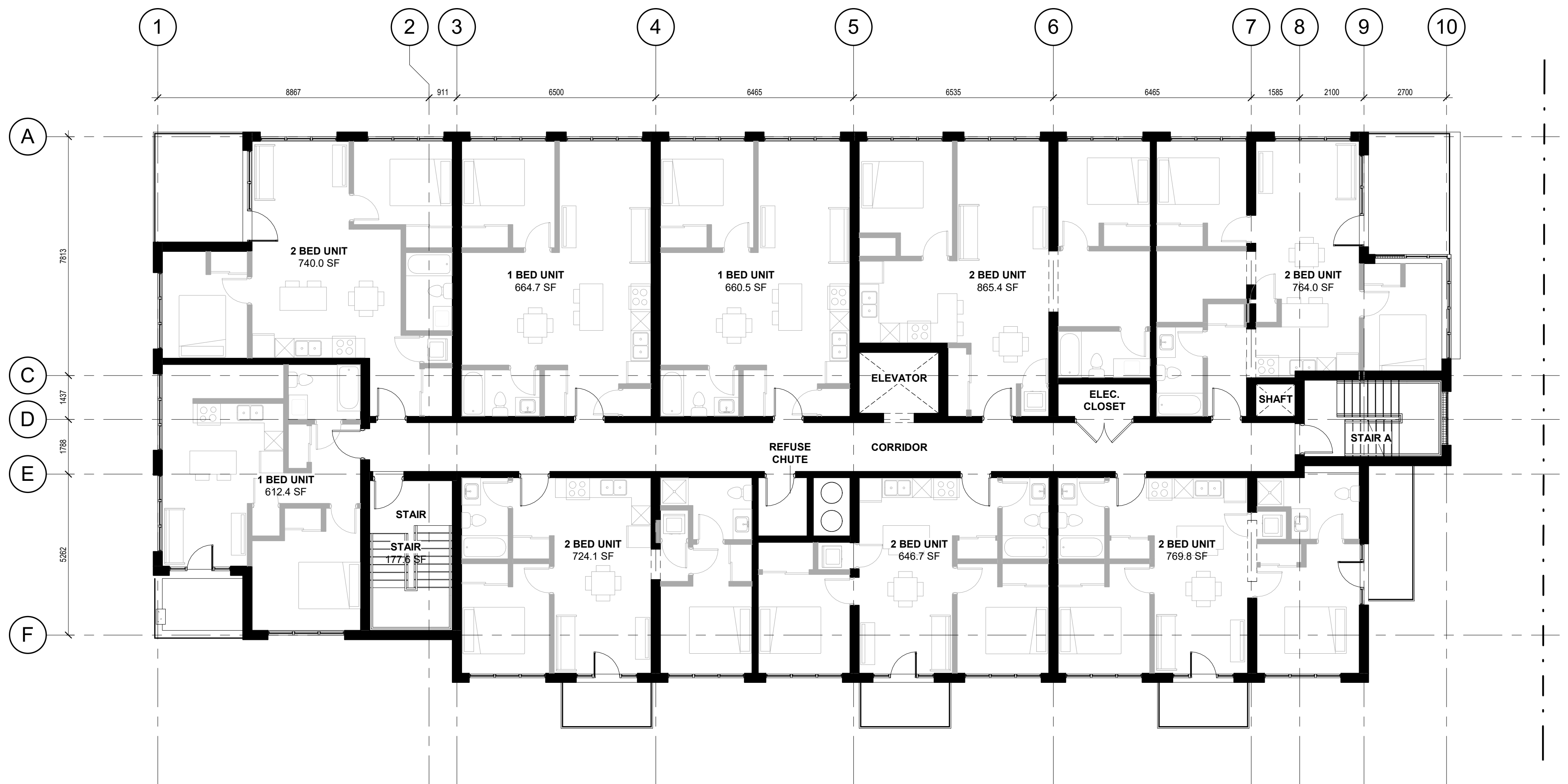
PRELIMINARY	Drawing Scale	1 : 100
	Status	
	COORDINATION	
	Drawing No.	Revision No.
	A2.5 - r3	



1 LEVEL 4-5 FLOOR PLAN
1:100

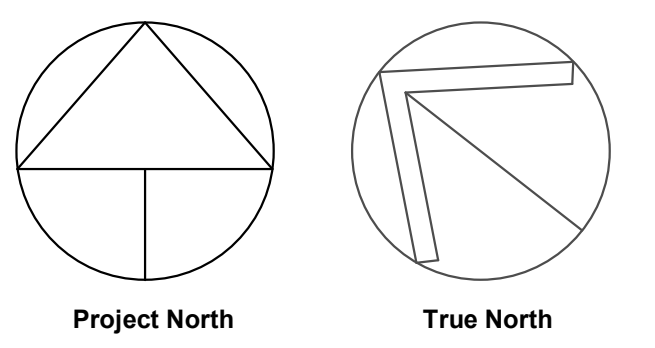


2 ROOF PLAN
1:100



1 LEVEL 6 FLOOR PLAN
1:100

AREA STATISTICS - LEVEL 6	
Name	Area
Common	
CORRIDOR	48.64 m ²
ELEVATOR	8.31 m ²
STAIR	16.50 m ²
STAIR A	15.81 m ²
	89.26 m²
Residential	
1 BED UNIT	56.90 m ²
1 BED UNIT	61.36 m ²
1 BED UNIT	61.75 m ²
2 BED UNIT	60.08 m ²
2 BED UNIT	67.28 m ²
2 BED UNIT	68.75 m ²
2 BED UNIT	70.98 m ²
2 BED UNIT	71.52 m ²
2 BED UNIT	80.40 m ²
	599.01 m²
Services	
ELEC. CLOSET	4.45 m ²
REFUSE CHUTE	7.19 m ²
SHAFT	2.10 m ²
	13.74 m²
Grand total	702.01 m²



- GENERAL NOTES**
- DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS SHALL HAVE PRECEDENCE OVER SCALED DIMENSIONS.
 - ALL WORK SHALL COMPLY WITH THE 2012 ONTARIO BUILDING CODE AND AMENDMENTS.
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No.	Date	Revision
3	2020-12-04	Consultant Coordination
2	2020-11-19	Consultant Coordination
1	2020-09-28	Consultant Coordination

Project No. 20052
 Project Date 2020-12-09
 Drawn by TJM
 Checked by MYV
 Plot Date / Time 2020-12-09 1:46:23 PM

**16 & 18 MILL STREET,
 GEORGETOWN
 DEVELOPMENT**

LEVEL 6 & ROOF PLAN

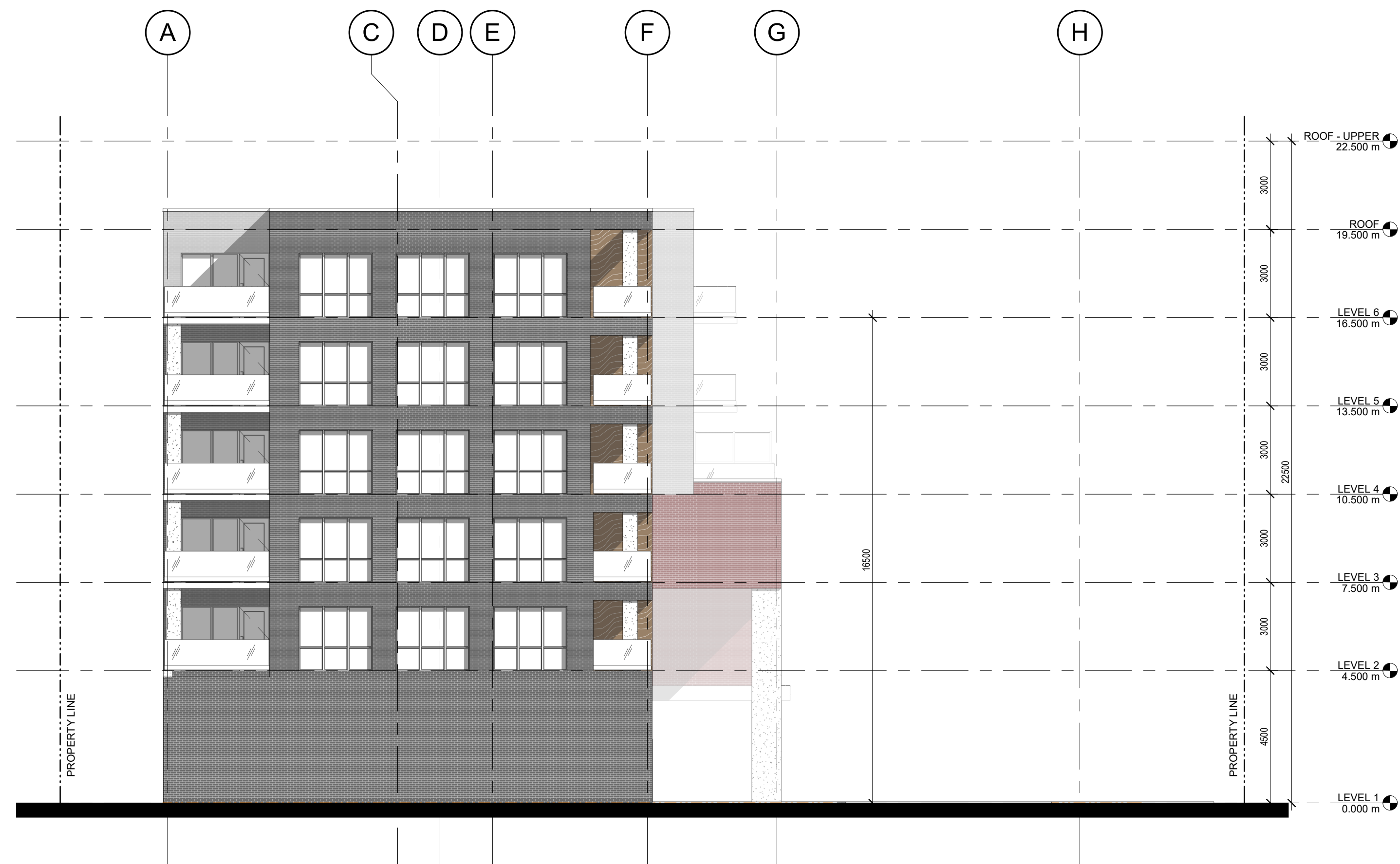
Drawing Scale	1:100
Status	COORDINATION
Drawing No.	Revision No.

PRELIMINARY

A2.6 - r3



1 EAST ELEVATION (MILL ST.)
1 : 125



4 WEST ELEVATION
1 : 125

- GENERAL NOTES**
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No.	Date	Revision
2	2020-11-19	Consultant Coordination
1	2020-09-28	Consultant Coordination

srm
ARCHITECTS INC.

Project No: 20052
Project Date: 2020-12-09
Drawn by: TJM
Checked by: MYV
Plot Date / Time: 2020-12-09 1:46:28 PM

**16 & 18 MILL STREET,
GEORGETOWN
DEVELOPMENT**

**EAST & WEST
ELEVATIONS**

PRELIMINARY

Drawing Scale: 1 : 125
Status: COORDINATION
Drawing No.: A3.1 - r2
Revision No.:




2 SOUTH ELEVATION
1 : 125



1 NORTH ELEVATION
1 : 125

- GENERAL NOTES**
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 3. CONTRACTORS MUST CHECK AND VERIFY ALL DIMENSIONS AND SPECIFICATIONS AND REPORT ANY DISCREPANCIES TO THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.
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2	2020-11-19	Consultant Coordination
1	2020-09-28	Consultant Coordination
No.	Date	Revision

	Project No.	20052
	Project Date	2020-12-09
	Drawn by	TJM
	Checked by	MYV
	Plot Date / Time	2020-12-09 1:46:37 PM

**16 & 18 MILL STREET,
GEORGETOWN
DEVELOPMENT**

**NORTH & SOUTH
ELEVATIONS**

Drawing Scale 1 : 125
Status

COORDINATION
Drawing No. Revision No.

PRELIMINARY

A3.2 - r2

APPENDIX B: Turning Movement Counts





Turning Movement Count
 Location Name: GUELPH ST & MILL ST
 Date: Tue, Nov 03, 2020 Deployment Lead: Theo Daglis

BA Group
 300 45 ST. CLAIR AVE W
 TORONTO ONTARIO, M4V 1K9
 CANADA

Turning Movement Count (1 - GUELPH ST & MILL ST)

Start Time	N Approach MILL ST				E Approach GUELPH ST				S Approach MILL ST				W Approach GUELPH ST				Int. Total (1 hr)	
	Right N/W	Thru N/S	Left N/E	Peds N:	Right E/N	Thru E/W	Left E/S	Peds E:	Right S/E	Thru S/N	Left S/W	Peds S:	Right W/S	Thru W/E	Left W/N	Peds W:		Approach Total
07:00:00	2	2	1	0	2	43	6	0	0	9	0	0	0	103	0	0	104	169
07:15:00	2	0	2	0	0	56	7	0	0	63	2	0	0	130	3	2	135	212
07:30:00	1	6	2	0	1	69	6	0	2	76	1	0	0	150	2	0	152	262
07:45:00	1	9	1	0	7	63	5	0	1	75	4	0	0	173	5	1	178	290
08:00:00	1	2	10	0	5	101	12	0	1	118	0	0	0	178	2	0	181	324
08:15:00	1	8	7	0	5	100	15	0	4	120	3	4	0	146	2	0	148	1078
08:30:00	2	4	6	0	1	75	15	0	2	91	3	12	0	163	0	6	163	311
08:45:00	6	5	7	0	6	97	19	0	0	122	1	7	1	118	3	0	122	303
BREAK																		
16:00:00	6	3	4	0	5	196	21	0	1	222	26	0	0	123	3	0	127	394
16:15:00	3	9	2	0	4	162	21	0	3	187	19	0	0	159	3	2	166	395
16:30:00	6	6	1	0	4	179	27	0	1	210	19	3	0	139	1	0	142	390
16:45:00	4	8	3	0	5	177	24	0	3	206	26	0	0	136	0	0	140	398
17:00:00	4	3	3	0	5	202	25	0	0	232	30	1	1	111	6	5	118	396
17:15:00	4	4	5	0	6	176	24	0	1	206	34	1	3	113	1	0	117	379
17:30:00	5	3	4	0	3	178	22	0	0	203	28	2	4	115	1	0	120	365
17:45:00	3	5	5	0	1	167	21	0	0	189	34	1	2	107	5	0	114	358
Grand Total	51	77	63	0	60	2041	270	0	19	2371	386	31	26	2164	37	0	2227	5553
Approach%	26.7%	40.3%	33%	0%	2.5%	86.1%	11.4%	0%	0%	83.2%	12.1%	4.7%	1.2%	97.2%	1.7%	0%	-	-
Totals %	1%	1.5%	1.2%	0%	1.1%	38.9%	5.1%	0%	8.8%	45.1%	7.3%	0.4%	0.5%	41.2%	0.7%	0%	42.4%	-
Heavy %	0%	1%	2%	0%	1%	95%	7%	0%	-	-	10%	0%	2%	97%	1%	0%	-	-
Bicycles %	0%	1.3%	3.2%	0%	1.7%	4.7%	2.6%	0%	-	-	1.8%	0%	7.7%	4.5%	2.7%	0%	-	-
Bicycle %	0%	0%	0%	0%	0%	0%	0%	0%	-	-	0%	0%	0%	0%	0%	0%	-	-



Peak Hour: 08:00 AM - 09:00 AM Weather: Shower Rain (4.47 °C)

Start Time	N Approach MILL ST					E Approach GUELPH ST					S Approach MILL ST					W Approach GUELPH ST					Int. Total (15 min)	
	Right	Thru	Left	U-Turn	Peds	Right	Thru	Left	U-Turn	Peds	Right	Thru	Left	U-Turn	Peds	Right	Thru	Left	U-Turn	Peds		
	Approach Total	Approach Total	Approach Total	Approach Total	Approach Total	Approach Total	Approach Total	Approach Total	Approach Total	Approach Total	Approach Total	Approach Total	Approach Total	Approach Total	Approach Total	Approach Total	Approach Total	Approach Total	Approach Total	Approach Total		
08:00:00	1	2	10	0	0	0	5	101	12	1	118	12	0	0	0	0	1	178	2	0	0	181
08:15:00	1	8	7	0	1	16	5	100	15	4	120	28	3	2	0	4	146	2	0	1	148	
08:30:00	2	4	6	0	2	12	1	75	15	0	91	40	3	2	0	12	163	0	0	6	163	
08:45:00	6	5	7	0	1	18	6	97	19	0	122	40	1	0	0	7	118	3	0	0	122	
Grand Total	10	19	30	0	4	59	17	373	61	7	451	120	7	4	0	23	605	7	0	7	614	
Approach%	16.9%	32.2%	50.8%	0%	0%	3.8%	82.7%	13.5%	0%	0%	35.9%	9.6%	5.3%	3.1%	0%	0%	98.6%	1.1%	0%	0%	1.1%	
Totals %	0.6%	1.5%	2.4%	0%	0%	4.7%	29.7%	4.9%	0%	0%	35.9%	9.6%	5.3%	3.1%	0%	0%	48.2%	0.6%	0%	0%	0.6%	
PHF	0.42	0.59	0.75	0	0	0.82	0.71	0.92	0.8	0	0.92	0.75	0.58	0.5	0	0	0.85	0.58	0	0	0.85	
Heavy	0	0	1	0	0	1	36	2	0	0	39	4	1	0	0	0	35	1	0	0	36	
Heavy %	0%	0%	3.3%	0%	0%	1.7%	9.7%	3.3%	0%	0%	8.6%	3.3%	14.3%	0%	0%	0%	5.8%	14.3%	0%	0%	5.9%	
Lights	10	19	29	0	0	58	16	337	59	0	412	116	6	4	0	0	570	6	0	0	578	
Lights %	100%	100%	96.7%	0%	0%	98.3%	94.1%	90.3%	96.7%	0%	91.4%	96.7%	85.7%	100%	0%	0%	94.2%	85.7%	0%	0%	94.1%	
Single-Unit Trucks	0	0	0	0	0	0	0	16	1	0	17	2	0	0	0	0	18	1	0	0	19	
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	0%	4.3%	1.6%	0%	3.8%	1.7%	0%	0%	0%	0%	3%	14.3%	0%	0%	3.1%	
Buses	0	0	1	0	0	1	0	10	1	0	11	2	0	0	0	0	13	0	0	0	13	
Buses %	0%	0%	3.3%	0%	0%	1.7%	2.7%	1.6%	0%	0%	2.4%	1.7%	0%	0%	0%	0%	2.1%	0%	0%	0%	2.1%	
Articulated Trucks	0	0	0	0	0	0	1	10	0	0	11	0	1	0	0	0	4	0	0	0	4	
Articulated Trucks %	0%	0%	0%	0%	0%	0%	5.9%	2.7%	0%	0%	2.4%	0%	14.3%	0%	0%	0%	0.7%	0%	0%	0%	0.7%	
Pedestrians	-	-	-	-	4	-	-	-	-	6	-	-	-	-	20	-	-	-	-	7	-	
Pedestrians %	-	-	-	-	9.8%	-	-	-	-	14.6%	-	-	-	-	48.8%	-	-	-	-	17.1%	-	
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	1	-	-	-	-	3	-	-	-	-	0	-	
Bicycles on Crosswalk %	-	-	-	-	0%	-	-	-	-	2.4%	-	-	-	-	7.3%	-	-	-	-	0%	-	
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	
Bicycles on Road %	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	

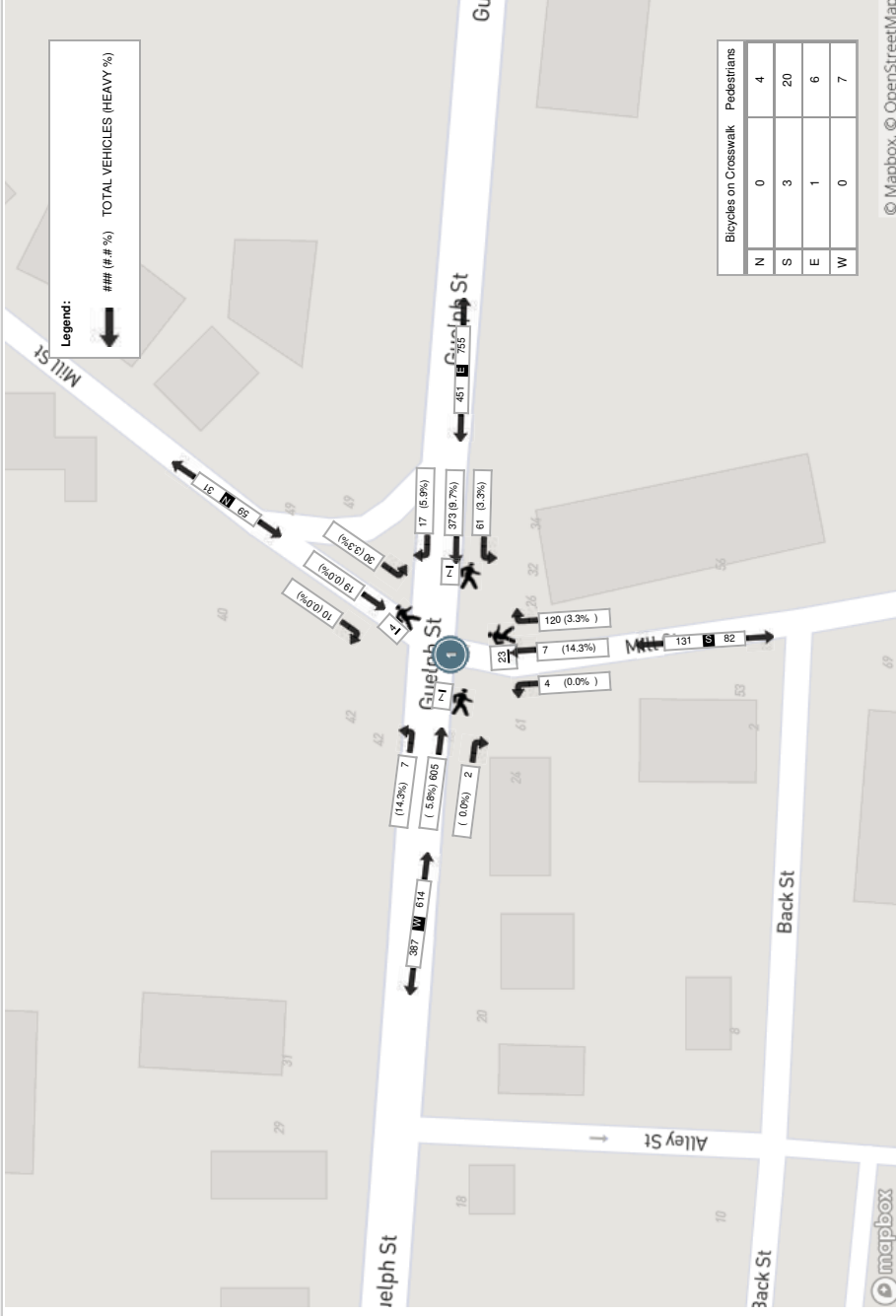


Turning Movement Count
 Location Name: GUELPH ST & MILL ST
 Date: Tue, Nov 03, 2020 Deployment Lead: Theo Daglis

BA Group
 300 45 ST. CLAIR AVE W
 TORONTO ONTARIO, M4V 1K9
 CANADA

Peak Hour: 04:15 PM - 05:15 PM Weather: Overcast Clouds (5.94 °C)

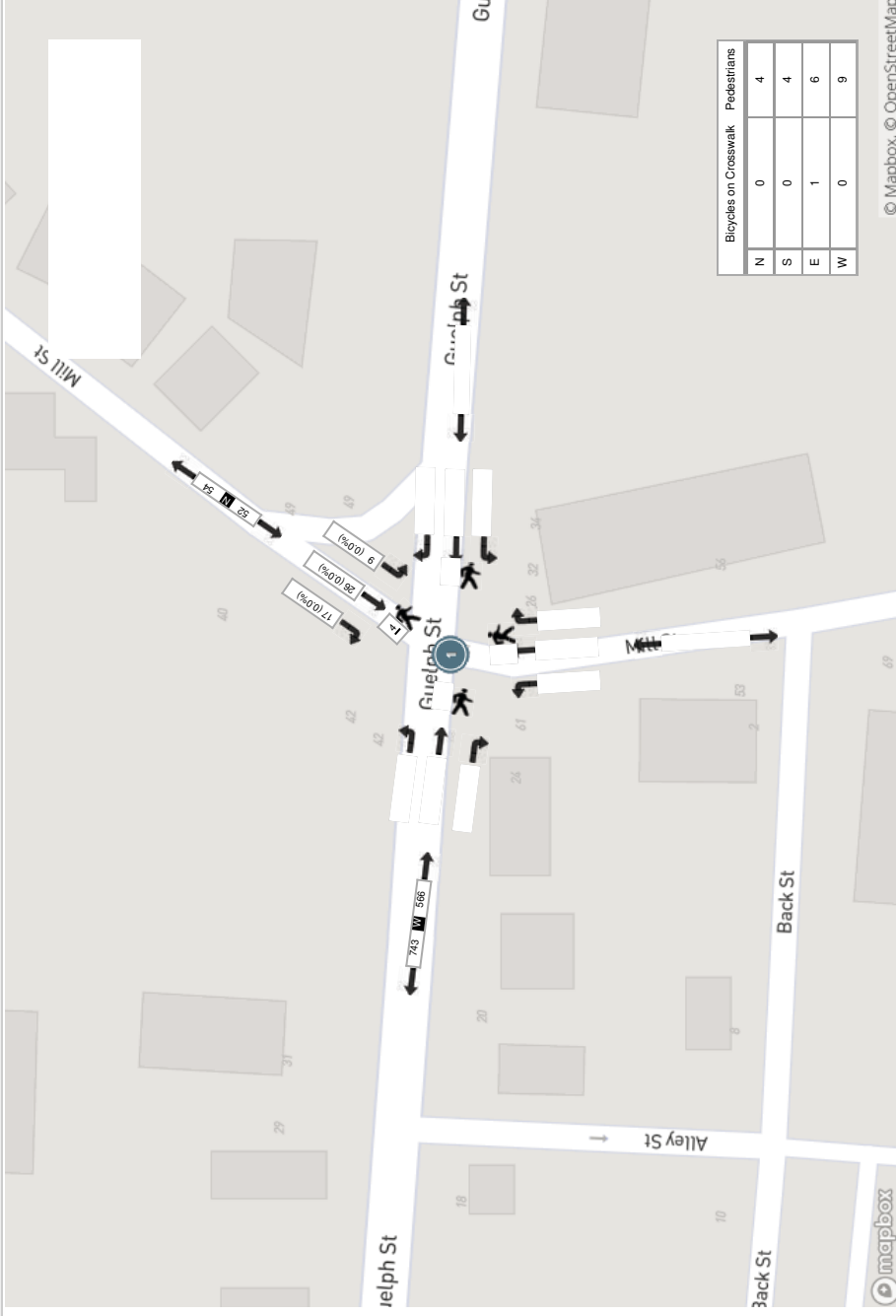
Start Time	N Approach MILL ST					E Approach GUELPH ST					S Approach MILL ST					W Approach GUELPH ST					Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Right	Thru	Left	U-Turn	Peds	Right	Thru	Left	U-Turn	Peds	Right	Thru	Left	U-Turn	Peds	
16:15:00	3	9	2	0	0	4	162	21	0	3	187	19	7	2	0	4	159	3	0	2	166
16:30:00	6	6	1	0	1	4	179	27	0	1	210	19	4	2	0	3	139	1	0	2	142
16:45:00	4	8	3	0	2	15	177	24	0	3	206	26	9	2	0	0	136	0	0	0	140
17:00:00	4	3	3	0	1	10	202	25	0	0	232	30	6	0	1	1	111	6	0	5	118
Grand Total	17	26	9	0	4	52	720	97	0	7	835	94	26	6	4	126	545	10	0	9	566
Approach%	32.7%	50%	17.3%	0%	0%	-	86.2%	11.6%	0%	0%	-	74.6%	20.6%	4.8%	0%	-	96.3%	1.8%	0%	0%	-
Totals %	1.1%	1.6%	0.6%	0%	0%	3.3%	45.6%	6.1%	0%	0%	52.9%	6%	1.6%	0.4%	0%	8%	34.5%	0.6%	0%	0%	35.8%
PHF	0.71	0.72	0.75	0	0	0.87	0.89	0.9	0	0	0.9	0.78	0.72	0.75	0	0.85	0.86	0.42	0	0	0.85
Heavy	0	0	0	0	0	0	11	1	0	0	12	2	0	0	0	2	28	0	0	0	29
Heavy %	0%	0%	0%	0%	0%	0%	1.5%	1%	0%	0%	1.4%	2.1%	0%	0%	0%	1.6%	5.1%	0%	0%	0%	5.1%
Lights	17	26	9	0	0	52	709	96	0	7	823	92	26	6	4	124	517	10	0	9	537
Lights %	100%	100%	100%	0%	0%	100%	98.5%	99%	0%	0%	98.6%	97.9%	100%	100%	0%	98.4%	94.9%	100%	0%	0%	94.9%
Single-Unit Trucks	0	0	0	0	0	0	5	0	0	0	5	1	0	0	0	1	21	0	0	0	22
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	0.7%	0%	0%	0%	0.6%	1.1%	0%	0%	0%	0.8%	3.9%	0%	0%	0%	3.9%
Buses	0	0	0	0	0	0	2	1	0	0	3	1	0	0	0	1	6	0	0	0	6
Buses %	0%	0%	0%	0%	0%	0%	0.3%	1%	0%	0%	0.4%	1.1%	0%	0%	0%	0.8%	1.1%	0%	0%	0%	1.1%
Articulated Trucks	0	0	0	0	0	0	4	0	0	0	4	0	0	0	0	0	1	0	0	0	1
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0.6%	0%	0%	0%	0.5%	0%	0%	0%	0%	0%	0.2%	0%	0%	0%	0.2%
Pedestrians	-	-	-	-	4	-	-	-	6	-	-	-	-	-	4	-	-	-	-	9	-
Pedestrians %	-	-	-	-	16.7%	-	-	-	25%	-	-	-	-	-	16.7%	-	-	-	-	37.5%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	1	-	-	-	-	-	0	-	-	-	-	0	-
Bicycles on Crosswalk %	-	-	-	-	0%	-	-	-	4.2%	-	-	-	-	-	0%	-	-	-	-	0%	-
Bicycles on Road	0	0	0	0	0	-	0	0	0	-	-	1	0	0	0	-	0	0	0	0	-
Bicycles on Road %	-	-	-	-	0%	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	0%	-





Turning Movement Count
Location Name: GUELPH ST & MILL ST
Date: Tue, Nov 03, 2020 Deployment Lead: Theo Daglis

Peak Hour: 04:15 PM - 05:15 PM Weather: Overcast Clouds (5.94 °C)



Guelph St @ Mill St

Morning Peak Diagram

Specified Period

From: 7:00:00

To: 9:00:00

One Hour Peak

From: 7:45:00

To: 8:45:00

Municipality: Halton Hills
Site #: 000000002
Intersection: Guelph St & Mill St
TFR File #: 2
Count date: 5-Nov-2018

Weather conditions:

Rain/Cloudy

Person(s) who counted:

Les

** Signalized Intersection **

Major Road: Guelph St runs W/E

North Leg Total: 134

North Entering: 69

North Peds: 8

Peds Cross: \times

Heavys	0	1	0	1
Trucks	0	0	1	1
Cars	21	31	15	67
Totals	21	32	16	



Heavys	1
Trucks	2
Cars	62
Totals	65

East Leg Total: 1368

East Entering: 440

East Peds: 3

Peds Cross: \times

Heavys	Trucks	Cars	Totals
23	9	374	406

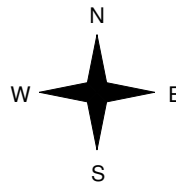


Mill St

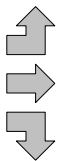
Cars	Trucks	Heavys	Totals
15	0	0	15
338	9	23	370
54	0	1	55
407	9	24	



Guelph St



Heavys	Trucks	Cars	Totals
1	1	23	25
20	14	710	744
0	0	2	2
21	15	735	



Guelph St



Peds Cross: \times
 West Peds: 0
 West Entering: 771
 West Leg Total: 1177

Cars	87	Cars	15	24	165	204
Trucks	0	Trucks	0	1	1	2
Heavys	2	Heavys	0	0	2	2
Totals	89	Totals	15	25	168	



Mill St



Peds Cross: \times
 South Peds: 18
 South Entering: 208
 South Leg Total: 297

Comments

Guelph St @ Mill St

Mid-day Peak Diagram

Specified Period

From: 11:00:00

To: 14:00:00

One Hour Peak

From: 11:15:00

To: 12:15:00

Municipality: Halton Hills
Site #: 000000002
Intersection: Guelph St & Mill St
TFR File #: 2
Count date: 5-Nov-2018

Weather conditions:

Rain/Cloudy

Person(s) who counted:

Les

** Signalized Intersection **

Major Road: Guelph St runs W/E

North Leg Total: 80

North Entering: 47

North Peds: 2

Peds Cross: \times

Heavys	0	0	0	0
Trucks	1	0	0	1
Cars	12	19	15	46
Totals	13	19	15	



Heavys 0

Trucks 1

Cars 32

Totals 33

East Leg Total: 1134

East Entering: 515

East Peds: 5

Peds Cross: \times

Heavys	Trucks	Cars	Totals
6	17	424	447

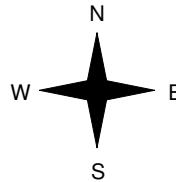


Mill St

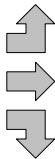
Cars	Trucks	Heavys	Totals
5	0	0	5
408	16	6	430
78	0	2	80
491	16	8	



Guelph St



Heavys	Trucks	Cars	Totals
0	0	6	6
10	11	452	473
0	0	5	5
10	11	463	



Mill St

Guelph St



Cars	Trucks	Heavys	Totals
595	13	11	619

Peds Cross: \times
 West Peds: 4
 West Entering: 484
 West Leg Total: 931

Cars	102	Cars	4	21	128	153
Trucks	0	Trucks	0	1	2	3
Heavys	2	Heavys	0	0	1	1
Totals	104	Totals	4	22	131	



Peds Cross: \times
 South Peds: 9
 South Entering: 157
 South Leg Total: 261

Comments

Guelph St @ Mill St

Afternoon Peak Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 16:45:00

To: 17:45:00

Municipality: Halton Hills
Site #: 000000002
Intersection: Guelph St & Mill St
TFR File #: 2
Count date: 5-Nov-2018

Weather conditions:

Rain/Cloudy

Person(s) who counted:

Les

** Signalized Intersection **

Major Road: Guelph St runs W/E

North Leg Total: 125

North Entering: 64

North Peds: 4

Peds Cross: \times

Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	27	28	9	64
Totals	27	28	9	



Heavys 0

Trucks 0

Cars 61

Totals 61

East Leg Total: 1666

East Entering: 982

East Peds: 4

Peds Cross: \times

Heavys	Trucks	Cars	Totals
10	12	876	898

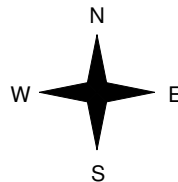


Mill St

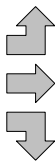
Cars	Trucks	Heavys	Totals
14	0	0	14
832	11	10	853
114	0	1	115
960	11	11	



Guelph St



Heavys	Trucks	Cars	Totals
0	0	16	16
9	6	532	547
0	0	11	11
9	6	559	



Mill St

Guelph St



Cars	Trucks	Heavys	Totals
667	7	10	684

Peds Cross: \times
 West Peds: 11
 West Entering: 574
 West Leg Total: 1472

Cars	153	Cars	17	31	126	174
Trucks	0	Trucks	1	0	1	2
Heavys	1	Heavys	0	0	1	1
Totals	154	Totals	18	31	128	



Peds Cross: \times
 South Peds: 5
 South Entering: 177
 South Leg Total: 331

Comments

Guelph St @ Mill St

Total Count Diagram

Municipality: Halton Hills
Site #: 000000002
Intersection: Guelph St & Mill St
TFR File #: 2
Count date: 5-Nov-2018

Weather conditions:
 Rain/Cloudy
Person(s) who counted:
 Les

**** Signalized Intersection ****

Major Road: Guelph St runs W/E

North Leg Total: 809
 North Entering: 445
 North Peds: 28
 Peds Cross: \times

Heavys	1	3	1	5
Trucks	3	5	6	14
Cars	134	215	77	426
Totals	138	223	84	



Heavys	3
Trucks	6
Cars	355
Totals	364

East Leg Total: 10097
 East Entering: 4777
 East Peds: 29
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
100	100	4044	4244

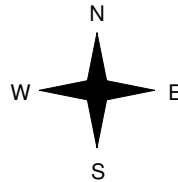


Mill St

Cars	Trucks	Heavys	Totals
90	1	0	91
3829	94	99	4022
649	5	10	664
4568	100	109	



Guelph St



Heavys	Trucks	Cars	Totals
2	2	108	112
128	99	3972	4199
0	1	55	56
130	102	4135	



Mill St

Guelph St



Cars	Trucks	Heavys	Totals
5060	120	140	5320

Peds Cross: \times
 West Peds: 54
 West Entering: 4367
 West Leg Total: 8611

Cars	919	Cars	81	157	1011	1249
Trucks	11	Trucks	3	3	15	21
Heavys	13	Heavys	0	1	11	12
Totals	943	Totals	84	161	1037	



Peds Cross: \times
 South Peds: 117
 South Entering: 1282
 South Leg Total: 2225

Comments



Turning Movement Count
 Location Name: MILL ST & DAYFOOT DR
 Date: Tue, Nov 03, 2020 Deployment Lead: Theo Daglis

BA Group
 300 45 ST. CLAIR AVE W
 TORONTO ONTARIO, M4V 1K9
 CANADA

Turning Movement Count (2 - MILL ST & DAYFOOT DR)

Start Time	N Approach MILL ST			E Approach EAST DRIVEWAY			S Approach MILL ST			W Approach DAYFOOT DR			Int. Total (1 hr)
	Right N/W	Thru N/S	Left N/E	Right E/N	Thru E/W	Left E/S	Right S/E	Thru S/N	Left S/W	Right W/S	Thru W/E	Left W/N	
07:00:00	0	4	0	0	0	0	0	2	0	0	0	4	10
07:15:00	0	2	0	0	0	0	0	5	1	0	1	6	11
07:30:00	0	8	0	0	0	0	0	5	0	0	2	5	15
07:45:00	1	10	0	0	0	0	0	14	1	0	2	15	28
08:00:00	0	8	0	0	0	1	0	5	2	0	0	7	20
08:15:00	1	13	1	0	0	0	0	8	2	0	2	10	28
08:30:00	0	9	0	0	0	0	0	2	2	0	0	4	16
08:45:00	2	17	0	0	0	0	0	9	1	0	4	10	35
BREAK													
16:00:00	7	11	0	0	0	0	1	9	2	1	0	13	35
16:15:00	2	13	1	0	0	0	0	13	0	0	0	13	31
16:30:00	5	9	0	0	0	0	0	5	2	0	4	7	28
16:45:00	5	14	0	0	0	0	0	7	4	0	1	11	33
17:00:00	3	4	1	0	0	1	0	15	2	0	1	17	29
17:15:00	2	11	0	0	0	0	1	12	0	0	0	13	26
17:30:00	5	7	0	0	0	0	0	4	0	0	1	4	18
17:45:00	2	10	0	0	0	0	0	11	0	0	0	11	24
Grand Total	35	150	3	0	2	0	4	126	19	7	24	148	387
Approach %	18.6%	79.8%	1.6%	0%	0%	50%	1.4%	85.1%	12.8%	0.7%	51.1%	48.9%	0%
Totals %	9%	38.8%	0.8%	0%	0%	0.5%	0.5%	32.6%	4.9%	0.3%	6.2%	5.9%	12.1%
Heavy %	1	3	0	0	0	0	0	2	1	0	1	0	0
Bicycles %	0	1	0	0	0	0	0	0	0	0	0	0	0
Bicycle %	0%	0.7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%



Turning Movement Count
 Location Name: MILL ST & DAYFOOT DR
 Date: Tue, Nov 03, 2020 Deployment Lead: Theo Daglis

BA Group
 300 45 ST. CLAIR AVE W
 TORONTO ONTARIO, M4V 1K9
 CANADA

Peak Hour: 08:00 AM - 09:00 AM Weather: Shower Rain (4.47 °C)

Start Time	N Approach MILL ST					E Approach EAST DRIVEWAY					S Approach MILL ST					W Approach DAYFOOT DR					Int. Total (15 min)				
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru		Left	U-Turn	Peds	Approach Total
08:00:00	0	8	0	0	0	8	0	0	1	0	2	1	0	5	2	0	0	0	4	0	0	0	0	1	4
08:15:00	1	13	1	0	0	15	0	0	0	1	0	0	0	8	2	0	0	0	0	1	0	2	0	2	3
08:30:00	0	9	0	0	0	9	1	0	0	1	1	1	0	2	2	0	1	1	4	2	0	0	4	2	16
08:45:00	2	17	0	0	0	19	0	0	0	0	0	0	0	9	1	0	0	10	2	0	4	0	0	6	35
Grand Total	3	47	1	0	0	51	1	0	1	0	4	2	0	24	7	0	1	31	9	0	6	0	7	15	99
Approach %	5.9%	92.2%	2%	0%	0%	-	50%	0%	50%	0%	0%	0%	0%	77.4%	22.6%	0%	0%	-	60%	0%	40%	0%	0%	0%	-
Totals %	3%	47.5%	1%	0%	0%	51.5%	1%	0%	1%	0%	0%	2%	0%	24.2%	7.1%	0%	0%	31.3%	9.1%	0%	6.1%	0%	0%	0%	15.2%
PHF	0.38	0.69	0.25	0	0	0.67	0.25	0	0.25	0	0.5	0.5	0	0.67	0.88	0	0	0.78	0.56	0	0.38	0	0	0.63	0.63
Heavy	0	2	0	0	0	2	0	0	0	0	0	0	0	2	1	0	0	3	0	0	0	0	0	0	0
Heavy %	0%	4.3%	0%	0%	0%	3.9%	0%	0%	0%	0%	0%	0%	0%	8.3%	14.3%	0%	0%	9.7%	0%	0%	0%	0%	0%	0%	0%
Lights	3	45	1	0	0	49	1	0	1	0	0	2	0	22	6	0	0	28	9	0	6	0	0	15	-
Lights %	100%	95.7%	100%	0%	0%	96.1%	100%	0%	100%	0%	0%	100%	0%	91.7%	85.7%	0%	0%	90.3%	100%	0%	100%	0%	0%	100%	-
Single-Unit Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4.2%	0%	0%	0%	3.2%	0%	0%	0%	0%	0%	0%	0%
Buses	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses %	0%	2.1%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Articulated Trucks	0	1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0
Articulated Trucks %	0%	2.1%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	4.2%	14.3%	0%	0%	6.5%	0%	0%	0%	0%	0%	0%	0%
Pedestrians	-	-	-	-	0	-	-	-	-	4	-	-	-	-	-	-	1	-	-	-	-	-	7	-	-
Pedestrians %	-	-	-	-	0%	-	-	-	-	33.3%	-	-	-	-	-	-	8.3%	-	-	-	-	-	56.3%	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk %	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	-
Bicycles on Road %	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-

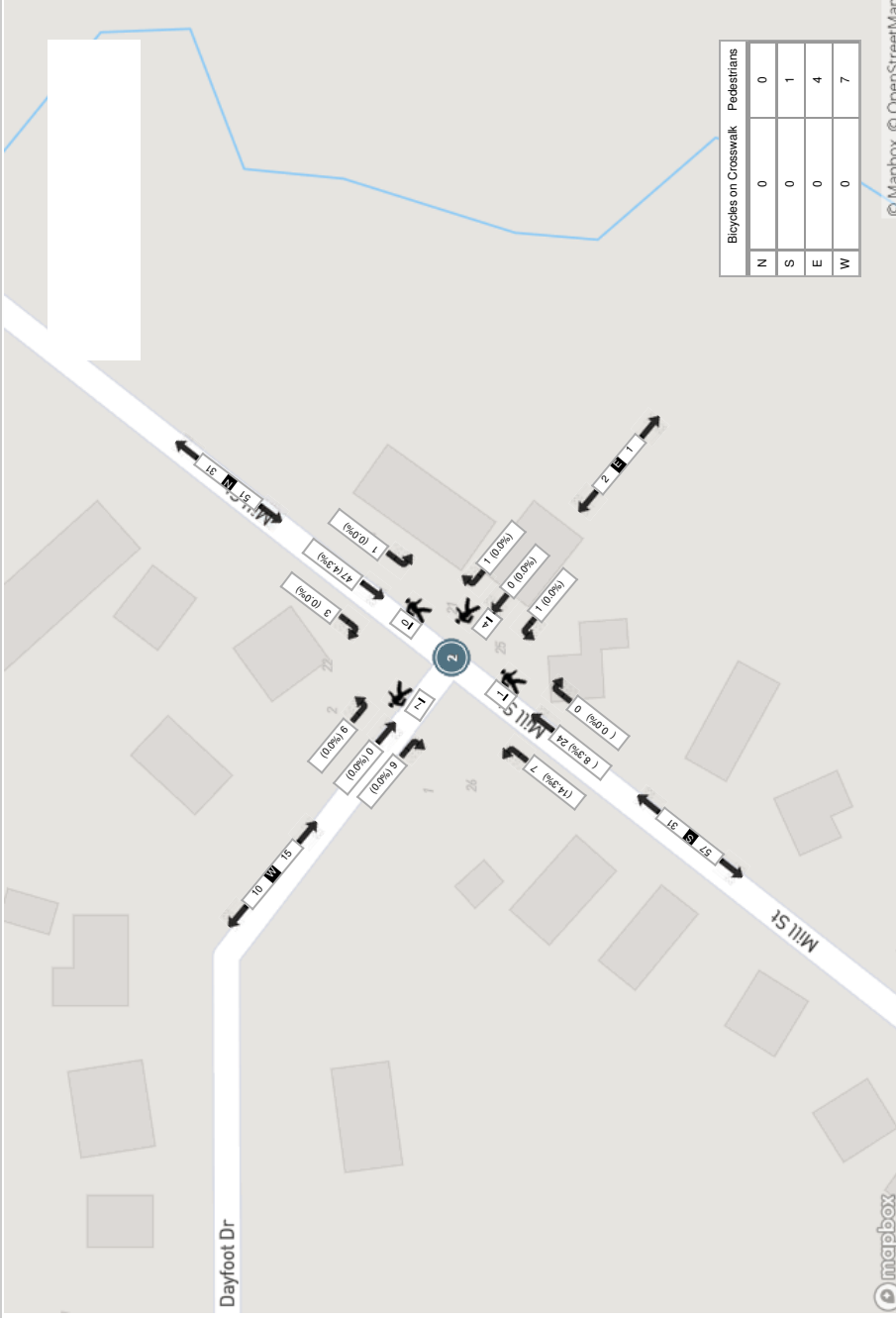


Turning Movement Count
Location Name: MILL ST & DAYFOOT DR
Date: Tue, Nov 03, 2020 Deployment Lead: Theo Daglis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

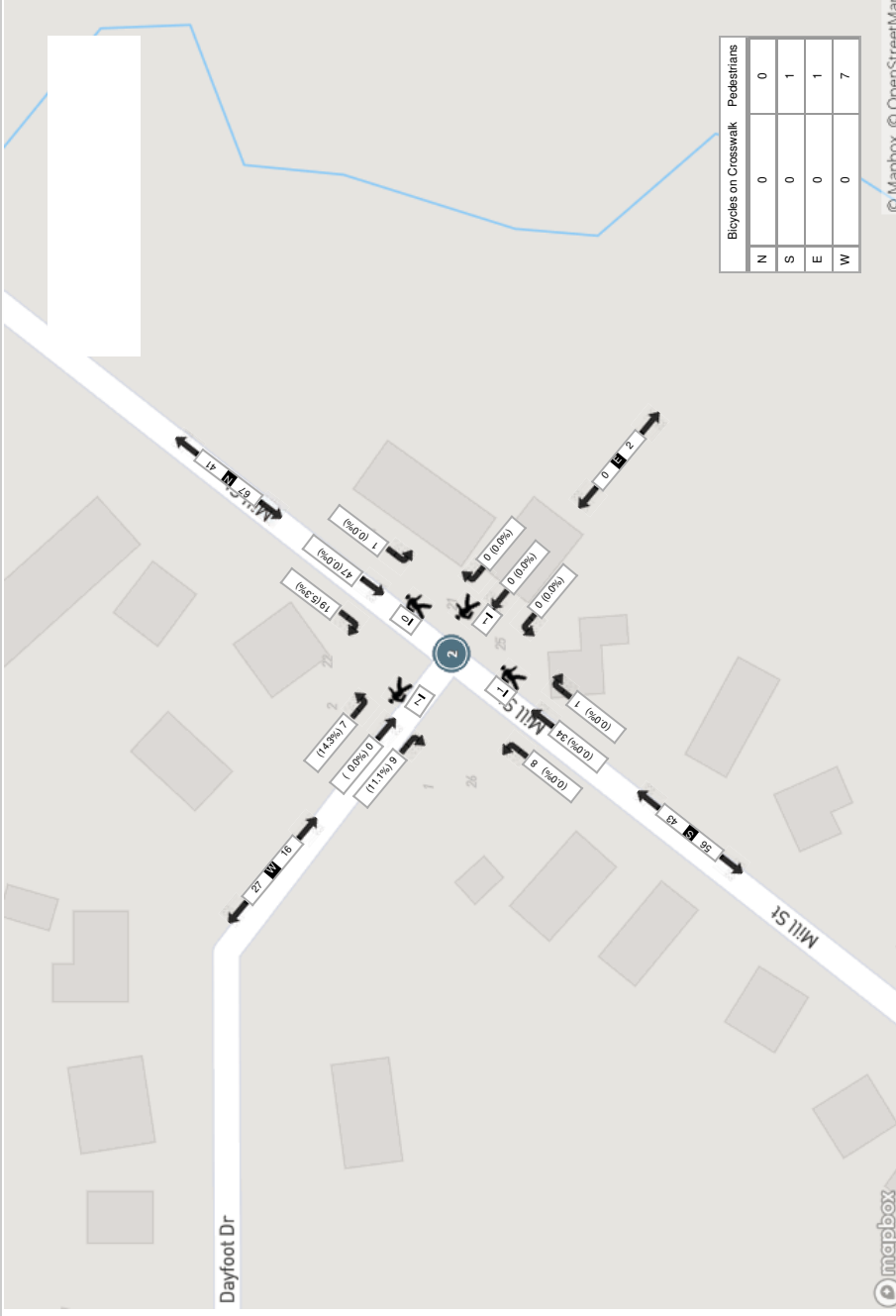
Peak Hour: 04:00 PM - 05:00 PM Weather: Overcast Clouds (5.94 °C)

Start Time	N Approach MILL ST						E Approach EAST DRIVEWAY						S Approach MILL ST						W Approach DAYFOOT DR						Int. Total (15 min)																								
	Right		Thru		Left		Right		Thru		Left		Right		Thru		Left		Right		Thru		Left			U-Turn		Peds		Approach Total																			
16:00:00	7	11	0	0	0	0	0	0	0	1	9	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	3	4	35													
16:15:00	2	13	1	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	31													
16:30:00	5	9	0	0	0	0	0	0	0	0	5	2	0	1	0	0	0	0	0	0	0	0	0	0	0	4	0	1	7	3	0	4	0	1	7	28													
16:45:00	5	14	0	0	0	0	0	0	0	0	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	3	2	0	1	0	3	3	33													
Grand Total	19	47	1	0	0	0	0	0	0	1	34	8	1	1	0	0	0	0	0	0	0	0	0	0	0	7	0	7	16	9	0	7	0	7	16	127													
Approach%	28.4%	70.1%	1.5%	0%	0%	0%	0%	0%	0%	2.3%	77.3%	18.2%	2.3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	56.3%	0%	43.8%	0%	0%	0%	-													
Totals %	15%	37%	0.8%	0%	0%	0%	0%	0%	0%	0.8%	26.8%	6.3%	0.8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7.1%	0%	5.5%	0%	0%	0%	12.6%													
PHF	0.68	0.84	0.25	0	0	0	0	0	0	0.25	0.65	0.5	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0.44	0	0.57	0.75	0	0.44	0	0.57	0.85	0	0.44	0	0.57	0.85										
Heavy	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0	1	0	2	2	0	1	0	2	2										
Heavy %	5.3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14.3%	0%	12.5%	11.1%	0%	14.3%	0%	12.5%	12.5%	0%	14.3%	0%	12.5%	12.5%										
Lights	18	47	1	0	0	0	0	0	0	1	34	8	1	1	0	0	0	0	0	0	0	0	0	0	0	6	0	14	8	0	6	0	14	44	0	6	0	14	44										
Lights %	94.7%	100%	100%	0%	0%	0%	0%	0%	0%	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	85.7%	0%	87.5%	88.9%	0%	85.7%	0%	87.5%	100%	0%	85.7%	0%	87.5%	100%										
Single-Unit Trucks	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	0	0	1	0	1	0										
Single-Unit Trucks %	5.3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14.3%	0%	6.3%	0%	0%	14.3%	0%	6.3%	0%	0%	14.3%	0%	6.3%	0%										
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0										
Buses %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6.3%	0%	0%	0%	0%	6.3%	0%	0%	0%	0%	6.3%	0%										
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%					
Pedestrians	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Pedestrians %	-	-	-	-	-	-	-	-	-	11.1%	-	-	-	11.1%	-	-	-	-	-	-	-	-	-	-	-	-	-	77.8%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Bicycles on Crosswalk %	-	-	-	-	-	-	-	-	-	0%	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Road %	-	-	-	-	-	-	-	-	-	0%	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					





Peak Hour: 04:00 PM - 05:00 PM Weather: Overcast Clouds (5.94 °C)



APPENDIX C: Corridor Growth Analysis



Project: 16-18 Mill St
Project ID: 8070-01
Intersection: Guelph St & Mill St
Peak Hour: AM Peak

		North of Intersection		
Date	Year	Northbound	Southbound	2-Way
05-Nov-18	2018	65	69	134
09-Nov-16	2016	49	57	106
16-Dec-14	2014	65	86	151
17-Dec-12	2012	59	88	147
13-Dec-07	2007	52	61	113
21-Dec-05	2005	69	86	155

Trend Point at start		58.6	70.2	128.8
Trend Point at end		61.3	79.5	140.8
Slope		-0.2	-0.7	-0.9
Annual Growth		-0.3%	-1.0%	-0.7%

		South of Intersection		
Date	Year	Northbound	Southbound	2-Way
05-Nov-18	2018	208	89	297
09-Nov-16	2016	207	114	321
16-Dec-14	2014	242	125	367
17-Dec-12	2012	243	126	369
13-Dec-07	2007	210	121	331
21-Dec-05	2005	229	172	401

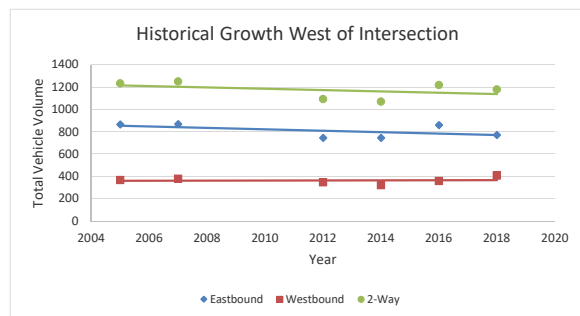
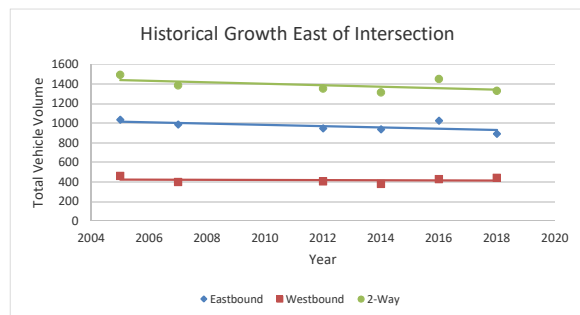
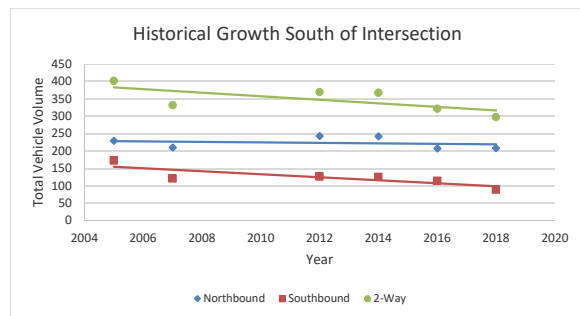
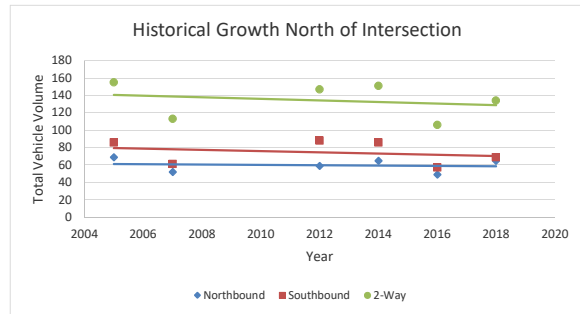
Trend Point at start		218.9	98.2	317.1
Trend Point at end		228.2	155.1	383.3
Slope		-0.7	-4.4	-5.1
Annual Growth		-0.3%	-3.5%	-1.4%

		East of Intersection		
Date	Year	Eastbound	Westbound	2-Way
05-Nov-18	2018	890	440	1330
09-Nov-16	2016	1026	425	1451
16-Dec-14	2014	937	376	1313
17-Dec-12	2012	947	404	1351
13-Dec-07	2007	986	398	1384
21-Dec-05	2005	1033	460	1493

Trend Point at start		930.9	411.7	1342.6
Trend Point at end		1015.2	423.5	1438.7
Slope		-6.5	-0.9	-7.4
Annual Growth		-0.7%	-0.2%	-0.5%

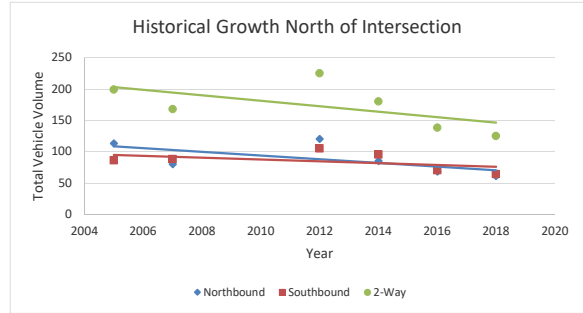
		West of Intersection		
Date	Year	Eastbound	Westbound	2-Way
05-Nov-18	2018	771	406	1177
09-Nov-16	2016	859	359	1218
16-Dec-14	2014	745	322	1067
17-Dec-12	2012	744	347	1091
13-Dec-07	2007	869	379	1248
21-Dec-05	2005	865	366	1231

Trend Point at start		769.7	365.9	1135.6
Trend Point at end		854.5	360.0	1214.5
Slope		-6.5	0.5	-6.1
Annual Growth		-0.8%	0.1%	-0.5%

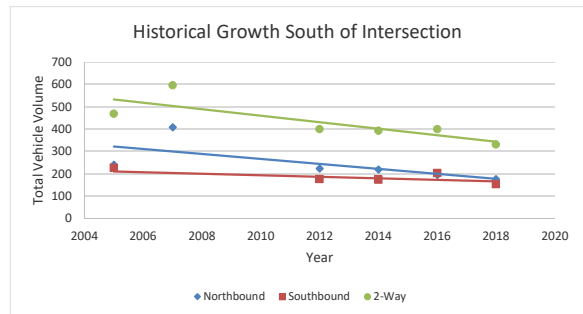


Project: 16-18 Mill St
 Project ID: 8070-01
 Intersection: Guelph St & Mill St
 Peak Hour: PM Peak

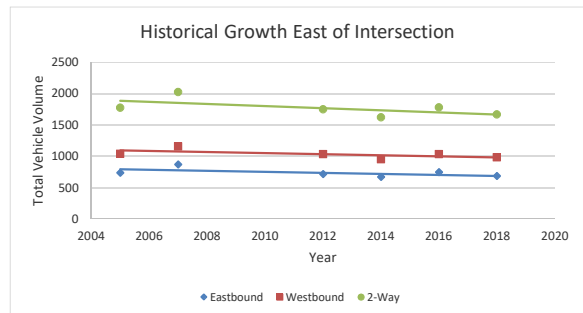
North of Intersection				
Date	Year	Northbound	Southbound	2-Way
05-Nov-18	2018	61	64	125
09-Nov-16	2016	68	70	138
16-Dec-14	2014	85	95	180
17-Dec-12	2012	120	105	225
13-Dec-07	2007	80	88	168
21-Dec-05	2005	113	86	199
Trend Point at start		70.2	76.0	146.1
Trend Point at end		108.5	94.8	203.2
Slope		-2.9	-1.4	-4.4
Annual Growth		-3.3%	-1.7%	-2.5%



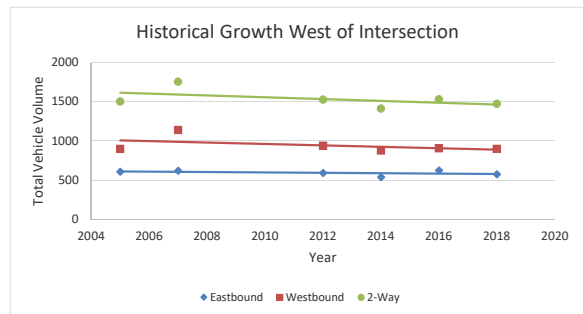
South of Intersection				
Date	Year	Northbound	Southbound	2-Way
05-Nov-18	2018	177	154	331
09-Nov-16	2016	195	204	399
16-Dec-14	2014	220	173	393
17-Dec-12	2012	223	176	399
13-Dec-07	2007	408	188	596
21-Dec-05	2005	241	227	468
Trend Point at start		177.3	166.6	343.9
Trend Point at end		321.8	210.9	532.7
Slope		-11.1	-3.4	-14.5
Annual Growth		-4.5%	-1.8%	-3.3%



East of Intersection				
Date	Year	Eastbound	Westbound	2-Way
05-Nov-18	2018	684	982	1666
09-Nov-16	2016	746	1036	1782
16-Dec-14	2014	669	952	1621
17-Dec-12	2012	716	1035	1751
13-Dec-07	2007	868	1157	2025
21-Dec-05	2005	737	1038	1775
Trend Point at start		687.1	982.1	1669.2
Trend Point at end		794.4	1093.2	1887.6
Slope		-8.3	-8.5	-16.8
Annual Growth		-1.1%	-0.8%	-0.9%



West of Intersection				
Date	Year	Eastbound	Westbound	2-Way
05-Nov-18	2018	574	898	1472
09-Nov-16	2016	623	906	1529
16-Dec-14	2014	536	876	1412
17-Dec-12	2012	588	939	1527
13-Dec-07	2007	620	1137	1757
21-Dec-05	2005	607	895	1502
Trend Point at start		575.6	887.1	1462.7
Trend Point at end		609.7	1005.7	1615.4
Slope		-2.6	-9.1	-11.7
Annual Growth		-0.4%	-1.0%	-0.8%



APPENDIX D: Synchro Outputs



Timings

1: Mill St & Guelph St

Existing AM

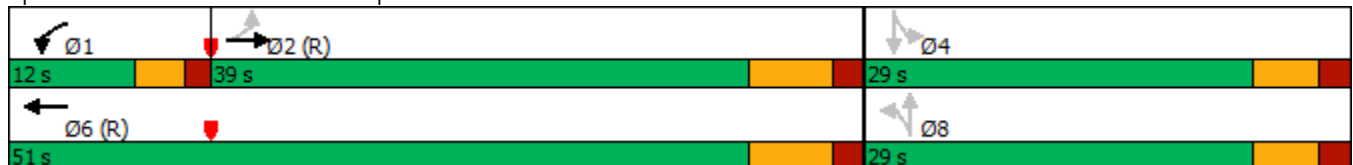


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↕		↕
Traffic Volume (vph)	25	745	55	370	15	25	15	30
Future Volume (vph)	25	745	55	370	15	25	15	30
Turn Type	Perm	NA	Prot	NA	custom	NA	custom	NA
Protected Phases		2	1	6				
Permitted Phases	2				8	8	4	4
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	30.0	30.0	6.0	30.0	8.0	8.0	8.0	8.0
Minimum Split (s)	37.0	37.0	10.5	37.0	29.0	29.0	29.0	29.0
Total Split (s)	39.0	39.0	12.0	51.0	29.0	29.0	29.0	29.0
Total Split (%)	48.8%	48.8%	15.0%	63.8%	36.3%	36.3%	36.3%	36.3%
Yellow Time (s)	5.0	5.0	3.0	5.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.5	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-0.5	-3.0		-2.0		-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0		4.0		4.0
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None	None
Act Effct Green (s)	50.9	50.9	8.1	58.6		13.4		13.4
Actuated g/C Ratio	0.64	0.64	0.10	0.73		0.17		0.17
v/c Ratio	0.05	0.71	0.35	0.17		0.55		0.28
Control Delay	10.0	18.4	39.1	4.2		12.1		22.6
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	10.0	18.4	39.1	4.2		12.1		22.6
LOS	B	B	D	A		B		C
Approach Delay		18.1		8.6		12.1		22.6
Approach LOS		B		A		B		C

Intersection Summary

Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 14.7
 Intersection LOS: B
 Intersection Capacity Utilization 66.7%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 1: Mill St & Guelph St



Queues

1: Mill St & Guelph St

Existing AM



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	27	815	60	418	228	71
v/c Ratio	0.05	0.71	0.35	0.17	0.55	0.28
Control Delay	10.0	18.4	39.1	4.2	12.1	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.0	18.4	39.1	4.2	12.1	22.6
Queue Length 50th (m)	1.5	81.4	9.0	6.5	6.3	7.2
Queue Length 95th (m)	7.2	#210.1	20.8	21.7	20.9	15.1
Internal Link Dist (m)		244.8		229.4	50.3	70.6
Turn Bay Length (m)	40.0		50.0			
Base Capacity (vph)	543	1151	182	2419	621	456
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.71	0.33	0.17	0.37	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Mill St & Guelph St

Existing AM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	745	5	55	370	15	15	25	170	15	30	20
Future Volume (vph)	25	745	5	55	370	15	15	25	170	15	30	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.98			1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.89			0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1600	1808		1711	3299			1618			1743	
Flt Permitted	0.51	1.00		0.95	1.00			0.98			0.80	
Satd. Flow (perm)	854	1808		1711	3299			1583			1414	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	810	5	60	402	16	16	27	185	16	33	22
RTOR Reduction (vph)	0	0	0	0	2	0	0	154	0	0	18	0
Lane Group Flow (vph)	27	815	0	60	416	0	0	74	0	0	53	0
Confl. Peds. (#/hr)	8		18	18		8			3	3		3
Heavy Vehicles (%)	8%	5%	0%	2%	9%	0%	0%	4%	2%	6%	3%	0%
Turn Type	Perm	NA		Prot	NA		custom	NA		custom	NA	
Protected Phases		2		1	6							
Permitted Phases	2						8	8		4	4	
Actuated Green, G (s)	46.1	46.1		5.0	55.6			11.4			11.4	
Effective Green, g (s)	49.1	49.1		5.5	58.6			13.4			13.4	
Actuated g/C Ratio	0.61	0.61		0.07	0.73			0.17			0.17	
Clearance Time (s)	7.0	7.0		4.5	7.0			6.0			6.0	
Vehicle Extension (s)	4.5	4.5		3.0	4.5			2.0			2.0	
Lane Grp Cap (vph)	524	1109		117	2416			265			236	
v/s Ratio Prot		c0.45		c0.04	0.13							
v/s Ratio Perm	0.03							c0.05			0.04	
v/c Ratio	0.05	0.73		0.51	0.17			0.28			0.22	
Uniform Delay, d1	6.2	10.9		36.0	3.3			29.1			28.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	4.3		3.8	0.2			0.2			0.2	
Delay (s)	6.3	15.2		39.7	3.4			29.3			29.0	
Level of Service	A	B		D	A			C			C	
Approach Delay (s)		14.9			8.0			29.3			29.0	
Approach LOS		B			A			C			C	

Intersection Summary

HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

2: Mill St & Dayfoot Dr

Existing AM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	10	5	60	55	5
Future Volume (Veh/h)	5	10	5	60	55	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	11	5	65	60	5
Pedestrians	7					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)	208					
pX, platoon unblocked						
vC, conflicting volume	144	70	72			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	144	70	72			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	99	99	100			
cM capacity (veh/h)	845	993	1447			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	16	70	65			
Volume Left	5	5	0			
Volume Right	11	0	5			
cSH	942	1447	1700			
Volume to Capacity	0.02	0.00	0.04			
Queue Length 95th (m)	0.4	0.1	0.0			
Control Delay (s)	8.9	0.6	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.9	0.6	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			17.3%	ICU Level of Service	A	
Analysis Period (min)			15			

Timings

1: Mill St & Guelph St

EXPM

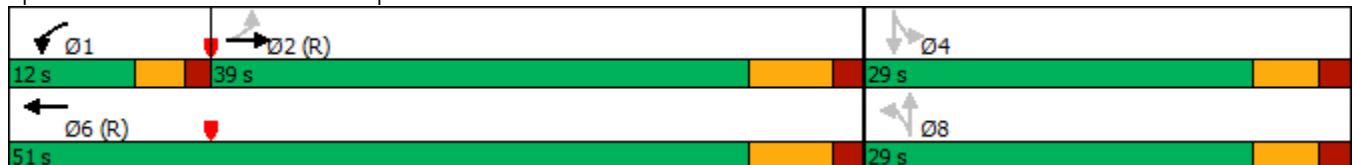


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↕		↕		↕
Traffic Volume (vph)	15	545	115	855	20	30	10	30
Future Volume (vph)	15	545	115	855	20	30	10	30
Turn Type	Perm	NA	Prot	NA	custom	NA	custom	NA
Protected Phases		2	1	6				
Permitted Phases	2				8	8	4	4
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	30.0	30.0	6.0	30.0	8.0	8.0	8.0	8.0
Minimum Split (s)	37.0	37.0	10.5	37.0	29.0	29.0	29.0	29.0
Total Split (s)	39.0	39.0	12.0	51.0	29.0	29.0	29.0	29.0
Total Split (%)	48.8%	48.8%	15.0%	63.8%	36.3%	36.3%	36.3%	36.3%
Yellow Time (s)	5.0	5.0	3.0	5.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.5	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-0.5	0.0		-2.0		-2.0
Total Lost Time (s)	4.0	4.0	4.0	7.0		4.0		4.0
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None	None
Act Effect Green (s)	44.1	44.1	10.4	55.6		13.4		13.4
Actuated g/C Ratio	0.55	0.55	0.13	0.70		0.17		0.17
v/c Ratio	0.05	0.59	0.56	0.39		0.51		0.24
Control Delay	11.7	16.6	44.2	6.5		13.9		19.9
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	11.7	16.6	44.2	6.5		13.9		19.9
LOS	B	B	D	A		B		B
Approach Delay		16.5		10.9		13.9		19.9
Approach LOS		B		B		B		B

Intersection Summary

Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 13.3	Intersection LOS: B
Intersection Capacity Utilization 76.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Mill St & Guelph St



Queues

1: Mill St & Guelph St

EXPM



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	16	603	125	945	196	71
v/c Ratio	0.05	0.59	0.56	0.39	0.51	0.24
Control Delay	11.7	16.6	44.2	6.5	13.9	19.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	16.6	44.2	6.5	13.9	19.9
Queue Length 50th (m)	1.0	56.0	18.5	22.5	8.1	6.4
Queue Length 95th (m)	5.2	119.1	#46.2	60.1	21.3	14.3
Internal Link Dist (m)		244.8		229.4	50.3	70.6
Turn Bay Length (m)	40.0		50.0			
Base Capacity (vph)	306	1015	225	2451	592	529
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.59	0.56	0.39	0.33	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Mill St & Guelph St

EXPM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	545	10	115	855	15	20	30	130	10	30	25
Future Volume (vph)	15	545	10	115	855	15	20	30	130	10	30	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	7.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.98			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.90			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1741	1840		1728	3530			1647			1772	
Flt Permitted	0.30	1.00		0.95	1.00			0.96			0.92	
Satd. Flow (perm)	555	1840		1728	3530			1588			1636	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	592	11	125	929	16	22	33	141	11	33	27
RTOR Reduction (vph)	0	0	0	0	1	0	0	117	0	0	22	0
Lane Group Flow (vph)	16	603	0	125	944	0	0	79	0	0	49	0
Confl. Peds. (#/hr)	4		5	5		4	11		4	4		11
Heavy Vehicles (%)	0%	3%	0%	1%	2%	0%	0%	0%	2%	0%	0%	0%
Turn Type	Perm	NA		Prot	NA		custom	NA		custom	NA	
Protected Phases		2		1	6							
Permitted Phases	2						8	8		4	4	
Actuated Green, G (s)	41.2	41.2		9.9	55.6			11.4			11.4	
Effective Green, g (s)	44.2	44.2		10.4	55.6			13.4			13.4	
Actuated g/C Ratio	0.55	0.55		0.13	0.70			0.17			0.17	
Clearance Time (s)	7.0	7.0		4.5	7.0			6.0			6.0	
Vehicle Extension (s)	4.5	4.5		3.0	4.5			2.0			2.0	
Lane Grp Cap (vph)	306	1016		224	2453			265			274	
v/s Ratio Prot		c0.33		c0.07	0.27							
v/s Ratio Perm	0.03							c0.05			0.03	
v/c Ratio	0.05	0.59		0.56	0.38			0.30			0.18	
Uniform Delay, d1	8.2	11.9		32.6	5.1			29.2			28.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.3	2.5		3.0	0.5			0.2			0.1	
Delay (s)	8.6	14.5		35.6	5.5			29.4			28.7	
Level of Service	A	B		D	A			C			C	
Approach Delay (s)		14.3			9.1			29.4			28.7	
Approach LOS		B			A			C			C	

Intersection Summary

HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

2: Mill St & Dayfoot Dr

EXPM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	10	10	50	55	20
Future Volume (Veh/h)	10	10	10	50	55	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.91
Hourly flow rate (vph)	11	11	11	54	60	22
Pedestrians	7					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)	208					
pX, platoon unblocked						
vC, conflicting volume	154	78	89			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	154	78	89			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	99	99	99			
cM capacity (veh/h)	800	953	1510			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	22	65	82			
Volume Left	11	11	0			
Volume Right	11	0	22			
cSH	869	1510	1700			
Volume to Capacity	0.03	0.01	0.05			
Queue Length 95th (m)	0.6	0.2	0.0			
Control Delay (s)	9.2	1.3	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.2	1.3	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			19.9%	ICU Level of Service	A	
Analysis Period (min)			15			

Timings

1: Mill St & Guelph St

Future Background AM

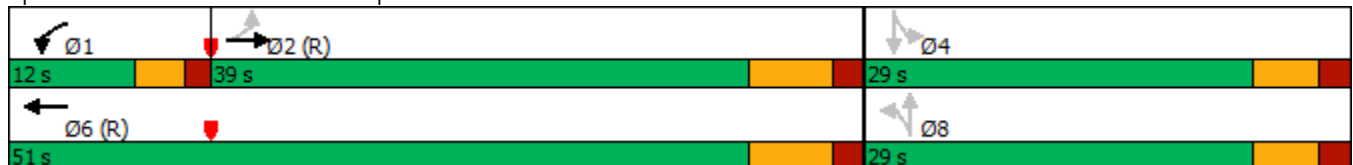


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↕		↕
Traffic Volume (vph)	30	745	55	370	15	30	60	40
Future Volume (vph)	30	745	55	370	15	30	60	40
Turn Type	Perm	NA	Prot	NA	custom	NA	custom	NA
Protected Phases		2	1	6				
Permitted Phases	2				8	8	4	4
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	30.0	30.0	6.0	30.0	8.0	8.0	8.0	8.0
Minimum Split (s)	37.0	37.0	10.5	37.0	29.0	29.0	29.0	29.0
Total Split (s)	39.0	39.0	12.0	51.0	29.0	29.0	29.0	29.0
Total Split (%)	48.8%	48.8%	15.0%	63.8%	36.3%	36.3%	36.3%	36.3%
Yellow Time (s)	5.0	5.0	3.0	5.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.5	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-0.5	-3.0		-2.0		-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0		4.0		4.0
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None	None
Act Effect Green (s)	49.2	49.2	8.1	56.9		15.1		15.1
Actuated g/C Ratio	0.62	0.62	0.10	0.71		0.19		0.19
v/c Ratio	0.06	0.73	0.35	0.19		0.52		0.71
Control Delay	10.9	20.4	39.1	4.6		11.3		46.0
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	10.9	20.4	39.1	4.6		11.3		46.0
LOS	B	C	D	A		B		D
Approach Delay		20.0		8.8		11.3		46.0
Approach LOS		C		A		B		D

Intersection Summary

Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 17.6	Intersection LOS: B
Intersection Capacity Utilization 76.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Mill St & Guelph St



Queues

1: Mill St & Guelph St

Future Background AM



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	33	815	60	440	234	135
v/c Ratio	0.06	0.73	0.35	0.19	0.52	0.71
Control Delay	10.9	20.4	39.1	4.6	11.3	46.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.9	20.4	39.1	4.6	11.3	46.0
Queue Length 50th (m)	2.1	92.6	9.0	8.6	6.8	18.5
Queue Length 95th (m)	8.3	#210.1	20.8	22.4	22.0	31.9
Internal Link Dist (m)		244.8		229.4	42.0	68.3
Turn Bay Length (m)	40.0		50.0			
Base Capacity (vph)	515	1112	182	2341	623	304
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.73	0.33	0.19	0.38	0.44



















Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Mill St & Guelph St

Future Background AM

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	30	745	5	55	370	35	15	30	170	60	40	25		
Future Volume (vph)	30	745	5	55	370	35	15	30	170	60	40	25		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6		
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0			
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00			1.00			
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.98			1.00			
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00			
Frt	1.00	1.00		1.00	0.99			0.89			0.97			
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.98			
Satd. Flow (prot)	1600	1808		1711	3282			1623			1736			
Flt Permitted	0.50	1.00		0.95	1.00			0.98			0.53			
Satd. Flow (perm)	837	1808		1711	3282			1590			940			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	33	810	5	60	402	38	16	33	185	65	43	27		
RTOR Reduction (vph)	0	0	0	0	6	0	0	150	0	0	13	0		
Lane Group Flow (vph)	33	815	0	60	434	0	0	84	0	0	122	0		
Confl. Peds. (#/hr)	8		18	18		8			3	3				
Heavy Vehicles (%)	8%	5%	0%	2%	9%	0%	0%	4%	2%	6%	3%	0%		
Turn Type	Perm	NA		Prot	NA		custom	NA		custom	NA			
Protected Phases		2		1	6									
Permitted Phases	2						8	8		4	4			
Actuated Green, G (s)	44.4	44.4		5.0	53.9			13.1			13.1			
Effective Green, g (s)	47.4	47.4		5.5	56.9			15.1			15.1			
Actuated g/C Ratio	0.59	0.59		0.07	0.71			0.19			0.19			
Clearance Time (s)	7.0	7.0		4.5	7.0			6.0			6.0			
Vehicle Extension (s)	4.5	4.5		3.0	4.5			2.0			2.0			
Lane Grp Cap (vph)	495	1071		117	2334			300			177			
v/s Ratio Prot		c0.45		c0.04	0.13									
v/s Ratio Perm	0.04							0.05			c0.13			
v/c Ratio	0.07	0.76		0.51	0.19			0.28			0.69			
Uniform Delay, d1	6.9	12.1		36.0	3.8			27.8			30.3			
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00			
Incremental Delay, d2	0.3	5.1		3.8	0.2			0.2			8.6			
Delay (s)	7.2	17.2		39.7	4.0			28.0			38.9			
Level of Service	A	B		D	A			C			D			
Approach Delay (s)		16.8			8.3			28.0			38.9			
Approach LOS		B			A			C			D			
Intersection Summary														
HCM 2000 Control Delay			17.6									HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.75											
Actuated Cycle Length (s)			80.0								14.0			
Intersection Capacity Utilization			76.4%										ICU Level of Service	D
Analysis Period (min)			15											
c Critical Lane Group														

HCM Unsignalized Intersection Capacity Analysis

2: Mill St & Dayfoot Dr

Future Background AM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	45	20	70	60	10
Future Volume (Veh/h)	10	45	20	70	60	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	49	22	76	65	11
Pedestrians	7					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)	205					
pX, platoon unblocked						
vC, conflicting volume	198	78	83			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	198	78	83			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	99	95	98			
cM capacity (veh/h)	779	983	1433			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	60	98	76			
Volume Left	11	22	0			
Volume Right	49	0	11			
cSH	938	1433	1700			
Volume to Capacity	0.06	0.02	0.04			
Queue Length 95th (m)	1.6	0.4	0.0			
Control Delay (s)	9.1	1.8	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.1	1.8	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			3.1			
Intersection Capacity Utilization			21.5%	ICU Level of Service	A	
Analysis Period (min)	15					

Timings

1: Mill St & Guelph St

Future Background PM

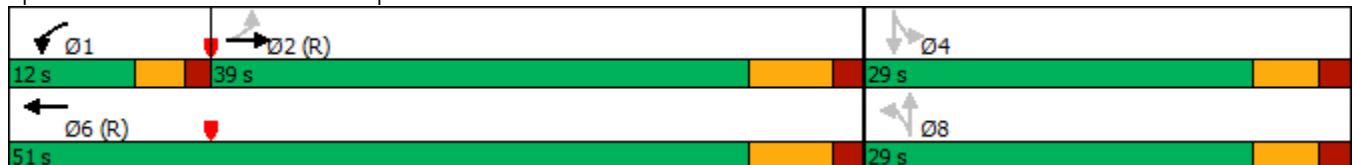


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↕		↕		↕
Traffic Volume (vph)	20	545	115	855	20	40	40	40
Future Volume (vph)	20	545	115	855	20	40	40	40
Turn Type	Perm	NA	Prot	NA	custom	NA	custom	NA
Protected Phases		2	1	6				
Permitted Phases	2				8	8	4	4
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	30.0	30.0	6.0	30.0	8.0	8.0	8.0	8.0
Minimum Split (s)	37.0	37.0	10.5	37.0	29.0	29.0	29.0	29.0
Total Split (s)	39.0	39.0	12.0	51.0	29.0	29.0	29.0	29.0
Total Split (%)	48.8%	48.8%	15.0%	63.8%	36.3%	36.3%	36.3%	36.3%
Yellow Time (s)	5.0	5.0	3.0	5.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.5	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0		-1.0		-1.0
Total Lost Time (s)	6.0	6.0	3.5	6.0		5.0		5.0
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	C-Min	C-Min	None	C-Min	Min	Min	Min	Min
Act Effect Green (s)	41.8	41.8	10.8	56.1		12.9		12.9
Actuated g/C Ratio	0.52	0.52	0.14	0.70		0.16		0.16
v/c Ratio	0.08	0.63	0.54	0.40		0.55		0.57
Control Delay	13.4	19.2	42.6	6.4		16.0		33.9
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	13.4	19.2	42.6	6.4		16.0		33.9
LOS	B	B	D	A		B		C
Approach Delay		19.0		10.4		16.0		33.9
Approach LOS		B		B		B		C

Intersection Summary

Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 14.9
 Intersection LOS: B
 Intersection Capacity Utilization 81.3%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 1: Mill St & Guelph St



Queues

1: Mill St & Guelph St

Future Background PM



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	22	603	125	994	206	119
v/c Ratio	0.08	0.63	0.54	0.40	0.55	0.57
Control Delay	13.4	19.2	42.6	6.4	16.0	33.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	19.2	42.6	6.4	16.0	33.9
Queue Length 50th (m)	1.6	62.2	18.4	24.3	9.9	14.5
Queue Length 95th (m)	7.0	#137.9	#44.4	61.7	24.1	25.6
Internal Link Dist (m)		244.8		229.4	42.0	68.3
Turn Bay Length (m)	40.0		50.0			
Base Capacity (vph)	275	961	234	2459	578	366
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.63	0.53	0.40	0.36	0.33






















Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Mill St & Guelph St

Future Background PM

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations					 			 			 			
Traffic Volume (vph)	20	545	10	115	855	60	20	40	130	40	40	30		
Future Volume (vph)	20	545	10	115	855	60	20	40	130	40	40	30		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6		
Total Lost time (s)	6.0	6.0		3.5	6.0			5.0			5.0			
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00			1.00			
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.98			0.99			
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00			
Frt	1.00	1.00		1.00	0.99			0.91			0.96			
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98			
Satd. Flow (prot)	1741	1840		1728	3502			1659			1782			
Flt Permitted	0.29	1.00		0.95	1.00			0.96			0.64			
Satd. Flow (perm)	528	1840		1728	3502			1603			1162			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	22	592	11	125	929	65	22	43	141	43	43	33		
RTOR Reduction (vph)	0	0	0	0	4	0	0	117	0	0	21	0		
Lane Group Flow (vph)	22	603	0	125	990	0	0	89	0	0	98	0		
Confl. Peds. (#/hr)	4		5	5		4	11		4	4		11		
Heavy Vehicles (%)	0%	3%	0%	1%	2%	0%	0%	0%	2%	0%	0%	0%		
Turn Type	Perm	NA		Prot	NA		custom	NA		custom	NA			
Protected Phases		2		1	6									
Permitted Phases	2						8	8		4	4			
Actuated Green, G (s)	40.8	40.8		9.8	55.1			11.9			11.9			
Effective Green, g (s)	41.8	41.8		10.8	56.1			12.9			12.9			
Actuated g/C Ratio	0.52	0.52		0.14	0.70			0.16			0.16			
Clearance Time (s)	7.0	7.0		4.5	7.0			6.0			6.0			
Vehicle Extension (s)	4.5	4.5		3.0	4.5			2.0			2.0			
Lane Grp Cap (vph)	275	961		233	2455			258			187			
v/s Ratio Prot		c0.33		c0.07	0.28									
v/s Ratio Perm	0.04							0.06			c0.08			
v/c Ratio	0.08	0.63		0.54	0.40			0.35			0.52			
Uniform Delay, d1	9.5	13.6		32.3	5.0			29.8			30.7			
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00			
Incremental Delay, d2	0.6	3.1		2.4	0.5			0.3			1.2			
Delay (s)	10.1	16.7		34.6	5.5			30.1			32.0			
Level of Service	B	B		C	A			C			C			
Approach Delay (s)		16.4			8.7			30.1			32.0			
Approach LOS		B			A			C			C			
Intersection Summary														
HCM 2000 Control Delay			14.5									HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.60											
Actuated Cycle Length (s)			80.0								15.5			
Intersection Capacity Utilization			81.3%										ICU Level of Service	D
Analysis Period (min)			15											
c	Critical Lane Group													

HCM Unsignalized Intersection Capacity Analysis

2: Mill St & Dayfoot Dr

Future Background PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	35	40	55	60	30
Future Volume (Veh/h)	15	35	40	55	60	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	38	43	60	65	33
Pedestrians	7					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)	205					
pX, platoon unblocked						
vC, conflicting volume	234	88	105			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	234	88	105			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	98	96	97			
cM capacity (veh/h)	703	940	1490			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	54	103	98			
Volume Left	16	43	0			
Volume Right	38	0	33			
cSH	854	1490	1700			
Volume to Capacity	0.06	0.03	0.06			
Queue Length 95th (m)	1.6	0.7	0.0			
Control Delay (s)	9.5	3.3	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.5	3.3	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			21.8%	ICU Level of Service	A	
Analysis Period (min)			15			

Timings

1: Mill St & Guelph St

Future Total AM

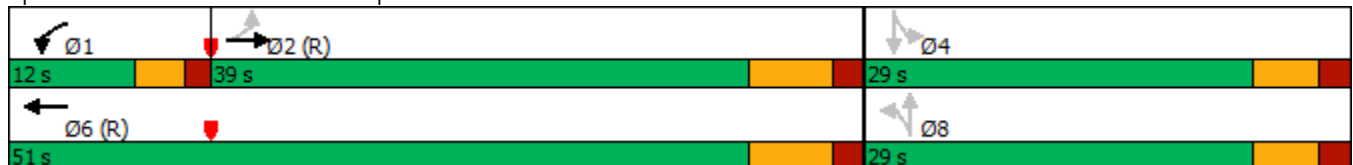


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↕		↕
Traffic Volume (vph)	30	745	55	370	15	30	70	45
Future Volume (vph)	30	745	55	370	15	30	70	45
Turn Type	Perm	NA	Prot	NA	custom	NA	custom	NA
Protected Phases		2	1	6				
Permitted Phases	2				8	8	4	4
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	30.0	30.0	6.0	30.0	8.0	8.0	8.0	8.0
Minimum Split (s)	37.0	37.0	10.5	37.0	29.0	29.0	29.0	29.0
Total Split (s)	39.0	39.0	12.0	51.0	29.0	29.0	29.0	29.0
Total Split (%)	48.8%	48.8%	15.0%	63.8%	36.3%	36.3%	36.3%	36.3%
Yellow Time (s)	5.0	5.0	3.0	5.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.5	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-0.5	-3.0		-2.0		-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0		4.0		4.0
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None	None
Act Effect Green (s)	48.3	48.3	8.1	56.0		16.0		16.0
Actuated g/C Ratio	0.60	0.60	0.10	0.70		0.20		0.20
v/c Ratio	0.07	0.75	0.35	0.19		0.50		0.77
Control Delay	11.3	21.5	39.1	4.9		10.7		50.7
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	11.3	21.5	39.1	4.9		10.7		50.7
LOS	B	C	D	A		B		D
Approach Delay		21.1		9.0		10.7		50.7
Approach LOS		C		A		B		D

Intersection Summary

Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 18.8	Intersection LOS: B
Intersection Capacity Utilization 78.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Mill St & Guelph St



Queues

1: Mill St & Guelph St

Future Total AM



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	33	815	60	445	234	152
v/c Ratio	0.07	0.75	0.35	0.19	0.50	0.77
Control Delay	11.3	21.5	39.1	4.9	10.7	50.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.3	21.5	39.1	4.9	10.7	50.7
Queue Length 50th (m)	2.3	97.7	9.0	9.5	6.6	21.4
Queue Length 95th (m)	8.3	#210.1	20.8	22.4	22.0	36.6
Internal Link Dist (m)		244.8		229.4	42.0	68.3
Turn Bay Length (m)	40.0		50.0			
Base Capacity (vph)	502	1092	182	2305	623	303
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.75	0.33	0.19	0.38	0.50



















Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Mill St & Guelph St

Future Total AM

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	30	745	5	55	370	40	15	30	170	70	45	25		
Future Volume (vph)	30	745	5	55	370	40	15	30	170	70	45	25		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6		
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0			
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00			1.00			
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.98			1.00			
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00			
Frt	1.00	1.00		1.00	0.99			0.89			0.98			
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.98			
Satd. Flow (prot)	1600	1808		1711	3278			1623			1733			
Flt Permitted	0.49	1.00		0.95	1.00			0.98			0.53			
Satd. Flow (perm)	833	1808		1711	3278			1590			940			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	33	810	5	60	402	43	16	33	185	76	49	27		
RTOR Reduction (vph)	0	0	0	0	8	0	0	148	0	0	11	0		
Lane Group Flow (vph)	33	815	0	60	438	0	0	86	0	0	141	0		
Confl. Peds. (#/hr)	8		18	18		8			3	3		3		
Heavy Vehicles (%)	8%	5%	0%	2%	9%	0%	0%	4%	2%	6%	3%	0%		
Turn Type	Perm	NA		Prot	NA		custom	NA		custom	NA			
Protected Phases		2		1	6									
Permitted Phases	2						8	8		4	4			
Actuated Green, G (s)	43.5	43.5		5.0	53.0			14.0			14.0			
Effective Green, g (s)	46.5	46.5		5.5	56.0			16.0			16.0			
Actuated g/C Ratio	0.58	0.58		0.07	0.70			0.20			0.20			
Clearance Time (s)	7.0	7.0		4.5	7.0			6.0			6.0			
Vehicle Extension (s)	4.5	4.5		3.0	4.5			2.0			2.0			
Lane Grp Cap (vph)	484	1050		117	2294			318			188			
v/s Ratio Prot		c0.45		c0.04	0.13									
v/s Ratio Perm	0.04							0.05			c0.15			
v/c Ratio	0.07	0.78		0.51	0.19			0.27			0.75			
Uniform Delay, d1	7.3	12.8		36.0	4.2			27.1			30.1			
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00			
Incremental Delay, d2	0.3	5.6		3.8	0.2			0.2			13.3			
Delay (s)	7.6	18.4		39.7	4.3			27.2			43.4			
Level of Service	A	B		D	A			C			D			
Approach Delay (s)		18.0			8.5			27.2			43.4			
Approach LOS		B			A			C			D			
Intersection Summary														
HCM 2000 Control Delay			18.7									HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.77											
Actuated Cycle Length (s)			80.0								14.0			
Intersection Capacity Utilization			78.3%										ICU Level of Service	D
Analysis Period (min)			15											
c Critical Lane Group														

HCM Unsignalized Intersection Capacity Analysis

2: Mill St & Dayfoot Dr

Future Total AM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	45	20	75	75	10
Future Volume (Veh/h)	10	45	20	75	75	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	49	22	82	82	11
Pedestrians	7					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)	205					
pX, platoon unblocked						
vC, conflicting volume	220	94	100			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	220	94	100			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	99	95	98			
cM capacity (veh/h)	756	962	1412			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	60	104	93			
Volume Left	11	22	0			
Volume Right	49	0	11			
cSH	916	1412	1700			
Volume to Capacity	0.07	0.02	0.05			
Queue Length 95th (m)	1.7	0.4	0.0			
Control Delay (s)	9.2	1.7	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.2	1.7	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			21.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Mill St & Site Access

Future Total AM

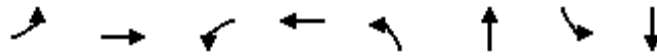


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	15	5	80	70	0
Future Volume (Veh/h)	0	15	5	80	70	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	16	5	87	76	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)	248					
pX, platoon unblocked						
vC, conflicting volume	173	76	76			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	173	76	76			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	100			
cM capacity (veh/h)	814	985	1523			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	16	92	76			
Volume Left	0	5	0			
Volume Right	16	0	0			
cSH	985	1523	1700			
Volume to Capacity	0.02	0.00	0.04			
Queue Length 95th (m)	0.4	0.1	0.0			
Control Delay (s)	8.7	0.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.7	0.4	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay	1.0					
Intersection Capacity Utilization	18.3%			ICU Level of Service	A	
Analysis Period (min)	15					

Timings

1: Mill St & Guelph St

Future Total PM

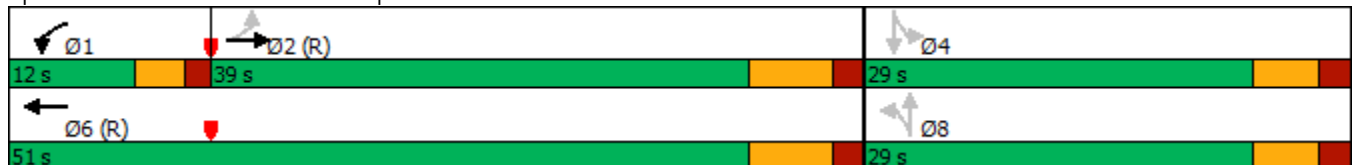


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	20	545	115	855	20	40	45	45
Future Volume (vph)	20	545	115	855	20	40	45	45
Turn Type	Perm	NA	Prot	NA	custom	NA	custom	NA
Protected Phases		2	1	6				
Permitted Phases	2				8	8	4	4
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	30.0	30.0	6.0	30.0	8.0	8.0	8.0	8.0
Minimum Split (s)	37.0	37.0	10.5	37.0	29.0	29.0	29.0	29.0
Total Split (s)	39.0	39.0	12.0	51.0	29.0	29.0	29.0	29.0
Total Split (%)	48.8%	48.8%	15.0%	63.8%	36.3%	36.3%	36.3%	36.3%
Yellow Time (s)	5.0	5.0	3.0	5.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.5	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-0.5	-3.0		-2.0		-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0		4.0		4.0
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None	None
Act Effect Green (s)	43.3	43.3	10.4	57.7		14.3		14.3
Actuated g/C Ratio	0.54	0.54	0.13	0.72		0.18		0.18
v/c Ratio	0.08	0.61	0.56	0.40		0.51		0.56
Control Delay	12.5	17.5	44.2	5.6		14.2		32.9
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	12.5	17.5	44.2	5.6		14.2		32.9
LOS	B	B	D	A		B		C
Approach Delay		17.3		9.9		14.2		32.9
Approach LOS		B		A		B		C

Intersection Summary

Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 14.0	Intersection LOS: B
Intersection Capacity Utilization 78.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Mill St & Guelph St



Queues

1: Mill St & Guelph St

Future Total PM



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	22	603	125	1005	206	131
v/c Ratio	0.08	0.61	0.56	0.40	0.51	0.56
Control Delay	12.5	17.5	44.2	5.6	14.2	32.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	17.5	44.2	5.6	14.2	32.9
Queue Length 50th (m)	1.6	60.2	18.5	22.6	9.3	16.5
Queue Length 95th (m)	6.7	119.1	#46.2	58.1	23.3	27.8
Internal Link Dist (m)		244.8		229.4	42.0	68.3
Turn Bay Length (m)	40.0		50.0			
Base Capacity (vph)	282	996	225	2529	599	393
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.61	0.56	0.40	0.34	0.33


















Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Mill St & Guelph St

Future Total PM

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	20	545	10	115	855	70	20	40	130	45	45	30		
Future Volume (vph)	20	545	10	115	855	70	20	40	130	45	45	30		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6		
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0			
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00			1.00			
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.98			0.99			
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00			
Frt	1.00	1.00		1.00	0.99			0.91			0.97			
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98			
Satd. Flow (prot)	1741	1840		1728	3497			1660			1788			
Flt Permitted	0.29	1.00		0.95	1.00			0.96			0.66			
Satd. Flow (perm)	523	1840		1728	3497			1606			1209			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	22	592	11	125	929	76	22	43	141	49	49	33		
RTOR Reduction (vph)	0	0	0	0	5	0	0	116	0	0	18	0		
Lane Group Flow (vph)	22	603	0	125	1000	0	0	90	0	0	113	0		
Confl. Peds. (#/hr)	4		5	5		4	11		4	4		11		
Heavy Vehicles (%)	0%	3%	0%	1%	2%	0%	0%	0%	2%	0%	0%	0%		
Turn Type	Perm	NA		Prot	NA		custom	NA		custom	NA			
Protected Phases		2		1	6									
Permitted Phases	2						8	8		4	4			
Actuated Green, G (s)	40.3	40.3		9.9	54.7			12.3			12.3			
Effective Green, g (s)	43.3	43.3		10.4	57.7			14.3			14.3			
Actuated g/C Ratio	0.54	0.54		0.13	0.72			0.18			0.18			
Clearance Time (s)	7.0	7.0		4.5	7.0			6.0			6.0			
Vehicle Extension (s)	4.5	4.5		3.0	4.5			2.0			2.0			
Lane Grp Cap (vph)	283	995		224	2522			287			216			
v/s Ratio Prot		c0.33		c0.07	0.29									
v/s Ratio Perm	0.04							0.06			c0.09			
v/c Ratio	0.08	0.61		0.56	0.40			0.31			0.52			
Uniform Delay, d1	8.8	12.5		32.6	4.4			28.6			29.8			
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00			
Incremental Delay, d2	0.5	2.7		3.0	0.5			0.2			1.1			
Delay (s)	9.3	15.3		35.6	4.8			28.8			30.8			
Level of Service	A	B		D	A			C			C			
Approach Delay (s)		15.0			8.2			28.8			30.8			
Approach LOS		B			A			C			C			
Intersection Summary														
HCM 2000 Control Delay			13.7									HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.60											
Actuated Cycle Length (s)			80.0								14.0			
Intersection Capacity Utilization			78.6%										ICU Level of Service	D
Analysis Period (min)			15											
c	Critical Lane Group													

HCM Unsignalized Intersection Capacity Analysis

2: Mill St & Dayfoot Dr

Future Total PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	35	40	65	70	30
Future Volume (Veh/h)	15	35	40	65	70	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	38	43	71	76	33
Pedestrians	7					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)	205					
pX, platoon unblocked						
vC, conflicting volume	256	100	116			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	256	100	116			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	98	96	97			
cM capacity (veh/h)	682	927	1477			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	54	114	109			
Volume Left	16	43	0			
Volume Right	38	0	33			
cSH	838	1477	1700			
Volume to Capacity	0.06	0.03	0.06			
Queue Length 95th (m)	1.7	0.7	0.0			
Control Delay (s)	9.6	3.0	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.6	3.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			3.1			
Intersection Capacity Utilization			22.3%	ICU Level of Service	A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

3: Mill St & Site Access

Future Total PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	10	10	70	90	5
Future Volume (Veh/h)	0	10	10	70	90	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	11	76	98	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)	248					
pX, platoon unblocked						
vC, conflicting volume	198	100	103			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	198	100	103			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	99			
cM capacity (veh/h)	784	955	1489			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	11	87	103			
Volume Left	0	11	0			
Volume Right	11	0	5			
cSH	955	1489	1700			
Volume to Capacity	0.01	0.01	0.06			
Queue Length 95th (m)	0.3	0.2	0.0			
Control Delay (s)	8.8	1.0	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.8	1.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay	0.9					
Intersection Capacity Utilization	20.9%			ICU Level of Service	A	
Analysis Period (min)	15					