Functional Servicing Report for:

26-42 Mill Street and 3-11 Dayfoot Drive
Town of Halton Hills (Georgetown)

GMBP File: 416100

October 2016

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1. INTRODUCTION

This functional servicing report has been prepared by GM BluePlan Engineering Limited to document the preliminary servicing requirements for the two (2) proposed 6-storey luxury condominium residences and one (1) retirement residence and/or condominium residence at Mill Street and Dayfoot Drive in the Town of Halton Hills (Georgetown).

The 1.89-hectare site is bound by Dayfoot Drive to the north, Mill Street to the east, the Sacre-Couer Church to the south, and Morris Street / an existing residential development to the west (see Figure No. 1).

A partial topographic survey of 42 Mill Street and 11 Dayfoot Drive was completed by Fiddes Clipsham Inc. (dated May 2015). A supplemental topographic survey of 26-38 Mill Street and 3 Dayfoot Drive was completed by Fiddes Clipsham Inc. (dated September 2016). The site layout was prepared by Amico Properties Inc. (dated September 2016).

2. PROPOSED DEVELOPMENT

The intent of the Owner at this time is to develop one (1) 105,000 sq.ft. GFA (gross floor area) luxury condominium residence, one (1) 75,000 sq.ft. GFA (gross floor area) luxury condominium residence and one (1) 100,000 sq.ft. GFA (gross floor area) retirement home and/or condominium residence, along with the associated below grade and surface parking areas and landscaped areas. Following development of the site, the ground cover will be predominately rooftop and asphalt, with landscaped areas.

The development is anticipated to occur in phases, with Phase 1 representing the 105,000 sq.ft. GFA (gross floor area plus two levels of underground parking) 76 unit luxury condominium residence, Phase 2 representing the 75,000 sq.ft. GFA (gross floor area plus two levels of underground parking) 54 unit luxury condominium residence and Phase 3 consisting of the 100,000 sq.ft. GFA (gross floor area plus one level of underground parking) 144 unit retirement home and/or condominium residence (see Figure No. 2).

The 7 existing single family residences along Mill Street (26-38 Mill Street) and 3 Dayfoot Drive will require removal/demolishing as part of the Phase 3 development.

2.1 Site Grading

As identified on the topographic survey for 42 Mill Street and 11 Dayfoot Drive, the site generally slopes in a west to east direction. The lowest elevation on the site of 243.63 is along the rear property line of 30 Mill Street. The highest elevation on the site of 253.90 is at the westerly limit of the site, adjacent to Morris Street. The centreline road elevation along Mill Street across the frontage of the site ranges from 245.02 (approximately) to 247.81 (approximately). The centreline road elevation along Dayfoot Drive, across the frontage of the site, ranges from 245.02 (approximately) to 252.00 (approximately).

The grade and elevations of the site, along with the internal driving aisles and finished floor elevation of each proposed building, is controlled by the existing centreline road elevation of Mill Street and Dayfoot Drive. The site will be graded to match the existing elevations along the property limits.

Major storm overland flow routes from the site will be directed to Mill Street and Dayfoot Drive (where appropriate).

Access to the site is currently provided via Mill Street. Upon development, driveway access to the site (Phase 1, Phase 2 and Phase 3) will be provided via Mill Street. A secondary driveway access will also be provided via Dayfoot Drive. The use of the Dayfoot Drive access have been detailed in the Traffic Impact Study.

In addition to this, an emergency accessway has been provided through the site, from the internal driveway access from Mill Street to Dayfoot Drive.

As part of the site plan approval process for the Phase 1 and Phase 2 developments, a structural review of the existing retaining walls, adjacent to the Sacre-Coeur Church and within the Lions Club Park, will need to be completed by the designer to determine the condition of the existing retaining walls and if the existing retaining walls are to remain or require replacement/extension. Should the existing retaining walls require removal replacement and/or extension, the detailed site grading plan will identify the location, finished surface grade of the retaining wall and a typical detail.

2.2 Water Supply

Water supply for 42 Mill Street is currently provided via a connection to the existing 300mm diameter watermain on Mill Street. Water supply for each of the existing single family residences along Mill Street (26-38 Mill Street) are provided via individual water service lateral connections to the existing 300mm diameter watermain on Mill Street. Water supply for the existing single family residence along Dayfoot Drive (3 Dayfoot Drive) is provided via an individual water service lateral connection to the existing 300mm diameter watermain on Dayfoot Drive.

There are existing municipal fire hydrants on both Mill Street and Dayfoot Drive.

Water supply for the proposed development will be provided via two (2) water service lateral connections. Phase 1 and Phase 2 of the proposed development will be serviced via a 300mm diameter water service lateral connected to the existing 300mm diameter watermain on Mill Street. Water supply for Phase 3 of the proposed development will be via a 200mm diameter water service lateral connection to the existing 300mm diameter watermain on Mill Street. See Figure No. 3 for the proposed water supply connections.

The water service laterals for the Phase 1, 2 and 3 developments will provide both fire protection and domestic supply.

To ensure adequate fire protection, on-site fire hydrants will be provided for each Phase of the development.

As part of the site plan approval process for each phase of the development, the water service size and point of connection within the Mill Street and Dayfoot Drive right-of-ways will be confirmed. During the construction of the Phase 3 works, the existing water service laterals for the existing single family residences along Mill Street (26-38 Mill Street) and Dayfoot Drive (3 Dayfoot Drive) will be removed and capped/abandoned at the main.

The unit rate and peaking factors of water consumption and allowable pressure were established based on the Sustainable Halton Water and Wastewater Master Plan (AECOM, 2011).

The following is a summary of the anticipated water demands for each phase of the development (Phase 1, Phase 2 and Phase 3), based on 314 L/c/day (as per the AECOM 2011 Sustainable Halton Water & Wastewater Master Plan):

Table No. 1: Anticipated Water Demands for Phase 1, Phase 2 and Phase 3

	Phase 1	Phase 2	Phase 3
Average Day domestic demand	0.95 L/s	0.68 L/s	1.91 L/s
Peak Day demand (1.9x daily demand)	1.81 L/s	1.29 L/s	3.63 L/s
Peak hour demand (3.0x daily demand)	2.85 L/s	2.04 L/s	5.73 L/s
Fire Flow *	150 L/s	130 L/s	150 L/s

* As part of the site plan approval process the fire flow will be calculated and verified as per the OBC and NFPA by the Mechanical Engineering Consultant.

Based on our analysis and according to the MOECC criteria, the allowable and available pressures under peak day conditions in both the existing watermain on Mill Street and Dayfoot Drive are as follows:

Table No. 2: Available and Allowable Pressures on Mill Street and Dayfoot Drive

	Allowable Pressure (kPa)		Available Pressures (kPa)
	Min.	Max.	
Peak Day (300mm diameter watermain on Mill Street)	350	550	482
Peak Day (300mm diameter watermain on Dayfoot Drive)	350	550	512

2.3 Sanitary Service

Sanitary service for 42 Mill Street is currently provided via a connection to the existing 200mm diameter sanitary sewer on Mill Street (located in the westerly boulevard on Mill Street). The existing 200mm diameter sanitary sewer on Mill Street conveys flows to an existing 200mm diameter sanitary sewer ultimately discharging to the existing 600mm diameter trunk sanitary sewer.

Sanitary service for 34, 36 and 38 Mill Street is also provided via the existing 200mm diameter sanitary sewer on Mill Street, ultimately discharging to the existing 200mm diameter sanitary sewer and the existing 600mm diameter trunk sanitary sewer.

The capacity of the existing 200mm diameter sanitary sewer, from Mill Street to the existing 600mm diameter trunk sanitary sewer, has been calculated to be $0.020m^3/s$ (approximately), based on a grade of 0.35%.

Sanitary service for 26, 28, 30 and 34 Mill Street is provided by individual sanitary service laterals connected to the existing 200mm diameter sanitary sewer on Mill Street, ultimately discharging to the existing 300mm diameter sanitary sewer on Mill Street and the existing 600mm diameter trunk sanitary sewer.

Sanitary service for 3 Dayfoot Drive is currently provided via an individual sanitary service lateral connection to the existing 250mm diameter sanitary sewer on Dayfoot Drive, ultimately discharging to the existing 300mm diameter sanitary sewer on Mill Street and the existing 600mm diameter trunk sanitary sewer.

The capacity of the existing 300mm diameter sanitary sewer on Mill Street, from Dayfoot Drive to the existing 600mm diameter trunk sanitary sewer, has been calculated to be $0.077m^3/s$ (approximately), based on a grade of 0.58%.

The capacity of the existing 600mm diameter trunk sanitary sewer, which conveys flows from both the existing 200mm diameter sanitary sewer and the existing 300mm diameter sanitary sewer has been calculated to be $0.371\ m^3/s$ (approximately), based on a grade of 0.35% (approximately).

Sanitary service for the Phase 1, Phase 2 and Phase 3 developments will be provided via two (2) individual sanitary sewer service lateral connections. Based on the available topographic survey data, Phase 1 and Phase 2 are anticipated to be serviced via a connection to the existing 200mm diameter sanitary sewer on Mill Street (located in the westerly boulevard on Mill Street), ultimately discharging to the existing 200mm diameter and the existing 600mm diameter trunk sanitary sewer. Phase 3 of the development is anticipated to be serviced via a connection to the existing 200mm diameter sanitary sewer on Mill Street, ultimately discharging to the existing 300mm diameter sanitary sewer and the existing 600mm diameter trunk sanitary sewer.

Phase 2 of the development may also be serviced via a connection to the existing 250mm diameter sanitary sewer on Dayfoot Drive, ultimately discharging to the existing 300mm diameter sanitary sewer on Mill Street and the existing 600mm diameter trunk sanitary sewer. Based on the elevation of the existing 250mm diameter sanitary sewer on Dayfoot Drive, an internal sewage pumping station is anticipated to be required if Phase 2 is serviced via Dayfoot Drive. The design of the internal sewage pumping station will be confirmed at the detailed design stage. The capacity of the existing 250mm sanitary sewer on Dayfoot Drive has been calculated to be $0.180\ m^3/s$ (approximately), based on a grade of 9.37% (approximately).

The following is a summary of the anticipated sanitary design flows contributing to existing 200mm diameter sanitary sewer on Mill Street (located in the westerly boulevard on Mill Street), ultimately discharging to the existing 200mm diameter and the existing 600mm diameter trunk sanitary sewer:

Table No. 3: Anticipated Sanitary Design Flows to Mill Street

	Anticipated Sanitary Design Flow
Phase 1 (76 units, 3.5 people per unit)	0.0044 m3/s
Phase 2 (54 units, 3.5 people per unit)	0.0032 m3/s
Existing flows (6 units, 3.5 people per unit)	0.0004 m3/s
Total Anticipated Flow	0.0080 m3/s

Therefore, the existing 200mm diameter sanitary sewer, from Mill Street to the existing 600mm diameter trunk sanitary sewer, has sufficient capacity to convey the anticipated design flows from the Phase 1 and Phase 2 developments.

The following is a summary of the anticipated sanitary design flows contributing to existing 250mm diameter sanitary sewer on Dayfoot Drive, ultimately discharging to the existing 300mm diameter and the existing 600 mm diameter trunk sanitary sewer:

Table No. 4: Anticipated Sanitary Design Flows to Dayfoot Drive

	Anticipated Sanitary Design Flow
Phase 2 (76 units, 3.5 people per unit)	0.0032 m^3/s
Existing flows (from Dayfoot Drive)	0.0500 m^3/s
Total Anticipated Flow	0.0532 m^3/s

Therefore, the existing 250mm diameter sanitary sewer, from Dayfoot Drive to the existing 300mm diameter sanitary sewer, has sufficient capacity to convey the anticipated design flows from the Phase 2 development.

The following is a summary of the anticipated sanitary design flows contributing to existing 300mm diameter sanitary sewer on Mill Street (between Dayfoot Drive and the existing 600mm diameter trunk sanitary sewer), ultimately discharging to the existing 600mm diameter trunk sanitary sewer:

Table No. 5: Anticipated Sanitary Design Flows to Mill Street

	Anticipated Sanitary Design Flow
Phase 2 (76 units, 3.5 people per unit)	0.0032 m^3/s
Phase 3 (144 units, 3.5 people per unit)	0.0081 m^3/s
Existing flows (from Dayfoot Drive)	0.0500 m^3/s
Total Anticipated Flow	0.0631 m^3/s

Therefore, the existing 300mm diameter sanitary sewer on Mill Street, from Dayfoot Drive to the existing 600mm diameter trunk sanitary sewer, has sufficient capacity to convey the anticipated design flows from the Phase 2 and Phase 3 developments.

The following is a summary of the anticipated sanitary design flows contributing to existing 600mm diameter trunk sanitary sewer, which conveys flows from both the existing 200mm diameter sanitary sewer and the existing 300mm diameter sanitary sewer:

Table No. 6: Anticipated Sanitary Flows to Existing 600mm Trunk Sewer

	Anticipated Sanitary Design Flow
Phase 1 (76 units, 3.5 people per unit)	0.0044 m^3/s
Phase 2 (54 units, 3.5 people per unit)	0.0032 m^3/s
Existing flows (6 units, 3.5 people per unit)	0.0004 m^3/s
Phase 3 (144 units, 3.5 people per unit)	0.0081 m^3/s
Existing flows (from Dayfoot Drive)	0.0500 m^3/s
Existing flows in trunk sanitary sewer	0.1920 m^3/s
Total Anticipated Flow	0.2581 m^3/s

Therefore, the existing 600mm diameter trunk sanitary sewer has sufficient capacity to convey the anticipated design flows from the Phase 1, Phase 2 and Phase 3 developments.

See Figure No. 4 for the proposed sanitary service connections.

2.4 Storm Service

Storm service for the majority of the site is currently provided via an existing 375mm diameter storm sewer, extended from 42 Mill Street through the existing residential lots to Mill Street, ultimately discharging to the existing 600mm diameter storm sewer and 675mm diameter storm sewer on Mill Street. Storm flows generated from the existing single family residences along Mill Street (26-38 Mill Street) generally sheetflow overland to the Mill Street right-of-way, ultimately discharging to the existing 600mm diameter storm sewer and 675mm diameter storm sewer on Mill Street.

To service the Phase 1 and Phase 2 developments, the existing storm sewer on Mill Street will need to be extended to the proposed driveway/site access location. Following the extension of the storm sewer along Mill Street, storm service for the Phase 1, Phase 2 and Phase 3 developments will be provided via two (2) individual storm sewer connections to the storm sewer on Mill Street. The size of storm sewer to be extended on Mill Street will be determined during the detailed engineering design.

Alternatively, Phase 2 of the development may also be serviced via a connection to the existing 300mm diameter storm sewer on Dayfoot Drive, ultimately discharging to the existing 600mm diameter storm sewer and 675mm diameter storm sewer on Mill Street.

See Figure No. 5 for the proposed storm service connections.

All post-development flows generated from the Phase 1, Phase 2 and Phase 3 developments will be attenuated on-site prior to discharge to the existing 600mm diameter storm sewer and 675mm diameter storm sewer on Mill Street.

As part of the Phase 3 development, the existing 375mm diameter storm sewer, from 42 Mill Street that is extended through the existing residential lots to Mill Street, will be removed and capped/abandoned at property line.

2.5 Stormwater Management

2.5.1 Stormwater Management Criteria

The stormwater management system for the site will be based on the following documents:

- Stormwater Management Policy (Town of Halton Hills, May 2009)
- Stormwater Management Criteria (Credit Valley Conservation Authority, 2012)
- Stormwater Management Planning and Design Manual (Ministry of Environment, March 2003)

A summary of the stormwater management design criteria to be applied to the 1.89-hectare site are as follows:

1. The post-development peak runoff generated from the site is to be attenuated to the existing condition/pre-development level, for the full range of design storm events up to and including the 100-year design storm.
2. Enhanced water quality treatment (80% TSS total suspended solids removal) is to be provided prior to the discharge of runoff from the site.
3. Major storm flows are to be routed overland to an appropriate outlet.
4. As per Credit Valley Conservation (CVC) Stormwater Management Criteria (2012), a water balance is required to provide a minimum post-development recharge of the first 3 mm for any precipitation event; or complete a site-specific water balance to identify pre-development groundwater recharge rates to be maintained post-development.

5. As per Credit Valley Conservation (CVC) Stormwater Management Criteria (2012), a minimum of 5 mm is to be detained on site for erosion control protection, as site conditions do not warrant the detailed analyses.

The Halton Region Chicago Rainfall Distribution parameters were used to provide the mass rainfall data. The 2, 5, 10, 25, 50 and 100-year design storms were analyzed to determine the impact on the site. The 2, 5, 10, 25, 50 and 100-year design storm results are appended.

The Chicago Rainfall Distribution parameters and the total depth of rainfall for the 5 and 100-year analysis are as follows:

Table No. 7: Region of Waterloo Chicago Rainfall Distribution Parameters

	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
a =	586.10	946.46	1,173.48	1,368.91	1,622.45	1,777.20
b =	6.0	7.0	8.0	8.0	9.0	9.0
c =	0.760	0.788	0.794	0.789	0.797	0.795
r =	0.375	0.375	0.375	0.375	0.375	0.375
Duration (minutes) =	180.0	180.0	180.00	180.00	180.00	180.00
Depth (mm) =	33.133	46.027	55.070	65.945	74.636	82.617

The Horton infiltration method was used in the runoff calculations. The parameters used in MIDUSS are as follows:

Table No. 8: Horton Infiltration Numbers

	Impervious Areas	Pervious Areas
Maximum Infiltration	0.0 mm/hr	76.0 mm/hr
Minimum Infiltration	0.0 mm/hr	13.0 mm/hr
Lag Constant	0.0 hr	0.25 hr
Depression Storage	1.5 mm	5.0 mm

The hydrologic model MIDUSS was used to create runoff hydrographs for the site.

2.5.2 Existing Condition / Pre-Development Condition Drainage Areas

For the existing condition analysis, the site was modelled as three (3) drainage catchments.

Catchment 1 (0.74-hectares, 90% Impervious) represents the old Memorial Arena, including the associated surface parking and landscaped areas. Runoff generated from Catchment 1 sheetflows overland towards the existing 375mm diameter storm sewer, ultimately discharging to the existing 600mm diameter storm sewer on Mill Street.

Catchment 2 (0.49-hectares, 50% Impervious) represents the existing Lions Club Park, and the associated surface parking area. Runoff generated from Catchment 2 sheetflows overland towards the existing 375mm diameter storm sewer, ultimately discharging to the existing 600mm diameter storm sewer on Mill Street.

Catchment 3 (0.66-hectares, 20% Impervious) represents the existing single family residences fronting onto Mill Street (26-38 Mill Street) and Dayfoot Drive (3 Dayfoot Drive). Runoff generated from Catchment 3 generally sheetflows overland towards the Mill Street right-of-way, ultimately discharging to the existing 600mm diameter storm sewer on Mill Street.

In summary, the existing condition / pre-development condition flow rates from the site are as follows:

Table No. 9: Existing Condition / Pre-Development Condition Flow Rates

	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Catchment 1	0.126 m^3/s	0.187 m^3/s	0.219 m^3/s	0.263 m^3/s	0.294 m^3/s	0.324 m^3/s
Catchment 2	0.055 m^3/s	0.082 m^3/s	0.104 m^3/s	0.136 m^3/s	0.160 m^3/s	0.184 m^3/s
Catchment 3	0.029 m^3/s	0.062 m^3/s	0.102 m^3/s	0.153 m^3/s	0.194 m^3/s	0.229 m^3/s
Total	**0.210 m^3/s**	**0.331 m^3/s**	**0.425 m^3/s**	**0.552 m^3/s**	**0.648 m^3/s**	**0.737 m^3/s**

2.5.3 Allowable Release Rates

As identified in Section 2.4, storm service for the Phase 1, Phase 2 and Phase 3 developments will be provided via three (3) individual storm sewer connections to the existing 600mm diameter storm sewer on Mill Street. Therefore, all post-development flows generated from the Phase 1, Phase 2 and Phase 3 developments will be attenuated on-site to the existing condition/pre-development level, prior to discharge to the existing 600mm diameter storm sewer on Mill Street.

Therefore, the total allowable release rates from the 1.89-hecatare site under post-development conditions are as follows:

Table No. 10: Allowable Release Rates

	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Allowable Release	0.210 m^3/s	0.331 m^3/s	0.425 m^3/s	0.552 m^3/s	0.648 m^3/s	0.737 m^3/s

2.5.4 Post-Development Drainage Areas

For the post-development condition analysis purposes, the site was modelled as three (3) drainage catchments.

Catchment 10 (0.74-hectares, 65% impervious) represents the Phase 1 luxury condominium, including the associated surface parking and landscaped area. Runoff generated from Catchment 10 will be collected and conveyed via the on-site storm sewer system to the storm sewer extended along Mill Street, ultimately discharging the existing 600mm diameter storm sewer on Mill Street.

Catchment 20 (0.49-hectares, 45% impervious) represents the Phase 2 luxury condominium, including the associated surface parking and landscaped area. Runoff generated from Catchment 20 will be collected and conveyed via the on-site storm sewer system to the storm sewer extended along Mill Street, ultimately discharging the existing 600mm diameter storm sewer on Mill Street.

Catchment 30 (0.66-hectares, 60% Impervious) represents the Phase 3 retirement home and/or residence, including the associated landscaped area. Runoff generated from Catchment 30 will be collected and conveyed via the on-site storm sewer system, ultimately discharging to the existing 600mm diameter storm sewer on Mill Street.

Based on our preliminary analysis, on-site stormwater management controls will be required to attenuate the post-development flows from the 1.89-hectare site to the existing condition / pre-development condition level. It is anticipated that the required storage volume of 60 m^3 (approximately) will be provided through the use of a combination of lot level stormwater management controls consisting of the following:

a) Rooftop storage
b) Parking lot ponding
c) Super pipe storage

The implementation and use of low impact development (LID) practices will also be investigated and considered during the site plan approval stage. These measures may include the use of as-source infiltration measures, rainwater cisterns and bio-swales to promote the infiltration/recharge of 5mm of runoff.

Enhanced water quality control treatment (80% TSS removal) will be provided for the Phase 1, Phase 2 and Phase 3 developments through the provision of oil/grit separator structures, prior to discharge to the existing storm sewer system on Mill Street.

2.5.5 Water Balance Analysis

The average annual precipitation for the area in which the site is located is estimated to be about 877mm. This amount is based on precipitation data recorded at the Georgetown Wastewater Treatment Plant meteorological station for the period from 1981 to 2010. It has been estimated that the potential annual evapotranspiration for this area is 507mm for pervious surfaces. Therefore, 152mm remains available for infiltration and runoff.

Based on the silty soils throughout the site, the potential infiltration across the site has been estimated to be 180 mm annually, with the remaining 190 mm representing runoff. For impervious surfaces within the development, the annual evapotranspiration is estimated to be 192 mm, resulting in approximately 725 mm available for runoff and infiltration.

Based on the annual infiltration rates, the existing annual average groundwater recharge occurring within the 1.89-hectare site is estimated to be 1,602m^3. Under post-development conditions, the annual natural groundwater recharge occurring on-site is estimated to be 1,548m^3. To address the change in groundwater recharge under post-development conditions, it is recommended that all runoff generated from the grassed areas within the Phase 1, Phase 2 and Phase 3 developments be infiltrated on site.

The estimated existing and post-development recharge and runoff volumes for the Phase 1, Phase 2 and Phase 3 development are provided in Table No. 11.

Table No. 11: Preliminary Water Balance Analysis

	Existing Conditions / Pre-Development Conditions							Post Development Conditions							Totals	
	Phase 1		Phase 2		Phase 3		Existing	Phase 1		Phase 2		Phase 3		Post-Dev	Existing	Post-Dev
	Impervious	Pervious	Impervious	Pervious	Impervious	Pervious	Total	Impervious	Pervious	Impervious	Pervious	Impervious	Pervious	Total	Total	Total
Annual Precipitation (mm)	877	877	877	877	877	877		877	877	877	877	877	877			
Annual Evapotranspiration (mm)	152	507	152	507	152	507		152	507	152	507	152	507			
Available for Recharge & Runoff	725	370	725	370	725	370		725	370	725	370	725	370			
Total Area (ha)	**0.74**		**0.49**		**0.66**			**0.74**		**0.49**		**0.66**				
Area (ha)	0.65	0.09	0.22	0.27	0.13	0.53	**1.89**	0.46	0.28	0.19	0.30	0.38	0.28	**1.89**	**1.89**	**1.89**
Area (m^2)	6,500	900	2,200	2,700	1,300	5,300	**18,900**	4,600	2,800	1,900	3,000	3,800	2,800	**18,900**		
Annual Infiltration:																
Pervious: @ 180 mm/year	-	162	-	486	-	954	**1,602**	-	504	-	540	-	504	**1,548**	**1,602**	**1,548**
Impervious: @ 0 mm/year	0	-	0	-	0	-	**-**	0	-	0	-	0	-	**-**	**-**	**-**
Total Annual Infiltration (m^3/year)	0	162	0	486	0	954	**1,602**	0	504	0	540	0	504	**1,548**	**1,602**	**1,548**
Annual Runoff:																
Pervious: @ 190 mm/year	-	171	-	513	-	1,007	**1,691**	-	532	-	570	-	532	**1,634**	**1,691**	**1,634**
Impervious: @ 725 mm/year	4,713	-	1,595	-	943	-	**7,250**	3,335	-	1,378	-	2,755	-	**7,468**	**7,250**	**7,468**
Total Annual Runoff (m^3/year)	4,713	171	1,595	513	943	1,007	**8,941**	3,335	532	1,378	570	2,755	532	**9,102**	**8,941**	**9,102**
Summary:																
Total Runoff (m^3/year)	4,713	171	1,595	513	943	1,007	**8,941**	3,335	532	1,378	570	2,755	532	**9,102**	**8,941**	**9,102**
Total Recharge (m^3/year)	0	162	0	486	0	954	**1,602**	0	504	0	540	0	504	**1,548**	**1,602**	**1,548**

3. MAINTENANCE PLAN

To ensure that the stormwater management system continues to function as designed and constructed, we recommend that the following inspections and maintenance activities be completed on an annual basis:

1. Is there any noticeable damage to the asphalt and grassed areas (i.e. erosion, blockages)? If yes, complete any necessary repairs.
2. Inspect all roof drains and associated piping. Remove and dispose of any accumulated sediment trash/litter debris (i.e. leaves)
3. Inspect the oil/grit structure and complete any necessary maintenance/repair activities as identified by the manufacturer.
4. Inspect all catchbasins and manholes. Remove and dispose of any accumulated sediment, trash/litter, debris (i.e. sediment, garbage, leaves, etc.)
5. Inspect all overflow locations. Remove and dispose of any accumulated sediment trash/litter, debris (i.e. sediment, garbage, leaves, etc.)

Please note that any structures identified during the annual inspection to be worn, missing or damaged are to be repaired or replaced within 48 hours.

4. EROSION AND SEDIMENT CONTROL PLAN

A silt fence will be installed along the property boundary in all locations where runoff will discharge from the site to adjacent lands. The silt fence will serve to minimize the opportunity for water borne sediments to be washed on to the adjacent properties.

Upon completion of the grading, any area not subject to active construction within 30 days will be topsoiled and hydroseeded as per OPSS 572.

Once manholes, catchbasins or inlet risers have been installed, the grates will be wrapped in woven geotextile filter cloth. This feature will be maintained until all building and landscaping has been completed.

Inspection and maintenance of all silt fencing will start after installation is complete. The fence will be inspected on a weekly basis during active construction or after a rainfall event of 13 mm or greater. Maintenance will be carried out, within 48 hours, on any part of the facility found to need repair.

Once construction and landscaping has been substantially completed, the silt fence will be removed, any accumulated sediment will be removed and the landscaping will be completed.

After construction of the complete development, erosion will not occur and sediment transport will be minimal.

5. UTILITIES

At this time, the proposed Phase 1, Phase 2 and Phase 3 buildings will be serviced via individual utility connections (Halton Hills Hydro, Union Gas, Cogeco Cable, Bell Canda, etc.). As part of the site plan approval process for each phase of development, the size and point of connection within the Mill Street and Dayfoot Drive right-of-ways for each utility will be confirmed.

6. CONCLUSIONS

In summary:

- Water supply for the proposed development will be provided via two (2) water service lateral connections. Phase 1 and Phase 2 of the proposed development will be serviced via a 300mm diameter water service lateral connected to the existing 300mm diameter watermain on Mill Street. Water supply for Phase 3 of the proposed development will be via a 200mm diameter water service lateral connection to the existing 300mm diameter watermain on Mill Street.
- The water service laterals for the Phase 1, 2 and 3 developments will provide both fire protection and domestic supply.
- To ensure adequate fire protection, on-site fire hydrants will be provided (as required) for each Phase of the development.
- Sanitary service for the Phase 1, Phase 2 and Phase 3 developments will be provided via two (2) individual sanitary sewer service lateral connections. Based on the available topographic survey data, Phase 1 and Phase 2 are anticipated to be serviced via a connection to the existing 200mm diameter sanitary sewer on Mill Street (located in the westerly boulevard on Mill Street), ultimately discharging to the existing 200mm diameter and the existing 600mm diameter trunk sanitary sewer. Phase 3 of the development is anticipated to be serviced via a connection to the remaining 200mm diameter sanitary sewer on Mill Street, ultimately discharging to the existing 300mm diameter sanitary sewer and the existing 600mm diameter trunk sanitary sewer.

  As an alternative, Phase 2 of the development may also be serviced via a connection to the existing 250mm diameter sanitary sewer on Dayfoot Drive, ultimately discharging to the existing 300mm diameter sanitary sewer on Mill Street and the existing 600mm diameter trunk sanitary sewer. Based on the elevation of the existing 250mm diameter sanitary sewer on Dayfoot Drive, an internal sewage pumping station is anticipated to be required if Phase 2 is serviced via Dayfoot Drive.
- Based on the preliminary analysis, there is sufficient capacity in the existing 200mm diameter sanitary sewer, from Mill Street to the existing 600mm diameter trunk sanitary sewer, in the existing 300mm diameter sanitary sewer on Mill Street, and in the existing 250mm diameter sanitary sewer on Dayfoot Drive. The existing 600mm diameter trunk sanitary sewer also has sufficient capacity to convey the anticipated design flows from the Phase 1, Phase 2 and Phase 3 developments.
- To service the Phase 1 and Phase 2 developments, the existing storm sewer on Mill Street will need to be extended to the proposed driveway/site access location. Following the extension of the storm sewer along Mill Street, storm service for the Phase 1, Phase 2 and Phase 3 developments will be provided via two (2) individual storm sewer connections to the storm sewer on Mill Street.

  As an alternative, Phase 2 of the development may also be serviced via a connection to the existing 300mm diameter storm sewer on Dayfoot Drive, ultimately discharging to the existing 600mm diameter storm sewer and 675mm diameter storm sewer on Mill Street.
- All post-development flows generated from the Phase 1, Phase 2 and Phase 3 developments will be attenuated on-site prior to discharge from the site.
- Based on our preliminary analysis, on-site stormwater management controls will be required to attenuate the post-development flows from the 1.89-hectare site to the existing condition / pre-development condition level. It is anticipated that the required storage volume of 60m^3 (approximately) will be provided through the use of a combination of lot level stormwater management controls consisting of rooftop storage, parking lot ponding and super pipe storage.

- The implementation and use of low impact development (LID) practices will also be investigated and considered during the site plan approval stage. These measures may include the use of as-source infiltration measures, rainwater cisterns and bio-swales to promote the infiltration/recharge of 5mm of runoff.
- Enhanced water quality control treatment (80% TSS removal) will be provided for the Phase 1, Phase 2 and Phase 3 developments through the provision oil/grit separator structures, prior to discharge to the existing storm sewer system on Mill Street and/or Dayfoot Drive.
- Based on the preliminary water balance analysis, it is recommended that all runoff generated from the grassed areas within the Phase 1, Phase 2 and Phase 3 developments be infiltrated on site.
- Prior to construction, a silt fence will be installed along the property boundary in all locations where runoff will discharge from the site to adjacent lands. This will minimize the transport of sediment off-site during the construction period.
- As part of the site plan approval process for each phase of development, the size and point of connection within the Mill Street and Dayfoot Drive right-of-ways for each utility will be confirmed.

All of which is respectfully submitted.

GM BLUEPLAN ENGINEERING LIMITED
Per:

Angela Kroetsch, P.Eng.

AK/sv

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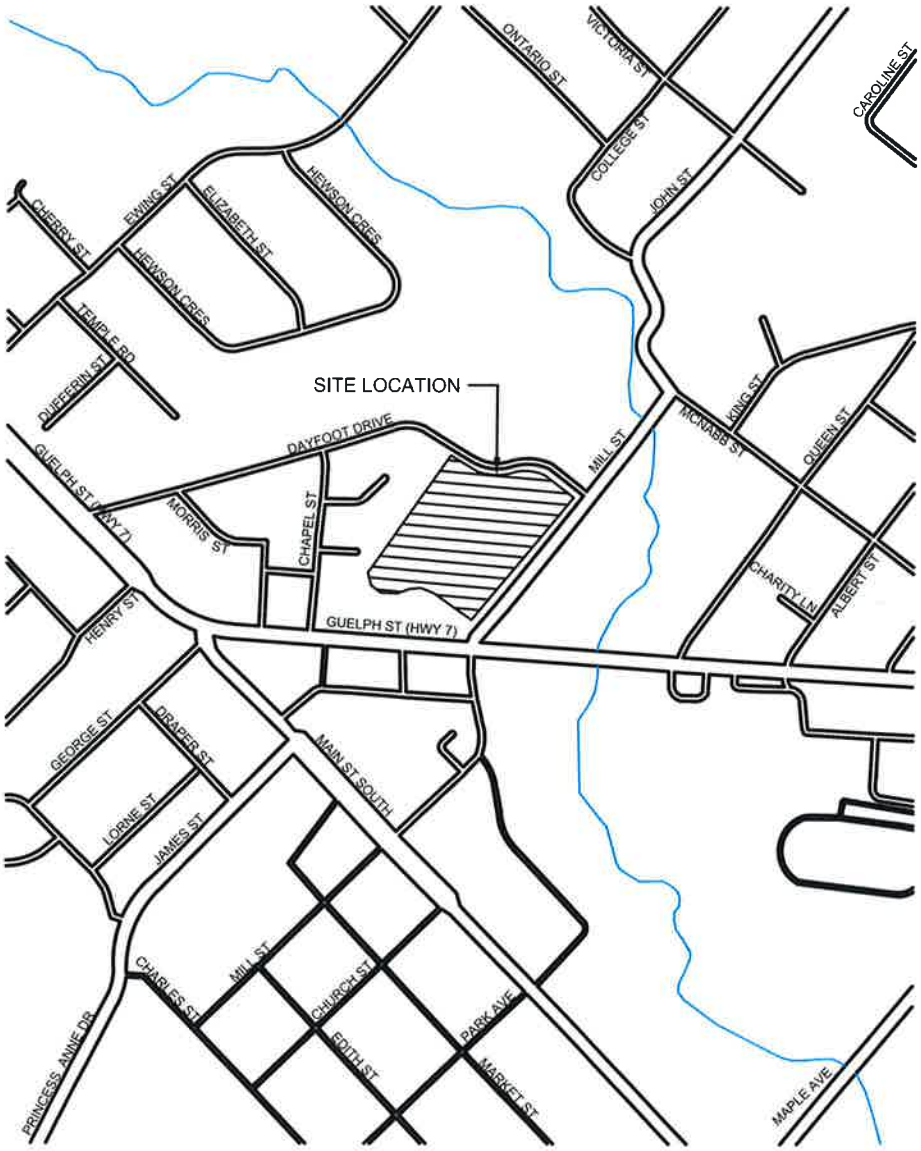
APPENDIX A:
Figures

Site Location/Conceptual Site Plan
Conceptual Water, Sanitary and Stormwater Servicing

Functional Servicing Report
26-42 Mill Street and 3-11 Dayfoot Drive
Town of Halton Hills (Georgetown)



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SITE LOCATION

Figure No. 1

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October 2016
Scale: N.T.S. | NAD 1983 UTM Zone 17N

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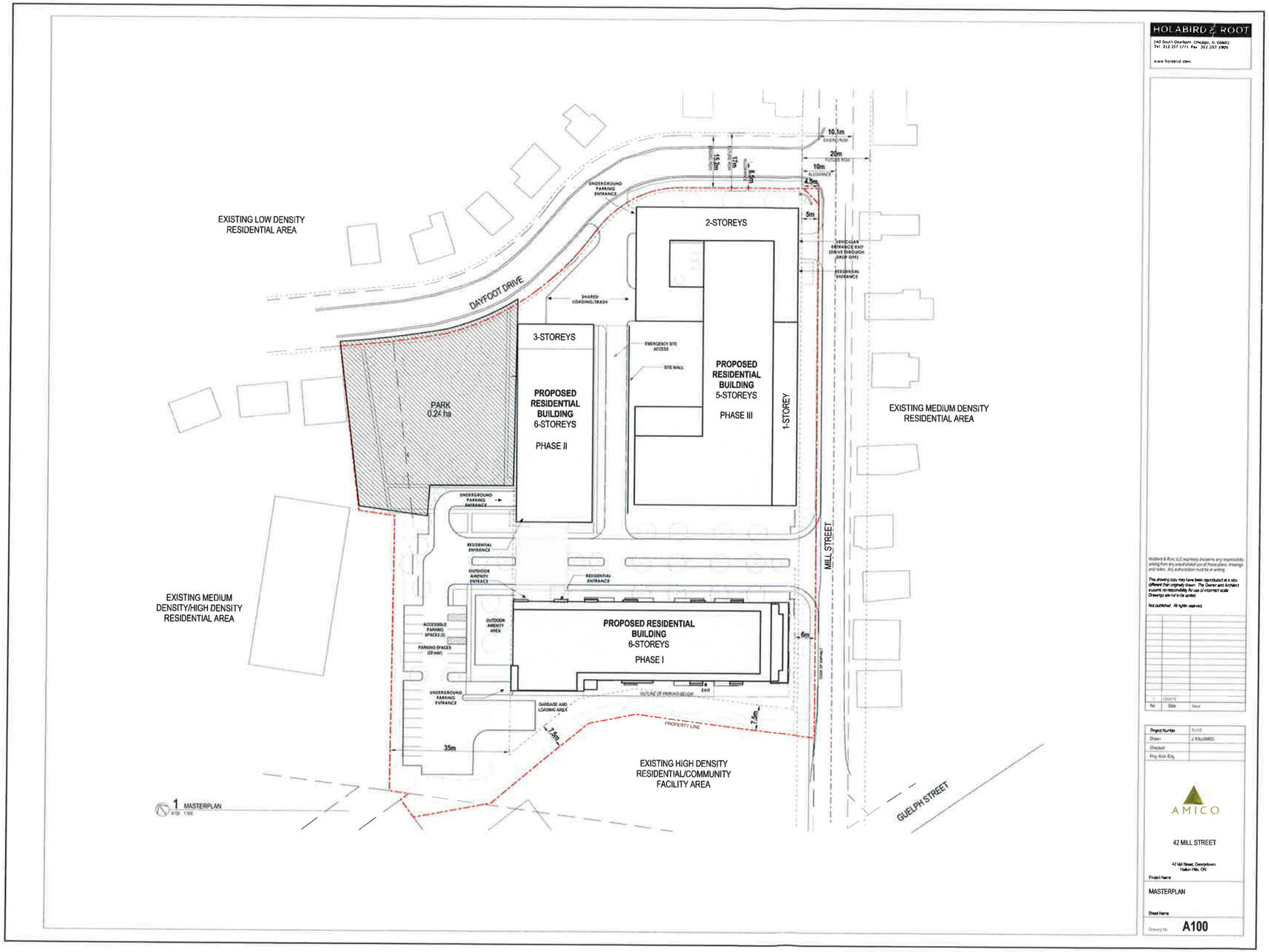
Functional Servicing Report
26-42 Mill Street and 3-11 Dayfoot Drive
Town of Halton Hills (Georgetown)



HOLABIRD & ROOT

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AMICO

42 MILL STREET

42 Mill Street, Georgetown
Halton Hills, ON

Project Name: MASTERPLAN

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CONCEPTUAL SITE LAYOUT

Figure No. 2

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Scale: N.T.S| NAD 1983 UTM Zone 17N

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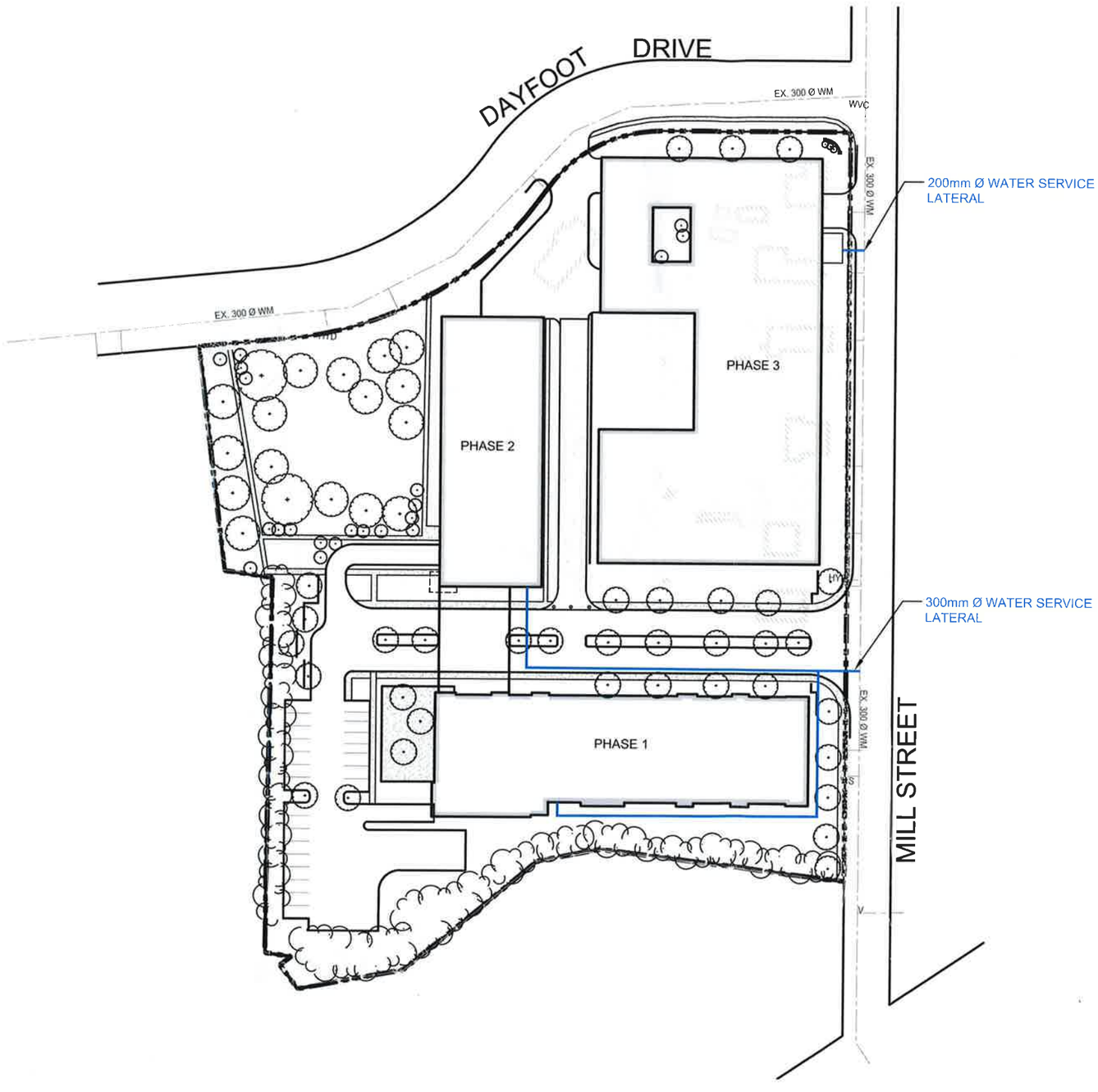
Functional Servicing Report
26-42 Mill Street and 3-11 Dayfoot Drive
Town of Halton Hills (Georgetown)



NOTES:
1. CONCEPTUAL SITE LAYOUT PROVIDED BY HOLABIRD & ROOT DATED OCTOBER 4, 2016.

2.TOPOGRAPHIC AND EXISTING FEATURES SURVEY BYFIDDES CLIPSHAM INC. DATED SEPTEMBER 2016.

3.SIZING OF ALL SERVICE LATERALS TO BE CONFIRMED AT DETAILED DESIGN STAGE.

CONCEPTUAL WATERMAIN SERVICING

Figure No. 3

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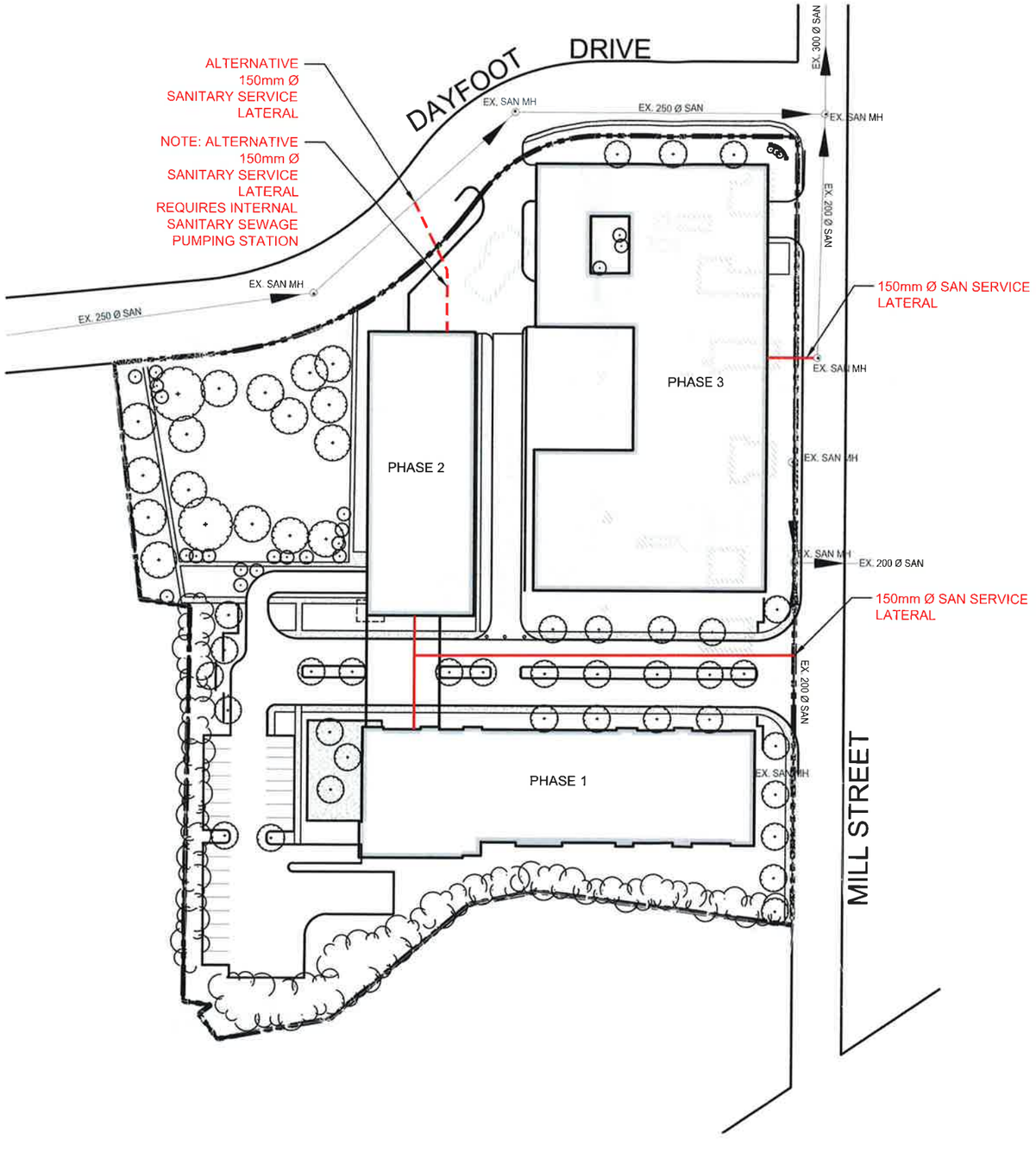
Scale: 1:1000 | NAD 1983 UTM Zone 17N

Functional Servicing Report
26-42 Mill Street and 3-11 Dayfoot Drive
Town of Halton Hills (Georgetown)



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2.TOPOGRAPHIC AND EXISTING FEATURES SURVEY BYFIDDES CLIPSHAM INC. DATED SEPTEMBER 2016.

3.SIZING OF ALL SERVICE LATERALS TO BE CONFIRMED AT DETAILED DESIGN STAGE.

CONCEPTUAL SANITARY SERVICING

Figure No. 4

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Scale: 1:1000 | NAD 1983 UTM Zone 17N

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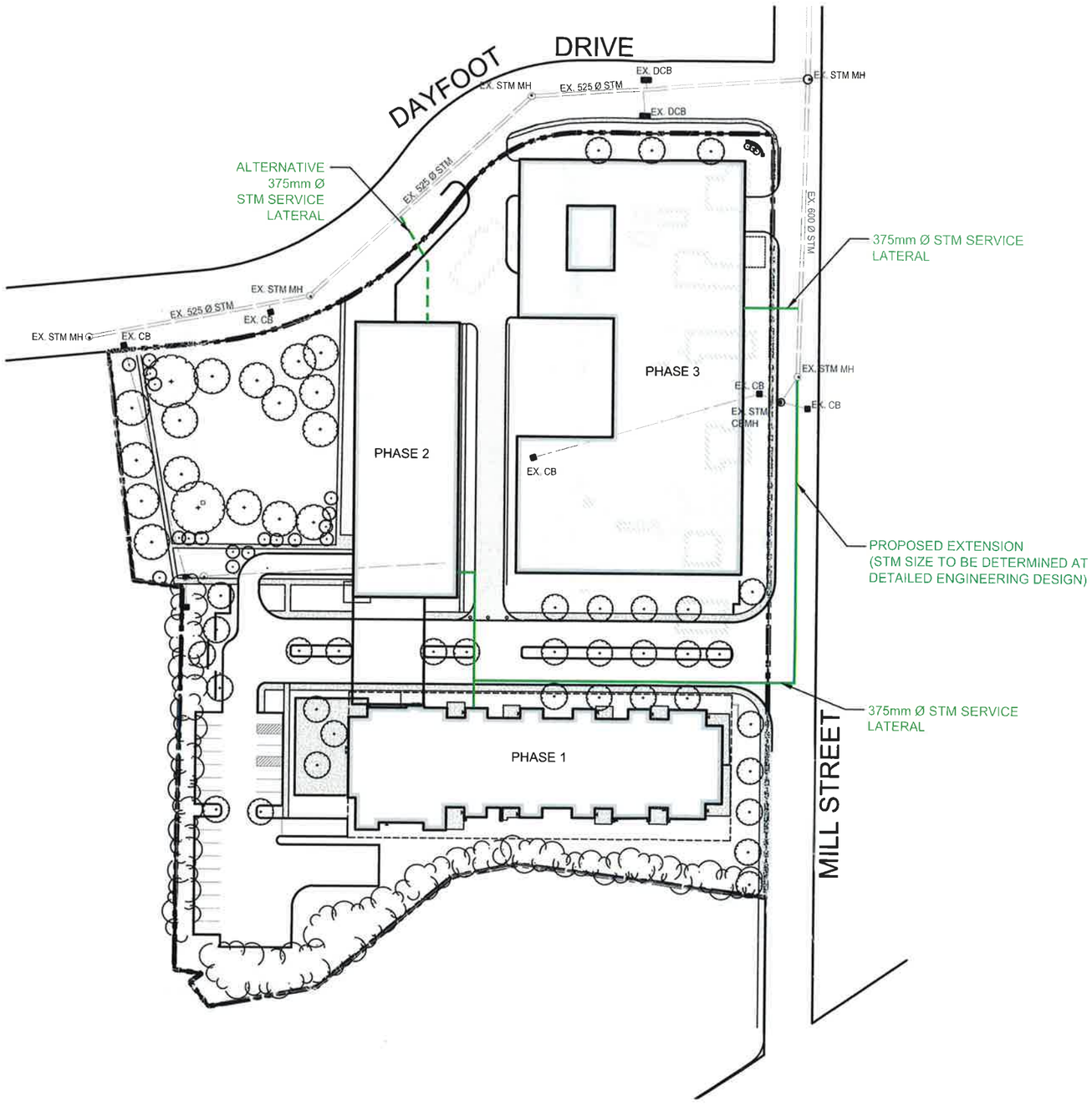
Functional Servicing Report
26-42 Mill Street and 3-11 Dayfoot Drive
Town of Halton Hills (Georgetown)



NOTES:
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2.TOPOGRAPHIC AND EXISTING FEATURES SURVEY BYFIDDES CLIPSHAM INC. DATED SEPTEMBER 2016.

3.SIZING OF ALL SERVICE LATERALS TO BE CONFIRMED AT DETAILED DESIGN STAGE.

CONCEPTUAL STORM SERVICING

Figure No. 5

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