Functional Servicing Report

Former Oakville Trafalgar Memorial Hospital Lands
327 Reynolds Street

Town of Oakville

GHD | 6705 Millcreek Drive Unit 1 Mississauga Ontario L5N 5M4 Canada

11148742 | 102 | Report No 1 | February 13 2018

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1. Introduction and Background

GHD Limited (GHD) has been retained by the Town of Oakville to prepare a Functional Servicing Report (FSR) for the redevelopment of the former Oakville Trafalgar Memorial Hospital Site (OTMH) located at 327 Reynold Street (the Site), in the Town of Oakville (the Town).

The objective of this FSR is to assess the serviceability of the Site in terms of grading, sanitary sewers, water distribution system, storm drainage system, stormwater management, utility requirements and impact to existing trees, all based on the Town's proposed redevelopment concept.

The Site is located within the Sixteen Mile Creek watershed and within a mature residential area as shown on the Location Plan in **Figure 1**. It is bound by MacDonald Road to the north, Reynolds Street to the west, Allan Street to the east and the existing/proposed development on the north side of Sheddon Avenue to the south. The Site concurrently consists of the following:

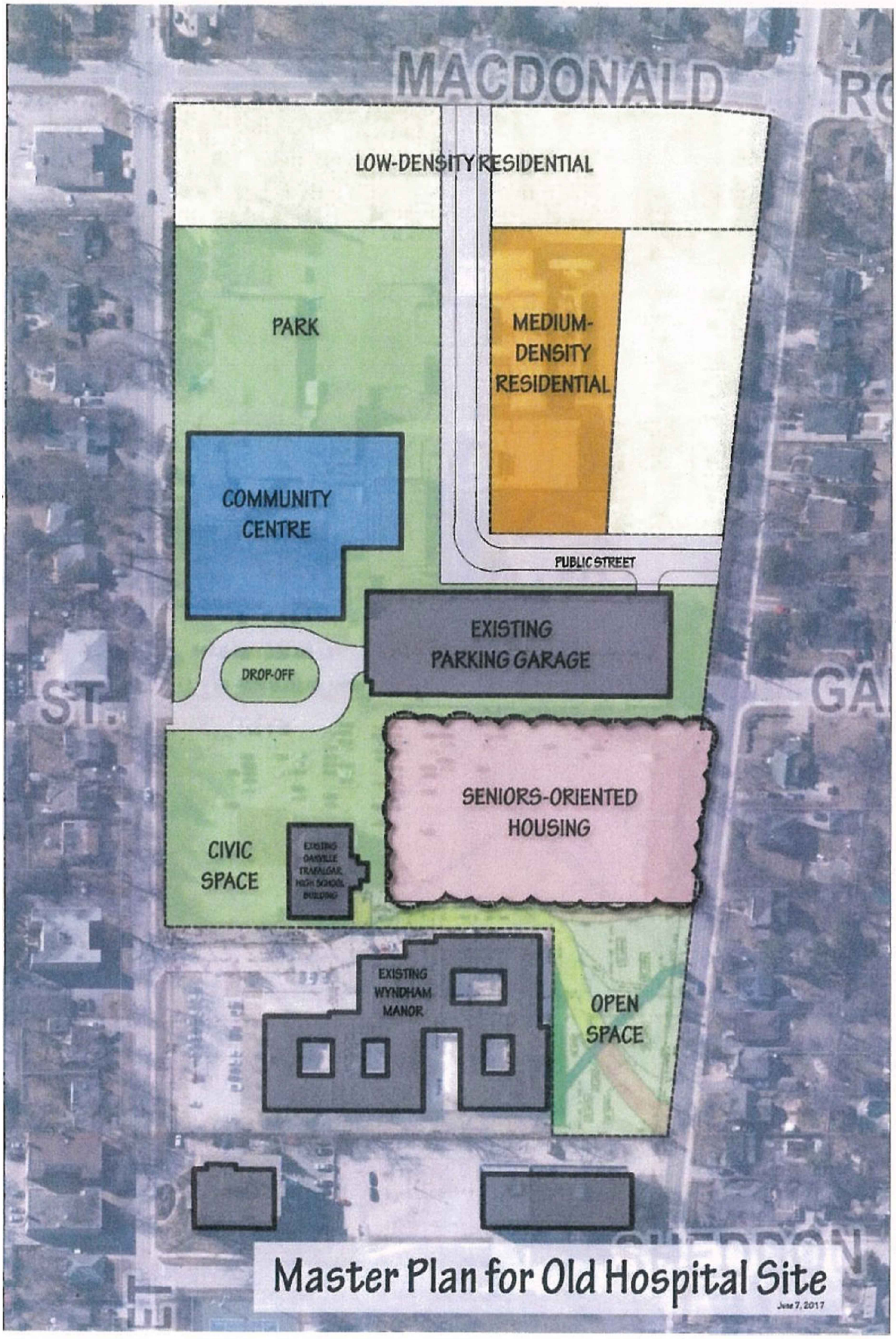
- The former OTMH hospital, medical buildings, nurses residence with associated parking areas, all of which are currently under demolition.
- An above ground parking facility with driveway connections to Allan Street and Reynolds Street planned to remain.
- A long term care facility (Wyndham Manor Extendicare) with parking and driveway access to Reynolds Street.
- Other parking and landscaped areas.

Figure 1 Location Plan

The total Site area is approximately 5.7 ha where the majority of the lands are proposed for redevelopment by the Town as shown on the Development Concept in **Figure 2**. The proposed redevelopment concept includes the following:

- Nineteen low-density residential lots with driveway connections to MacDonald Road and Allan Street.
- A 2-storey Community Centre of 3,900 m^2 gross floor area with associated parking.
- A subdivision road of 17.0 m right-of-way width with connections to McDonald Road and Allan Street.
- A 0.6 ha park block adjacent to the Community Centre, and a 0.3 ha park block at the southeast corner of the Site.
- Two medium density freehold residential blocks (approx. 2-8 unit townhouse blocks).
- A contemplated senior residence facility with associated parking and driveway connection to Reynolds Street (Note: allowance considered for two possible medium density blocks; each fronting on Reynolds Street and Allan Street).

- The existing above ground parking facility which is to be maintained with removal of the existing driveway to Allan Street and revised north driveway connection to the proposed subdivision road.



FORMER OAKVILLE-TRAFALGAR MEMORIAL HOSPITAL LANDS

DEVELOPMENT CONCEPT

Job Number 11148742
Revision 1
Date Nov 30, 2017

Figure 2

705 Millcreek Drive, Unit 1, Mississauga Ontario L5N 5M4 T 1 416 213 7121 F 1 416 890 8499 E info@ghdcanada.com W www.ghd.com

Plot Date: 2 February 2018 - 12:12 PM Plotted by: Prakrati
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2. Site Topography and Grading

Existing Conditions

The existing topography across the Site shows the northern portion of the property (north of the Lawson Street and Galt Avenue intersections) generally falling in the southwest direction with approx. 5.0 m of fall to Reynolds Street. For the South Catchment, the topographic survey shows elevations falling in the northwesterly direction for the majority of the property towards Reynolds Street of approximately 1.0 m of fall. A small portion of the landscaped areas (south of Galt Avenue intersection adjacent to Allan Street) fall in the southeasterly direction with minimal fall. Refer to the Existing Conditions Drainage Plan shown in **Figure 3** and the topographic survey provided in **Appendix A**.

Topographic survey information shows that the previous internal driveway grading design included a low point adjacent to the old entrance to the hospital. Also, some existing boulevard grading along the north and east property lines adjacent to MacDonald Road and Allan Street show reverse sloping boulevards.

Proposed Conditions

Based on the Town's development concept, the proposed grading design for the Site is shown on the Preliminary Grading Plan on **Figure 4** which can be summarized as follows:

- Split drainage for the low-density residential lots with rear yard swales/catchbasins for self-contained drainage.
- A lot point along the new subdivision road located at the bend adjacent to the Community Centre site.
- Park drainage via overland flow and swales generally in the southwesterly direction to Reynolds Street.
- Community centre drainage in the southwesterly direction to Reynolds Street.
- Emergency overland flow accommodated between the Community Centre and the existing parking facility from the new subdivision road low point.
- Medium density residential blocks draining in the westerly direction toward the new subdivision road for self-contained drainage.
- Emergency overland flow swale along the south side of the parking garage flowing in westerly direction for emergency overland from external areas.
- Drainage within the southern portion of the Site generally matching existing drainage patterns to Reynolds Street and Allan Street.

The proposed drainage design is further described in the Storm Drainage section of this Report.

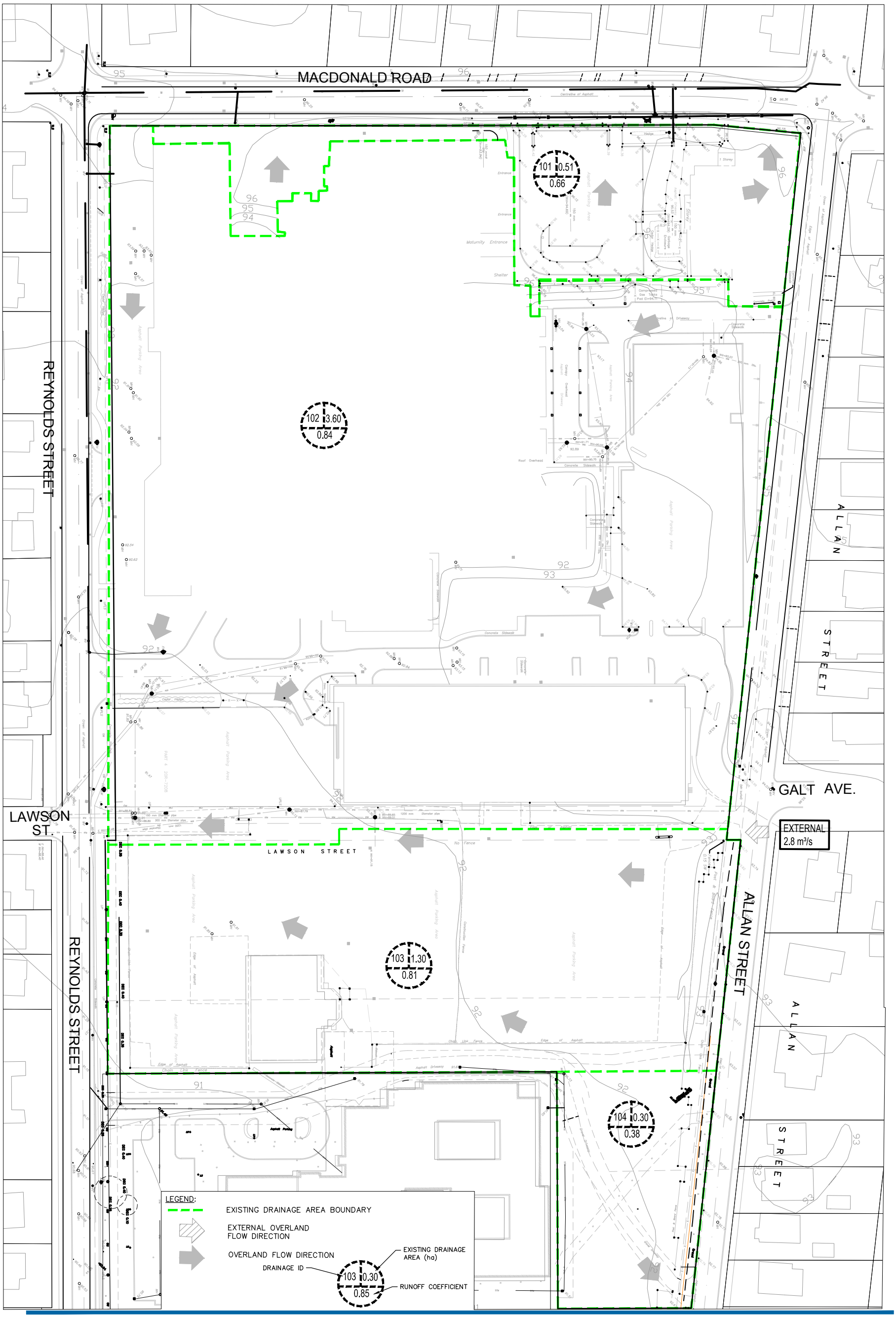
Preliminary Earthworks

Based on the Preliminary Grading Plan shown on **Figure 4**, preliminary earthwork calculations were completed to give a preliminary assessment of the required earthworks for the development. The following conservative assumptions were made for the preliminary earthwork calculations:

- All required building removals in range of 0.5 to 1.0 m depth below the surveyed elevations.
- All required removals of existing parking and driveway areas completed to a depth of 0.5 m below the surveyed elevations.
- Additional stripping depth of 0.3 m across all development areas to reach suitable native material elevation.
- Proposed pre-grade depths of the following:
  - 0.30 m for park/landscaped blocks
  - 0.75 m for the new subdivision road
  - 0.90 m for the low-density residential lots
  - 1.10 m for the medium density residential block
  - 0.5 m for the Community Centre site
  - 0.5 m for the Seniors Facility
- No additional sub-excavation/export of any geotechnically unsuitable or contaminated material.

The preliminary earthwork calculations show approximate removals of 24,000 m^3 and rough grading surplus of 3,000 m^3 for the northern portion of the Site (north of Lawson Street and Galt Avenue intersections), and removals of 7,000 m^3 with a rough grading balance for the southern portion of the Site. Therefore, allowances have been made within the preliminary development cost calculations for the Town located in **Appendix I**.

In speaking to Town staff, the planned demolition for the Site involves filling basement excavations filled with crushed concrete which may require the developer to provide allowances for additional engineered clay fill for overlying house foundations and possibly additional subsurface drainage works. Also all required topsoil is to be imported for all development areas to a minimum depth of 0.3 m.



FORMAL OAKVILLE-TRAFALGAR MEMORIAL HOSPITAL LANDS

EXISTING CONDITIONS DRAINAGE PLAN

Job Number 11148742
Revision
Date Oct.31, 2017

Figure -3

705 Millcree Drive, Unit 1, Mississauga Ontario L5N 5M4 T 1 41 213 7121 F 1 41 890 8499 E info gdcanada.com W www.gd.com

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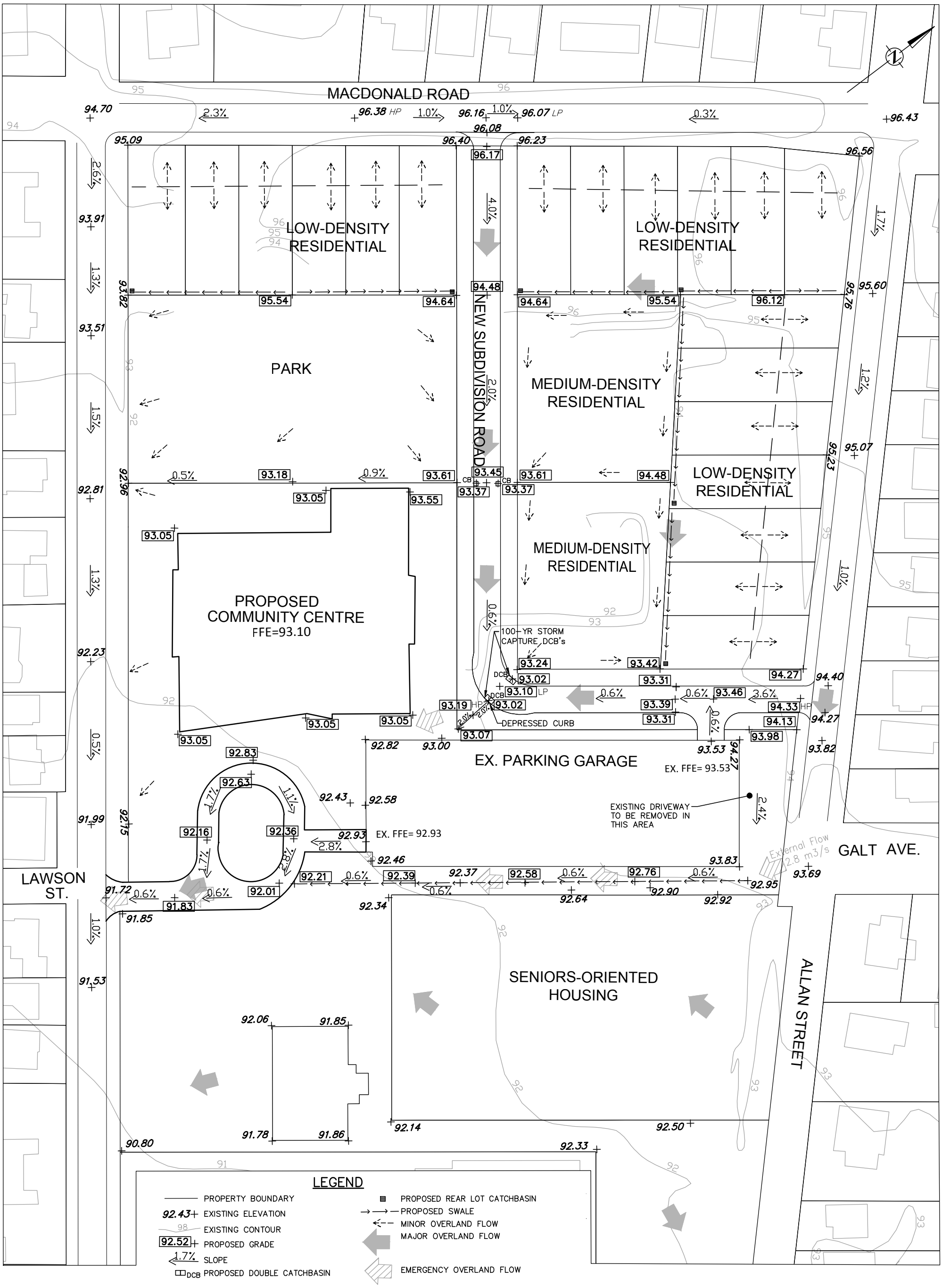

FORMER OAKVILLE-TRAFALGAR MEMORIAL HOSPITAL LANDS

PRELIMINARY GRADING PLAN

Job Number 11148742
Revision 4
Date Feb.13, 2018
Figure 4

705 Millcreek Drive, Unit 1, Mississauga Ontario L5N 5M4 T 1 41 213 7121 F 1 41 890 8499 E info@gdcanada.com W www.gd.com

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Scale 1:1000

3. Sanitary Servicing

Existing Conditions

The Site is located within the Region of Halton's Oakville Southwest WWTP catchment. Record plan and profile drawings and operating maps from the Region of Halton show the following existing municipal sanitary sewers surrounding the Site:

- 200 mm dia. sanitary sewer on MacDonald Road with high point in the middle splitting drainage in the westerly direction to Reynolds Street and easterly direction to Allan Street.
- 200 mm dia. sanitary sewer on Allan Street flowing in the southerly direction.
- 200 mm dia. sanitary sewer on Reynolds Street flowing in the southerly direction.
- 300 mm dia. sanitary sewer on Lawson Street flowing in the westerly direction.

The sanitary sewers along the west side of the Site along Reynolds Street and Lawson Street eventually connect to the existing 450 mm dia. trunk sanitary sewer along Palmer Avenue which then connects to the existing 675 mm dia. sanitary on Dunn Street.

Through additional review of background drawings of the Site and topographic surveys, there are existing sanitary services within the property that connect to the Lawson Street sanitary sewer within the north portion of the Site. Therefore, it is believed that all the lands from the subject site are conveyed to the trunk sanitary sewer on Dunn Street. Please refer to **Figure 5** for the Existing Conditions Sanitary Drainage Plan.

After reviewing existing demands from the current development and using the Region of Halton design criteria, the following demands were calculated for the existing conditions from the Site:

- 15.4 L/s peak sanitary flow to Lawson Street sanitary sewer.

The sanitary flow calculations can be found in **Appendix C**.

Proposed Conditions

Base on the Town's development concept, the following sanitary servicing requirements were identified and are summarized on the Preliminary Servicing Plan on **Figure 7**:

- Individual sanitary service connections to the existing MacDonald Road and Allan Street sewers for each low-density residential unit.
- Individual sanitary service connections for the two medium density freehold residential blocks assuming basement requirements.
- Separate sanitary service for the Community Centre connected direct to the existing municipal sanitary system (separate from the subdivision works).
- New sanitary service to the Seniors Facility (with allowance for separate sanitary services for two possible medium density blocks; each fronting on Reynolds Street and Allan Street).

At the time of preparing this report, it was assumed that sanitary servicing for the park blocks and landscaped areas would not be required.

MACDONALD ROAD

EX.300mmø WM
EX.200mmø SAN
EX.525mmø STM
EX.975mmø STM
EX.300mmø WM
EX.200mmø SAN
EX.1050mmø STM
EX.675mmø STM
EX.200mmø SAN
EX.900mmø WM
EX.200mmø WM
EX.200mmø SAN
EX.200mmø WM
EX.1200mmø STM
EX.450mmø STM
EX.400mmø STM
EX.300mmø SAN
EX.300mmø WM
EX.300mmø SAN
EX.450mmø STM
200mmø WM

SUMP PUMPS CONNECTED TO STORM SEWER

LOW-DENSITY RESIDENTIAL

LOW-DENSITY RESIDENTIAL

NEW SUBDIVISION ROAD

MEDIUM-DENSITY RESIDENTIAL

LOW-DENSITY RESIDENTIAL

PARK

PROPOSED COMMUNITY CENTRE

EX. PARKING GARAGE

SENIORS-ORIENTED HOUSING

SUPERPIPE

NEW FH

STORM SEWER CONTROL ORIFICE PIPE

OIL GRIT SEPARATOR

100-YR STORM CAPTURE DCB's

SUPERPIPE

SAN @ 1.0%

External Flow 2.8 m³/s

RYCB
CBMH
CB
DCB
OCS
VC

PR. INV. 91.25
PR. INV. 90.65
PR. INV. 89.60
PR. INV. 89.90
PR. INV. 89.34
PR. INV. 89.69
PR. INV. 88.28
PR. INV. 88.78
PR. INV. 89.24
PR. INV. 89.35

SAN OBV. 89.04
STM INV. 89.35
SAN OBV. 90.10
STM INV. 90.60

EX. N INV. 91.75
EX. W INV. 91.39
EX. E INV. 91.21
EX. W INV. 92.89
EX. E INV. 92.58
EX. S INV. 93.66
EX. N INV. 93.68
EX. S INV. 92.85
EX. N INV. 92.88
EX. S INV. 94.35
EX. N INV. 94.39
EX. S INV. 94.11
EX. N INV. 94.05
EX. N INV. 93.47
EX. S INV. 93.54
EX. W INV. 93.30
EX. N INV. 94.00
EX. E INV. 93.88
EX. W INV. 94.02
EX. W INV. 90.02
EX. E INV. 89.96
EX. W INV. 89.95
EX. E INV. 89.93
EX. N INV. 87.93
EX. E INV. 87.91
EX. W INV. 87.87
EX. N INV. 88.76
EX. N INV. 89.88
EX. E INV. 87.42
EX. W INV. 87.71
EX. W INV. 87.73
EX. N INV. 87.46
EX. E INV. 88.43
EX. W INV. 87.33
EX. N INV. 87.33
EX. S INV. 87.31
EX. W INV. 89.00
EX. E INV. 87.70
EX. W INV. 88.87
EX. E INV. 88.43
EX. N INV. 88.55
EX. E INV. 89.39
EX. W INV. 88.23
EX. W INV. 88.55
EX. S INV. 89.39
EX. S INV. 89.30
EX. W INV. 89.31
EX. S INV. 92.94

LAWSON ST.

REYNOLDS STREET

ALLAN STREET

GALT AVE.

LEGEND

- EX.900mmø — EXISTING STORM SEWER
- EX.200mmø — EXISTING SANITARY SEWER
- EX.600mmø — EXISTING WATERMAIN
- PROPOSED STORM SEWER AND MANHOLE (WITH FLOW DIRECTION)
- PROPOSED STORM SEWER SUPERPIPE
- PROPOSED SANITARY SEWER AND MANHOLE (WITH FLOW DIRECTION)
- 300mmø — PROPOSED WATERMAIN
- VC — FIRE HYDRANT
- WATER SERVICE CONNECTION
- PROPOSED SWALE
- MAJOR OVERLAND FLOW
- EMERGENCY OVERLAND FLOW

FORMER OAKVILLE-TRAFALGAR MEMORIAL HOSPITAL LANDS

GHD

PRELIMINARY SERVICING PLAN

Job Number 11148742
Revision 4
Date Feb.13, 2018

Figure 5

705 Millcree Dri e, Unit 1, Mississa ga Ontario L5N 5M4 T 1 41 213 7121 F 1 41 890 8499 E in o g dcanada.com W www.g d.com

Scale 1:1000

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In order to adequately service, the two medium density residential blocks along the new subdivision road, the following design scenarios were carefully evaluated:

- Direct flows along the new subdivision road in the southerly and easterly directions to the existing **Allan Street** sanitary sewer.
- Direct flows along the new subdivision road in the northerly direction then in the westerly direction through an easement within the park block to the existing **Reynolds Street** sanitary sewer.
- Direct flows along the new subdivision road in the southerly direction then in the southwesterly direction through an easement in the Community Centre site to the existing **Lawson Street** sanitary sewer.

After the review of the above design scenarios, the following was determined:

- Draining both the medium density blocks to either the Allan Street or Reynolds Street sanitary sewers would be redirecting existing condition flows from the Lawson Street sanitary sewer and require additional capacity approval from the Region.
- The elevation of the existing Allan Street sanitary sewer was too high to provide gravity drainage and frost protection for the sanitary sewer along the new subdivision road.
- The elevation of the existing Reynolds Street sanitary sewer may provide enough depth within the subdivision road to adequately drain basements from the medium density block to the north (assuming steps to the ground floor), however, would not drain basements from the block to the south.
- Based on the grading design of the new subdivision road and the elevation of the Lawson Street sanitary sewer, adequate depth could be provided to provide gravity drainage for future basements within the medium density blocks and keep the demands within the Lawson Street sanitary sewer system.

After reviewing the findings and considering the need for the medium density freehold individual connections, it was determined that a new municipal sanitary sewer located within the new subdivision road, through a future easement between Community Centre and the existing parking facility, outletting to the Lawson Street connection would be the best solution.

Therefore, the preliminary sanitary servicing strategy can be shown on the Preliminary Servicing Plan on **Figure 6** and summarized as follows:

- Individual 125 mm dia. sanitary service connections for the low-density residential units to the MacDonald Road and Allan Street sanitary sewers (Note: based on the shallow elevation of the municipal sanitary sewers, proposed basement elevations must be carefully reviewed for adequate gravity drainage).
- Individual 125 mm dia. sanitary service connections for the medium-density freehold residential blocks which will connect to proposed 200 mm dia sanitary sewer on the new subdivision road, conveyed through the easement between the Community Centre and existing parking garage to the Lawson Street connection.

- A separate 200 mm dia. sanitary service to the Community Centre connected direct to the existing Lawson Street sanitary sewer through the existing sanitary service.
- A new minimum 150 mm dia. sanitary service to the Seniors Facility connected to the Reynolds Street sanitary sewer, and allowances for two medium density blocks with separate new sanitary services each connected to the Reynolds Street and Allan Street sanitary sewers.

After reviewing proposed demands and using the Region of Halton design criteria, the following demands were calculated to compare against the Lawson Street sanitary sewer systems:

- 2.47 L/s peak sanitary flow to Lawson Street sanitary sewer.

Proposed demand along MacDonald Road, Allan Street and Reynolds Street sanitary sewer systems are:

- 0.97 L/s peak sanitary flow to MacDonald Road sanitary sewer.
- 2.19 L/s peak sanitary flow to Allan Street sanitary sewer.
- 1.42 L/s peak sanitary flow to Reynolds Street sanitary sewer.

MACDONALD ROAD

EX.200mmø SAN

EX. S INV. 93.66 EX. N INV. 93.68

EX. S INV. 94.35 EX. N INV. 94.39

EX. S INV. 94.11

EX. W INV. 92.88 EX. E INV. 92.58

EX. N INV. 94.00
EX. E INV. 93.88
EX. W INV. 94.02

0.46
21
LOW-DENSITY RESIDENTIAL

0.47
21
LOW-DENSITY RESIDENTIAL

NEW SUBDIVISION ROAD

0.31
31
MEDIUM-DENSITY RESIDENTIAL

0.57
25
LOW-DENSITY RESIDENTIAL

0.56
0
PARK

MEDIUM-DENSITY RESIDENTIAL
0.30
30

PROPOSED COMMUNITY CENTRE
1.04
17

EX. W INV. 89.95 EX. E INV. 89.65

PR. INV. 89.34 PR. INV. 89.69

SAN OBV. 90.10

SAN OBV. 89.04

EX. 300mmø SAN

EX. N INV. 87.93
EX. E INV. 87.91
EX. W INV. 87.87

EX. 300mmø SAN SAN @ 1.0%

PR. INV. 88.28

0.62
0
EX. PARKING GARAGE

GALT AVE.

/SON ST.

SENIORS-ORIENTED HOUSING

REYNOLDS STREET

EX.200mmø SAN

0.67
27

0.71
27

GALLAN STREET

EX. N INV. 90.64
EX. S INV. 90.34

0.30
0

LEGEND:

0.45
25
AREA IN HECTARES
POPULATION

200mmø SAN
MANHOLE (WITH FLOW DIRECTION)
PROPOSED SANITARY SEWER AND

EX.200mmø SAN
EXISTING SANITARY SEWER

DRAINAGE AREA BOUNDARY

SANITARY FLOW DIRECTION

0 10 20 30 40 50m

SCALE 1:1000 AT ORIGINAL SIZE

FORMER OAKVILLE-TRAFALGAR MEMORIAL HOSPITAL LANDS

GHD

POST-DEVELOPMENT SANITARY DRAINAGE PLAN

Job Number 11148742
Revision 0
Date Dec.11, 2017
Figure

705 Millcree Dri e, Unit 1, Mississa ga Ontario L5N 5M4 T 1 41 213 7121 F 1 41 890 8499 E in o g dcanada.com W www.g d.com

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Therefore, based on the completed sanitary calculations, an overall theoretical post-development decrease of 8.35 L/s is shown to the Lawson Street sanitary sewers respectively. The sanitary flow calculations can be found in **Appendix C**.

After discussions with Region of Halton staff it was confirmed that all post-development increases on the municipal system must be reviewed in terms of the available capacity in the municipal sanitary system. This includes the minor additional load from the low-density residential units on the MacDonald Road and Allan Street sanitary sewers. GHD staff then initiated a downstream sanitary sewer capacity analysis to review the possible impact on the municipal system.

Downstream Sanitary Capacity Analysis

In order to complete the downstream sanitary capacity analysis, spreadsheets were set up with separate data for each of the four legs of the municipal sanitary sewer system. Using Region of Halton record drawings, the pipe diameters and slopes were input into the spreadsheets in between each manhole location. The Region design criteria were utilized (July 2017) to determine the flows, population and infiltration rates. GHD also completed a site visit in January 2018 to confirm existing developments for the analysis. Each analysis incorporated external flows and terminated at the 450 mm dia. trunk sewer connection point as confirmed with Region staff.

The findings from the analysis showed that all the post-development flows were well below the available capacity of the sewer, where the used capacity at the most critical point summarized as follows in **Table 1**:

Table 1 Downstream Sanitary Sewer Analysis Results

Leg	Description	Used Capacity (%)
Oakville Southwest WWTP Catchment:		
1	Lawson Street to Trafalgar Road	12%
2	MacDonald Road to Reynolds Street	28%
Oakville Southeast WWTP Catchment:		
3	Allan Street to Palmer Avenue	16%
4	MacDonald Road to Douglas Avenue	31%

Refer to **Appendix C** for the downstream sanitary capacity calculations.

4. Water Distribution System

Existing Conditions

The Site is located within the Region of Halton's Pressure Zone OB1. Record plan and profile drawings and operating maps provided by Region of Halton show the following existing watermains surrounding the Site:

- 300 mm dia. watermain on Macdonald Road.
- 200 mm dia. watermain on Allan Street.
- 300 mm dia. watermain on Reynolds Street.
- 900 mm dia. transmission main on Allan Street.

Through discussions with Region of Halton staff, it was confirmed that the existing 900 mm dia. transmission main on Allan Street is not be considered for future development connections in this area.

Hydrant Flow Tests

In order to verify existing flows and pressures of the surrounding water distribution system, hydrant flow tests were conducted at the following locations:

- Hydrants #18481 and #7739 located on Reynolds Street north of Lawson Street.
- Hydrants #7782 and #7781 located on Allan Street south of MacDonald Road.

The hydrant flow tests were performed by Corix Water Services on November 23, 2017 with good results showing static pressures in the range of 60 psi (415 kPa) and substantial flows with both ports open in the range of 1500 USGPM (95 L/s) with minimal pressure loss. Refer to **Appendix D** for the hydrant flow test results.

Proposed Conditions

Based on the Town's development concept, the water servicing requirements were identified:

- Individual water service connections to the existing MacDonald Road and Allan Street watermains for each low-density residential unit.
- Individual water service connections to service the two medium density freehold residential blocks from the new municipal watermain along the new subdivision road.
- Separate water (fire and domestic) service for the Community Centre connected direct to the existing municipal watermain (separate from the subdivision works).
- Maintain water servicing to the existing parking facility (if required).
- New water service to the Seniors Facility.

At the time of preparing this report, it was assumed that water servicing for the park blocks and landscaped areas would not be required.

The proposed domestic water servicing demands were calculated using Region of Halton design criteria for each development type where the results are summarized in **Table 2** below:

Table 2 Proposed Domestic Water Demands

	Area (ha)	Population	Average Day		Maximum Day		Peak Hour	
			Flows (L/d)	Flows (L/s)	Flows (L/d)	Flows (L/s)	Flows (L/d)	Flows (L/s)
Residential-Houses	1.5	83	22,688	0.3	51,047	0.6	90,750	1.1
Medium DensityTownhouses	0.61	82	22,646	0.3	50,954	0.6	90,585	1.0
Community Centre	1	44	12,100	0.1	27,225	0.3	27,225	0.3
Senior Resd. (Medium Density)	1.38	186	51,233	0.6	115,273	1.3	115,273	1.3

To review the worst case fire flow demand scenario, the required fire protection for the proposed Community Centre was calculated using the Fire Underwriters Survey and the following assumptions:

- Two storeys with total GFA of 4,900 m^2, (Ground Floor 3,800 m^2, Second Floor 1,100 m^2).
- Sprinkler protection is provided.
- Non-combustible construction.
- Vertical openings and exterior vertical communications are properly protected.
- Closest spacing to adjacent building (parking garage) is 9 m.

Based on the above assumptions the required fire flow for the Community Centre is calculated to be in the range of 150 L/s within minimum required pressure of 20 psi (140 kPa). Please refer to **Appendix D** for the fire flow calculations.

After reviewing the proposed domestic demands and worst case fire flow protection requirements of 150.3 L/s (maximum day demand plus fire flow), against the hydrant flow test results, it is believed that the existing municipal system has sufficient capacity to convey the required 150.3 L/s while maintaining the required residual pressure of 20 psi (140 kPa).

Therefore, the preliminary water servicing strategy can be shown on the Preliminary Servicing Plan on **Figure 5** and summarized as follows:

- Individual 25 mm dia. water service connections for the low-density residential units to the MacDonald Road and Allan Street watermains.
- A new 200 mm dia. watermain along the new subdivision road connected to the MacDonald Road and Allan Street.
- Individual 25 mm dia. water service connections medium density freehold residential blocks connected to the new 200 mm dia. watermain in the new subdivision road.
- A separate 200 mm dia. water service for the Community Centre connected direct to the existing 300 mm dia. watermain on Reynolds Street.
- A new 200 mm dia. water service to the Seniors Facility connected to the existing 300 mm dia. watermain on Reynolds Street and allowance for two possible medium density blocks with separate water services connected to the Reynolds Street and Allan Street watermain.

5. Storm Drainage

Existing Conditions

The Site is located within the Sixteen Mile Creek watershed, where record plan and profile drawings and GIS information provided by the Town of Oakville show the following existing surrounding municipal storm sewers:

- 525 mm dia. storm sewer on MacDonald Road in the westerly direction to Reynolds Street.
- 975 mm dia. to 1,050 mm dia. storm sewers on Reynolds Street flowing in the southerly and 675 mm dia. northerly directions to the Lawson Street 1,200 mm dia. storm sewer which flows in the westerly direction.
- No existing storm sewer along Allan Street in the vicinity of the Site.
- 450 mm dia. storm sewer on Lawson Street flowing in the westerly direction.
- 1,200 mm dia. trunk storm sewer within an easement along the south side of the existing parking garage flowing in the westerly direction through Lawson Street.

Through additional review of background drawings of the Site and topographic surveys, it was confirmed that there are two existing private storm sewer connection at the Reynolds Street and Lawson Street intersection that connect to the existing 450 mm dia. storm sewer along Lawson Street.

External Drainage

Through discussions with Town staff is currently undertaking an update to the Town's Master Drainage Plan with their consultant (Wood PLC). As part of this undertaking, it was identified that there is a large external drainage area of approx. 5.0 ha to the north and east of the Site that needed to be addressed. Based on the currently modelling it shows a major overland flow in the range of 2.8 m^3/s during a Regional Storm event possibly entering the Site. Therefore, based on the proposed grading design this emergency overland flow route would be located on the south side of the existing parking garage flowing in the westerly direction, outletting at the Reynolds Street and Lawson Street intersection. GHD staff utilized the 2.8 m^3/s flow rate provided by Wood PLC, and based on existing topography along the south side of the parking garage conservatively assumed an available width of 9.0 m and 0.6 percent slope for the emergency swale. The emergency swale design requirements are noted on the Preliminary Grading Plan on **Figure 4** and the cross-section details are provided in **Appendix E**.

Proposed Conditions

Further to the proposed grading details outlined within the Grading Section of this report, the following minor and major storm drainage requirements were identified and shown on the Preliminary Servicing Plan on **Figure 5**:

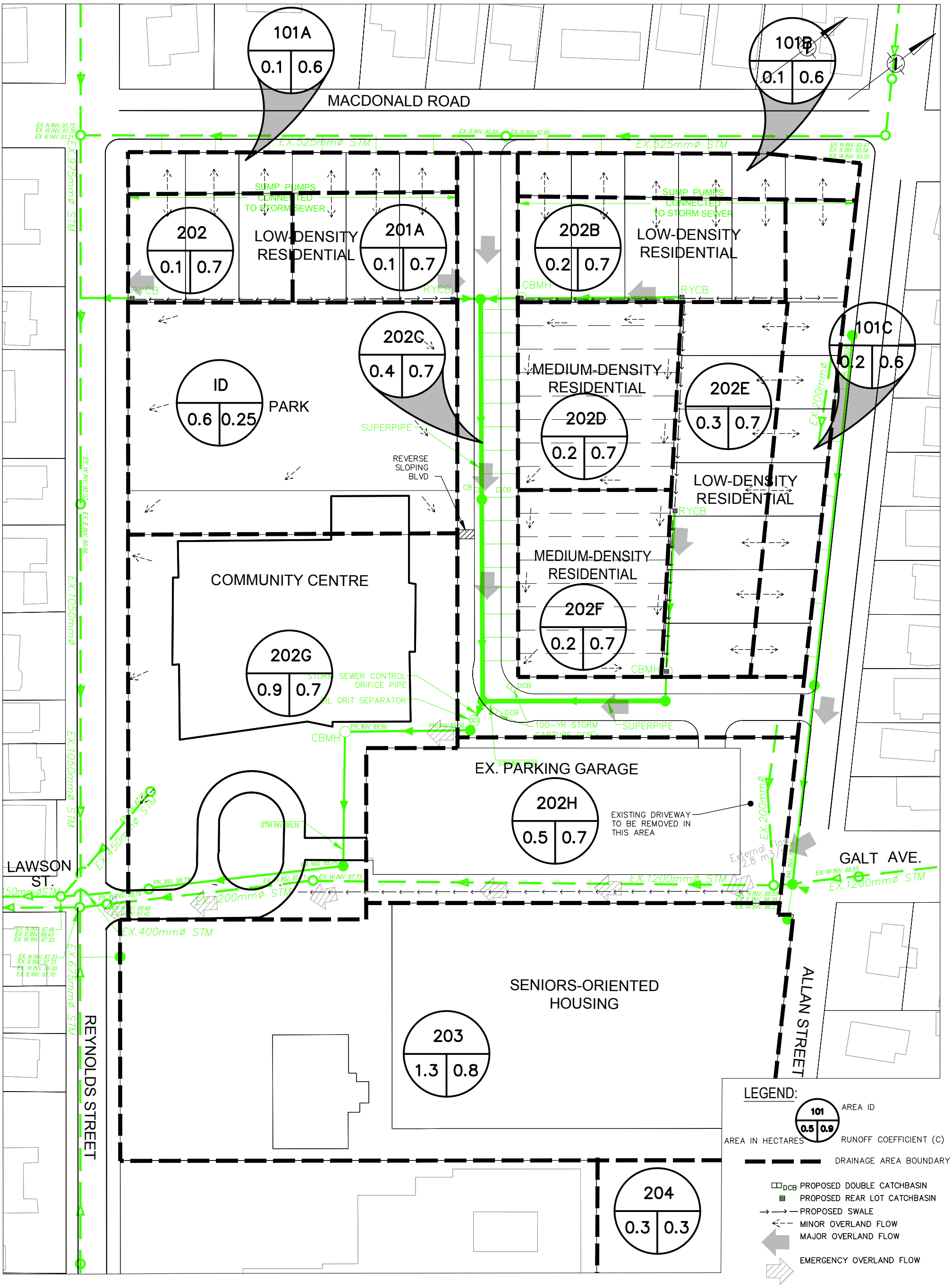
- Individual storm connections for the low-density residential lots to the existing MacDonald Road and Allan Street storm sewers (where possible).
- Rear yard catchbasins for the low-density residential lots with 100-year capture design.

- Storm sewer design within the new subdivision road to capture and convey the 100-year storm event.
- Proposed 300 mm dia. Storm sewer on Allan Street for foundation drain collection which will connect to the existing 1,200 mm dia. trunk sewer located at Allan Street and Galt Avenue.
- Individual storm connections to the two medium density freehold blocks connecting (assuming basement requirements) to the new storm sewer in the new subdivision road.
- Separate storm service connection for the Community Centre (and park block) connect direct to the existing storm sewer system on Lawson Street (separate from the subdivision works).
- New storm service for the Seniors Facility direct to the existing storm sewer system on Lawson Street and allowance for separate storm service for a possible medium density block connected to the existing 1,200 mm dia. trunk sewer on the south side of the existing parking garage.
- Emergency overland flow route from the low point at the bend in the new subdivision road between the Community Centre and existing parking facility flowing in westerly direction to Reynolds Street.
- Emergency overland flow route across the south side of the existing parking facility flowing in the westerly direction to Reynolds Street.
- Landscaped areas drainage via overland flow and swales generally in the easterly direction to Allan Street.

Based on the preliminary grading and servicing design, all of the required minor and major storm requirements can be accommodated with the following points to be noted:

- Community Centre and corresponding park storm system (designed by Town's consultant MTE) are to be designed with stormwater management quantity controls to ensure pre-development flow rates and capacity of the existing storm service to the Lawson Street sewer are not exceeded.
- Subdivision storm sewer system (superpipe) sizing to be confirmed at time of detailed design where superpipe design shall not exceed pre-development flow rates nor the capacity of the existing storm service connected to the Lawson Street storm sewer.
- Some sump pumps would be required for the individual low-density residential units with basements along MacDonald Road and Allan Street based on the shallow depth (or availability) of the existing storm sewers.
- The emergency overland flow swale required on the south side of the parking garage should be protected with an easement should there be a severance/transfer of land in the area.

The required stormwater management quantity and quality measures are discussed in the next section of the report.



0 10 20 30 40 50m

SCALE 1:1000 AT ORIGINAL SIZE

N

FORMER OAKVILLE-TRAFALGAR MEMORIAL HOSPITAL LANDS

GHD

POST -DEVELOPMENT STORM DRAINAGE PLAN

Job Number 11148742
Revision 1
Date Nov 30, 2017
Figure 7

705 Millcreek Drive, Unit 1, Mississauga Ontario L5N 5M4 T 1 416 213 7121 F 1 416 890 8499 E info@gdcanada.com W www.gdc.com

Scale 1:1000

Plot Date: 14 February 2018 - 8:37 AM Plotted by: Praja Pati

Cad File No: N:\CA\Mississauga\Projects\111\11148742\CADD\Drawings\11148742-Post Development Drainage Plan.dwg

6. Stormwater Management

6.1 Stormwater Quality Control

Based on the Town's development concept and the preliminary storm drainage strategy, the following stormwater (SWM) quality controls are recommended:

- Oil and Grit separator be provided at the storm outlet for the Community Centre (and corresponding park block), the low point within the new sub-division road and Seniors Facility site (or medium density blocks) located to the south.
- Bioswales for landscaped areas.
- Lot level controls for residential units for roof leaders outletting to splash pads, etc.
- Best Management Practices (BMP) and Low Impact Development (LID) measures.

6.2 Stormwater Quantity Control

The Town of Oakville's primary design criteria for the required SWM Quantity controls for redevelopment applications outlines:

- Post-development runoff shall not exceed pre-development runoff for all rainfall events up to and including the 100-year storm event.

Pre-Development Drainage

As shown in the Existing Conditions Drainage Plan in **Figure 3**, there are four main drainage areas with separate outlet locations from the Site. Pre-development runoff rates were calculated for the 2-year, 5-year, 10-year, 25-year, 50-year, and 100-year storm rainfall events for all the catchment areas using the Rational Method and the Town of Oakville storm intensity parameters. The pre-development storm runoff flow rates are summarized in **Table 3** below:

Table 3 Pre-Development Flow Rates

Description	Area (ha)	ID No.	Pre-Development Flow Rates (L/s)					
			2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
MacDonald/Allan (north)	0.51	101	77.3	107.4	126.7	152.5	171.2	188.8
Lawson Street	3.60	102	683.5	949.9	1121.0	1348.7	1514.1	1670.0
Reynolds Street	1.30	103	243.6	338.6	399.6	480.8	539.7	595.3
Allan Street (south)	0.30	104	27.0	37.5	44.2	53.2	59.7	65.9

Post-Development Drainage

As shown in the Post-Development Drainage Plan in **Figure 7**, the same four main drainage areas and outlets are generally maintained with the preliminary storm servicing strategy for the Site. Similar to the pre-development runoff calculations, post-development runoff rates were calculated

for the 2-year, 5-year, 10-year, 25-year, 50-year and 100-year storm rainfall events summarized in **Table 4** below:

Table 4 Post-Development Flow Rates

Description	Area (ha)	ID No.	Post-Development Flow Rates (L/s)					
			2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
MacDonald/Allan (north)	0.43	201	57.4	79.8	94.2	113.3	127.2	140.3
Lawson Street	3.50	202	525.5	730.3	861.9	1036.9	1164.1	1284.0
Reynolds Street	1.4	203	226.1	314.2	370.8	446.1	500.8	552.3
Allan Street (south)	0.30	204	16	22.2	26.2	31.5	35.3	39

* Discrepancies is Area 202 is due to small portion of 0.1 ha goes to Reynolds Street

Based on the results, it can be concluded that there is a net overall decrease in the amount of post-development runoff from the Site in the range of 7 percent to 41 percent due to the increased perviousness within the proposed redevelopment concept.

In order to ensure pre-development flow rates are not exceeded, the following SWM quantity controls are recommended:

- Rear yard catchbasins for the low-density residential lots with 100-year storm capture design.
- Community Centre and park storm drainage (designed by Town's consultant MTE) where the SWM controls are to ensure pre-development flow rates and the capacity of the existing storm service to Lawson Street sewer are both not exceeded.
- Subdivision storm sewer system (superpipe) to be sized for 100-year storm capture to mitigate overland flow through the Community Centre site, and controlled to ensure pre-development flow rates and the capacity of the existing storm service to the Lawson Street sewer are not exceeded.
- Medium density block storm drainage to be designed uncontrolled in accordance to the allowances within the new subdivision 100-year superpipe design.
- Senior Facility site (or medium density blocks) storm drainage to ensure post-development runoff does not exceed pre-development runoff for all storm events.

7. Erosion & Sediment Control

Sediment and erosion control measures will need to be implemented to minimize soil erosion and sediment migration to the adjacent lands and surrounding municipal streets, which will include but not be limited to the following:

- Sediment control fence are to be installed prior to commencement of grading works.
- The sediment control fencing shall be installed around all construction areas, and around the perimeter of all temporary topsoil stockpiles.
- Silt fences will be inspected routinely and after storm events. Sediment shall be removed once its depth reaches half of the design depth.
- Silt sacks are to be installed at catchbasins and catchbasin manholes upon completion of servicing.
- Catchbasin buffer controls are to be provided as servicing commences.
- Mud mats will be installed at construction entrance for vehicle tracking control and to prevent the transport of sediment onto the municipal streets.
- Temporary drainage swales are to be created with temporary rock check dams.
- The rock check dams will be placed perpendicular to the flow in the temporary swales to reduce runoff velocities with the accumulation of sedimentation.
- Native grass mixes with topsoil will be used to stabilize the disturbed grassed areas upon grading completion.

8. Utilities

Discussions are ongoing with Hydro One Oakville staff regarding the proposed demand from the redevelopment of the Site. Any external upgrades to the existing hydro or other utilities are to be determined over the course of the application.

A street light design shall be prepared for the new subdivision road which shall include poles with utility cabinets and fixtures with LED lamps per the Town of Oakville standards. Also, a lighting assessment shall also apply to MacDonald Road and Allan Street to determine the need for any additional lighting to meet current photometric requirements.

9. Tree Assessment

As part of the development application process within the Town of Oakville, all existing trees must be accurately assessed and reviewed in in terms of their condition and possible retention through the design. After the review of record drawings, topographic surveys, GIS information, background arborist reports, and site visits completed by GHD staff, the location and type of each tree were recorded and mapped. Based on the preliminary grading and servicing design completed by GHD, each tree was then reviewed and assessed by certified ISA Ontario Arborist J-P Fleras, with the findings shown on the figures located in **Appendix E**.

10. Conclusions

Based on the findings of this report, we believe the proposed development can be supported without negative impact to the surrounding existing developments. The key conclusions of this report can be summarized as follows:

- The proposed grading design can generally meet the existing topography of the subject lands and can be accommodated without any negative impact to the surrounding properties.
- The proposed grading design will require reconstruction of the existing boulevards along MacDonald Road and Allan Street including road improvements in order to meet the Town of Oakville's urban design standards.
- The proposed sanitary design can be adequately accommodated to the existing sanitary system from a capacity perspective and without any external improvements.
- The proposed water distribution design can be accommodated with the proposed connections to the existing watermains surrounding the property for adequate flow and pressure requirements without any external improvements.
- The proposed storm sewer design can be accommodated with the proposed storm connections to the existing storm sewers.
- Basement designs for the individual low-density residential units along MacDonald Road and Allan Street are to be carefully coordinated with the shallow municipal storm and sanitary sewers for gravity and/or sump pump servicing.
- Emergency overland flow from possible external drainage from the Allan Street and Galt Avenue intersection in the range of 2.8 m^3/s can be accommodated through a grassed swale within a 9 m wide easement along the south side of the parking garage to Reynolds Street.
- Emergency overland flow from possible spill from the new subdivision road must be provided between the Community Centre and existing parking structure within the 9 m width available and is to be coordinated with the Community Centre site plan grading design.
- All post-development storm runoff can meet pre-development rates with the recommended 100-year storm capture and control measures outlined in this report.
- Stormwater quality objective can be met through the use of oil grit separators, bioswales, lot level controls, BMP's and LID's.

All of Which is Respectfully Submitted,

GHD

LICENSED PROFESSIONAL ENGINEER
M. A. PARACHA
100162276
FEB 13/18
PROVINCE OF ONTARIO

Muhammad Afzal Paracha, P. Eng.
Project Engineer

LICENSED PROFESSIONAL ENGINEER
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90539925
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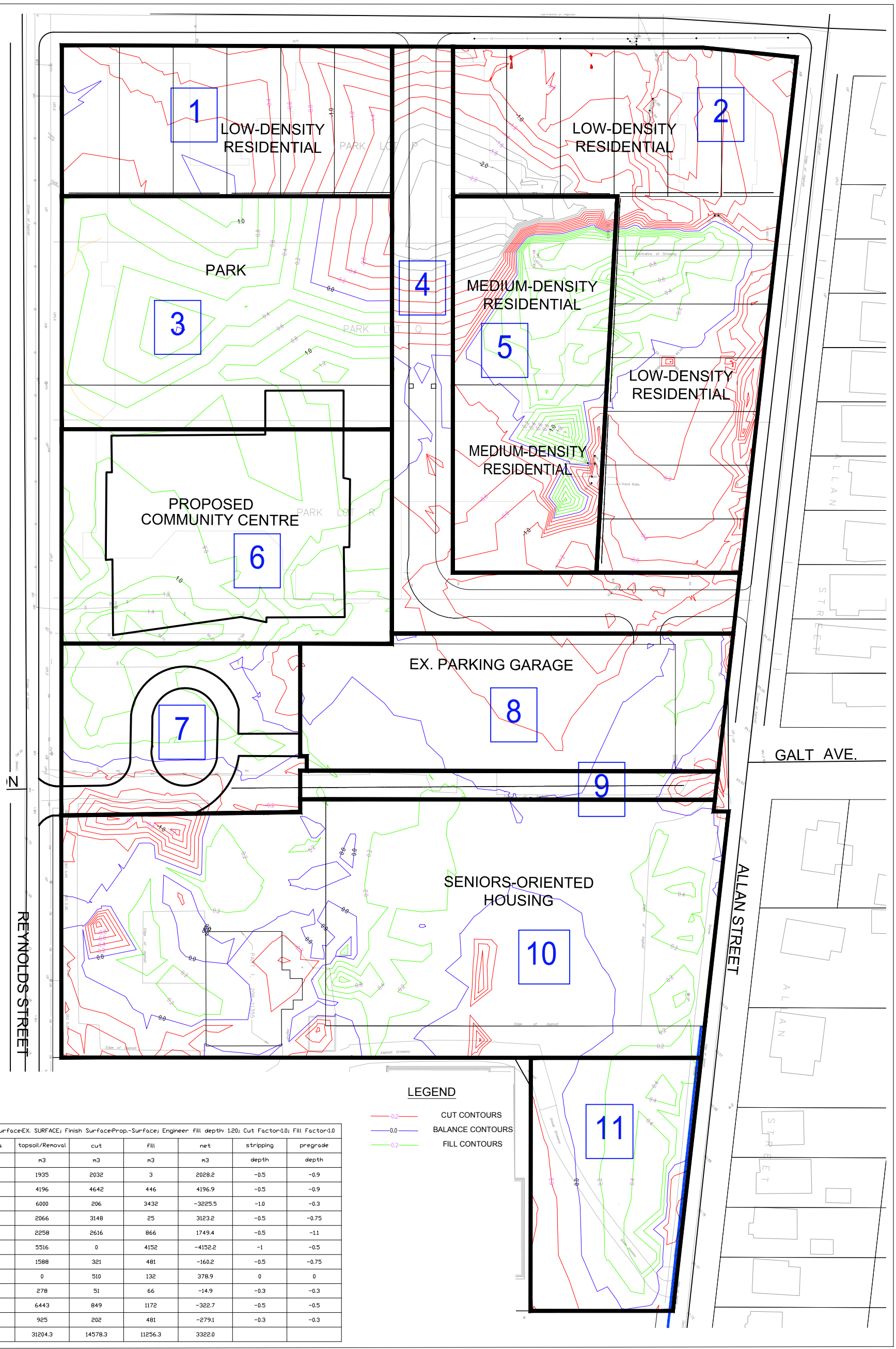
PROVINCE OF ONTARIO

Scott W. Passmore, P. Eng.
Project Director

Appendix A
Grading Background Information



Feb 02 2018 9.61AM; Base Surface:EX. SURFACE; Finish Surface:Prop.-Surface; Engineer fill depth: 1.20; Cut Factor:1.0; Fill Factor:1.0

Area#	tot_Area	topsoil/Removal	cut	fill	net	stripping	pregrade
ID	m2	m3	m3	m3	m3	depth	depth
1 LOW DENS	3870	1935	2032	3	2028.2	-0.5	-0.9
2 LOW DENS	8392	4196	4642	446	4196.9	-0.5	-0.9
3 PARK	6000	6000	206	3432	-3225.5	-1.0	-0.3
4 ROAD	4132	2066	3148	25	3123.2	-0.5	-0.75
5 MED DENS	4515	2258	2616	866	1749.4	-0.5	-1.1
6 COMM CENT	5516	5516	0	4152	-4152.2	-1	-0.5
7	3175	1588	321	481	-160.2	-0.5	-0.75
8 EX PARKING	4476	0	510	132	378.9	0	0
9 SWALE	927	278	51	66	-14.9	-0.3	-0.3
10 SENIOR HOUSE	12885	6443	849	1172	-322.7	-0.5	-0.5
11	3083	925	202	481	-279.1	-0.3	-0.3
totals:	56973	31204.3	14578.3	11256.3	3322.0		

FORMER OAKVILLE-TRAFALGAR MEMORIAL HOSPITAL LANDS

PRELIMINARY EARTHWORKS

Job Number 11148742
Revision 1
Date Nov 30, 2017
Figure EW

705 Millcree Drive, Unit 1, Mississauga Ontario L5N 5M4 T 1 41 213 7121 F 1 41 890 8499 E info gdcanada.com W www.gd.com

Plot Date: 2 Febr ar 2018 - 11:53 AM Plotted b P ra Praja ati

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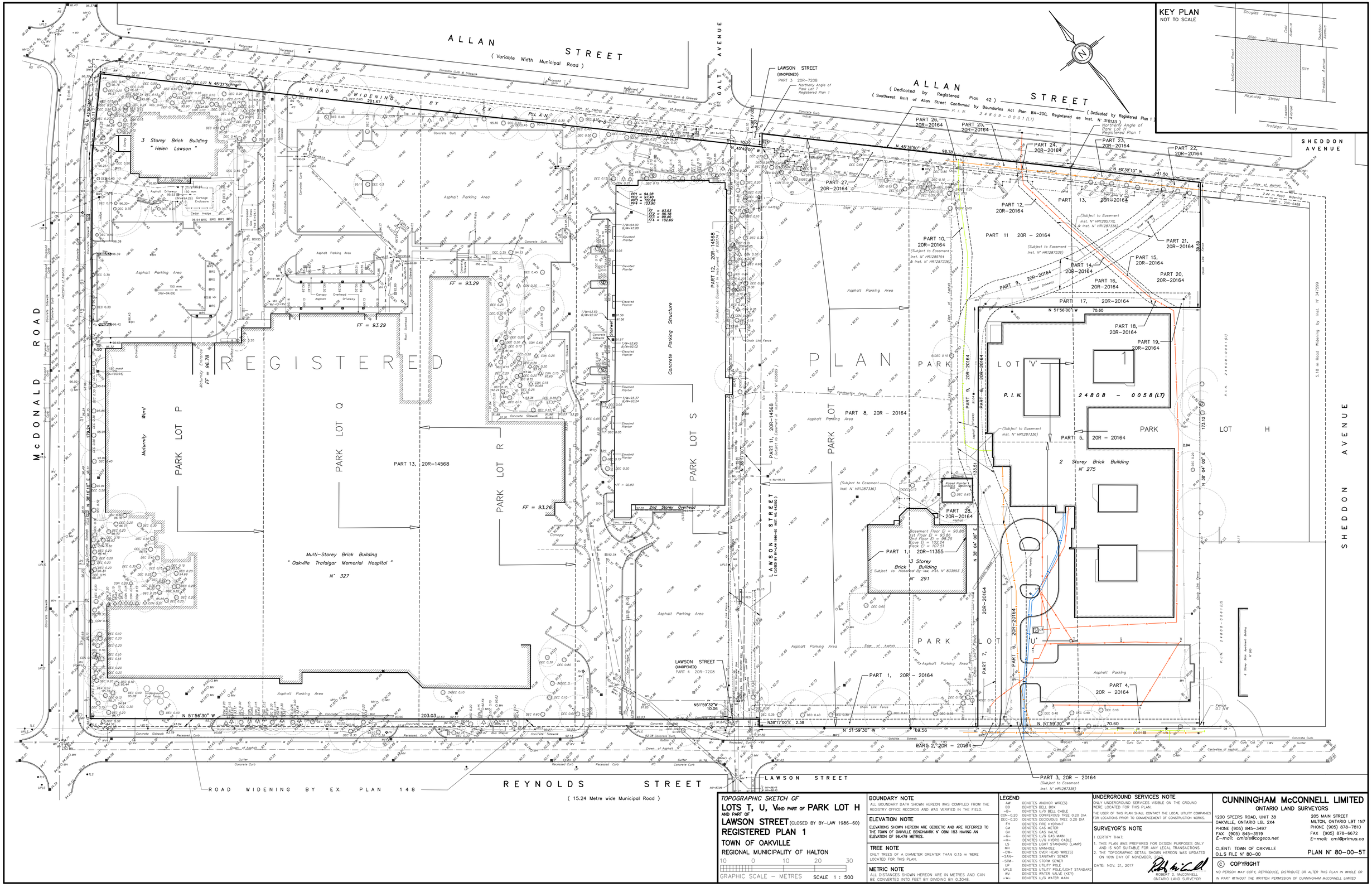
Scale 1:500



TOPOGRAPHIC SKETCH OF

LOTS T, U, V AND PART OF PARK LOT H AND PART OF LAWSON STREET (CLOSED BY BY-LAW 1986-60) REGISTERED PLAN 1

TOWN OF OAKVILLE

REGIONAL MUNICIPALITY OF HALTON

10 0 10 20 30

GRAPHIC SCALE – METRES SCALE 1 : 500

BOUNDARY NOTE

ALL BOUNDARY DATA SHOWN HEREON WAS COMPILED FROM THE REGISTRY OFFICE RECORDS AND WAS VERIFIED IN THE FIELD.

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO THE TOWN OF OAKVILLE BENCHMARK N° OBM 153 HAVING AN ELEVATION OF 96.479 METRES.

TREE NOTE

ONLY TREES OF A DIAMETER GREATER THAN 0.15 m WERE LOCATED FOR THIS PLAN.

METRIC NOTE

ALL DISTANCES SHOWN HEREON ARE IN METRES AND CAN BE CONVERTED INTO FEET BY DIVIDING BY 0.3048.

LEGEND

AW	DENOTES ANCHOR WIRE(S)
BB	DENOTES BELL BOX
–B–	DENOTES U/G BELL CABLE
CON–0.20	DENOTES CONIFEROUS TREE 0.20 DIA
DEC–0.20	DENOTES DECIDUOUS TREE 0.20 DIA
FH	DENOTES FIRE HYDRANT
GM	DENOTES GAS METER
GV	DENOTES GAS VALVE
–G–	DENOTES U/G GAS MAIN
–H–	DENOTES U/G HYDRO CABLE
LS	DENOTES LIGHT STANDARD (LAMP)
MH	DENOTES MANHOLE
–OW–	DENOTES OVER HEAD WIRE(S)
–SAN–	DENOTES SANITARY SEWER
–STM–	DENOTES STORM SEWER
UP	DENOTES UTILITY POLE
UPLS	DENOTES UTILITY POLE/LIGHT STANDARD
WV	DENOTES WATER VALVE (KEY)
–W–	DENOTES U/G WATER MAIN

UNDERGROUND SERVICES NOTE

ONLY UNDERGROUND SERVICES VISIBLE ON THE GROUND WERE LOCATED FOR THIS PLAN.

THE USER OF THIS PLAN SHALL CONTACT THE LOCAL UTILITY COMPANIES FOR LOCATIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS.

SURVEYOR'S NOTE

I CERTIFY THAT:

1. THIS PLAN WAS PREPARED FOR DESIGN PURPOSES ONLY AND IS NOT SUITABLE FOR ANY LEGAL TRANSACTIONS.
2. THE TOPOGRAPHIC DETAIL SHOWN HEREON WAS UPDATED ON 10th DAY OF NOVEMBER, 2017.

DATE: NOV. 21, 2017

ROBERT D. McCONNELL
ONTARIO LAND SURVEYOR

CUNNINGHAM McCONNELL LIMITED
ONTARIO LAND SURVEYORS

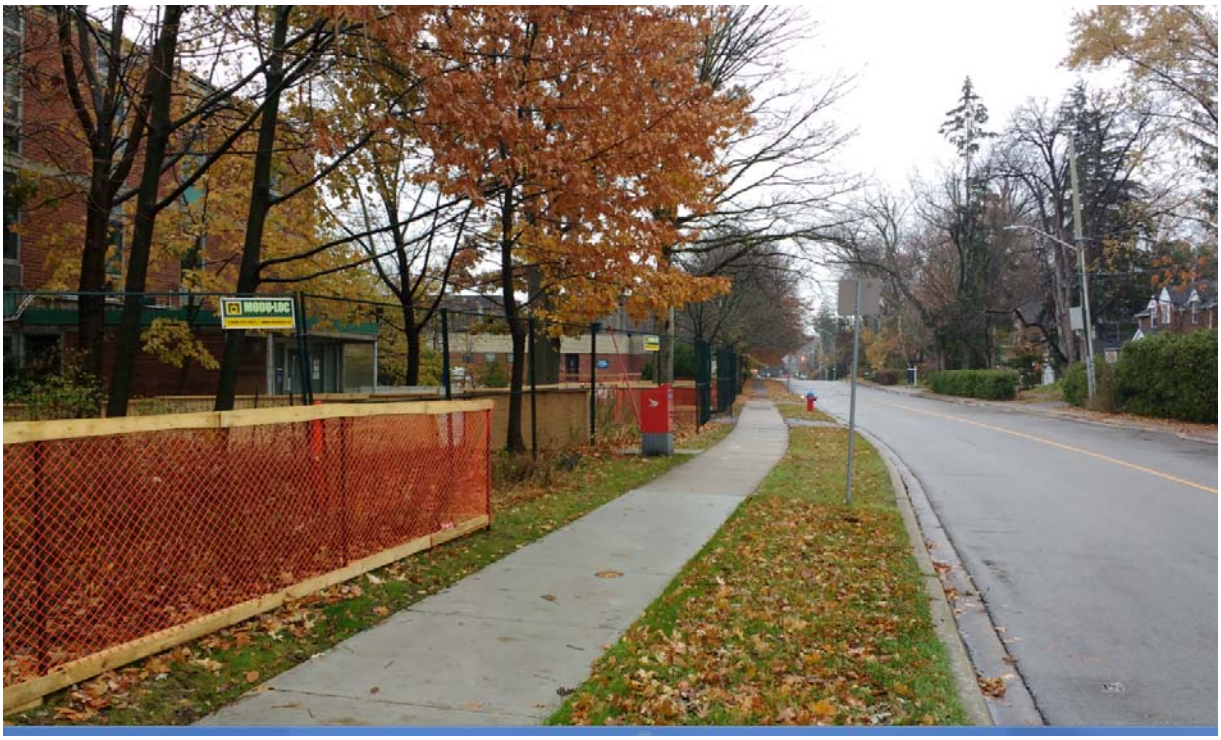
1200 SPEERS ROAD, UNIT 38
OAKVILLE, ONTARIO L6L 2X4
PHONE (905) 845-3497
FAX (905) 845-3519
E-mail: cmlols@cogeco.net

205 MAIN STREET
MILTON, ONTARIO L9T 1N7
PHONE (905) 878-7810
FAX (905) 878-6672
E-mail: cml@primus.ca

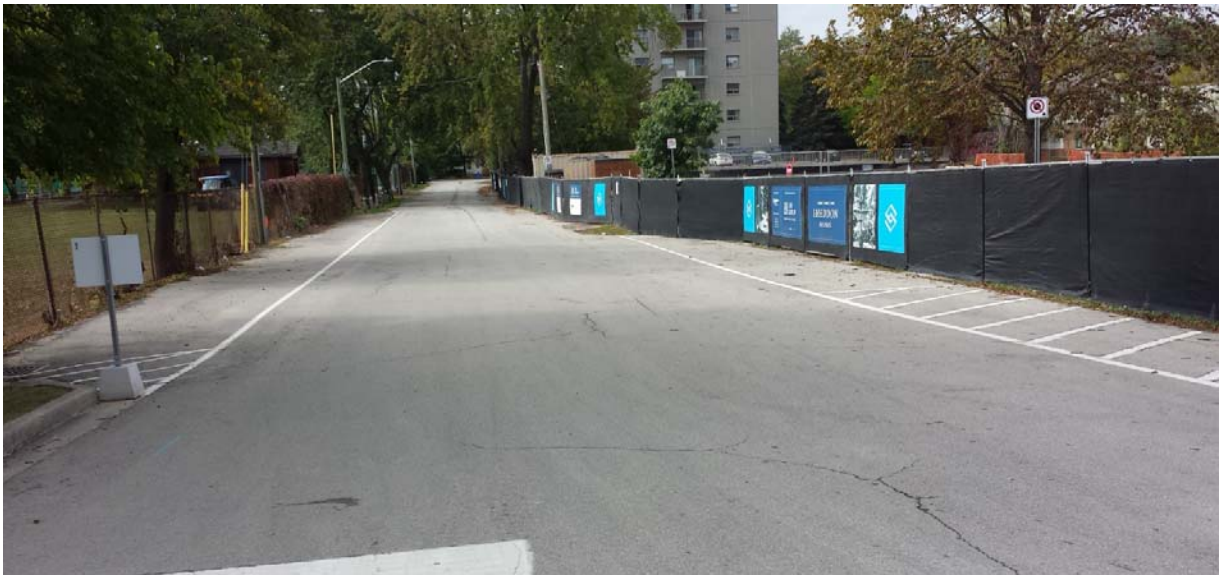
CLIENT: TOWN OF OAKVILLE
O.L.S FILE N° 80-00

PLAN N° 80-00-5T

Site Photos




DELSAN
GATE 1
DELSAN
CONSTRUCTION SITE
ENTRY ONLY

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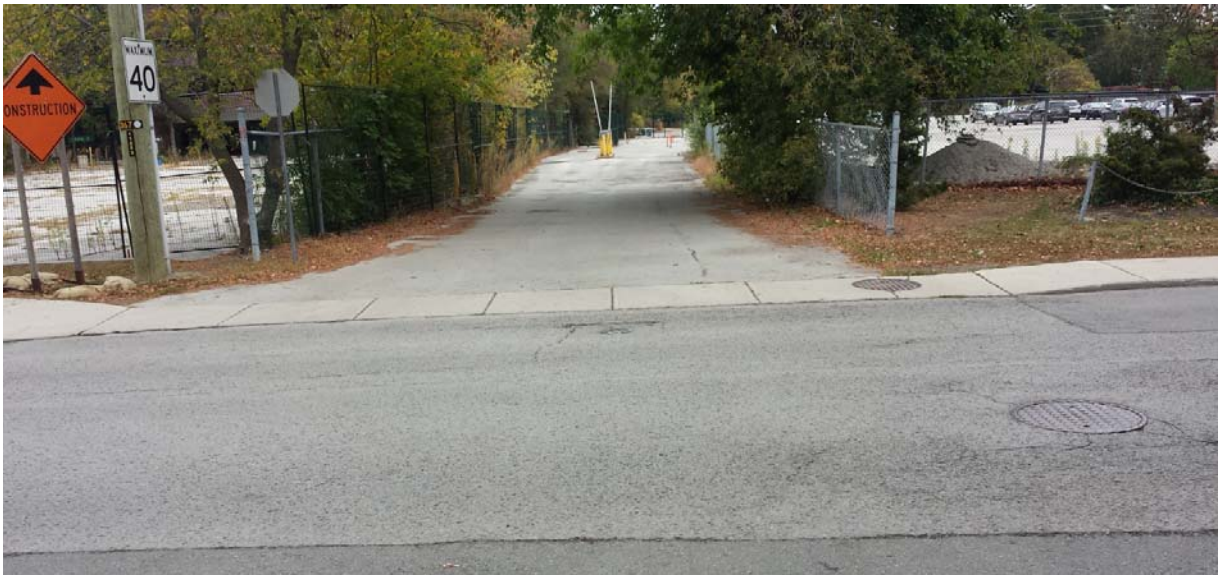
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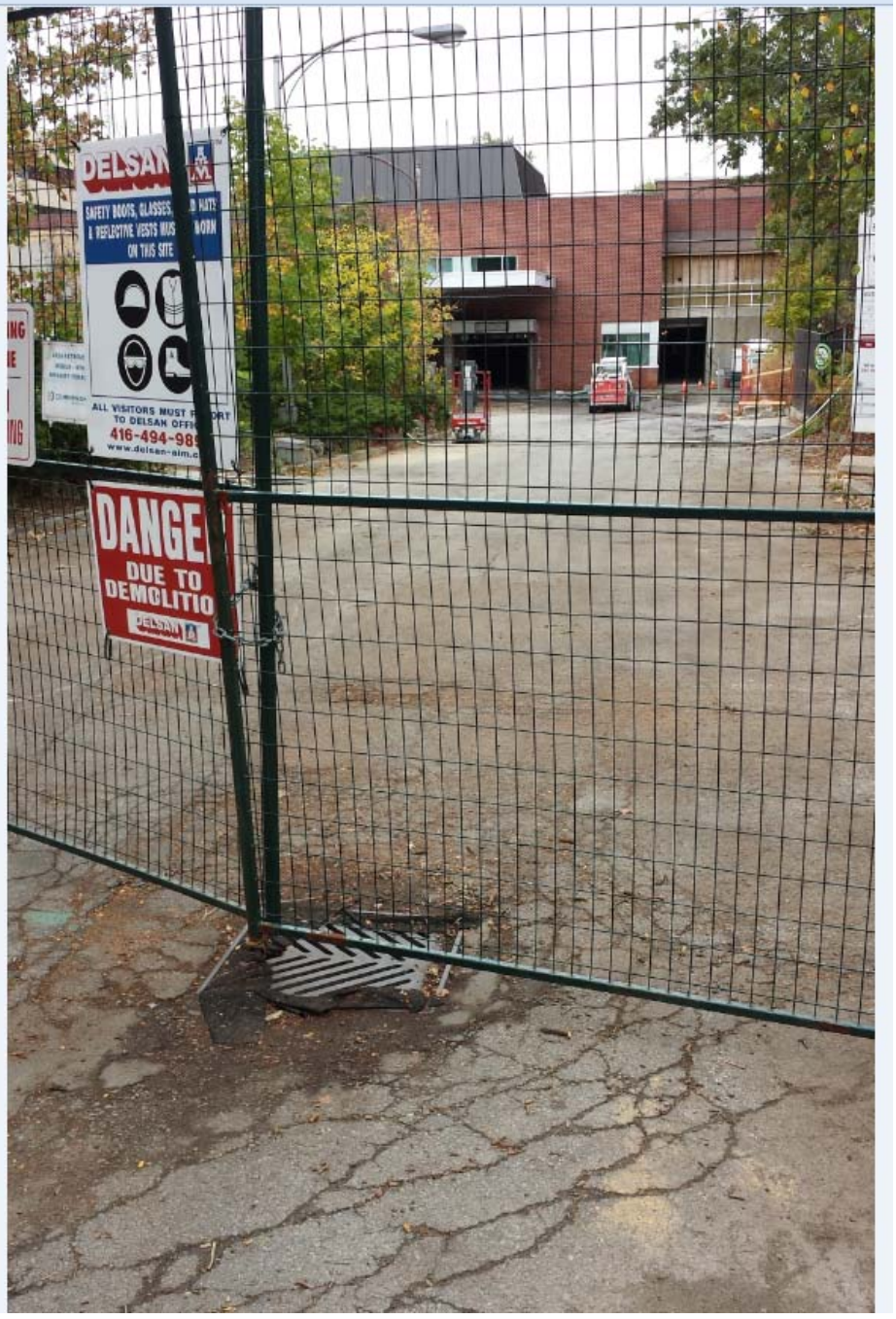
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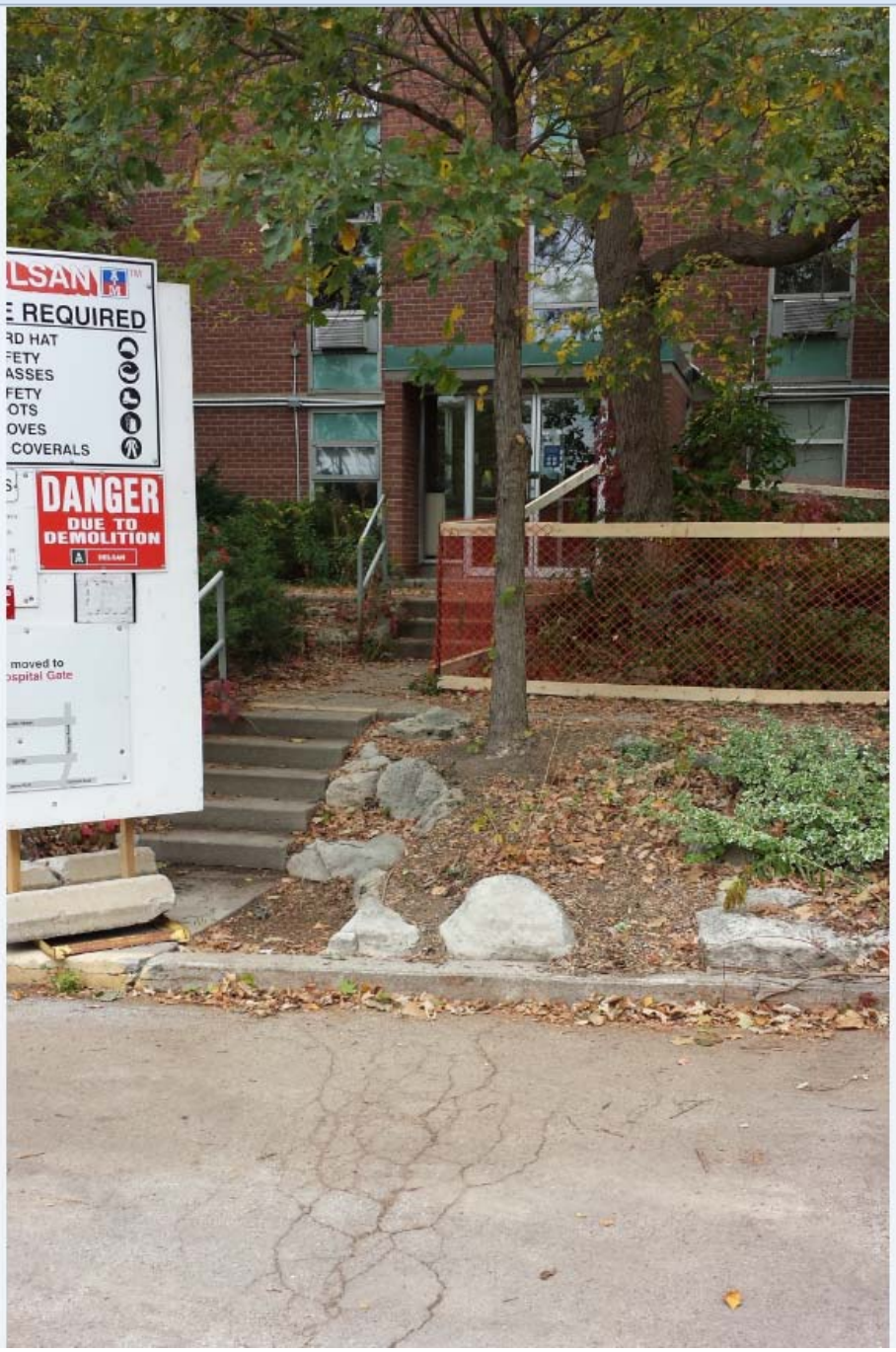
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DANGER
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DEMOLITION
moved to
ospital Gate


EMERGENCY
RESPONSE
ON-CALL
PHYSICIAN
PARKING


EMERGENCY
RESPONSE


REYNOLDS


40

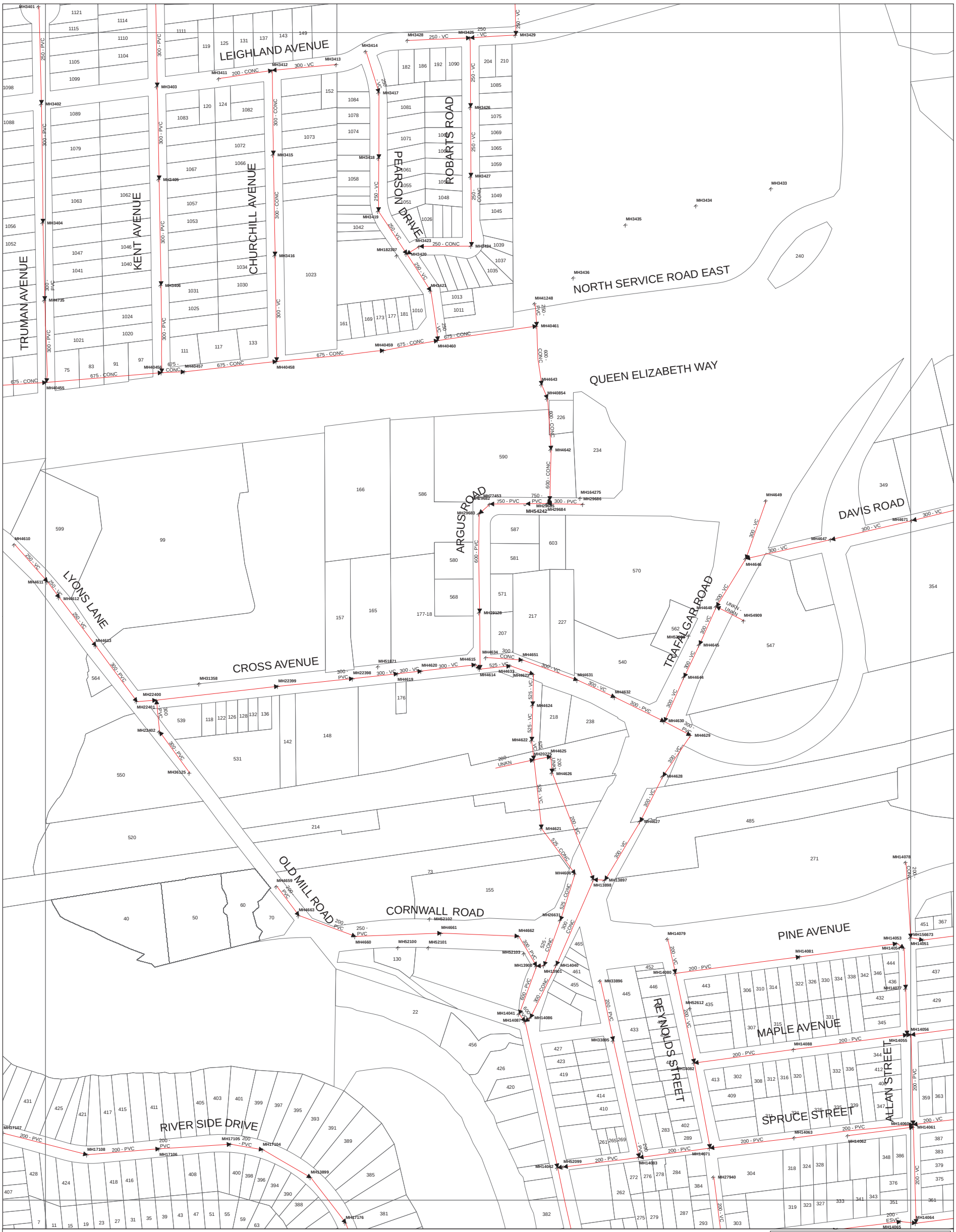

E 31st Ave


SHEDDON
AVENUE
Your New Home in Olde Oakville
331SheddonAvenue.ca


THREE | THREE | ONE
SHEDDON
AVENUE


SHEDDON AVE
REYNOLDS ST

Appendix B
Sanitary Servicing Background Information



Halton REGION

REGIONAL MUNICIPALITY OF HALTON

Department of Public Works

SANITARY OPERATING MAPS

TOWN OF OAKVILLE

Sewer Types

- Treated Discharge Sewer
- Untreated Discharge Sewer
- ForceMain
- Proposed ForceMain
- Gravity Sewer (In Service)
- Gravity Sewer (Out of Service)
- Proposed Gravity Sewer

Maintenance Hole Types

- K Maintenance Hole
- J Chamber

Major System Facilities

- E Wastewater Storage Tank
- G Wastewater Treatment Plant
- B Pumping Station
- Municipal Boundary

Meters: 0 25 50 100 150 200

Map Index

Grid Number: 195B

Print Date: Nov 26, 2015

REGIONAL MUNICIPALITY OF HALTON
Department of Public Works

SANITARY OPERATING MAPS

TOWN OF OAKVILLE

Sewer Types

- Treated Discharge Sewer
- Untreated Discharge Sewer
- ForceMain
- Proposed ForceMain
- Gravity Sewer (In Service)
- Gravity Sewer (Out of Service)
- Proposed Gravity Sewer

Maintenance Hole Types

- K Maintenance Hole
- J Chamber

Major System Facilities

- E Wastewater Storage Tank
- G Wastewater Treatment Plant
- B Pumping Station
- Municipal Boundary

Meters
0 25 50 100 150 200

Map Index

Grid Number: 196A
Print Date: Nov 26, 2015

REGIONAL MUNICIPALITY OF HALTON
Department of Public Works

SANITARY OPERATING MAPS

TOWN OF OAKVILLE

Sewer Types

- Treated Discharge Sewer
- Untreated Discharge Sewer
- ForceMain
- Proposed ForceMain
- Gravity Sewer (In Service)
- Gravity Sewer (Out of Service)
- Proposed Gravity Sewer

Maintenance Hole Types

- K Maintenance Hole
- J Chamber

Major System Facilities

- E Wastewater Storage Tank
- G Wastewater Treatment Plant
- B Pumping Station
- Municipal Boundary

Meters
0 25 50 100 150 200

Map Index

Grid Number: 196C
Print Date: Nov 26, 2015

Halton REGION

REGIONAL MUNICIPALITY OF HALTON

Department of Public Works

SANITARY OPERATING MAPS

TOWN OF OAKVILLE

Sewer Types

- Treated Discharge Sewer
- Untreated Discharge Sewer
- ForceMain
- Proposed ForceMain
- Gravity Sewer (In Service)
- Gravity Sewer (Out of Service)
- Proposed Gravity Sewer

Maintenance Hole Types

- K Maintenance Hole
- J Chamber

Major System Facilities

- E Wastewater Storage Tank
- G Wastewater Treatment Plant
- B Pumping Station
- Municipal Boundary

Meters: 0 25 50 100 150 200

Map Index

Grid Number: 195D

Print Date: Nov 26, 2015

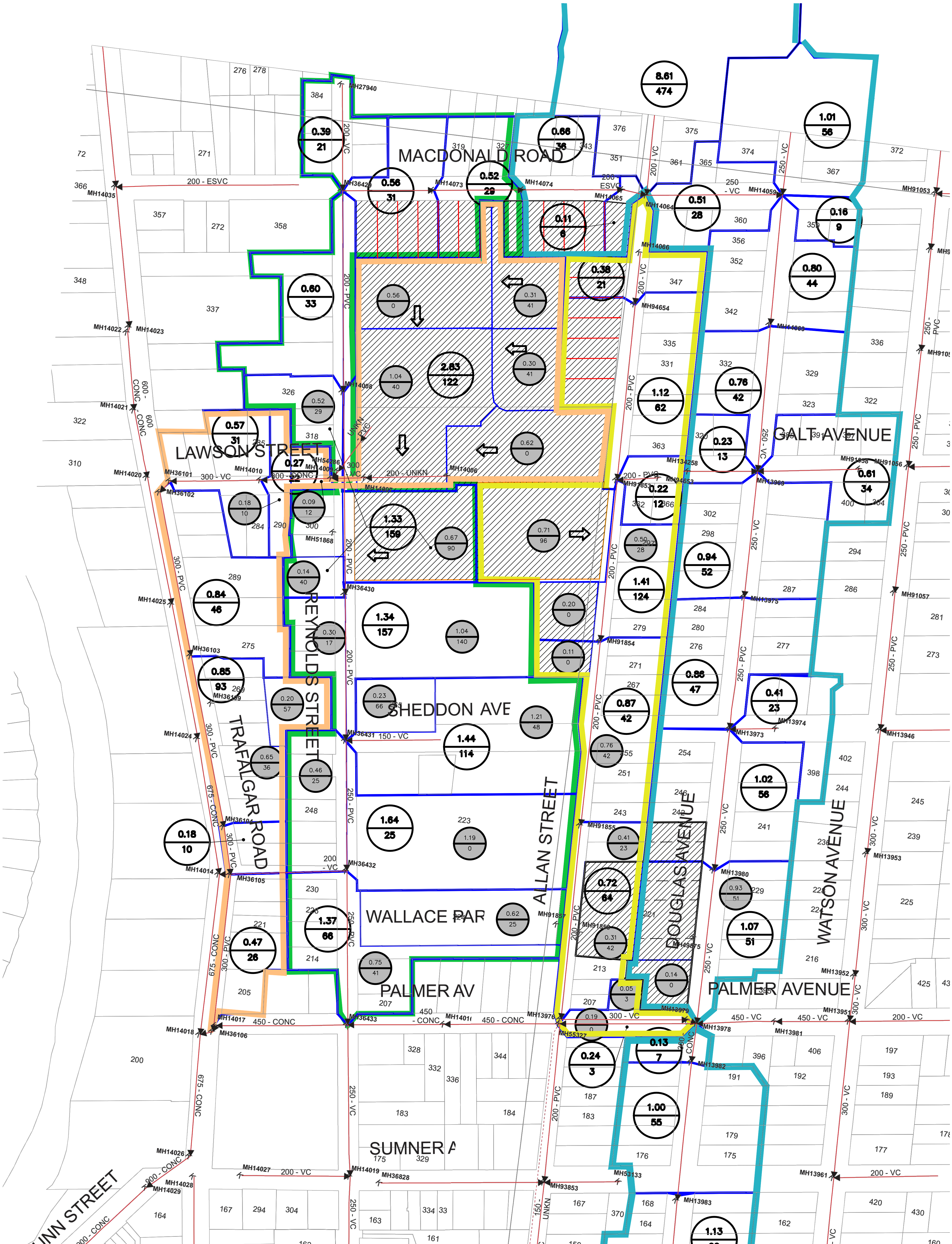
Project:	OTMH Site			
Project No:	11148742			
Date:	30-Nov-17			
OTMH Site - Existing Sanitary Flow				
Site Area =			**5.7**	**ha**
Total Beds as Per Online Records			367	beds
Population Rate (Region Water and Waste Water Design Manual, 2017) =				
Population 4 persons per bed			1468	
Peaking Factor (commercial) =			2.95	
Infiltration =			0.000286	m^3/ha/s
			0.0016302	m^3/s
			1.6	L/s
Average Sewage Flow =			0.00001270	m^3/bed/s
			0.005	m3/s
			5	L/s
Average Sewage Flow * Average Peak Flow			13.7	L/s
Peak + Infiltration Flow =			15.4	L/s
Total Flow to Lawson Street			**15.4**	**L/s**

Project:	OTMH Site			
Project No:	11148742			
Date:	30-Nov-17			
OTMH Site - Proposed Sanitary Flow				
A. Community Site Area =			**1**	**ha**
Population Rate (Region Water and Waste Water Design Manual, 2017) =			40	pers/ha
Community Center + Senior Residence Population =			40	persons
Peaking Factor =			4.33	
Infiltration =			0.000286	m^3/ha/s
			0.000286	m^3/s
			0.29	L/s
Average Sewage Flow =			0.00012732	m^3/ha/s
			0.00012732	m3/s
			0.13	L/s
Peak Sewage Flow =			0.55	L/s
Peak + Infiltration Flow =			0.84	L/s
B. Future Medium Density (proposed sub-division road) =			**0.61**	**ha**
Population Rate (Region Water and Waste Water Design Manual, 2017) =			135	pers/ha
Population =			82	persons
Peaking Factor =			4.27	
Infiltration =			0.000286	m^3/ha/s
			0.00017446	m^3/s
			0.17	L/s
Average Sewage Flow =			0.000003183	m^3/per/s
			0.00026212	m_3/s
			0.26	L/s
Peak Sewage Flow =			1.12	L/s
Peak + Infiltration Flow =			1.29	L/s
C. Park Site Area + Ex. Parking Garage =			**1.18**	**ha**
Infiltration =			0.000286	m^3/ha/s
			0.00033748	m^3/s
			0.34	L/s

Project:	OTMH Site			
Project No:	11148742			
Date:	30-Nov-17			
D. Detached Dwellings Site Area (Mcdonalds Road) =			**0.93**	**ha**
Single Family			12	unit
Population Rate (Region Water and Waste Water Design Manual, 2017) =			55	pers/ha
Population =			51	persons
Peaking Factor =			4.31	
Infiltration =			0.000286	m^3/ha/s
			0.00026598	m^3/s
			0.27	L/s
Average Sewage Flow =			0.000003183	m^3/per/s
			0.00016281	m_3/s
			0.16	L/s
Peak Sewage Flow =			0.70	L/s
Peak + Infiltration Flow =			0.97	L/s
E. Detached Dwellings Site Area (Allan Street) =			**0.57**	**ha**
Single Family			7	unit
Population Rate (Region Water and Waste Water Design Manual, 2017) =			55	pers/ha
Population =			31	persons
Peaking Factor =			4.35	
Infiltration =			0.000286	m^3/ha/s
			0.00016302	m^3/s
			0.16	L/s
Average Sewage Flow =			0.000003183	m^3/per/s
			9.97871E-05	m_3/s
			0.10	L/s
Peak Sewage Flow =			0.43	L/s
Peak + Infiltration Flow =			0.60	L/s
F. Senior Residence (Future Medium Density to Allan Street) =			**0.71**	**ha**
Population Rate (Region Water and Waste Water Design Manual, 2017) =			135	pers/ha
Population =			96	persons
Peaking Factor =			4.25	

Project:	OTMH Site			
Project No:	11148742			
Date:	30-Nov-17			
Infiltration =			0.000286	m^3/ha/s
			0.00020306	m^3/s
			0.20	L/s
Average Sewage Flow =			0.000003183	m^3/per/s
			0.000305091	m_3/s
			0.31	L/s
Peak Sewage Flow =			1.30	L/s
Peak + Infiltration Flow =			1.50	L/s
G. Senior Residence (Future Medium Density to Reynolds Street) =			**0.67**	**ha**
Population Rate (Region Water and Waste Water Design Manual, 2017) =			135	pers/ha
Population =			90	persons
Peaking Factor =			4.26	
Infiltration =			0.000286	m^3/ha/s
			0.00019162	m^3/s
			0.19	L/s
Average Sewage Flow =			0.000003183	m^3/per/s
			0.000287902	m_3/s
			0.29	L/s
Peak Sewage Flow =			1.23	L/s
Peak + Infiltration Flow =			1.42	L/s
H. Park Site Area to Allan Street =			**0.3**	**ha**
Infiltration =			0.000286	m^3/ha/s
			0.0000858	m^3/s
			0.09	L/s

Appendix C
Downstream Sanitary Analysis



LEGEND:

- 0.45 / 25 — AREA IN HECTARES / POPULATION
- 1.04 / 140 — SUB - AREA IN HECTARES / POPULATION
- LEG 1 BOUNDARY
- LEG 3 BOUNDARY
- PROPOSED DEVELOPMENT
- 200 – PVC — EXISTING SANITARY SEWER AND MANHOLE (WITH FLOW DIRECTION)
- DRAINAGE AREA BOUNDARY
- LEG 2 BOUNDARY
- LEG 4 BOUNDARY

FORMER OAKVILLE-TRAFALGAR MEMORIAL HOSPITAL LANDS

GHD

EXISTING POST - DEVELOPMENT SANITARY CATCHMENT PLAN

ob Nmber	11148742
Reision	0
Date	AN.30, 2018

Figre 1

705 Millcree Drie, Unit 1, Mississaga Ontario L5N 5M4 T 1 41 213 7121 F 1 41 890 8499 E inb gdcanada.com W www.gd.com

Plot Date: 14 Febrar 2018 - 10:19 AM Plotted b: Alecia H

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Scale N.T.S.

Project: Town of Oakville - Former Oakville Trafalgar Memorial Hospital Lands

LEG #1 - LAWSON STREET TO TRAFALGAR ROAD

Prepared by: A.H.
Checked by: M.P. & S.P.

Date: 14-Feb-18

DOWNSTREAM SANITARY SEWER ANALYSIS

Region of Halton:

Peaking Factor M =	**1+(14/(4+SQRT(P/1000)))** Halton Region Section 3.2.3 (July 2017)
Single Family Pers/ha =	**55** Halton Region Table 3-1 (July 2017)
Semi-Detached, Duplex & 4-Plex Pers/ha =	**100** Halton Region Table 3-1 (July 2017)
Townhouse, Maisonette (6 storey apt or less) Pers/h	**135** Halton Region Table 3-1 (July 2017)
Apartment (over 6 storey high) Pers/ha =	**285** Halton Region Table 3-1 (July 2017)
Community Services Pers/ha =	**40** Halton Region Table 3-2 (July 2017)
Residential Average Flow (m^3/**capita**/day) =	**0.275** Halton Region Table 3-1 (July 2017)
Community Services Average Flow (m^3/**ha**/day) =	**11** Halton Region Table 3-2 (July 2017)
Infiltration (m^3/s/ha) =	**0.0002860** Halton Region Section 3.2.4 (July 2017)
Mannings 'n'	**n=0.013** Halton Region Section 3.3.1 (July 2017)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 17 18 19 20 21 22 24 25 26 27 28 29 30 31 32

	STREET NAME	From MH	To MH	Tributary Residential Areas: Increment (ha) Single Family	Semi-Detached	Town House	Apartment (over 6 storey)	Total Incr. (ha)	Total Cumul. (ha)	Tributary Residential Population: Increment (pers) Single Family	Semi-Detached	Town House	Apartment (over 6 storey)	Total Incr (pers)	Total Cumul. (pers)	Residential Flow: Cumul Flow (m^3/s)	Peak Factor (M)	Total Peak Dry Flow (m^3/s)	Community Services: Incr Area (ha)	Cum Area (ha)	Total Flow (m^3/s)	Infiltration: Cumul Area (ha)	Total Infiltration (m^3/s)	MAX WET FLOW m3/s	PIPE: Dia mm	Slope %	Qcap m^3/s	V m/s Full	V m/s Act	Surcharge (Yes/No)	Used Capacity %
	LAWSON STREET	OTMH LANDS	MH14009			0.61		0.61	0.61	0	0	82	0	82	82	0.000262	4.27	0.001118	1.04	1.04	0.000573	2.83	0.000809	0.002501	300	0.50	0.071334	0.98	0.46	no	4%
	LAWSON STREET	MH14009	MH14010	0.18		0.09		0.27	0.88	10	0	12	0	22	104	0.000332	4.24	0.001408		1.04	0.000573	3.10	0.000887	0.002868	300	0.70	0.084404	1.16	0.46	no	3%
	LAWSON STREET	MH14010	MH36101	0.57				0.57	1.45	31	0	0	0	31	136	0.000432	4.20	0.001817		1.04	0.000573	3.67	0.001050	0.003440	300	0.70	0.084404	1.16	0.54	no	4%
	LAWSON STREET	MH36101	MH36102					0.00	1.45	0	0	0	0	0	136	0.000432	4.20	0.001817		1.04	0.000573	3.67	0.001050	0.003440	300	0.70	0.084404	1.16	0.54	no	4%
	TRAFALGAR ROAD	MH36102	MH36103	0.84				0.84	2.29	46	0	0	0	46	182	0.000579	4.16	0.002411		1.04	0.000573	4.51	0.001290	0.004274	300	0.26	0.051440	0.70	0.43	no	8%
	TRAFALGAR ROAD	MH36103	MH36104	0.65			0.20	0.85	3.14	36	0	0	57	93	275	0.000874	4.09	0.003580		1.04	0.000573	5.36	0.001533	0.005686	300	0.26	0.051440	0.70	0.47	no	11%
	TRAFALGAR ROAD	MH36104	MH36105	0.18				0.18	3.32	10	0	0	0	10	285	0.000906	4.09	0.003703		1.04	0.000573	5.54	0.001584	0.005861	300	0.25	0.050441	0.69	0.48	no	12%
	TRAFALGAR ROAD	MH36105	MH36106 (trunk)	0.47				0.47	3.79	26	0	0	0	26	310	0.000988	4.07	0.004024		1.04	0.000573	6.01	0.001719	0.006316	300	0.26	0.051440	0.70	0.49	no	12%

NOTES:
1. PARK LANDS (0.56 HA) & EX. PARKING GARAGE (0.62 HA) ARE INCLUDED IN INFILTRATION AREA/FLOW CALCULATIONS.
2. THE POPULATION DENSITY AT 312 REYNOLDS STREET (6-PLEX) IS ASSUMED TO BE EQUIVALENT TO TOWNHOUSE DEVELOPMENT (135 PERS/HA).
3. THE SANITARY SEWERS FROM 4-STOREY HIGH 4-PLEX BUILDINGS AT 262 & 268 REYNOLDS STREET DRAIN TO TRAFALGAR ROAD WITH POPULATION DESITY ASSUMED EQUIVALENT TO OVER 6 STOREY DEVELOPMENT (285 PERS/HA).

Project: Town of Oakville - Former Oakville Trafalgar Memorial Hospital Lands

LEG #2 - MACDONALD ROAD TO REYNOLDS STREET

Prepared by: A.H.
Checked by: M.P. & S.P.

Date: 14-Feb-18

DOWNSTREAM SANITARY SEWER ANALYSIS

Region of Halton:

Peaking Factor M =	**1+(14/(4+SQRT(P/1000)))**	Halton Region Section 3.2.3 (July 2017)
Single Family Pers/ha =	**55**	Halton Region Table 3-1 (July 2017)
Semi-Detached, Duplex & 4-Plex Pers/ha =	**100**	Halton Region Table 3-1 (July 2017)
Townhouse, Maisonette (6 storey apt or less) Pers/h	**135**	Halton Region Table 3-1 (July 2017)
Apartment (over 6 storey high) Pers/ha =	**285**	Halton Region Table 3-1 (July 2017)
Community Services Pers/ha =	**40**	Halton Region Table 3-2 (July 2017)
Residential Average Flow (m^3/**capita**/day) =	**0.275**	Halton Region Table 3-1 (July 2017)
Community Services Average Flow (m^3/**ha**/day) =	**11**	Halton Region Table 3-2 (July 2017)
Infiltration (m^3/s/ha) =	**0.0002860**	Halton Region Section 3.2.4 (July 2017)
Mannings 'n'	**n=0.013**	Halton Region Section 3.3.1 (July 2017)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 17 18 19 20 21 22 24 25 26 27 28 29 30 31 32

	STREET NAME	From MH	To MH	Tributary Residential Areas: Increment (ha) Single Family	Semi-Detached	Town House	Apartment (over 6 storey)	Total Incr. (ha)	Total Cumul. (ha)	Tributary Residential Population: Increment (pers) Single Family	Semi-Detached	Town House	Apartment (over 6 storey)	Total Incr (pers)	Total Cumul. (pers)	Residential Flow: Cumul Flow (m^3/s)	Peak Factor (M)	Total Peak Dry Flow (m^3/s)	Community Services: Incr Area (ha)	Cum Area (ha)	Total Flow (m^3/s)	Infiltration: Cumul Area (ha)	Total Infiltration (m^3/s)	MAX WET FLOW m3/s	PIPE: Dia mm	Slope %	Qcap m^3/s	V m/s Full	V m/s Act	Surcharge (Yes/No)	Used Capacity %
	MACDONALD ROAD	MH14074	MH14073	0.52				0.52	0.52	29	0	0	0	29	29	0.000091	4.36	0.000397		0.00	0.000000	0.52	0.000149	0.000545	200	0.98	0.033873	1.04	0.33	no	2%
	MACDONALD ROAD	MH14073	MH36429	0.56				0.56	1.08	31	0	0	0	31	59	0.000189	4.30	0.000813		0.00	0.000000	1.08	0.000309	0.001122	200	0.82	0.030984	0.96	0.45	no	4%
	REYNOLDS STREET	MH36429	MH14008	0.99				0.99	2.07	54	0	0	0	54	114	0.000362	4.23	0.001532		0.00	0.000000	2.07	0.000592	0.002124	200	1.50	0.041907	1.29	0.66	no	5%
	REYNOLDS STREET	MH14008	MH36430	0.52		0.67	0.14	1.33	3.40	29	0	90	40	159	273	0.000868	4.10	0.003556		0.00	0.000000	3.40	0.000972	0.004529	200	0.70	0.028628	0.88	0.66	no	16%
	REYNOLDS STREET	MH36430	MH36431	0.30		1.04		1.34	4.74	17	0	140	0	157	430	0.001368	4.01	0.005481		0.00	0.000000	4.74	0.001356	0.006836	200	0.52	0.024674	0.76	0.66	no	28%
	REYNOLDS STREET	MH36431	MH36432	0.46			0.23	0.69	5.43	25	0	0	66	91	521	0.001657	3.97	0.006570	1.21	1.21	0.000607	7.83	0.002239	0.009416	250	0.40	0.039237	0.77	0.64	no	24%
	REYNOLDS STREET	MH36432	MH36433 (trunk)	0.75				0.75	6.18	41	0	0	0	41	562	0.001788	3.95	0.007059	0.62	1.83	0.000913	9.20	0.002631	0.010603	250	0.40	0.039237	0.77	0.66	no	27%

NOTES:
1. SANITARY FLOW FROM MH27940 TO MH36429 ON REYNOLDS STREET (0.39 HA) HAS BEEN COMPILED TO THE CONFLUENCE POINT MH36429.
2. POPULATION DENSITY AT 288 REYNOLDS STREET (4 STOREY HIGH, 4-PLEX BUILDING) IS ASSUMED AS APARTMENT DENSITY (285 PERS/HA).
3. 291 REYNOLDS STREET LONG TERM CARE CENTRE HAS 128 BEDS, THE POPULATION DENSITY IS ASSUMED EQUIVALENT TO TOWNHOUSE DEVELOPMENT (135 PERS/HA).
4. THE APARTMENT BUILIDNG LOCATED AT 265 REYNOLDS STREET HAS 45 UNITS, THE POPULATION DENSITY IS ASSUMED EQUIVALENT TO APARTMENT (285 PERS/HA).
5. SANITARY FLOW FROM SHEDDON AVENUE TO MH36431 ON REYNOLDS STREET HAS BEEN COMPILED TO THE CONFLUENCE POINT MH36431.
6. PARK LANDS (1.19 HA) ARE INCLUDED IN INFILTRATION AREA/FLOW CALCULATIONS.

Project: Town of Oakville - Former Oakville Trafalgar Memorial Hospital Lands

LEG #3 - ALLAN STREET TO PALMER AVENUE

Prepared by: A.H.
Checked by: M.P. & S.P.
Date: 13-Feb-18

DOWNSTREAM SANITARY SEWER ANALYSIS

Region of Halton:

Peaking Factor M =	**1+(14/(4+SQRT(P/1000)))**	Halton Region Section 3.2.3 (July 2017)
Single Family Pers/ha =	**55**	Halton Region Table 3-1 (July 2017)
Semi-Detached, Duplex & 4-Plex Pers/ha =	**100**	Halton Region Table 3-1 (July 2017)
Townhouse, Maisonette (6 storey apt or less) Pers/h	**135**	Halton Region Table 3-1 (July 2017)
Apartment (over 6 storey high) Pers/ha =	**285**	Halton Region Table 3-1 (July 2017)
Community Services Pers/ha =	**40**	Halton Region Table 3-2 (July 2017)
Residential Average Flow (m^3/**capita**/day) =	**0.275**	Halton Region Table 3-1 (July 2017)
Community Services Average Flow (m^3/**ha**/day) =	**11**	Halton Region Table 3-2 (July 2017)
Infiltration (m^3/s/ha) =	**0.0002860**	Halton Region Section 3.2.4 (July 2017)
Mannings 'n'	**n=0.013**	Halton Region Section 3.3.1 (July 2017)

	STREET NAME	From MH	To MH	Tributary Residential Areas: Increment (ha) Single Family	Semi-Detached	Town House	Apartment (over 6 storey)	Total Incr. (ha)	Total Cumul. (ha)	Tributary Residential Population: Increment (pers) Single Family	Semi-Detached	Town House	Apartment (over 6 storey)	Total Incr (pers)	Total Cumul. (pers)	Residential Flow: Cumul Flow (m^3/s)	Peak Factor (M)	Total Peak Dry Flow (m^3/s)	Community Services: Incr Area (ha)	Cum Area (ha)	Average Flow (m^3/s)	Infiltration: Cumul Area (ha)	Total Infiltration (m^3/s)	MAX WET FLOW m3/s	PIPE: Dia mm	Slope %	Qcap m^3/s	V m/s Full	V m/s Act	Surcharge (Yes/No)	Used Capacity %
	ALLAN STREET	MH14066	MH94654	0.38				0.38	0.38	21	0	0	0	21	21	0.000067	4.38	0.000291		0.00	0.000000	0.38	0.000109	0.000400	200	0.50	0.024195	0.75	0.24	no	2%
	ALLAN STREET	MH94654	MH91853	1.12				1.12	1.50	62	0	0	0	62	83	0.000263	4.27	0.001120		0.00	0.000000	1.50	0.000429	0.001549	200	1.25	0.038255	1.18	0.55	no	4%
	ALLAN STREET	MH91853	MH91854	0.72		0.71		1.43	2.93	40	0	96	0	135	218	0.000694	4.13	0.002868		0.00	0.000000	3.13	0.000895	0.003763	200	0.76	0.029829	0.92	0.65	no	13%
	ALLAN STREET	MH91854	MH91855	0.76				0.76	3.69	42	0	0	0	42	260	0.000827	4.10	0.003393		0.00	0.000000	4.00	0.001144	0.004537	200	0.86	0.031731	0.98	0.70	no	14%
	ALLAN STREET	MH91855	MH13976	0.41		0.31		0.72	4.41	23	0	42	0	64	324	0.001032	4.06	0.004193		0.00	0.000000	4.72	0.001350	0.005543	200	1.07	0.035394	1.09	0.81	no	16%
	PALMER AVENUE	MH13976	MH13979	0.05				0.05	4.46	3	0	0	0	3	327	0.001041	4.06	0.004229		0.00	0.000000	4.96	0.001420	0.005649	300	0.20	0.045116	0.62	0.44	no	13%
	PALMER AVENUE	MH13979	MH13978 (CONF PT)					0.00	4.46	0	0	0	0	0	327	0.001041	4.06	0.004229		0.00	0.000000	4.96	0.001420	0.005649	300	0.20	0.045116	0.62	0.44	no	13%

NOTE:
1. THE PARK (0.3 HA) NEAR THE PROPOSED COMMUNITY CENTRE IS INCLUDED IN INFILTRATION AREA/FLOW CALCULATIONS.
2. SANITARY FLOW FROM MH94653 TO MH91853 ON GALT AVENUE (0.22 HA) HAS BEEN COMPILED TO THE CONFLUENCE POINT MH91853 ON ALLAN STREET.

Project: Town of Oakville - Former Oakville Trafalgar Memorial Hospital Lands

LEG #4 - MACDONALD ROAD TO DOUGLAS AVENUE

Prepared by: A.H.
Checked by: M.P. & S.P.

Date: 13-Feb-18

DOWNSTREAM SANITARY SEWER ANALYSIS

Region of Halton:

Peaking Factor M =	**1+(14/(4+SQRT(P/1000)))**	Halton Region Section 3.2.3 (July 2017)
Single Family Pers/ha =	**55**	Halton Region Table 3-1 (July 2017)
Semi-Detached, Duplex & 4-Plex Pers/ha =	**100**	Halton Region Table 3-1 (July 2017)
Townhouse, Maisonette (6 storey apt or less) Pers/h	**135**	Halton Region Table 3-1 (July 2017)
Apartment (over 6 storey high) Pers/ha =	**285**	Halton Region Table 3-1 (July 2017)
Community Services Pers/ha =	**40**	Halton Region Table 3-2 (July 2017)
Residential Average Flow (m^3/**capita**/day) =	**0.275**	Halton Region Table 3-1 (July 2017)
Community Services Average Flow (m^3/**ha**/day) =	**11**	Halton Region Table 3-2 (July 2017)
Infiltration (m^3/s/ha) =	**0.0002860**	Halton Region Section 3.2.4 (July 2017)
Mannings 'n'	**n=0.013**	Halton Region Section 3.3.1 (July 2017)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	17	18	19	20	21	22	24	25	26	27	28	29	30	31	32
	STREET NAME	From MH	To MH	**Tributary Residential Areas**						**Tributary Residential Population**						**Residential Flow**			**Community Services**			**Infiltration**		MAX WET FLOW m3/s	PIPE					Surcharge (Yes/No)	Used Capacity %
				Increment (ha)				Total Incr. (ha)	Total Cumul. (ha)	Increment (pers)				Total Incr (pers)	Total Cumul. (pers)	Cumul Flow (m^3/s)	Peak Factor (M)	Total Peak Dry Flow (m^3/s)	Incr Area (ha)	Cum Area (ha)	Average Flow (m^3/s)	Cumul Area (ha)	Total Infiltration (m^3/s)		Dia mm	Slope %	Qcap m^3/s	V m/s			
				Single Family	Semi-Detached	Town House	Apartment (over 6 storey)			Single Family	Semi-Detached	Town House	Apartment (over 6 storey)															Full	Act		
	MACDONALD ROAD	MH14074	MH14065	0.66				0.66	0.66	36	0	0	0	36	36	0.000116	4.34	0.000502		0.00	0.000000	0.66	0.000189	0.000690	200	0.52	0.024674	0.76	0.30	no	3%
	MACDONALD ROAD	MH14065	MH14064	0.11				0.11	0.77	6	0	0	0	6	42	0.000135	4.33	0.000583		0.00	0.000000	0.77	0.000220	0.000804	200	0.50	0.024195	0.75	0.30	no	3%
	MACDONALD ROAD	MH14064	MH14059	9.12				9.12	9.89	502	0	0	0	502	544	0.001731	3.96	0.006848		0.00	0.000000	10.62	0.003037	0.009885	250	0.79	0.055141	1.09	0.83	no	18%
	DOUGLAS AVENUE	MH14059	MH14069	1.97				1.97	11.86	108	0	0	0	108	652	0.002076	3.91	0.008122		0.00	0.000000	11.86	0.003392	0.011514	250	0.40	0.039237	0.77	0.67	no	29%
	DOUGLAS AVENUE	MH14069	MH13969	0.76				0.76	12.62	42	0	0	0	42	694	0.002209	3.90	0.008609		0.00	0.000000	12.62	0.003609	0.012218	250	0.40	0.039237	0.77	0.69	no	31%
	DOUGLAS AVENUE	MH13969	MH13975	1.78				1.78	14.4	98	0	0	0	98	792	0.002521	3.86	0.009738		0.00	0.000000	14.40	0.004118	0.013856	250	1.20	0.067960	1.34	1.05	no	20%
	DOUGLAS AVENUE	MH13975	MH13973	0.86				0.86	15.26	47	0	0	0	47	839	0.002671	3.85	0.010279		0.00	0.000000	15.26	0.004364	0.014643	250	1.20	0.067960	1.34	1.07	no	22%
	DOUGLAS AVENUE	MH13973	MH13980	1.43				1.43	16.69	79	0	0	0	79	918	0.002922	3.82	0.011172		0.00	0.000000	16.69	0.004773	0.015945	250	1.20	0.067960	1.34	1.10	no	23%
	DOUGLAS AVENUE	MH13980	MH13978	0.93				0.93	17.62	51	0	0	0	51	969	0.003085	3.81	0.011748		0.00	0.000000	17.76	0.005079	0.016828	250	1.20	0.067960	1.34	1.12	no	25%
	DOUGLAS AVENUE	MH13978 (CONF PT)	MH13982	3.44		1.02		4.46	22.1	189	0	138	0	327	1296	0.004125	3.72	0.015364		0.00	0.000000	22.72	0.006498	0.021862	350	3.10	0.267928	2.70	1.63	no	8%
	DOUGLAS AVENUE	MH13982	MH13983	1.00				1.00	23.08	55	0	0	0	55	1351	0.004300	3.71	0.015962		0.00	0.000000	23.72	0.006784	0.022746	350	1.50	0.186373	1.88	1.29	no	12%
	DOUGLAS AVENUE	MH13983	MH13987 (trunk)	1.13				1.13	24.21	62	0	0	0	62	1413	0.004498	3.70	0.016634		0.00	0.000000	24.85	0.007107	0.023741	350	1.20	0.166697	1.68	1.21	no	14%

1. THE PROPOSED PARKS ON ALLAN STREET & DOUGLAS AVENUE ARE INCLUDED IN INFILTRATION FLOW CALCULATIONS.
2. SANITARY FLOW (8.61 HA) FROM ALLAN STREET, THE NORTH OF MACDONALD ROAD HAS BEEN COMPILED TO THE CONFLUENCE POINT MH14064 ON MACDNALD ROAD.
3. SANITARY FLOWS FROM DOUGLAS AVENUE, THE NORTH OF MACDONLD ROAD (1.01HA), AND MACDONLD ROAD (0.16 HA) HAVE BEEN COMPILED TO THE CONFLUENCE POINT MH14059 ON DOUGLAS AVENUE.
4. SANITARY FLOWS FROM GALT AVENUE (0.61HA & 0.23 HA) HAVE BEEN COMPILED TO THE CONFLUENCE POINT MH13969 ON DOUGLAS AVENUE.
5. SANITARY FLOW FROM SHEDDON AVENUE (0.41HA) HAS BEEN COMPILED TO THE CONFLUENCE POINT MH13973 ON DOUGLAS AVENUE.
6. SANITARY FLOWS FROM LEG #3 (3.75 HA RESIDENTIAL, 0.50 HA PARK & ROAD AREA), HAVE BEEN COMPILED TO THE CONFLUENCE POINT MH13978 ON DOUGLAS AVENUE.

Appendix D
Water Servicing Background Information

REGIONAL MUNICIPALITY OF HALTON
Department of Public Works

WATER OPERATING MAPS

TOWN OF OAKVILLE

Protection Valve Type
- Q Air Release
- N Check
- ° Pressure Reducing
- ≠ Surge
- ⊭ Vacuum

Control Valve
- ▫ Valve In Chamber
- · System
- . Zone Isolation, No ByPass
- · Zone Isolation, With ByPass

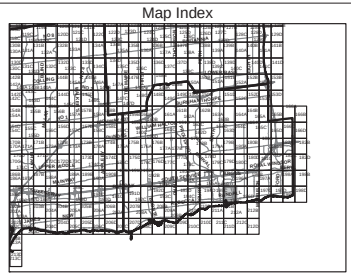
Fittings
- o Cap
- p Cross
- q Reducer
- v Sleeve
- r Tee
- s Tapping Sleeve

System Structure
- K Booster Station
- L Intake
- J Municipal Well
- I Reservoir
- H Tank
- G Water Purification Plant

Other
- In Service Watermain
- Proposed Watermain
- Private Watermain/Service Lead
- M System Meter
- U Hydrant
- Chamber
- Pressure Zone
- Municipal Boundary

0 25 50 100 150 200 Meters

Map Index



Grid Number: 195D
Print Date: Nov 26, 2015

REGIONAL MUNICIPALITY OF HALTON
Department of Public Works

WATER OPERATING MAPS

TOWN OF OAKVILLE

Protection Valve Type

- Q Air Release
- N Check
- ° Pressure Reducing
- Surge
- Vacuum

Control Valve

- Valve In Chamber
- System
- Zone Isolation, No ByPass
- Zone Isolation, With ByPass

Fittings

- o Cap
- p Cross
- q Reducer
- v Sleeve
- r Tee
- s Tapping Sleeve

System Structure

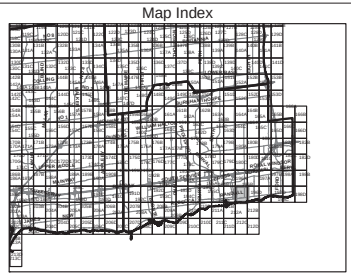
- K Booster Station
- L Intake
- J Municipal Well
- I Reservoir
- H Tank
- G Water Purification Plant

Other

- In Service Watermain
- Proposed Watermain
- Private Watermain/Service Lead
- M System Meter
- U Hydrant
- Chamber
- Pressure Zone
- Municipal Boundary

Meters
0 25 50 100 150 200

Map Index



Grid Number: 196C
Print Date: Nov 26, 2015

CORIX®
Water Services

10 Estate Drive, Toronto, Ontario M1H 2Z1
Phone: 416.282.1665 Fax: 416.282.7702 Toll Free: 1.888.349.2493
www.corix.com

SITE NAME: GHD DATE: Nov 23, 2017

LOCATION: Reynolds St + Lawson St., Oakville

TEST DATA TIME OF TEST: 12:55 pm

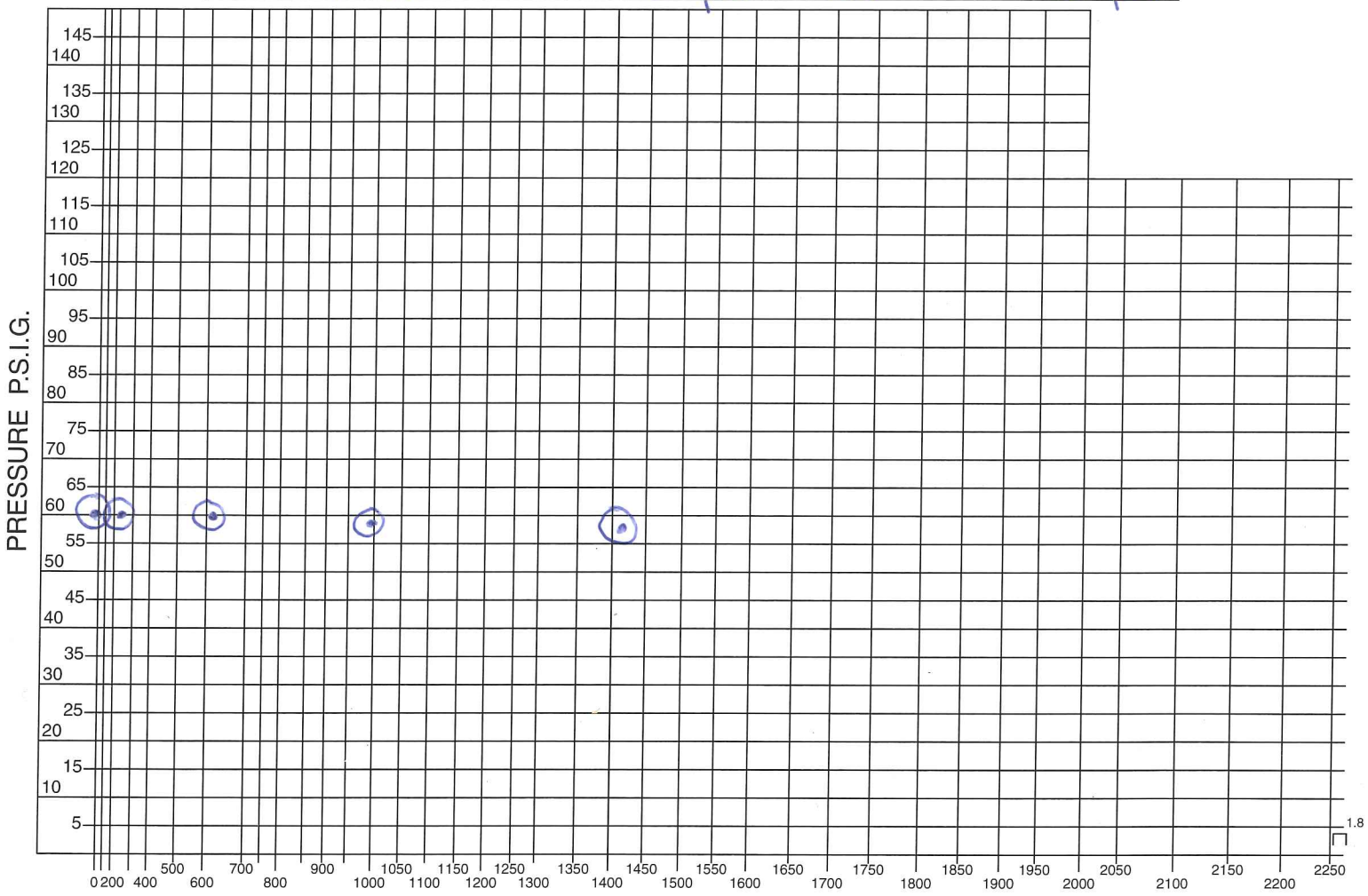
LOCATION OF TEST: (FLOW) CV Cent 3P Across #338 Reynolds St

(RESIDUAL) CV. Cent 3P Across #312 Reynolds St

MAIN SIZE: 300mm

STATIC PRESSURE: 60 psi

	NUMBER OF OUTLETS & ORIFICE SIZE	PITOT PRESSURE	FLOW (U.S. G.P.M.)	RESIDUAL PRESSURE
# 1	1 X 1 1/8	50 psi	265	60 psi
# 2	1 X 1 3/4	45 psi	609	60 psi
# 3	1 X 2 1/2	36 psi	1004	59 psi
# 4	2 X 2 1/2	18 psi	1420	58 psi



FLOW U.S. G.P.M.

COMMENTS: Completed NFPA 291 flow test as requested

Authorized Signature _____ Corix Water Services Signature _____

CORIX®
Water Services

10 Estate Drive, Toronto, Ontario M1H 2Z1
Phone: 416.282.1665 Fax: 416.282.7702 Toll Free: 1.888.349.2493
www.corix.com

SITE NAME: GHD DATE: Nov 23, 2017

LOCATION: Allan St + MacDonell Rd, Oakville

TEST DATA TIME OF TEST: 1:26pm

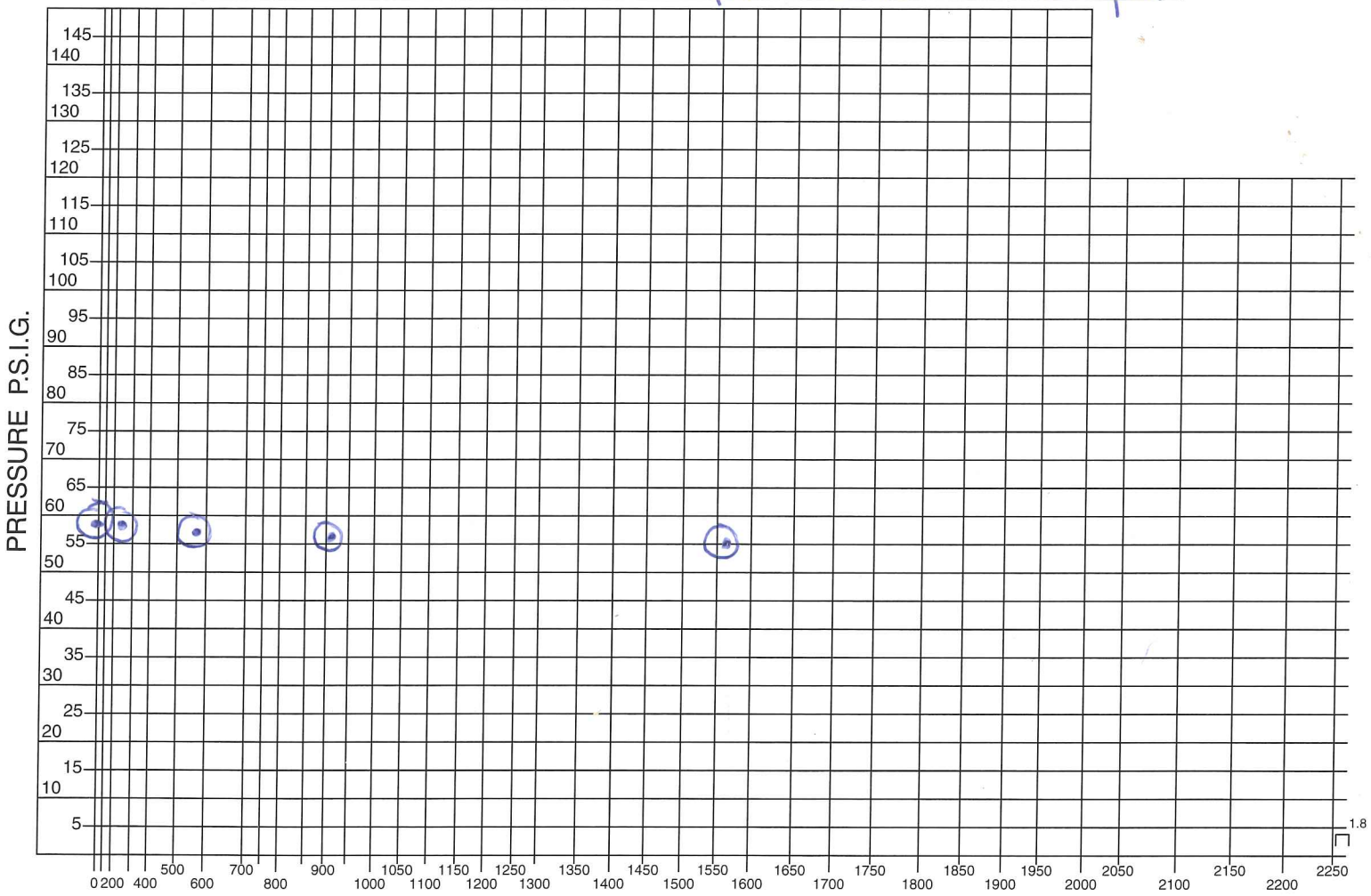
LOCATION OF TEST: (FLOW) CV Cert 3P 1 Sd MacDonell on Allan

(RESIDUAL) CV Cert 3P 2 Sd MacDonell on Allan

MAIN SIZE: 200mm

STATIC PRESSURE: 58 psi

	NUMBER OF OUTLETS & ORIFICE SIZE	PITOT PRESSURE	FLOW (U.S. G.P.M.)	RESIDUAL PRESSURE
# 1	1 X 1 1/8	46 psi	254	58 psi
# 2	1 X 1 3/4	42 psi	589	57 psi
# 3	1 X 2 1/2	30 psi	917	56 psi
# 4	2 X 2 1/2	22 psi	1570	55 psi



FLOW U.S. G.P.M.

COMMENTS: Completed NFPA 291 flow test as requested

Authorized Signature _____ Corix Water Services Signature _____

Project Name	OTMHI Site
Project No.	11148742
Subject	Water Demand Calculations

	Area (ha)	Population	Average Day		Maximum Day		Peak Hour	
			Flows (L/d)	Flows (L/s)	Flows (L/d)	Flows (L/s)	Flows (L/d)	Flows (L/s)
Residential-Houses	**1.5**	**83**	**22,688**	**0.3**	**51,047**	**0.6**	**90,750**	**1.1**
Medium DensityTownhouses	**0.61**	**82**	**22,646**	**0.3**	**50,954**	**0.6**	**90,585**	**1.0**
Community Centre	**1**	**40**	**11,000**	**0.1**	**24,750**	**0.3**	**24,750**	**0.3**
Senior Resd. (Medium Density)	**1.38**	**186**	**51,233**	**0.6**	**115,273**	**1.3**	**115,273**	**1.3**

Water Demands

residential	275.0	L/cap/d	Population/Hectare	
max. day factor	2.25		Single Family	55
peak hour factor	4.00	Residential	Townhouses	135
peak hour factor	2.25	Community Services	Community Ser.	40

Peak Hour Flows< Max. Day Flows +Fire Flow

Total System Demand (House)=Max. Day Flows+ Fire Flow	33.9	L/s
Total System Demand (appartment)=Max. Day Flows+ Fire Fl	150.3	L/s

*Based on Regional Municipality of Halton Water and Wastew
Linear Design Manual Version 3.01

Project Name	OTMH Site
Project No.	11148742
Subject	Water Demand Calculations

Community Center

As per Fire Underwriter's Survey Guidelines

PROJ: **OTMH Site** **DATE CREATED:** **6-Dec-17**
JOB#: **11148742** **DATE PRINTED:** **December 6, 2017**

C **Coefficient related to type of construction** [yes/no]

◆ Wood frame		1.5
◆ Ordinary construction		1
◆ Non-combustible construction	yes	0.8
◆ Fire resistive construction (< 2 hrs)		0.7
◆ Fire resistive construction (> 2 hrs)		0.6
◆ Interpolation (Using FUS Tables)		

Assumes Vertical Openings & Exterior Vertical Communications Are Properly Protected (One Hour Rating)

A **Area of structure considered (m^2)** ***4,075*** <==> 43,863 ft^2
(All floors excluding Basement, under 2-Storeys)

F **Required fire flow (L/min)**
$F = 220\ C\ (A)^{0.5}$ ***11,000 L/min***

Occupancy hazard reduction of surcharge [yes/no]

◆ Non-combustible	yes	-25%
◆ Limited combustible		-15%
◆ Combustible		0%
◆ Free burning		15%
◆ Rapid burning		25%

8,250 L/min

Sprinkler Reduction

◆ Non-combustible - Fire Resistive (3)	yes	30%

2,475 L/min

Exposure surcharge (cumulative (%), 4 side [yes/no]

0 - 3 m		25%		
3.1 - 10 m	yes	20%	1 side	20%
10.1 - 20 m		15%	2 side	
20.1 - 30 m	yes	10%	2 side	20%
30.1- 45 m	yes	5%	1 side	5%
			Cumulative Total	**45%**

3,713 L/min

REQUIRED FIRE FLOW [(1) - (2) + (3)]		***9,000 L/min***
(2,000 L/min < Fire Flow < 45,000 L/min)	***or***	***150.00 L/s***
	or	***2,378 USGPM***

Note: The calculation is based on the following sumptions:
1.The proposed building is 2-Storeys.
2. Main Floor Area is 4252 sq.m.

Appendix E
Storm Servicing Background Information

Muhammad Paracha

From: Kristina Parker <kristina.parker@oakville.ca>
Sent: Friday, December 22, 2017 2:51 PM
To: Scott Passmore
Cc: Rita Juliao
Subject: Fwd: Drainage System Capacity and Spill Assessment at Old Oakville Hospital
Attachments: Major System Flows - reduced.pdf

CompleteRepository: 011148742
Description: OTMH, Brantwood School & Trafalgar
JobNo: 11487
OperatingCentre: 01
RepoEmail: 011148742@ghd.com
RepoType: Proposal
SubJob: 42

Scott
please see below and attached related to flows.
thanks

Sent from my Samsung Galaxy smartphone.

-------- Original message --------
From: "Farrell, Aaron" <aaron.farrell@woodplc.com>
Date: 2017-12-22 2:43 PM (GMT-05:00)
To: Kristina Parker <kristina.parker@oakville.ca>
Cc: "Scheckenberger, Ron" <ron.scheckenberger@woodplc.com>, patrick.macdonald@woodplc.com, Rita Juliao <rita.juliao@oakville.ca>, Philip Kelly <philip.kelly@oakville.ca>, George Trenkler <george.trenkler@oakville.ca>
Subject: RE: Drainage System Capacity and Spill Assessment at Old Oakville Hospital

Hi Kristina.

Just following-up on this item from last week. We've extracted the 100 year major system (overland) flows from the PCSWMM model in the vicinity of the hospital. The attached figure shows the flows in the various locations.

The flows from the modelling indicate major system flows of 0.927 cms and 0.281 cms respectively, conveyed along Allan and Galt toward (i.e. upstream) of the intersection of the roads. Beyond this intersection (i.e. downstream), 0.689 cms would be conveyed along the connector road between Galt and Lawson (running through the old hospital site), and 0.52 cms conveyed south along Allan.

The modelled flows indicate 0.965 cms conveyed along Reynolds toward (i.e. upstream) of the intersection with Lawson and the connector road through the old hospital site, as well as 2.758 cms conveyed along the connector road to this same location; the higher flow along the connector road at this location is due to the additional runoff from the old hospital site. Beyond the intersection (i.e. downstream) 2.005 cms is conveyed along Lawson, and 1.538 cms is conveyed along Reynolds.

We trust that this information satisfies your current requirements. Our office will be closed next week for the holidays, however we will be open again on January 2; let us know if you'd like to connect at all to discuss.

All the best to you and your family for the holidays and into 2018.

Cheers.

Aaron.

From: Kristina Parker [mailto:kristina.parker@oakville.ca]
Sent: Thursday, December 14, 2017 3:33 PM
To: Farrell, Aaron <aaron.farrell@woodplc.com>
Cc: Scheckenberger, Ron <ron.scheckenberger@woodplc.com>; Macdonald, Patrick <patrick.macdonald@woodplc.com>; Rita Juliao <rita.juliao@oakville.ca>; Philip Kelly <philip.kelly@oakville.ca>; George Trenkler <george.trenkler@oakville.ca>
Subject: Re: Drainage System Capacity and Spill Assessment at Old Oakville Hospital

thanks Aaron, much appreciated. no need to re-run calculations.

the consultant working on the FSR for the community centre would like to look at the need to attenuate flows. can you please provide flows at Galt/Allan and Lawson/Reynolds assuming no spill upstream. they will look at the cross section needed to convey these flows across the site.

many thanks,
kristina

Sent from my Samsung Galaxy smartphone.

-------- Original message --------
From: "Farrell, Aaron" <aaron.farrell@woodplc.com>
Date: 2017-12-13 3:12 PM (GMT-05:00)
To: Kristina Parker <kristina.parker@oakville.ca>
Cc: "Scheckenberger, Ron" <ron.scheckenberger@woodplc.com>, "Macdonald, Patrick" <patrick.macdonald@woodplc.com>, Rita Juliao <rita.juliao@oakville.ca>
Subject: RE: Drainage System Capacity and Spill Assessment at Old Oakville Hospital

Hi Kristina.

Just following-up on this item from last week, regarding the spill assessment and associated assumptions for the entrance to the old hospital from Allan St. To answer your question, our assessment was predicated upon the grades for Allan Street and at the entrance to the old hospital being approximately equal. The attached plan shows where we see the grading along the Allan Street which would cause the flow from the road to be directed toward the old hospital. The grading information shows a 2 cm difference between the critical elevation to the old hospital (i.e. 95.36 m) versus the low point of the crest along Allan Street (i.e. 95.33 m). However, the grading information along Allan Street indicates that this 2 cm difference would be localized toward the curb, and further toward the centerline of Allan Street and the east side of the road the grades would be above the crest elevation along the entrance road to the old hospital site.

The weir calculations can certainly be updated to better reflect the conditions along Allan Street (i.e. incorporate a triangular weir), however we anticipate that the refinement to the assessment would result in a greater proportion of flow into the old hospital site for the 100 year storm event.

We trust that this satisfies your current requirements. Let us know if you have any further questions or wish to discuss.

Aaron.

From: Kristina Parker [mailto:kristina.parker@oakville.ca]
Sent: Wednesday, December 06, 2017 4:30 PM
To: 'Farrell, Aaron' <aaron.farrell@woodplc.com>
Cc: Scheckenberger, Ron <ron.scheckenberger@woodplc.com>; Macdonald, Patrick <patrick.macdonald@woodplc.com>; Rita Juliao <rita.juliao@oakville.ca>
Subject: RE: Drainage System Capacity and Spill Assessment at Old Oakville Hospital

Thanks Aaron and Pat,
I appreciate the follow up, has the weir spreadsheet been updated to confirm the flow still overtops the high point and flows to the depression storage area at the old hospital off Allan st? Please see attached zoom-in of the entrance to the hospital off Allan ST. Was the elevation of 95.36 m used as the critical weir height? I suppose we would need to look at the high point in the road to see if the drainage from the east spills across the crest of the road, plus the high point on the driveway entrance.
Thoughts?
Thanks,

From: Farrell, Aaron [mailto:aaron.farrell@woodplc.com]
Sent: Tuesday, December 05, 2017 8:54 AM
To: Kristina Parker
Cc: Scheckenberger, Ron; Macdonald, Patrick; Rita Juliao
Subject: RE: Drainage System Capacity and Spill Assessment at Old Oakville Hospital

Hi Kristina.

Just following-up on this item from last week. We've reviewed the drainage information and PCSWMM modelling, and have found that the original estimate of 7 ha based upon the PCSWMM GIS data extraction was an over-estimate. After a closer review of the model data, and confirmation from review of drainage information in the area, we have determined that the major and minor system runoff from 2.16 ha drains toward the old hospital site, and the major system runoff from an additional 2.81 ha drains toward the site as well. As such, during formative storm events which exceed the capacity of the minor system, the drainage area to the spill point is 4.97 ha. We're in the process of preparing a graphic which depicts these area clearly, and will forward once complete.

Apologies for any confusion or inconvenience from the previous estimate. Let us know if you wish to discuss at all.

Aaron.

From: Kristina Parker [mailto:kristina.parker@oakville.ca]
Sent: Tuesday, November 28, 2017 1:44 PM
To: 'Farrell, Aaron' <aaron.farrell@woodplc.com>
Cc: Scheckenberger, Ron <ron.scheckenberger@woodplc.com>; Macdonald, Patrick <patrick.macdonald@woodplc.com>; Rita Juliao <rita.juliao@oakville.ca>
Subject: RE: Drainage System Capacity and Spill Assessment at Old Oakville Hospital

Hi Aaron,
Thanks for providing the spill assessment results.
The results have sparked some discussion with the design consultant, and while they are working away to analyze the issue, we are seeking some clarification.

I spoke with Pat on this item late last week and got some clarification on the excel sheet. I'm still not certain of the drainage area that contributes to the 570 m3 of spill from Allan St to the site. I understand about 7 ha drains to the intersection of Allan and MacDonald, but there is a split for the major system. can you advise the percentage of flow or actual drainage area that would contribute to Allan st? I believe the design consultant had estimated a smaller external drainage area, so it would be useful to compare.

Also, please confirm no field verification was carried out to confirm drainage area boundaries in the area, and that the subcatchments would be based on the DEM?

Many thanks,
Kristina

Kristina Parker, M.A.Sc., P.Eng.
Water Resources Engineer
Development Engineering
Town of Oakville | 905-845-6601, ext.3889 | f: 905-338-4414 | www.oakville.ca

Complete our Community Development customer service survey

Vision: To be the most livable town in Canada

From: Farrell, Aaron [mailto:aaron.farrell@woodplc.com]
Sent: Friday, November 17, 2017 2:15 PM
To: Kristina Parker
Cc: Scheckenberger, Ron; Macdonald, Patrick
Subject: Drainage System Capacity and Spill Assessment at Old Oakville Hospital

Hi Kristina.

As requested, we've completed the capacity assessment of the major and minor system in the vicinity of the old Oakville Hospital, and have also assess the potential and associated magnitude of spill into the site from the adjacent roadways.

The attached drawings show the results of the major and minor system capacity along the roads surrounding the site (i.e. Reynolds, Allan, Macdonald, and Sheddon), as well as the access road through the site which connects Lawson and Galt. The results of the capacity assessment indicate that the minor system surrounding the site generally provide sufficient capacity to convey the 5 year flow without surcharging; although surcharging would be anticipated for some locations, the 5 year flow would be conveyed within the sewer network and not flood the roads. It should be noted that Allan Road is rurally drained, hence has no storm sewers to capture runoff during the 5 year storm event.

The results for the major system assessment indicate that, in general, the major system has sufficient capacity to convey the 100 year flow without exceeding the curb of the road. The exceptions are the south portion of Reynolds and the west portion of Sheddon, where the 100 year flow would exceed the depth of the curb but would be contained within the road ROW, as well as the west limit of the access road through the site which would be anticipated to flood beyond the ROW at the west limit of the road.

We also reviewed the TIN and DEM provided for the study to determine potential locations for spill from the adjacent roadways into the site, and have reviewed the detailed topo received Wednesday to verify and refine these findings, as well as to determine the maximum depth of flow within the major system which could be conveyed prior to spilling into the site. Through this review, potential spill locations were identified at the northwest entrance to the site off of Reynolds Street, the northeast entrance to the site off of Allan Street, and the west limit of the access road through the site in the vicinity of the parking lot. Spreadsheet analyses were completed using the results of the PCSWMM modelling for the major system and applying the weir equation at the entrances to determine the flow into the site. The results of the assessment indicated that, during a 100 year storm event, 25 m^3 would be anticipated to spill from Reynolds Street into the site, at a maximum flow rate of 0.07 m^3/s; this represents a small portion of the total runoff along Reynolds Road during the 100 year event (i.e. 1380 m^3 of runoff at a maximum flow rate of 1.04 m^3/s), hence is not considered to represent a significant spill potential. However, the results for the entrance off of Allan Street indicate that 570 m^3 would be anticipated to spill into the site off of Allan Street, at a

maximum flow rate of 0.40 m^3/s; essentially, during a 100 year storm event, approximately 57% of the runoff along Allan Street would be anticipated to spill into the old Hospital site, and accumulate within the depression area identified in the depression storage mapping. The results of the major system modelling for the access road through the site indicate that spill would be anticipated at the west limit of the access road, however this spill would be anticipated to sheet flow south through the site (across the parking lot) and be recaptured and conveyed within the major system along Reynolds Street.

We trust that the foregoing and the attached satisfy your current requirements in this regard; as always, feel free to call should you wish to discuss any of the foregoing. In the meantime, we are continuing with the assessments of the remaining priority areas, and will forward results as soon as the assessments have been completed.

Regards,

Aaron.

Aaron Farrell, M.Eng., P.Eng., CPM
Associate
Direct: (905) 335-2353
Mobile: (289) 208-4936
www.woodplc.com

Legend

- Major System Conduits
- Roads

Old Oakville Hospital

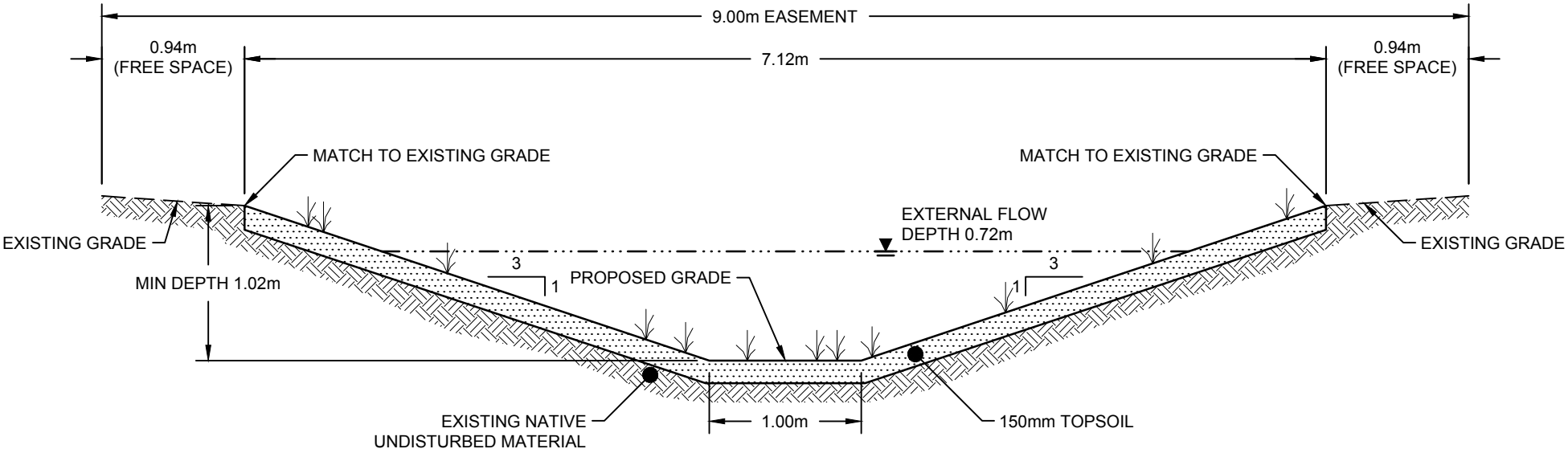
Major System Flow Rates

amec foster wheeler

Scale: 50 m

Project No. **TP115045**

Drawing No. **1**



NOTE:
THE EXTERNAL FLOWS ARE 2.8m^3/s PROVIDED BY WOOD PLC. THE PROPOSED SWALE CONVEYS THE EXTERNAL FLOW OF 2.8m^3/s WITH DEPTH OF 0.72m GIVEN THE PROPOSED DIMENSIONS.

TOWN OF OAKVILLE
FORMER OAKVILLE-TRAFALGAR
MEMORIAL HOSPITAL LANDS

PROPOSED SOUTH SWALE EXTERNAL FLOWS

11148742-00

Feb 13, 2018

FIGURE 1

CAD File: N:\CA\Waterloo\Projects\CAD\drawings\11148000s\11148742\11148742-PRES\11148742-00(PRES001)\11148742-00(PRES001)GN\11148742-00(PRES001)GN-WA001.dwg

Appendix F
Stormwater Management Background Information

Client:	Town of Oakville	Job no.:	11148742	Sheet:	2
Project:	OTMH Site - Oakville	Calcs by:	MP	Date:	5-Dec-17
Subject:	Predevelopment Runoff	Checked by:	SP	Date:	5-Dec-17

Uncontrolled Areas to Macdonald/Allan North Area 101

CONTRIBUTING AREAS 5143 m^2

	Area (m^2)	
Roof:	602	m^2
Pavement / Impervious:	2623	m^2
Landscaped / Pervious:	1918	m^2
TOTAL	5143	m^2

Site	Area (m^2)	Area*RC		Runoff Coefficients	
Roof	602	542		Roof	0.9
Pavement	2623	2361		Pavement	0.9
Landscaped	1918	480		Landscaped	0.25
TOTAL	5143	RC =	0.658		

2 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	82.2	mm/hr
Uncontrolled RC	0.658	

TOTAL 2 yr PRE-DEVELOPMENT RELEASE RATE: 77.3 L/s

5 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	114.2	mm/hr
Uncontrolled RC	0.658	

TOTAL 5 yr PRE-DEVELOPMENT RELEASE RATE: 107.4 L/s

10 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	134.8	mm/hr
Uncontrolled RC	0.658	

TOTAL 10 yr POST-DEVELOPMENT RELEASE RATE: 126.7 L/s

25 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	162.2	mm/hr
Uncontrolled RC	0.658	

TOTAL 25 yr POST-DEVELOPMENT RELEASE RATE: 152.5 L/s

50 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	182.1	mm/hr
Uncontrolled RC	0.658	

TOTAL 50 yr POST-DEVELOPMENT RELEASE RATE: 171.2 L/s

100 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	200.8	mm/hr
Uncontrolled RC	0.658	

TOTAL 100 yr POST-DEVELOPMENT RELEASE RATE: 188.8 L/s

Calculations

Client:	Town of Oakville	Job no.:	11148742	Sheet:	2
Project:	OTMH Site - Oakville	Calcs by:	MP	Date:	5-Dec-17
Subject:	Predevelopment Runoff	Checked by:	SP	Date:	5-Dec-17

Uncontrolled Areas to Lawson Street Area 102

CONTRIBUTING AREAS 35810 m^2

	Area (m^2)	
Roof:	18165	m^2
Pavement / Impervious:	14087	m^2
Landscaped / Pervious:	3558	m^2
TOTAL	35810	m^2

Site	Area (m^2)	Area*RC		Runoff Coefficients	
Roof	18165	16349		Roof	0.9
Pavement	14087	12678		Pavement	0.9
Landscaped	3558	890		Landscaped	0.25
TOTAL	35810	RC =	0.835		

2 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	82.2	mm/hr
Uncontrolled RC	0.835	

TOTAL 2 yr PRE-DEVELOPMENT RELEASE RATE: **683.5 L/s**

5 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	114.2	mm/hr
Uncontrolled RC	0.835	

TOTAL 5 yr PRE-DEVELOPMENT RELEASE RATE: **949.9 L/s**

10 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	134.8	mm/hr
Uncontrolled RC	0.835	

TOTAL 10 yr POST-DEVELOPMENT RELEASE RATE: **1121.0 L/s**

25 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	162.2	mm/hr
Uncontrolled RC	0.835	

TOTAL 25 yr POST-DEVELOPMENT RELEASE RATE: **1348.7 L/s**

50 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	182.1	mm/hr
Uncontrolled RC	0.835	

TOTAL 50 yr POST-DEVELOPMENT RELEASE RATE: **1514.1 L/s**

100 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	200.8	mm/hr
Uncontrolled RC	0.835	

TOTAL 100 yr POST-DEVELOPMENT RELEASE RATE: **1670.0 L/s**

CALCULATIONS

Client:	Town of Oakville	Job no.:	11148742	Sheet:	2
Project:	OTMH Site - Oakville	Calcs by:	MP	Date:	5-Dec-17
Subject:	Predevelopment Runoff	Checked by:	SP	Date:	5-Dec-17

Uncontrolled Areas to Reynolds Street Area 103

CONTRIBUTING AREAS 13097 m^2

	Area (m^2)	
Roof:	733	m^2
Pavement / Impervious:	10636	m^2
Landscaped / Pervious:	1728	m^2
TOTAL	13097	m^2

Site	Area (m^2)	Area*RC		Runoff Coefficients	
Roof	733	660		Roof	0.9
Pavement	10636	9572		Pavement	0.9
Landscaped	1728	432		Landscaped	0.25
TOTAL	13097	RC =	0.814		

2 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	82.2	mm/hr
Uncontrolled RC	0.814	

TOTAL 2 yr PRE-DEVELOPMENT RELEASE RATE: 243.6 L/s

5 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	114.2	mm/hr
Uncontrolled RC	0.814	

TOTAL 5 yr PRE-DEVELOPMENT RELEASE RATE: 338.6 L/s

10 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	134.8	mm/hr
Uncontrolled RC	0.814	

TOTAL 10 yr POST-DEVELOPMENT RELEASE RATE: 399.6 L/s

25 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	162.2	mm/hr
Uncontrolled RC	0.814	

TOTAL 25 yr POST-DEVELOPMENT RELEASE RATE: 480.8 L/s

50 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	182.1	mm/hr
Uncontrolled RC	0.814	

TOTAL 50 yr POST-DEVELOPMENT RELEASE RATE: 539.7 L/s

100 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	200.8	mm/hr
Uncontrolled RC	0.814	

TOTAL 100 yr POST-DEVELOPMENT RELEASE RATE: 595.3 L/s

CALCULATIONS

Client:	Town of Oakville	Job no.:	11148742	Sheet:	2
Project:	OTMH Site - Oakville	Calcs by:	MP	Date:	5-Dec-17
Subject:	Predevelopment Runoff	Checked by:	SP	Date:	5-Dec-17

Uncontrolled Areas to Allan Street South Area 104

CONTRIBUTING AREAS 3081 m^2

	Area (m^2)	
Roof:	0	m^2
Pavement / Impervious:	630	m^2
Landscaped / Pervious:	2451	m^2
TOTAL	3081	m^2

Site	Area (m^2)	Area*RC		Runoff Coefficients	
Roof	0	0		Roof	0.9
Pavement	630	567		Pavement	0.9
Landscaped	2451	613		Landscaped	0.25
TOTAL	3081	RC =	0.383		

2 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	82.2	mm/hr
Uncontrolled RC	0.383	

TOTAL 2 yr PRE-DEVELOPMENT RELEASE RATE: **27.0 L/s**

5 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	114.2	mm/hr
Uncontrolled RC	0.383	

TOTAL 5 yr PRE-DEVELOPMENT RELEASE RATE: **37.5 L/s**

10 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	134.8	mm/hr
Uncontrolled RC	0.383	

TOTAL 10 yr POST-DEVELOPMENT RELEASE RATE: **44.2 L/s**

25 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	162.2	mm/hr
Uncontrolled RC	0.383	

TOTAL 25 yr POST-DEVELOPMENT RELEASE RATE: **53.2 L/s**

50 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	182.1	mm/hr
Uncontrolled RC	0.383	

TOTAL 50 yr POST-DEVELOPMENT RELEASE RATE: **59.7 L/s**

100 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	200.8	mm/hr
Uncontrolled RC	0.383	

TOTAL 100 yr POST-DEVELOPMENT RELEASE RATE: **65.9 L/s**

CALCULATIONS

Client:	Town of Oakville	Job no.:	11148742	Sheet:	2
Project:	OTMH Site - Oakville	Calcs by:	MP	Date:	5-Dec-17
Subject:	Predevelopment Runoff	Checked by:	SP	Date:	5-Dec-17

Uncontrolled Areas to Macdonald/Allan North Area 201

CONTRIBUTING AREAS 4370 m^2

	Area (m^2)	
Roof:	874	m^2
Pavement / Impervious:	1311	m^2
Landscaped / Pervious:	2185	m^2
TOTAL	4370	m^2

Site	Area (m^2)	Area*RC		Runoff Coefficients	
Roof	874	787		Roof	0.9
Pavement	1311	1180		Pavement	0.9
Landscaped	2185	546		Landscaped	0.25
TOTAL	4370	RC =	0.575		

2 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	82.2	mm/hr
Uncontrolled RC	0.575	

TOTAL 2 yr PRE-DEVELOPMENT RELEASE RATE: **57.4 L/s**

5 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	114.2	mm/hr
Uncontrolled RC	0.575	

TOTAL 5 yr PRE-DEVELOPMENT RELEASE RATE: **79.8 L/s**

10 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	134.8	mm/hr
Uncontrolled RC	0.575	

TOTAL 10 yr POST-DEVELOPMENT RELEASE RATE: **94.2 L/s**

25 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	162.2	mm/hr
Uncontrolled RC	0.575	

TOTAL 25 yr POST-DEVELOPMENT RELEASE RATE: **113.3 L/s**

50 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	182.1	mm/hr
Uncontrolled RC	0.575	

TOTAL 50 yr POST-DEVELOPMENT RELEASE RATE: **127.2 L/s**

100 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	200.8	mm/hr
Uncontrolled RC	0.575	

TOTAL 100 yr POST-DEVELOPMENT RELEASE RATE: **140.3 L/s**

Calculations

Client:	Town of Oakville	Job no.:	11148742	Sheet:	2
Project:	OTMH Site - Oakville	Calcs by:	MP	Date:	5-Dec-17
Subject:	Predevelopment Runoff	Checked by:	SP	Date:	5-Dec-17

Uncontrolled Areas to Lawson Street Area 202

CONTRIBUTING AREAS 35266 m^2

	Area (m^2)	
Roof:	13405	m^2
Pavement / Impervious:	8417	m^2
Landscaped / Pervious:	13444	m^2
TOTAL	35266	m^2

Site	Area (m^2)	Area*RC		Runoff Coefficients	
Roof	13405	12065		Roof	0.9
Pavement	8417	7575		Pavement	0.9
Landscaped	13444	3361		Landscaped	0.25
TOTAL	35266	RC =	0.652		

2 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	82.2	mm/hr
Uncontrolled RC	0.652	

TOTAL 2 yr PRE-DEVELOPMENT RELEASE RATE: 525.5 L/s

5 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	114.2	mm/hr
Uncontrolled RC	0.652	

TOTAL 5 yr PRE-DEVELOPMENT RELEASE RATE: 730.3 L/s

10 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	134.8	mm/hr
Uncontrolled RC	0.652	

TOTAL 10 yr POST-DEVELOPMENT RELEASE RATE: 861.9 L/s

25 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	162.2	mm/hr
Uncontrolled RC	0.652	

TOTAL 25 yr POST-DEVELOPMENT RELEASE RATE: 1036.9 L/s

50 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	182.1	mm/hr
Uncontrolled RC	0.652	

TOTAL 50 yr POST-DEVELOPMENT RELEASE RATE: 1164.1 L/s

100 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	200.8	mm/hr
Uncontrolled RC	0.652	

TOTAL 100 yr POST-DEVELOPMENT RELEASE RATE: 1284.0 L/s

CALCULATIONS

Client:	Town of Oakville	Job no.:	11148742	Sheet:	2
Project:	OTMH Site - Oakville	Calcs by:	MP	Date:	5-Dec-17
Subject:	Predevelopment Runoff	Checked by:	SP	Date:	5-Dec-17

Uncontrolled Areas toReynolds Street Area 203

CONTRIBUTING AREAS 13011 m^2

	Area (m^2)	
Roof:	7616	m^2
Pavement / Impervious:	2602	m^2
Landscaped / Pervious:	2793	m^2
TOTAL	13011	m^2

Site	Area (m^2)	Area*RC		Runoff Coefficients	
Roof	7616	6854		Roof	0.9
Pavement	2602	2342		Pavement	0.9
Landscaped	2793	698		Landscaped	0.25
TOTAL	13011	RC =	0.760		

2 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	82.2	mm/hr
Uncontrolled RC	0.760	

TOTAL 2 yr PRE-DEVELOPMENT RELEASE RATE: **226.1 L/s**

5 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	114.2	mm/hr
Uncontrolled RC	0.760	

TOTAL 5 yr PRE-DEVELOPMENT RELEASE RATE: **314.2 L/s**

10 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	134.8	mm/hr
Uncontrolled RC	0.760	

TOTAL 10 yr POST-DEVELOPMENT RELEASE RATE: **370.8 L/s**

25 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	162.2	mm/hr
Uncontrolled RC	0.760	

TOTAL 25 yr POST-DEVELOPMENT RELEASE RATE: **446.1 L/s**

50 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	182.1	mm/hr
Uncontrolled RC	0.760	

TOTAL 50 yr POST-DEVELOPMENT RELEASE RATE: **500.8 L/s**

100 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	200.8	mm/hr
Uncontrolled RC	0.760	

TOTAL 100 yr POST-DEVELOPMENT RELEASE RATE: **552.3 L/s**

CALCULATIONS

Client:	Town of Oakville	Job no.:	11148742	Sheet:	2
Project:	OTMH Site - Oakville	Calcs by:	MP	Date:	5-Dec-17
Subject:	Predevelopment Runoff	Checked by:	SP	Date:	5-Dec-17

Uncontrolled Areas to Allan Street South Area 204

CONTRIBUTING AREAS 3074 m^2

	Area (m^2)	
Roof:	0	m^2
Pavement / Impervious:	0	m^2
Landscaped / Pervious:	2793	m^2
TOTAL	2793	m^2

Site	Area (m^2)	Area*RC		Runoff Coefficients	
Roof	0	0		Roof	0.9
Pavement	0	0		Pavement	0.9
Landscaped	2793	698		Landscaped	0.25
TOTAL	2793	RC =	0.250		

2 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	82.2	mm/hr
Uncontrolled RC	0.250	

TOTAL 2 yr PRE-DEVELOPMENT RELEASE RATE: 16.0 L/s

5 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	114.2	mm/hr
Uncontrolled RC	0.250	

TOTAL 5 yr PRE-DEVELOPMENT RELEASE RATE: 22.2 L/s

10 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	134.8	mm/hr
Uncontrolled RC	0.250	

TOTAL 10 yr POST-DEVELOPMENT RELEASE RATE: 26.2 L/s

25 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	162.2	mm/hr
Uncontrolled RC	0.250	

TOTAL 25 yr POST-DEVELOPMENT RELEASE RATE: 31.5 L/s

50 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	182.1	mm/hr
Uncontrolled RC	0.250	

TOTAL 50 yr POST-DEVELOPMENT RELEASE RATE: 35.3 L/s

100 YEAR PRE-DEVELOPMENT FLOW

Time of Concentration	10	min
Intensity	200.8	mm/hr
Uncontrolled RC	0.250	

TOTAL 100 yr POST-DEVELOPMENT RELEASE RATE: 39.0 L/s

Client:	Town of Oakville	Job no.:	11148742	Sheet:	2
Project:	OTMH Site - Oakville	Calcs by:	MP	Date:	5-Dec-17
Subject:	Comparison	Checked by:	SP	Date:	5-Dec-17

	Pre Develop. Area 101 (l/s)	**Post Develop. Area 201 (l/s)**
2 year	77.3	57.4
5 year	107.4	79.8
10 year	126.7	94.2
25 year	152.5	113.3
50 year	171.2	127.2
100 year	188.8	140.3

	Pre Develop. Area 102 (l/s)	**Post Develop. Area 202 (l/s)**
2 year	683.5	525.5
5 year	949.9	730.3
10 year	1121.0	861.9
25 year	1348.7	1036.9
50 year	1514.1	1164.1
100 year	1670	1284.0

	Pre Develop. Area 103 (l/s)	**Post Develop. Area 203 (l/s)**
2 year	243.6	226.1
5 year	338.6	314.2
10 year	399.6	370.8
25 year	480.8	446.1
50 year	539.7	500.8
100 year	595.3	552.3

	Pre Develop. Area 104 (l/s)	**Post Develop. Area 204 (l/s)**
2 year	27	16.0
5 year	37.5	22.2
25 year	44.2	26.2
10 year	53.2	31.5
25 year	59.7	35.3
50 year	65.9	39.0

Appendix G
Background Utility Information

Appendix H
Background Tree Assessment Information

Town of Oakville

Legend

- Ash - Privately Treated for EAB
- Proposed Tree Planting
- Town Trees
  - 0 - 4m height
  - 5 - 7m height
  - 8 - 10m height
  - 11 - 15m height
  - >16m height
- Scheduled for Removal
- Town Trees - Removed or Stu
- Ash Trees
- Ash - Treated for EAB
- Woodlots
- Regeneration Strategy
  - NATURAL REGENERATION
  - ENHANCEMENT SITE
  - PRIME SITE

1: 3,000

Notes

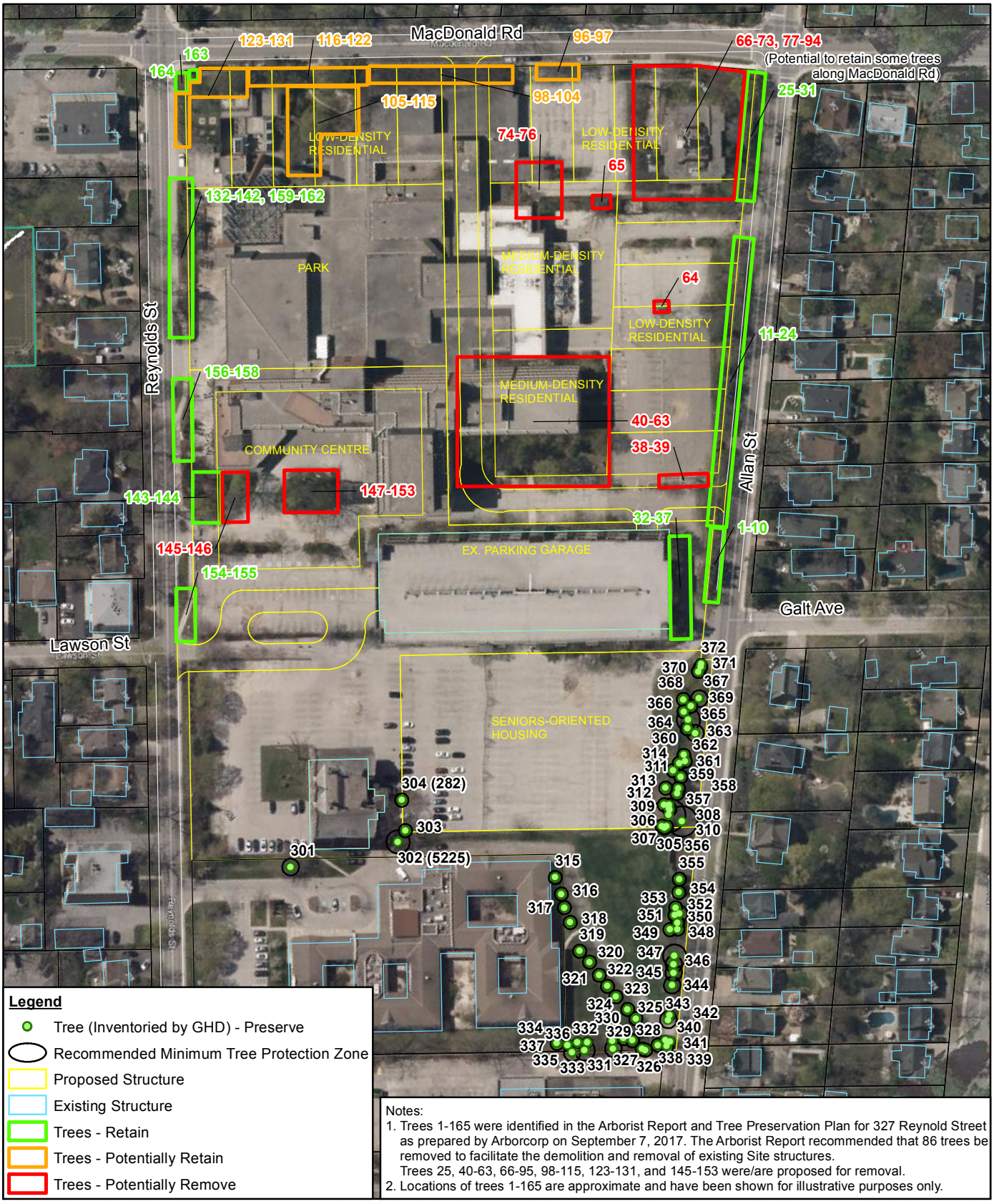
152.4 0 76.20 152.4 Meters

NAD_1983_UTM_Zone_17N

Disclaimer: THIS IS NOT A LEGAL PLAN OF SURVEY.

August 23, 2017

FIGURE 9



Aerial Image: Town of Oakville, 2017.

0 15 30 45
Meters

Coordinate System:
NAD 1983 UTM Zone 17N

FORMER OAKVILLE - TRAFALGAR MEMORIAL HOSPITAL
OAKVILLE, ONTARIO

11148742-00
Feb 6, 2018

TREE INVENTORY

FIGURE 1

GIS File: Q:\GIS\PROJECTS\11148000s\11148742\Layouts\PRES001\11148742-00(PRES001)GIS-WA003.mxd

TABLE 1 - TREE INVENTORY - TREES 301-372												
Tree ID	Northing	Easting	Civic Address	Species (Common)	Species (Scientific)	DBH (cm)	Est. Height (m)	Est. Dripline Radius (m)	Recommended Minimum Tree Protection Zone(m[6])	Trunk Integrity	Canopy Structure	Canopy Vigour
301	4811921.128	607418.749	327 Reynolds St.	Honey Locust	*Gleditsia triacanthos*	50.0	12	8	3.0	FAIR-GOOD	FAIR-GOOD	FAIR-GOOD
302 (5225)	4811957.163	607435.438	327 Reynolds St.	Honey Locust	*Gleditsia triacanthos*	63.9	16	10	4.2	FAIR-GOOD	FAIR-GOOD	FAIR-GOOD
303	4811961.718	607433.877	327 Reynolds St.	Honey Locust	*Gleditsia triacanthos*	13.1	4	2	2.4	FAIR-GOOD	FAIR	FAIR-GOOD
304 (282)	4811967.387	607424.495	327 Reynolds St.	Manitoba Maple	*Acer negundo*	16.9	6	6	2.4	FAIR	FAIR	FAIR
305	4812035.825	607490.627	327 Reynolds St.	Norway Maple	*Acer platanoides*	16.0	6	3	2.4	POOR-FAIR	POOR-FAIR	FAIR
306	4812036.637	607490.593	327 Reynolds St.	Norway Maple	*Acer platanoides*	18.0	6	3	2.4	POOR-FAIR	POOR-FAIR	FAIR
307	4812035.432	607489.461	327 Reynolds St.	Norway Maple	*Acer platanoides*	10.1	6	2	2.4	POOR-FAIR	POOR-FAIR	FAIR
308	4812039.815	607487.904	327 Reynolds St.	White Mulberry	*Morus alba*	10.5,9.9	8	5	6.0	POOR-FAIR	POOR-FAIR	FAIR
309	4812041.258	607486.523	327 Reynolds St.	White Mulberry	*Morus alba*	10.3	6	2	2.4	FAIR	POOR-FAIR	FAIR
310	4812041.44	607486.134	327 Reynolds St.	Manitoba Maple	*Acer platanoides* 'globosum'	14.3	8	4	2.4	FAIR	FAIR	FAIR
311	4812042.196	607485.172	327 Reynolds St.	White Mulberry	*Acer platanoides* 'globosum'	8.7	8	3	1.8	FAIR	FAIR	FAIR
312	4812040.848	607484.007	327 Reynolds St.	White Mulberry	*Thuja occidentalis*	15.3	10	6	2.4	FAIR	FAIR	FAIR
313	4812044.907	607479.603	327 Reynolds St.	Black Walnut	*Thuja occidentalis*	14.3	10	4	2.4	GOOD	GOOD	GOOD
314	4812050.888	607476.265	327 Reynolds St.	Manitoba Maple	*Thuja occidentalis*	16.8,15.1	10	6	2.4	FAIR	FAIR	FAIR
315	4811993.903	607480.366	327 Reynolds St.	Northern Red Oak	*Quercus rubra*	21.0	10	5	2.4	FAIR-GOOD	FAIR-GOOD	FAIR-GOOD
316	4811991.934	607486.35	327 Reynolds St.	Northern Red Oak	*Quercus rubra*	28.7	10	5	2.4	GOOD	FAIR-GOOD	GOOD
317	4811989.829	607490.842	327 Reynolds St.	Northern Red Oak	*Quercus rubra*	24.0	10	5	2.4	GOOD	GOOD	GOOD
318	4811988.232	607496.303	327 Reynolds St.	Northern Red Oak	*Quercus rubra*	27.0	10	5	2.4	GOOD	GOOD	GOOD
319	4811984.556	607506.535	327 Reynolds St.	Northern Red Oak	*Quercus rubra*	23.6	8	4	2.4	GOOD	FAIR-GOOD	GOOD
320	4811984.985	607511.799	327 Reynolds St.	Northern Red Oak	*Quercus rubra*	14.8	6	3	2.4	GOOD	FAIR-GOOD	FAIR
321	4811984.84	607517.632	327 Reynolds St.	Northern Red Oak	*Quercus rubra*	20.1	8	4	2.4	FAIR	GOOD	GOOD
322	4811984.743	607522.575	327 Reynolds St.	Northern Red Oak	*Quercus rubra*	17.7	8	4	2.4	GOOD	GOOD	FAIR-GOOD
323	4811984.813	607527.392	327 Reynolds St.	Northern Red Oak	*Quercus rubra*	21.3	10	5	2.4	GOOD	GOOD	GOOD
324	4811985.384	607533.583	327 Reynolds St.	Northern Red Oak	*Quercus rubra*	21.5	8	4	2.4	GOOD	GOOD	GOOD
325	4811985.621	607538.009	327 Reynolds St.	Northern Red Oak	*Quercus rubra*	13.2	6	3	2.4	GOOD	GOOD	FAIR
326	4811981.434	607548.986	327 Reynolds St.	Norway Maple	*Acer platanoides*	14.2	6	4	2.4	FAIR	FAIR	FAIR
327	4811980.771	607548.018	327 Reynolds St.	Norway Maple	*Acer platanoides*	12.2	6	4	2.4	FAIR	FAIR	FAIR
328	4811979.826	607543.504	327 Reynolds St.	White Spruce	*Picea glauca*	18.6	10	4	2.4	FAIR	FAIR-GOOD	FAIR
329	4811977.802	607540.896	327 Reynolds St.	White Spruce	*Picea glauca*	11.7	6	2	2.4	FAIR	FAIR	POOR
330	4811974.149	607539.081	327 Reynolds St.	White Spruce	*Picea glauca*	7.4	3	2	1.8	FAIR	POOR-FAIR	POOR
331	4811972.662	607541.446	327 Reynolds St.	White Mulberry	*Morus alba*	34.2,22.0,13.4	10	8	3.0	FAIR	FAIR	FAIR
332	4811966.585	607533.943	327 Reynolds St.	White Spruce	*Picea glauca*	9.7	6	3	1.8	POOR-FAIR	FAIR	POOR
333	4811964.158	607535.645	327 Reynolds St.	White Mulberry	*Morus alba*	Est. 30,30	51	8	3.6	POOR	POOR	POOR-FAIR
334	4811963.864	607531.834	327 Reynolds St.	White Spruce	*Picea glauca*	7.8	6	2	1.8	DEAD	DEAD	DEAD
335	4811960.089	607533.49	327 Reynolds St.	Black Walnut	*Juglans nigra*	45.8	16	8	3.0	FAIR	FAIR	FAIR
336	4811960.564	607530.34	327 Reynolds St.	White Spruce	*Picea glauca*	6.6	3	2	1.8	FAIR	POOR	POOR
337	4811957.887	607527.481	327 Reynolds St.	White Spruce	*Picea glauca*	10.8	6	3	2.4	FAIR	FAIR	FAIR
338	4811986.095	607550.373	327 Reynolds St.	Douglas Fir	*Pseudotsuga menziesii*	26.0	12	4	2.4	GOOD	GOOD	FAIR
339	4811988.46	607552.628	327 Reynolds St.	Eastern White Pine	*Pinus strobus*	12.0	6	2	2.4	FAIR	FAIR	POOR
340	4811989.205	607550.764	327 Reynolds St.	Eastern White Pine	*Pinus strobus*	9.0	4	2	1.8	DEAD	DEAD	DEAD
341	4811990.265	607551.984	327 Reynolds St.	Eastern White Pine	*Pinus strobus*	9.5	6	2	1.8	FAIR	FAIR	POOR-FAIR
342	4811994.597	607545.51	327 Reynolds St.	Black Walnut	*Juglans nigra*	48.8	15	8	3.0	GOOD	FAIR-GOOD	FAIR-GOOD
343	4811995.967	607544.571	327 Reynolds St.	Norway Spruce	*Picea abies*	5.5	2	2	1.8	FAIR-GOOD	FAIR	FAIR
344	4812003.332	607536.602	327 Reynolds St.	Black Walnut	*Juglans nigra*	36.2	15	6	3.0	GOOD	FAIR-GOOD	FAIR-GOOD
345	4812006.513	607533.385	327 Reynolds St.	Black Walnut	*Juglans nigra*	37.0	15	6	3.0	FAIR	FAIR	FAIR-GOOD
346	4812008.415	607531.021	327 Reynolds St.	Black Walnut	*Juglans nigra*	40.1	15	7	3.0	FAIR-GOOD	FAIR	FAIR-GOOD
347	4812010.426	607528.95	327 Reynolds St.	White Mulberry	*Morus alba*	43.0,41.0,30.6	15	9	4.2	POOR	FAIR	FAIR
348	4812017.289	607521.984	327 Reynolds St.	Douglas Fir	*Pseudotsuga menziesii*	23.5	12	4	2.4	FAIR	FAIR-GOOD	FAIR-GOOD
349	4812014.954	607520.453	327 Reynolds St.	Manitoba Maple	*Acer negundo*	16.2	8	5	2.4	FAIR	FAIR	FAIR-GOOD
350	4812018.598	607520.133	327 Reynolds St.	Douglas Fir	*Pseudotsuga menziesii*	19.3	10	4	2.4	FAIR	FAIR-GOOD	FAIR
351	4812019.552	607517.486	327 Reynolds St.	Douglas Fir	*Pseudotsuga menziesii*	12.7	6	2	2.4	FAIR	FAIR	FAIR
352	4812021.031	607518.062	327 Reynolds St.	White Mulberry	*Morus alba*	31.2	10	6	3.0	FAIR	FAIR	FAIR
353	4812021.368	607515.531	327 Reynolds St.	Douglas Fir	*Pseudotsuga menziesii*	18.7	10	4	2.4	FAIR	FAIR	FAIR
354	4812025.696	607511.955	327 Reynolds St.	Norway Spruce	*Picea abies*	19.5	10	4	2.4	GOOD	GOOD	GOOD
355	4812028.689	607508.278	327 Reynolds St.	White Spruce	*Picea glauca*	12.8	8	3	2.4	GOOD	GOOD	FAIR-GOOD
356	4812042.279	607492.65	327 Reynolds St.	Northern Red Oak	*Quercus rubra*	82.6	15	10	5.4	GOOD	FAIR-GOOD	FAIR-GOOD
357	4812046.93	607483.623	327 Reynolds St.	Eastern White Pine	*Pinus strobus*	13.8	6	3	2.4	POOR	POOR	FAIR
358	4812048.429	607482.54	327 Reynolds St.	Eastern White Pine	*Pinus strobus*	17	8	3	2.4	POOR-FAIR	FAIR	FAIR
359	4812051.639	607479.745	327 Reynolds St.	Eastern White Pine	*Pinus strobus*	17.4	8	3	2.4	POOR-FAIR	POOR-FAIR	POOR
360	4812054.234	607475.596	327 Reynolds St.	Eastern White Pine	*Pinus strobus*	10.3	6	2	2.4	POOR	POOR-FAIR	POOR-FAIR
361	4812056.36	607476.279	327 Reynolds St.	White Mulberry	*Morus alba*	15.5	8	4	2.4	FAIR-GOOD	FAIR-GOOD	FAIR-GOOD
362	4812057.281	607474.398	327 Reynolds St.	Northern Red Oak	*Quercus rubra*	13.2	8	4	2.4	FAIR	FAIR-GOOD	POOR
363	4812065.435	607470.703	327 Reynolds St.	Northern Red Oak	*Quercus rubra*	31.5	12	8	3.0	FAIR	FAIR	FAIR-GOOD
364	4812064.106	607467.594	327 Reynolds St.	Black Walnut	*Juglans nigra*	19.4	10	6	2.4	GOOD	FAIR-GOOD	GOOD
365	4812066.434	607465.35	327 Reynolds St.	Northern Red Oak	*Quercus rubra*	62.0	12	8	4.2	FAIR	FAIR	FAIR
366	4812066.928	607462.093	327 Reynolds St.	Manitoba Maple	*Acer negundo*	21.5	10	6	2.4	FAIR	FAIR	FAIR
367	4812070.067	607462.061	327 Reynolds St.	Black Walnut	*Juglans nigra*	12.8	10	3	2.4	GOOD	FAIR-GOOD	GOOD
368	4812069.435	607458.53	327 Reynolds St.	Norway Maple	*Acer platanoides*	11.0	8	4	2.4	FAIR	FAIR-GOOD	GOOD
369	4812074.134	607461.777	327 Reynolds St.	Norway Maple	*Acer platanoides*	32.8	12	6	3.0	GOOD	FAIR-GOOD	FAIR-GOOD
370	4812079.962	607453.974	327 Reynolds St.	Norway Maple	*Acer platanoides*	10.3,86	6	3	2.4	POOR	POOR-FAIR	FAIR
371	4812081.516	607453.186	327 Reynolds St.	Black Walnut	*Juglans nigra*	15.6	8	3	2.4	FAIR	FAIR-GOOD	FAIR-GOOD
372	4812082.322	607452.385	327 Reynolds St.	White Mulberry	*Acer platanoides*	9.7	6	3	1.8	FAIR	POOR-FAIR	FAIR

Notes:
1. GHD recommends that Site trees with the potential to be preserved be reassessed upon completion of demolition works.
2. Trees 1-165 were identified in the Arborist Report and Tree Preservation Plan for 327 Reynold Street as prepared by Arborcorp on September 7, 2017. The Arborist Report recommended that 86 trees be removed to facilitate the demolition and removal of existing Site structures. Trees 25, 40-63, 66-95, 98-115, 123-131, and 145-153 were/are proposed for removal.
3. Locations of trees 1-165 are approximate and have been shown for illustrative purposes only.
4. Trees adjacent and southwest of the existing parking garage have been tagged/inventoried (200-series tags). Tree data was unavailable to GHD.
5. Trees 301-372 were inventoried by GHD Ltd. on January 30, 2018. The majority of the remaining Site trees (e.g. Trees 1-165) could not be accessed due to sound barrier hoarding and tree protection fence.
6. Recommended minimum tree protection zone is based on diameter at breast height (DBH) and town of Oakville standards.

Arborist Report and Tree Preservation Plan for
327 Reynold St.
Oakville, ON
L6M 0L8

Prepared for:

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7 September 2017

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Background Information

This report has been prepared in preparation for the application of a Demolition Permit in the Town of Oakville. The owner of this property intends to demolish the exciting buildings on the property. The Arborcorp Tree Experts have been retained to provide an inventory of the existing trees, to give an overview of their current state of health and structure and to monitor the trees condition throughout the construction process. At the time of this inspection no construction activities had been started on this property. This report summarizes our findings and recommendations.

Methodology

The tree inventory and assessment was conducted on September 2, 2017. There are one hundred and sixty-five (165) trees included in this report. The existing trees have been numbered and identified on the site plan provided by DST Consulting Engineers. Each tree was assigned a unique number and detailed data was collected.

A preservation priority rating was assigned to each tree based on its current health and structure. Typically under existing conditions, trees having a high or moderate preservation priority rating are recommended for preservation, and those with a low rating are recommended for removal. Recommendations were assigned to preserve or remove each tree based on its current health and/or structure, and the expected impact from the proposed development. A final recommendation has been made of each tree that takes into account the tree's current biological health, structural condition, and the anticipated development impacts.

The scope of this report involves the identification of the existing trees on the property and to identify tree protection methods throughout the construction process.

Tree valuations for the municipal trees were calculated using the Replacement Cost Method as described in the Guide to Plant Appraisal 9th Edition. Species ratings were determined from the Ontario Supplement of this text.

Municipal Trees

There are forty-two (42) municipal trees included in this report.
(Refer to Appendix 2 for approximate location of trees)

Tree number one (1) is a 36 cm dbh Sugar Maple. This tree is in fair condition and additional protective measures have been recommended.

Tree number two (2) is a 22 cm dbh Blue Spruce. This tree is in fair condition and additional protective measures have been recommended.

Tree number three (3) is a 20 cm dbh Blue Spruce. This tree is in fair condition and additional protective measures have been recommended.

Tree number four (4) is an 18 cm dbh Blue Spruce. This tree is in fair condition and additional protective measures have been recommended.

Tree number five (5) is a 17 cm dbh Blue Spruce. This tree is in fair condition and additional protective measures have been recommended.

Tree number six (6) is an 18 cm dbh Blue Spruce. This tree is in fair condition and additional protective measures have been recommended.

Tree number seven (7) is a 19 cm dbh Blue Spruce. This tree is in fair condition and additional protective measures have been recommended.

Tree number eight (8) is a 19 cm dbh Blue Spruce. This tree is in fair condition and additional protective measures have been recommended.

Tree number nine (9) is a 41 cm dbh Norway Maple. This tree is in fair condition and additional protective measures have been recommended.

Tree number ten (10) is a 23 cm dbh Norway Maple. This tree is in fair condition and additional protective measures have been recommended.

Tree number eleven (11) is a 51 cm dbh Norway Maple. This tree is in good condition and additional protective measures have been recommended.

Tree number twelve (12) is a 38 cm dbh Black Locust. This tree is in good condition and additional protective measures have been recommended.

Tree number thirteen (13) is a 34 cm dbh Norway Maple. This tree is in fair condition and additional protective measures have been recommended.

Tree number fourteen (14) is a 44 cm dbh Norway Maple. This tree is in good condition and additional protective measures have been recommended.

Tree number fifteen (15) is a 45 cm dbh Norway Maple. This tree is in good condition and additional protective measures have been recommended.

Tree number sixteen (16) is a 47 cm dbh Austrian Pine. This tree is in fair condition and additional protective measures have been recommended.

Tree number seventeen (17) is a 31 cm dbh Austrian Pine. This tree is in fair condition and additional protective measures have been recommended.

Tree number eighteen (18) is a 46 cm dbh Norway Maple. This tree is in fair condition and additional protective measures have been recommended.

Tree number nineteen (19) is a 43 cm dbh Austrian Pine. This tree is in fair condition and additional protective measures have been recommended.

Tree number twenty (20) is a 22 cm dbh Norway Maple. This tree is in fair condition and additional protective measures have been recommended.

Tree number twenty-one (21) is a 49 cm dbh Black Locust. This tree is in fair condition and additional protective measures have been recommended.

Tree number twenty-two (22) is a 62 cm dbh Honey Locust. This tree is in good condition and additional protective measures have been recommended.

Tree number twenty-three (23) is a 41 cm dbh White Oak. This tree is in fair condition and additional protective measures have been recommended.

Tree number twenty-four (24) is a 63 cm dbh Honey Locust. This tree is in good condition and additional protective measures have been recommended.

Tree number twenty-five (25) is a 65 cm dbh Honey Locust. This tree is in poor condition and it is recommended for removal.

Tree number twenty-six (26) is a 20 cm dbh Northern Catalpa. This tree is in fair condition and additional protective measures have been recommended.

Tree number twenty-seven (27) is a 44 cm dbh White Oak. This tree is in good condition and additional protective measures have been recommended.

Tree number twenty-eight (28) is a 16 cm dbh Ginko. This tree is in fair condition and additional protective measures have been recommended.

Tree number twenty-nine (29) is a 24 cm dbh Red Oak. This tree is in fair condition and additional protective measures have been recommended.

Tree number thirty (30) is a 50 cm dbh Norway Maple. This tree is in fair condition and additional protective measures have been recommended.

Tree number thirty-one (31) is a 25 cm dbh Northern Catalpa. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and fifty-five (155) is a two stem Manitoba Maple. This tree is in poor condition and additional protective measures have been recommended.

Tree number one hundred and fifty-six (156) is a 25 cm dbh Red Oak. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and fifty-seven (157) is a 26 cm dbh Red Oak. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and fifty-eight (158) is a 27 cm dbh Horse Chestnut. This tree is in poor condition and additional protective measures have been recommended.

Tree number one hundred and fifty-nine (159) is a 27 cm dbh Norway Maple. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and sixty (160) is a 26 cm dbh Red Oak. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and sixty-one (161) is a 34 cm dbh Red Oak. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and sixty-two (162) is a 24 cm dbh Red Oak. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and sixty-three (163) is a 10 cm dbh White Cedar hedge. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and sixty-four (164) is a 28 cm dbh Norway Maple. This tree is in good condition and additional protective measures have been recommended.

Tree number one hundred and sixty-five (165) is a 52 cm dbh Austrian Pine. This tree is in fair condition and additional protective measures have been recommended.

Additional information on these trees can be found in Appendix 1, and a valuation of these trees can be found in Appendix 8.

Neighbouring Trees

There are zero (0) neighbouring trees within 6m of the property line.

Additional information on these trees can be found in Appendix 1.

Observations

There are one hundred and twenty-three (123) privately owned trees on this property.
(Refer to Appendix 2 for approximate location of trees)

Tree number thirty-two (32) is a 25 cm dbh Austrian Pine. This tree is in fair condition and additional protective measures have been recommended.

Tree number thirty-three (33) is a 34 cm dbh Austrian Pine. This tree is in fair condition and additional protective measures have been recommended.

Tree number thirty-four (34) is a 31 cm dbh Austrian Pine. This tree is in fair condition and additional protective measures have been recommended.

Tree number thirty-five (35) is a 20 cm dbh Red Maple. This tree is in fair condition and additional protective measures have been recommended.

Tree number thirty-six (36) is a 34 cm dbh Austrian Pine. This tree is in fair condition and additional protective measures have been recommended.

Tree number thirty-seven (37) is a 26 cm dbh Austrian Pine. This tree is in fair condition and additional protective measures have been recommended.

Tree number thirty-eight (38) is a 26 cm dbh Black Locust. This tree is in fair condition and additional protective measures have been recommended.

Tree number thirty-nine (39) is a two stem Little Leaf Linden. This tree is in fair condition and additional protective measures have been recommended.

Tree number forty (40) is a 65 cm dbh Norway Maple. This tree is in good condition however it is recommended for removal due to development impacts.

Tree number forty-one (41) is a 26 cm dbh White Spruce. This tree is in good condition however it is recommended for removal due to development impacts.

Tree number forty-two (42) is a 32 cm dbh Norway Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number forty-three (43) is an 18 cm dbh Norway Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number forty-four (44) is a 35 cm dbh Manitoba Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number forty-five (45) is a 22 cm dbh Norway Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number forty-six (46) is a 22 cm dbh Black Walnut. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number forty-seven (47) is a 19 cm dbh Chinese Elm. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number forty-eight (48) is an 18 cm dbh Chinese Elm. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number forty-nine (49) is a 23 cm dbh Black Walnut. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number fifty (50) is a 21 cm dbh Black Walnut. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number fifty-one (51) is an 18 cm dbh White Spruce. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number fifty-two (52) is a 33 cm dbh Ivory Silk Lilac. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number fifty-three (53) is a 17 cm dbh Norway Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number fifty-four (54) is a 42 cm dbh Tamarack. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number fifty-five (55) is a 20 cm dbh Chinese Elm. This tree is in poor condition however it is recommended for removal due to development impacts.

Tree number fifty-six (56) is a 25 cm dbh Chinese Elm. This tree is in poor condition however it is recommended for removal due to development impacts.

Tree number fifty-seven (57) is a 22 cm dbh Chinese Elm. This tree is in poor condition however it is recommended for removal due to development impacts.

Tree number fifty-eight (58) is a 23 cm dbh White Spruce. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number fifty-nine (59) is a 44cm dbh Norway Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number sixty (60) is a 28 cm dbh Manitoba Maple. This tree is in poor condition however it is recommended for removal due to development impacts.

Tree number sixty-one (61) is a 26 cm dbh Black Walnut. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number sixty-two (62) is a 19 cm dbh Norway Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number sixty-three (63) is a 25 cm dbh Manitoba Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number sixty-four (64) is a 28 cm dbh Honey Locust. This tree is in good condition and additional protective measures have been recommended.

Tree number sixty-five (65) is a 72 cm dbh Bur Oak. This tree is in good condition and additional protective measures have been recommended.

Tree number sixty-six (66) is a 16 cm dbh Norway Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number sixty-seven (67) is a 20 cm dbh Little Leaf Linden. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number sixty-eight (68) is a 16 cm dbh Bur Oak. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number sixty-nine (69) is a 46 cm dbh Manitoba Maple. This tree is in poor condition however it is recommended for removal due to development impacts.

Tree number seventy (70) is a 21 cm dbh Ivory Silk Lilac. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number seventy-one (71) is a 25 cm dbh Black Walnut. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number seventy-two (72) is a 46 cm dbh Bur Oak. This tree is in good condition however it is recommended for removal due to development impacts.

Tree number seventy-three (73) is a 45 cm dbh Honey Locust. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number seventy-four (74) is a 27 cm dbh Red Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number seventy-five (75) is a three stem Manitoba Maple. This tree is in poor condition however it is recommended for removal due to development impacts.

Tree number seventy-six (76) is a 26 cm dbh Chinese Elm. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number seventy-seven (77) is an 18 cm dbh Eastern Hemlock. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number seventy-eight (78) is an 18 cm dbh Norway Maple. This tree is in good condition however it is recommended for removal due to development impacts.

Tree number seventy-nine (79) is a 28 cm dbh Manitoba Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number eighty (80) is a 19 cm dbh Red Oak. This tree is in good condition however it is recommended for removal due to development impacts.

Tree number eighty-one (81) is a 23 cm dbh Red Oak. This tree is in good condition however it is recommended for removal due to development impacts.

Tree number eighty-two (82) is a 33 cm dbh Norway Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number eighty-three (83) is a 21 cm dbh Red Oak. This tree is in good condition however it is recommended for removal due to development impacts.

Tree number eighty-four (84) is a 29 cm dbh Norway Maple. This tree is in good condition however it is recommended for removal due to development impacts.

Tree number eighty-five (85) is a 46 cm dbh Bur Oak. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number eighty-six (86) is a 17 cm dbh Bur Oak. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number eighty-seven (87) is a 75 cm dbh Bur Oak. This tree is in poor condition however it is recommended for removal due to development impacts.

Tree number eighty-eight (88) is a 76 cm dbh Bur Oak. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number eighty-nine (89) is an 18 cm dbh Mulberry. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number ninety (90) is an 18 cm dbh Mulberry. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number ninety-one (91) is a 17 cm dbh Northern Catalpa. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number ninety-two (92) is a 20 cm dbh Alder. This tree is in poor condition however it is recommended for removal due to development impacts.

Tree number ninety-three (93) is a 41 cm dbh Chinese Elm. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number ninety-four (94) is a 23 cm dbh Northern Catalpa. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number ninety-five (95) is a 23 cm dbh Honey Locust. This tree is in good condition however it is recommended for removal due to development impacts.

Tree number ninety-six (96) is a 35 cm dbh Honey Locust. This tree is in good condition and additional protective measures have been recommended.

Tree number ninety-seven (97) is a 41 cm dbh Honey Locust. This tree is in good condition and additional protective measures have been recommended.

Tree number ninety-eight (98) is a 48 cm dbh Little Leaf Linden. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number ninety-nine (99) is a 50 cm dbh Little Leaf Linden. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred (100) is a 30 cm dbh Little Leaf Linden. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and one (101) is a 50 cm dbh Little Leaf Linden. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and two (102) is a 38 cm dbh Little Leaf Linden. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and three (103) is a 48 cm dbh Little Leaf Linden. This tree is in good condition however it is recommended for removal due to development impacts.

Tree number one hundred and four (104) is a 47 cm dbh Little Leaf Linden. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and five (105) is a 17 cm dbh Norway Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and six (106) is a 19 cm dbh Little Leaf Linden. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and seven (107) is a 51 cm dbh Chinese Elm. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and eight (108) is a 28 cm dbh Honey Locust. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and nine (109) is a 52 cm dbh Black Locust. This tree is in good condition however it is recommended for removal due to development impacts.

Tree number one hundred and ten (110) is a 39 cm dbh Norway Maple. This tree is in good condition however it is recommended for removal due to development impacts.

Tree number one hundred and eleven (111) is a 25 cm dbh Norway Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and twelve (112) is a 20 cm dbh Black Locust. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and thirteen (113) is a 22 cm dbh Black Locust. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and fourteen (114) is a 24 cm dbh Black Locust. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and fifteen (115) is a 23 cm dbh Black Locust. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and sixteen (116) is a 62 cm dbh Austrian Pine. This tree is in good condition and additional protective measures have been recommended.

Tree number one hundred and seventeen (117) is an 18 cm dbh Norway Maple. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and eighteen (118) is an 18 cm dbh Norway Maple. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and nineteen (119) is an 18 cm dbh Norway Maple. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and twenty (120) is a 19 cm dbh Norway Maple. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and twenty-one (121) is a 23 cm dbh Norway Maple. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and twenty-two (122) is a 33 cm dbh Chinese Elm. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and twenty-three (123) is a 22 cm dbh Norway Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and twenty-four (124) is a 61 cm dbh Austrian Pine. This tree is in good condition however it is recommended for removal due to development impacts.

Tree number one hundred and twenty-five (125) is a 23 cm dbh Black Walnut. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and twenty-six (126) is a 20 cm dbh Norway Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and twenty-seven (127) is a 15 cm dbh Norway Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and twenty-eight (128) is an 18 cm dbh Bur Oak. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and twenty-nine (129) is a 33 cm dbh Black Walnut. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and thirty (130) is a 36 cm dbh Norway Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and thirty-one (131) is a 44 cm dbh Norway Maple. This tree is in good condition however it is recommended for removal due to development impacts.

Tree number one hundred and thirty-two (132) is a 35 cm dbh Red Oak. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and thirty-three (133) is an 18 cm dbh White Spruce. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and thirty-four (134) is an 18 cm dbh White Spruce. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and thirty-five (135) is a 16 cm dbh White Spruce. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and thirty-six (136) is a 27 cm dbh Norway Maple. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and thirty-seven (137) is a 26 cm dbh Austrian Pine. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and thirty-eight (138) is an 18 cm dbh Norway Maple. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and thirty-nine (139) is a 26 cm dbh Eastern White Pine. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and forty (140) is a 28 cm dbh Red Oak. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and forty-one (141) is a 19 cm dbh Eastern White Pine. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and forty-two (142) is a 21 cm dbh Red Oak. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and forty-three (143) is a 56 cm dbh Norway Maple. This tree is in poor condition and additional protective measures have been recommended.

Tree number one hundred and forty-four (144) is a 53 cm dbh Norway Maple. This tree is in fair condition and additional protective measures have been recommended.

Tree number one hundred and forty-five (145) is a 68 cm dbh Bur Oak. This tree is in good condition however it is recommended for removal due to development impacts.

Tree number one hundred and forty-six (146) is a 33 cm dbh Norway Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and forty-seven (147) is a 16 cm dbh Red Oak. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and forty-eight (148) is a two stem Canada Yew. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and forty-nine (149) is a 20 cm dbh Columnar Oak. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred and fifty (150) is an 18 cm dbh Norway Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred fifty-one (151) is a 16 cm dbh Norway Maple. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred fifty-two (152) is a 53 cm dbh Bur Oak. This tree is in fair condition however it is recommended for removal due to development impacts.

Tree number one hundred fifty-three (153) is a 77 cm dbh Red Oak. This tree is in good condition however it is recommended for removal due to development impacts.

Additional information on these trees can be found in Appendix 1 and Appendix 2.

Tree Protection Recommendations

The Following recommendations shall serve as guidelines for specific trees. These recommendations are intended to protect specific trees throughout the construction process. Protective tree hoarding shall be constructed according to Town of Oakville specifications and will consist of orange snow fencing with two by four frame top and bottom. The Arborcorp Tree Experts have been retained to ensure that all tree protection measures are being followed.

Refer to Appendix 2 for protection recommendations for trees to be protected.

In addition to these specific recommendations all of the guidelines indicated in Appendix 5 shall be adhered to throughout the construction process. The Arborcorp Tree Experts have been retained to complete all required arboricultural actions.

Conclusions

There are one hundred and sixty-four (164) trees associated with this property, one hundred and sixty-four (164) of which will be affected by the proposed construction. There are forty-two (42) municipal trees associated with this project. Tree preservation recommendations have been made for all trees affected by the proposed construction. There are eighty-six (86) trees recommended for removal. Tree removals shall be carried out in accordance with the Town of Oakville's Private Tree Protection By-Law.

Appendix 1 Detailed Tree Data Graph

Tree No.	Tree Species	Latin Name	Municipal Address	DBH (cm)	Height (m)	Crown Reserve (m)	Crown Height (m)	Biological Health	Structural Conditions	Minimum Required TPZ	Municipal Tree	Recommendation Based on Health & Structure	Recommendation Based on Development Impacts	Final Recommendation	Observations / Comments
1	Maple Sugar (hard maple)	*Acer saccharum*	327	36	9	6	6	M	M	2.4	Y	P	P	P	PP, WNC, RP, ER
2	Spruce Blue	*Picea pungens*	327	22	9	4	8	M	M	2.4	Y	P	P	P	RP, DC
3	Spruce Blue	*Picea pungens*	327	20	9	4	8	M	M	2.4	Y	P	P	P	RP, DC
4	Spruce Blue	*Picea pungens*	327	18	9	4	8	M	M	2.4	Y	P	P	P	Rp, DC
5	Spruce Blue	*Picea pungens*	327	17	9	4	8	M	M	2.4	Y	P	P	P	Rp, DC
6	Spruce Blue	*Picea pungens*	327	18	9	4	8	M	M	2.4	Y	P	P	P	RP, DC
7	Spruce Blue	*Picea pungens*	327	19	9	4	8	M	M	2.4	Y	P	P	P	DC, RP
8	Spruce Blue	*Picea pungens*	327	19	9	4	8	M	M	2.4	Y	P	P	P	LN (M), RP, DC
9	Maple Norway	*Acer platanoides*	327	41	10	8	8	M	M	3	Y	P	P	P	PP, WNC, DC
10	Maple Norway	*Acer platanoides*	327	23	8	6	6	M	M	2.4	Y	P	P	P	RP, ML, FK3@2M
11	Maple Norway	*Acer platanoides*	327	51	10	11	8	H	H	3.6	Y	P	P	P	RP, ML, BR3, DC
12	Locust Black	*Robina pseudoacacia*	327	38	10	6	4	H	H	2.4	Y	P	P	P	DC, SF, ML
13	Maple Norway	*Acer platanoides*	327	34	9	8	7	M	M	2.4	Y	P	P	P	PP, WNC, ML, RP
14	Maple Norway	*Acer platanoides*	327	44	9	9	6	H	H	3	Y	P	P	P	RP, ML, DC
15	Maple Norway	*Acer platanoides*	327	45	10	8	8	H	H	3	Y	P	P	P	PP, WNC, ML, RP
16	Pine Red	*Pinus resinosa*	327	47	8	9	6	M	M	3	Y	P	P	P	VC, RP, ML

Tree No.	Tree Species	Latin Name	Municipal Address	DBH (cm)	Height (m)	Crown Reserve (m)	Crown Height (m)	Biological Health	Structural Conditions	Minimum Required TPZ	Municipal Tree	Recommendation Based on Health & Structure	Recommendation Based on Development Impacts	Final Recommendation	Observations / Comments
17	Pine Red	*Pinus resinosa*	327	31	6	5	5	M	M	2.4	Y	P	P	P	ML, RP, VC
18	Maple Norway	*Acer platanoides*	327	46	10	8	7	M	M	3	Y	P	P	P	DC, SF, BR2, ML, RP
19	Pine Red	*Pinus resinosa*	327	43	10	6	8	M	M	3	Y	P	P	P	RP, ML, DC
20	Maple Norway	*Acer platanoides*	327	22	8	4	5	M	M	2.4	Y	P	P	P	ER, RP, ML
21	Locust Black	*Robina pseudoacacia*	327	49	10	6	8	M	M	3	Y	P	P	P	DC, RP, ML
22	Locust Honey	*Gleditsia triacanthos*	327	62	13	8	10	H	H	4.2	Y	P	P	P	DC, TW, WNC, ML
23	Oak White	*Quercus alba*	327	41	11	6	8	M	M	3	Y	P	P	P	PP, RP, WNC, ML
24	Locust Honey	*Gleditsia triacanthos*	327	63	13	9	8	H	H	4.2	Y	P	P	P	PP, WNC, SC, RP
25	Locust Honey	*Gleditsia triacanthos*	327	65	14	0	0	L	L	4.2	Y	R	R	R	DEAD
26	Catalpa Northern	*Catalpa speciosa*	327	20	10	4	8	M	M	2.4	Y	P	P	P	RP, ML, DC
27	Oak White	*Quercus alba*	327	44	14	8	6	H	H	3	Y	P	P	P	DC, RP, ML, SF
28	Ginko	*Ginko biloba*	327	16	7	4	4	M	M	2.4	Y	P	P	P	PP, WC, ML
29	Oak Red	*Quercus rubra*	327	24	10	6	7	M	M	2.4	Y	P	P	P	RP, ML, DC
30	Maple Norway	*Acer platanoides*	327	50	14	8	12	M	M	3	Y	P	P	P	PP, WNC, LN (L)
31	Catalpa Northern	*Catalpa speciosa*	327	25	9	4	6	M	M	2.4	Y	P	P	P	RP, ML, 50%DW
32	Pine Red	*Pinus resinosa*	327	25	9	5	5	M	M	2.4	N	P	P	P	RP, DC
33	Pine Red	*Pinus resinosa*	327	34	10	6	6	M	M	2.4	N	P	P	P	BR2, RP, DC
34	Pine Red	*Pinus resinosa*	327	31	10	6	6	M	M	2.4	N	P	P	P	DC, RP, SF

Tree No.	Tree Species	Latin Name	Municipal Address	DBH (cm)	Height (m)	Crown Reserve (m)	Crown Height (m)	Biological Health	Structural Conditions	Minimum Required TPZ	Municipal Tree	Recommendation Based on Health & Structure	Recommendation Based on Development Impacts	Final Recommendation	Observations / Comments
35	Maple Red (soft maple)	*Acer rubrum*	327	20	15	5	7	M	M	2.4	N	P	P	P	PP, WNC, RP, ML
36	Pine Red	*Pinus resinosa*	327	34	15	7	8	M	M	2.4	N	P	P	P	PP, BR2, WNC
37	Pine Red	*Pinus resinosa*	327	26	15	5	8	M	M	2.4	N	P	P	P	RP, ML, DC
38	Locust Black	*Robina pseudoacacia*	327	26	15	6	12	M	M	2.4	N	P	P	P	RP, ML, DC
39	Linden Little Leaf	*Tilia cordata*	327	24, 14	9	7	8	M	M	2.4	N	P	P	P	ST, SC, RP, ML
40	Maple Norway	*Acer platanoides*	327	65	16	11	15	H	H	4.2	N	P	R	R	SF, DC, RP, ER
41	Spruce White	*Picea glauca*	327	26	16	7	15	H	H	2.4	N	P	R	R	RP, DC, SF
42	Maple Norway	*Acer platanoides*	327	32	13	8	11	M	M	2.4	N	P	R	R	DC, RP, ML, PP
43	Maple Norway	*Acer platanoides*	327	18	15	3	13	M	M	2.4	N	P	R	R	RP, ML, DC, SF
44	Maple Manitoba	*Acer negundo*	327	35	15	6	12	M	M	2.4	N	P	R	R	PP, WNC, RP
45	Maple Norway	*Acer platanoides*	327	22	13	4	10	M	M	2.4	N	P	R	R	PP, WC, ML
46	Walnut Black	*Juglans nigra*	327	22	13	7	6	M	M	2.4	N	P	R	R	RP, ML, LN (L)
47	Elm Chinese	*Ulmus parvifolia*	327	19	14	2	4	M	M	2.4	N	P	R	R	PP, WNC, SC
48	Elm Chinese	*Ulmus parvifolia*	327	18	15	2	3	M	M	2.4	N	P	R	R	PP, WNC, ML
49	Walnut Black	*Juglans nigra*	327	23	14	5	6	M	M	2.4	N	P	R	R	LN (L), RP, ML
50	Walnut Black	*Juglans nigra*	327	21	13	5	6	M	M	2.4	N	P	R	R	ML, RP
51	Spruce White	*Picea glauca*	327	18	13	6	12	M	M	2.4	N	P	R	R	DC, RP
52	Lilac Ivory Silk	*Syringa reticulata 'Ivory Silk'*	327	33	7	8	6	M	M	2.4	N	P	R	R	ML, DC, BR2,

Tree No.	Tree Species	Latin Name	Municipal Address	DBH (cm)	Height (m)	Crown Reserve (m)	Crown Height (m)	Biological Health	Structural Conditions	Minimum Required TPZ	Municipal Tree	Recommendation Based on Health & Structure	Recommendation Based on Development Impacts	Final Recommendation	Observations / Comments
53	Maple Norway	*Acer platanoides*	327	17	13	5	8	M	M	2.4	N	P	R	R	RP, ML, DC, ER
54	Tamarack	*Larix laricina*	327	42	16	6	13	M	M	3	N	P	R	R	VC, RP, DC
55	Elm Chinese	*Ulmus parvifolia*	327	20	14	3	11	L	L	2.4	N	P	R	R	ML, RP, ST
56	Elm Chinese	*Ulmus parvifolia*	327	25	14	2	10	L	L	2.4	N	P	R	R	PP, WNC, SC
57	Elm Chinese	*Ulmus parvifolia*	327	22	14	3	10	L	L	2.4	N	P	R	R	PP, WNC, ST, SC, RP
58	Spruce White	*Picea glauca*	327	23	12	5	11	M	M	2.4	N	P	R	R	RP, DC, ER, VC
59	Maple Norway	*Acer platanoides*	327	44	12	8	10	M	M	3	N	P	R	R	DC, RP, ML, ER
60	Maple Manitoba	*Acer negundo*	327	28	10	6	8	L	L	2.4	N	P	R	R	Ln (h), RP, ML
61	Walnut Black	*Juglans nigra*	327	26	8	7	5	M	M	2.4	N	P	R	R	PP, WNC, RP, DC
62	Maple Norway	*Acer platanoides*	327	19	9	4	5	M	M	2.4	N	P	R	R	PP, WC, RP, ML
63	Maple Manitoba	*Acer negundo*	327	25	10	7	8	M	M	2.4	N	P	R	R	RP, ML, SC, ST, TW
64	Locust Honey	*Gleditsia triacanthos*	327	28	8	7	6	H	H	2.4	N	P	P	P	RP, PP, WNC, DC
65	Oak Bur	*Quercus macrocarpa*	327	72	15	9	11	H	H	4.8	N	P	P	P	SC, ST, VC, RP
66	Maple Norway	*Acer platanoides*	327	16	8	6	6	M	M	2.4	N	P	R	R	ER, GR, RP, ML
67	Linden Little Leaf	*Tilia cordata*	327	20	9	6	7	M	M	2.4	N	P	R	R	Er, RP, ML, PP
68	Oak Bur	*Quercus macrocarpa*	327	16	9	5	7	M	M	2.4	N	P	R	R	RP, ML, BR
69	Maple Manitoba	*Acer negundo*	327	46	12	8	9	L	L	3	N	P	R	R	VC, RP, ML, PP, FB

Tree No.	Tree Species	Latin Name	Municipal Address	DBH (cm)	Height (m)	Crown Reserve (m)	Crown Height (m)	Biological Health	Structural Conditions	Minimum Required TPZ	Municipal Tree	Recommendation Based on Health & Structure	Recommendation Based on Development Impacts	Final Recommendation	Observations / Comments
70	Lilac Ivory Silk	*Syringa reticulata 'Ivory Silk'*	327	21	8	7	6	M	M	2.4	N	P	R	R	PP, WNC, TW
71	Walnut Black	*Juglans nigra*	327	25	12	8	10	M	M	2.4	N	P	R	R	RP, ML, DC
72	Oak Bur	*Quercus macrocarpa*	327	46	14	13	12	H	H	3	N	P	R	R	VC, RP, ML, PP, WNC
73	Locust Honey	*Gleditsia triacanthos*	327	45	14	10	12	M	M	3	N	P	R	R	PP, WC, ML, RP
74	Maple Red (soft maple)	*Acer rubrum*	327	27	9	6	8	M	M	2.4	N	P	R	R	DC, RP, TOB
75	Maple Manitoba	*Acer negundo*	327	20, 16, 15	8	7	7	L	L	2.4	N	P	R	R	PP, WNC, ST
76	Elm Chinese	*Ulmus parvifolia*	327	26	12	5	11	M	M	2.4	N	P	R	R	RP, ML, ST, SC
77	Hemlock Eastern	*Tsuga canadensis*	327	18	12	4	11	M	M	2.4	N	P	R	R	DC, ER, RP
78	Maple Norway	*Acer platanoides*	327	18	12	5	11	H	H	2.4	N	P	R	R	ER, RP, ML, PP, WNC
79	Maple Manitoba	*Acer negundo*	327	28	13	7	10	M	M	2.4	N	P	R	R	ER, RP, SC, ML
80	Oak Red	*Quercus rubra*	327	19	12	8	9	H	H	2.4	N	P	R	R	LN (L), RP, ML, GR
81	Oak Red	*Quercus rubra*	327	23	12	8	10	H	H	2.4	N	P	R	R	RP, SG, LN (L)
82	Maple Norway	*Acer platanoides*	327	33	14	9	10	M	M	2.4	N	P	R	R	PP, WC, RP, ML
83	Oak Red	*Quercus rubra*	327	21	10	5	7	H	H	2.4	N	P	R	R	PP, WC, ER, DC
84	Maple Norway	*Acer platanoides*	327	29	13	8	11	H	H	2.4	N	P	R	R	PP, WNC, ER, DC
85	Oak Bur	*Quercus macrocarpa*	327	46	12	6	9	M	M	3	N	P	R	R	ST, SC, RP, ML, UW

Tree No.	Tree Species	Latin Name	Municipal Address	DBH (cm)	Height (m)	Crown Reserve (m)	Crown Height (m)	Biological Health	Structural Conditions	Minimum Required TPZ	Municipal Tree	Recommendation Based on Health & Structure	Recommendation Based on Development Impacts	Final Recommendation	Observations / Comments
86	Oak Bur	*Quercus macrocarpa*	327	17	9	5	8	M	M	2.4	N	P	R	R	ML, DC, ST
87	Oak Red	*Quercus rubra*	327	75	17	0	0	L	L	4.8	N	R	R	R	DEAD
88	Oak Red	*Quercus rubra*	327	76	17	10	15	M	M	4.8	N	P	R	R	SC, RP, UW, ST, PP, WNC
89	Mulberry Common	*Morus* spp.	327	18	6	5	6	M	M	2.4	N	P	R	R	SC, RP, ML
90	Mulberry Common	*Morus* spp.	327	18	6	5	6	M	M	2.4	N	P	R	R	SC, RP, ML
91	Catalpa Northern	*Catalpa speciosa*	327	17	9	3	6	M	M	2.4	N	P	R	R	DC, RP, ML, PP, WC
92	Alder	*Alnus* spp.	327	20	4	5	3	L	L	2.4	N	P	R	R	PC, RP, ML, VC
93	Elm Chinese	*Ulmus parvifolia*	327	41	11	7	7	M	M	3	N	P	R	R	PP, WC, SC, ML
94	Catalpa Northern	*Catalpa speciosa*	327	23	10	5	8	M	M	2.4	N	P	R	R	PP, WMC, ST, CT, ML
95	Locust Honey	*Gleditsia triacanthos*	327	23	10	7	8	H	H	2.4	N	P	R	R	DC, RP, ML
96	Locust Honey	*Gleditsia triacanthos*	327	35	10	7	8	H	H	2.4	N	P	P	P	PP, WC, DC, SC
97	Locust Honey	*Gleditsia triacanthos*	327	41	10	9	8	H	H	3	N	P	P	P	ER, RP, ML, DC, PP, WNC
98	Linden Little Leaf	*Tilia cordata*	327	48	14	11	11	M	M	3	N	P	R	R	ER, RP, DC, ML
99	Linden Little Leaf	*Tilia cordata*	327	50	14	12	12	M	M	3	N	P	R	R	ER, GR, RP, ML, PP, WNC

Tree No.	Tree Species	Latin Name	Municipal Address	DBH (cm)	Height (m)	Crown Reserve (m)	Crown Height (m)	Biological Health	Structural Conditions	Minimum Required TPZ	Municipal Tree	Recommendation Based on Health & Structure	Recommendation Based on Development Impacts	Final Recommendation	Observations / Comments
100	Linden Little Leaf	*Tilia cordata*	327	30	9	7	6	M	M	2.4	N	P	R	R	LN (L, RP, ML, ER
101	Linden Little Leaf	*Tilia cordata*	327	50	13	10	11	M	M	3	N	P	R	R	ER, GR, RP, ML, DC
102	Linden Little Leaf	*Tilia cordata*	327	38	13	10	10	M	M	2.4	N	P	R	R	GR, ER, RP, ML
103	Linden Little Leaf	*Tilia cordata*	327	48	14	12	12	H	H	3	N	P	R	R	ER, GR, SG, ML
104	Linden Little Leaf	*Tilia cordata*	327	47	14	11	11	M	M	3	N	P	R	R	GR, ER, RP, ML
105	Maple Norway	*Acer platanoides*	327	17	10	4	8	M	M	2.4	N	P	R	R	DC, RP, ML
106	Linden Little Leaf	*Tilia cordata*	327	19	10	5	9	M	M	2.4	N	P	R	R	RP, ML, PP, WC
107	Elm Chinese	*Ulmus parvifolia*	327	51	14	7	8	M	M	3.6	N	P	R	R	PP, WNC, RP, ML
108	Locust Honey	*Gleditsia triacanthos*	327	28	14	6	6	M	M	2.4	N	P	R	R	DC, RP, ML
109	Locust Black	*Robina pseudoacacia*	327	52	15	8	9	H	H	3.6	N	P	R	R	DC, ML, PP, WC
110	Maple Norway	*Acer platanoides*	327	39	13	10	10	H	H	2.4	N	P	R	R	PP, WNC, DC, ML
111	Maple Norway	*Acer platanoides*	327	25	13	8	12	M	M	2.4	N	P	R	R	CT, TW, RP, ML
112	Locust Black	*Robina pseudoacacia*	327	20	12	5	8	M	M	2.4	N	P	R	R	RP, ML, TOB
113	Locust Black	*Robina pseudoacacia*	327	22	12	6	8	M	M	2.4	N	P	R	R	RP, ML, ER, TOB
114	Locust Black	*Robina pseudoacacia*	327	24	12	4	8	M	M	2.4	N	P	R	R	TOB, RP, ML
115	Locust Black	*Robina pseudoacacia*	327	23	13	5	7	M	M	2.4	N	P	R	R	VC, RP, ML, TW, WNC

Tree No.	Tree Species	Latin Name	Municipal Address	DBH (cm)	Height (m)	Crown Reserve (m)	Crown Height (m)	Biological Health	Structural Conditions	Minimum Required TPZ	Municipal Tree	Recommendation Based on Health & Structure	Recommendation Based on Development Impacts	Final Recommendation	Observations / Comments
116	Pine Red	*Pinus resinosa*	327	62	12	8	7	H	H	4.2	N	P	P	P	DC, RP, ML
117	Maple Norway	*Acer platanoides*	327	18	11	6	8	M	M	2.4	N	P	P	P	DC, LS ML RP
118	Maple Norway	*Acer platanoides*	327	18	11	7	8	M	M	2.4	N	P	P	P	RP, ML, DC
119	Maple Manitoba	*Acer negundo*	327	18	10	5	8	M	M	2.4	N	P	P	P	LN (M), RP, ML
120	Maple Norway	*Acer platanoides*	327	19	11	8	8	M	M	2.4	N	P	P	P	RP, ML, ST, SC
121	Maple Norway	*Acer platanoides*	327	23	12	7	10	M	M	2.4	N	P	P	P	CT, RP, ML, PP, WC
122	Elm Chinese	*Ulmus parvifolia*	327	33	12	8	10	M	M	2.4	N	P	P	P	LN (L), RP, ML, SC
123	Maple Norway	*Acer platanoides*	327	22	13	6	12	M	M	2.4	N	P	R	R	ER, RP, ML, PP, WC
124	Pine Red	*Pinus resinosa*	327	61	13	9	8	H	H	4.2	N	P	R	R	VC, RP, ML, DC
125	Walnut Black	*Juglans nigra*	327	23	12	7	9	M	M	2.4	N	P	R	R	RP, ML, RP, DC
126	Maple Norway	*Acer platanoides*	327	20	12	5	8	M	M	2.4	N	P	R	R	VC, RP, PP, WC
127	Maple Norway	*Acer platanoides*	327	15	10	5	8	M	M	2.4	N	P	R	R	DC, VC, RP
128	Oak Bur	*Quercus macrocarpa*	327	18	10	6	7	M	M	2.4	N	P	R	R	VC, RP, ML, PP, WC
129	Walnut Black	*Juglans nigra*	327	33	12	9	10	M	M	2.4	N	P	R	R	VC, RP, ML, DC
130	Maple Norway	*Acer platanoides*	327	36	11	9	9	M	M	2.4	N	P	R	R	PP, WC, ML, RP
131	Maple Norway	*Acer platanoides*	327	44	13	10	11	H	H	3	N	P	R	R	PP, WC, ER, GR, ML

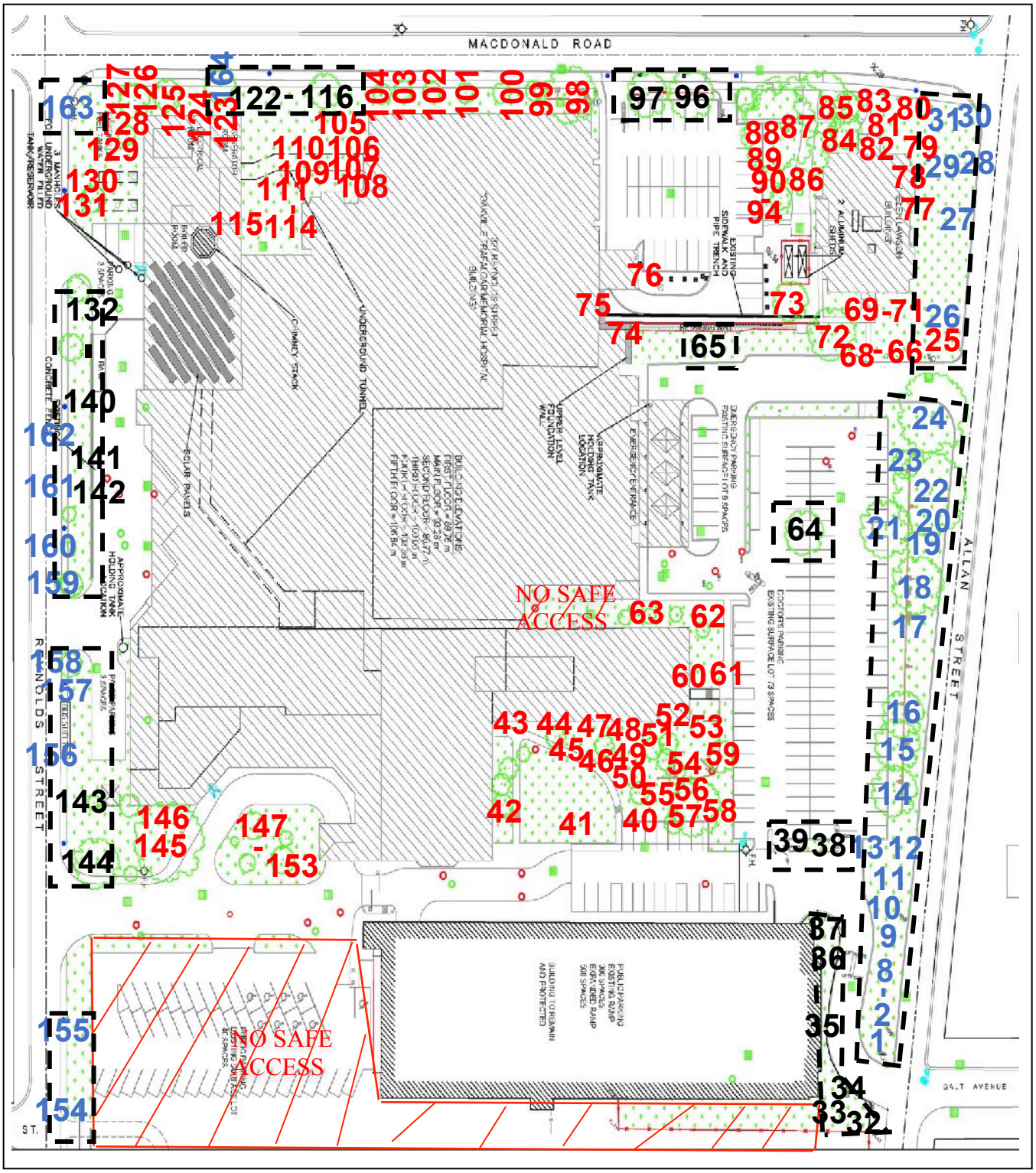
Tree No.	Tree Species	Latin Name	Municipal Address	DBH (cm)	Height (m)	Crown Reserve (m)	Crown Height (m)	Biological Health	Structural Conditions	Minimum Required TPZ	Municipal Tree	Recommendation Based on Health & Structure	Recommendation Based on Development Impacts	Final Recommendation	Observations / Comments
132	Oak Red	*Quercus rubra*	327	35	11	8	9	M	M	2.4	N	P	P	P	UW, RP, ML
133	Spruce White	*Picea glauca*	327	18	11	4	10	M	M	2.4	N	P	P	P	UW, DC, RP
134	Spruce White	*Picea glauca*	327	18	11	4	10	M	M	2.4	N	P	P	P	DC, UW, RP
135	Spruce White	*Picea glauca*	327	16	8	4	7	M	M	2.4	N	P	P	P	VC, RP, ML
136	Maple Norway	*Acer platanoides*	327	27	11	8	8	M	M	2.4	N	P	P	P	VC, UW, RP
137	Pine Red	*Pinus resinosa*	327	26	10	6	9	M	M	2.4	N	P	P	P	DC, RP
138	Maple Norway	*Acer platanoides*	327	18	11	7	8	M	M	2.4	N	P	P	P	RP, ML, PP, WC
139	Pine Eastern White	*Pinus strobus*	327	26	11	7	8	M	M	2.4	N	P	P	P	PP, WNC, RP
140	Oak Red	*Quercus rubra*	327	28	11	9	9	M	M	2.4	N	P	P	P	UW, RP, MI
141	Pine Eastern White	*Pinus strobus*	327	19	11	6	9	M	M	2.4	N	P	P	P	DC, PP
142	Oak Red	*Quercus rubra*	327	21	11	8	9	M	M	2.4	N	P	P	P	VC, RP, ML, UW
143	Maple Norway	*Acer platanoides*	327	56	10	7	6	L	L	3.6	N	P	P	P	PP, UW, WNC, 15%LC
144	Maple Norway	*Acer platanoides*	327	53	10	9	8	M	M	3.6	N	P	P	P	RP, ML, PP, WNC, ER
145	Oak Bur	*Quercus macrocarpa*	327	68	15	12	13	H	H	4.2	N	P	R	R	PP, WNC, RP, DC, SF
146	Maple Norway	*Acer platanoides*	327	33	13	11	9	M	M	2.4	N	P	R	R	RP, ML, RC1

Tree No.	Tree Species	Latin Name	Municipal Address	DBH (cm)	Height (m)	Crown Reserve (m)	Crown Height (m)	Biological Health	Structural Conditions	Minimum Required TPZ	Municipal Tree	Recommendation Based on Health & Structure	Recommendation Based on Development Impacts	Final Recommendation	Observations / Comments
147	Oak Red	*Quercus rubra*	327	16	12	6	10	M	M	2.4	N	P	R	R	DC, RP, ML
148	Yew Canada	*Taxus canadensis*	327	13, 14	7	7	5	M	M	2.4	N	P	R	R	PC, RP
149	Oak Columnar	*Quercus robur 'Fastigiata'*	327	20	12	9	9	M	M	2.4	N	P	R	R	BR, RP, ML, SC
150	Maple Norway	*Acer platanoides*	327	18	12	7	9	M	M	2.4	N	P	R	R	DC, RP, ML, ER
151	Maple Norway	*Acer platanoides*	327	16	12	7	9	M	M	2.4	N	P	R	R	ER, ML, RP
152	Oak Bur	*Quercus macrocarpa*	327	53	13	10	8	M	M	3.6	N	P	R	R	VC, RP, ML
153	Oak Red	*Quercus rubra*	327	77	13	15	8	H	H	4.8	N	P	R	R	PP, WC, DC, SF
154	Maple Manitoba	*Acer negundo*	327	22, 22	9	7	7	L	L	2.4	Y	P	P	P	UW, RP, ML, TK2, RW
155	Oak Red	*Quercus rubra*	327	25	9	6	7	M	M	2.4	Y	P	P	P	UW, RP, ML, PC
156	Oak Red	*Quercus rubra*	327	26	11	8	9	M	M	2.4	Y	P	P	P	UW, PP, WC, RP
157	Horsechestnut	*Aesculus hippocastanum*	327	27	10	6	6	L	L	2.4	Y	P	P	P	UW, RP, ML, DE
158	Maple Norway	*Acer platanoides*	327	27	10	4	7	L	L	2.4	Y	P	P	P	UW, RP, ML, PP, WNC
159	Oak Red	*Quercus rubra*	327	26	11	6	8	M	M	2.4	Y	P	P	P	UW, DC, RP, ML, ER
160	Oak Red	*Quercus rubra*	327	34	11	5	9	M	M	2.4	Y	P	P	P	PP, WNC, ER, GR, ML

Tree No.	Tree Species	Latin Name	Municipal Address	DBH (cm)	Height (m)	Crown Reserve (m)	Crown Height (m)	Biological Health	Structural Conditions	Minimum Required TPZ	Municipal Tree	Recommendation Based on Health & Structure	Recommendation Based on Development Impacts	Final Recommendation	Observations / Comments
161	Oak Red	*Quercus rubra*	327	24	11	7	9	M	M	2.4	Y	P	P	P	UW, RP, PP, WNC, LN (L)
162	Cedar White	*Thuja occidentalis*	327	10	2	1	2	M	M	1.8	Y	P	P	P	TK10, RP, ML
163	Maple Norway	*Acer platanoides*	327	28	12	6	9	H	H	2.4	Y	P	P	P	UW, RP, VC, PP, WC
164	Pine Red	*Pinus resinosa*	327	52	12	8	7	H	H	3.6	Y	P	P	P	UW, ML, PP, WC, VC

Items highlighted in yellow are recommended for removal
Trees highlighted in green are municipally owned

Appendix 2 Tree Locations



Note: The proposed Tree Protection Zone (TPZ) hoarding shown as – – lines and are not to scale on this drawing

Appendix 3 Tree Inventory Methodology

DBH (cm) Diameter at breast height, 1.4m above ground, measured in centimeters.

Height (m) Height of tree from ground to top of crown.

Crown Reserve (m) Crown diameter (tree's canopy) measured at intervals of 1, 3, 5, 7.5, 10, 15 meters.

Biological Health Related to presence and extent of disease/disease symptoms and the vigour of the tree.
H (high) - No disease or disease symptoms present, moderate to high vigour.
M (Moderate) - Presence of minor diseases/disease symptoms, and/or moderate vigour.
L (Low) - Presence of diseases/disease symptoms, and/or severely poor vigour.

Structure Condition Related to defects in a tree's structure, (i.e., lean, co dominant stems).
H (High) - No structural defects, well-developed crown.
M (Moderate) - Presence of minor structural defects.
L (Low) - Presence of major structural defects.

Position on Site AP—above ground planter; ED - edge of forest or woodland; IN– interior of forest or woodland; HR - hedgerow, or group of trees in a line; OG-open grown; PI - planting island.

Preservation Priority A rating of each tree's projected survival related to existing conditions.

1 (high) - high to moderate biological health, and well developed crown. Well suited as a shade tree of screen planting. Will survive existing conditions indefinitely.
2 (moderate) - one or more moderate to severe defects in biological health and/or structural condition. Marginally suited as a shade tree or screen planting. Can survive at least 3 - 5 years under existing conditions. This category also includes stock planted within past 2 years that is not yet established.
3 (low) - low biological health and/or severely damaged/defective structural condition, and/or unsuitable for urban uses. If biologically defective, survival for more than 1 - 3 years under existing conditions is unlikely.

Tree Location Tree is located on Subject Property – S; Tree is located on neighbouring property – N; Tree is located on property line – PL

Municipal tree Tree is located on the property of the local municipality/town. Y = Municipal tree.

Site Dev. Impact Impact to tree is anticipated from proposed development at or near the tree, and/or grade changes (cut/fill) of which the tree is not likely to survive. 1 - Site dev. impact.

Rec. Action A recommendation to preserve or remove a tree based on i) anticipated impacts from proposed development, ii) the tree's current biological health and structural condition, and iii) having a moderate to high hazard potential.
P (preserve) - tree having moderate to high biological health and moderate to low structural defects. Tree is likely to survive at least 3-5 years.
R (remove) - tree having low biological health and/or severe structural defects, and is not likely to survive more than 1-3 years, and/or will not survive proposed development.
C (conditional) - tree's preservation or removal is related to potential relocation/modification of the limit of construction, and/or known treatments that will likely improve the biological health and/or structural condition of the tree. May require review of tree's condition, e.g., roots, at time of construction/excavation. Also applies to trees that may require further or regular evaluation.

Action Priority A rating, which relates to the urgency of treatment(s). H - high (immediate), M - moderate (within 2 years), L - low (little or no action required)

Appendix 4 Tree Inventory Methodology

1-SD= 1 SIDED CROWN
BC= BROKEN CROWN
BN= BARK NECROSIS
BR= BROKEN BRANCH
BSD= BASAL TRUNK DAMAGE
BT= BENT TRUNK
CD= CROWN DIEBACK
CK= CHLORONIC LEAVES
CL= CROWN NECROSIS
CT= CROOKED CROWN
DC= DELEVOPED CROWN FORM
DE= DISEASED
DED= DUTCH ELM DISEASE
DF= DEFOLIATED
DL= DEVELOP LEADER
DW= DEADWOOD
ER= EXPOSED ROOTS
ETB= ENLARGED TRUNK BASE
FK#@XM= # OF TRUNKS, HT. ABOVE GROUND
FC= FROST CRACKS
GC= ANTICIPATED IMPACT FROM GRADE CHANGE
GR= GIRDLING ROOT (S)
HP= HAZARD POTENTAIL OF TREE
IU= INSPECT UNDER SOIL FOR WIRES/ STRINGS/ETC
LC= LIVE CROWN, LC 20%- 20% LIVE CROWN
LN= LEAN: L (LOW, <5°), M (MODERATE, 5-15°), (HIGH, >15°); (N, E, S, W) INDICATES DIRECTION OF LEAN
LS= LIGHT SUPPRESSED
MB= MULTI-BRANCH NODE ON TRUNK
ML= MULTIPLE LEADERS
OS= OFF SITE TREE
PC= POLLARDED CROWN
PL= POOR LEADER DEVELPOMENT
PP= PAST PRUNING
PTH= PLANTED TO HIGH
PTL= PLANTED LOW
RAC= REVIEW ACTION DURING CONSTRUCTION
RB= REMOVE BASKET/ BURLAP
RC (#)= REQUIRES CABLING AND NUMBER
RM= REMOVE PLANT
RP= REQUIRES PRUNING AND/OR THINNING
RS= REMOVE STRING/ TAG/ WIRE
RU= REMOVE TREE TO PROMOTE UNDERSTORY
SB= SPROUTS AT TRUNK BASE
SC= SPROUTS IN CROWN
SF= SUPERIOR TREE FORM
ST= SPROUTS ON TRUNK
TC= THIN CROWN (REDUCED FOLIAGE)
TD= TRUNK DECAY
TG= TRUNK/ STEM GIRDLING ROOT
TK (#)= MULTIPLE TRUNKS AT OR BELOW GROUND
TOB= LOCATED AT TOP OF BANK
TP= TRANSPLANT POTENTIAL
TNR= TRANSPLANT NOT RECOMMENDED
TRS= TRANSPLANT STRESS
TS= TRUNK SPLIT
TT= TWISTED TRUNK
TW= TRUNK WOUND
UC= UNBALANCED CROWN (N, E, S, W) INDICATES WEIGHTED SIDE OF CROWN
UW= TREE UNDER/ OVER POWER WIRES
VC= VINE COVERED
WC= WOUND COMPARMENTALIZED
WNC= WOUND NOT COMPARTMENTALIZED

Directions (N, S, E, W)
(L-S) = minor lean to the south

Quantified Conditions (defects, diseases) e.g. LN
L (low, minor), M (moderate), H (high, severe)
e.g. CT (H) = severely crooked stem

Appendix 5 Management Recommendations

The following steps should be taken to remove trees, to assess the conditions of trees at time of tree works and excavation, and to protect trees identified for preservation. A qualified arborist or professional forester should oversee implementation of tree works.

A. Prior to Construction:

1 Mark trees for treatments as outlined in the detailed tree assessment descriptions. Ensure that branches and/or trees are removed so as not to damage trees to be preserved. Prune trees to correct/improve structure; remove deadwood, snags, and clear limbs that are likely to be impacted from proposed structures. Treatments are to be carried out prior to commencement of construction. Details of tree pruning and thinning recommendations are to be provided at the time of tree work activities.

2 Erect tree protection fencing (1.5 meter high plywood hoarding, paige wire fencing or equivalent) around trees to be preserved approximately 1 meter outside the drip line of the trees. Where this is not possible and changes to grades will occur within the tree's drip line, onsite inspection is required to identify the full and precise extent of disturbance to each tree and to determine additional protection measures. However if more than 25% of the root system is to be compromised, preservation is not recommended.

3 Identify areas on site to be used to stockpile and store soils, supplies and materials so that they do not impact trees to be preserved. Do not pile materials within the drip line of the trees to be preserved.

4 Identify and locate routes to be used by large, heavy excavation and building machinery. Do not drive equipment within the drip line of trees to be preserved.

B. During Construction:

1 Excavation works near trees to be preserved must be conducted carefully so as to minimize impacts. Where necessary, pruning of excavated or damaged roots and limbs should be conducted by qualified personnel. All exposed roots of trees to be preserved must be kept moist and covered at all times.

2 On-site guidance to preserve/remove trees based on underground findings at time of excavation is recommended.

C. Following Construction Including Lot Grading:

1 Fertilize trees that receive crown/root pruning with a slow release fertilizer. In the absence of soil and/or foliar nutrient analysis, a fertilizer ratio of 3:1:1 should be used.

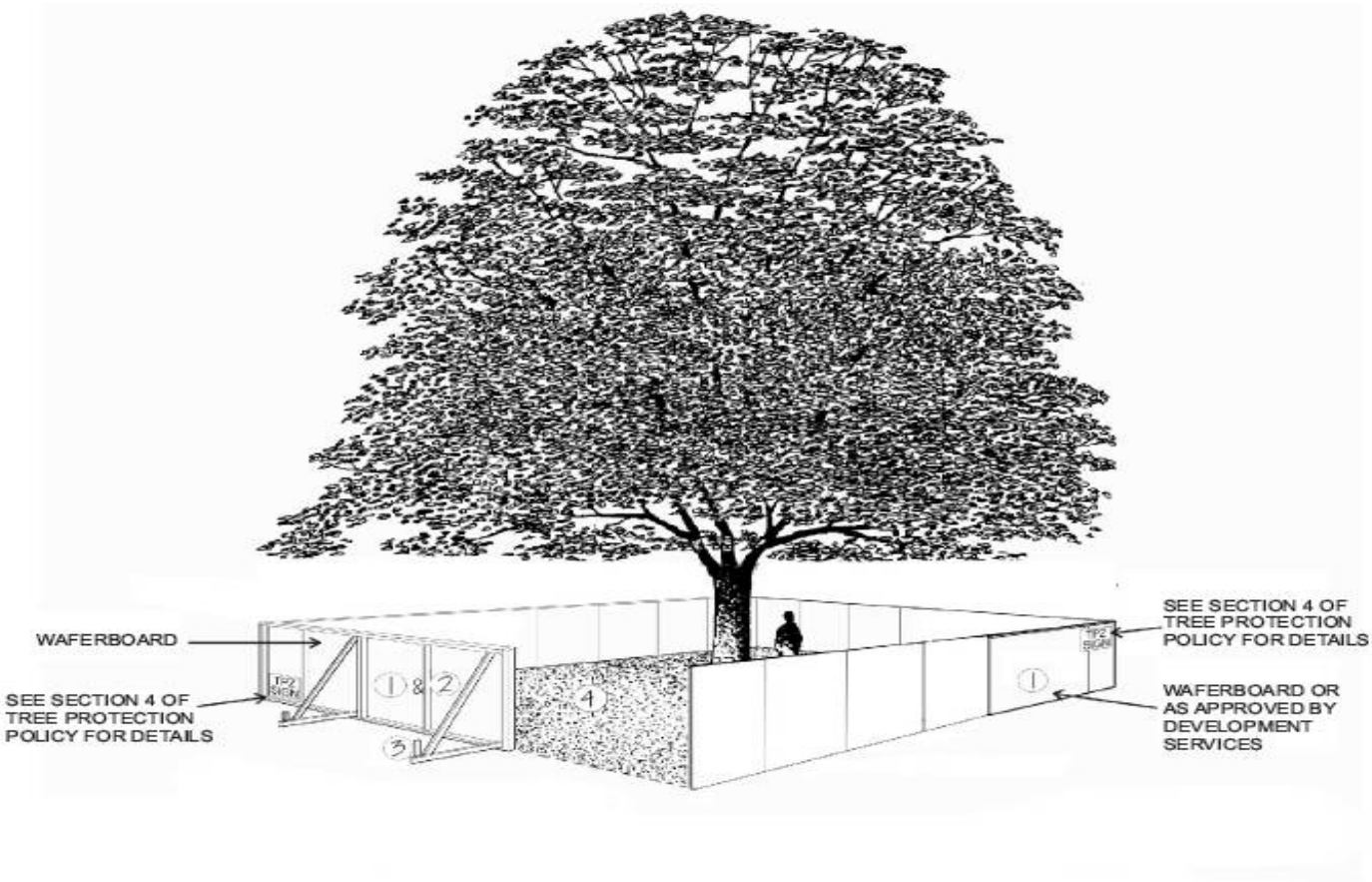
2 Where possible and in consultation with the arborist/landscape architect apply a mixture of wood chips and ¾ clear gravel over tree root zones that may be encroached. Depth of cover and extent of area covered shall be determined on a per case basis.

3 Use light soils where fill is required up to a depth of 6 inches. Where depth of fill is greater than 6 inches, retaining wall structures and/or vertical mulching are recommended. Local drainage patterns within the root zones of trees to be preserved should be maintained as existing.

4 Monitor the health and condition of trees annually for 5 years.

Appendix 6 Tree Protection Barriers

Tree Protection Procedure EN-TRE-001-001



① Tree protection barriers must be 1.2m (4ft.) high, waferboard hoarding or an equivalent approved by Development Services.

② Where earthworks material is to be temporarily located near a tree protection barrier, plywood must be used to ensure no material enters the Tree Protection Zone.

③ All supports and bracing should be outside the Tree Protection Zone. All such supports should minimize damaging roots outside the Tree Protection Barrier.

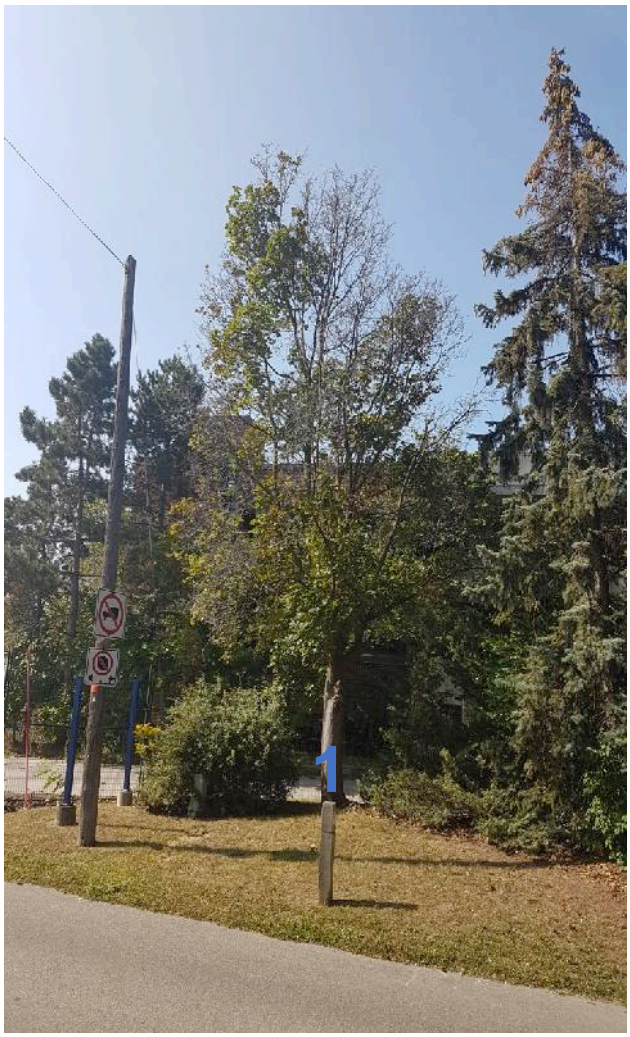
④ No construction activity, grade changes, surface treatment, or excavations of any kind is permitted within the Tree Protection Zone.

Tree Protection Zones

Trunk Diameter (DBH)	Minimum Protection Distances Required
Less than 10cm	1.8m
11-40cm	2.4m
41-50cm	3.0m
51-60cm	3.6m
61-70cm	4.2m
71-80cm	4.8m
81-90cm	5.4m
91-100+cm	6.0m

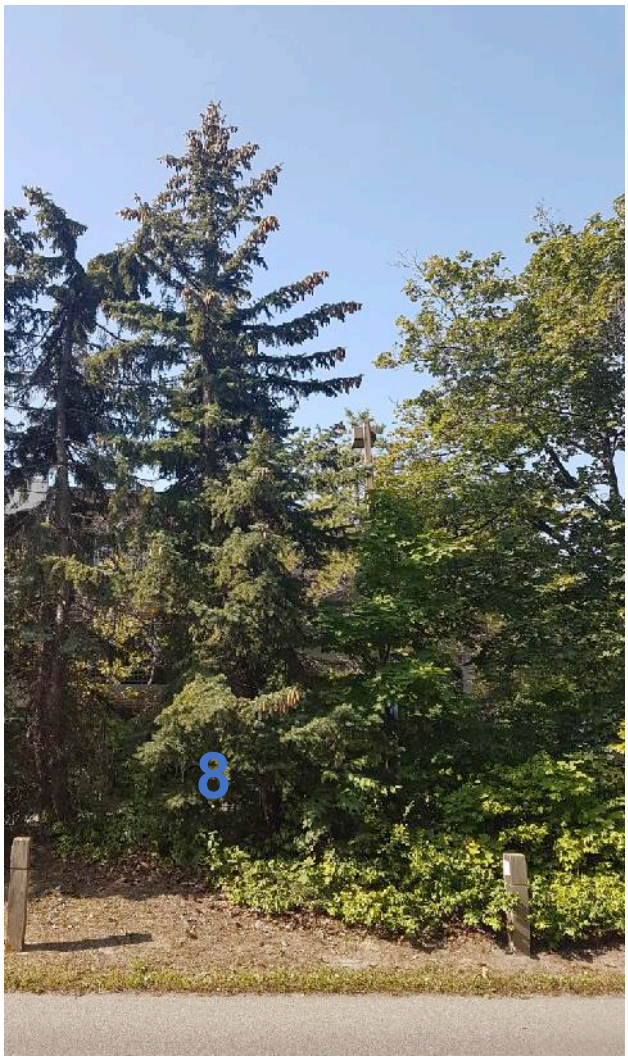
Appendix 7 Municipal Tree Photo(s)

Tree Number 1



Tree Numbers 2 to 7

Tree Number 8

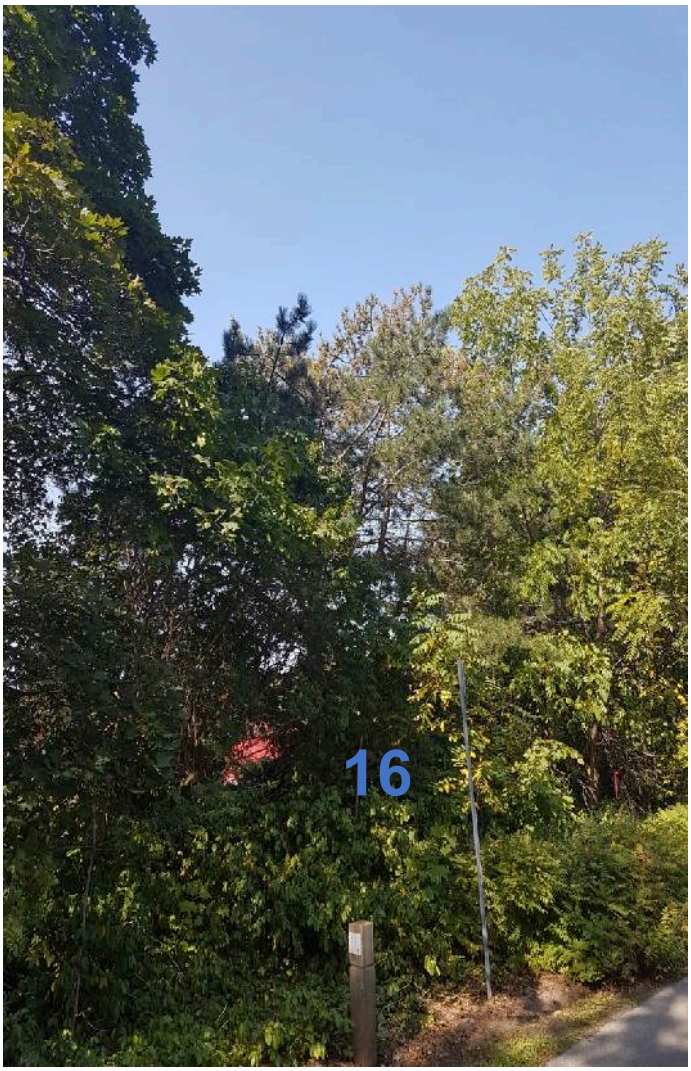


Tree Numbers 9 and 10

Tree Numbers 11 to 13

Tree Numbers 14 and 15

Tree Number 16



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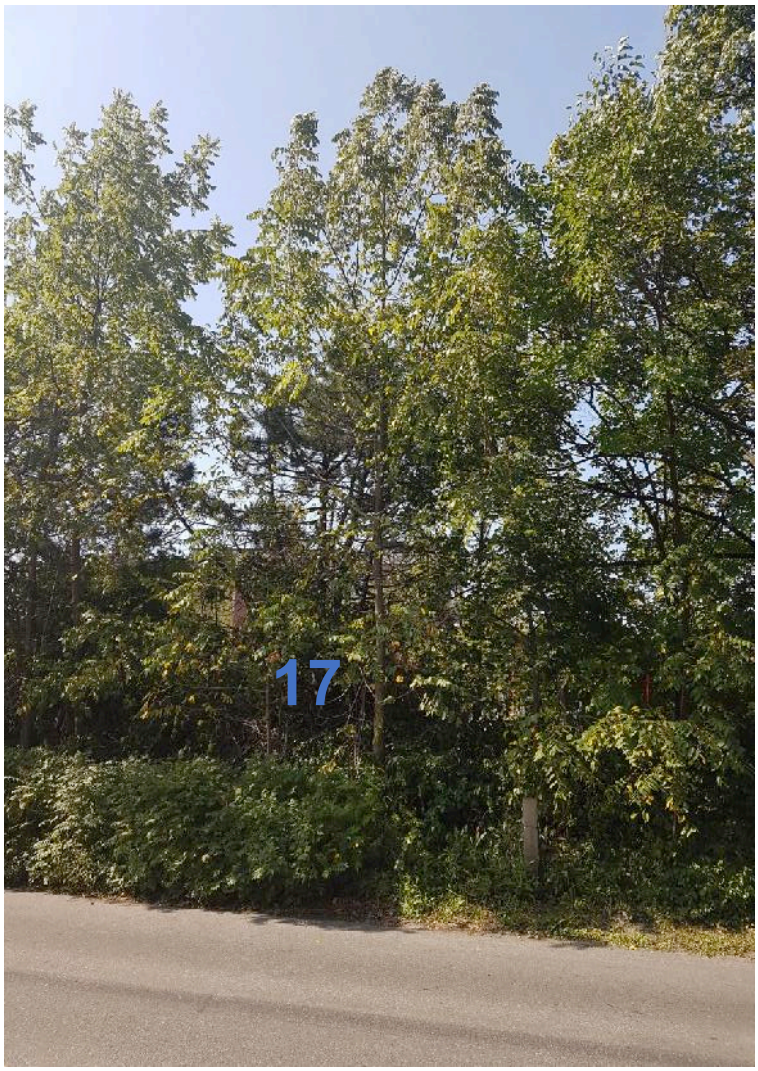
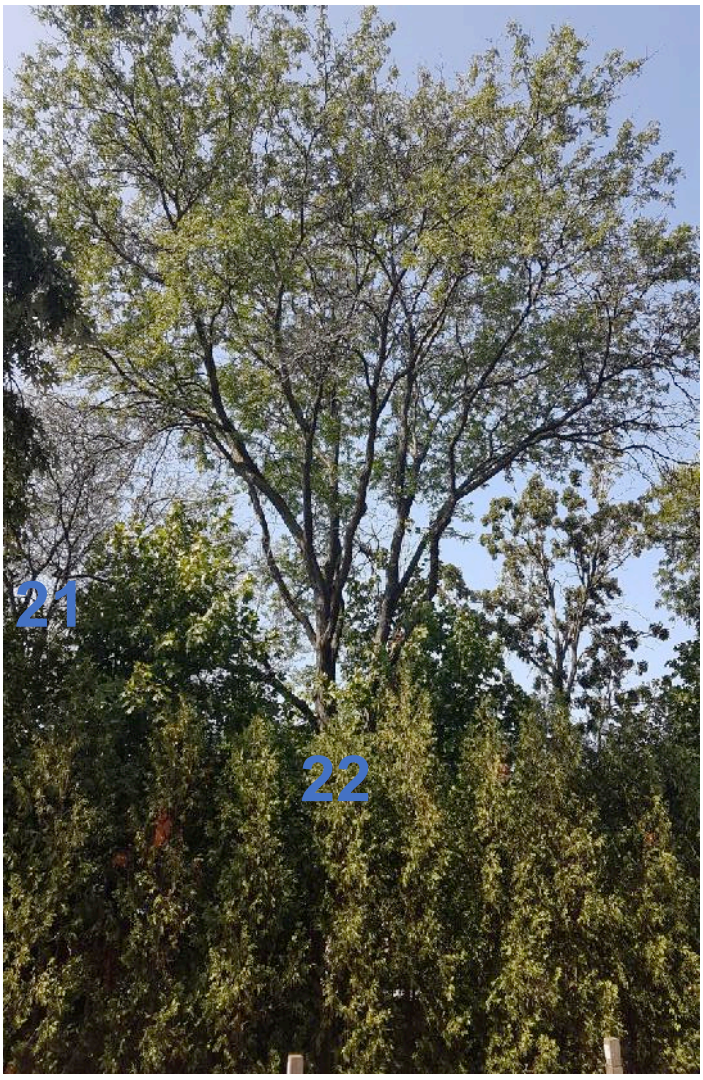


Tree Number 18

Tree Number 19 and 20

Tree Number 21 and 22 Tree Numbers 23



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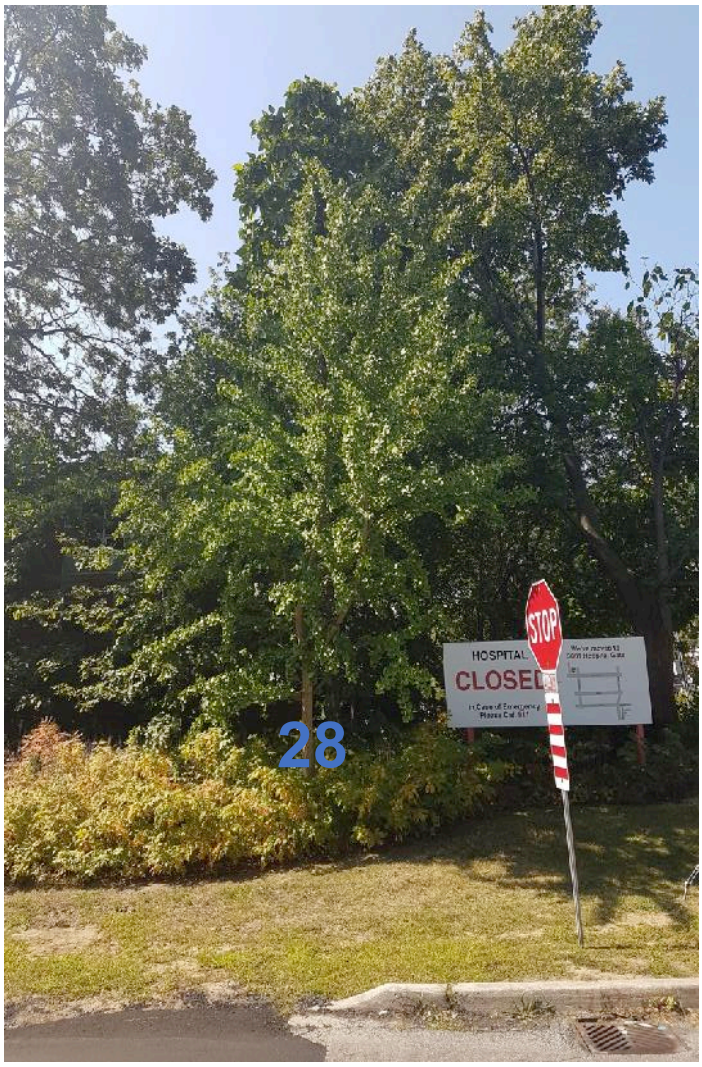
Tree Number 25

Tree Number 26

Tree Number 27

Tree Number 28



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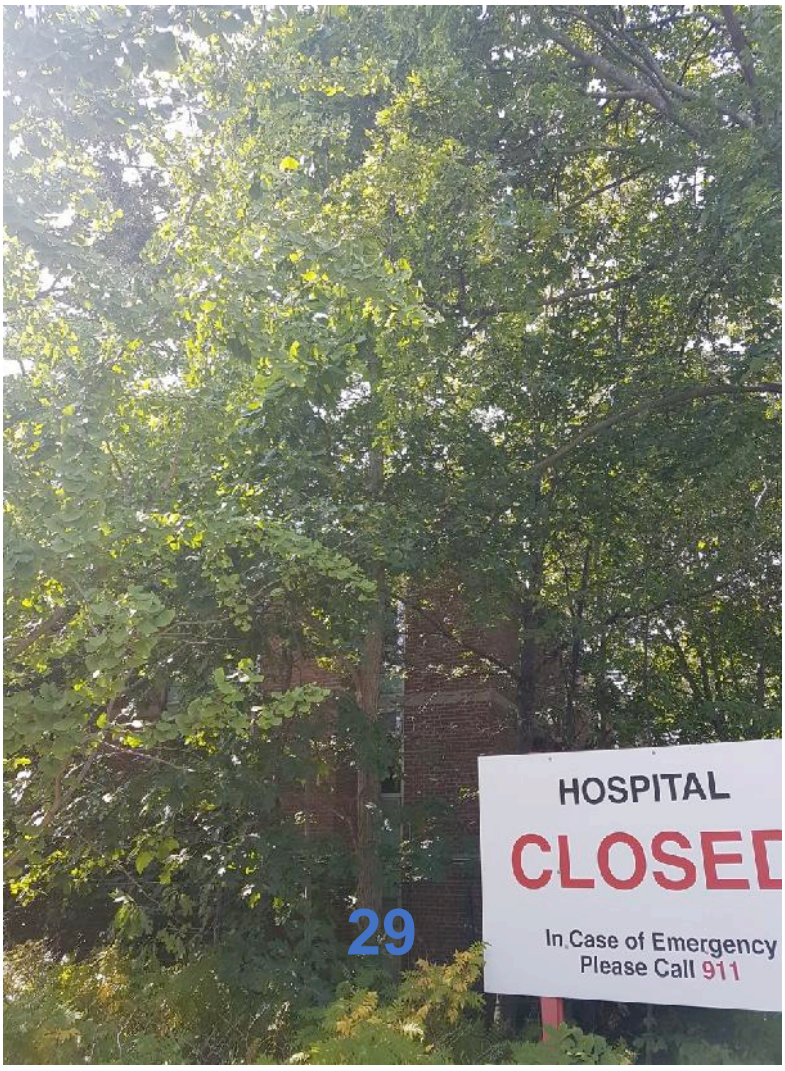

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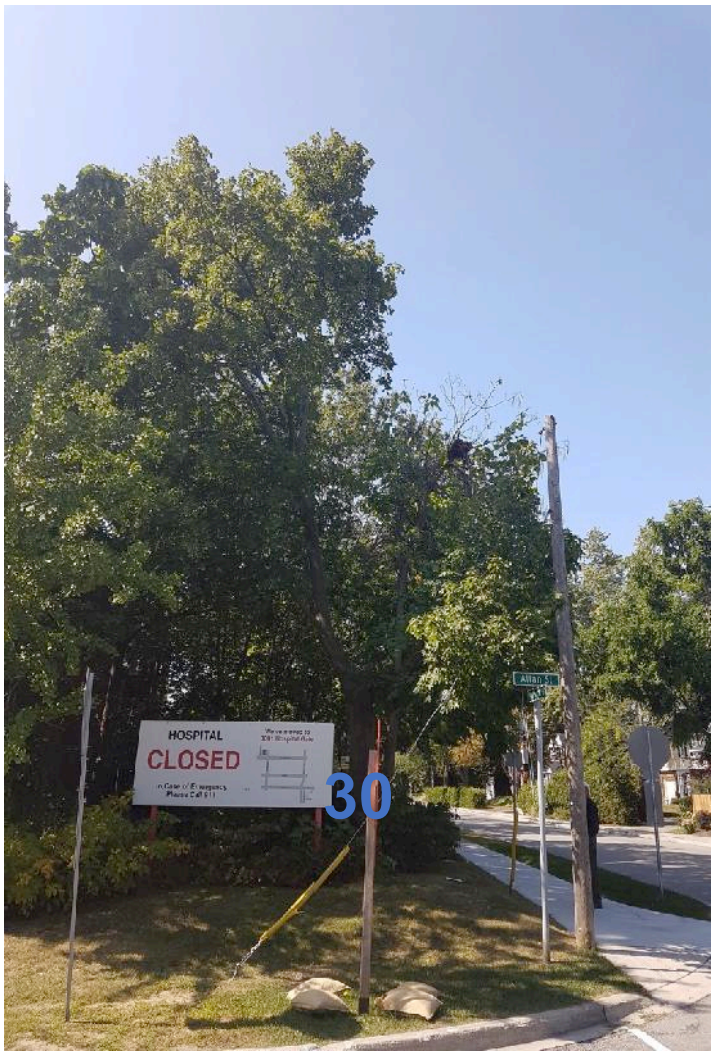
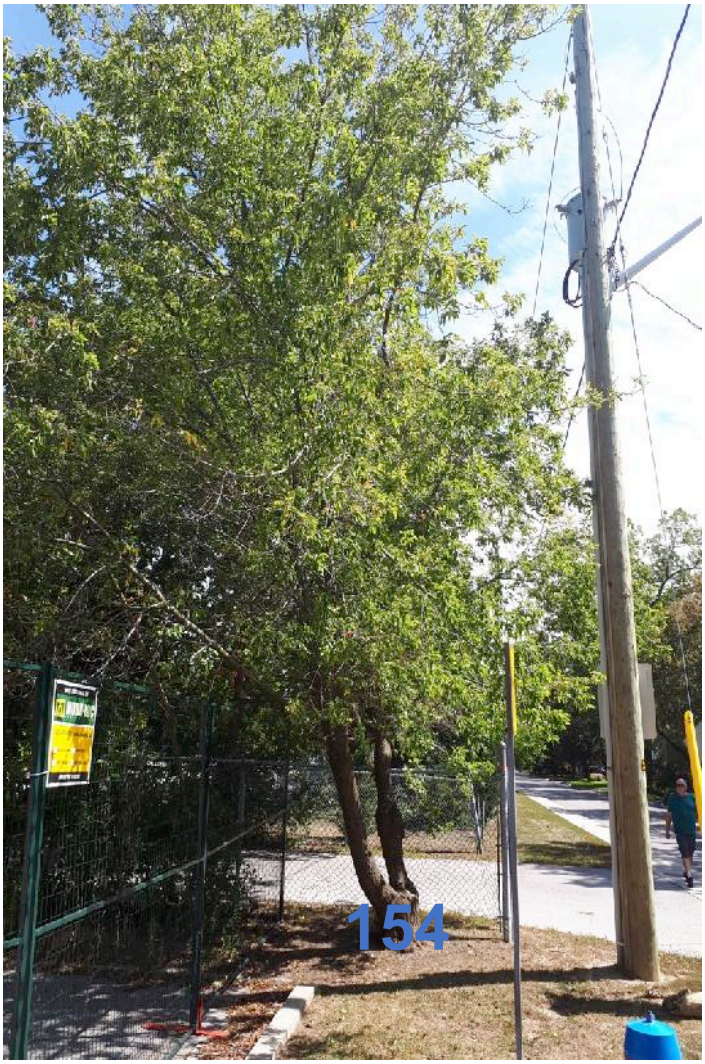


Tree Number 31

Tree Number 154



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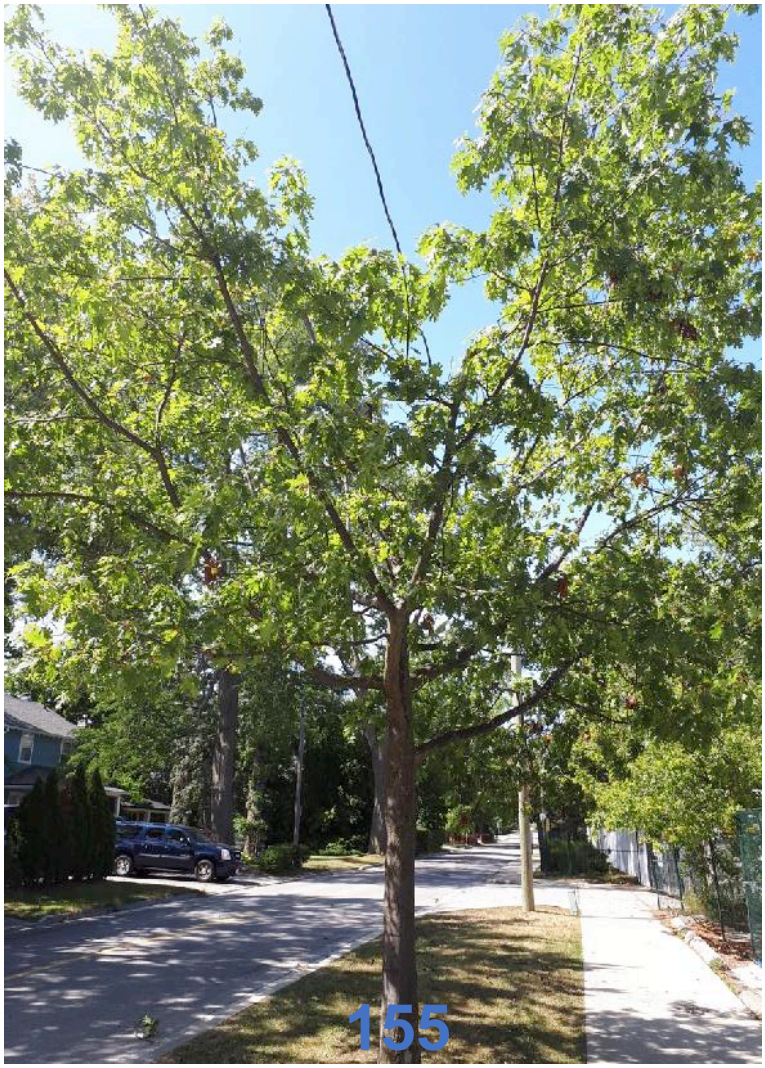


Tree Number 156

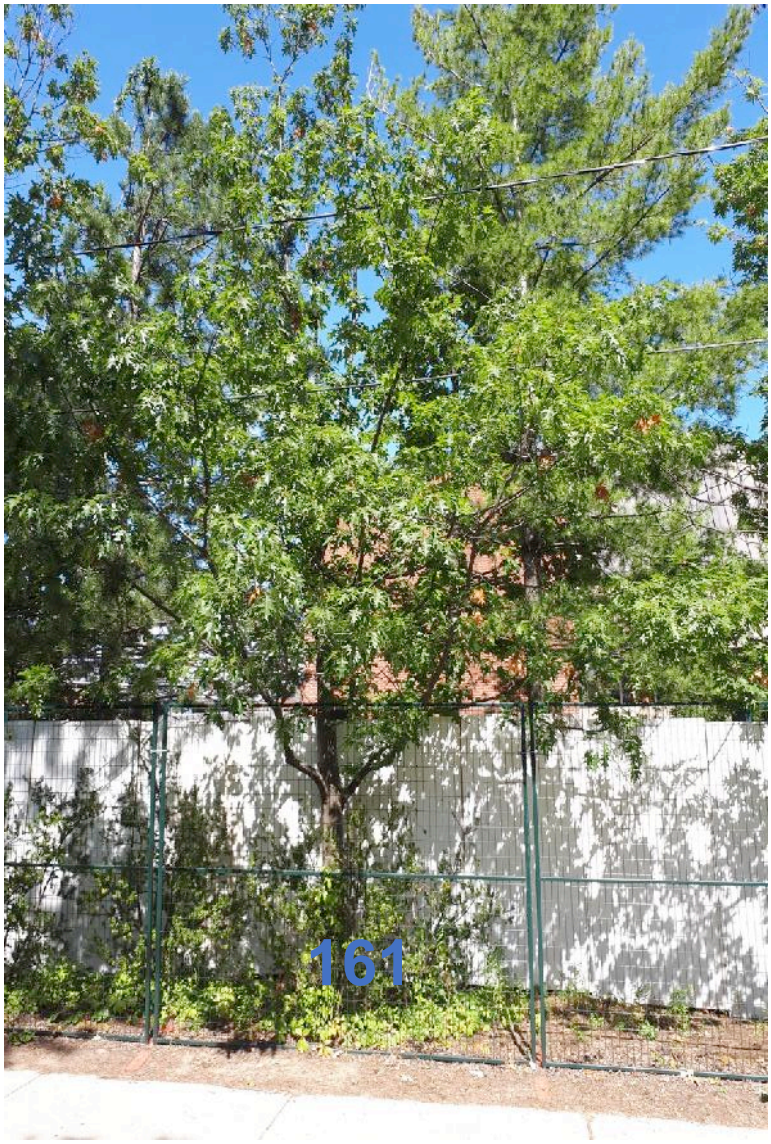
Tree Number 157

Tree Number 158

Tree Number 159

Tree Number 160

Tree Number 161



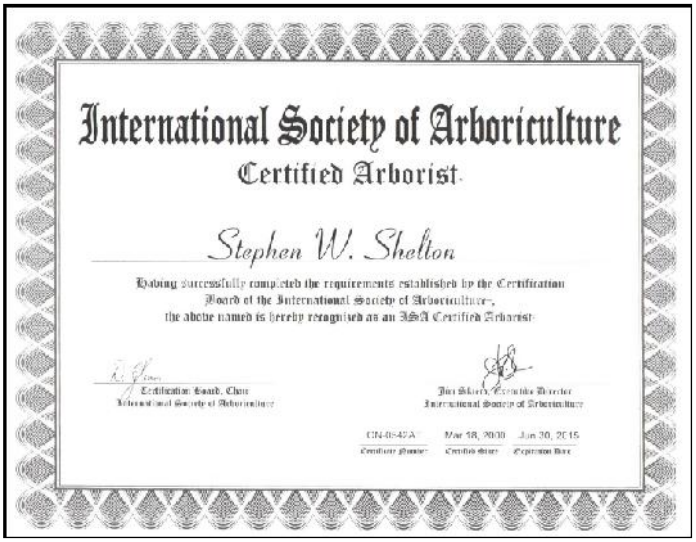
Tree Number 162

Tree Number 163

Tree Number 164

Appendix 8 Appraisal Calculations

Appendix 9 Staff Credentials and Qualifications



International Society of Arboriculture
Certified Arborist

Stephen W. Shelton

Having successfully completed the requirements established by the Certification Board of the International Society of Arboriculture, the above named is hereby recognized as an ISA Certified Arborist.

Certification Board, Chair
International Society of Arboriculture

Executive Director
International Society of Arboriculture

CN-0647A — Mar 18, 2010 — Jun 30, 2015
Certificate Number — Certified Since — Expiration Date

ISA QUALIFICATIONS

International Society of Arboriculture™
Tree Risk Assessment Qualification

Stephen W. Shelton

Having successfully completed the requirements established by the Certification Board of the International Society of Arboriculture,™ the above named is hereby recognized as ISA Tree Risk Assessment Qualified.

David Glenn, Certification Board Chair
International Society of Arboriculture

Jim Skiera, Executive Director
International Society of Arboriculture

February 1, 2013
Issue Date

June 30, 2016
Term of Validity End Date

Appendix 10 Limitations of Assessment

It is the policy of Arborcorp Tree Experts Ltd. to attach the following clause regarding limitations. We do this to ensure that developers, agencies, municipalities and owners are clearly aware what is technically and professionally realistic in retaining trees.

The assessment of the trees presented in this report has been made using accepted arboricultural techniques. These include a visual examination of the above ground parts of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack and crown dieback, discolored foliage, the condition of any visible root structures, the degree and direction of lean, the general condition of the trees and the surrounding site, and the proximity of property and people. Except where specifically noted in the report, none of the trees examined were dissected, cored, probed, or climbed, and detailed root crown examinations involving excavation were not undertaken.

Trees greater than 100 mm in DBH have been assessed for structural integrity by following the methodology in the International Society of Arboriculture's (ISA) "Evaluation of Hazard Trees in Urban Areas", Second Edition. Monetary values for trees have been determined using the Guide for Plant Appraisal 9th Edition's replacement cost method.

Notwithstanding the recommendations and conclusions made in this report, it must be realized that trees are living organisms, and their health and vigour constantly change over time. They are not immune to changes in site conditions, or seasonal variations in the weather conditions, including severe storms with high-speed winds.

While reasonable efforts have been made to ensure that the trees recommended for retention are healthy no guarantees are offered, or implied, that these trees, or any parts of them, will remain standing. It is both professionally and practically impossible to predict with absolute certainty the behavior of any single tree or group of trees or their component parts in all circumstances. Inevitably, a standing tree will always pose some risk. Most trees have the potential for failure in the event of adverse weather conditions, and this risk can only be eliminated if the tree is removed.

Although every effort has been made to ensure that this assessment is reasonably accurate, the trees should be re-assessed periodically. The assessment presented in this report is valid at the time of the inspection.

This?? Page report was prepared by

Stephen W. Shelton
Arborcorp Tree Experts
ISA Certified Arborist ON-0542AT

Appendix I
Development Cost Calculations

Former Oakville Trafalgar Memorial Hospital Site
Preliminary Development Proforma Estimate for Town of Oakville
Date: Jan 18-2018
Project No: 11148742

Prepared by: Scott Passmore
Checked by: Muhammad Paracha

No.	Item	Description	Quantity	Unit	Unit Rate	Total	Assumptions
1.0	**INTERNAL**						
1.1	**Rough Grading**						
1.1.1	Clearing/Grubbing	Clearing and removal of existing trees and vegetation	1	ls	$50,000.00	$50,000.00	Does not include demolition or removals of existing buildings or structures
1.1.2	Erosion and Sediment Control (ESC)	Includes temporary ESC pond, silt fence, diversion swales, mud mat and street cleaning	1	ls	$150,000.00	$150,000.00	Street cleaning allowance until undergrounds and base works have been completed
1.1.3	Export Allowance	All export of topsoil stripping, removals and surplus fill from rough grading activities	34,000	m^3	$50.00	$1,700,000.00	Estimated based on stripping depths and pregrades listed in GHD FSR Section 2
1.1.4	Rough Grading (Cut/Fill)	Required cutting to fill areas to meet design pregrades (scraper only)	15,000	m^3	$7.00	$105,000.00	Remediation completed by others to assumed pregrades
1.1.5	Topsoil Import Allowance	All topsoil to be imported for 0.3m depth for all required areas shown on development concept	8,000	m^3	$5.00	$40,000.00	Clean topsoil import includes builder requirements to finish lots
					Sub-Total =	**$2,045,000.00**	
1.2	**Servicing**						
1.2.1	Municipal Watermain	Includes all watermains, hydrants, valves, chambers, cleaning and testing	260	m	$350.00	$91,000.00	Only proposed watermains within new subdivision road
1.2.2	Water Services	Individual 25mm dia water services to property line curb stop	35	ea	$950.00	$33,250.00	All individual service connections including road restoration along existing MacDonald Road, Allan Street and Reynolds Street
1.2.3	Municipal Sanitary	Includes all sanitary mains and manholes	255	m	$250.00	$63,750.00	Only proposed sanitary within new subdivision road and easement to Lawson Street connection
1.2.4	Sanitary Services	Individual 125mm dia sanitary services to property line	35	ea	$1,300.00	$45,500.00	All individual service connections within new subdivision road only
1.2.5	Municipal Storm	Includes all storm sewers, manholes and catchbasins but excludes Superpipe	255	m	$650.00	$165,750.00	Assumes standard Town of Oakville sizing for municipal storm sewers
1.2.6	Storm Services	Individual 125mm dia storm services to property line	35	ea	$1,300.00	$45,500.00	All individual service connections within new subdivision road only
1.2.7	Rear Yard Catchbasins	Rear yard catchbasin structure only	4	ea	$1,500.00	$6,000.00	Storm sewers to RYCB connection included in municipal storm sewer estimate
					Sub-Total =	**$450,750.00**	
1.3	**Municipal Road**						
1.3.1	Base Works	Includes fine grading, granulars, base curb and base asphalt	255	m	$650.00	$165,750.00	Based on 17.0m ROW width for new subdivision road
1.3.2	Surface Works	Includes top curb and top asphalt, sidewalks, line painting and signage	255	m	$625.00	$159,375.00	Does not include any street trees or landscaping
					Sub-Total =	**$325,125.00**	
1.4	**Stormwater Management (SWM)**						
1.4.1	SWM Quality	Includes OGS downstream of control pipe from Superpipe	1	ea	$75,000.00	$75,000.00	Assumes OGS style treatment for 80% TSS removal approved by Town
1.4.2	SWM Quantity (Superpipe)	Underground oversized "Superpipe" for quantity control	165	m	$1,500.00	$247,500.00	Assumes 1200mm dia storm sewer for underground storage
					Sub-Total =	**$322,500.00**	
1.5	**Privacy Fence**	1.8m high wood privacy fence	560	m	$150.00	$84,000.00	Assumes privacy fence surrounding all low density and medium density development
					Sub-Total =	**$84,000.00**	
1.6	**Street Lighting**	Municipal LED streetlights in new subdivision road	1	ls	$73,000.00	$73,000.00	Assumes LED lighting as per Town of Oakville standards
					Sub-Total =	**$73,000.00**	
1.7	**Utilities**						
1.7.1	Hydro and Utilitiy Servicing	Includes switchgears, transformers, road crossings and service tails	1	ls	$200,000.00	$200,000.00	
1.7.2	Hydro Offer to Connect (OTC)	Oakville Hydro charges for design and inspection	1	ls	$150,000.00	$150,000.00	Addresses Oakville Hydro design and inspection fees as infrastructure captured in external budget estimate
					Sub-Total =	**$350,000.00**	
					Total Internal =	**$3,650,375.00**	
					+ 25% Contingency =	**$912,593.75**	
					TOTAL INTERNAL ESTIMATE =	**$4,600,000.00**	Rounded
2.0	**EXTERNAL**						
2.1	**Non-Recoverable Costs**						
2.1.1	Boulevard Reconstruction Works	Urban design boulevard reconstruction along MacDonald Road and Allan Street	575	m	$200.00	$115,000.00	Assumes reconstructed curb, road patchwork, positive sloping boulevard and sidewalks, does not include streetscaping
2.1.2	Utility Relocations	Provisional budget for external utility relocations	1	ls	$75,000.00	$75,000.00	Provisional budget for any unforseen above and/or below relocation work
2.1.3	Municipal Watermain Connections	2 municipal water connections for new subdivision road to MacDonald Road and Allan Street	2	ea	$30,000.00	$60,000.00	Includes unshrinkable fill backfill and connections and testing completed in accordance to Region of Halton standards
2.1.4	Individual Perimeter Servicing Connections	water, storm and sanitary connections for 19 lots adjacent to MacDonald Road and Allan Street	19	ea	$14,000.00	$266,000.00	Includes native backfill and shared trenches wherever possible and road restoration
2.1.4	Existing Municipal Servicing Upgrades	Provisional budget for reconstruction of existing storm/sanitary services to Lawson Street	1	ls	$50,000.00	$50,000.00	Assumes open cut constructed required to replace exisitng storm and/or sanitary services within ROW after CCTV inspection
2.1.5	Allan Street Storm Sewer	New foundation drain collector to trunk sewer connection point at Galt Avenue	155	m	$450.00	$69,750.00	Assumes 300mm dia PVC foundation drain collector pipe at required depth to gravity drain basements
2.1.6	Streetlight Works	Implement new streetlights for compliance on Reynolds Street, MacDonald Road and Allan Street	1	ls	$150,000.00	$150,000.00	Budget for any new streetlights along existing roads to meet current photometric standards
					Sub-Total =	**$785,750.00**	
2.2	**Potential Front End Costs with Possible Recoveries**						
2.2.1	Hydro Feed	Additional required external hydro works	1,000	m	$1,000.00	$1,000,000.00	Assumes 1km of new feedermain, chambers and 2 switchgears required for the development
					Sub-Total =	**$1,000,000.00**	
					Total External =	**$1,785,750.00**	
					+25 % Contingency =	**$446,437.50**	
					TOTAL EXTERNAL ESTIMATE =	**$2,300,000.00**	Rounded

NOTES:

1 Assumes any requried environmental remediation or structrual demolition works have been completed prior to rough grading activities
2 Based on findings in GHD FSR that water and sanitary capacity is available within Region of Halton municipal system without any external upgrades required
3 Assumes SWM measures proposed in GHD FSR are acceptable to Town and Conservation Authority
4 Does not include any landscaping, street trees, or chain link fencing
5 No allowances have been made for any special vegetation or heritage features to be maintained
6 Any costs associated with potential loss of property such as blocks dedicated to Region of Halton are not included
7 Does not include any development charges or consultant fees
8 Park block works include grading only and do not include any lighting or servicing works
9 Estimate based on current rates seen for Town of Oakville

Appendix J
Additional Correspondence

Minutes

October 3, 2017

Subject/Client:	Town of Oakville FSR's – OTMH Lands, Brantwood School & Trafalgar Works Yard	Ref. No.	11148742
From:	Scott Passmore	Tel:	905-814-4383
Venue/Date/Time:	Town of Oakville Offices, October 3, 2017 @ 9:00 a.m.		
Copies To:	All attendees and others listed		

Attendees:	Phil Kelly (Town of Oakville)	philip.kelly@oakville.ca
	George Trenkler (Town of Oakville)	george.trenkler@oakville.ca
	Richard Renaud (Town of Oakville)	richard.renaud@oakville.ca
	Gabe Charles (Town of Oakville)	gabe.charles@oakville.ca
	Rita Juliao (Town of Oakville)	rita.juliao@oakville.ca
	Kristina Parker (Town of Oakville)	kristina.parker@oakville.ca
	Cindy Toth (Town of Oakville)	cindy.toth@oakville.ca
	Jeffrey Lee (Town of Oakville)	jeffrey.lee@oakville.ca
	Domenic Lunardo (Town of Oakville)	domenic.lunardo@oakville.ca
	Ron MacKenzie (Region of Halton)	ronald.mackenzie@halton.ca
	Craig Jordan (Region of Halton)	craig.jordan@halton.ca
	Scott Passmore (GHD)	Scott.Passmore@ghd.com
	Muhammad Paracha (GHD)	Muhammad.Paracha@ghd.com
Others to Copy:	Adolfo Emer (GHD)	Adolfo.Emer@ghd.com
	Laura Lawlor (GHD)	Laura.Lawlor@ghd.com
	Robert Przyslupski (GHD)	Robert.Przyslupski@ghd.com
	Sergey Yunyaev (GHD)	Sergey.Yunyaev@ghd.com

Item	Description	Action
1.0	**Introduction**	
1.1	The objective behind the meeting was to start up the Functional Servicing Reports (FSRs) for the former Oakville Trafalgar Memorial Hospital (OTMH) Lands, the former Brantwood School Site and the former Oakville Trafalgar Works Yard.	INFO
1.2	The current status of each site was discussed and an overview of each contemplated development concept was reviewed.	INFO
1.3	The Town has forwarded background information on each site including Phase 1 and Phase 2 ESA documents. The ESA's may be helpful in reviewing earthwork budget allowances within the proforma development cost estimate.	INFO
2.0	**Stormwater Management**	
2.1	The Town is currently undertaking a Master Drainage Plan with consultant Foster Wheeler.	INFO

Item	Description	Action
2.2	There is an external drainage area to the OTMH Lands located at the north east corner and an existing low point within the OTMH site that will require careful attention.	GHD
2.3	No consultation is required with Conservation Halton staff at this point since all 3 sites are well out of the regulation areas.	INFO
2.4	Soil conditions within the OTMH lands were discussed. Any recommended Low Impact Development (LID) measures (i.e. infiltration) will be carefully reviewed in these areas.	GHD
3.0	**Region Requirements**	
3.1	The Region will require hydrant flow testing to verify available flow and pressures against the proposed fire protection water demand. GHD to get quotes for hydrant flow testing and forward to Town for approval.	GHD
3.2	The Region requires the demands from each development to be completed in accordance to the latest Region standards and unit rates, not using OBC calculations. The capacity of the downstream sanitary system to handle the proposed development flows to be addressed in the reports. Muhammad to contact Craig for any available capacity or design sheet information for sanitary sewers downstream.	GHD
3.3	The Region will require and drainage and/or stormwater management (SWM) impacts to Regional Roads to be very clearly outlined in the reports.	GHD
3.4	Craig Jordan will be point contact person for Region documents and information requests.	INFO
4.0	**Tree Assessments**	
4.1	Trees are a very sensitive component of these redevelopment applications and a very high level of interest for residents.	INFO
4.2	The reporting needs to address the following for each site: 1) existing tree inventory, 2) impact from proposed development and 3) what can be removed. Any recommended removals should be done in **one single** phase by Town.	GHD
4.3	The Town has a GIS system with tree inventory information where some of this information can be provided to GHD.	INFO
4.4	The site with the most internal trees to be maintained may be the Brantwood School site and should be evaluated carefully in that regard.	GHD
5.0	**Moving Forward**	
5.1	Scott and Muhammad from GHD have scheduled site visit for all three sites on Friday, October 6. The Contractor for OTMH Lands will be given advanced notice of site visit and required safety equipment will be worn by GHD staff.	GHD
5.2	Top priority is to review existing condition drainage patterns vs post development drainage plans with preliminary vision for SWM strategy as this drives the grading design. Once the SWM vision is discussed with Town staff a meeting will be set up with Foster Wheeler.	GHD

Item	Description	Action
5.3	George Trenkler will be engineering contact person for documents related to the OTMH Lands and Brantwood School. Richard Renaud will be contact for the Trafalgar Works Yard site. Gabe Charles and Phil Kelly are to be copied on Town correspondence.	INFO
5.4	Muhammad to connect with George and Richard from Town for AutoCAD copies of latest documents and Craig from Region for remaining Region drawings.	GHD
5.5	Next meeting is to be scheduled for approximately 3 weeks timeframe.	INFO

This confirms and records GHD's interpretation of the discussions which occurred and our understanding reached during this meeting. Unless notified in writing within 7 days of the date issued, we will assume that this recorded interpretation or description is complete and accurate.

Minutes

November 6, 2017

Subject/Client:	Town of Oakville FSR's – OMTH Lands, Brantwood School & Trafalgar Works Yard	Ref. No.	11148742
From:	Scott Passmore - GHD	Tel:	(905) 814-4383
Venue/Date/Time:	Town of Oakville Offices, October 24, 2017 @ 9:00 a.m.		
Copies To:	All attendees and others listed		

Attendees:	Phil Kelly – Town of Oakville George Trenkler - Town of Oakville Richard Renaud – Town of Oakville Gabe Charles – Town of Oakville Rita Juliao – Town of Oakville Domenic Lunardo – Town of Oakville Scott Passmore – GHD	Email:	Philip.kelly@oakville.ca George.trenkler@oakville.ca Richard.renaud@oakville.ca Gabe.charles@oakville.ca Rita.Juliao@oakville.ca Domenic.Lunardo@oakville.ca Scott.Passmore@ghd.com
Others to Copy:	Kristina Parker – Town of Oakville Cindy Toth – Town of Oakville Jeffrey Lee – Town of Oakville Ron MacKenzie – Region of Halton Craig Jordan – Region of Halton Adolfo Emer – GHD Laura Lawlor – GHD Robert Przyslupski – GHD Sergey Yunyaev – GHD Muhammad Paracha – GHD	Email:	Kristina.Parker@oakville.ca Cindy.Toth@oakville.ca Jeffrey.Lee@oakville.ca Ronald.MacKenzie@halton.ca Craig.Jordan@halton.ca Adolfo.Emer@ghd.com Laura.Lawlor@ghd.com Robert.Przyslupski@ghd.com Sergey.Yunyaev@ghd.com Muhammad.Paracha@ghd.com

Item	Description	Action
1.0	**Objective**	
1.1	The objective behind the meeting was to provide Town staff with a status of GHD's progress on the Functional Servicing Reports (FSR's) for the former Oakville Trafalgar Memorial Hospital (OTMH) Lands, the former Brantwood School Site and the former Oakville Trafalgar Works Yard.	INFO
2.0	**Pre-Development Drainage**	
2.1	The site visit was completed by GHD staff for the civil works on Friday, October 6 and the key findings from the site visit were reviewed.	INFO
2.2	The external drainage tributary to the OMTH was discussed which encompasses a portion of MacDonald Road and Allan Street to the north. This external drainage is to be considered in the storage calculations and not as "by-pass" since it may already be controlled under existing conditions (by default). The Town also noted some existing storm servicing may capture and direct flows north to MacDonald Road. GHD to confirm with record site plan drawings provided by Town.	GHD

Item	Description	Action
2.3	The pre-development drainage for the former Brantwood School site was discussed including the two major overland outlet points.	GHD
2.4	The pre-development drainage from the former Works Yard shows a significant amount of drainage conveyed in the east direction to the Trafalgar Road culverts. GHD to confirm the storm drainage allowance included in the MMM subdivision design for the lands to the west of Taunton Road.	Info
3.0	**Preliminary Grading**	
3.1	The preliminary grading design for the former OMTH lands was discussed. The public road is to be 17.0 m ROW with maximum slope 6 percent for preliminary design purposes. The existing low point adjacent to the parking structure near Allan Street is to be considered as option for primary sag capture point for 100-year storm capture. The east side of the parking structure will be redeveloped which will give GHD an opportunity to direct storm drainage (and emergency overflow) from public road to the trunk sewer in the easement to the south.	
3.2	The Town is anxious to coordinate the public road grading and SWM with the MTE's Community Centre site plan design. GHD to prepare Preliminary Grading for OMTH lands by end of week and send to Town for coordination and set up meeting with MTE.	
3.3	The preliminary grading for the former Brantwood School site was discussed which included isolating the Residential Conversion site to drain solely west to Allan Street (no drainage east to single detached dwellings). The Town has arranged for a topo survey for the former Brantwood School site which is to include "Z" elevations so that GHD can create 3D surfaces.	
3.4	The preliminary grading for the Works Yard was discussed including the possible phasing of development and underground parking requirements.	
4.0	**Region Requirements**	
4.1	GHD has obtained quotes for the hydrant flow tests from Corix and sent information to Town. Town has started arrangements for payment to Corix to commence the flow tests. Once flow test results have been obtained they will be reviewed against the peak demands plus the worst case fire protection requirements for each site.	Corix/GHD
4.2	The downstream sanitary system for each site was discussed to the trunk sanitary sewer connection points. GHD to prepare the sanitary demand calculations per each connecting sanitary leg and per phase (if applicable) and identify locations for increases to post development demands.	GHD
4.3	The pre-development drainage plan for the Works Yard was discussed as there is a significant portion of the property that drains east to the existing Trafalgar Road culverts. GHD to send the predevelopment plan with the culvert information to Town so they can coordinate with RV Anderson as part of the Region's Trafalgar Road design.	GHD
5.0	**Tree Assessments**	

Item	Description	Action
5.1	The first of the tree assessment site visits was completed by GHD staff on October 23. The preliminary grading designs will be reviewed in concert with the tree assessments.	Info
5.2	The Town requests that trees be classified with red (“take out”), yellow (“may have to take out”), green (“can most likely save”) for colour coding tree assessment to correspond with Town’s past presentation approach.	GHD
6.0	**Other Items**	
6.1	Amec Foster Wheeler is currently looking to finish the draft modelling results from the Master Drainage Plan by end of October. When completed they will be reviewed by GHD for impact to the post-development drainage design.	Info
6.2	Next meeting is to be scheduled for approximately 2 weeks’ timeframe.	Info

This confirms and records GHD's interpretation of the discussions which occurred and our understanding reached during this meeting. Unless notified in writing within 7 days of the date issued, we will assume that this recorded interpretation or description is complete and accurate.

MEETING MINUTES

PROJECT NAME:	SECC	**MTE FILE NO.:**	43124-100
		DATE:	2017.11.07
LOCATION:	1225 Trafalgar Rd, Oakville, ON L6H	**TIME:**	9:30am to 11:30 am

ATTENDEES:
Town of Oakville: Rita Juliao, Philip Kelly, Domenic Lunardo, George Trenkler, Kristina Parker
GHD: Scott Passmore
MTE: Kayam Ramsewak, Wesley Taylor

REVIEW OF FSR FINDINGS BY GHD

- After reviewing of the topographic survey and given there is no record that the hospital flooded, MTE believes that surface ponding does not occur in the depression at the hospital entrance. The proposed SWM design of the campus will reduce post development flows to less than or equal to existing therefore, attenuation and storage of overland flow from Allaen Street will not be required.

- Overland flow along the west and east sides of Allaen Street is believed to be independent. The west side has a small drainage area delineated by GHD and to be confirmed with Town/AMEC.

- GHD to revise the grading at the intersection between Allaen Street and L Street to convey Allaen Street overland flows past the L Street in southerly direction.

- We can possibly convey overland flow from the west side of Allen Street to Reynolds Street along south side of parking garage. GHD (through consultation with Town/AMEC) to provide flow rates anticipated from Allen Street for all design storms.

- GHD to revise the L Street grading to include low point at the park for local overland flow to be conveyed through the park to Reynolds. MTE to confirm grading. This will require a reverse sloping boulevard in that area and to be shown on GHD's preliminary grading plan.

- The low point on the L Street should be = 93.50, and the high point grade at the L Street bulb = 93.7660. to provide min 0.6% slope.

- GHD notes that the grades at north side of the park can be lowered to accommodate the park design. This could provide lookout or walkout basements within the low density residential blocks. The maximum longitudinal slope along L Street be 6%.

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Fax: 905-639-7727
www.mte85.com

- MTE to provide a cross section for the interface between the existing parking garage and L Street to show space requirements to satisfy grading.
- MTE to provide concept of grading at intersection of L Street, SECC, and the existing parking garage.

- GHD (with Town/AMEC) to confirm flow rates to be conveyed along south side of parking garage.

- The property line along south side of the parking garage is not fixed. Additional space can be taken to provide sufficient cross section for conveyance of the external overland flows.

- The municipal sanitary sewers and/or watermains from the L Street cannot be designed through the park block. GHD to coordinate within preliminary servicing design.

Minutes recorded by WST Please report any errors or omissions

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