TRAFALGAR ENGINEERING

# FUNCTIONAL SERVICING REPORT

Water, Sanitary, and Stormwater Management

## SPRUCE ROSE INC. SUBDIVISION

304 & 318 SPRUCE STREET
TOWN OF OAKVILLE

OUR FILE: 1819

**PREPARED FOR SPRUCE ROSE INC.**

**FEBRUARY 29TH, 2024**

(905) 338-3366 #1-481 Morden Road, Oakville, ON, L6K 3W6 www.trafalgareng.com

## REVISION HISTORY

| DATE | REVISION | SUBMISSION |
|---|---|---|
| February 29th, 2024 | 1 | First ZBA/DPS Application |

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## 1.0 INTRODUCTION

### 1.1 Scope of Functional Servicing Report

This report has been prepared in support of the Rezoning and Draft Plan of Subdivision Application for a proposed residential development located at 304 & 318 Spruce Street in Oakville.

The Draft Plan of Subdivision for the subject lands was prepared by SGL Planning & Design Inc. dated February 9, 2023 and can be found in Appendix 'A'. The Draft Plan of Subdivision consist of 1 Block (Block 1) and 7 Lots. Block 1 consists of a 5 m x 5 m daylight triangle at the northeast corner of the site. The 7 lots will all have a single family detached home. The topographic survey prepared by R-PE Surveying Ltd. can also be found in Appendix 'A'.

This report outlines how the subdivision can be serviced by the existing infrastructure for water, wastewater, and storm drainage. This report should be read in conjunction with the other plans and reports submitted in support of the planning approvals being sought for the project. For the purposes of this report, north is defined as running parallel to Reynolds Street.

### 1.2 Reference Documents

The following studies/reports/documents were reviewed in the preparation of this report.

- Pre-Consultation Comments Report, Town of Oakville, July 19, 2023
- Drawing 7.3 to 7.4 - "Stormwater Management Master Plan, Town of Oakville"
- Development Engineering Procedures & Guidelines Manual, Town of Oakville, May 2023 (**Town's Manual**)
- Stormwater Management Planning and Guidelines Manual, Ministry of Environment, March, 2003 (**MOE Manua**l).
- "Water and Wastewater Linear Design Manual", Region of Halton October, 2019. (**Region's Manual**)

### 1.3 Site Location and Description

As previously mentioned, the site is known municipally as 304 & 318 Spruce Street. The 0.412 ha property is located on the southeast corner of Spruce Street and Reynolds Street. The east and south sides of the property abut existing low density residential uses. There is a single family dwelling at 318 Spruce Street and the Grace Lutheran Church of Oakville at 304 Spruce Street on the subject lands. East between the church and the residential dwelling is a large

parking lot with mature trees between it and the property to the south. Two driveway accesses are provided to the parking lot, both from Spruce Street and there is a residential driveway to spruce street at the residential dwelling. The existing site is relatively flat with drainage generally from back to front, draining towards Spruce and Reynolds Street.

### 1.4 Proposed Development

The development block created by the Plan of Subdivision will be further divided into 7 parcels/units and developed with 7 detached single family dwellings, complete with basements, three fronting Reynolds Street, and four fronting Spruce Street. Each dwelling will have its own driveway entrance, the sidewalks along Spruce and Reynolds Street will be maintained. A copy of the preliminary site plan is included in Appendix 'A' for reference.

## 2.0 MUNICIPAL WATER AND WASTEWATER

Municipal water and wastewater services for the subject site are to be designed in accordance with the Region of Halton water and Wastewater Linear Design Manual.

Per the Halton Water & Wastewater Linear Design Manual, for detached residential dwellings, the equivalent population density is 55 persons per hectare. Based on this density, the site would have an equivalent of 23 persons (55 persons/ha x 0.412 ha).

### 2.1 Water

There is an existing 300 mm diameter watermain along Spruce Street and an existing 150 mm diameter watermain along Reynolds Street. Both watermains are relatively new, being constructed in 1982. The existing church is connected to the Reynolds Street watermain while the residential dwelling is connected to the Spruce Street watermain. See the engineering record drawings in Appendix 'B' for further detail.

The three proposed residential dwellings fronting to Reynolds Street (Lots 1-3) will be serviced by the 150 mm diameter along Reynolds Street, while the four proposed residential dwellings fronting Spruce Street (Lots 4-7) will be serviced by the 300 mm diameter watermain along Spruce Street. A 9.6 m long section of the 150 mm diameter watermain on Spruce Street will be lowered between Lots 1 and 2 to allow sanitary servicing to these lots. See the Servicing Plan (S1), and the Sections and Details Plan (D1) for details.

Using the development area and Region of Halton design criteria, the expected domestic water usage for each watermain is estimated and summarized below (see Appendix 'C' for supporting calculations). The fire flow is estimated for demand purposes only using the Fire Underwriter's Survey methodology and should be confirmed at the building permit stage.

**Table 1: Estimated Water Demands Reynolds Street (L/min)**

| | |
|---|---|
| Average Daily Demand | 0.5 |
| Minimum Hourly Demand | 0.5 |
| Maximum Hourly Demand | 1.9 |
| Maximum Daily Demand | 1.1 |
| Estimated Fire Demand (FUS 1999) | 5000 |
| Maximum Daily Plus Fire Demand | 5001.1 |

**Table 2: Estimated Water Demands Spruce Street (L/min)**

| | |
|---|---|
| Average Daily Demand | 0.5 |
| Minimum Hourly Demand | 0.5 |
| Maximum Hourly Demand | 2.0 |
| Maximum Daily Demand | 1.1 |
| Estimated Fire Demand (FUS 1999) | 5000 |
| Maximum Daily Plus Fire Demand | 5001.1 |

Fire hydrants exist at the northeast corner of Spruce and Reynolds as well as adjacent to the site on the north side of Spruce Street at 321 Spruce Street. Flow testing will be undertaken at the earliest possible date to confirm the system can provide adequate fire flow to meet the above demands.

The locations of the nearby hydrants on Spruce Street provide adequate coverage for the proposed development and are within 90 m of all principal entrances.

Each dwelling will have typical 25 mm individual service connections. The existing water connections to Spruce and Reynolds Street will be disconnected. Refer to the Servicing Plan, S1 in Appendix 'D' for details.

## 2.2 Wastewater

There are existing 200 mm diameter sanitary sewers along Spruce Street and Reynolds Street. The sanitary on Reynolds Street originates at a manhole approximately 22 m north of the southern property line and flows south along Reynolds Street, this main is approximately 2 m deep along the development's frontage. The connectivity of the sewer along Reynolds Street is not clear on the Region's operating maps. The sanitary sewer on Spruce Street flows west to the Trafalgar Road trunk sewer. This sewer is approximately 2 m deep along the development's frontage. Records show that the existing church and residential dwelling are connected to the existing sewer along Spruce Street.

The two southernmost residential dwellings fronting Reynolds Street (Lots 1 and 2) will be serviced by the 200 mm diameter sanitary sewer on Reynolds Street, while the remaining five residential dwellings (lots 3-7) will be serviced by the 200 mm diameter sanitary sewer along

Spruce Street. The sewage flows were calculated for the development and the results for each sanitary main are as summarized below. Further detail can be found in Appendix 'C'.

**Table 3: Estimated Wastewater Flow to Reynolds Street (L/s)**

| | |
|---|---|
| Average Residential Daily Dry Weather Flow | 0.07 |
| Modified Harmon Residential Peaking Factor | 4.37 |
| Infiltration Allowance (0.26L/s-ha) | 0.12 |
| Peak Daily Flow | 0.43 |

**Table 4: Estimated Wastewater Flow to Spruce Street (L/s)**

| | |
|---|---|
| Average Residential Daily Dry Weather Flow | 0.07 |
| Modified Harmon Residential Peaking Factor | 4.37 |
| Infiltration Allowance (0.26L/s-ha) | 0.12 |
| Peak Daily Flow | 0.43 |

Each residential dwelling will have typical 125mm individual service connections. The existing sanitary services to the buildings will be disconnected.

The Spruce Street and Reynolds Street sanitary sewers are tributary to the Trafalgar Road/Rebecca Street Trunk sewers. An analysis of the downstream sewer system can be provided once the Region's Infoworks model is available.

## 3.0 STORM DRAINAGE AND STORMWATER MANAGEMENT

### 3.1 Existing Storm Drainage

#### 3.1.1 Minor System

There is an existing 675 mm diameter storm sewer running along Spruce Street adjacent to the subject site. This sewer flows west to Reynolds Street. From the intersection of Reynolds and Spruce Street there is an existing 750 mm diameter storm sewer flowing south along Reynolds. The sewer system is tributary to the Sixteen Mile Creek.

Based on a review of Oakville's Stormwater Master Plan (Drawing 7.3 *and 7.4 – see Appendix 'B'* for further detail), the storm sewers on Reynolds Street and Spruce Street in the vicinity of the site is identified as below ½ surcharging depth and above the obvert during the 5-year event and above ½ surcharging depth and below the rim elevation during the 100-year storm in the existing condition.

The topographic survey indicates the majority of the site drains to the Spruce Street and Reynolds Street sewers, with a small portion of the lands flowing south to the adjacent property.

#### 3.1.2 Major System

Based on a review of Oakville's Stormwater Master Plan (Drawing 7.7 – See Appendix 'B' for further detail), the flow is contained within the Right-of-Way during the 100-year storm in the existing condition.

A review of the existing major overland flow along streets adjacent to the subject lands using lidar data indicates that overland flow travels south along Reynolds Street and east along Spruce street within the municipal rights-of-way.

### 3.2 Proposed Storm Drainage

#### 3.2.1 Minor and Major System

The Town's Stormwater Management Master Plan sets out evaluation criteria and hierarchy for conveyance capacity improvements (major systems) within the Town's network. Figure 8.2.1 from the Master Plan provides a flow chart for making those evaluations. As the major system is contained within the municipal ROW no conveyance capacity improvements are required.

The front yards and driveways will sheet flow from the buildings to Spruce Street and Reynolds Street. The roof areas will splash to grade and be directed to the property line swales which lead to rear lot catchbasins. The rear lot catchbasins between properties which front to Spruce will have catchbasin leads to the 675 mm diameter storm sewer on Spruce Street, while the remaining catchbasin will have catchbasin leads to the 750 mm diameter storm sewer on Reynolds Street.

Every dwelling will feature 150 mm diameter storm service connections to the adjacent storm sewers. Each dwelling will have a sump pump to protect the basement in the event the storm sewer surcharges.

### 3.3 Stormwater Management

The Town of Oakville requirements for stormwater management are as follows:

1. Stormwater Quantity Control (Peak Flow Control)

   The minimum control is to maintain post-development peak runoff rates to pre-development levels for all events up to and including the 100-year storm.

2. Stormwater Runoff Volume Reduction (Water Balance)

   As per the draft Oakville Development Engineering Procedures and Guidelines (May 2023), sites are to be designed such that the runoff from a 25 mm event shall be retained on site.

3. Stormwater Quality Control

   i) Construction Phase (Erosion and Sediment Control)

   ii) Post Construction: Achieve Enhanced Level 1 Protection, as per the Ministry of Environment's Stormwater Management Planning and Design Manual (March 2003).

### 3.3.1 Stormwater Quantity Control (Peak Flow Control)

The required quantity control for the site is to limit the peak post-development flows to the 5-year pre-development rate for all storms up to the 100-year event. To control post-development flows to the 5-year pre-development level, three 600 mm dia. oversized sewers are proposed from each of the rear lot catchbasins to property line manholes. The manholes will be fitted with a 75 mm dia. orifice plate on the upstream side of the manhole.

To estimate the pre- and post-development flows, HydroCAD was used to model the system. The existing impervious and pervious areas were estimated using the topographic survey and resulted in a weighted SCS curve number of 88. The proposed imperviousness was estimated for the uncontrolled area, and the area tributary to each catchbasin. See Table 5 below for a summary of the imperviousness of each drainage area and corresponding weighted SCS curved number.

**Table 5: Catchment Imperviousness and SCS Curve Number**

| Catchment | Pervious Area ($m^2$) | Impervious Area ($m^2$) | Weighted SCS Curve Number |
|---|---|---|---|
| Existing Condition | 2395 | 1721 | 88 |
| Uncontrolled Area | 607 | 507 | 88 |
| Catchbasin (Lot 1) | 487 | 552 | 90 |
| Catchbasin (Lot 5) | 589 | 337 | 86 |
| Catchbasin (Lot 6) | 644 | 393 | 87 |

The 75 mm dia. orifice plates were modeled with a discharge coefficient of 0.64 and invert elevation's matching those on the servicing plan. The length and slope of each oversized storm sewer and catchbasin top of grate modeled match those on the servicing plan. The grading plan was used to estimate surface storage and spill elevations. See Appendix 'E' for the HydroCAD

model output. See Table 6 below for a summary of the total pre- and post-development stormwater flows.

**Table 6: Total Stormwater Flows**

| Return | Pre-Dev Total (L/s) | Post-Dev Uncontrolled (L/s) | Post-Dev Controlled (L/s) | Post-Dev Total (L/s) | Storage Required ($m^3$) | Storage Provided ($m^3$) |
|---|---|---|---|---|---|---|
| 5-yr | 75 | 20 | 29 | 49 | 12.3 | 49.3 |
| 10-yr | 96 | 26 | 36 | 62 | 16.4 | 49.3 |
| 25-yr | 125 | 34 | 43 | 75 | 24.1 | 49.3 |
| 50-yr | 146 | 39 | 48 | 87 | 29.9 | 49.3 |
| 100-yr | 166 | 45 | 53 | 98 | 36.5 | 49.3 |

The three 75 mm dia. orifice plates are sufficient in reducing post-development flows to less than pre-development rates for all storms. The orifice plates are able to restrict the post-development 5-year, 10-year, and 25-year storms to the 5-year pre-development flow rate. The 50-year and 100-year post development flows are greater than the 5-year pre-development rate as 75 mm is the smallest acceptable orifice size for practical reasons and in keeping with to the Town's Development Engineering Procedures & Guidelines Manual. See Table 7 below for a comparison of pre-post development flows for the 5- to 100-year storm events.

**Table 7: Pre- to Post-Development Flow Comparison**

| Return | Pre-Dev Total (L/s) | Post-Dev Total (L/s) | Pre-Post Percent Change | Comparison to 5-Year Pre-Dev |
|---|---|---|---|---|
| 5-yr | 75 | 49 | -35% | -35% |
| 10-yr | 96 | 62 | -35% | -17% |
| 25-yr | 125 | 75 | -40% | 0% |
| 50-yr | 146 | 87 | -40% | 16% |
| 100-yr | 166 | 98 | -40% | 31% |

As illustrated in Table 7, the post development flows are well below the pre-development flow rates for all storm systems up to the 100-year, and the 5- to 25-year post-development flow rates are at or below the 5-year pre-development flow rate.

### 3.3.2 Stormwater Runoff Volume Reduction (Water Balance)

As per the Town's Development Manual, it is recommended that 25 mm of water is retained across the site. This would result in 102.9 $m^3$ of retention volume. Given the tenure of the development, space limitation, and desired tree preservation, the opportunity to incorporate meaningful LID measures is limited. Due to the size of the rear yard and desired tree protection, no formal volume reduction by means of infiltration is proposed. We would note that that the

grading design, specifically swale slopes are generally flat and enhance infiltration. Incorporating French drains along and in key locations of the swales would provide further mitigation.

### 3.3.3 Stormwater Quality Control

Stormwater quality controls will need to be implemented during the construction phase as well as post-construction.

i) Construction Phase (Erosion and Sediment Control)

The primary source of sediment laden runoff will be as a result of vehicle mud tracking. In addition to on-site controls, off-site controls in the vicinity of the site will be required to mitigate sediment transport. Prior to any construction activity, all sediment and erosion control measures shall be implemented. These measures include sediment control fence, mud mat at construction entrance, catch basin sediment control and routine 'housekeeping' such as sweeping and flushing of the surrounding roads.

All controls shall be inspected on a regular basis and after rainfall events that generate runoff. Of particular importance are the controls placed at catch basins. If not maintained, the tendency for these to become obstructed is high and hence there is a potential for localized pooling and/or drainage issues.

ii) Post Construction

Approximately 92% of the site's drainage will be from the roof of the buildings, and the front and rear yards, all of which can be considered clean and will not require treatment. No measures are proposed for the driveways. All drainage from the roofs will be directed through grassed swales in the front and rear yards, which will provide filtration prior to discharge into the rear lot catchbasin and municipal sewer. No further quality control measures are proposed.

## 4.0 GRADING

The grading of the subdivision must take into account the boundary conditions that exist along all sides of the property such that existing drainage patterns are maintained, as well as any efforts related to tree protection. The grading to the north is controlled by the existing curb and sidewalk on Spruce Street, while the grading to the west is controlled by the existing curb and sidewalk on Reynolds Street. The west and south sides of the site must match into the existing elevations along the adjoining properties. In addition, the south side of the site provides some further constraints due to several trees along the property line that are to be protected. In general, the grades within the tree protection zone remain unaffected, however there are a few localized area's where minor grading is proposed to construct the drainage swales to the rear

yard catchbasin. This grading is to be done by hand, under the direct supervision of an arborist. Refer to the Grading Plan (G1) in Appendix 'D' for further information.

It is proposed that the lots follow a split drainage approach. The highpoint between the lots will be set towards the front of the houses such that rainwater leaders can be directed to the rear lot catchbasins and stormwater controls, limiting the amount of uncontrolled discharge.

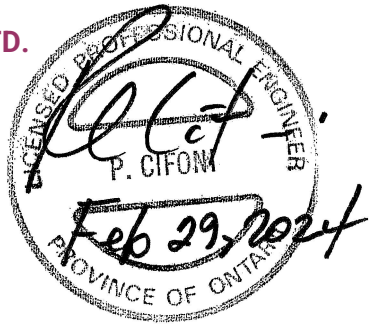
## 5.0 CONCLUSION

Adequate municipal infrastructure exists within the abutting road allowances to support the proposed Draft Plan of Subdivision and Rezoning Amendments being sought. The information in this report provides the framework from which detailed engineering designs can evolve as the development progresses through the planning approval and subdivision registration process.

Through the use of rear lot catchbasins, oversized storm sewers, and orifice plates, the development proposal results in decreased flows from the subject lands for all storms up to the 100-year event. No formal stormwater quality controls are proposed.

Implementation of the servicing and grading designs presented in this report will provide the expected level of service for low density infill residential developments. No adverse impact to the abutting properties is expected.

**PREPARED BY TRAFALGAR ENGINEERING LTD.**




**Malcolm Wallace, EIT**
Intermediate Designer

**Paul Cifoni, P.Eng.**
Consulting Engineer
Principal

P:\1819 Spruce Street Oakville\03-Documents\05-Reports\2024-02-07 FSR.docx

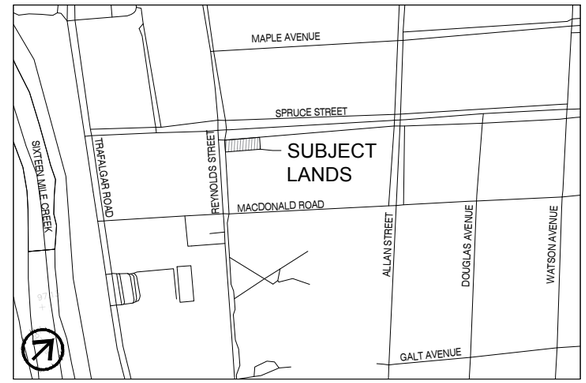
# APPENDIX ‘A’

Draft Plan of Subdivision

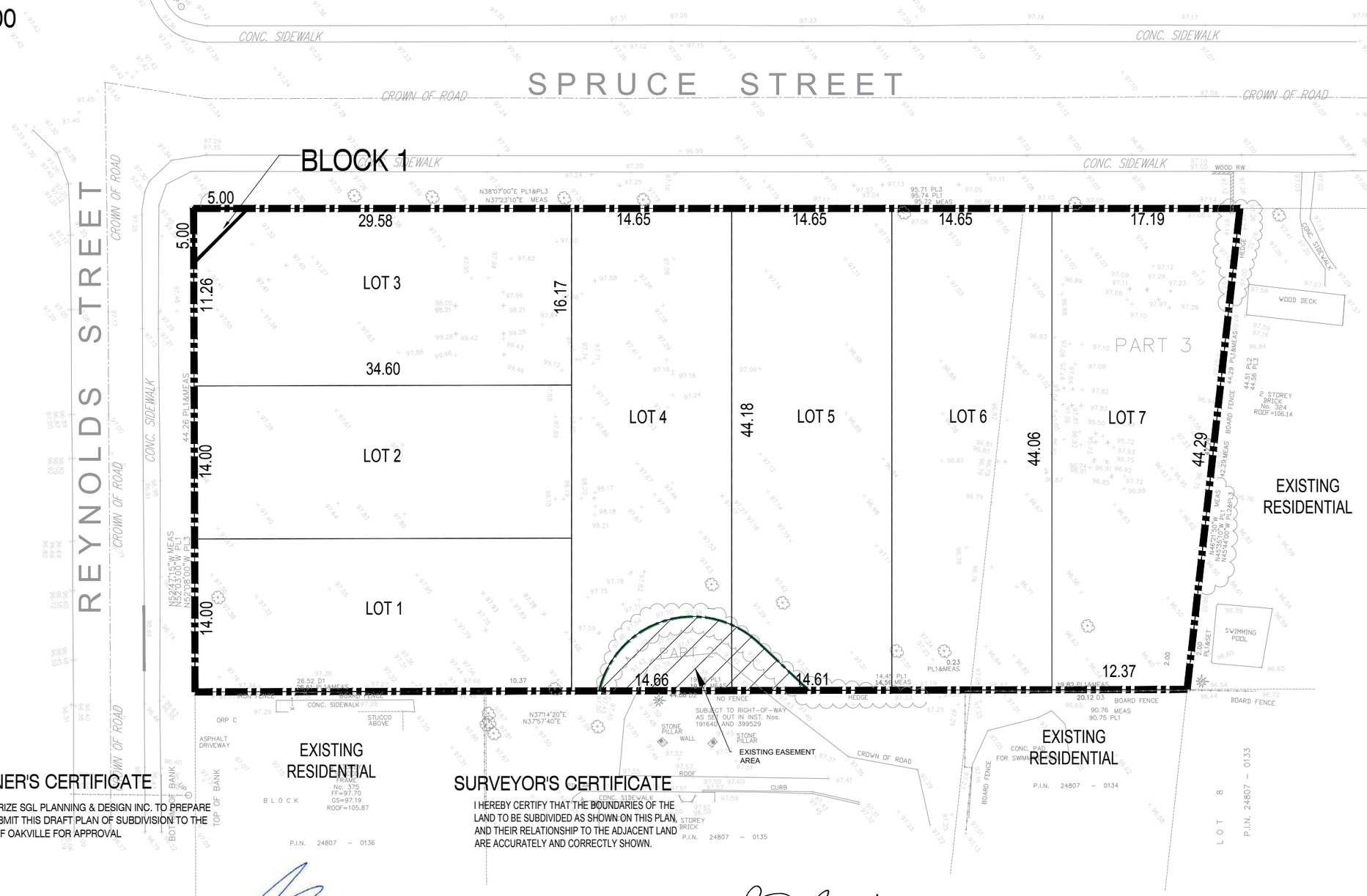
Topographic Survey

Architectural Site Plan

# DRAFT PLAN OF SUBDIVISION
# PART OF BLOCK A
# REGISTERED PLAN 121
# TOWN OF OAKVILLE
# REGIONAL MUNICIPALITY OF HALTON
1:400




KEY PLAN SCALE: 1:1000




## OWNER'S CERTIFICATE

I AUTHORIZE SGL PLANNING & DESIGN INC. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE TOWN OF OAKVILLE FOR APPROVAL

DATE FEBRUARY 23, 2024

SILVIO GUGLIETTI A.S.O

## SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED AS SHOWN ON THIS PLAN, AND THEIR RELATIONSHIP TO THE ADJACENT LAND ARE ACCURATELY AND CORRECTLY SHOWN.

DATE FEBRUARY 23, 2024

R. DENBROEDER O.L.S

## SECTION 51, PLANNING ACT, ADDITIONAL INFORMATION

A. AS SHOWN ON DRAFT PLAN
B. NOT APPLICABLE
C. AS SHOWN ON DRAFT PLAN
D. AS SHOWN ON DRAFT PLAN
E. AS SHOWN ON DRAFT PLAN
F. AS SHOWN ON DRAFT PLAN
G. AS SHOWN ON DRAFT PLAN
H. MUNICIPAL WATER SERVICES
I. CLAY-LOAM
J. AS SHOWN ON DRAFT PLAN
K. MUNICIPAL SANITARY AND STORM SEWER AVAILABLE FROM ADJACENT STREET

## SCHEDULE OF LAND USE

| | | BLOCKS | RES. UNITS | +Ha. | +Acs. |
|---|---|---|---|---|---|
| BLOCK 1 | DAYLIGHT TRIANGLE | 1 | | 0.001 | 0.003 |
| LOT 1 | SINGLE-DETACHED | 1 | 1 | 0.048 | 0.119 |
| LOT 2 | SINGLE-DETACHED | 1 | 1 | 0.048 | 0.119 |
| LOT 3 | SINGLE-DETACHED | 1 | 1 | 0.055 | 0.136 |
| LOT 4 | SINGLE-DETACHED | 1 | 1 | 0.065 | 0.161 |
| LOT 5 | SINGLE-DETACHED | 1 | 1 | 0.065 | 0.161 |
| LOT 6 | SINGLE-DETACHED | 1 | 1 | 0.065 | 0.161 |
| LOT 7 | SINGLE-DETACHED | 1 | 1 | 0.065 | 0.161 |
| TOTAL | | 8 | 7 | 0.412 | 1.02 |

# PLAN OF SURVEY AND TOPOGRAPHY OF PART OF BLOCK A REGISTERED PLAN 121 TOWN OF OAKVILLE REGIONAL MUNICIPALITY OF HALTON

SCALE 1:250

10m 5m 0 10m 20metres

R-PE SURVEYING LTD., O.L.S.

METRIC

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

## LEGEND

| | |
|---|---|
| BELLPED | DENOTES BELL BOX |
| BXC | DENOTES COMMUNICATION CABLE BOX |
| CB | DENOTES CATCH BASIN |
| CONC | DENOTES CONCRETE |
| P | DENOTES PORCH |
| RW | DENOTES RETAINING WALL |
| BF | DENOTES BOARD FENCE |
| IF | DENOTES IRON FENCE |
| PWF | DENOTES POST WIRE FENCE |
| FF | DENOTES FINISHED FLOOR |
| ST | DENOTES STAIRS |
| DS | DENOTES DOOR SILL |
| GS | DENOTES GARAGE SILL |
| UP | DENOTES UTILITY POLE |
| MH | DENOTES MANHOLE |
| MHSA | DENOTES SANITARY MANHOLE |
| MHST | DENOTES STORM MANHOLE |
| WV | DENOTES WATER VALVE |
| -W- | DENOTES OVERHEAD WIRE |
| E/W/N/S | DENOTES EAST/WEST/NORTH/SOUTH |
| Ø | DENOTES DIAMETER |
| 0.50Ø | DENOTES DECIDUOUS TREE |
| 0.15Ø | DENOTES CONIFEROUS TREE |
| X--- | DENOTES FENCE LINE |

## NOTES

| | |
|---|---|
| ■ | DENOTES MONUMENT FOUND |
| SIB | DENOTES STANDARD IRON BAR |
| IB | DENOTES IRON BAR |
| IP | DENOTES IRON PIPE |
| P.I.N. | DENOTES PROPERTY IDENTIFIER NUMBER |
| D1 | DENOTES INST. No. OC21070 |
| D2 | DENOTES INST. No. 399525 |
| D3 | DENOTES INST. No. 824827 |
| PL1 | DENOTES PLAN 20R-10208 |
| PL2 | DENOTES SURVEYOR'S REAL PROPERTY REPORT BY J. H. GELBLOOM SURVEYING LIMITED., O.L.S., DATED JANUARY 18, 2023 |
| PL3 | DENOTES REGISTERED PLAN 121 |
| (626) | DENOTES H. D. SEWELL, O.L.S. |
| (760) | DENOTES McCONNELL, MAUGHAN LIMITED, O.L.S. |
| (950) | DENOTES CUNNINGHAM McCONNELL LIMITED, O.L.S. |
| (1808) | DENOTES J. H. GELBLOOM SURVEYING LIMITED., O.L.S. |
| (WIT) | DENOTES WITNESS |
| (NI) | DENOTES NOT IDENTIFIED |
| ORP | DENOTES OBSERVED REFERENCE POINT |

## BENCHMARK NOTE

ELEVATIONS ARE REFERRED TO BENCHMARK No. 0011931U1999 HAVING AN ELEVATION OF 90.39 METRES.
TABLET IN THE TOP OF THE SQUARE PIER IN THE SOUTHWEST CORNER OF GEORGE'S SQUARE, 29.3 METRES NORTHWEST OF SUMNER AVENUE AND 12.5 METRES NORTHEAST OF TRAFALGAR ROAD.
ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).

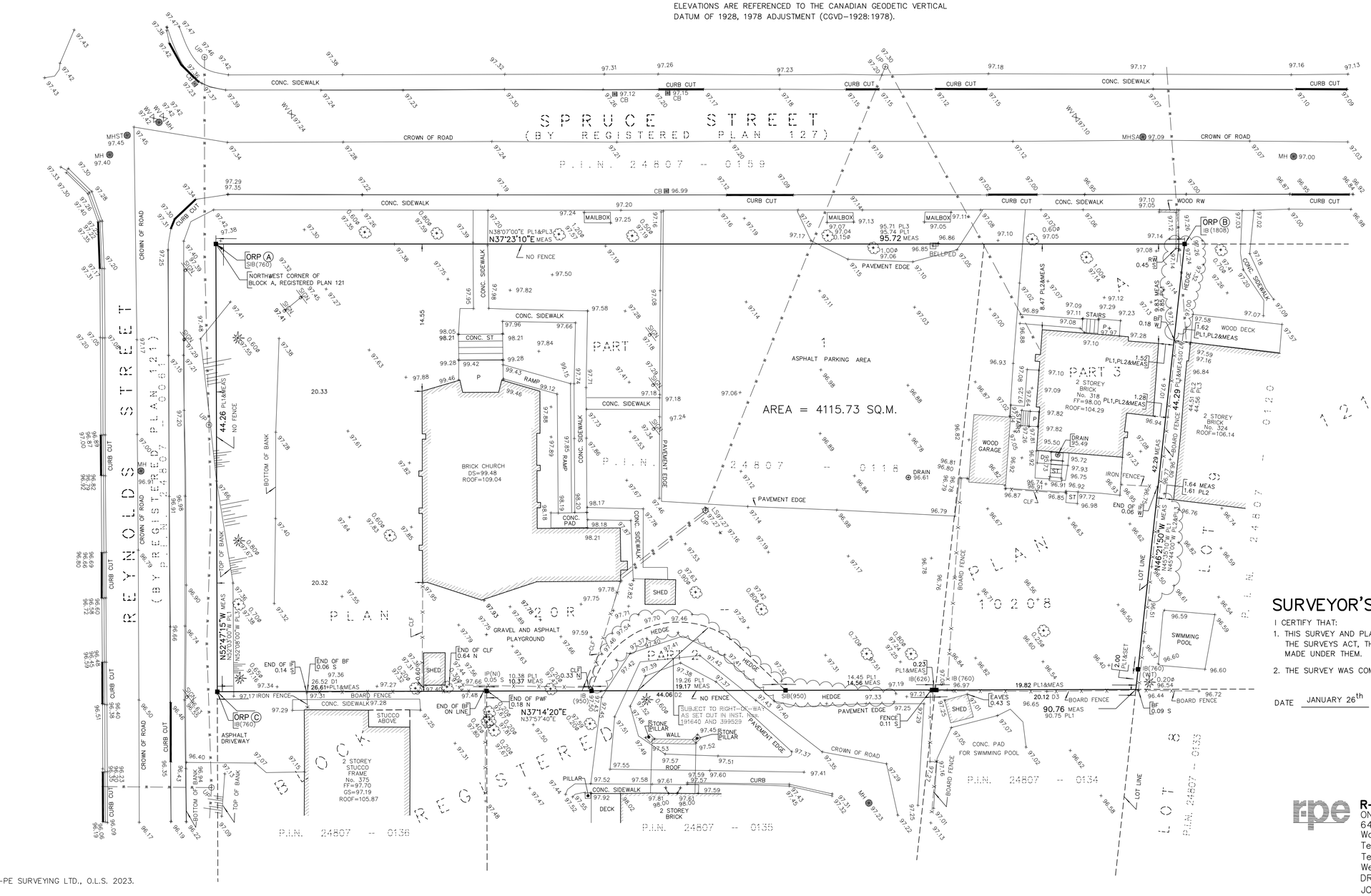
## INTEGRATION NOTE

BEARINGS ARE GRID, UTM, NAD83 (CSRS: CBNv6: 2010.0), DERIVED FROM OBSERVED REFERENCE POINTS FROM REAL TIME NETWORK STATION 20120110009 (NORTHING 4801633.529, EASTING 597944.44).

COORDINATES ARE UTM, ZONE 17, NAD83 (CSRS: CBNv6: 2010.0), TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10, AND CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

| POINT | NORTHING | EASTING |
|---|---|---|
| ORP Ⓐ | 4812129.16 | 607084.35 |
| ORP Ⓑ | 4812205.19 | 607142.45 |
| ORP Ⓒ | 4812102.40 | 607119.59 |

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999732.




## SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 20th DAY OF JANUARY, 2023

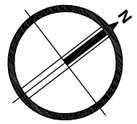
DATE JANUARY 26th, 2023

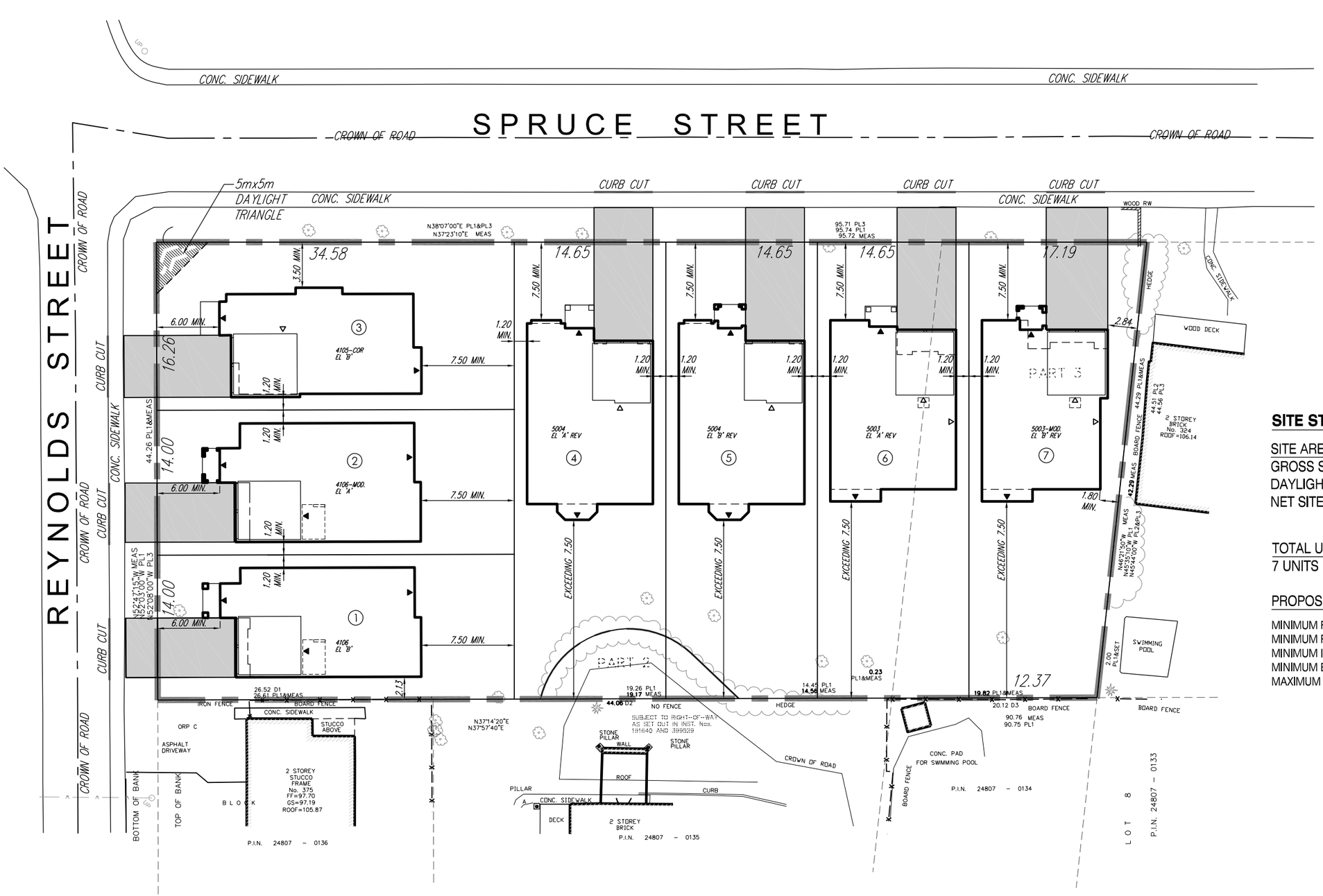
R. DENBROEDER
ONTARIO LAND SURVEYOR

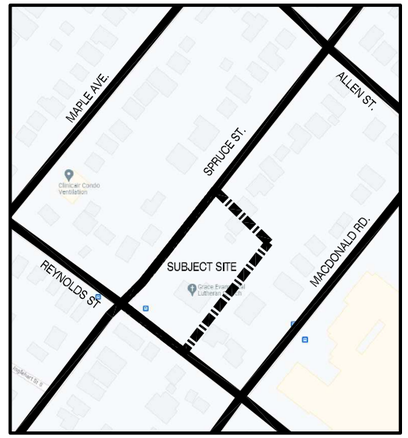
THIS PLAN OF SURVEY RELATES TO AOLS PLAN SUBMISSION FORM NUMBER 2203822.


**R-PE SURVEYING LTD.**
ONTARIO LAND SURVEYORS
643 Chrislea Road, Suite 7
Woodbridge, Ontario L4L 8A3
Tel.(416)635-5000 Fax (416)635-5001
Tel.(905)264-0881 Fax (905)264-2099
Website: www.r-pe.ca


DRAWN: S.L. CHECKED: R.D.
JOB No. 23-005 FILE No.23-005TP01




**KEYMAP**
N.T.S.

## SITE STATISTICS

SITE AREA:
GROSS SITE AREA = 4115.64 S.M.
DAYLIGHT TRIANGLE = 12.50 S.M.
NET SITE AREA = 4103.14 S.M.

TOTAL UNITS:
7 UNITS

PROPOSED ZONING STANDARDS:

| | |
|---|---|
| MINIMUM FRONT YARD: | 7.5m (6m FOR LOTS 1, 2 & 3) |
| MINIMUM REAR YARD: | 7.5m |
| MINIMUM INTERIOR SIDE YARD: | VARIES (SEE SITE PLAN) |
| MINIMUM EXTERIOR SIDE YARD: | 3.5m |
| MAXIMUM LOT COVERAGE: | 35% (41% FOR LOT 1) (44% FOR LOT 2) |

**COVERAGE CALCULATIONS**

| LOT | LOT AREA | UNIT COVERAGE | | |
|---|---|---|---|---|
| | (S.M.) | (S.M.) | (S.F.) | (%) |
| 1 | 482.58 | 196.00 | 2109.73 | 40.6% |
| 2 | 483.21 | 212.16 | 2283.67 | 43.9% |
| 3 | 547.70 | 188.24 | 2026.2 | 34.4% |
| 4 | 646.83 | 215.75 | 2322.31 | 33.4% |
| 5 | 646.28 | 215.25 | 2316.93 | 33.3% |
| 6 | 645.73 | 205.33 | 2210.15 | 31.8% |
| 7 | 650.78 | 198.58 | 2137.5 | 30.5% |

HUNT DESIGN ASSOCIATES INC.
www.huntdesign.ca

**ROSEHAVEN HOMES - 223029**
304 & 318 SPRUCE STREET, OAKVILLE, ON.
8966 Woodbine Ave, Markham, ON L3R 0J7 ■ T 905.737.5133 ■
■ MAY. 2023 ■ VG ■

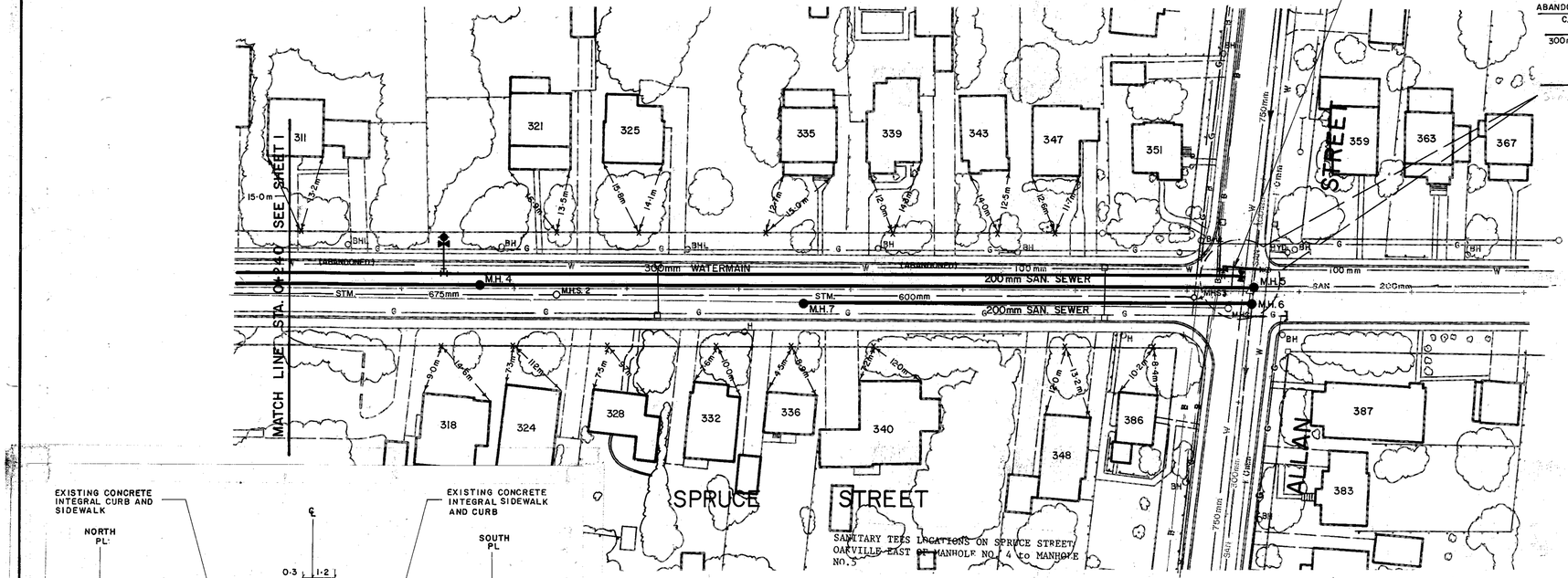
**CONCEPTUAL SITE PLAN**
SCALE 1:400
(Including Part 2 as lot area)

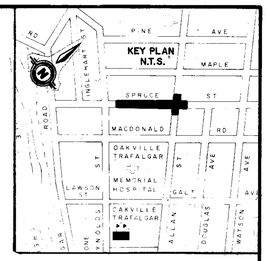
# APPENDIX ‘B’

Engineering Record Drawings

*Town of Oakville Stormwater Management Master Plan, Drawings 7.3 - 7.4, 7.7*

METRIC



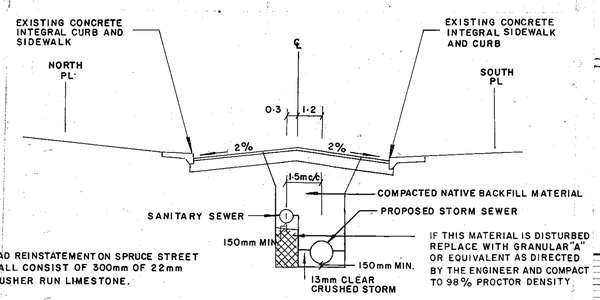




## SANITARY SEWER DATA

| M.H. | STATION | ℄ CONSTR. OFFSET | STD. | INVERTS | | GRATE STD. | TOP OF GRATE ELEV. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | INLET | OUTLET | | | |
| MH4 | 0+274·2 | 0·6m LT. | 322 | – | W. 95·090<br>E. 95·020 | 331 | | MATCH TOP OF GRATE TO EXIST. PAVEMENT ELEV. |
| MH5 | 0+411·4 | 0·7m LT. | 322 | W. 94·501 | – | 331 | | |
| MH 7 | 0+332·1 | 3·2m RT. | 322 | – | E. 94·856 | 331 | | |
| MH·6 | 0+411·8 | 2·0m RT. | 322 | W. 94·490 | – | 331 | | |

## WATERMAIN DATA

| ITEM | STATION | ℄ CONSTR. OFFSET | STD. | INVERT ELEV. | REMARKS |
|---|---|---|---|---|---|
| HYD. LAT. & SEC. G.V. | 0+267·8 | 8·2m LT. | 441 | 94·907 | COMPLETE WITH 150 OFF 300mm M.J. ANCHOR TEE |
| 150 OFF 300mm FL. ANCHOR TEE & 150mm FL. GATE VALVE & V.B. | 0+402·2 | 2·8m LT. | 405 | 94·357 | |
| 90° HORIZ. BEND FL. | | 4·5m LT. | | 94·357 | 150 mm DIA. |
| | | | | | |
| 300mm DIAMETER VALVE & 300mm x 750mm TAPPING SADDLE | 0+410<br>410 | 2·0m LT. | | 92·20 (ASSUMED) | CONNECT TO EX. 750mm (30") HYPRESCON WATERMAIN AWWA |
| 150 TO 100mm REDUCER | 0+419·2 | 4·0m ±LT. | | 95·30 (ASSUMED) | CONNECT TO EX. 100 x 150mm CROSS |




TYPICAL SECTION THROUGH DUAL TRENCH ON SPRUCE STREET

N.T.S.

SANITARY TEES LOCATIONS ON SPRUCE STREET, OAKVILLE EAST OF MANHOLE NO. 4 TO MANHOLE NO. 5

| | | |
|---|---|---|
| Hse. No. 318 | Tee to the Right | 4.1m |
| Hse. No. 324 | Tee to the Right | 10.1m |
| Hse. No. 321 | Tee to the Left | 12.8m |

NOTE: Sanitary tees left in the sanitary sewer for the above houses. No laterals found. Laterals for above houses found and connection further to the east.

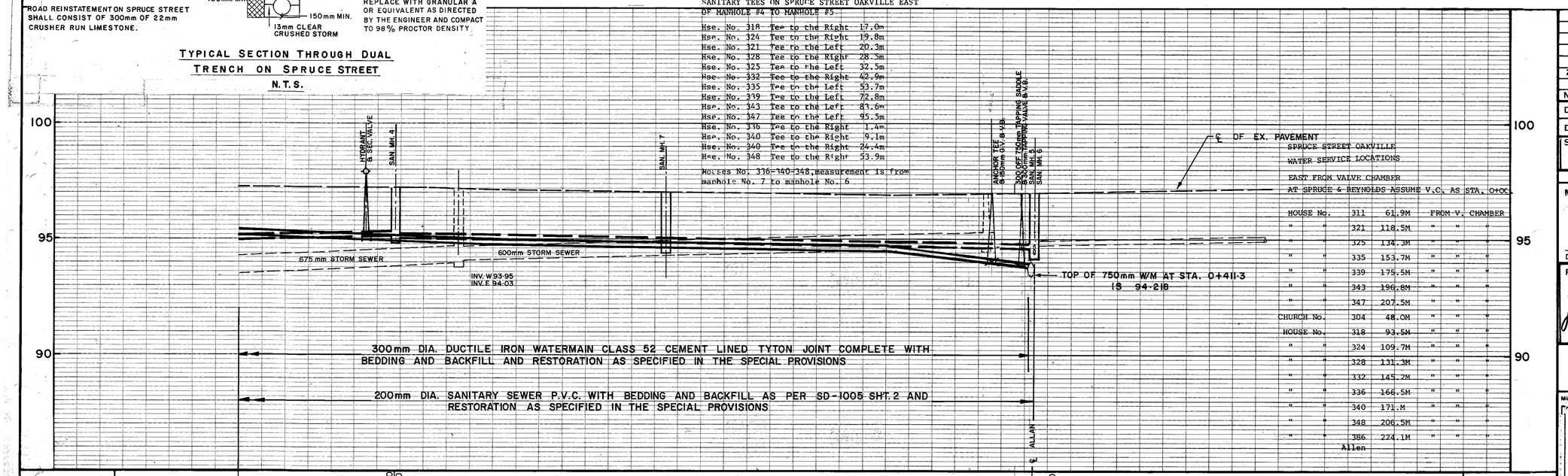
SANITARY TEES ON SPRUCE STREET OAKVILLE EAST OF MANHOLE #4 TO MANHOLE #5

| | | |
|---|---|---|
| Hse. No. 318 | Tee to the Right | 17.0m |
| Hse. No. 324 | Tee to the Right | 19.8m |
| Hse. No. 321 | Tee to the Left | 20.3m |
| Hse. No. 328 | Tee to the Right | 28.5m |
| Hse. No. 325 | Tee to the Left | 32.5m |
| Hse. No. 332 | Tee to the Right | 42.9m |
| Hse. No. 335 | Tee to the Left | 53.7m |
| Hse. No. 339 | Tee to the Left | 72.8m |
| Hse. No. 343 | Tee to the Left | 83.6m |
| Hse. No. 347 | Tee to the Left | 95.5m |
| Hse. No. 336 | Tee to the Right | 1.4m |
| Hse. No. 340 | Tee to the Right | 9.1m |
| Hse. No. 340 | Tee to the Right | 24.4m |
| Hse. No. 348 | Tee to the Right | 53.9m |

Houses No. 336-340-348, measurement is from manhole No. 7 to manhole No. 6

NOTES

1. SANITARY SEWER LATERALS REPLACED TO SOLID PIPE (OR TO LIMIT OF P.L) AND RECONNECTED TO NEW SEWER.
2. WATER SERVICE LATERALS INSTALLED PER STD. DWG. 431.
3. WHERE THE WATERMAIN CROSSES UNDER A SANITARY OR STORM LATERAL, THE CONTRACTOR SHALL PROVIDE CONCRETE ENCASEMENT OF THE SEWER AND WATERMAIN.




SPRUCE STREET OAKVILLE
WATER SERVICE LOCATIONS
EAST FROM VALVE CHAMBER
AT SPRUCE & REYNOLDS ASSUME V.C. AS STA. 0+00

| | | | |
|---|---|---|---|
| HOUSE No. | 311 | 61.9M | FROM V. CHAMBER |
| " " | 321 | 118.5M | " " " |
| " " | 325 | 134.3M | " " " |
| " " | 335 | 153.7M | " " " |
| " " | 339 | 175.5M | " " " |
| " " | 343 | 196.8M | " " " |
| " " | 347 | 207.5M | " " " |
| CHURCH No. | 304 | 48.0M | " " " |
| HOUSE No. | 318 | 93.5M | " " " |
| " " | 324 | 109.7M | " " " |
| " " | 328 | 131.3M | " " " |
| " " | 332 | 145.2M | " " " |
| " " | 336 | 166.5M | " " " |
| " " | 340 | 171.M | " " " |
| " " | 348 | 206.5M | " " " |
| " " | 386 | 224.1M | " " " |

Allen

| | | | |
|---|---|---|---|
| SANITARY INVERTS | 100.2m AT +0.47% (W. 95.090, E. 95.020) | 137.2 m AT -0.38 % (W. 94.500, E. 94.631, S. 94.440) | SANITARY INVERTS |
| WATERMAIN INVERTS | 117·7m AT 0·79% (94.690) | 115·0m AT 0·30% | WATERMAIN INVERTS |
| | E. 94.856 — 79.7m AT -0.46 % | W. 94.490, N. 94.440, S. 94.440 | |
| CHAINAGE | 0+240, 0+260, 0+274·2, 0+280, 0+295, 0+300, 0+320, 0+340, 0+360, 0+380, 0+400, 0+4022, 0+409·4, 0+420, 0+440, 0+460 | | CHAINAGE |

| No | Date | By | REVISIONS |
|---|---|---|---|
| 2 | AUG./82 | J.S. | "AS-CONSTRUCTED" |
| 1. | 81/09/23 | M.J.H. | REVISE PROF. STM. SEWER SIZE. |

Design G.E.R. Checked
Drawn M.J.H. Checked
Date AUGUST 1981
Scale HORIZ. 10 5 0 10 VERT. 2 1 0 2

APPROVALS

Municipal

DIRECTOR OF PUBLIC WORKS

Regional

DIRECTOR OF PUBLIC WORKS

MANAGER OF DESIGN 1981 08 31

REFERENCES

FIELD NOTES

STAMP

MUNICIPALITY

TOWN OF OAKVILLE PUBLIC WORKS DEPARTMENT

JOINT CONTRACT

REGIONAL MUNICIPALITY OF HALTON PUBLIC WORKS DEPARTMENT

TITLE

300mm Ø WATERMAIN
SPRUCE STREET
FROM ALLAN ST. TO 170m WEST
TOWN OF OAKVILLE
STA. 0+240 TO 0+460

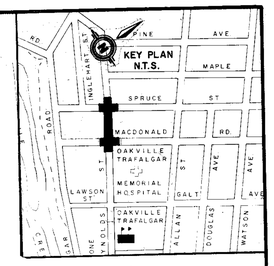
MUNICIPAL DRAWING Nº

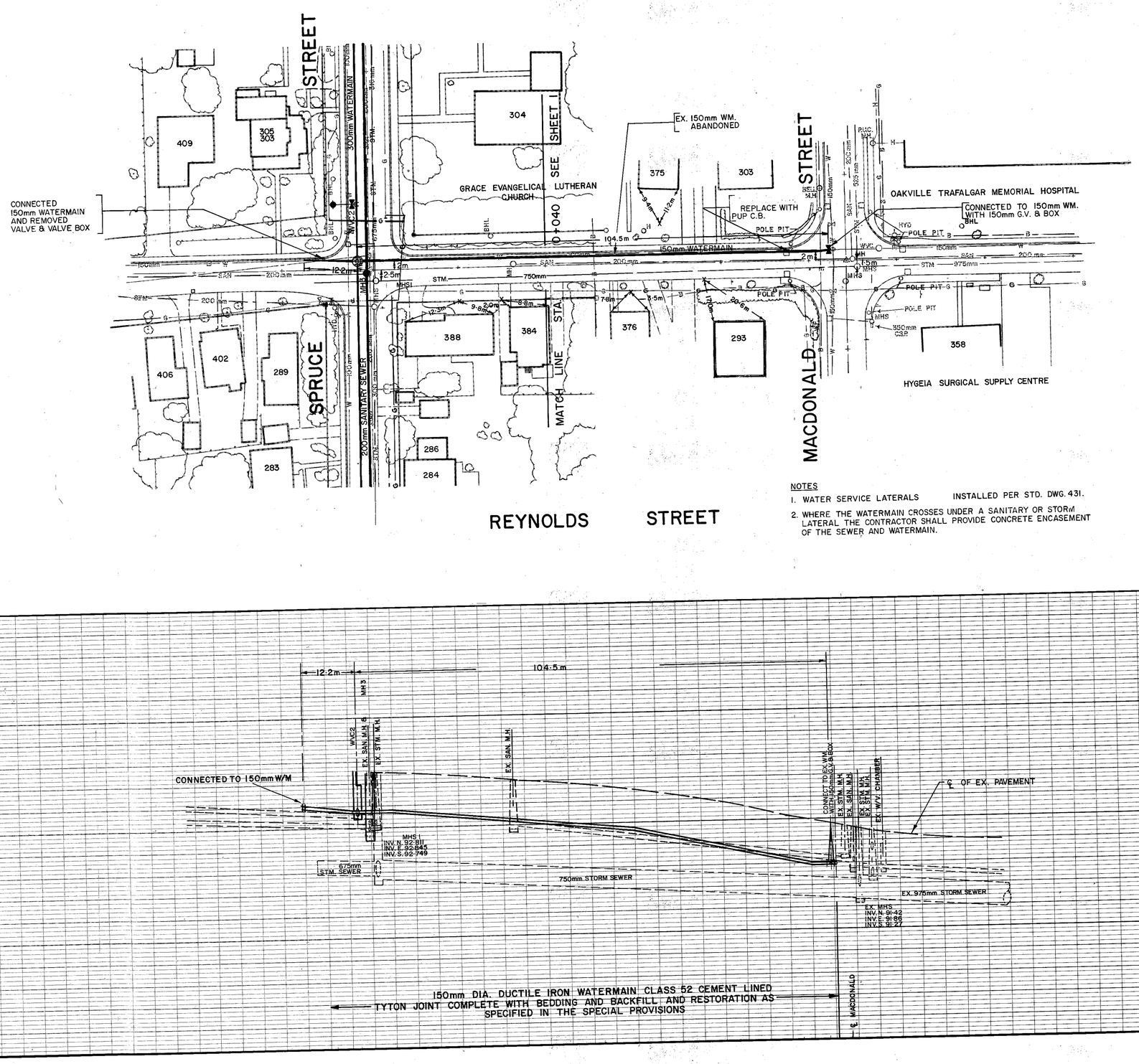
REGIONAL DRAWING Nº 0-4400

CONTRACT Nº WS-579-81

SHEET 2 OF 12

METRIC




NOTES

1. WATER SERVICE LATERALS INSTALLED PER STD. DWG. 431.
2. WHERE THE WATERMAIN CROSSES UNDER A SANITARY OR STORM LATERAL THE CONTRACTOR SHALL PROVIDE CONCRETE ENCASEMENT OF THE SEWER AND WATERMAIN.




| | |
|---|---|
| SANITARY INVERTS | |
| WATERMAIN INVERTS | 7·599m AT 0·00% — 12·2m — 95·675 — 95·675 — 55m AT 1·95% — 40m AT 4·25% — 92·900 — 92·900 (ASSUMED) — 5·45m AT 0·00% |
| EXISTING SANITARY INVERTS | N. 94.931 W. 94.881 E. 95.141 — N. 95.014 S. 94.954 — N. 92.947 S. 92.797 E. 93.077 |
| CHAINAGE | 0+12.2 — 0+002.599 — 0+000 — 0+005 — 0+020 — 0+040 — 0+060 — 0+080 — 0+100 — 0+104.5 — 0+120 — 0+140 |

| No | Date | By | REVISIONS |
|---|---|---|---|
| 2 | AUG./82 | J.S. | "AS-CONSTRUCTED" |
| 1 | 81/09/23 | M.J.H. | REVISE PROP. STM. SEWER SIZE. |

| | | | |
|---|---|---|---|
| Design | G.E.R. | Checked | Date AUGUST 1981 |
| Drawn | M.J.H. | Checked | |
| Scale HORIZ. 10 5 0 10 | | | REFERENCES |
| Scale VERT. 2 1 0 2 | | | |

APPROVALS

Municipal

DIRECTOR OF PUBLIC WORKS

Regional

DIRECTOR OF PUBLIC WORKS

MANAGER OF DESIGN 1981 08 31

FIELD NOTES

STAMP

MUNICIPALITY

TOWN OF OAKVILLE
PUBLIC WORKS DEPARTMENT

JOINT CONTRACT

REGIONAL MUNICIPALITY OF HALTON
PUBLIC WORKS DEPARTMENT

TITLE

150mm Ø WATERMAIN
REYNOLDS STREET
SPRUCE ST. TO MACDONALD ST.
TOWN OF OAKVILLE
STA. 0+000 TO 0+140

MUNICIPAL DRAWING No

REGIONAL DRAWING No
0-4401

CONTRACT No
WS-579-81

SHEET 3 OF 12

POSITION EDGE OF PRINT ON THIS LINE

POSITION EDGE OF PRINT ON THIS LINE

0-4401

METRIC

LIMIT OF STORM SEWER CONSTRUCTION STA. 0+013.0N.

LIMIT OF STORM SEWER CONSTRUCTION STA. 0+110.7

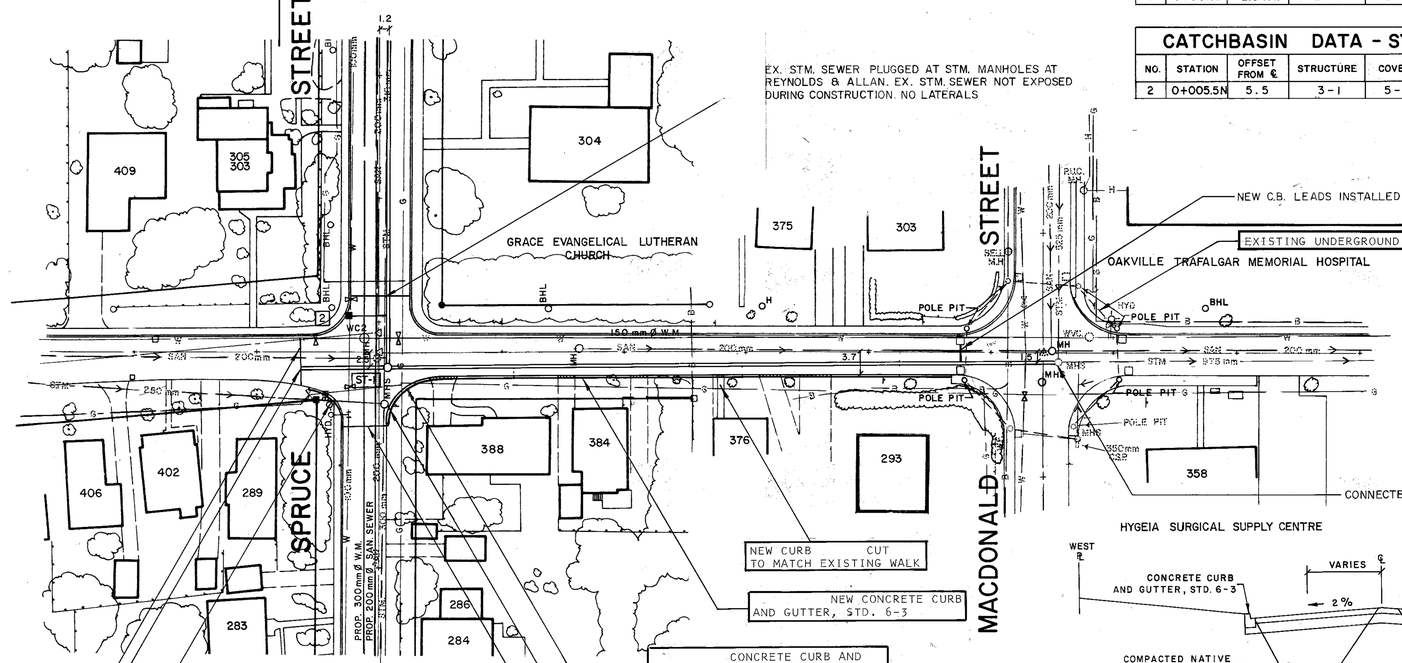
EX. STM. SEWER PLUGGED AT STM. MANHOLES AT REYNOLDS & ALLAN. EX. STM. SEWER NOT EXPOSED DURING CONSTRUCTION. NO LATERALS

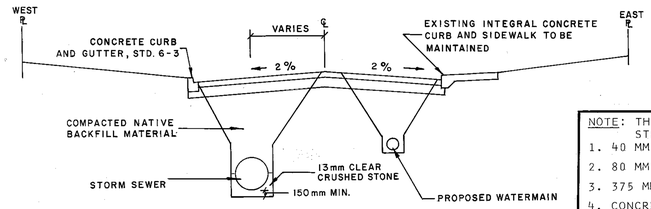
## STORM SEWER DATA - SYMBOL ST.

| NO. | STATION | OFFSET FROM ℄ | STRUCTURE | COVER | COMMENTS |
|---|---|---|---|---|---|
| 1 | 0+001.2 | 2.5 RT. | 2 - 4 | 5 - 1 | |

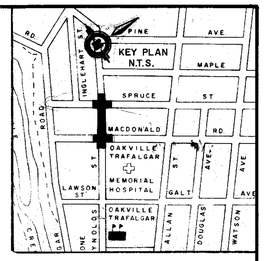
## CATCHBASIN DATA - SYMBOL □

| NO. | STATION | OFFSET FROM ℄ | STRUCTURE | COVER | COMMENTS |
|---|---|---|---|---|---|
| 2 | 0+005.5N | 5.5 | 3 - 1 | 5 - 4 | IN CURB |




**TYPICAL SECTION THROUGH TRENCH OF REYNOLDS STREET**
N.T.S.





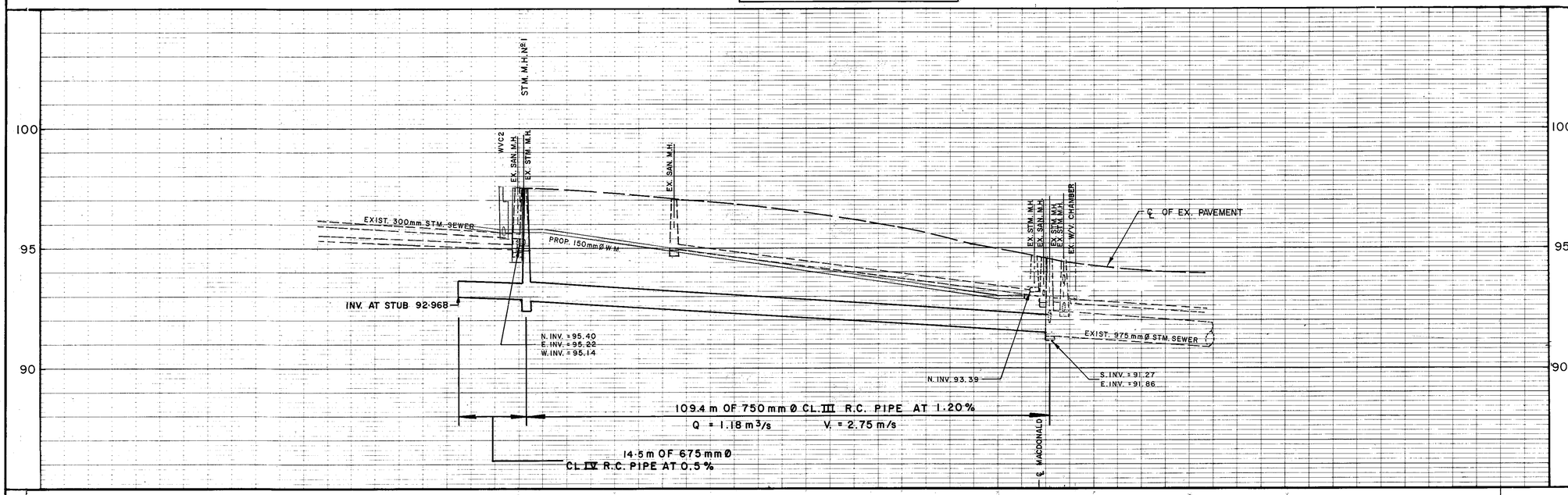
**NOTES:**

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2. ALL CATCHBASIN LEADS ARE TO BE 250 MM E.S. CONCRETE PIPE @ 1% SLOPE UNLESS OTHERWISE NOTED.
3. ALL STORM LATERALS ARE TO BE LOCATED IN THE FIELD.
4. SAWCUT ALL EXISTING ASPHALT AND CONCRETE

PROPOSED CURB CUTS

**NOTE:** THE ENTIRE SURFACE OF REYNOLDS STREET IS TO BE REINSTATED WITH:

1. 40 MM OF HL-3A SURFACE COURSE ASPHALT
2. 80 MM OF HL-6 BASE COURSE ASPHALT
3. 375 MM OF 22 MM CRUSHER RUN LIMESTONE
4. CONCRETE CURB & GUTTER, STD. 6-3 CENTRELINE GRADES AND WEST GUTTER LINE GRADES ARE TO BE ESTABLISHED BASED ON THE EXISTING EAST CURBLINE WITH 2% CROSSFALL.




| | | | |
|---|---|---|---|
| 2 | AUG. 82 | J.S. | "AS-CONSTRUCTED" |
| 1 | 81/09/04 | S.M.R. | REVISED PROP. STORM SEWER SIZE |
| № | Date | By | REVISIONS |

| | | | | |
|---|---|---|---|---|
| Design | S.M.R. | Checked | D.A.B. | Date AUG 1981 |
| Drawn | B.W. | Checked | D.A.B. | |

Scale HORIZ. 10 5 0 10
VERT. 2 1 0 2

REFERENCES

FIELD NOTES

APPROVALS

Municipal

O.H. Ellis, P. Eng Director of Public Works

Regional

DIRECTOR OF PUBLIC WORKS

MANAGER OF DESIGN

STAMP

CONSULTANT

MUNICIPALITY

TOWN OF OAKVILLE

DEPARTMENT OF PUBLIC WORKS

TITLE

STORM SEWER

**REYNOLDS STREET**

SPRUCE ST. TO MACDONALD ST.

TOWN OF OAKVILLE

STA. 0+000 TO 0+140

| MUNICIPAL DRAWING № | REGIONAL DRAWING № |
|---|---|
| ST - 42 - 81 | 0-4402 |
| CONTRACT № | SHEET 4 OF 12 |
| WS - 579 - 81 | |

STORM SEWER INVERTS

91.42 N.

N. 92.811
S. 92.749
E. 92.845

CHAINAGE

0+000 | 0+001. | 0+020 | 0+040 | 0+060 | 0+080 | 0+100 | 0+110.7 | 0+120 | 0+140

0-4402

**Legend**

- Network
- Parcels
- Streams
- Roads
- Outfalls

**Minor System Performance**

- Unsurcharged
- Below 1/2 Surcharging Depth and Above Obvert
- Above 1/2 Surcharging Depth and Below Rim Elevation
- Surcharged Above Rim Elevation

**Stormwater Management Master Plan**

**Phase 2**

**Town of Oakville**

**5 Year Storm Event Urban and Hybrid Performance Assessment - Existing Condition**

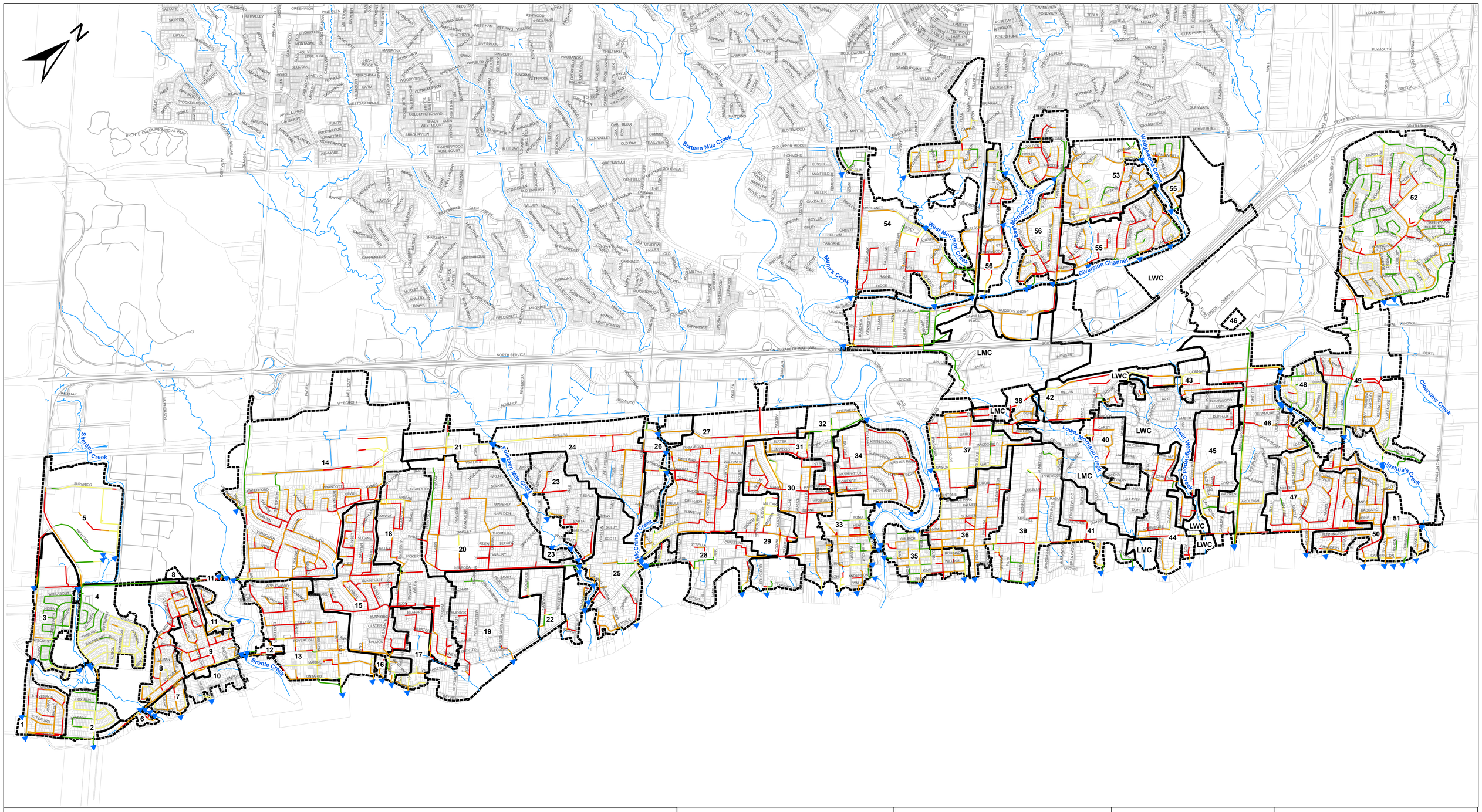
wood.

Scale **1:17,000**

0 250 500 1,000 1,500 Meters

Project No. **TP 115045**

Drawing No. **7.3**




**Legend**

- Network
- Parcels
- Streams
- Roads
- Outfalls

**Minor System Performance**

- Unsurcharged
- Below 1/2 Surcharging Depth and Above Obvert
- Above 1/2 Surcharging Depth and Below Rim Elevation
- Surcharged Above Rim Elevation

**Stormwater Management Master Plan**

**Phase 2**

**Town of Oakville**

**100 Year Storm Event Minor System Performance - Existing Condition**

wood.

Scale **1:17,000**

0 250 500 1,000 1,500 Meters

Project No. **TP 115045**

Drawing No. **7.4**

# APPENDIX ‘C’

Estimated Water Demand

Estimated Sanitary Flow

## TRAFALGAR ENGINEERING LTD.

### ESTIMATED PROPOSED WATER DEMAND

**Project:** Spruce Rose Inc.
**Desc:** Draft Plan of Subdivision

**Project No.:** 1819
**Prepared By:** MW
**Checked By:** PC

| | Occupancy Data | | | | | Peaking Factors | | | Demand Flow | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use / Occupancy Type | Site Area (ha) | Population Density (pers/ha) | Eq. Population (cap.) | Per Cap. Demand (L/cap. Day) | Average Daily Demand (L/min) | Min. Hour | Peak Hour | Max. Daily | Min. Hour Demand (L/min) | Max. Hour Demand (L/min) | Max. Daily Demand (L/min) |
| Single Family Residential | 0.07 | 55 | 4 | 191 | 0.5 | 1.00 | 4.00 | 2.25 | 0.5 | 1.9 | 1.1 |
| | | | | | | | | | | | 0.0 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| **TOTAL** | **0.07** | | **4** | | **0.5** | | | | **0.5** | **1.9** | **1.1** |

**Average Daily Demand:** **0.5 (L/min)**
**Minimum Hourly Demand:** **0.5 (L/min)**
**Maximum Hourly Demand:** **1.9 (L/min)**
**Maximum Daily Demand:** **1.1 (L/min)**
**Max. Daily Plus Fire:** **5001.1 (L/min)**

**Fire Flow**
**Using Fire Underwriters Survey Methodology:**

**1.** **An estimate of the fire flow is given by the formula** $F = 220C\sqrt{A}$

Where:
F = The required fire flow in litres per minute
C = Coefficient related to the type of construction
A = The total floor area in square metres (including all storeys but excluding basements at least 50% below grade)

Type of Construction: Ordinary  Coefficient: 1.00  Total Floor Area: 383 ($m^2$)

**F = 4000 (L/min)**

Adequately Protected Vertical Openings: No

**Area Note:** For adequately protected vertical openings consider only the area of the largest floor plus 25% of each of the two immediately adjoining floors.

**2.** **Adjust the value in No. 1 for occupancy surcharge/reduction**

Occupancy Contents: Combustible  Factor: 0%

**F = 4000 (L/min)**

**3.** **Adjust the value in No. 2 for sprinkler**

| | | | |
|---|---|---|---|
| NFPA 13 Sprinkler: | No | Reduction: | 20% |
| Standard Water Supply: | Yes | Reduction: | 10% |
| Fully Supervised: | No | Reduction: | 10% |
| | | **Total Reduction:** | **40%** |
| | | **Sprinkler Reduction:** | **1600 (L/min)** |

**4. Adjust the value in No. 2 for exposure**

| | Separation (m) | Charge |
|---|---|---|
| North | 2.5 | 25% |
| East | 10 | 15% |
| South | 2.5 | 25% |
| West | 30 | 5% |
| **Total Charge:** | | **70%** |
| **Exposure Charge:** | | **2800 (L/min)** |

**5.** **Estimated Fire Flow is value in No. 2 less *Sprinkler Reduction* plus *Exposure Charge*, rounded to the nearest 1000**

**F = 5000 (L/min)**

## TRAFALGAR ENGINEERING LTD.

### ESTIMATED PROPOSED WATER DEMAND

**Project:** Spruce Rose Inc.
**Desc:** Draft Plan of Subdivision

**Project No.:** 1819
**Prepared By:** MW
**Checked By:** PC

| | Occupancy Data | | | | | Peaking Factors | | | Demand Flow | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use / Occupancy Type | Site Area (ha) | Population Density (pers/ha) | Eq. Population (cap.) | Per Cap. Demand (L/cap. Day) | Average Daily Demand (L/min) | Min. Hour | Peak Hour | Max. Daily | Min. Hour Demand (L/min) | Max. Hour Demand (L/min) | Max. Daily Demand (L/min) |
| Single Family Residential | 0.07 | 55 | 4 | 191 | 1 | 1.00 | 4.00 | 2.25 | 1 | 2 | 1 |
| | | | | | | | | | | | 0 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| **TOTAL** | **0.07** | | **4** | | **1** | | | | **1** | **2** | **1** |

**Average Daily Demand:** 0.5 (L/min)
**Minimum Hourly Demand:** 0.5 (L/min)
**Maximum Hourly Demand:** 2 (L/min)
**Maximum Daily Demand:** 1.1 (L/min)
**Max. Daily Plus Fire:** 5001.1 (L/min)

**Fire Flow**
**Using Fire Underwriters Survey Methodology:**

**1.** **An estimate of the fire flow is given by the formula** $F = 220C\sqrt{A}$

Where:
F = The required fire flow in litres per minute
C = Coefficient related to the type of construction
A = The total floor area in square metres (including all storeys but excluding basements at least 50% below grade)

Type of Construction: Ordinary  Coefficient: 1.00  Total Floor Area: 400 ($m^2$)

**F = 4000 (L/min)**

Adequately Protected Vertical Openings: No

**Area Note:** For adequately protected vertical openings consider only the area of the largest floor plus 25% of each of the two immediately adjoining floors.

**2.** **Adjust the value in No. 1 for occupancy surcharge/reduction**

Occupancy Contents: Combustible  Factor: 0%

**F = 4000 (L/min)**

**3.** **Adjust the value in No. 2 for sprinkler**

| | | | |
|---|---|---|---|
| NFPA 13 Sprinkler: | Yes | Reduction: | 20% |
| Standard Water Supply: | Yes | Reduction: | 10% |
| Fully Supervised: | Yes | Reduction: | 10% |

**Total Reduction:** 40%
**Sprinkler Reduction:** 1600 (L/min)

**4. Adjust the value in No. 2 for exposure**

| | Separation (m) | Charge |
|---|---|---|
| North | 30 | 5% |
| East | 2.5 | 25% |
| South | 30 | 5% |
| West | 2.5 | 25% |

**Total Charge:** 60%
**Exposure Charge:** 2400 (L/min)

**5.** **Estimated Fire Flow is value in No. 2 less *Sprinkler Reduction* plus *Exposure Charge*, rounded to the nearest 1000**

**F = 5000 (L/min)**

## TRAFALGAR ENGINEERING LTD.

### ESTIMATED PROPOSED SANITARY FLOW

**Project:** Spruce Rose Inc. **Project No.:** 1819
**Desc:** Draft Plan of Subdivision **Prepared By:** MW
**Checked By:** PC

**Residential**

| Land Use / Occupancy Type | Site Area (ha) | Population Density (pers/ha) | Eq. Population (cap.) | Per Cap. Demand (L/cap. Day) | Average Daily Dry Weather Flow (L/s) |
|---|---|---|---|---|---|
| Single Family Residential | 0.41 | 55.0 | 23 | 275 | 0.07 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| **TOTAL** | **0.41** | | **23** | | **0.07** |

**Industrial / Commercial / Institutional**

| Land Use / Occupancy Type | Site Area (ha) | Population Density (pers/ha) | Eq. Population (cap.) | Unit Sewage Flow (L/Ha. Day) | Average Daily Dry Weather Flow (L/s) |
|---|---|---|---|---|---|
| | | | 0 | 24750 | 0.0 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| **TOTAL** | **0.00** | | **0** | | **0.00** |

| | | |
|---|---|---|
| Residential Peaking Factor: | 4.37 | |
| ICI Peaking Factor: | 4.50 | |
| Include ICI Peaking? | No | |
| Tributary Area: | 0.41 | (ha) |
| Infiltration Allowance: | 0.286 | (L/s ha) |
| Foundation Drain Allowance: | 0.00 | (L/s ha) |
| | | |
| Residential + Infilitration Avg Flow: | 0.19 | (L/s) |
| ICI Average Flow: | 0.00 | (L/s) |
| Groundwater Discharge: | | (L/s) |
| **Total Average Flow:** | **0.19** | **(L/s)** |
| | | |
| Residential Peak + Infiltration Flow: | 0.43 | (L/s) |
| ICI Peak Flow: | 0.00 | (L/s) |
| Groundwater Discharge: | | (L/s) |
| **Total Peak Flow:** | **0.43** | **(L/s)** |

## APPENDIX ‘D’

Cover Sheet

Erosion and Sediment Control Plan

General Servicing Plan

Storm Drainage Area Plan

Sanitary Drainage Area Plan

Composite Utility Plan

Grading Plan

Sections and Details Plan

Standard Notes

# SPRUCE ROSE INC.
# SUBDIVISION

24T-XXXXX/XXX

20M-XXXX

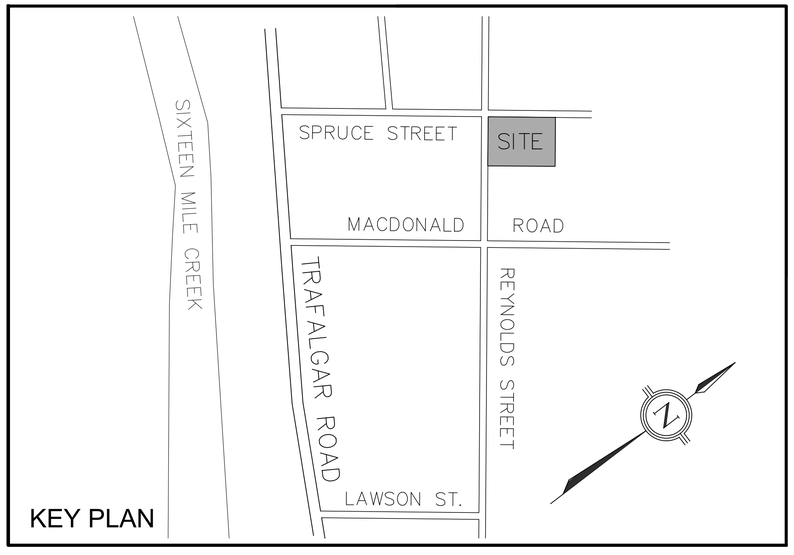
308 & 318 SPRUCE STREET

TOWN OF OAKVILLE

Halton REGION

## DRAWING INDEX


| Sheet | Title |
|---|---|
| E1 | EROSION AND SEDIMENT CONTROL PLAN |
| S1 | GENERAL SERVICING PLAN |
| S2 | STORM DRAINAGE AREA PLAN |
| S3 | SANITARY DRAINAGE AREA PLAN |
| CU1 | COMPOSITE UTILITY PLAN |
| G1 | GRADING PLAN |
| D1 | SECTIONS AND DETAILS PLAN |
| N1 | STANDARD NOTES |



TRAFALGAR ENGINEERING

#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6

www.trafalgareng.com


CONSULTANT FILE: 1819

TOWN FILE: 24T-XXXXX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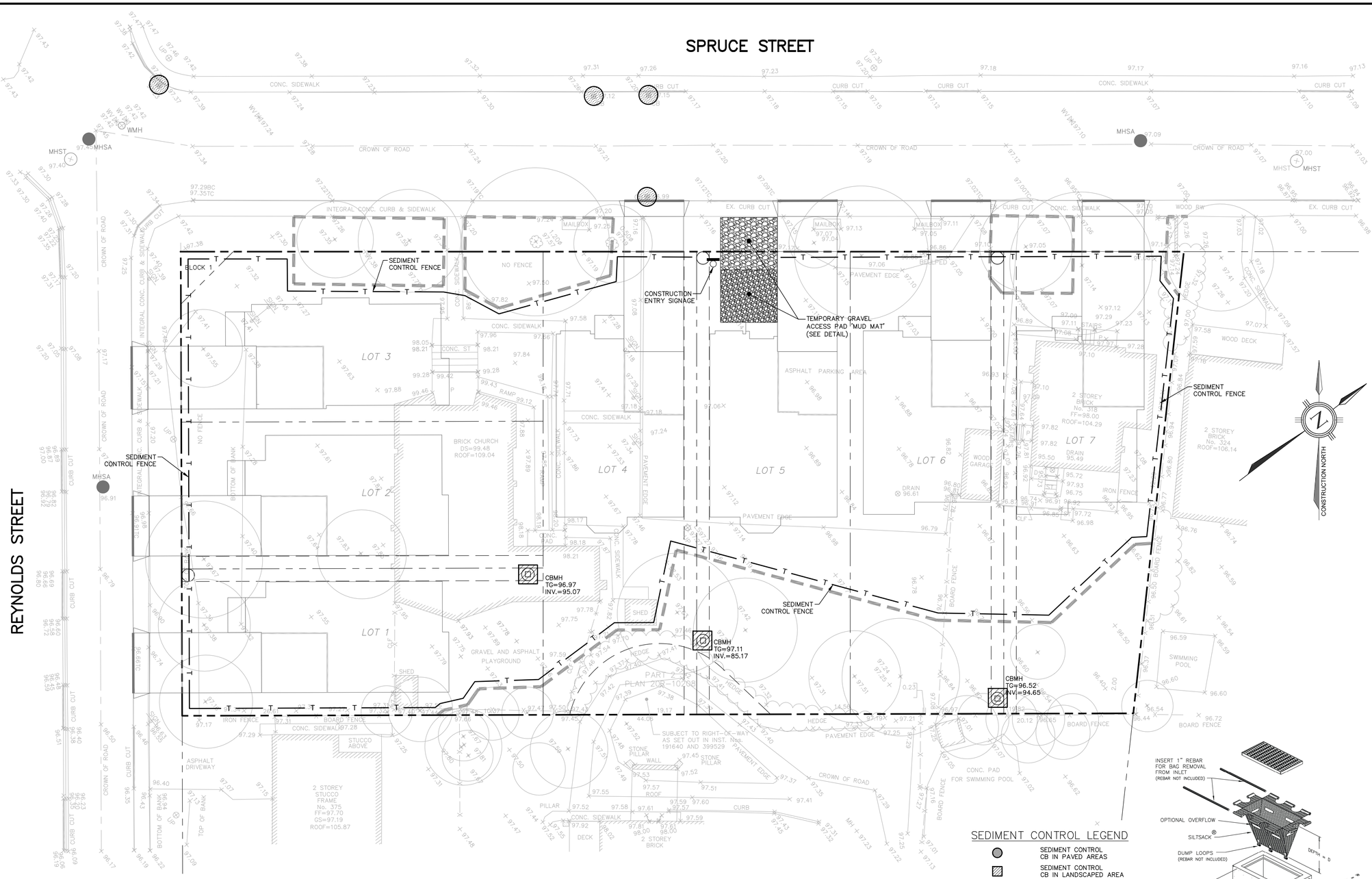
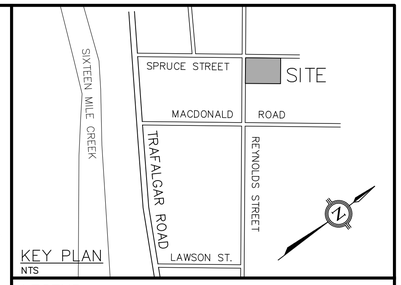



## LEGEND

- PROPOSED CATCHBASIN MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED VALVE & BOX
- PROPOSED CURB STOP
- EXISTING CURB STOP
- PROPERTY LINE
- SUBDIVISION LOT LINE
- 96.88 EXISTING ELEVATION
- PROPOSED DRAINAGE DIRECTION
- PROPOSED SWALE DRAINAGE DIRECTION
- TREE PROTECTION FENCE (GREEN PRINT CONSULTING, 2023)

## BENCHMARK

ELEVATIONS ARE REFERRED TO BENCHMARK No. 001193IU1999 HAVING AN ELEVATION OF 90.39 METRES. TABLET IN THE TOP OF THE SQUARE PIER IN THE SOUTHWEST CORNER OF GEORGE'S SQUARE, 29.3 METRES NORTHWEST OF SUMNER AVENUE AND 12.5 METRES NORTHEAST OF TRAFALGAR ROAD.
ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).

## NOTE

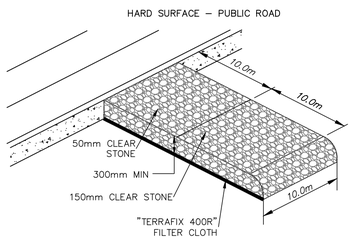
THE SURVEY WAS COMPLETED ON THE 20TH DAY OF JANUARY, 2023 BY R-PE SURVEYING LTD., ONTARIO LAND SURVEYORS. JOB No. 23-005 CAD FILE No.23-005TP01

## EROSION AND SEDIMENT CONTROL NOTES

1. ALL EROSION AND SEDIMENT MEASURES/DEVICES SHALL INSTALLED PRIOR TO ANY SITE DISTURBANCE/CONSTRUCTION
2. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSPECTED, REPAIRED/MAINTAINED WEEKLY AND FOLLOWING ALL SIGNIFICANT RAINFALLS.
3. THE MEASURES AS PROPOSED MAY BE MODIFIED AT THE DISCRETION OF THE ENGINEER TO SUIT THE PROPOSED CONSTRUCTION PROGRAMS. THE GENERAL INTENT OF THE PROPOSED EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES.
4. DECOMMISSIONING OF ALL EROSION CONTROL MEASURES SHALL OCCUR ONLY ONCE VEGETATIVE COVER IS ESTABLISHED.
5. DESIGNATED ENTRANCE FOR ALL CONSTRUCTION TRAFFIC TO BE INSTALLED WITH MUD CONTROL DEVICE AS PER MUD MAT DETAIL. MUD CONTROL DEVICES TO BE INSTALLED PRIOR TO START OF CONSTRUCTION AND ARE TO BE MAINTAINED IN GOOD WORKING ORDER UNTIL GRADING WORKS ARE COMPLETED. MUD MAT MAY BE DELETED WITH THE APPROVAL OF THE TOWN OF OAKVILLE.
6. ANY DISTURBED AREA NOT SCHEDULED FOR FURTHER CONSTRUCTION WITHIN 30 DAYS SHALL BE PROVIDED WITH A TEMPORARY SEED.
7. INSTALL CATCHBASIN SEDIMENT CONTROL ON EXISTING CATCHBASINS PRIOR TO START OF CONSTRUCTION.
8. INSTALL CATCHBASIN SEDIMENT CONTROL ON NEW CATCHBASINS AT TIME OF INSTALLATION.
9. EROSION AND SEDIMENT CONTROLS SHALL BE INSPECTED BY THE BUILDER/DEVELOPER:
   - WEEKLY
   - BEFORE AND AFTER ANY PREDICTED RAINFALL EVENT
   - FOLLOWING AN UNPREDICTED RAINFALL EVENT
   - DAILY, DURING EXTENDED DURATION RAINFALL EVENTS
   - AFTER SIGNIFICANT SNOW MELT EVENTS
10. WHERE A SITE REQUIRES DEWATERING AND WHERE THE EXPELLED WATER CAN BE FREELY RELEASED TO A SUITABLE RECEIVER, THE EXPELLED WATER SHALL BE TREATED TO CAPTURE SUSPENDED PARTICLES GREATER THAN 40 MICRON IN SIZE. THE CAPTURED SEDIMENT SHALL BE DISPOSED OF PROPERLY PER MOECC GUIDELINES. THE CLEAN EXPELLED WATER SHALL BE FREELY RELEASED TO A SUITABLE RECEIVER THAT DOES NOT CREATE DOWNSTREAM ISSUES INCLUDING BUT NOT LIMITED TO EROSION, FLOODING – NUISANCE OR OTHERWISE, INTERFERENCE ISSUES, ETC.
11. EXISTING STORM SEWER AND DRAINAGE DITCHES ADJACENT TO THE WORKS SHALL BE PROTECTED AT ALL TIMES FROM THE ENTRY OF SEDIMENT/SILT THAT MAY MIGRATE FROM THE SITE. FOR STORM SEWERS: ALL INLETS (REAR LOT CATCHBASINS, ROAD CATCHBASINS, PIPE INLETS, ETC.) MUST BE SECURED/FITTED WITH SILTATION CONTROL MEASURES. FOR DRAINAGE DITCHES: THE INSTALLATION OF ROCK CHECK DAMS, SILTATION FENCE, SEDIMENT CONTAINMENT DEVICES MUST BE INSTALLED TO TRAP AND CONTAIN SEDIMENT. THESE SILTATION CONTROL DEVICES SHALL BE INSPECTED AND MAINTAINED PER ITEMS B AND C ABOVE.
12. IN THE EVENT OF A SPILL (RELEASE OF DELETERIOUS MATERIAL) ON OR EMANATING FROM THE SITE, THE OWNER OR OWNERS AGENT SHALL IMMEDIATELY NOTIFY ALL APPLICABLE AGENCIES INCLUDING BUT NOT LIMITED TO MOECC, LOCAL AND REGIONAL AUTHORITIES AND FOLLOW ANY PRESCRIBED CLEAN UP PROCEDURE. THE OWNER OR OWNERS AGENT WILL ADDITIONALLY IMMEDIATELY NOTIFY THE TOWN.

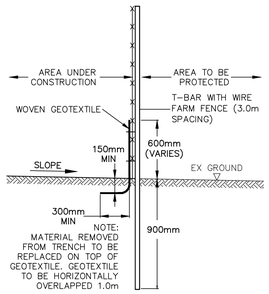
## SEDIMENT CONTROL LEGEND

- SEDIMENT CONTROL CB IN PAVED AREAS
- SEDIMENT CONTROL CB IN LANDSCAPED AREA
- SEDIMENT CONTROL FENCE
- MUD MAT
- FIBRE ROLL




NOTE: LOCATION TO BE DETERMINED IN THE FIELD

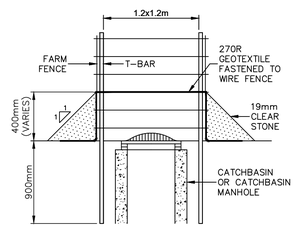
GRAVEL ACCESS PAD (MUD MAT)
NTS




SEDIMENT CONTROL FENCE
NTS




CATCHBASIN SEDIMENT CONTROL IN PAVED AREAS
NTS




CATCHBASIN SEDIMENT CONTROL IN LANDSCAPED AREAS
NTS

| No | DD/MM/YY | By/DRN | REVISIONS |
|---|---|---|---|
| 2 | 29/02/24 | MW/GL | ISSUED FOR ZBA/DPS |
| 1 | 07/12/23 | MW/MW | ISSUED FOR COORDINATION |

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|---|---|---|---|
| Design | MW | Chk'd | PC |
| Drawn | MW | Chk'd | |
| Cad File | 1819E.dwg | | |
| Plot Date | 02/29/24 | | |

Scale 1:200 (0, 5, 10m)

References

APPROVALS

Field Notes

Municipal
APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS.

Date: ___ ___ ___ ___

Manager of Development Services

Bell ☐ Hydro ☐ Gas ☐ Cable ☐ Traf. ☐ Water ☐

Regional Approval

DESIGN OF WATER &/OR WASTEWATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY.

SIGNED: ___ ___ DATE: ___ ___ ___

LEGISLATIVE AND PLANNING SERVICES DEPT.

LICENSED PROFESSIONAL ENGINEER P. CITOM Feb 29, 2024 PROVINCE OF ONTARIO

Consultant

TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

Municipality

OAKVILLE Halton REGION

PROJECT

SPRUCE ROSE INC.
RESIDENTIAL SUBDIVISION

DRAWING TITLE

EROSION AND SEDIMENT CONTROL PLAN

| Municipal No. | Regional No. |
|---|---|
| 24T-XXXX | 1819 |
| Contract No. | Consultant No. 1819 |
| – | Sheet E1 |

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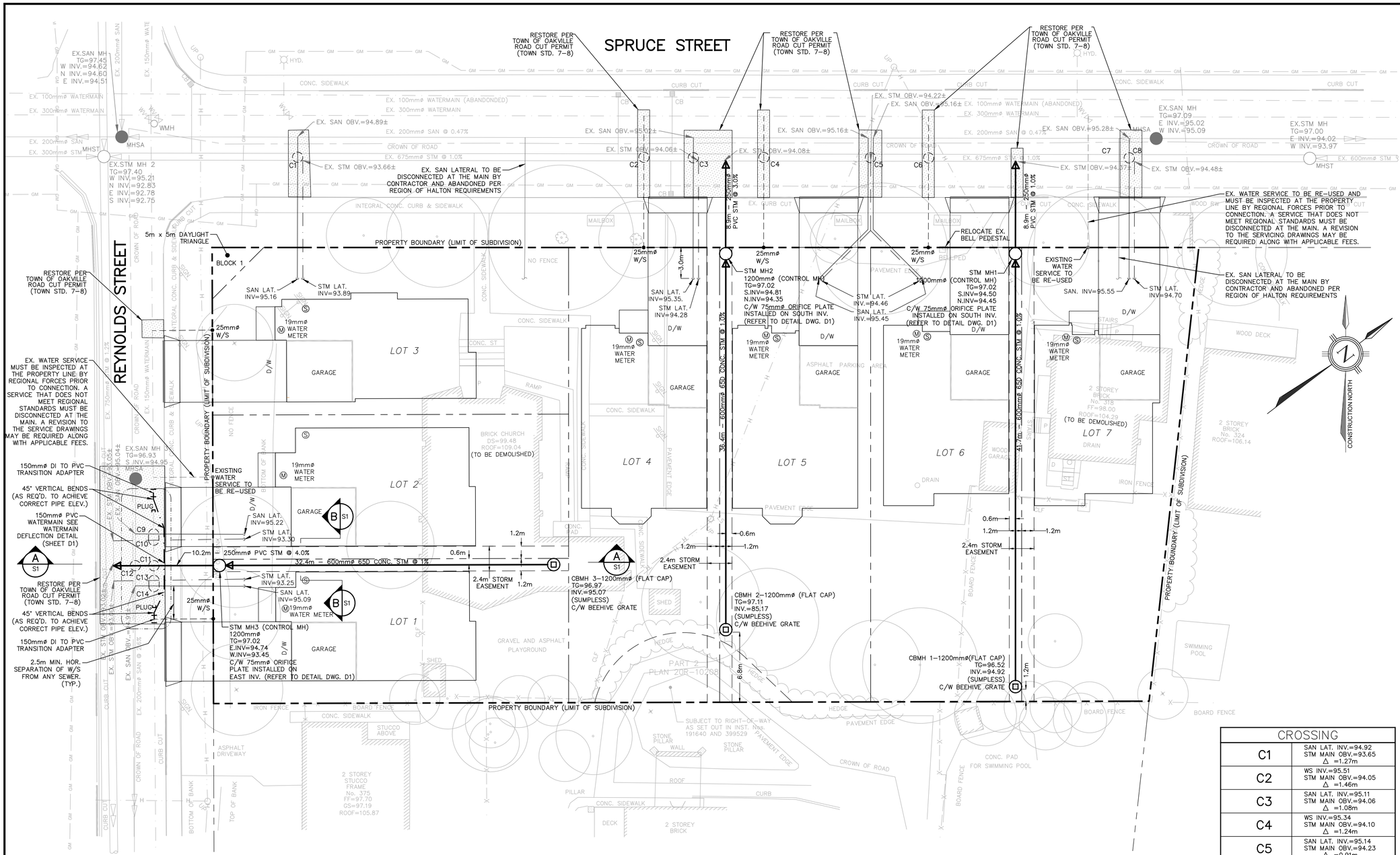


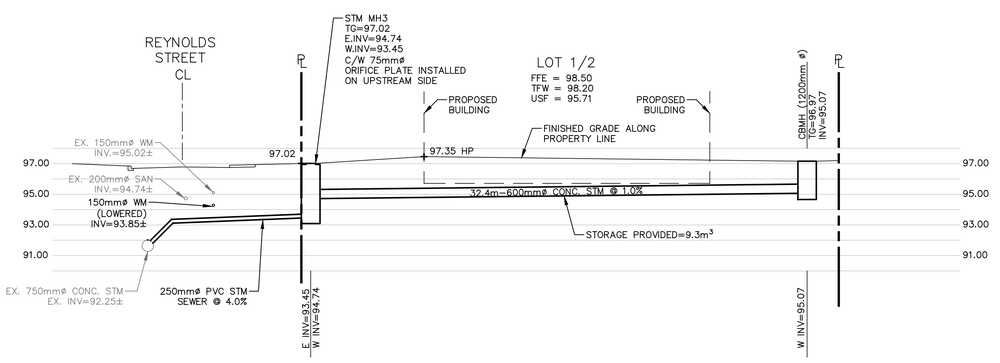


CROSS SECTION A
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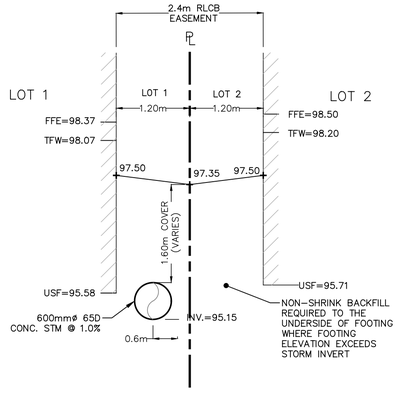
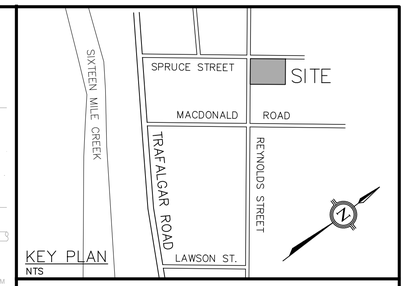



CROSS SECTION B
1:50

| CROSSING | |
|---|---|
| C1 | SAN LAT. INV.=94.92<br>STM MAIN OBV.=93.65<br>Δ =1.27m |
| C2 | WS INV.=95.51<br>STM MAIN OBV.=94.05<br>Δ =1.46m |
| C3 | SAN LAT. INV.=95.11<br>STM MAIN OBV.=94.06<br>Δ =1.08m |
| C4 | WS INV.=95.34<br>STM MAIN OBV.=94.10<br>Δ =1.24m |
| C5 | SAN LAT. INV.=95.14<br>STM MAIN OBV.=94.23<br>Δ =0.91m |
| C6 | WS INV.=95.30<br>STM MAIN OBV.=94.26<br>Δ =1.04m |
| C7 | WS INV.=95.25<br>STM OBV.=94.38<br>Δ =0.87m |
| C8 | SAN LAT. INV.=95.32<br>STM MAIN OBV.=94.48<br>Δ =0.84m |
| C9 | SAN LAT. INV.=95.08<br>WATERMAIN OBV.=94.43<br>Δ =0.65m |
| C10 | WATERMAIN INV.=94.26<br>STM LAT. OBV.=93.32<br>Δ =0.94m |
| C11 | WATERMAIN INV.=94.21<br>STM CB LEAD OBV.=93.48<br>Δ =0.73m |
| C12 | SAN MAIN INV.=94.68<br>STM CB LEAD OBV.=93.37<br>Δ =1.31m |
| C13 | WATERMAIN INV.=94.16<br>STM LAT. OBV.=93.27<br>Δ =0.89m |
| C14 | SAN LAT. INV.=94.95<br>WATERMAIN OBV.=94.30<br>Δ =0.65m |




KEY PLAN
NTS

## LEGEND

- PROPOSED CATCHBASIN MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED VALVE & BOX
- PROPOSED PLUG
- PROPOSED WATER METER
- PROPOSED STORM SEWER
- PROPOSED WATERMAIN
- PROPERTY BOUNDARY
- PROPOSED SUMP PUMP
- PROPOSED STORM LATERAL
- PROPOSED SANITARY LATERAL
- PROPOSED WATER SERVICE AND CURB STOP
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING BURIED GAS MAIN
- EXISTING OVERHEAD WIRE
- TREE PROTECTION FENCE

## BENCHMARK

ELEVATIONS ARE REFERRED TO BENCHMARK No. 0011931U1999 HAVING AN ELEVATION OF 90.39 METRES.
TABLET IN THE TOP OF THE SQUARE PIER IN THE SOUTHWEST CORNER OF GEORGE'S SQUARE, 29.3 METRES NORTHWEST OF SUMNER AVENUE AND 12.5 METRES NORTHEAST OF TRAFALGAR ROAD.
ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).

## NOTE

THE SURVEY WAS COMPLETED ON THE 20TH DAY OF JANUARY, 2023 BY R-PE SURVEYING LTD., ONTARIO LAND SURVEYORS. JOB No. 23-005 CAD FILE No.23-005TP01

| No | DD/MM/YY | By/DRN | REVISIONS |
|---|---|---|---|
| 2 | 29/02/24 | MW/GL | ISSUED FOR ZBA/DPS |
| 1 | 13/02/24 | MW/MW | ISSUED FOR COORDINATION |

| | | | |
|---|---|---|---|
| Design | MW | Chk'd | PC |
| Drawn | MW | Chk'd | |
| Cad File | 1819S1.dwg | | |
| Plot Date | 02/29/24 | | |

Scale 0 5 10m
1:200

References

APPROVALS

Municipal
APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS.

Date:
Manager of Development Services

Field Notes

Bell ☐ Hydro ☐
Gas ☐ Cable ☐
Traf. ☐ Water ☐

Regional Approval

DESIGN OF WATER &/OR WASTEWATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY.

SIGNED: DATE:
LEGISLATIVE AND PLANNING SERVICES DEPT.

LICENSED PROFESSIONAL ENGINEER P. CIFONI Feb 29, 2024 PROVINCE OF ONTARIO

Consultant
TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

Municipality
OAKVILLE Halton REGION

PROJECT
SPRUCE ROSE INC.
RESIDENTIAL SUBDIVISION

DRAWING TITLE
SERVICING PLAN

| Municipal No. | Regional No. |
|---|---|
| 24T–XXXX | |
| Contract No. | Consultant No. 1819 |
| – | Sheet S1 |

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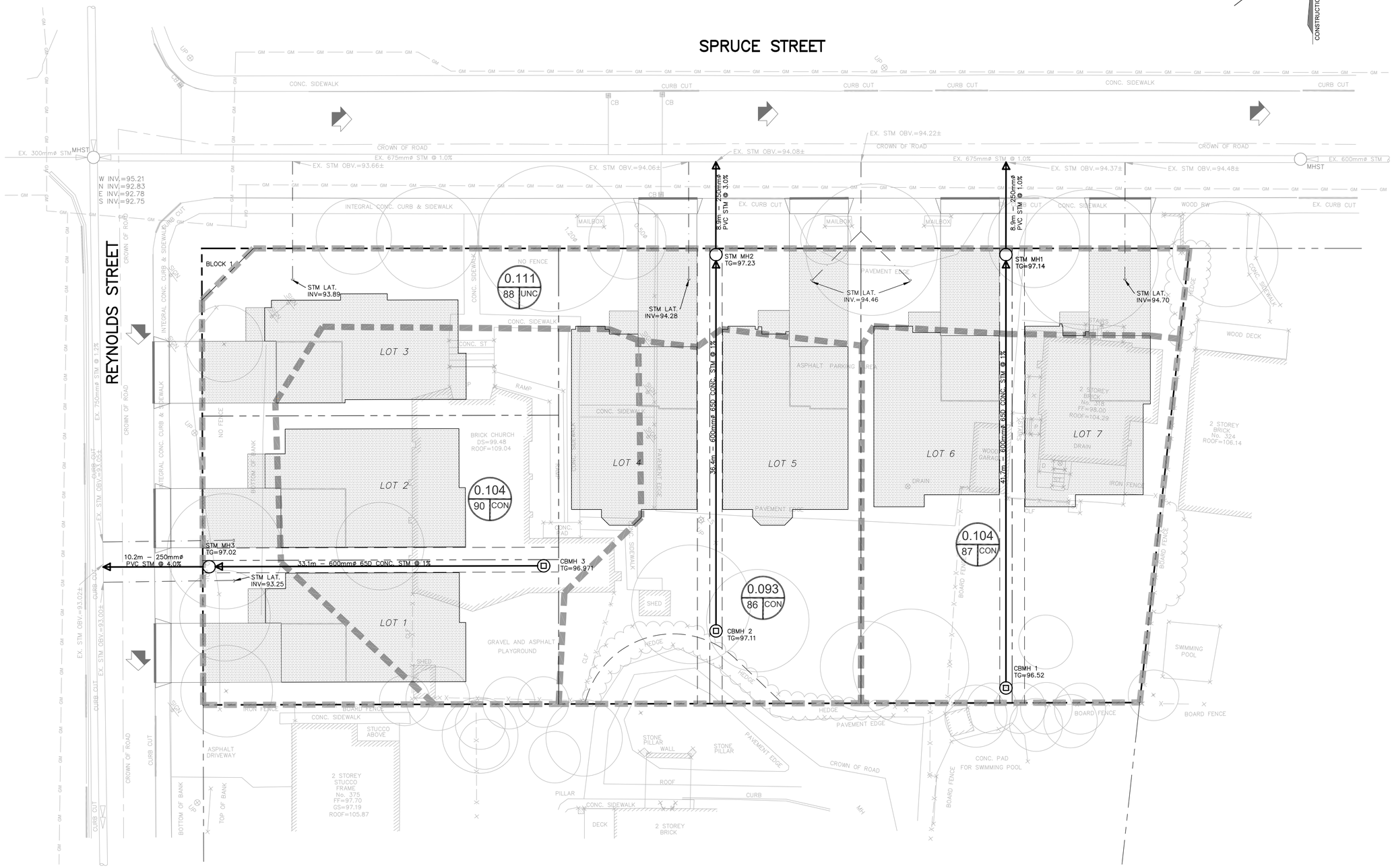


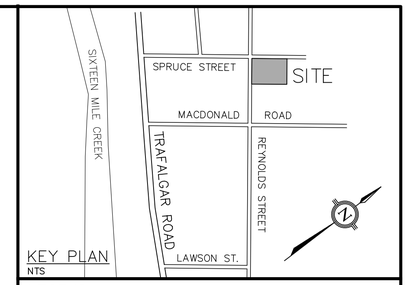


## LEGEND

- 0.814 / 88 UNC — DRAINAGE AREA IN HECTARES; CONTROLLED/UNCONTROLLED FLOWS; SCS CURVE NUMBER
- STORM DRAINAGE AREA BOUNDARY
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED STORM SEWER
- PROPERTY LINE
- PROPOSED STORM LATERAL
- OVERLAND FLOW ROUTE
- IMPERVIOUS AREA

## BENCHMARK

ELEVATIONS ARE REFERRED TO BENCHMARK No. 0011931U1999 HAVING AN ELEVATION OF 90.39 METRES.
TABLET IN THE TOP OF THE SQUARE PIER IN THE SOUTHWEST CORNER OF GEORGE'S SQUARE, 29.3 METRES NORTHWEST OF SUMNER AVENUE AND 12.5 METRES NORTHEAST OF TRAFALGAR ROAD.
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## NOTE

THE SURVEY WAS COMPLETED ON THE 20TH DAY OF JANUARY, 2023 BY R–PE SURVEYING LTD., ONTARIO LAND SURVEYORS.
JOB No. 23–005 CAD FILE No.23–005TP01

| No | DD/MM/YY | By/DRN | REVISIONS |
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| 1 | 13/02/24 | MW/MW | ISSUED FOR COORDINATION |

| | | | |
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| Drawn | MW | Chk'd | |
| Cad File | 1819S2.dwg | | |
| Plot Date | 02/29/24 | | |

Scale 0 5 10m — 1:200

References

APPROVALS

Field Notes

Municipal
APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS.

Date: ___ ___ ___ ___ ___

Manager of Development Services

Bell ☐ Hydro ☐ Gas ☐ Cable ☐ Traf. ☐ Water ☐

Regional Approval

DESIGN OF WATER &/OR WASTEWATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY.

SIGNED: ___ ___ ___ DATE: ___ ___ ___

LEGISLATIVE AND PLANNING SERVICES DEPT.

LICENSED PROFESSIONAL ENGINEER P. CIFONI Feb 29, 2024 PROVINCE OF ONTARIO

Consultant

TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

Municipality

OAKVILLE Halton REGION

PROJECT

SPRUCE ROSE INC.
RESIDENTIAL SUBDIVISION

DRAWING TITLE

STORM DRAINAGE AREA PLAN

| Municipal No. | Regional No. |
|---|---|
| 24T–XXXX | |
| Contract No. | Consultant No. 1819 |
| – | Sheet S2 |

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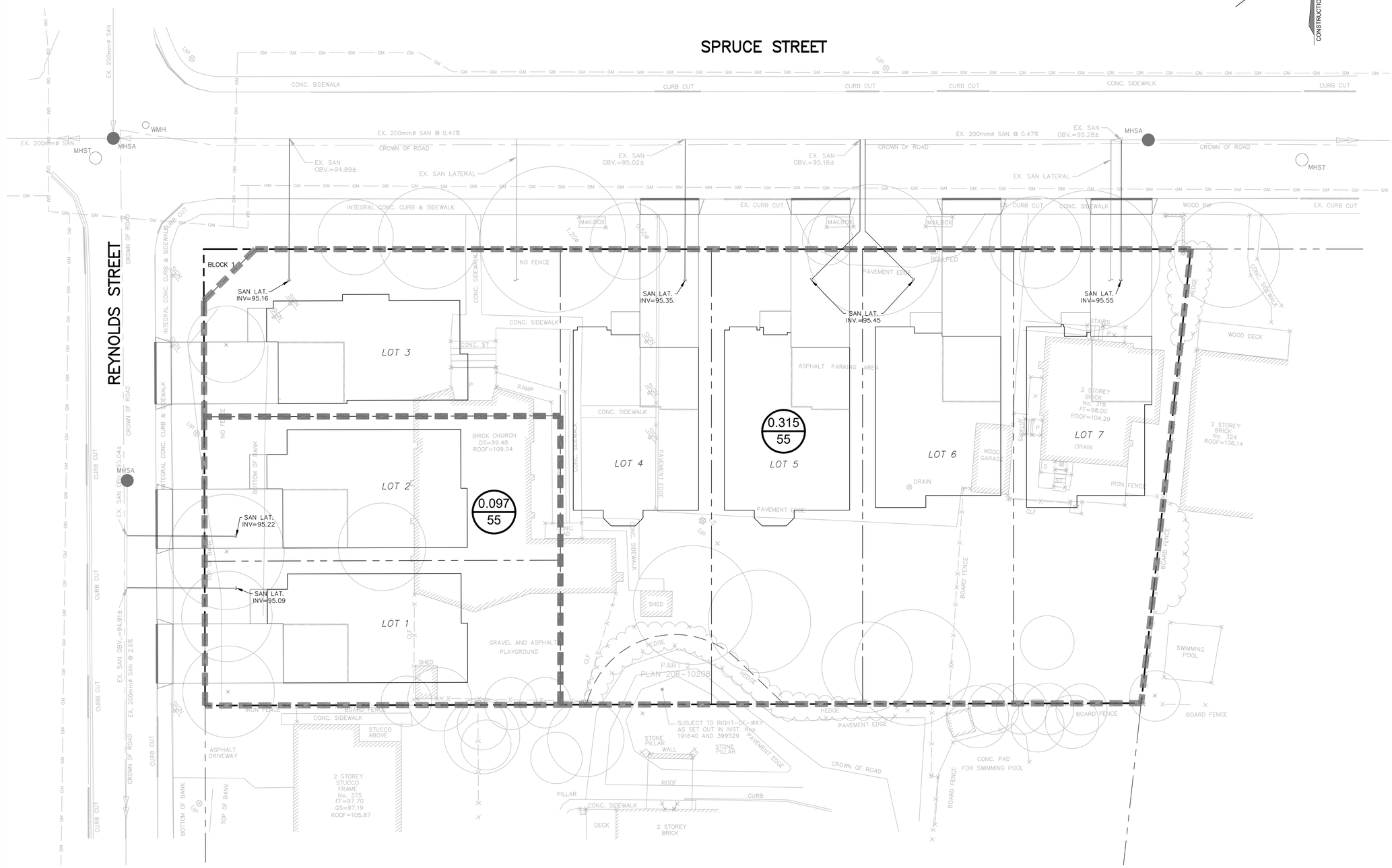
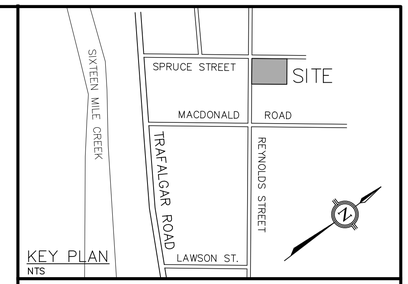



## LEGEND

| | |
|---|---|
| 0.283 | DRAINAGE AREA IN HECTARES |
| 135 | POPULATION DENSITY (PERSONS/HECTARE) |
| | DRAINAGE AREA BOUNDARY |
| | PROPERTY LINE |
| | EXISTING SANITARY SEWER |
| | EXISTING SANITARY MANHOLE |
| | EXISTING SANITARY LATERAL |
| | PROPOSED SANITARY LATERAL |

## BENCHMARK

ELEVATIONS ARE REFERRED TO BENCHMARK No. 0011931U1999 HAVING AN ELEVATION OF 90.39 METRES.
TABLET IN THE TOP OF THE SQUARE PIER IN THE SOUTHWEST CORNER OF GEORGE'S SQUARE, 29.3 METRES NORTHWEST OF SUMNER AVENUE AND 12.5 METRES NORTHEAST OF TRAFALGAR ROAD.
ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).

## NOTE

THE SURVEY WAS COMPLETED ON THE 20TH DAY OF JANUARY, 2023 BY R-PE SURVEYING LTD., ONTARIO LAND SURVEYORS.
JOB No. 23-005 CAD FILE No.23-005TP01

| No | DD/MM/YY | By/DRN | REVISIONS |
|---|---|---|---|
| 2 | 29/02/24 | MW/GL | ISSUED FOR ZBA/DPS |
| 1 | 13/02/24 | MW/MW | ISSUED FOR COORDINATION |

| | | | |
|---|---|---|---|
| Design | MW | Chk'd | PC |
| Drawn | MW | Chk'd | |
| Cad File | 1819S3.dwg | | |
| Plot Date | 02/29/24 | | |

Scale 1:200 (0, 5, 10m)

References

APPROVALS

Field Notes

Municipal
APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS.

Date: ___ ___ ___ ___ ___

Manager of Development Services

Bell ☐ Hydro ☐ Gas ☐ Cable ☐ Traf. ☐ Water ☐

Regional Approval

DESIGN OF WATER &/OR WASTEWATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY.

SIGNED: ___ ___ ___ DATE: ___ ___ ___

LEGISLATIVE AND PLANNING SERVICES DEPT.

LICENSED PROFESSIONAL ENGINEER P. CIFONI Feb 29, 2024 PROVINCE OF ONTARIO

Consultant

TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

Municipality

OAKVILLE Halton REGION

PROJECT

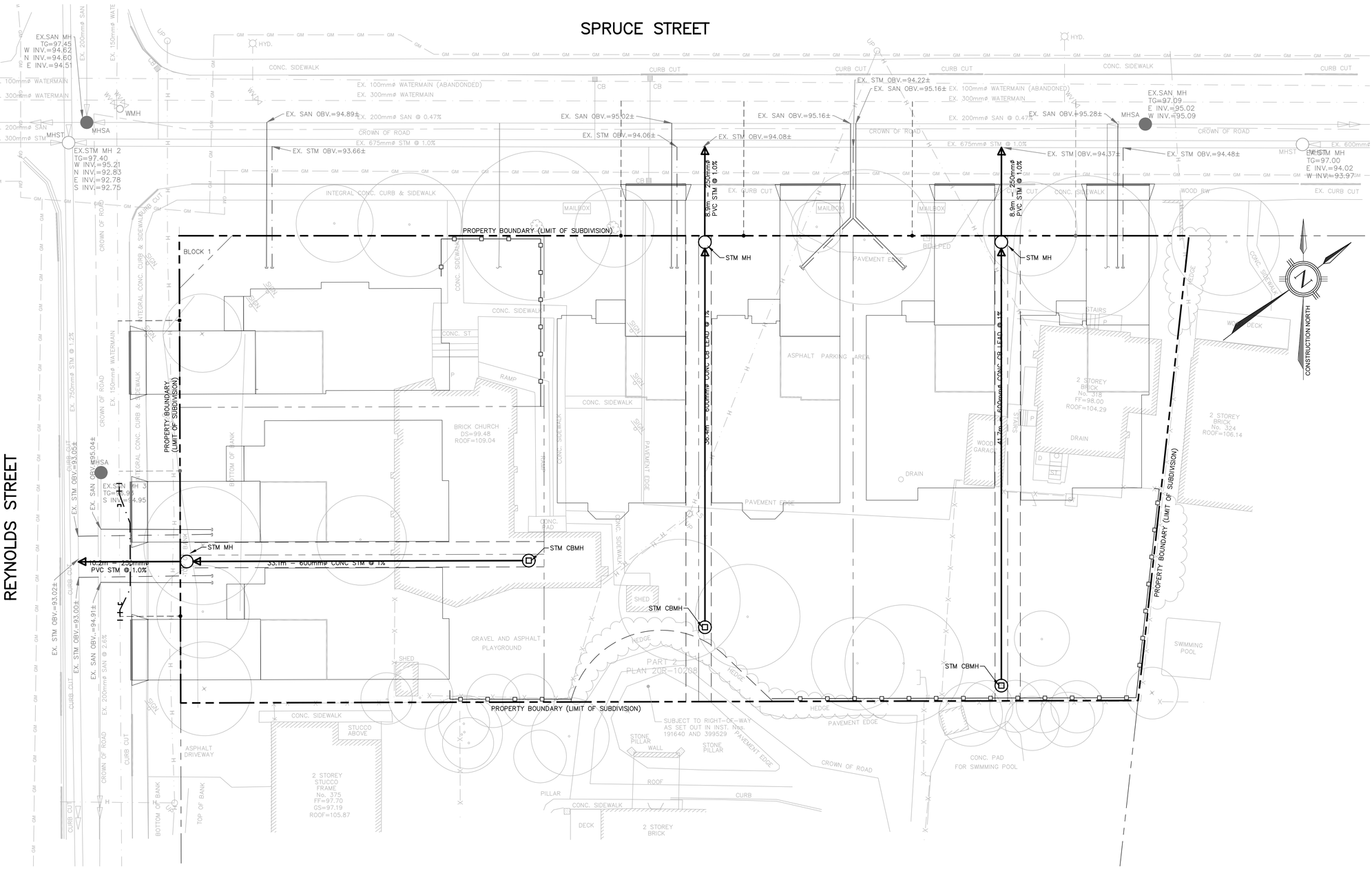
SPRUCE ROSE INC.
RESIDENTIAL SUBDIVISION

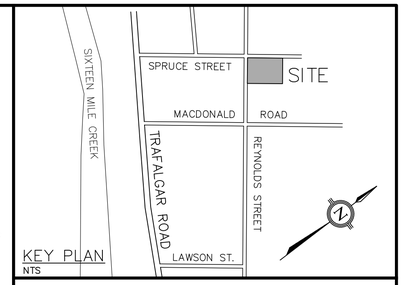
DRAWING TITLE

SANITARY DRAINAGE AREA PLAN

| Municipal No. | Regional No. |
|---|---|
| 24T-XXXX | |
| Contract No. | Consultant No. 1819 |
| – | Sheet S3 |

FILENAME: P:\1819 Spruce Street Oakville\04-CAD\04-Subdivision\1819S3.dwg
PLOTDATE: Feb 29, 2024 - 12:40pm




## LEGEND

- PROPOSED CATCHBASIN
- PROPOSED STORM MANHOLE
- PROPOSED VALVE & BOX
- PROPOSED PLUG
- PROPOSED WATER METER
- PROPOSED STORM SEWER
- PROPOSED WATERMAIN
- PROPERTY BOUNDARY
- PROPOSED SUMP PUMP
- PROPOSED WATER SERVICE AND CURB STOP
- PROPOSED SANITARY SERVICE
- PROPOSED STORM SERVICE
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING BURIED GAS MAIN
- EXISTING OVERHEAD WIRE

## BENCHMARK

ELEVATIONS ARE REFERRED TO BENCHMARK No. 0011931U1999 HAVING AN ELEVATION OF 90.39 METRES.
TABLET IN THE TOP OF THE SQUARE PIER IN THE SOUTHWEST CORNER OF GEORGE'S SQUARE, 29.3 METRES NORTHWEST OF SUMNER AVENUE AND 12.5 METRES NORTHEAST OF TRAFALGAR ROAD.
ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).

## NOTE

THE SURVEY WAS COMPLETED ON THE 20TH DAY OF JANUARY, 2023 BY R-PE SURVEYING LTD., ONTARIO LAND SURVEYORS. JOB No. 23-005 CAD FILE No.23-005TP01

| | | | |
|---|---|---|---|
| 2 | 29/02/24 | MW/GL | ISSUED FOR ZBA/DPS |
| 1 | 07/12/23 | MW/MW | ISSUED FOR COORDINATION |
| No | DD/MM/YY | By/DRN | REVISIONS |

| | | | |
|---|---|---|---|
| Design | MW | Chk'd | PC |
| Drawn | MW | Chk'd | |
| Cad File | 1819CU.dwg | | |
| Plot Date | 02/29/24 | | |

Scale 0 5 10m — 1:200

References

APPROVALS

Field Notes

Municipal
APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS.

Date: ___ ___ ___ ___ ___

Manager of Development Services

Bell ☐ Hydro ☐ Gas ☐ Cable ☐ Traf. ☐ Water ☐

Regional Approval

DESIGN OF WATER &/OR WASTEWATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY.

SIGNED: ___ ___ ___ DATE: ___ ___ ___

LEGISLATIVE AND PLANNING SERVICES DEPT.

LICENSED PROFESSIONAL ENGINEER P. CITONI Feb 29, 2024 PROVINCE OF ONTARIO

| | |
|---|---|
| BELL CANADA<br>NAME<br>DATE | OAKVILLE HYDRO**<br>NAME<br>DATE |
| CANADA POST<br>NAME<br>DATE | COGECO CABLE<br>NAME<br>DATE |
| | ENBRIDGE GAS*<br>NAME<br>DATE |

*GAS LINES ARE SHOWN FOR LOCATION PURPOSES ONLY. GAS WILL BE SUPPLIED ON END USER REQUIREMENTS.

**OAKVILLE HYDRO UTILITY ASSET LOCATIONS SHOWN ON THIS DRAWING ARE BASED ON DESIGN DRAWINGS AND ARE SUBJECT TO CHANGE DURING CONSTRUCTION. OAKVILLE HYDRO RESERVES THE RIGHT TO APPROVE OR DENY TREES IN THE VICINITY OF TRANSFORMERS OR ANY OTHER ASSETS. NO UTILITY PEDESTAL, MAILBOX, TREE AND/OR OTHER ASSETS ALLOWED TO BE INSTALLED ON TOP OF TRENCH.

Consultant

TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

Municipality

OAKVILLE Halton REGION

PROJECT

# SPRUCE ROSE INC. RESIDENTIAL SUBDIVISION

DRAWING TITLE

# COMPOSITE UTILITY PLAN

| | |
|---|---|
| Municipal No. 24T-XXXX | Regional No. 1819 |
| Contract No. – | Consultant No. 1819 |
| | Sheet CU1 |

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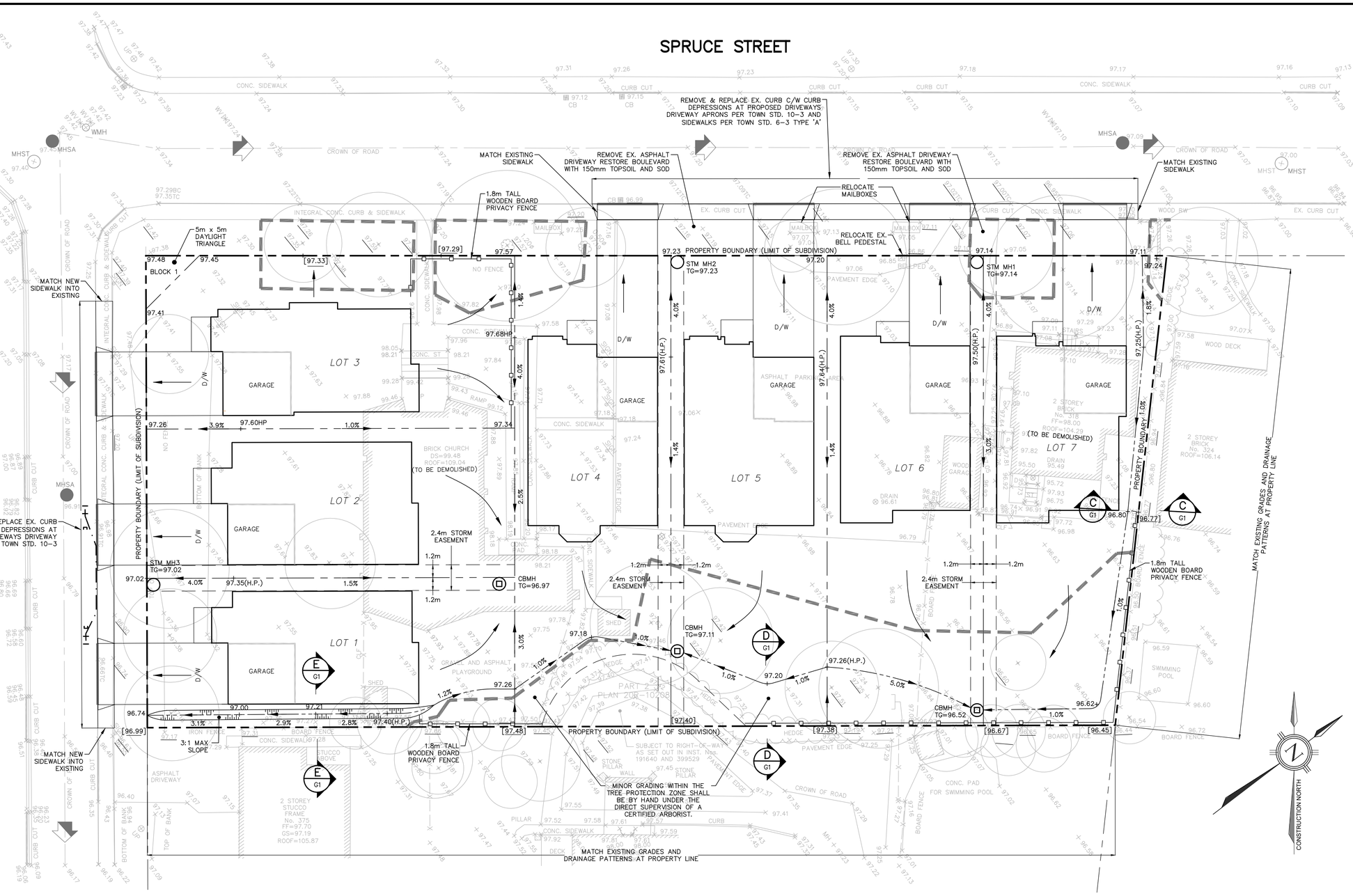
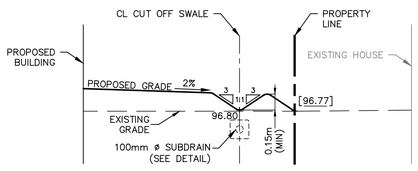
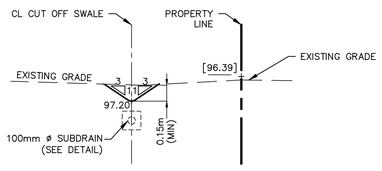



CROSS SECTION C
LOT 7 SIDE YARD SWALE
N.T.S.




CROSS SECTION D
LOT 5 REAR YARD SWALE
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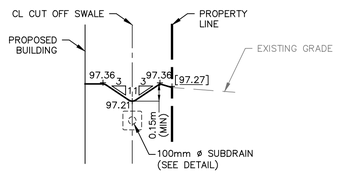


CROSS SECTION E
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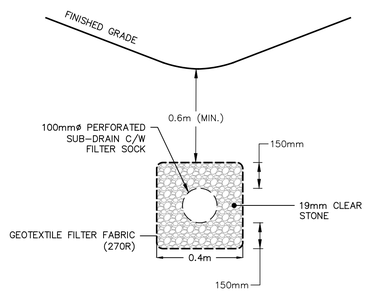


SUBDRAIN DETAIL
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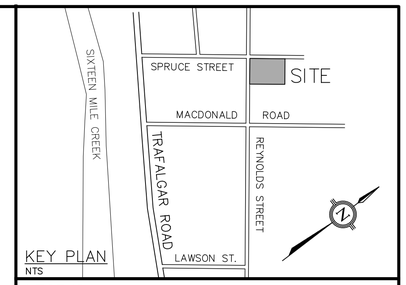


KEY PLAN
NTS

## LEGEND

- PROPOSED CATCHBASIN
- PROPOSED STORM MANHOLE
- PROPOSED VALVE & BOX
- 97.57 EXISTING ELEVATION
- 97.57 EXISTING ELEVATION TO REMAIN
- [97.57] INTERPOLATED EXISTING ELEVATION TO REMAIN
- 94.56 + PROPOSED FINISHED ELEVATION
- PROPOSED DRAINAGE DIRECTION
- PROPOSED SWALE DRAINAGE DIRECTION
- EXISTING OVERLAND FLOW DIRECTION
- PROPOSED OVERLAND FLOW DIRECTION
- PROPOSED SLOPE
- TREE PROTECTION FENCE (GREEN PRINT CONSULTING, 2023)
- PROPERTY LINE
- SUBDIVISION LOT LINE

## BENCHMARK

ELEVATIONS ARE REFERRED TO BENCHMARK No. 0011931U1999 HAVING AN ELEVATION OF 90.39 METRES.
TABLET IN THE TOP OF THE SQUARE PIER IN THE SOUTHWEST CORNER OF GEORGE'S SQUARE, 29.3 METRES NORTHWEST OF SUMNER AVENUE AND 12.5 METRES NORTHEAST OF TRAFALGAR ROAD.
ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).

## NOTE

THE SURVEY WAS COMPLETED ON THE 20TH DAY OF JANUARY, 2023 BY R-PE SURVEYING LTD., ONTARIO LAND SURVEYORS. JOB No. 23-005 CAD FILE No.23-005TP01

| No | DD/MM/YY | By/DRN | REVISIONS |
|---|---|---|---|
| 2 | 29/02/24 | MW/GL | ISSUED FOR ZBA/DPS |
| 1 | 13/02/24 | MW/MW | ISSUED FOR COORDINATION |

| | | | |
|---|---|---|---|
| Design | MW | Chk'd | PC |
| Drawn | MW | Chk'd | |
| Cad File | 1819G.dwg | | |
| Plot Date | 02/29/24 | | |

Scale 0 5 10m
1:200

References

APPROVALS

Municipal
APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS.

Date: ___ ___ ___ ___
Manager of Development Services

Field Notes

Bell ☐ Hydro ☐
Gas ☐ Cable ☐
Traf. ☐ Water ☐

LICENSED PROFESSIONAL ENGINEER P. CIFONI Feb 29, 2024 PROVINCE OF ONTARIO

Consultant
TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

Municipality
OAKVILLE Halton REGION

PROJECT
SPRUCE ROSE INC.
RESIDENTIAL SUBDIVISION

DRAWING TITLE
GRADING PLAN

| Municipal No. | Regional No. |
|---|---|
| 24T-XXXX | |
| Contract No. | Consultant No. 1819 |
| – | Sheet G1 |

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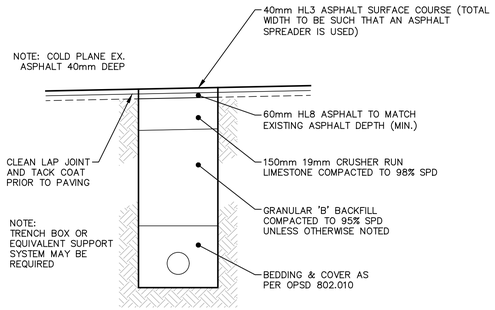
PLOTDATE: Feb 29, 2024 - 16:04pm

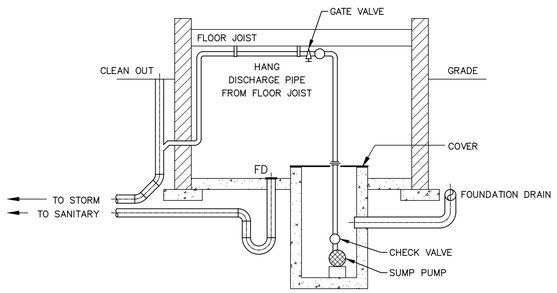



## NOTE:

1. PLACE HL8 ASPHALT TO MATCH EX SURFACE.
2. IN FOLLOWING CONSTRUCTION SEASON GRIND ASPHALT 40mm DEEP AND PLACE 40mm HL3 ASPHALT

## TYPICAL TRENCH RESTORATION

N.T.S.

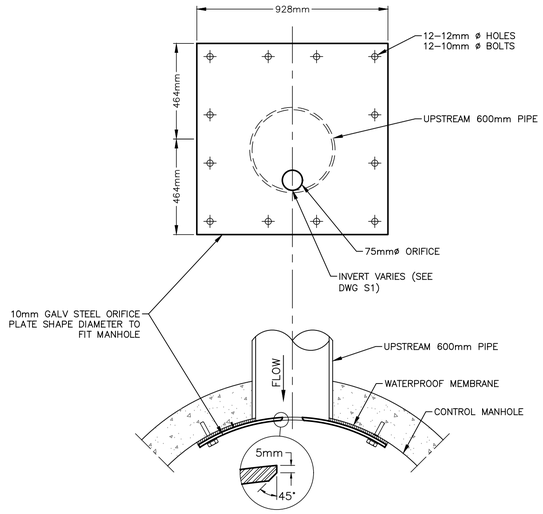



## NOTE:

INTERNAL PLUMBING IS THE RESPONSIBILITY OF THE BUILDER AND SHALL BE SUBJECT TO REVIEW BY TOWN OF OAKVILLE AND SUBJECT TO A BUILDING PERMIT. DETAIL SHOWN HERE IS PROVIDED FOR ILLUSTRATION OF THE DESIGN INTENT ONLY INSOFAR AS TO PROTECT THE BASEMENT FROM STORM SEWER SURCHARGE.

## TYPICAL SUMP PUMP DETAIL

N.T.S.



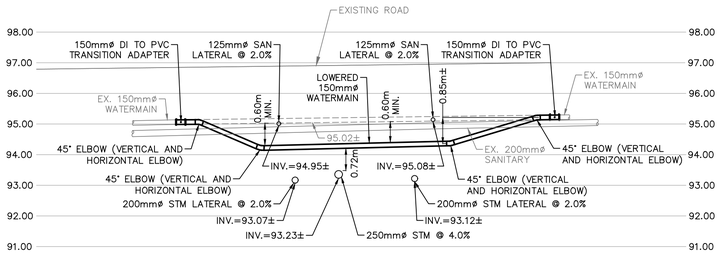

BEVELLED EDGE AT ORIFICE OPENING

## NOTE:

- ALL STEEL TO BE HOT DIPPED GALVANIZED AFTER FABRICATION ORIFICE PLATE TO BE WATERTIGHT
- PROVIDE 0.60m SUMP AT CONTROL MANHOLE

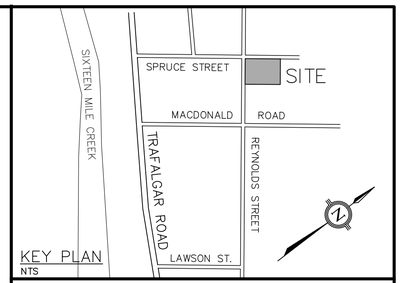
## CONTROL ORIFICE DETAIL

N.T.S.




## WATERMAIN DEFLECTION DETAIL

1:100




KEY PLAN
NTS

## LEGEND

## BENCHMARK

ELEVATIONS ARE REFERRED TO BENCHMARK No. 0011931U1999 HAVING AN ELEVATION OF 90.39 METRES.
TABLET IN THE TOP OF THE SQUARE PIER IN THE SOUTHWEST CORNER OF GEORGE'S SQUARE, 29.3 METRES NORTHWEST OF SUMNER AVENUE AND 12.5 METRES NORTHEAST OF TRAFALGAR ROAD.
ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).

## NOTE

THE SURVEY WAS COMPLETED ON THE 20TH DAY OF JANUARY, 2023 BY R-PE SURVEYING LTD., ONTARIO LAND SURVEYORS. JOB No. 23-005 CAD FILE No.23-005TP01

| No | DD/MM/YY | By/DRN | REVISIONS |
|---|---|---|---|
| 2 | 29/02/24 | MW/GL | ISSUED FOR ZBA/DPS |
| 1 | 13/02/24 | MW/MW | ISSUED FOR COORDINATION |

| | | | |
|---|---|---|---|
| Design | MW | Chk'd | PC |
| Drawn | MW | Chk'd | |
| Cad File | 1819D.dwg | | |
| Plot Date | 02/29/24 | | |

Scale 0 5 10m
1:200

References

APPROVALS

Municipal
APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS.
Date:
Manager of Development Services

Field Notes

Bell ☐ Hydro ☐ Gas ☐ Cable ☐ Traf. ☐ Water ☐

Regional Approval
DESIGN OF WATER &/OR WASTEWATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY.
SIGNED: DATE:
LEGISLATIVE AND PLANNING SERVICES DEPT.

LICENSED PROFESSIONAL ENGINEER P. CITONI Feb 29, 2024 PROVINCE OF ONTARIO

Consultant
TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

Municipality
OAKVILLE Halton REGION

PROJECT
SPRUCE ROSE INC.
RESIDENTIAL SUBDIVISION

DRAWING TITLE
SECTIONS AND DETAILS

| Municipal No. | Regional No. |
|---|---|
| 24T-XXXX | |
| Contract No. | Consultant No. 1819 |
| - | Sheet D1 |

FILENAME: P:\1819 Spruce Street Oakville\04-CAD\04-Subdivision\1819D.dwg
PLOTDATE: Feb 29, 2024 - 12:09pm

## GENERAL NOTES

1. ALL ROADS, STORM SEWERS AND OTHER MISCELLANEOUS ITEMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE TOWN OF OAKVILLE REQUIREMENTS. SANITARY SEWERS AND WATERMAINS SHALL BE IN ACCORDANCE WITH THE REGION OF HALTON REQUIREMENTS. IN ABSENCE OF LOCAL STANDARDS, ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS SHALL BE USED, AS MODIFIED BY THE LOCAL MUNICIPALITY. ALL MATERIALS SHALL MEET OR EXCEED ONTARIO PROVINCIAL STANDARDS AND TOWN STANDARD SPECIFICATIONS.
2. ONTARIO PROVINCIAL STANDARD DRAWINGS (O.P.S.D.) ARE TO BE USED WHEN INDICATED (EXAMPLE: O.P.S.D. 600.04) TOWN OF OAKVILLE STANDARDS ARE USED FOR ROADS, STORM SEWERS AND MISCELLANEOUS WHEN INDICATED (EXAMPLE: 6-1). THE REGION OF HALTON STANDARDS ARE USED ON WATERMAINS AND SANITARY SEWERS AS INDICATED (EXAMPLE: RH 400.01).
3. ALL INFORMATION SHOWN ON THE ENGINEERING DRAWINGS REGARDING THE SIZE AND LOCATION OF EXISTING UTILITIES AND/OR SERVICES HAS NOT BEEN VERIFIED IN THE FIELD. BEFORE STARTING WORK, THE CONTRACTOR IS RESPONSIBLE FOR VERIFICATION AND LOCATION OF SAID UTILITIES, PROTECTING AND MAINTAINING UTILITIES DURING CONSTRUCTION, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.
4. THE CONTRACTOR SHALL REPORT ALL DISCREPANCIES TO THE ENGINEER.
5. MINIMUM 1.8m (6 FOOT) HEIGHT CONSTRUCTION FENCE SHALL BE ERECTED PRIOR TO ANY GRADING OR CONSTRUCTION AND SHALL REMAIN IN PLACE AND IN GOOD REPAIR THROUGHOUT THE CONSTRUCTION AND GRADING PHASE AND REMOVED ONLY AS DIRECTED BY THE ENGINEER.
6. PRIOR TO THE PLACEMENT OF ANY FILL MATERIAL ALL TOPSOIL IS TO BE REMOVED AND SUBGRADE IS TO BE CERTIFIED BY THE SOILS ENGINEER.
7. THE CONTRACTOR SHALL NOT DAMAGE TREES OUTSIDE AREAS INDICATED TO BE CLEARED AND GRUBBED.
8. TRAFFIC DETOURS AND SIGNAGE TO BE APPROVED BY OAKVILLE TRAFFIC DEPARTMENT. MAINTAIN ONE LANE OPEN TO TRAFFIC AT ALL TIMES.
9. TOWN OF OAKVILLE AND REGION OF HALTON STANDARD DRAWINGS, O.P.S.S. AND O.P.S.D. WITH REGIONAL AMENDMENTS FOR SANITARY SEWERS AND WATERMAINS SHALL CONSTITUTE PART OF THE ENGINEERING DESIGN AND CONSTRUCTION CONTRACT.
10. ALL WATERMAIN AND SANITARY MAIN APPURTENANCES, MATERIALS AND COMPONENTS SHALL COMPLY WITH THE REGION'S APPROVED MANUFACTURER'S PRODUCT LIST FOR WATER SYSTEMS AND SANITARY SYSTEMS. ALTERNATIVE MATERIALS MAY BE ACCEPTABLE, PROVIDED APPROVAL HAS FIRST BEEN OBTAINED FROM THE CITY/TOWN ENGINEER AND/OR THE REGIONAL COMMISSIONER OF PUBLIC WORKS.
11. NO BLASTING IS PERMITTED.
12. MANHOLE AND VALVE CHAMBER COVERS ARE TO BE SET FLUSH WITH BASE COURSE ASPHALT AND ADJUSTED TO FINAL GRADE PRIOR TO INSTALLING TOP LIFT OF ASPHALT.
13. ALL TRENCHES WITHIN EXISTING RIGHT-OF-WAY ARE TO BE BACKFILLED IN ACCORDANCE WITH TOWN OF OAKVILLE REQUIREMENTS.
14. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO COMMENCING ANY CONSTRUCTION.
15. ALL OVERLY MOIST, SOFT OR OTHERWISE UNSUITABLE SOIL MUST BE REMOVED DOWN TO FIRM NATIVE SUBSOIL. THE BASE SHOULD BE PROOF-ROLLED AND COMPACTED TO A FIRM STABLE STATE WHICH IS TO BE APPROVED BY THE GEOTECHNICAL ENGINEER BEFORE THE START OF FILL PLACEMENT.
16. FILL PLACEMENT MUST BE CARRIED OUT IN A CONTROLLED SYSTEMATIC PROGRESSION WHICH ALLOWS FOR HARMONIOUS AND UNIFORM COVERAGE BY THE COMPACTION EQUIPMENT.
17. THE MAXIMUM ALLOWABLE LIFT THICKNESS IS 150mm. THE REQUIRED COMPACTION IS MINIMUM 98% STANDARD PROCTOR MAX. DRY DENSITY.

## WATERMAINS

1. WATERMAINS 150MM TO 300MM DIAMETER TO BE P.V.C. CL235 (DR-18) AS PER AWWA C900 (CSA B137.3) WITH GASKETED JOINTS.
2. WATER SERVICE CONNECTIONS TO BE AS PER O.P.S.D. 1104.01. AS AMENDED BY REGION OF HALTON PIPE FOR ALL SERVICE CONNECTIONS UP TO 50MM DIA. SHALL BE TYPE "K" SOFT COPPER TUBING MEETING AWWA C800 (LATEST EDITION).
3. A MIN. HORIZONTAL SEPARATION OF 2.5M MUST BE MAINTAINED BETWEEN WATERMAINS AND SANITARY OR STORM SEWERS, INCLUDING SERVICE LATERALS.
4. A MIN. VERTICAL SEPARATION OF 0.15M BETWEEN WATERMAINS AND SEWERS MUST BE MAINTAINED IF WATERMAIN CROSSES ABOVE SEWER OR 0.50m IF WATERMAIN CROSSES SEWER.
5. WATERMAIN BEDDING AND COVER TO BE SUITABLE GRANULAR 'A' BEDDING MATERIAL AS PER O.P.S.D. 802.010 AND O.P.S.S. 401.
6. ALL HYDRANTS AS PER O.P.S.D. 1105.01 TO HAVE STEAMER CONNECTIONS. HYDRANTS TO BE SUPPLIED WITH:
   a) TWO (2) 63.5MM (21/2") WITH CSA STANDARD THREAD, 63.5MM I.D., 79.4 O.D., 5 THREADS PER 25MM, 31.75MM SQUARE OPERATING NUT; AND
   b) ONE (1) 100MM (4") STORZ PUMPER CONNECTION AS PER CAN/ULC #S-520, 31.75MM SQUARE OPERATING NUT, AND STORZ CAP PAINTED GLOSS BLACK.
   c) SECONDARY VALVE AND ANCHOR TEE.
7. HYDRANTS SHALL BE INSTALLED SUCH THAT THE ROD STEM LENGTH SHALL NOT EXCEED 1.7M MEASURED FROM THE BREAK-OFF FLANGE. IF HYDRANT BARREL LENGTH EXCEEDS 1.7M THEN A HYDRANT THAT CAN BE RAISED FROM THE BOTTOM WITHOUT INCREASING ROD LENGTH IS TO BE USED.
8. ALL METALLIC WATERMAINS, FITTINGS, AND APPURTENANCES SHALL BE INSTALLED WITH A MINIMUM OF ONE ANODE PER LENGTH PER PIPE AND ONE ANODE PER ELECTRONICALLY ISOLATED APPURTENANCE AND INSTALLED IN ACCORDANCE WITH OPSS 442 AND OPSD 1109.010 AND 1109.011. ANODE INSTALLATION IS NOT REQUIRED WITHIN VALVE CHAMBERS, DRAIN CHAMBERS, AIR RELEASE CHAMBERS OR SWAB PORTS.
9. ALL SACRIFICIAL ANODES SHALL CONFORM TO A.S.T.M. B-418 TYPE II AND SHALL BE MADE OF HIGH GRADE ELECTROLYTIC ZINC, 99.99% PURE, AS PER HALTON LINEAR DESIGN MANUAL, WATER SERVICE CONNECTIONS – 2.10.4.B.ii
10. ALL WELD CONNECTIONS TO BE COATED WITH "TC MASTIC" OR APPROVED EQUIVALENT.
11. FOR ALL ANODES CONNECTED TO NEW PIPE, FITTINGS OR TO EXISTING METALLIC WATERMAINS, A CADWELDER AND CA-15 OR EQUIVALENT CARTRIDGE SHALL BE USED. ANODE INSTALLATION SHALL BE PERFORMED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
12. WHERE NEW PIPE IS METALLIC OR OTHERWISE TO BE CONNECTED TO EXISTING DUCTILE IRON OR CAST IRON PIPE A 14.5KG MAGNESIUM ANODE IS TO BE CONNECTED TO THE FIRST LENGTH OF EXISTING PIPE, AS PER OPSS 442 AND OPSD 1109.010 AND 1109.011
13. ALL VALVES TO OPEN LEFT (COUNTER-CLOCKWISE), BE OF THE APPROVED TYPE WITH NON-RISING STEM AND SHALL HAVE 50MM SQUARE STANDARD AWWA OPERATING NUT.
14. ALL PLUGS, CAPS, TEES, BENDS, AND OTHER APPURTENANCES SHALL BE MECHANICALLY RESTRAINED AS PER MANUFACTURER'S SPECIFICATIONS. MECHANICAL THRUST RESTRAINT DEVICES SHALL HAVE THIRD PARTY TESTING, APPROVALS FROM THE UNDERWRITERS LABORATORY (UL) AND FACTORY MUTUAL (FM), AND BE INCLUDED IN HALTON REGION'S APPROVED MANUFACTURER'S PRODUCT LIST FOR WATER SYSTEMS.

## WATERMAINS Cont'd

15. WHERE WATERMAIN IS PLACED IN FILL OR IN PREVIOUSLY DISTURBED GROUND, ALL JOINTS TO BE MECHANICALLY RESTRAINED.
16. MINIMUM DEPTH OF COVER OVER WATERMAIN SHALL BE 1.70M MEASURED FROM THE TOP OF THE PIPE TO THE FINISHED GRADE.
17. THE DEPTH OF WATER SERVICES AT PROPERTY LINE SHOULD BE A MINIMUM OF 1.7M AND A MAXIMUM OF 2.0M. THE DISTANCE BETWEEN THE GROUND ELEVATION AND THE TOP OF THE ROD SHOULD BE BETWEEN 0.5M AND 1.0M.
18. WATER SERVICES CROSSING THE STORM SEWER TO HAVE MIN. 1.70M OF COVER. WHERE THIS CANNOT BE ACHIEVED, WATER SERVICE IS TO CROSS UNDER SEWER.
19. GATE VALVES CONFORMING TO A.W.W.A. C509 OR C515 ARE REQUIRED ON WATERMAINS 300MM AND UNDER. LINE GATE VALVES SHALL HAVE SCREW TYPE VALVE BOXES.
20. ALL WATERMAIN FITTINGS SHALL HAVE MECHANICAL JOINTS. VALVES IN CHAMBERS TO BE FLANGED.
21. PIPE BARREL BENDING/DEFLECTION SHALL NOT BE ALLOWED. PIPE JOINT DEFLECTIONS ARE DISCOURAGED (UTILIZE STANDARD BENDS TO ACHIEVE DESIRED VERTICAL AND HORIZONTAL PIPE ALIGNMENT). HOWEVER, IF ABSOLUTELY NECESSARY THE MAXIMUM ALLOWABLE PIPE JOINT DEFLECTION SHALL BE 50% OF THE MANUFACTURER'S SPECIFICATIONS.
22. TRACER WIRE IS TO BE INSTALLED ON ALL NEW INSTALLATIONS OF PVC WATERMAIN PIPE FOR LOCATING PURPOSES. A SOLID 10 GAUGE T.W.U. COPPER WIRE IS TO BE INSTALLED ALONG THE TOP OF THE PIPE, STRAPPED TO THE PIPE AT 6M INTERVALS.
23. THE INSPECTOR MAY TEST THE TRACING WIRE FOR CONDUCTIVITY. THE TRACER WIRE SHALL BE INSTALLED BETWEEN EACH VALVE AND/OR THE END OF THE NEW WATERMAIN TO ENSURE A CONTINUOUS SIGNAL FOR LOCATING THE MAIN. JOINTS IN THE TRACER WIRE BETWEEN VALVES IS DISCOURAGED, BUT WHEN NECESSARY, MUST BE WATER- PROOFED (REFER TO O.P.S.D. 1109.025) AND DONE IN SUCH A WAY TO ENSURE ELECTRICAL CONDUCTIVITY. AT EACH VALVE, A LOOP OF WIRE IS TO BE BROUGHT UP OUTSIDE THE VALVE BOX AS PER HALTON STANDARD DRAWING RH 406.010. TRACER WIRE FOR HORIZONTAL DIRECTIONAL DRILLING AND PIPE BURSTING INSTALLATION SHALL BE IN ACCORDANCE WITH HALTON REGION'S AMENDMENTS TO O.P.S.S. IF THE TRACING WIRE IS NOT CONTINUOUS FROM VALVE TO VALVE, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, REPLACE OR REPAIR THE WIRE.
24. ALL WATER CUSTOMERS SUPPLIED BY A WATERMAIN TO BE SHUT DOWN SHALL BE NOTIFIED BY THE CONTRACTOR AT LEAST 48 HOURS IN ADVANCE OF THE SHUT DOWN AS PER REGION OF HALTON SPECIFICATIONS. NOTIFICATION SHALL TAKE PLACE UNDER THE ENGINEER'S DIRECTION.
25. OPERATING OF EXISTING WATERMAINS SHALL BE BY REGION OF HALTON STAFF ONLY.

## STORM SEWERS

1. ALL STORM SEWERS 450mm DIA. OR SMALLER SHALL BE RIBBED PVC PIPE IN ACCORDANCE WITH CSA B182.4. SDR35 WITH LOCK IN RUBBER SEAL RING BEDDING SHALL BE O.P.S.D. 802.010. BEDDING MATERIAL SHALL BE CRUSHED STONE BASE (HL-6) GRAVEL AGGREGATE) AND A GRANULAR "C" COVER MATERIAL.
2. ALL STORM SEWERS LARGER THAN 450mm DIAMETER SHALL BE REINFORCED CONCRETE PIPE (CLASS AS SHOWN) IN ACCORDANCE WITH CSA A257.2. BEDDING SHALL BE O.P.S.D. 802.030. BEDDING MATERIAL SHALL BE CRUSHED STONE BASE (HL-6 GRAVEL AGGREGATE) AND A GRANULAR "C" COVER MATERIAL.
3. CONTRACTOR IS RESPONSIBLE FOR SUPPLYING ADDITIONAL BEDDING AND/OR STRONGER PIPE IF ACTUAL TRENCH WIDTHS EXCEED DESIGN WIDTHS.
4. MANHOLE SIZES AS SHOWN.
5. SURROUND ALL MANHOLES WITH A MINIMUM OF 1.0m COMPACTED GRANULAR "C"BACKFILL. ALL CATCHBASINS TO HAVE COMPLETE, COMPACTED GRANULAR "C" BACKFILL SURROUND.
6. CATCHBASIN (CB) PER O.P.S.D. 705.010 C/W 250mm DIA. LEAD. DOUBLE CATCHBASINS (DCB) PER O.P.S.D. 705.020 C/W 300mm DIA. LEAD. CATCHBASINS TO BE FITTED WITH INLET CONTROL DEVICE AS SHOWN. REAR LOT CATCHBASINS TO BE SUMPLESS PER TOWN STD 3-1 C/W BEEHIVE GRATE PER TOWN STD 5-2.
7. FOR COMMON TRENCH DETAILS REFER TO REGION STD. RH 302.01.
8. DROP STRUCTURES TO BE TOWN OF OAKVILLE STD. 2-2.
9. BENCHING IN MANHOLES IS TO EXTEND UP TO THE SPRINGLINE OF THE PIPE.
10. DITCH INLETS TO BE AS PER O.P.S.D. 705.030 3:1 GRATE.
11. CATCHBASIN FRAME AND GRATES FOR ROADS TO BE AS PER O.P.S.D. 400.11.
12. SERVICE CONNECTION AT THE STREET LINE IS TO BE HIGHER THAN THE SANITARY CONNECTION AT THAT POINT.
13. ALL ENDS OF SERVICE CONNECTIONS SHALL BE MARKED WITH 100x50 LUMBER MARKERS PLACED FROM THE INVERT OF THE SERVICE TO 1.0m ABOVE GROUND LEVEL AND PAINTED WHITE.
14. SAFETY GRATINGS SHALL BE PROVIDED IN ALL MANHOLES WHEN THE DEPTH OF THE MANHOLE EXCEEDS 5.3m. TOWN STD. 2-1 (2003)
15. STORM SERVICE LATERALS TO BE 200mmø DIA FOR SINGLE FAMILY DWELLINGS. LATERALS TO BE MINIMUM 2.00% GRADE. PVC PIPES TO BE WHITE IN COLOUR AND DR28 SHALL BE USED.

## SANITARY SEWERS

1. SANITARY MANHOLES AS PER O.P.S.D. 701.010 WITH FRAMES AND COVERS AS PER O.P.S.D. 401.010 TYPE "A" (AS AMENDED RESPECTIVELY BY THE REGION OF HALTON) UNLESS OTHERWISE NOTED ON THE DRAWINGS.
2. BENCHING IN MANHOLES TO BE AS PER O.P.S.D. 701.021 AS AMENDED BY THE REGION OF HALTON. BENCHING IN SANITARY MANHOLES TO BE TO THE OBVERT OF THE PIPE.
3. SANITARY SEWER PIPE SHALL BE PVC SDR35 (GREEN IN COLOUR) CONFORMING TO CSA B182.2 UNLESS OTHERWISE NOTED.
4. SANITARY SERVICE CONNECTIONS TO BE 125mm DIA. FOR SINGLE FAMILY DWELLINGS AND ROWED TOWNHOUSES. COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL LATERALS SHALL BE A MINIMUM OF 150mm DIAMETER. SANITARY SERVICE CONNECTIONS TO BE MINIMUM 2% GRADE AND SHALL BE NON-WHITE IN COLOUR. FOR PVC LATERAL CONNECTIONS, PIPE SHALL BE GREEN IN COLOUR AND DR28 SHALL BE USED.
5. SERVICES TO BE MIN. 2.15M AND MAX. 2.75M DEEP AT PROPERTY LINE. RISERS SHALL BE USED WHERE NOTED AS PER O.P.S.D. 1006.010.
6. GRANULAR "A" BEDDING AND COVER ON ALL SEWERS AND CONNECTIONS TO BE AS PER O.P.S.D. 802.010 UNLESS NOTED OTHERWISE, WITH GRANULAR "B" BACKFILL.
7. GRANULAR BACKFILL AROUND MANHOLES SHALL BE COMPACTED BY MECHANICAL MEANS TO A MINIMUM OF 95% S.P.D.

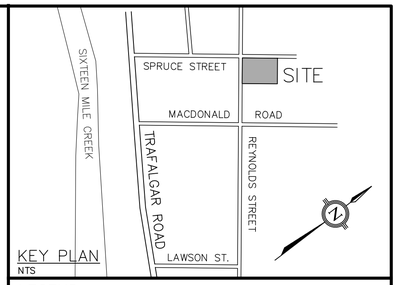
## ROADS

1. ALL ROAD BASE AND SUB-BASE MATERIALS SHALL BE CRUSHER RUN LIMESTONE MEETING OPSS TYPE II SPECIFICATIONS.
2. ANY AREAS WITHIN R.O.W. WHICH REQUIRE FILL IN EXCESS OF 0.30m ARE SUBJECT TO COMPACTION TESTS AND SUCH TESTS MUST SHOW A MIN. COMPACTION OF 98% S.P.M.D.D. AT ALL DEPTHS. ALL EARTHWORKS MUST COMPLY WITH GEOTECHNICAL INVESTIGATION.
3. GRANULAR BASE SHALL BE COMPACTED TO A MIN. OF 100% SPMDD IN LIFTS OF 150mm OR LESS.
4. ASPHALT MATERIALS SHALL BE ROLLED AND COMPACTED TO A MIN. OF 97% MARSHALL BULK DENSITY.
5. PRIOR TO PLACEMENT OF GRANULAR COURSES, THE SUBGRADE SHALL BE PROOF-ROLLED AND ALL LOOSE, SOFT OR UNSTABLE AREAS REMOVED AS DIRECTED BY THE ENGINEER.
6. ALL CURB AND GUTTERS SHALL BE PER OPSD 600.040 UNLESS OTHERWISE NOTED.
7. PERFORATED SUBDRAINS C/W FILTER SOCK PER TOWN STD. 7-60, SHALL BE INSTALLED UNDER ALL CURBS.
8. SIDEWALK TO BE TOWN STD. 6-3 TYPE 'A'.
9. AN EXTRA 150mm THICKNESS GRANULAR 'B' SHALL BE ADDED AT ARTERIAL AND INDUSTRIAL ROAD INTERSECTIONS. THIS EXTRA DEPTH SHALL BE EXTENDED FOR A MINIMUM OF 15.0m FROM THE PROPERTY LINE OF THE INTERSECTING STREET.
10. TOP COURSE ASPHALTIC CONCRETE SHALL BE PLACED ONLY AFTER ADJACENT BUILDINGS (HOMES, INDUSTRIAL, COMMERCIAL, ETC.) HAVE BEEN CONSTRUCTED AND ONLY WITH THE CONSENT OF THE DIRECTOR OF ENGINEERING AND CONSTRUCTION.
11. SIDEWALK RAMPS AT INTERSECTIONS AND MID-BLOCK CROSSINGS SHALL CONFORM TO OPSD 310.030 WITH THE REQUIREMENT THAT THE RAMP GRADIENT SHALL NOT EXCEED 5%.
12. PAVEMENT STRUCTURE (TO BE CONFIRMED BY GEOTECHNICAL CONSULTANT):

    40mm HL3
    50mm HL8
    150mm – 19mm CRL
    350mm – 50mm CRL

## CONSTRUCTION

1. CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY TRAFFIC CONTROLS, PER MTO BOOK 7.
2. CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION LAYOUT, WITH CONTROL BARS PROVIDED BY THE OWNER. PROTECTION OF CONTROL BARS IS THE RESPONSIBILITY OF THE CONTRACTOR.
3. CONTRACTOR IS RESPONSIBLE TO VERIFY THE SIZE AND LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION, INCLUDING VAC TRUCK AND RESTORATION AS REQUIRED.
4. CONTRACTOR SHALL PROVIDE THIRD-PARTY DIGITAL AS-BUILTS IN CAD TO INCLUDE ALL NEW SITE SERVICING INCLUDING TOPS AND INVERTS, AND FINISHED GRADES, INCLUDING PAVED AREAS, SWALES, CURBS, SIDEWALKS AND AND RETAINING WALLS, TO THE SATISFACTION OF THE ENGINEER.
5. CONTRACTOR SHALL FLUSH AND VIDEO ALL EXISTING SEWERS PRIOR TO AND AFTER CONNECTION, AND NEW AND DISTURBED SEWERS UPON INSTALLATION AND LATER UPON COMPLETION OF TOP WORKS AND LANDSCAPING, PER OPSS 409. VIDEOS TO BE PROVIDED TO THE ENGINEER FOR REVIEW AND APPROVAL.




KEY PLAN
NTS

## LEGEND

## BENCHMARK

ELEVATIONS ARE REFERRED TO BENCHMARK No. 0011931U1999 HAVING AN ELEVATION OF 90.39 METRES.
TABLET IN THE TOP OF THE SQUARE PIER IN THE SOUTHWEST CORNER OF GEORGE'S SQUARE, 29.3 METRES NORTHWEST OF SUMNER AVENUE AND 12.5 METRES NORTHEAST OF TRAFALGAR ROAD.
ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).

## NOTE

THE SURVEY WAS COMPLETED ON THE 20TH DAY OF JANUARY, 2023 BY R-PE SURVEYING LTD., ONTARIO LAND SURVEYORS.
JOB No. 23-005 CAD FILE No.23-005TP01

| No | DD/MM/YY | By/DRN | REVISIONS |
|---|---|---|---|
| 2 | 29/02/24 | MW/GL | ISSUED FOR ZBA/DPS |
| 1 | 13/02/24 | MW/MW | ISSUED FOR COORDINATION |

| | | | |
|---|---|---|---|
| Design | MW | Chk'd | PC |
| Drawn | MW | Chk'd | |
| Cad File | 1819N.dwg | | |
| Plot Date | 02/29/24 | | |

Scale 0 5 10m
1:200

References

Field Notes

APPROVALS

Municipal
APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS.

Date:
Manager of Development Services

| | | | |
|---|---|---|---|
| Bell | ☐ | Hydro | ☐ |
| Gas | ☐ | Cable | ☐ |
| Traf. | ☐ | Water | ☐ |

Regional Approval

DESIGN OF WATER &/OR WASTEWATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY.

SIGNED: _____ DATE: _____
LEGISLATIVE AND PLANNING SERVICES DEPT.

LICENSED PROFESSIONAL ENGINEER
P. CIFONI
Feb 29, 2024
PROVINCE OF ONTARIO

Consultant
TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

Municipality
OAKVILLE Halton REGION

PROJECT
SPRUCE ROSE INC.
RESIDENTIAL SUBDIVISION

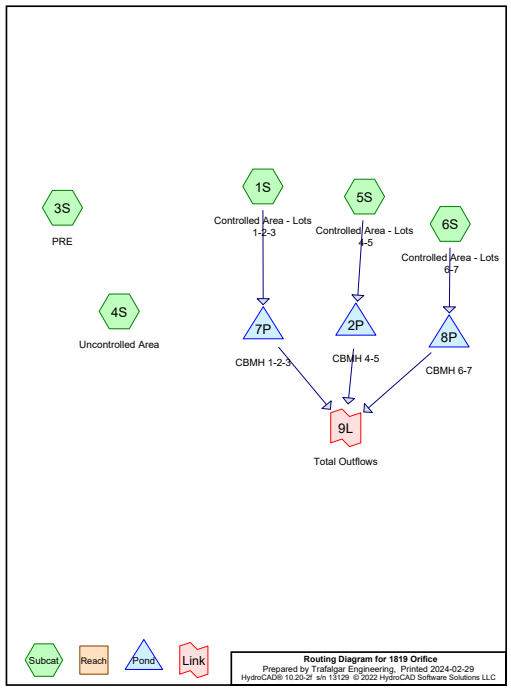
DRAWING TITLE
STANDARD NOTES

| Municipal No. | Regional No. |
|---|---|
| 24T-XXXX | |
| Contract No. | Consultant No. 1819 |
| – | Sheet N1 |

FILENAME: P:\1819 Spruce Street Oakville\04-CAD\04-Subdivision\1819N.dwg
PLOTDATE: Feb 29, 2024 - 11:54am

# APPENDIX ‘E’

HydroCAD Model Output






## Project Notes

Copied 6 events from ON Oakville 24hr storm



## Rainfall Events Listing (selected events)

| Event# | Event Name | Storm Type | Curve | Mode | Duration (hours) | B/B | Depth (mm) | AMC |
|---|---|---|---|---|---|---|---|---|
| 1 | 5-Year | ON Oakville 24hr | 5-Year | Default | 24.00 | 1 | 60 | 2 |
| 2 | 10-Year | ON Oakville 24hr | 10-Year | Default | 24.00 | 1 | 70 | 2 |
| 3 | 25-Year | ON Oakville 24hr | 25-Year | Default | 24.00 | 1 | 82 | 2 |
| 4 | 50-Year | ON Oakville 24hr | 50-Year | Default | 24.00 | 1 | 89 | 2 |
| 5 | 100-Year | ON Oakville 24hr | 100-Year | Default | 24.00 | 1 | 97 | 2 |



## Area Listing (all nodes)

| Area (sq-meters) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 4,693.0 | 80 | >75% Grass cover, Good, HSG D (1S, 3S, 4S, 5S, 6S) |
| 2,580.0 | 98 | Paved parking, HSG A (1S, 3S, 5S) |
| 393.0 | 98 | Paved parking, HSG D (6S) |
| 507.0 | 98 | Water Surface, HSG A (4S) |
| **8,173.0** | **88** | **TOTAL AREA** |



## Soil Listing (all nodes)

| Area (sq-meters) | Soil Group | Subcatchment Numbers |
|---|---|---|
| 3,087.0 | HSG A | 1S, 3S, 4S, 5S |
| 0.0 | HSG B | |
| 0.0 | HSG C | |
| 5,086.0 | HSG D | 1S, 3S, 4S, 5S, 6S |
| 0.0 | Other | |
| **8,173.0** | | **TOTAL AREA** |



## Ground Covers (all nodes)

| HSG-A (sq-meters) | HSG-B (sq-meters) | HSG-C (sq-meters) | HSG-D (sq-meters) | Other (sq-meters) | Total (sq-meters) | Ground Cover |
|---|---|---|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 4,693.0 | 0.0 | 4,693.0 | >75% Grass cover, Good |
| 2,580.0 | 0.0 | 0.0 | 393.0 | 0.0 | 2,973.0 | Paved parking |
| 507.0 | 0.0 | 0.0 | 0.0 | 0.0 | 507.0 | Water Surface |
| **3,087.0** | **0.0** | **0.0** | **5,086.0** | **0.0** | **8,173.0** | **TOTAL AREA** |

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Controlled Area -** Runoff Area=1,039.0 m² 53.13% Impervious Runoff Depth>35 mm
Tc=20.6 min CN=90 Runoff=0.014 m³/s 36.1 m³

**Subcatchment 3S: PRE** Runoff Area=4,116.0 m² 41.81% Impervious Runoff Depth>31 mm
Tc=10.0 min CN=88 Runoff=0.075 m³/s 128.4 m³

**Subcatchment 4S: Uncontrolled Area** Runoff Area=1,114.0 m² 45.51% Impervious Runoff Depth>31 mm
Tc=10.0 min CN=88 Runoff=0.020 m³/s 34.7 m³

**Subcatchment 5S: Controlled Area - Lots** Runoff Area=867.0 m² 35.41% Impervious Runoff Depth>28 mm
Tc=16.0 min CN=86 Runoff=0.011 m³/s 24.1 m³

**Subcatchment 6S: Controlled Area -** Runoff Area=1,037.0 m² 37.90% Impervious Runoff Depth>29 mm
Tc=16.0 min CN=87 Runoff=0.014 m³/s 30.5 m³

**Pond 2P: CBMH 4-5** Peak Elev=95.297 m Storage=2.9 m³ Inflow=0.011 m³/s 24.1 m³
Outflow=0.008 m³/s 24.1 m³

**Pond 7P: CBMH 1-2-3** Peak Elev=95.580 m Storage=4.1 m³ Inflow=0.014 m³/s 36.1 m³
Outflow=0.011 m³/s 36.1 m³

**Pond 8P: CBMH 6-7** Peak Elev=95.156 m Storage=4.4 m³ Inflow=0.014 m³/s 30.5 m³
Outflow=0.010 m³/s 30.5 m³

**Link 9L: Total Outflows** above 10.0000 m³/s Inflow=0.029 m³/s 90.7 m³
Primary=0.000 m³/s 0.0 m³ Secondary=0.029 m³/s 90.7 m³

**Total Runoff Area = 8,173.0 m² Runoff Volume = 253.9 m³ Average Runoff Depth = 31 mm**
**57.42% Pervious = 4,693.0 m² 42.58% Impervious = 3,480.0 m²**



### Summary for Subcatchment 1S: Controlled Area - Lots 1-2-3

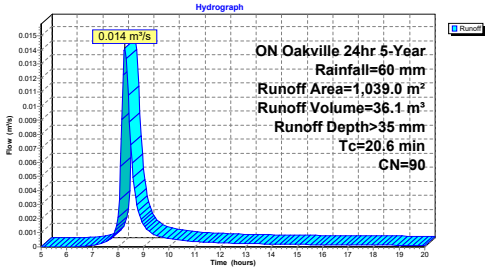
Runoff = 0.014 m³/s @ 8.28 hrs, Volume= 36.1 m³, Depth> 35 mm
Routed to Pond 7P : CBMH 1-2-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 5-Year Rainfall=60 mm

| Area (m²) | CN | Description |
|---|---|---|
| 552.0 | 98 | Paved parking, HSG A |
| 487.0 | 80 | >75% Grass cover, Good, HSG D |
| 1,039.0 | 90 | Weighted Average |
| 487.0 | | 46.87% Pervious Area |
| 552.0 | | 53.13% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 20.6 | | | | | **Direct Entry,** |

### Subcatchment 1S: Controlled Area - Lots 1-2-3






### Summary for Subcatchment 3S: PRE

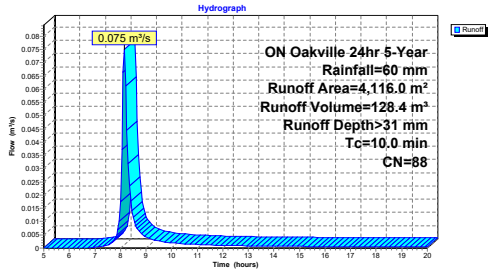
Runoff = 0.075 m³/s @ 8.14 hrs, Volume= 128.4 m³, Depth> 31 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 5-Year Rainfall=60 mm

| Area (m²) | CN | Description |
|---|---|---|
| 1,721.0 | 98 | Paved parking, HSG A |
| 2,395.0 | 80 | >75% Grass cover, Good, HSG D |
| 4,116.0 | 88 | Weighted Average |
| 2,395.0 | | 58.19% Pervious Area |
| 1,721.0 | | 41.81% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 10.0 | | | | | **Direct Entry,** |

### Subcatchment 3S: PRE






### Summary for Subcatchment 4S: Uncontrolled Area

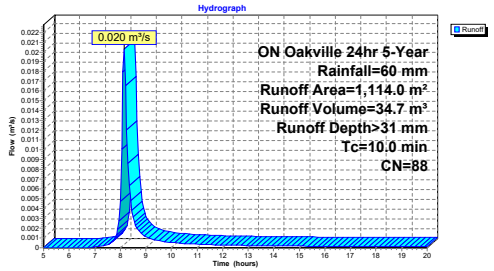
Runoff = 0.020 m³/s @ 8.14 hrs, Volume= 34.7 m³, Depth> 31 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 5-Year Rainfall=60 mm

| Area (m²) | CN | Description |
|---|---|---|
| 507.0 | 98 | Water Surface, HSG A |
| 607.0 | 80 | >75% Grass cover, Good, HSG D |
| 1,114.0 | 88 | Weighted Average |
| 607.0 | | 54.49% Pervious Area |
| 507.0 | | 45.51% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 10.0 | | | | | **Direct Entry,** |

### Subcatchment 4S: Uncontrolled Area






### Summary for Subcatchment 5S: Controlled Area - Lots 4-5

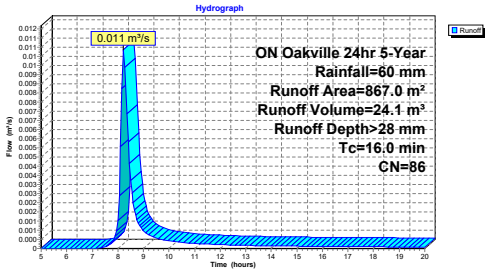
Runoff = 0.011 m³/s @ 8.22 hrs, Volume= 24.1 m³, Depth> 28 mm
Routed to Pond 2P : CBMH 4-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 5-Year Rainfall=60 mm

| Area (m²) | CN | Description |
|---|---|---|
| 307.0 | 98 | Paved parking, HSG A |
| 560.0 | 80 | >75% Grass cover, Good, HSG D |
| 867.0 | 86 | Weighted Average |
| 560.0 | | 64.59% Pervious Area |
| 307.0 | | 35.41% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 16.0 | | | | | **Direct Entry,** |

### Subcatchment 5S: Controlled Area - Lots 4-5






### Summary for Subcatchment 6S: Controlled Area - Lots 6-7

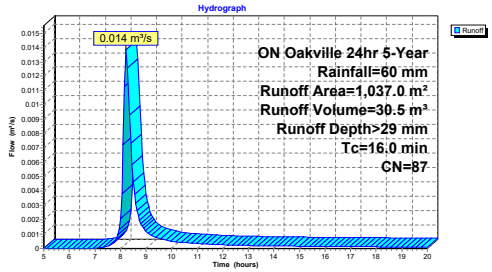
Runoff = 0.014 m³/s @ 8.22 hrs, Volume= 30.5 m³, Depth> 29 mm
Routed to Pond 8P : CBMH 6-7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 5-Year Rainfall=60 mm

| Area (m²) | CN | Description |
|---|---|---|
| 393.0 | 98 | Paved parking, HSG D |
| 644.0 | 80 | >75% Grass cover, Good, HSG D |
| 1,037.0 | 87 | Weighted Average |
| 644.0 | | 62.10% Pervious Area |
| 393.0 | | 37.90% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 16.0 | | | | | **Direct Entry,** |

### Subcatchment 6S: Controlled Area - Lots 6-7



## Summary for Pond 2P: CBMH 4-5

Inflow Area = 867.0 m², 35.41% Impervious, Inflow Depth > 28 mm for 5-Year event
Inflow = 0.011 m³/s @ 8.22 hrs, Volume= 24.1 m³
Outflow = 0.008 m³/s @ 8.32 hrs, Volume= 24.1 m³, Atten= 23%, Lag= 6.0 min
Primary = 0.008 m³/s @ 8.32 hrs, Volume= 24.1 m³
Routed to Link 9L : Total Outflows

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 95.297 m @ 8.32 hrs Storage= 2.9 m³

Plug-Flow detention time= 4.9 min calculated for 24.0 m³ (100% of inflow)
Center-of-Mass det. time= 4.2 min ( 584.5 - 580.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 94.810 m | 19.5 m³ | **Custom Stage Data**Listed below |

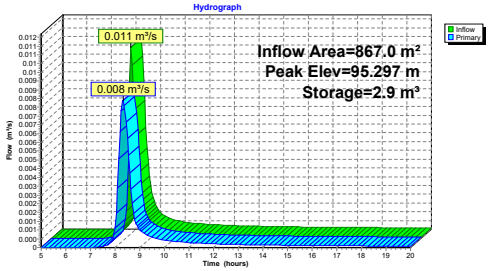
| Elevation (meters) | Cum.Store (cubic-meters) |
|---|---|
| 94.810 | 0.0 |
| 97.110 | 13.5 |
| 97.260 | 19.5 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 94.810 m | **75 mm Vert. Orifice/Grate** C= 0.640 Limited to weir flow at low heads |

**Primary OutFlow** Max=0.008 m³/s @ 8.32 hrs HW=95.290 m (Free Discharge)
**1=Orifice/Grate** (Orifice Controls 0.008 m³/s @ 1.89 m/s)



## Pond 2P: CBMH 4-5






## Summary for Pond 7P: CBMH 1-2-3

Inflow Area = 1,039.0 m², 53.13% Impervious, Inflow Depth > 35 mm for 5-Year event
Inflow = 0.014 m³/s @ 8.28 hrs, Volume= 36.1 m³
Outflow = 0.011 m³/s @ 8.39 hrs, Volume= 36.1 m³, Atten= 21%, Lag= 6.9 min
Primary = 0.011 m³/s @ 8.39 hrs, Volume= 36.1 m³
Routed to Link 9L : Total Outflows

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 95.580 m @ 8.39 hrs Storage= 4.1 m³

Plug-Flow detention time= 4.6 min calculated for 35.9 m³ (100% of inflow)
Center-of-Mass det. time= 4.1 min ( 577.2 - 573.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 94.740 m | 15.1 m³ | **Custom Stage Data**Listed below |

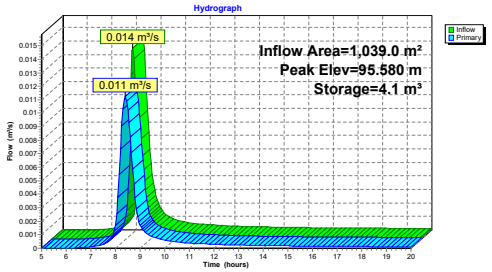
| Elevation (meters) | Cum.Store (cubic-meters) |
|---|---|
| 94.740 | 0.0 |
| 96.970 | 11.0 |
| 97.260 | 15.1 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 94.740 m | **75 mm Vert. Orifice/Grate** C= 0.640 Limited to weir flow at low heads |

**Primary OutFlow** Max=0.011 m³/s @ 8.39 hrs HW=95.575 m (Free Discharge)
**1=Orifice/Grate** (Orifice Controls 0.011 m³/s @ 2.53 m/s)



## Pond 7P: CBMH 1-2-3






## Summary for Pond 8P: CBMH 6-7

Inflow Area = 1,037.0 m², 37.90% Impervious, Inflow Depth > 29 mm for 5-Year event
Inflow = 0.014 m³/s @ 8.22 hrs, Volume= 30.5 m³
Outflow = 0.010 m³/s @ 8.34 hrs, Volume= 30.5 m³, Atten= 29%, Lag= 7.1 min
Primary = 0.010 m³/s @ 8.34 hrs, Volume= 30.5 m³
Routed to Link 9L : Total Outflows

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 95.156 m @ 8.34 hrs Storage= 4.4 m³

Plug-Flow detention time= 6.1 min calculated for 30.5 m³ (100% of inflow)
Center-of-Mass det. time= 5.2 min ( 582.8 - 577.6 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 94.500 m | 14.7 m³ | **Custom Stage Data**Listed below |

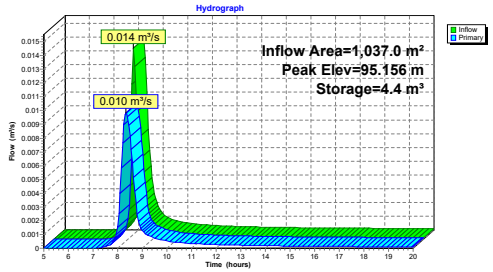
| Elevation (meters) | Cum.Store (cubic-meters) |
|---|---|
| 94.500 | 0.0 |
| 96.520 | 13.5 |
| 96.670 | 14.7 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 94.500 m | **75 mm Vert. Orifice/Grate** C= 0.640 Limited to weir flow at low heads |

**Primary OutFlow** Max=0.010 m³/s @ 8.34 hrs HW=95.152 m (Free Discharge)
**1=Orifice/Grate** (Orifice Controls 0.010 m³/s @ 2.22 m/s)



## Pond 8P: CBMH 6-7

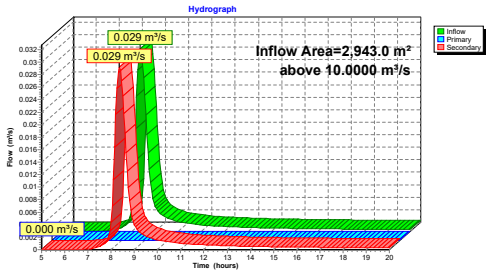


## Summary for Link 9L: Total Outflows

Inflow Area = 2,943.0 m², 42.54% Impervious, Inflow Depth > 31 mm for 5-Year event
Inflow = 0.029 m³/s @ 8.35 hrs, Volume= 90.7 m³
Primary = 0.000 m³/s @ 5.00 hrs, Volume= 0.0 m³, Atten= 100%, Lag= 0.0 min
Secondary = 0.029 m³/s @ 8.35 hrs, Volume= 90.7 m³

Primary outflow = Inflow above 10.0000 m³/s, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

## Link 9L: Total Outflows






Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Controlled Area -** Runoff Area=1,039.0 m² 53.13% Impervious Runoff Depth>43 mm
Tc=20.6 min CN=90 Runoff=0.018 m³/s 44.6 m³

**Subcatchment 3S: PRE** Runoff Area=4,116.0 m² 41.81% Impervious Runoff Depth>39 mm
Tc=10.0 min CN=88 Runoff=0.096 m³/s 160.5 m³

**Subcatchment 4S: Uncontrolled Area** Runoff Area=1,114.0 m² 45.51% Impervious Runoff Depth>39 mm
Tc=10.0 min CN=88 Runoff=0.026 m³/s 43.4 m³

**Subcatchment 5S: Controlled Area - Lots** Runoff Area=867.0 m² 35.41% Impervious Runoff Depth>35 mm
Tc=16.0 min CN=86 Runoff=0.014 m³/s 30.6 m³

**Subcatchment 6S: Controlled Area -** Runoff Area=1,037.0 m² 37.90% Impervious Runoff Depth>37 mm
Tc=16.0 min CN=87 Runoff=0.018 m³/s 38.5 m³

**Pond 2P: CBMH 4-5** Peak Elev=95.528 m Storage=4.2 m³ Inflow=0.014 m³/s 30.6 m³
Outflow=0.010 m³/s 30.6 m³

**Pond 7P: CBMH 1-2-3** Peak Elev=95.936 m Storage=5.9 m³ Inflow=0.018 m³/s 44.6 m³
Outflow=0.013 m³/s 44.5 m³

**Pond 8P: CBMH 6-7** Peak Elev=95.450 m Storage=6.3 m³ Inflow=0.018 m³/s 38.5 m³
Outflow=0.012 m³/s 38.4 m³

**Link 9L: Total Outflows** above 10.0000 m³/s Inflow=0.036 m³/s 113.5 m³
Primary=0.000 m³/s 0.0 m³ Secondary=0.036 m³/s 113.5 m³

**Total Runoff Area = 8,173.0 m² Runoff Volume = 317.5 m³ Average Runoff Depth = 39 mm**
**57.42% Pervious = 4,693.0 m² 42.58% Impervious = 3,480.0 m²**



## Summary for Subcatchment 1S: Controlled Area - Lots 1-2-3

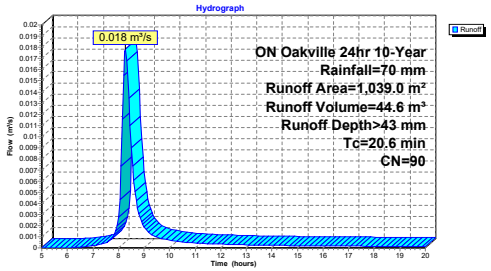
Runoff = 0.018 m³/s @ 8.27 hrs, Volume= 44.6 m³, Depth> 43 mm
Routed to Pond 7P : CBMH 1-2-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 10-Year Rainfall=70 mm

| Area (m²) | CN | Description |
|---|---|---|
| 552.0 | 98 | Paved parking, HSG A |
| 487.0 | 80 | >75% Grass cover, Good, HSG D |
| 1,039.0 | 90 | Weighted Average |
| 487.0 | | 46.87% Pervious Area |
| 552.0 | | 53.13% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 20.6 | | | | | Direct Entry, |

## Subcatchment 1S: Controlled Area - Lots 1-2-3






## Summary for Subcatchment 3S: PRE

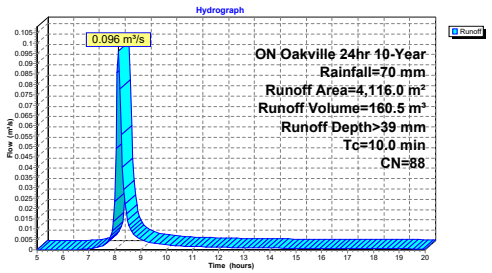
Runoff = 0.096 m³/s @ 8.14 hrs, Volume= 160.5 m³, Depth> 39 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 10-Year Rainfall=70 mm

| Area (m²) | CN | Description |
|---|---|---|
| 1,721.0 | 98 | Paved parking, HSG A |
| 2,395.0 | 80 | >75% Grass cover, Good, HSG D |
| 4,116.0 | 88 | Weighted Average |
| 2,395.0 | | 58.19% Pervious Area |
| 1,721.0 | | 41.81% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 10.0 | | | | | Direct Entry, |

## Subcatchment 3S: PRE






## Summary for Subcatchment 4S: Uncontrolled Area

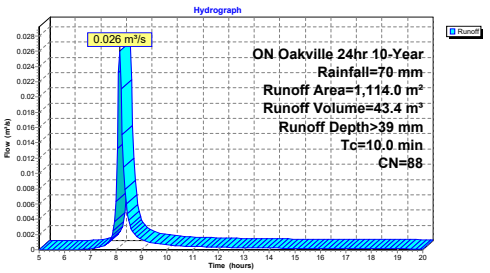
Runoff = 0.026 m³/s @ 8.14 hrs, Volume= 43.4 m³, Depth> 39 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 10-Year Rainfall=70 mm

| Area (m²) | CN | Description |
|---|---|---|
| 507.0 | 98 | Water Surface, HSG A |
| 607.0 | 80 | >75% Grass cover, Good, HSG D |
| 1,114.0 | 88 | Weighted Average |
| 607.0 | | 54.49% Pervious Area |
| 507.0 | | 45.51% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 10.0 | | | | | Direct Entry, |

## Subcatchment 4S: Uncontrolled Area






## Summary for Subcatchment 5S: Controlled Area - Lots 4-5

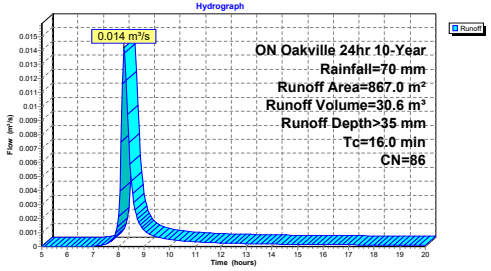
Runoff = 0.014 m³/s @ 8.22 hrs, Volume= 30.6 m³, Depth> 35 mm
Routed to Pond 2P : CBMH 4-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 10-Year Rainfall=70 mm

| Area (m²) | CN | Description |
|---|---|---|
| 307.0 | 98 | Paved parking, HSG A |
| 560.0 | 80 | >75% Grass cover, Good, HSG D |
| 867.0 | 86 | Weighted Average |
| 560.0 | | 64.59% Pervious Area |
| 307.0 | | 35.41% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 16.0 | | | | | Direct Entry, |

## Subcatchment 5S: Controlled Area - Lots 4-5



## Summary for Subcatchment 6S: Controlled Area - Lots 6-7

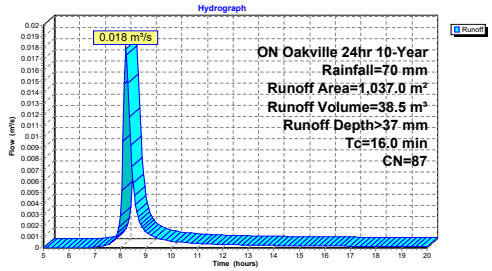
Runoff = 0.018 m³/s @ 8.22 hrs, Volume= 38.5 m³, Depth> 37 mm
Routed to Pond 8P : CBMH 6-7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 10-Year Rainfall=70 mm

| Area (m²) | CN | Description |
|---|---|---|
| 393.0 | 98 | Paved parking, HSG D |
| 644.0 | 80 | >75% Grass cover, Good, HSG D |
| 1,037.0 | 87 | Weighted Average |
| 644.0 | | 62.10% Pervious Area |
| 393.0 | | 37.90% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 16.0 | | | | | **Direct Entry,** |

### Subcatchment 6S: Controlled Area - Lots 6-7






## Summary for Pond 2P: CBMH 4-5

Inflow Area = 867.0 m², 35.41% Impervious, Inflow Depth > 35 mm for 10-Year event
Inflow = 0.014 m³/s @ 8.22 hrs, Volume= 30.6 m³
Outflow = 0.010 m³/s @ 8.33 hrs, Volume= 30.6 m³, Atten= 27%, Lag= 6.7 min
Primary = 0.010 m³/s @ 8.33 hrs, Volume= 30.6 m³
Routed to Link 9L : Total Outflows

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 95.528 m @ 8.33 hrs Storage= 4.2 m³

Plug-Flow detention time= 5.3 min calculated for 30.5 m³ (100% of inflow)
Center-of-Mass det. time= 4.7 min ( 578.6 - 573.9 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 94.810 m | 19.5 m³ | **Custom Stage Data**Listed below |

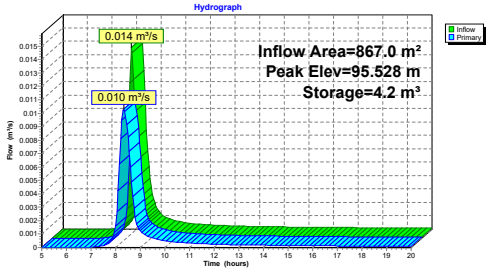
| Elevation (meters) | Cum.Store (cubic-meters) |
|---|---|
| 94.810 | 0.0 |
| 97.110 | 13.5 |
| 97.260 | 19.5 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 94.810 m | **75 mm Vert. Orifice/Grate** C= 0.640<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=0.010 m³/s @ 8.33 hrs HW=95.521 m (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.010 m³/s @ 2.33 m/s)



### Pond 2P: CBMH 4-5






## Summary for Pond 7P: CBMH 1-2-3

Inflow Area = 1,039.0 m², 53.13% Impervious, Inflow Depth > 43 mm for 10-Year event
Inflow = 0.018 m³/s @ 8.27 hrs, Volume= 44.6 m³
Outflow = 0.013 m³/s @ 8.40 hrs, Volume= 44.5 m³, Atten= 25%, Lag= 7.7 min
Primary = 0.013 m³/s @ 8.40 hrs, Volume= 44.5 m³
Routed to Link 9L : Total Outflows

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 95.936 m @ 8.40 hrs Storage= 5.9 m³

Plug-Flow detention time= 5.1 min calculated for 44.4 m³ (100% of inflow)
Center-of-Mass det. time= 4.6 min ( 572.5 - 567.9 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 94.740 m | 15.1 m³ | **Custom Stage Data**Listed below |

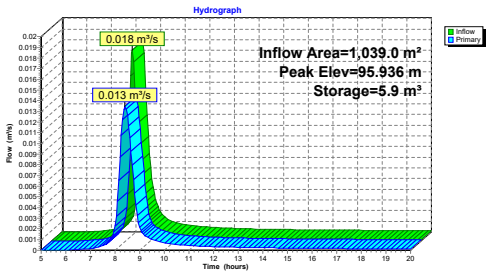
| Elevation (meters) | Cum.Store (cubic-meters) |
|---|---|
| 94.740 | 0.0 |
| 96.970 | 11.0 |
| 97.260 | 15.1 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 94.740 m | **75 mm Vert. Orifice/Grate** C= 0.640<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=0.013 m³/s @ 8.40 hrs HW=95.934 m (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.013 m³/s @ 3.05 m/s)



### Pond 7P: CBMH 1-2-3






## Summary for Pond 8P: CBMH 6-7

Inflow Area = 1,037.0 m², 37.90% Impervious, Inflow Depth > 37 mm for 10-Year event
Inflow = 0.018 m³/s @ 8.22 hrs, Volume= 38.5 m³
Outflow = 0.012 m³/s @ 8.35 hrs, Volume= 38.4 m³, Atten= 33%, Lag= 7.9 min
Primary = 0.012 m³/s @ 8.35 hrs, Volume= 38.4 m³
Routed to Link 9L : Total Outflows

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 95.450 m @ 8.35 hrs Storage= 6.3 m³

Plug-Flow detention time= 6.7 min calculated for 38.3 m³ (100% of inflow)
Center-of-Mass det. time= 5.8 min ( 577.4 - 571.6 )

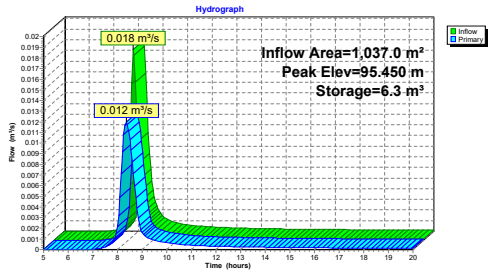
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 94.500 m | 14.7 m³ | **Custom Stage Data**Listed below |

| Elevation (meters) | Cum.Store (cubic-meters) |
|---|---|
| 94.500 | 0.0 |
| 96.520 | 13.5 |
| 96.670 | 14.7 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 94.500 m | **75 mm Vert. Orifice/Grate** C= 0.640<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=0.012 m³/s @ 8.35 hrs HW=95.449 m (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.012 m³/s @ 2.71 m/s)

### Pond 8P: CBMH 6-7



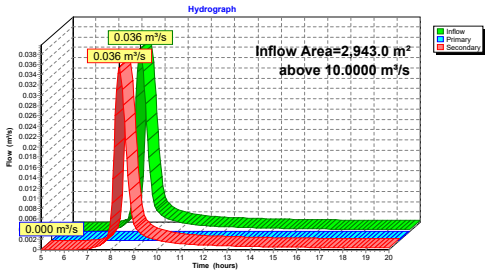



### Summary for Link 9L: Total Outflows

Inflow Area = 2,943.0 m², 42.54% Impervious, Inflow Depth > 39 mm for 10-Year event
Inflow = 0.036 m³/s @ 8.36 hrs, Volume= 113.5 m³
Primary = 0.000 m³/s @ 5.00 hrs, Volume= 0.0 m³, Atten= 100%, Lag= 0.0 min
Secondary = 0.036 m³/s @ 8.36 hrs, Volume= 113.5 m³

Primary outflow = Inflow above 10.0000 m³/s, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Link 9L: Total Outflows






Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Controlled Area -** Runoff Area=1,039.0 m² 53.13% Impervious Runoff Depth>54 mm
Tc=20.6 min CN=90 Runoff=0.023 m³/s 55.8 m³

**Subcatchment 3S: PRE** Runoff Area=4,116.0 m² 41.81% Impervious Runoff Depth>50 mm
Tc=10.0 min CN=88 Runoff=0.125 m³/s 203.8 m³

**Subcatchment 4S: Uncontrolled Area** Runoff Area=1,114.0 m² 45.51% Impervious Runoff Depth>50 mm
Tc=10.0 min CN=88 Runoff=0.034 m³/s 55.2 m³

**Subcatchment 5S: Controlled Area - Lots** Runoff Area=867.0 m² 35.41% Impervious Runoff Depth>45 mm
Tc=16.0 min CN=86 Runoff=0.019 m³/s 39.4 m³

**Subcatchment 6S: Controlled Area -** Runoff Area=1,037.0 m² 37.90% Impervious Runoff Depth>47 mm
Tc=16.0 min CN=87 Runoff=0.023 m³/s 49.2 m³

**Pond 2P: CBMH 4-5** Peak Elev=95.886 m Storage=6.3 m³ Inflow=0.019 m³/s 39.4 m³
Outflow=0.013 m³/s 39.3 m³

**Pond 7P: CBMH 1-2-3** Peak Elev=96.465 m Storage=8.5 m³ Inflow=0.023 m³/s 55.8 m³
Outflow=0.016 m³/s 55.8 m³

**Pond 8P: CBMH 6-7** Peak Elev=95.891 m Storage=9.3 m³ Inflow=0.023 m³/s 49.2 m³
Outflow=0.015 m³/s 49.1 m³

**Link 9L: Total Outflows** above 10.0000 m³/s Inflow=0.043 m³/s 144.2 m³
Primary=0.000 m³/s 0.0 m³ Secondary=0.043 m³/s 144.2 m³

**Total Runoff Area = 8,173.0 m² Runoff Volume = 403.3 m³ Average Runoff Depth = 49 mm**
**57.42% Pervious = 4,693.0 m² 42.58% Impervious = 3,480.0 m²**



### Summary for Subcatchment 1S: Controlled Area - Lots 1-2-3

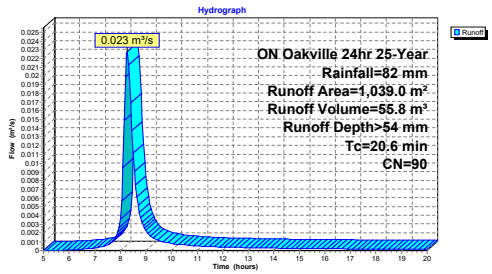
Runoff = 0.023 m³/s @ 8.27 hrs, Volume= 55.8 m³, Depth> 54 mm
Routed to Pond 7P : CBMH 1-2-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 25-Year Rainfall=82 mm

| Area (m²) | CN | Description |
|---|---|---|
| 552.0 | 98 | Paved parking, HSG A |
| 487.0 | 80 | >75% Grass cover, Good, HSG D |
| 1,039.0 | 90 | Weighted Average |
| 487.0 | | 46.87% Pervious Area |
| 552.0 | | 53.13% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 20.6 | | | | | Direct Entry, |

### Subcatchment 1S: Controlled Area - Lots 1-2-3






### Summary for Subcatchment 3S: PRE

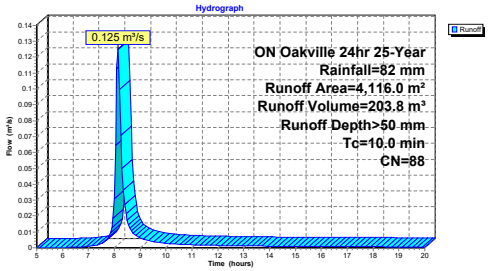
Runoff = 0.125 m³/s @ 8.14 hrs, Volume= 203.8 m³, Depth> 50 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 25-Year Rainfall=82 mm

| Area (m²) | CN | Description |
|---|---|---|
| 1,721.0 | 98 | Paved parking, HSG A |
| 2,395.0 | 80 | >75% Grass cover, Good, HSG D |
| 4,116.0 | 88 | Weighted Average |
| 2,395.0 | | 58.19% Pervious Area |
| 1,721.0 | | 41.81% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 10.0 | | | | | Direct Entry, |

### Subcatchment 3S: PRE






### Summary for Subcatchment 4S: Uncontrolled Area

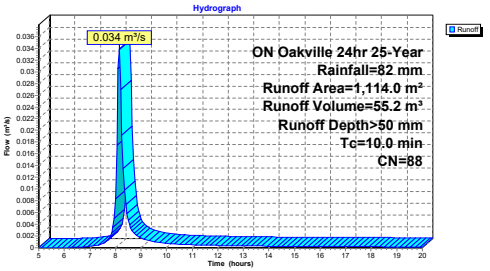
Runoff = 0.034 m³/s @ 8.14 hrs, Volume= 55.2 m³, Depth> 50 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 25-Year Rainfall=82 mm

| Area (m²) | CN | Description |
|---|---|---|
| 507.0 | 98 | Water Surface, HSG A |
| 607.0 | 80 | >75% Grass cover, Good, HSG D |
| 1,114.0 | 88 | Weighted Average |
| 607.0 | | 54.49% Pervious Area |
| 507.0 | | 45.51% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 10.0 | | | | | Direct Entry, |

### Subcatchment 4S: Uncontrolled Area



### Summary for Subcatchment 5S: Controlled Area - Lots 4-5

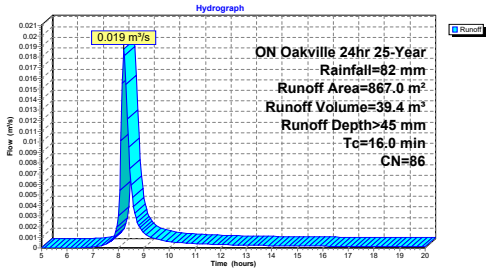
Runoff = 0.019 m³/s @ 8.22 hrs, Volume= 39.4 m³, Depth> 45 mm
Routed to Pond 2P : CBMH 4-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 25-Year Rainfall=82 mm

| Area (m²) | CN | Description |
|---|---|---|
| 307.0 | 98 | Paved parking, HSG A |
| 560.0 | 80 | >75% Grass cover, Good, HSG D |
| 867.0 | 86 | Weighted Average |
| 560.0 | | 64.59% Pervious Area |
| 307.0 | | 35.41% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 16.0 | | | | | **Direct Entry,** |

### Subcatchment 5S: Controlled Area - Lots 4-5






### Summary for Subcatchment 6S: Controlled Area - Lots 6-7

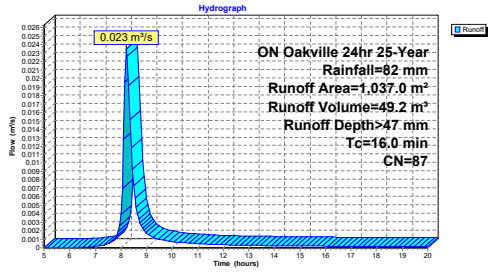
Runoff = 0.023 m³/s @ 8.22 hrs, Volume= 49.2 m³, Depth> 47 mm
Routed to Pond 8P : CBMH 6-7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 25-Year Rainfall=82 mm

| Area (m²) | CN | Description |
|---|---|---|
| 393.0 | 98 | Paved parking, HSG D |
| 644.0 | 80 | >75% Grass cover, Good, HSG D |
| 1,037.0 | 87 | Weighted Average |
| 644.0 | | 62.10% Pervious Area |
| 393.0 | | 37.90% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 16.0 | | | | | **Direct Entry,** |

### Subcatchment 6S: Controlled Area - Lots 6-7






### Summary for Pond 2P: CBMH 4-5

Inflow Area = 867.0 m², 35.41% Impervious, Inflow Depth > 45 mm for 25-Year event
Inflow = 0.019 m³/s @ 8.22 hrs, Volume= 39.4 m³
Outflow = 0.013 m³/s @ 8.34 hrs, Volume= 39.3 m³, Atten= 32%, Lag= 7.5 min
Primary = 0.013 m³/s @ 8.34 hrs, Volume= 39.3 m³
Routed to Link 9L : Total Outflows

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 95.886 m @ 8.34 hrs Storage= 6.3 m³

Plug-Flow detention time= 6.0 min calculated for 39.3 m³ (100% of inflow)
Center-of-Mass det. time= 5.3 min ( 573.6 - 568.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 94.810 m | 19.5 m³ | **Custom Stage Data**Listed below |

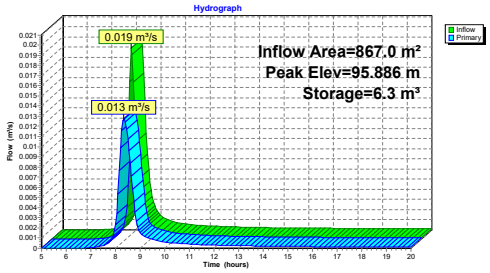
| Elevation (meters) | Cum.Store (cubic-meters) |
|---|---|
| 94.810 | 0.0 |
| 97.110 | 13.5 |
| 97.260 | 19.5 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 94.810 m | **75 mm Vert. Orifice/Grate** C= 0.640<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=0.013 m³/s @ 8.34 hrs HW=95.882 m (Free Discharge)
**↳1=Orifice/Grate** (Orifice Controls 0.013 m³/s @ 2.88 m/s)



### Pond 2P: CBMH 4-5






### Summary for Pond 7P: CBMH 1-2-3

Inflow Area = 1,039.0 m², 53.13% Impervious, Inflow Depth > 54 mm for 25-Year event
Inflow = 0.023 m³/s @ 8.27 hrs, Volume= 55.8 m³
Outflow = 0.016 m³/s @ 8.41 hrs, Volume= 55.8 m³, Atten= 29%, Lag= 8.4 min
Primary = 0.016 m³/s @ 8.41 hrs, Volume= 55.8 m³
Routed to Link 9L : Total Outflows

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.465 m @ 8.41 hrs Storage= 8.5 m³

Plug-Flow detention time= 5.8 min calculated for 55.6 m³ (100% of inflow)
Center-of-Mass det. time= 5.3 min ( 568.4 - 563.1 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 94.740 m | 15.1 m³ | **Custom Stage Data**Listed below |

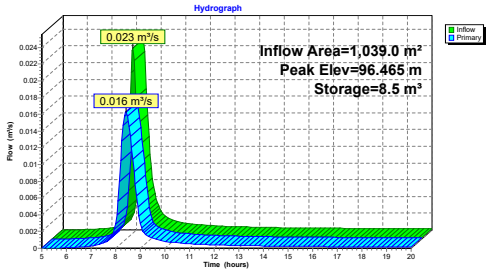
| Elevation (meters) | Cum.Store (cubic-meters) |
|---|---|
| 94.740 | 0.0 |
| 96.970 | 11.0 |
| 97.260 | 15.1 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 94.740 m | **75 mm Vert. Orifice/Grate** C= 0.640<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=0.016 m³/s @ 8.41 hrs HW=96.453 m (Free Discharge)
**↳1=Orifice/Grate** (Orifice Controls 0.016 m³/s @ 3.67 m/s)



### Pond 7P: CBMH 1-2-3



## Summary for Pond 8P: CBMH 6-7

Inflow Area = 1,037.0 m², 37.90% Impervious, Inflow Depth > 47 mm for 25-Year event
Inflow = 0.023 m³/s @ 8.22 hrs, Volume= 49.2 m³
Outflow = 0.015 m³/s @ 8.36 hrs, Volume= 49.1 m³, Atten= 38%, Lag= 8.6 min
Primary = 0.015 m³/s @ 8.36 hrs, Volume= 49.1 m³
Routed to Link 9L : Total Outflows

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 95.891 m @ 8.36 hrs Storage= 9.3 m³

Plug-Flow detention time= 7.4 min calculated for 48.9 m³ (100% of inflow)
Center-of-Mass det. time= 6.6 min ( 572.8 - 566.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 94.500 m | 14.7 m³ | **Custom Stage Data** Listed below |

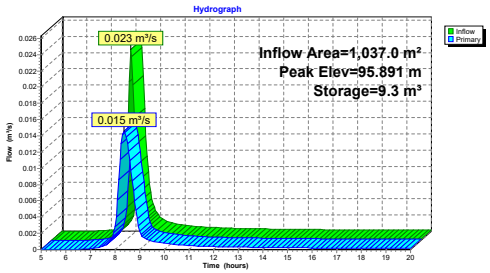
| Elevation (meters) | Cum.Store (cubic-meters) |
|---|---|
| 94.500 | 0.0 |
| 96.520 | 13.5 |
| 96.670 | 14.7 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 94.500 m | **75 mm Vert. Orifice/Grate** C= 0.640 Limited to weir flow at low heads |

**Primary OutFlow** Max=0.015 m³/s @ 8.36 hrs HW=95.882 m (Free Discharge)
↳**1=Orifice/Grate** (Orifice Controls 0.015 m³/s @ 3.29 m/s)



## Pond 8P: CBMH 6-7



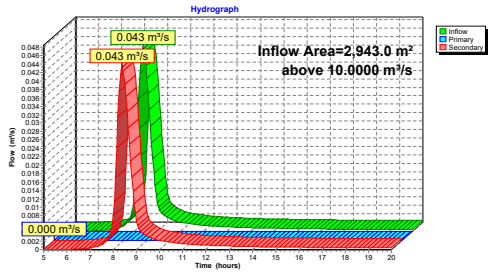



## Summary for Link 9L: Total Outflows

Inflow Area = 2,943.0 m², 42.54% Impervious, Inflow Depth > 49 mm for 25-Year event
Inflow = 0.043 m³/s @ 8.37 hrs, Volume= 144.2 m³
Primary = 0.000 m³/s @ 5.00 hrs, Volume= 0.0 m³, Atten= 100%, Lag= 0.0 min
Secondary = 0.043 m³/s @ 8.37 hrs, Volume= 144.2 m³

Primary outflow = Inflow above 10.0000 m³/s, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

## Link 9L: Total Outflows






Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Controlled Area -** Runoff Area=1,039.0 m² 53.13% Impervious Runoff Depth>60 mm Tc=20.6 min CN=90 Runoff=0.026 m³/s 62.5 m³

**Subcatchment 3S: PRE** Runoff Area=4,116.0 m² 41.81% Impervious Runoff Depth>56 mm Tc=10.0 min CN=88 Runoff=0.146 m³/s 229.6 m³

**Subcatchment 4S: Uncontrolled Area** Runoff Area=1,114.0 m² 45.51% Impervious Runoff Depth>56 mm Tc=10.0 min CN=88 Runoff=0.039 m³/s 62.1 m³

**Subcatchment 5S: Controlled Area - Lots** Runoff Area=867.0 m² 35.41% Impervious Runoff Depth>51 mm Tc=16.0 min CN=86 Runoff=0.022 m³/s 44.6 m³

**Subcatchment 6S: Controlled Area -** Runoff Area=1,037.0 m² 37.90% Impervious Runoff Depth>54 mm Tc=16.0 min CN=87 Runoff=0.027 m³/s 55.5 m³

**Pond 2P: CBMH 4-5** Peak Elev=96.161 m Storage=7.9 m³ Inflow=0.022 m³/s 44.6 m³ Outflow=0.014 m³/s 44.6 m³

**Pond 7P: CBMH 1-2-3** Peak Elev=96.869 m Storage=10.5 m³ Inflow=0.026 m³/s 62.5 m³ Outflow=0.018 m³/s 62.5 m³

**Pond 8P: CBMH 6-7** Peak Elev=96.225 m Storage=11.5 m³ Inflow=0.027 m³/s 55.5 m³ Outflow=0.016 m³/s 55.5 m³

**Link 9L: Total Outflows** above 10.0000 m³/s Inflow=0.048 m³/s 162.5 m³ Primary=0.000 m³/s 0.0 m³ Secondary=0.048 m³/s 162.5 m³

**Total Runoff Area = 8,173.0 m² Runoff Volume = 454.4 m³ Average Runoff Depth = 56 mm**
**57.42% Pervious = 4,693.0 m² 42.58% Impervious = 3,480.0 m²**



## Summary for Subcatchment 1S: Controlled Area - Lots 1-2-3

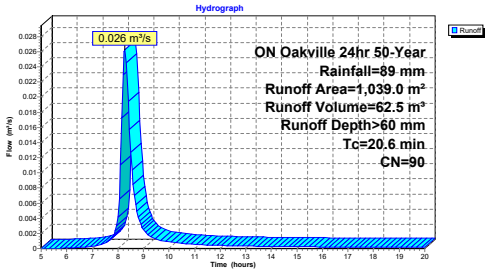
Runoff = 0.026 m³/s @ 8.27 hrs, Volume= 62.5 m³, Depth> 60 mm
Routed to Pond 7P : CBMH 1-2-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 50-Year Rainfall=89 mm

| Area (m²) | CN | Description |
|---|---|---|
| 552.0 | 98 | Paved parking, HSG A |
| 487.0 | 80 | >75% Grass cover, Good, HSG D |
| 1,039.0 | 90 | Weighted Average |
| 487.0 | | 46.87% Pervious Area |
| 552.0 | | 53.13% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 20.6 | | | | | **Direct Entry,** |

## Subcatchment 1S: Controlled Area - Lots 1-2-3






## Summary for Subcatchment 3S: PRE

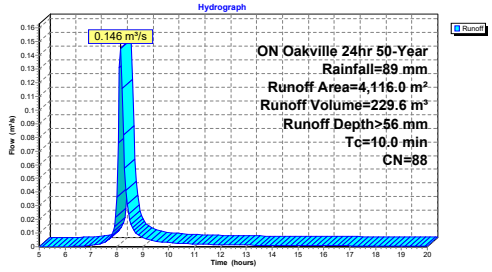
Runoff = 0.146 m³/s @ 8.14 hrs, Volume= 229.6 m³, Depth> 56 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 50-Year Rainfall=89 mm

| Area (m²) | CN | Description |
|---|---|---|
| 1,721.0 | 98 | Paved parking, HSG A |
| 2,395.0 | 80 | >75% Grass cover, Good, HSG D |
| 4,116.0 | 88 | Weighted Average |
| 2,395.0 | | 58.19% Pervious Area |
| 1,721.0 | | 41.81% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 10.0 | | | | | **Direct Entry,** |

## Subcatchment 3S: PRE



## Summary for Subcatchment 4S: Uncontrolled Area

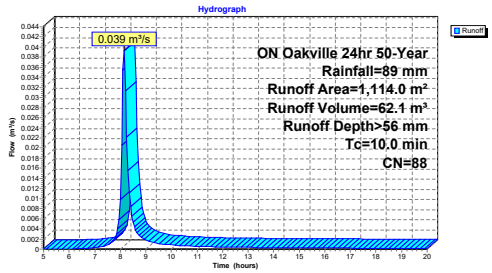
Runoff = 0.039 m³/s @ 8.14 hrs, Volume= 62.1 m³, Depth> 56 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 50-Year Rainfall=89 mm

| Area (m²) | CN | Description |
|---|---|---|
| 507.0 | 98 | Water Surface, HSG A |
| 607.0 | 80 | >75% Grass cover, Good, HSG D |
| 1,114.0 | 88 | Weighted Average |
| 607.0 | | 54.49% Pervious Area |
| 507.0 | | 45.51% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 10.0 | | | | | **Direct Entry,** |

### Subcatchment 4S: Uncontrolled Area






## Summary for Subcatchment 5S: Controlled Area - Lots 4-5

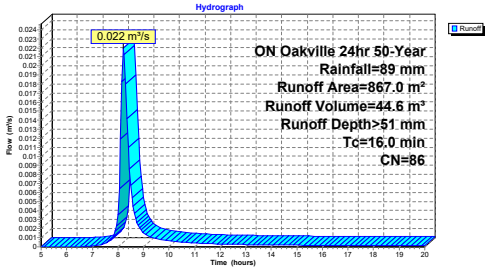
Runoff = 0.022 m³/s @ 8.22 hrs, Volume= 44.6 m³, Depth> 51 mm
Routed to Pond 2P : CBMH 4-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 50-Year Rainfall=89 mm

| Area (m²) | CN | Description |
|---|---|---|
| 307.0 | 98 | Paved parking, HSG A |
| 560.0 | 80 | >75% Grass cover, Good, HSG D |
| 867.0 | 86 | Weighted Average |
| 560.0 | | 64.59% Pervious Area |
| 307.0 | | 35.41% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 16.0 | | | | | **Direct Entry,** |

### Subcatchment 5S: Controlled Area - Lots 4-5






## Summary for Subcatchment 6S: Controlled Area - Lots 6-7

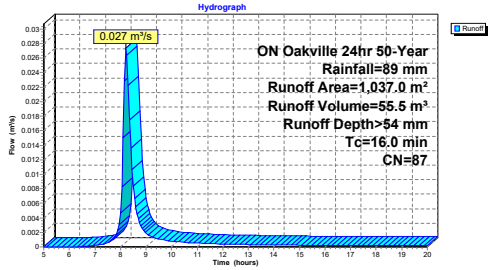
Runoff = 0.027 m³/s @ 8.22 hrs, Volume= 55.5 m³, Depth> 54 mm
Routed to Pond 8P : CBMH 6-7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 50-Year Rainfall=89 mm

| Area (m²) | CN | Description |
|---|---|---|
| 393.0 | 98 | Paved parking, HSG D |
| 644.0 | 80 | >75% Grass cover, Good, HSG D |
| 1,037.0 | 87 | Weighted Average |
| 644.0 | | 62.10% Pervious Area |
| 393.0 | | 37.90% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 16.0 | | | | | **Direct Entry,** |

### Subcatchment 6S: Controlled Area - Lots 6-7






## Summary for Pond 2P: CBMH 4-5

Inflow Area = 867.0 m², 35.41% Impervious, Inflow Depth > 51 mm for 50-Year event
Inflow = 0.022 m³/s @ 8.22 hrs, Volume= 44.6 m³
Outflow = 0.014 m³/s @ 8.35 hrs, Volume= 44.6 m³, Atten= 35%, Lag= 8.0 min
Primary = 0.014 m³/s @ 8.35 hrs, Volume= 44.6 m³
Routed to Link 9L : Total Outflows

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.161 m @ 8.35 hrs Storage= 7.9 m³

Plug-Flow detention time= 6.4 min calculated for 44.6 m³ (100% of inflow)
Center-of-Mass det. time= 5.8 min ( 568.5 - 562.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 94.810 m | 19.5 m³ | **Custom Stage Data**Listed below |

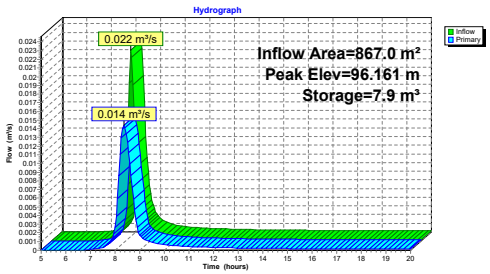
| Elevation (meters) | Cum.Store (cubic-meters) |
|---|---|
| 94.810 | 0.0 |
| 97.110 | 13.5 |
| 97.260 | 19.5 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 94.810 m | **75 mm Vert. Orifice/Grate** C= 0.640 Limited to weir flow at low heads |

**Primary OutFlow** Max=0.014 m³/s @ 8.35 hrs HW=96.160 m (Free Discharge)
↳**1=Orifice/Grate** (Orifice Controls 0.014 m³/s @ 3.25 m/s)



## Pond 2P: CBMH 4-5






## Summary for Pond 7P: CBMH 1-2-3

Inflow Area = 1,039.0 m², 53.13% Impervious, Inflow Depth > 60 mm for 50-Year event
Inflow = 0.026 m³/s @ 8.27 hrs, Volume= 62.5 m³
Outflow = 0.018 m³/s @ 8.42 hrs, Volume= 62.5 m³, Atten= 31%, Lag= 8.8 min
Primary = 0.018 m³/s @ 8.42 hrs, Volume= 62.5 m³
Routed to Link 9L : Total Outflows

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.869 m @ 8.42 hrs Storage= 10.5 m³

Plug-Flow detention time= 6.3 min calculated for 62.3 m³ (100% of inflow)
Center-of-Mass det. time= 5.9 min ( 564.2 - 558.3 )

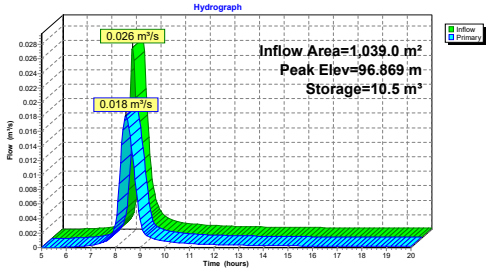
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 94.740 m | 15.1 m³ | **Custom Stage Data**Listed below |

| Elevation (meters) | Cum.Store (cubic-meters) |
|---|---|
| 94.740 | 0.0 |
| 96.970 | 11.0 |
| 97.260 | 15.1 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 94.740 m | **75 mm Vert. Orifice/Grate** C= 0.640 Limited to weir flow at low heads |

**Primary OutFlow** Max=0.018 m³/s @ 8.42 hrs HW=96.852 m (Free Discharge)
↳**1=Orifice/Grate** (Orifice Controls 0.018 m³/s @ 4.08 m/s)

### Pond 7P: CBMH 1-2-3






### Summary for Pond 8P: CBMH 6-7

Inflow Area = 1,037.0 m², 37.90% Impervious, Inflow Depth > 54 mm for 50-Year event
Inflow = 0.027 m³/s @ 8.22 hrs, Volume= 55.5 m³
Outflow = 0.016 m³/s @ 8.37 hrs, Volume= 55.5 m³, Atten= 41%, Lag= 9.0 min
Primary = 0.016 m³/s @ 8.37 hrs, Volume= 55.5 m³
Routed to Link 9L : Total Outflows

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.225 m @ 8.37 hrs Storage= 11.5 m³

Plug-Flow detention time= 8.0 min calculated for 55.5 m³ (100% of inflow)
Center-of-Mass det. time= 7.3 min ( 568.0 - 560.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 94.500 m | 14.7 m³ | **Custom Stage Data** Listed below |

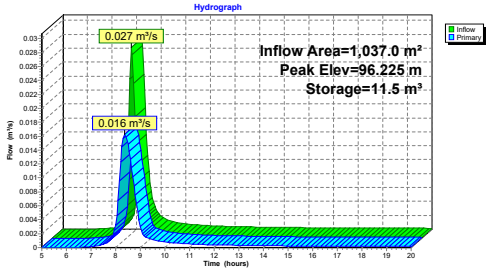
| Elevation (meters) | Cum.Store (cubic-meters) |
|---|---|
| 94.500 | 0.0 |
| 96.520 | 13.5 |
| 96.670 | 14.7 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 94.500 m | **75 mm Vert. Orifice/Grate** C= 0.640 Limited to weir flow at low heads |

**Primary OutFlow** Max=0.016 m³/s @ 8.37 hrs HW=96.211 m (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.016 m³/s @ 3.67 m/s)



### Pond 8P: CBMH 6-7



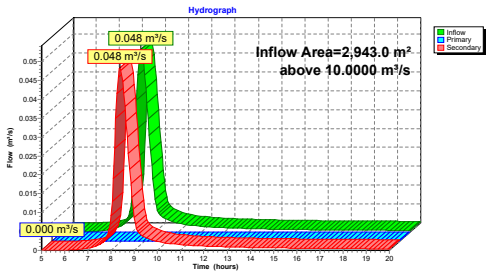



### Summary for Link 9L: Total Outflows

Inflow Area = 2,943.0 m², 42.54% Impervious, Inflow Depth > 55 mm for 50-Year event
Inflow = 0.048 m³/s @ 8.38 hrs, Volume= 162.5 m³
Primary = 0.000 m³/s @ 5.00 hrs, Volume= 0.0 m³, Atten= 100%, Lag= 0.0 min
Secondary = 0.048 m³/s @ 8.38 hrs, Volume= 162.5 m³

Primary outflow = Inflow above 10.0000 m³/s, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Link 9L: Total Outflows






Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Controlled Area -** Runoff Area=1,039.0 m² 53.13% Impervious Runoff Depth>68 mm
Tc=20.6 min CN=90 Runoff=0.030 m³/s 70.7 m³

**Subcatchment 3S: PRE** Runoff Area=4,116.0 m² 41.81% Impervious Runoff Depth>63 mm
Tc=10.0 min CN=88 Runoff=0.166 m³/s 261.3 m³

**Subcatchment 4S: Uncontrolled Area** Runoff Area=1,114.0 m² 45.51% Impervious Runoff Depth>63 mm
Tc=10.0 min CN=88 Runoff=0.045 m³/s 70.7 m³

**Subcatchment 5S: Controlled Area - Lots** Runoff Area=867.0 m² 35.41% Impervious Runoff Depth>59 mm
Tc=16.0 min CN=86 Runoff=0.025 m³/s 51.1 m³

**Subcatchment 6S: Controlled Area -** Runoff Area=1,037.0 m² 37.90% Impervious Runoff Depth>61 mm
Tc=16.0 min CN=87 Runoff=0.031 m³/s 63.4 m³

**Pond 2P: CBMH 4-5** Peak Elev=96.462 m Storage=9.7 m³ Inflow=0.025 m³/s 51.1 m³
Outflow=0.016 m³/s 51.1 m³

**Pond 7P: CBMH 1-2-3** Peak Elev=97.098 m Storage=12.8 m³ Inflow=0.030 m³/s 70.7 m³
Outflow=0.019 m³/s 70.7 m³

**Pond 8P: CBMH 6-7** Peak Elev=96.577 m Storage=14.0 m³ Inflow=0.031 m³/s 63.4 m³
Outflow=0.018 m³/s 63.4 m³

**Link 9L: Total Outflows** above 10.0000 m³/s Inflow=0.053 m³/s 185.1 m³
Primary=0.000 m³/s 0.0 m³ Secondary=0.053 m³/s 185.1 m³

**Total Runoff Area = 8,173.0 m² Runoff Volume = 517.3 m³ Average Runoff Depth = 63 mm**
**57.42% Pervious = 4,693.0 m² 42.58% Impervious = 3,480.0 m²**



### Summary for Subcatchment 1S: Controlled Area - Lots 1-2-3

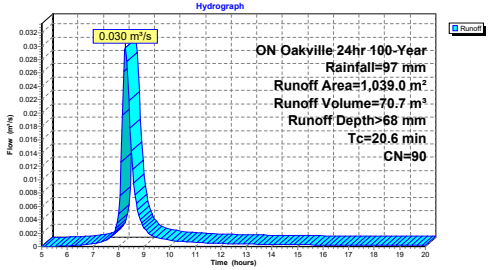
Runoff = 0.030 m³/s @ 8.27 hrs, Volume= 70.7 m³, Depth> 68 mm
Routed to Pond 7P : CBMH 1-2-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 100-Year Rainfall=97 mm

| Area (m²) | CN | Description |
|---|---|---|
| 552.0 | 98 | Paved parking, HSG A |
| 487.0 | 80 | >75% Grass cover, Good, HSG D |
| 1,039.0 | 90 | Weighted Average |
| 487.0 | | 46.87% Pervious Area |
| 552.0 | | 53.13% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 20.6 | | | | | **Direct Entry,** |

### Subcatchment 1S: Controlled Area - Lots 1-2-3



### Summary for Subcatchment 3S: PRE

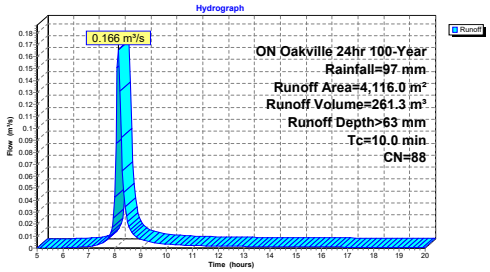
Runoff = 0.166 m³/s @ 8.14 hrs, Volume= 261.3 m³, Depth> 63 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 100-Year Rainfall=97 mm

| Area (m²) | CN | Description |
|---|---|---|
| 1,721.0 | 98 | Paved parking, HSG A |
| 2,395.0 | 80 | >75% Grass cover, Good, HSG D |
| 4,116.0 | 88 | Weighted Average |
| 2,395.0 | | 58.19% Pervious Area |
| 1,721.0 | | 41.81% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 10.0 | | | | | **Direct Entry,** |

### Subcatchment 3S: PRE






### Summary for Subcatchment 4S: Uncontrolled Area

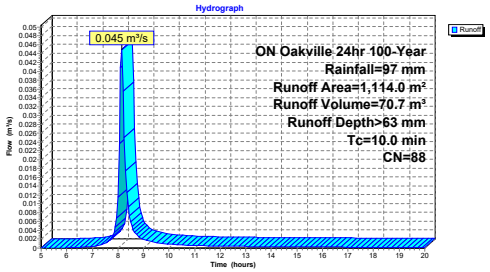
Runoff = 0.045 m³/s @ 8.14 hrs, Volume= 70.7 m³, Depth> 63 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 100-Year Rainfall=97 mm

| Area (m²) | CN | Description |
|---|---|---|
| 507.0 | 98 | Water Surface, HSG A |
| 607.0 | 80 | >75% Grass cover, Good, HSG D |
| 1,114.0 | 88 | Weighted Average |
| 607.0 | | 54.49% Pervious Area |
| 507.0 | | 45.51% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 10.0 | | | | | **Direct Entry,** |

### Subcatchment 4S: Uncontrolled Area






### Summary for Subcatchment 5S: Controlled Area - Lots 4-5

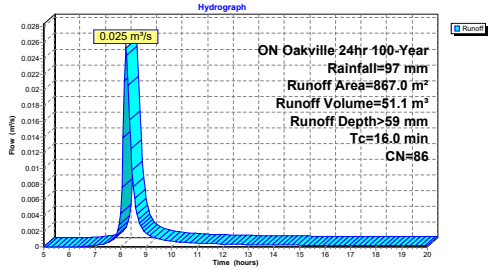
Runoff = 0.025 m³/s @ 8.22 hrs, Volume= 51.1 m³, Depth> 59 mm
Routed to Pond 2P : CBMH 4-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 100-Year Rainfall=97 mm

| Area (m²) | CN | Description |
|---|---|---|
| 307.0 | 98 | Paved parking, HSG A |
| 560.0 | 80 | >75% Grass cover, Good, HSG D |
| 867.0 | 86 | Weighted Average |
| 560.0 | | 64.59% Pervious Area |
| 307.0 | | 35.41% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 16.0 | | | | | **Direct Entry,** |

### Subcatchment 5S: Controlled Area - Lots 4-5






### Summary for Subcatchment 6S: Controlled Area - Lots 6-7

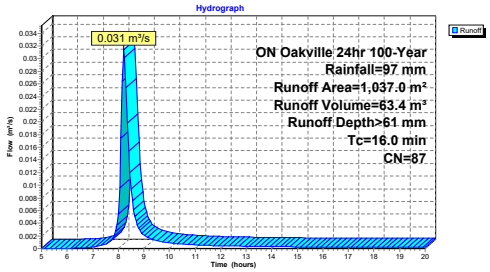
Runoff = 0.031 m³/s @ 8.22 hrs, Volume= 63.4 m³, Depth> 61 mm
Routed to Pond 8P : CBMH 6-7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
ON Oakville 24hr 100-Year Rainfall=97 mm

| Area (m²) | CN | Description |
|---|---|---|
| 393.0 | 98 | Paved parking, HSG D |
| 644.0 | 80 | >75% Grass cover, Good, HSG D |
| 1,037.0 | 87 | Weighted Average |
| 644.0 | | 62.10% Pervious Area |
| 393.0 | | 37.90% Impervious Area |

| Tc (min) | Length (meters) | Slope (m/m) | Velocity (m/sec) | Capacity (m³/s) | Description |
|---|---|---|---|---|---|
| 16.0 | | | | | **Direct Entry,** |

### Subcatchment 6S: Controlled Area - Lots 6-7






### Summary for Pond 2P: CBMH 4-5

Inflow Area = 867.0 m², 35.41% Impervious, Inflow Depth > 59 mm for 100-Year event
Inflow = 0.025 m³/s @ 8.22 hrs, Volume= 51.1 m³
Outflow = 0.016 m³/s @ 8.36 hrs, Volume= 51.1 m³, Atten= 37%, Lag= 8.4 min
Primary = 0.016 m³/s @ 8.36 hrs, Volume= 51.1 m³
Routed to Link 9L : Total Outflows

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.462 m @ 8.36 hrs Storage= 9.7 m³

Plug-Flow detention time= 6.9 min calculated for 51.1 m³ (100% of inflow)
Center-of-Mass det. time= 6.3 min ( 566.8 - 560.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 94.810 m | 19.5 m³ | **Custom Stage Data**Listed below |

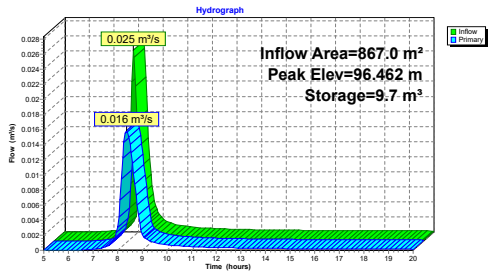
| Elevation (meters) | Cum.Store (cubic-meters) |
|---|---|
| 94.810 | 0.0 |
| 97.110 | 13.5 |
| 97.260 | 19.5 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 94.810 m | **75 mm Vert. Orifice/Grate** C= 0.640 Limited to weir flow at low heads |

**Primary OutFlow** Max=0.016 m³/s @ 8.36 hrs HW=96.455 m (Free Discharge)
**1=Orifice/Grate** (Orifice Controls 0.016 m³/s @ 3.59 m/s)



### Pond 2P: CBMH 4-5



## Summary for Pond 7P: CBMH 1-2-3

Inflow Area = 1,039.0 m², 53.13% Impervious, Inflow Depth > 68 mm for 100-Year event
Inflow = 0.030 m³/s @ 8.27 hrs, Volume= 70.7 m³
Outflow = 0.019 m³/s @ 8.43 hrs, Volume= 70.7 m³, Atten= 36%, Lag= 9.8 min
Primary = 0.019 m³/s @ 8.43 hrs, Volume= 70.7 m³
Routed to Link 9L : Total Outflows

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.098 m @ 8.43 hrs Storage= 12.8 m³

Plug-Flow detention time= 6.9 min calculated for 70.5 m³ (100% of inflow)
Center-of-Mass det. time= 6.4 min ( 562.9 - 556.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 94.740 m | 15.1 m³ | **Custom Stage Data** Listed below |

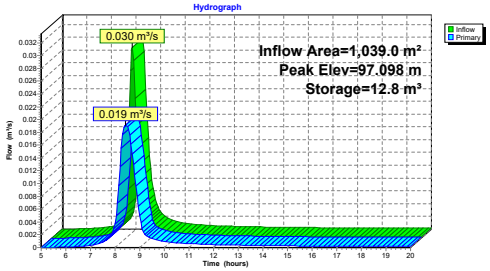
| Elevation (meters) | Cum.Store (cubic-meters) |
|---|---|
| 94.740 | 0.0 |
| 96.970 | 11.0 |
| 97.260 | 15.1 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 94.740 m | **75 mm Vert. Orifice/Grate** C= 0.640 Limited to weir flow at low heads |

**Primary OutFlow** Max=0.019 m³/s @ 8.43 hrs HW=97.093 m (Free Discharge)
↳**1=Orifice/Grate** (Orifice Controls 0.019 m³/s @ 4.31 m/s)



## Pond 7P: CBMH 1-2-3






## Summary for Pond 8P: CBMH 6-7

Inflow Area = 1,037.0 m², 37.90% Impervious, Inflow Depth > 61 mm for 100-Year event
Inflow = 0.031 m³/s @ 8.22 hrs, Volume= 63.4 m³
Outflow = 0.018 m³/s @ 8.37 hrs, Volume= 63.4 m³, Atten= 43%, Lag= 9.4 min
Primary = 0.018 m³/s @ 8.37 hrs, Volume= 63.4 m³
Routed to Link 9L : Total Outflows

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.577 m @ 8.37 hrs Storage= 14.0 m³

Plug-Flow detention time= 8.6 min calculated for 63.4 m³ (100% of inflow)
Center-of-Mass det. time= 7.9 min ( 566.5 - 558.6 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 94.500 m | 14.7 m³ | **Custom Stage Data** Listed below |

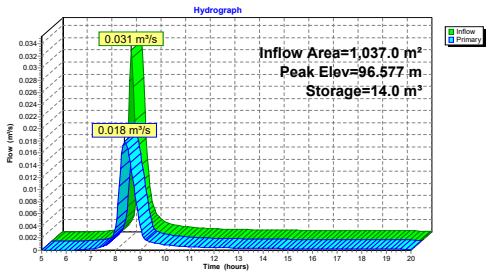
| Elevation (meters) | Cum.Store (cubic-meters) |
|---|---|
| 94.500 | 0.0 |
| 96.520 | 13.5 |
| 96.670 | 14.7 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 94.500 m | **75 mm Vert. Orifice/Grate** C= 0.640 Limited to weir flow at low heads |

**Primary OutFlow** Max=0.018 m³/s @ 8.37 hrs HW=96.560 m (Free Discharge)
↳**1=Orifice/Grate** (Orifice Controls 0.018 m³/s @ 4.03 m/s)



## Pond 8P: CBMH 6-7






## Summary for Link 9L: Total Outflows

Inflow Area = 2,943.0 m², 42.54% Impervious, Inflow Depth > 63 mm for 100-Year event
Inflow = 0.053 m³/s @ 8.38 hrs, Volume= 185.1 m³
Primary = 0.000 m³/s @ 5.00 hrs, Volume= 0.0 m³, Atten= 100%, Lag= 0.0 min
Secondary = 0.053 m³/s @ 8.38 hrs, Volume= 185.1 m³

Primary outflow = Inflow above 10.0000 m³/s, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

## Link 9L: Total Outflows