FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

PROPOSED MIXED-USE DEVELOPMENT
109 GARDEN DRIVE

TOWN OF OAKVILLE
REGIONAL MUNICIPALITY OF HALTON

FILE No. 224-OK30

Revised:
FEBRUARY 4, 2025

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1.0 INTRODUCTION

Skira & Associates Ltd. Was retained by Oakville Garden Residences Corp. to investigate and prepare a Functional Servicing Report (FSR) and Stormwater Management Report (SWM) in support of the proposed mixed-use development consisting of two (2) commercial units and four (4) townhouse blocks (48 units).

The proposed mixed-use development is located on the east side of Garden Dr., north of Lakeshore Rd. in the Town of Oakville, Regional Municipality of Halton. The existing dwellings within the boundary of the site have been demolished as part of the preparation of the proposed development.

It is intended that this report will assist in the assessment and review of Site Plan application and guide the detailed design of the proposed mixed-use development. The proposed design criteria is intended to meet the requirements of the Town of Oakville and any other relevant authorities. This report is to be implemented and reviewed in conjunction with the detailed design on site grading and servicing plans.

2.0 SITE AREA INFORMATION

The subject site is part of Lot 17, Concession 3, south of Dundas St., Town of Oakville, Regional Municipality of Halton. It covers and area of 0.4989 Ha. The existing municipal easement was quit claimed.

The subject site is bounded by Garden Dr. to the southwest and Lakeshore Rd. W. to the southeast. The subject site is surrounded by existing townhouses and mid-rise condominium on the northeast side and northwest side. *Refer to* ***Figure 1: Key Plan***.

The existing dwellings in the subject site have been demolished as part of the preparation for the proposed development. Currently, the subject site is vacant. The subject site is sloping from northwest to southeast with a grade differential of approx. 2.0m.

The proposed mixed-use development will consist of two (2) retail units and four (4) townhouse blocks (48 units) with garages being part of the building footprint.

3.0 SITE ACCESS

The subject site access will be Garden Dr. The existing road network will provide access to arterial roads such as Lakeshore Rd. W, Dorval Dr., and to nearby highways such as Highway QEW.

Currently, the subject site has a driveway off Garden Dr. The existing driveway will be removed.

The proposed mixed-use development will be provided with four (4) 7.5m wide driveway accesses off Garden Dr. to each townhouse block.

Block A, B & C will have garage access doors at the face of the building fronting Garden Dr. Block D will be accessed through a short condominium road complete with visitor parking for retail/commercial units as well as residential dwellings.

Lakeshore Rd. frontage will be reconstructed to provide urbanized boulevard cross-section complete with hard surface streetscaping treatment.

Garden Dr. E. boulevard will be complete with top curb and sidewalk to finalise the work previously started by Vandyk Corporation.

Refer to ***Dwg. No. 224-OK30-2: Concept Grading Plan***.

4.0 STORM DRAINAGE SYSTEM

4.1 Existing Drainage Conditions

According to available records, there is an existing 450mm storm sewer running east on Garden Dr. The existing storm sewer on Garden Dr. is designed for 5-yr storm intensity at runoff coefficient C = 0.40.

Refer to Storm Drainage Plan prepared by Skira & Associates – Dwg. No. 210-OK22-4.

The existing discharge from the site is as follows:

A = 0.4948 Ha
C = 0.40
T_c = 10.00 min.

$$I_{5yr} = \frac{1{,}170}{(10+5.8)^{0.843}}$$

= 114.2 mm/hr

Q = CIA / 360

Q_{5yr} = 0.40 x 114.2 x 0.4989 / 360
= **0.063m³/s**

Therefore, the allowable discharge from the site is **0.063m³/s**.

4.2 Proposed Site

A 300mm storm connection will be constructed off the existing storm sewer on Garden Dr. to service the proposed development. The proposed development consists of two (2) retail units and four (4) townhouse blocks.

Site Statistics:

Roof Area	= 0.2540 Ha
Paved Asphalt Area	= 0.0260 Ha
Hardscape Surface (incl. permeable pavers)	= 0.0780 Ha
Soft Landscape Area	= 0.1368 Ha

4.2.1 Uncontrolled Discharge

An area of 200m² fronting Garden Dr. and 50m² fronting Lakeshore Rd. W. cannot be controlled due to architectural building site layout. Uncontrolled areas are mostly landscape surface sections of asphalt driveways C = 0.30.

Q_{UN} = 0.025 x 0.30 x 200 x 80 / 360
= 0.004m³/s

*Refer to **Dwg. No. 224-OK30-1: Concept Servicing Plan**.*

Remaining area (less uncontrolled) on-site stormwater management will be implemented to restrict post-development flows up to 100-yr storm intensity to 5-yr storm intensity at pre-development level.

C_W = (0.2540 x 0.95 + 0.026 x 0.90 + 0.083 x 0.60 + 0.1168 x 0.25) / 0.4698
= 0.513 + 0.05 + 0.093 + 0.06
= 0.716

Using the Rational Method for the 100-yr storm event calculation and established allowable discharge, the required detention volume is calculated as follows:

YEAR STORM
100 YEAR
CITY
OAKVILLE

C = 0.716
A (ha) = 0.46980
Allow. Discharge Qa (m³/s) = 0.063000
Safety Factor Sf = 0.00%

Max. Required Detention (m³) = ***78.10***

RAINFALL DURATION *Tc (min)*	RAINFALL INTENSITY *I (mm/hr)*	TOTAL UNCONTROLLED RUNOFF *Q=CIA/360 (m³/sec)*	INFLOW VOLUME Vi (m³)	OUTFLOW VOLUME Vo (m³)	REQUIRED DETENTION VOLUME (m³) *D=(Vi-Vo)*Sf*
5	279.34	0.2610	78.30	20.68	57.62
10	200.80	0.1876	112.58	37.80	74.78
15	158.27	0.1479	133.09	54.99	78.10
20	131.37	0.1227	147.30	72.25	75.05
25	112.72	0.1053	157.99	89.54	68.45
30	98.99	0.0925	166.49	106.87	59.62

The maximum required detention volume is **78.10m³** which will be provided by a CULTEC Recharger 360HD system and underground storage. The cultec system is designed with 4 rows x 28 units in two sections between Blocks 1 & 2 and 2 & 3 courtyards. Both legs of cultec can provide a combined total a storage volume of **51.55m³** which satisfies the detention requirement.

Underground Storm Sewer System

SEWER LEG	SIZE (mm)	SLOPE (%)	FLOW AREA (m²)	SEWER LENGTH (m)	SEWER VOLUME (m³)
STMMH 1-2	825	0.50	0.534	36	19.22
STMMH 2 (1500mm) – 1pc x 1.76m² x 2.80m STMMH 3 (1500mm) – 1pc x 1.76m² x 2.68m Cultect Stormwater System (4 rows x 7 units)					4.93 4.72 51.55
				TOTAL	**80.42**

Therefore, the storage volume satisfies the requirements.

*See **Appendix D** for cultect volume calculations.*

Understanding that based on the latest Town of Oakville stormwater management plan for this area, the minor and major storm sewer hydraulic grade line is above the obvert of the existing storm pipe. As such, a backflow preventor will be provided at the outlet pipe to secure the proposed infrastructure from possible backwater flows.

4.3 Orifice Control

The allowable discharge of **0.059m³/s** will be controlled by means of an orifice restrictor plate installed downstream of control manhole STMMH 1. The size of the orifice plate is **144mm x 144mm dia.** (diagonal), with a discharge rate of **0.059m³/s**.

*Refer to **Appendix B*** for the orifice control plate calculations done through Flow Master program developed by Haestad Methods Inc. (USA).

4.4 Quality Control

According to the Ministry of the Environment & Climate Change's Stormwater Management Planning & Design Manual, the site is required to provide a long-term average removal of 80% of Total Suspended Solids (TSS) for the enhanced protection of waterways. Quality control will be provided to Level 1 TSS removal through the use of oil/grit separator (OGS).

Oil/grit separator is suitable for residential areas where the level of concentrated pollutants is not expected to be high. For the proposed mixed-use development, it is considered feasible to provide an OGS on the proposed storm sewer.

Stormwater runoff will be intercepted at catchbasins and conveyed through the OGS prior to being released into the proposed storm sewer. Catchbasins will be fitted with the catchbasin shield structures to provide additional treatment train for road surface runoff.

The proposed OGS is HydroDome HD 6 manufactured by Hydroworks. This unit will provide Level 1 protection (83% TSS removal).

*Refer to **Appendix C*** for the output file created by Hydroworks.

4.5 Water Balance Consideration

The Town of Oakville requires the site to retain 25mm of every rainfall and allow it to infiltrate back into the ground.

The required volume to be retained on site is as follows:

V_{5mm} = 4,949m² x 0.025m
= **121.22m³** per rainfall

The cultec system will be extended 0.30m below the outlet to accommodate the required maximum volume.

Total volume provided for infiltration is therefore,

V_{TOTAL} = 18.0 + 19.8
= 37.8m³

The storage volume provided is as follows:

V_{cultec} = 150.0m² (base area) 0.30m (depth) x 0.40 (porosity)
= **18.0m³**

Based on the Hydrogeological Report provided by MCR Engineering Ltd. for this area, the hydraulic conductivity for the silty sand layers is approx. $4.6E^{-04}$ (percolation rate = 12 to 20 min./cm).
*See **Appendix E**.*

The MCR report provides opinion that the recommended required 25mm infiltration may lead to accumulation of groundwater due to shallow bedrock. As such, we will limit infiltration gallery to 0.30m below the base of the cultect system or permeable paving.

The expected drawdown time for the infiltration cell was calculated using Equation 4.3 of the MECP Stormwater Management Planning & Design Manual.

Based on Equation 4.3:

(Time to Infiltrate)

$$\Delta t = \frac{1000V}{APn}$$

Where, A = bottom of trench area
V = volume to be infiltrated
n = porosity
P = percolation rate of native soil
Δt = retention time

Using the worst-case scenario, bottom surface of the trench at elevation is approx. 85.00 and 30mm/hr, and groundwater surface 83.75 (1.25m below):

$$\Delta t = \frac{1000 \times 18m^3}{150m^2 \times 0.4 \text{ (porosity)} \times 30mm/hr / 4.5 \text{ (safety factor)}}$$

Δt = **45.0 hrs**

In addition to cultect system, section of permeable paving is proposed within the visitor parking. An area of 165m² will be installed. The permeable paving will also assist in improving the natural quality control from storm runoff provided for this site.

The clear crushed stone retention volume below the EcoLock paving area 165m², 0.30m (depth), bottom 86.30 (GWL 84.22) will provide storage medium gravel layer.

Volume = 165 x 0.30 x 0.4 (porosity)
= **19.8m³**

$$\Delta t = \frac{1000 \times 19.8}{165m^2 \times 0.4 \times 30 / 4.5 \text{ (safety factor)}}$$

Δt = **45.0 hrs**

The time of infiltration is acceptable as per latest WWM guidelines for max. 72 hrs and Town of Oakville drawdown time criteria of 48 hrs.

Other methods for runoff reduction have been explored but proved inefficient in a residential-type environment.

Based on hydrogeological assessment of the site, it concludes that injection of runoff into ground surface might create excessive saturation. Proposed storage and infiltration of 37.8m³ within permeable paving and cultec layer in addition to passive irrigate by roof downspouts disconnected at landscape areas form the best efforts management practice to this site.

Additional infiltration according to the hydrologist will have detrimental consequences for surrounding buildings. The proposed reduction is satisfactory to the Town criteria.

5.0 SANITARY DRAINAGE SYSTEM

According to available records, there is an existing 250mm sanitary sewer running west on Garden Dr. The existing sanitary connections will be disconnected as per Region of Halton standards.

Four (4) 150mm sanitary connections will be constructed off the existing sanitary sewer on Garden Dr. to service the proposed development. Individual 125mm sanitary connections will be provided for the townhouse units and a 150mm sanitary connection will be provided for the retail units. Detailed sanitary sewer layout will be provided through site plan application process.

Refer to ***Dwg. No. 224-OK30-1: Concept Servicing Plan***.

The existing 250mm sanitary sewer will have sufficient capacity and depth to accept the proposed mixed-use development via gravity flow.

Sanitary drainage plan and design sheet to 900mm trunk on Rebecca Dr. *See* ***Appendix G***.

The sanitary design flow for the proposed mixed-use development is established as follows:

Sanitary Design Flow Calculation

Commercial Population = 90p/ha x 0.0264ha
= 2.376p ≈ 3p

Peak Flow Factor = $1 + \frac{14}{4+\sqrt{0.003}}$
= 4.453

Commercial Average Flow = 24.75m³/ha/day x 0.0264ha
= 0.6534m³/day
= 0.0076 L/s

Commercial Peak Flow = 0.0076 L/s x 4.453
= **0.0338 L/s**

Townhouse Population = 135p/ha x 0.4725ha
= 63.79p ≈ 64p

Peak Flow Factor = $1 + \frac{14}{4+\sqrt{0.064}}$
= 4.292

Townhouse Average Flow = 0.275m³/p/day x 64p
= 17.6 m³/day
= 0.2037 L/s

Townhouse Peak Flow = 0.2037 L/s x 4.292
= **0.8743 L/s**

Infiltration Flow = 0.286 L/ha/s x 0.4989ha
= **0.1427 L/s**

Total Combined Design Flow = 0.0338 + 0.8743 + 0.1427
= **1.051 L/s**

6.0 WATER DISTRIBUTION SYSTEM

According to available records, there is an existing 200mm watermain on Garden Drive. The existing water service connections will be disconnected as per Region of Halton standards.

An existing 150mm watermain within the municipal easement has been decommissioned and pipe will be removed during construction. Easement was quit claimed and all abandoned watermains will be removed off-site.

For reference see Skira & Associates Ltd. Drawing for Maurice Dr. Reconstruction – Dwg. No. 212-OK86 in ***Appendix A****.*

A 150mm watermain connection will be constructed off the existing watermain on Garden Dr. and looped back to the existing watermain on Garden Dr. Individual 25mm copper type 'K' water service connections will be provided for the townhouse units and a 150mm water service connection will be provided for the retail units. Detailed watermain layout will be provided through site plan application process. *Refer to* ***Dwg. No. 224-OK30-1: Concept Servicing Plan***.

The existing fire hydrant on Garden Dr. will be utilized to provide fire coverage for the proposed mixed-use development.

Each residential block will be provided with fire main sprinkler riser. Based on building code requirement, the garage space, as well as each individual unit, will be completely sprinklered.

Water demand from the proposed mixed-use development is established as follows:

Water Demand Calculation

Commercial Population	= 3p
Townhouse Population	= 64p
Total Population	= 3 + 64 = 67p
Average Daily Demand	= 0.275 m³/p/day x 67p = 18.43 m³/day = 0.2133 L/s
Max. Daily Demand	= 0.2133 L/s x 2.25 = **0.4799 L/s**
Max. Hourly Demand	= 0.2133 L/s x 4.00 = **0.8532** L/s

Based on Fire Underwriters Survey (2019), the fire flow demand for the proposed mixed-use development was calculated using the formula:

$F = 220C\sqrt{A}$ where, F = fire flow in L/min
C = construction coefficient, 1.0 for ordinary construction
A = total effective area, 2,476m²

F = 220 x 1.0 x √2,476
= 10,947 L/min

Decrease can be applied for occupancy having a low content fire hazard:

F = 10,947 L/min x (1 – 25%)
= 8,210 L/min

Each unit will be sprinklered allowing further reduction:

F = 8,210 L/min x (1 – 30%)
= 5,474 L/min

Adjustment surcharge must be applied based on the exposure of the building and close proximity to other existing residences:

F = 5,747 L/min x (1 + 60%)
= 9,195 L/min ≈ 9,000 L/min
= **150 L/s**

Design Water Demand = 0.4799 L/s + 150 L/s
= **150.48 L/s**

A fire flow test was conducted on the existing Garden Dr. watermain to confirm that there is sufficient fire protection and water demand. *See **Appendix F** for results.*

System will maintain 40Psi residual pressure during fire flow operations.

7.0 SUMMARY

The findings and recommendations were prepared in accordance with accepted professional engineering principles and practices. Based on the above, the proposed mixed-use development can be adequately serviced by the proposed and existing municipal infrastructure.

The findings and recommendations of this report are global and are related to the servicing functionality of this application. These findings by means are final and are not to replace the detail review of this application which shall take place upon submission of future application for building permit.

The conclusion is as follows:

- The proposed mixed-use development will be serviced by the existing storm sewer on Garden Dr. Quantity control will be achieved by Cultec system. Quality control will be achieved by oil/grit separator.
- The proposed mixed-use development will be serviced by the existing sanitary sewer on Garden Dr. Individual 125mm sanitary connections will be provided for townhouse units and a 150mm sanitary connection will be provided for retail units.
- The proposed mixed-use development will be serviced by the existing watermain on Garden Dr. Individual 25mm water service connections will be provided for townhouse units and a 150mm water service connection will be provided for retail units. All blocks will be provided with 150 dia. fire line and individual units will be sprinklered.
- The existing fire hydrant will be utilized to provide fire coverage

We respectively submit this report with intention of obtaining approval in principal the recommendations herein, which will be implemented in detail design during engineering submission, site plan process and building permits.

Yours truly,

SKIRA & ASSOCIATES LTD.

Michael Jozwik, P. Eng.
MJ:ak

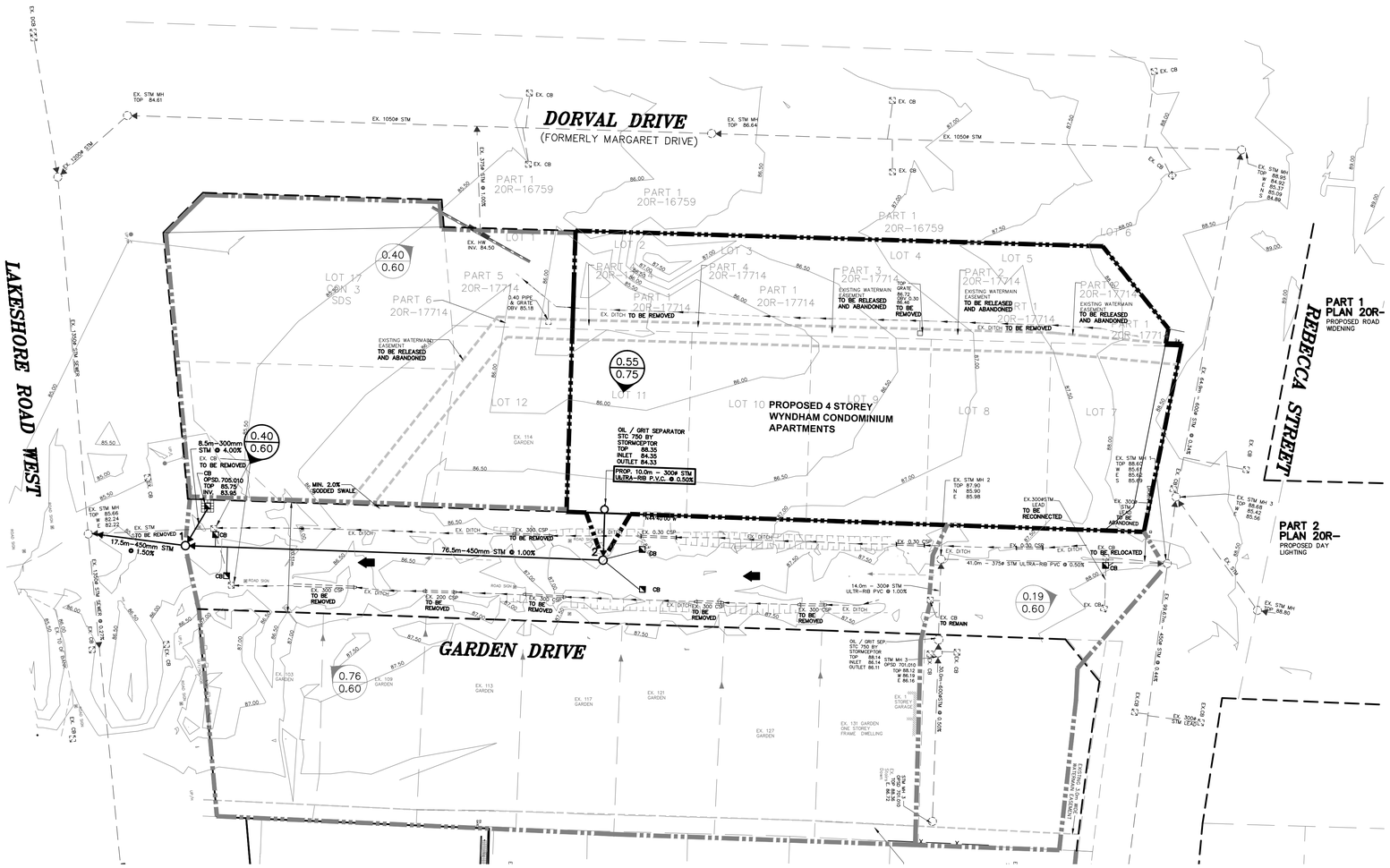
NOTE: ***Limitation of Report***

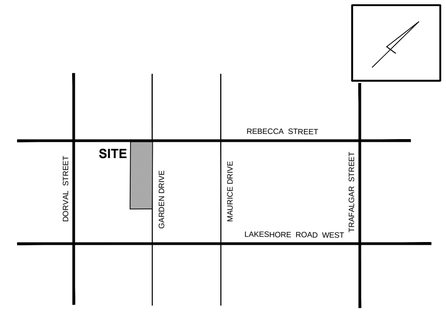
*This report was prepared by **Skira & Associates Ltd.** for **Oakville Garden Residences Corp.** for review and approval by government agencies only.*

*In light of the information available at the time of preparation of this report, any use by a **Third Party** of this report are solely the responsibility of such **Third Party** and **Skira & Associates Ltd.** accepts no responsibility for any damages, if any, suffered by the **Third Party**.*

APPENDIX A

GARDEN DR. STORM DRAINAGE PLAN
MAURICE DR. WATERMAIN RECONSTRUCTION PLAN





KEY PLAN (N.T.S.)

LEGEND

- 0.55 / 0.75 — AREA (HECTARES) / RUN-OFF COEFFICIENT
- SINGLE CATCHBASIN
- DOUBLE CATCHBASIN
- CATCHBASIN WITH SEDIMENT CONTROL WITH SILT FENCE
- STORM MANHOLE
- DIRECTION OF FLOW
- OVERLAND FLOW ROUTE
- EXISTING OVERLAND FLOW ROUTE
- DRAINAGE AREA BOUNDARY
- EXISTING DRAINAGE AREA BOUNDARY

NOTES

1. FOR GENERAL NOTES SEE DWG. No. 1.
2. FOR STANDARD DETAILS SEE DWG. No. 7 & 8.

CONTRACTOR TO BE RESPONSIBLE FOR LOCATION OF ALL EXISTING UNDERGROUND & OVERHEAD UTILITIES. VARIOUS UTILITIES CONCERNED TO BE GIVEN REQUIRED ADVANCE NOTICE PRIOR TO ANY DIGGING, FOR STAKE OUT. THE CONSULTANT ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE LOCATION OF EXISTING UTILITIES

No	DATE	BY	REVISIONS
1	-	-	-

DESIGN	Z.S.	CHECKED	R.K.	DATE
DRAWN	M.B.	CHECKED	R.K.	

BENCHMARK No.: OBM-008 ELEV. 86.68m
DESCRIPTION: EASTERLY CORNER OF CONCRETE BASE OF LIGHT STANDARD ON THE NORTH SIDE OF SOUTHERLY DRIVEWAY TO ST. THOMAS AQUINAS HIGH SCHOOL (124 MARGARET DR.)

FIRST	SECOND	INTERIM	PRE-SER	FINAL
DATE SEPT. 16/10	DATE MAR. 17/11	DATE DEC. 08/11	DATE	DATE FEB.27/12

SCALE
HOR 1:500 (0 5 10 15 20 25)

REFERENCES

FIELD NOTES

APPROVALS

MUNICIPAL

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

ORIGINAL SIGNED BY:

Signed _____ Date _____
DIR. OF PLANNING SERVICES - TOWN OF OAKVILLE

REGIONAL

DESIGN OF SANITARY AND WATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARD AND SPECIFICATIONS AND LOCATION APPROVAL FROM AREA MUNICIPALITY.

ORIGINAL SIGNED BY:

Signed _____ Date _____
LEGISLATIVE & PLANNING SERVICES

STAMP

REGISTERED PROFESSIONAL ENGINEER
ROMAN T. KERKUSZ
FEB.27/12
PROVINCE OF ONTARIO

CONSULTANT

SKIRA & ASSOCIATES LTD.
CONSULTING ENGINEERS
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MUNICIPALITY

TOWN OF OAKVILLE

The Regional Municipality Of Halton

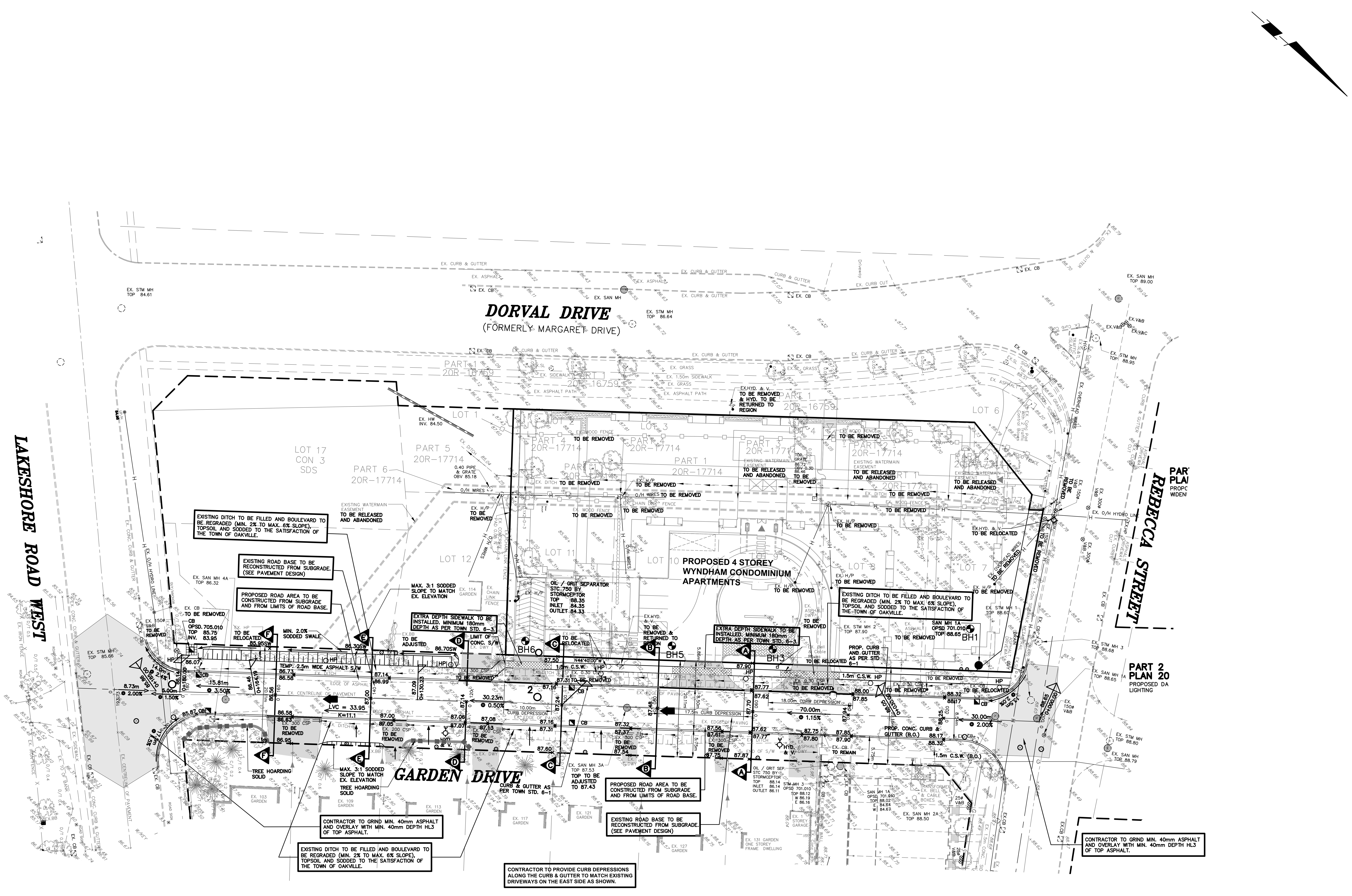
TITLE

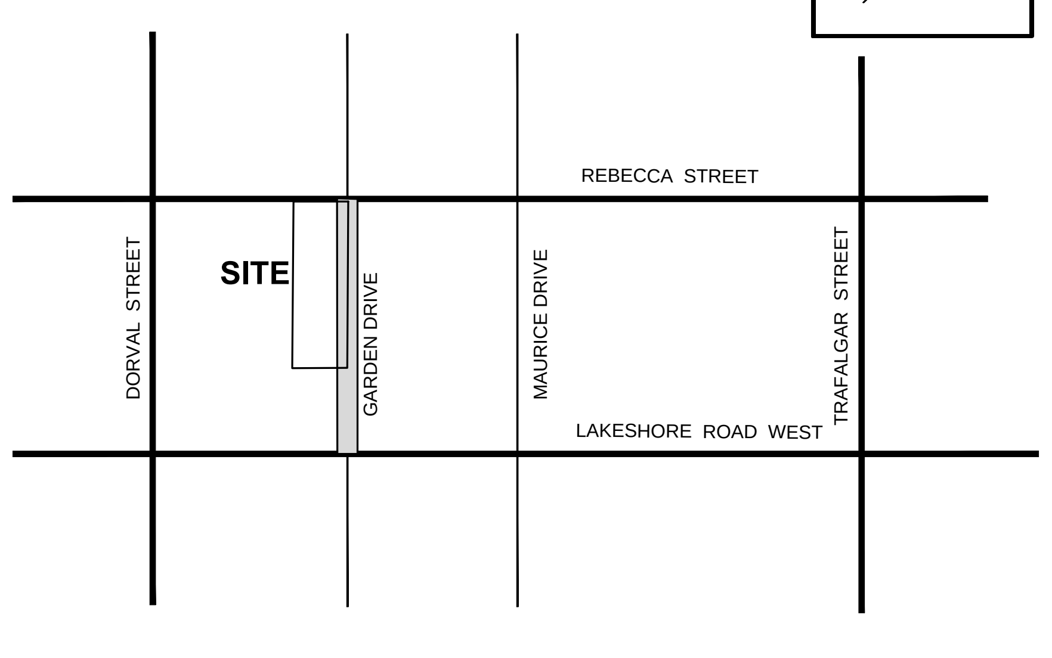
VANDYK - WYNDHAM PLACE LTD.
STORM DRAINAGE PLAN

(SHEET 1 OF 1)

MUNICIPAL DRAWING NO.	REGIONAL DRAWING NO.
R-481-11	DO-695

PROJECT NO.	DRAWING NO.	SHEET
210-OK22	3	3 OF 8





KEY PLAN (N.T.S.)

LEGEND

198.95	- EXIST. ELEVATION	◪	- SINGLE CATCHBASIN
(000.00)	- EXIST. ELEVATION TO REMAIN	◪◪	- DOUBLE CATCHBASIN
126.25	- PROP. ELEVATION	▦	- CATCHBASIN WITH SEDIMENT CONTROL WITH SILT FENCE
126.25	- PROP. ELEVATION BY OTHERS	○	- STORM MANHOLE
199.45	- PROP. FRONT BUILDING LINE ELEVATION	●	- SANITARY MANHOLE
198.50	- PROP. REAR BUILDING LINE ELEVATION		- HYDRANT & VALVE
198.50	- PROP. SWALE ELEVATION	⊗	- VALVE & BOX
×198.50	- FUTURE ELEVATION	■—■	- ACOUSTICAL FENCE (REFER TO LANDSCAPE ARCHITECT DWG).
→	- DIRECTION OF SURFACE FLOW	×—×	- BLACK VINYL CHAIN LINK FENCE
000.00	- EXISTING CONTOURS	□—□	- WOOD SCREEN FENCE (REFER TO LANDSCAPE ARCHITECT DWG).
	- MAX. 3:1 SLOPE	T/F;B/F	- TOP OF FENCE OR BOTTOM OF FENCE
118	- LOT NUMBER	T/W;B/W	- TOP OF WALL OR BOTTOM OF WALL
A	- PROP. GRADING TYPE	T/C;B/C	- TOP OF CURB OR BOTTOM OF CURB
➡	- OVERLAND FLOW ROUTE	T/B	- TOP OF BERM
●	- EX.TREE TO REMAIN	W.O.	- WALKOUT BASEMENT
⊗	- EX.TREE TO BE REMOVED	▨	- EX. ASPHALT DRIVEWAY
	- EX.TREE TO BE RELOCATED		- ENGINEERED FILL AREA
	- BOREHOLE		
	- HYDRO TRANSFORMER		
⊠	- PAD MOUNTED SWITCHGEAR		

NOTES

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AND SPECIFICATIONS.

ORIGINAL SIGNED BY:
Signed ______ Date ______
DIR. OF PLANNING SERVICES - TOWN OF OAKVILLE

REGIONAL

DESIGN OF SANITARY AND WATER SERVICES APPROVED
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AND LOCATION APPROVAL FROM AREA MUNICIPALITY.

ORIGINAL SIGNED BY:
Signed ______ Date ______
LEGISLATIVE & PLANNING SERVICES

STAMP
ROMAN T. KERKUSZ
FEB.27/12

CONSULTANT
SKIRA & ASSOCIATES LTD.
CONSULTING ENGINEERS
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MUNICIPALITY
TOWN OF
OAKVILLE

The Regional Municipality
Of Halton

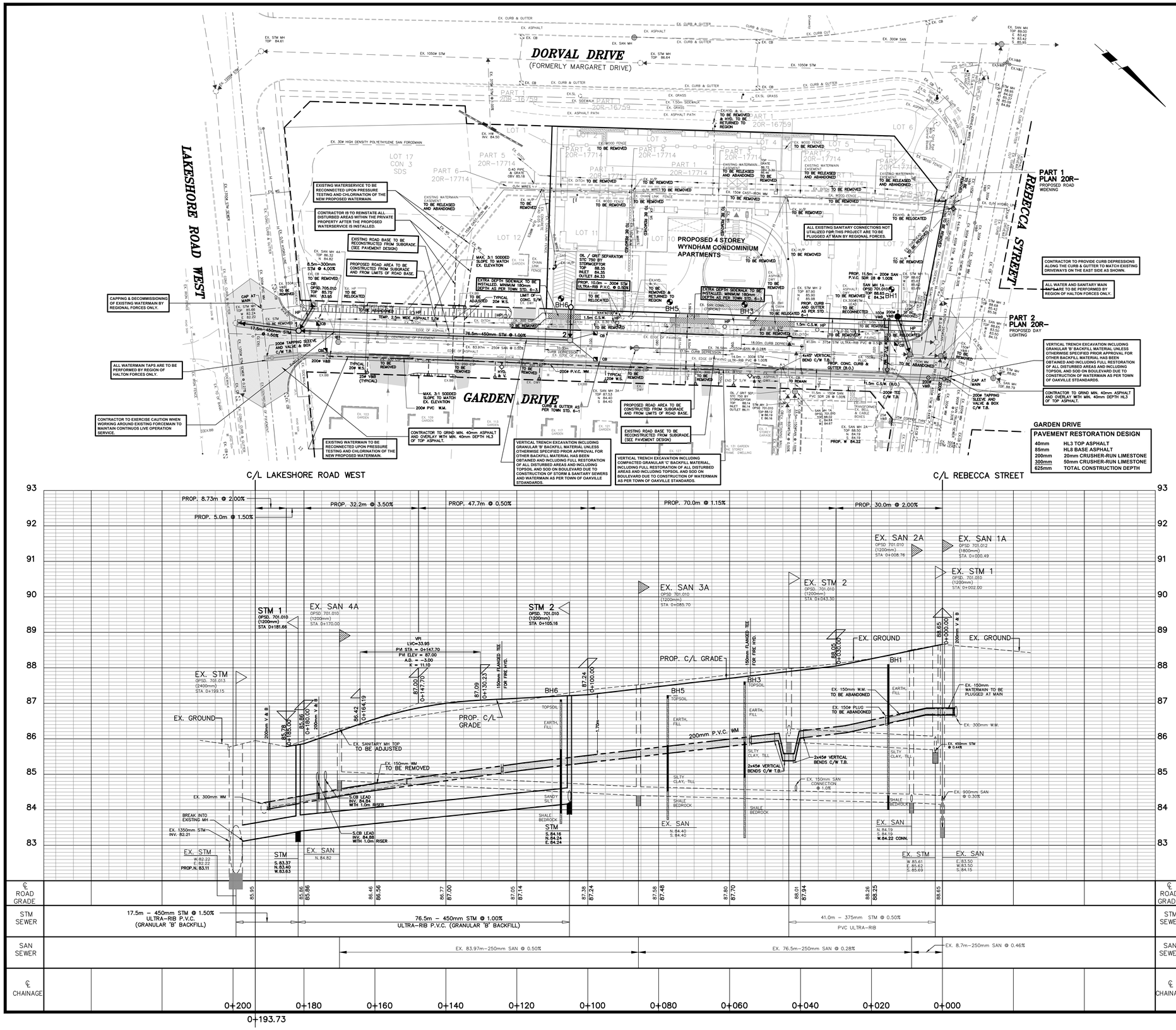
TITLE
VANDYK - WYNDHAM PLACE LTD.
GRADING PLAN
(SHEET 1 OF 1)

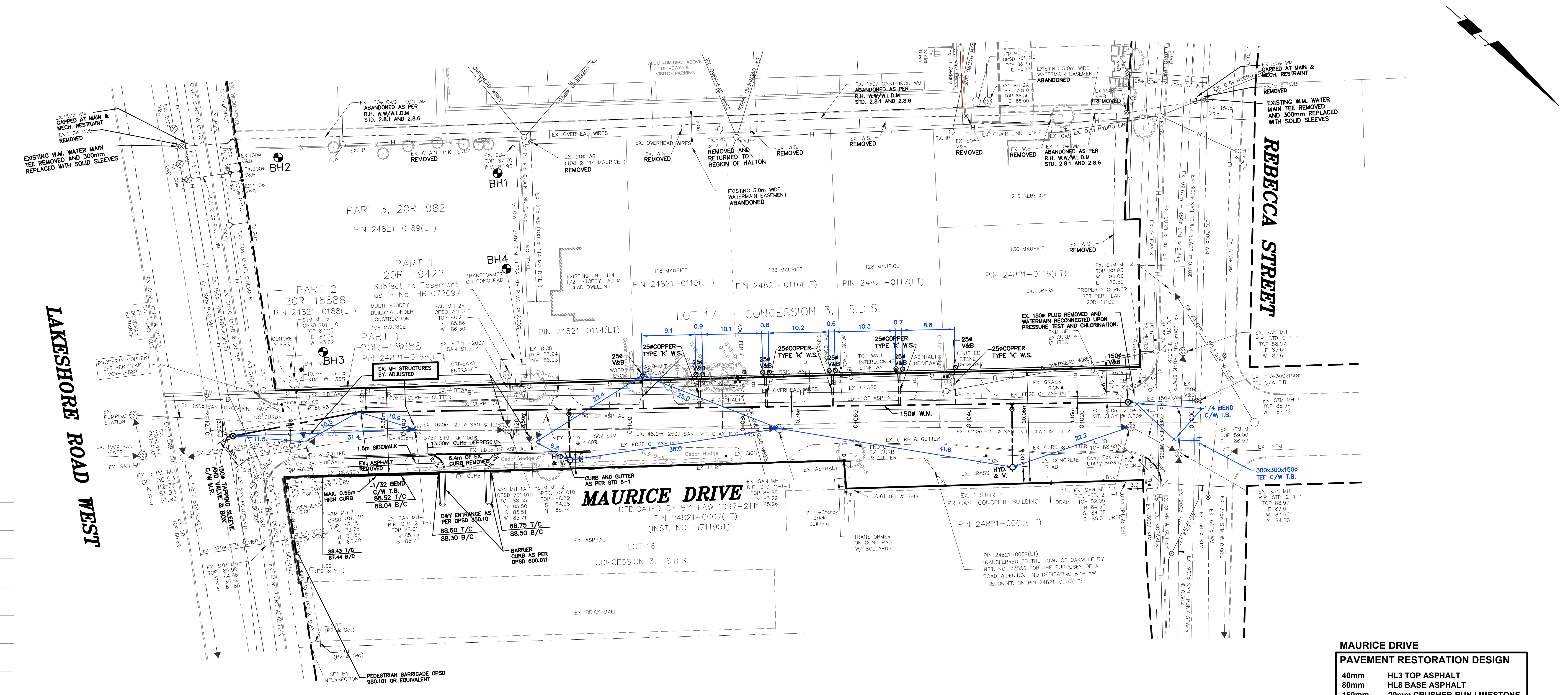
MUNICIPAL DRAWING NO. R-481-11	REGIONAL DRAWING NO. DO-695
PROJECT NO. **210-OK22**	DRAWING NO. **4** SHEET 4 OF 8

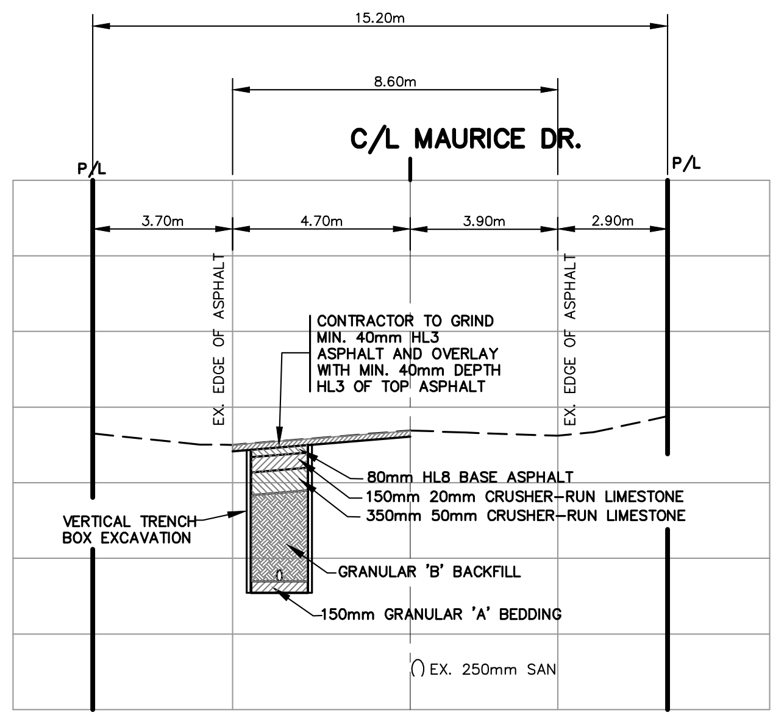
NOTE

1. THE ELEVATION OF SIDE SWALE AT THE LOT LINE SHALL BE A MINIMUM OF 150 mm BELOW THE BUILDING LINE ELEVATION AT THE CENTRE OF THE LOT.
2. THE DRIVEWAY FROM STREETLINE TO THE GARAGE IS NOT TO EXCEED 8% IN GRADE.
3. NO SODDING ON ANY LOTS OR BLOCKS IS PERMITTED UNTIL PRELIMINARY INSPECTION IS DONE BY BOTH THE ENGINEER AND THE BUILDER.
4. BUILDER IS TO VERIFY WITH THE ENGINEER THAT THE FINAL FOOTING AND TOP OF FOUNDATION WALL ELEVATIONS ARE IN CONFORMITY WITH THE BUILDING CODE AND CERTIFIED GRADING PLAN PRIOR TO PROCEEDING WITH THE FIRST FLOOR CONSTRUCTION.
5. PRIOR TO ANY SODDING, THE BUILDER IS TO ENSURE TO THE SOILS CONSULTANT AND/OR THE ENGINEER THAT THE LOT HAS BEEN GRADED AND TOPSOILED AND SODDED COMPLETELY WITH A MINIMUM DEPTH OF 100mm OF TOPSOIL AND NO. 1 NURSERY SOD. A MINIMUM DEPTH OF 150mm OF CRUSHED STONE IS TO BE PROVIDED ON THE ENTIRE LENGTH OF EACH DRIVEWAY ON A FIRM SUBGRADE AND THE DRIVEWAY IS TO BE PAVED WITH A MINIMUM COMPACTED DEPTH OF 75mm OF ASPHALT BETWEEN THE CURB AND THE GARAGE. PAVING OF THE DRIVEWAY IS TO BE UNDERTAKEN IN TWO SEPARATE PHASES, PHASE 1, BEING THE PLACING OF THE 50mm OF HL8 ASPHALT, IS TO BE COMPLETED AT THE TIME OF SODDING OF THE LOT WHILE PHASE 2, BEING THE PLACING OF 25mm HL3A ASPHALT, IS TO BE COMPLETED AT THE TIME OF TOP COURSE ASPHALT PAVEMENT ON THE ROADWAY.
6. ALL BACKYARDS TO HAVE GRADES NO GREATER THAN 5.0% SLOPE AND A MINIMUM OF 2.0% SLOPE
7. ALL REAR LOT CATCHBASINS ARE TO BE TOWN OF OAKVILLE STD. 3-2 & STD. 5-2.
8. THE DIFFERENCE IN GRADE BETWEEN TOP OF SILL OF DOOR AND GROUND ELEVATION SHALL NOT BE GREATER THAN 0.4m.
9. FOUNDATION FOOTINGS ADJACENT TO PROPOSED REARLOT CATCHBASIN LEAD SHALL BE EXTENDED TO UNDISTURBED GROUND AND APPROVED BY SOILS CONSULTANT.

PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR IS TO REFER TO THE TREE PRESERVATION PLAN PREPARED BY THE LANDSCAPE ARCHITECT.


DORVAL DRIVE
(FORMERLY MARGARET DRIVE)
LAKESHORE ROAD WEST
REBECCA STREET
GARDEN DRIVE
PROPOSED 4 STOREY
WYNDHAM CONDOMINIUM
APARTMENTS
PART 1
PLAN 20R-
PROPOSED ROAD
WIDENING
PART 2
PLAN 20R-
PROPOSED DAY
LIGHTING
EX. 1050ø STM
EX. 300ø SAN
EX. 30ø HIGH DENSITY POLYETHYLENE SAN FORCEMAIN
EX. CURB & GUTTER
EX. ASPHALT
EX. SIDEWALK
EX. GRASS
EX. ASPHALT PATH
EX. 1.50m SIDEWALK
EX. STM MH
TOP 84.61
EX. SAN MH
TOP 89.00
E 83.42
E 83.42
S 85.95
EX. STM MH
TOP 86.64
EX. CB
EX. HYD. & V.
TO BE REMOVED & HYD. TO BE RETURNED TO REGION
EX. HYD. & V. TO BE REMOVED
EX. WOOD FENCE TO BE REMOVED
EX. CHAIN LINK FENCE
EX. O/H WIRES TO BE REMOVED
EX. DITCH TO BE REMOVED
EX. 150M CAST-IRON WM
EXISTING WATERMAIN EASEMENT TO BE RELEASED AND ABANDONED
EXISTING WATERMAIN EASEMENT TO BE RELEASED AND ABANDONED TO BE REMOVED
EX. 0.40 PIPE & GRATE OBV. 85.18
EX. HP
INV. 84.50
EX. 300mm WM
EX. 150mm WM
EX. 200mm WM
EX. 250mm WM
EX. 1050ø STM
EX. 1350mm STM
EX. 1500mm STM
EX. 1800mm STM
EX. 2100mm STM
EX. 2400mm STM
EX. 2700mm STM
EX. 3000mm STM
EX. 3300mm STM
EX. 3600mm STM
EX. 3900mm STM
EX. 4200mm STM
EX. 4500mm STM
EX. 4800mm STM
EX. 5100mm STM
EX.



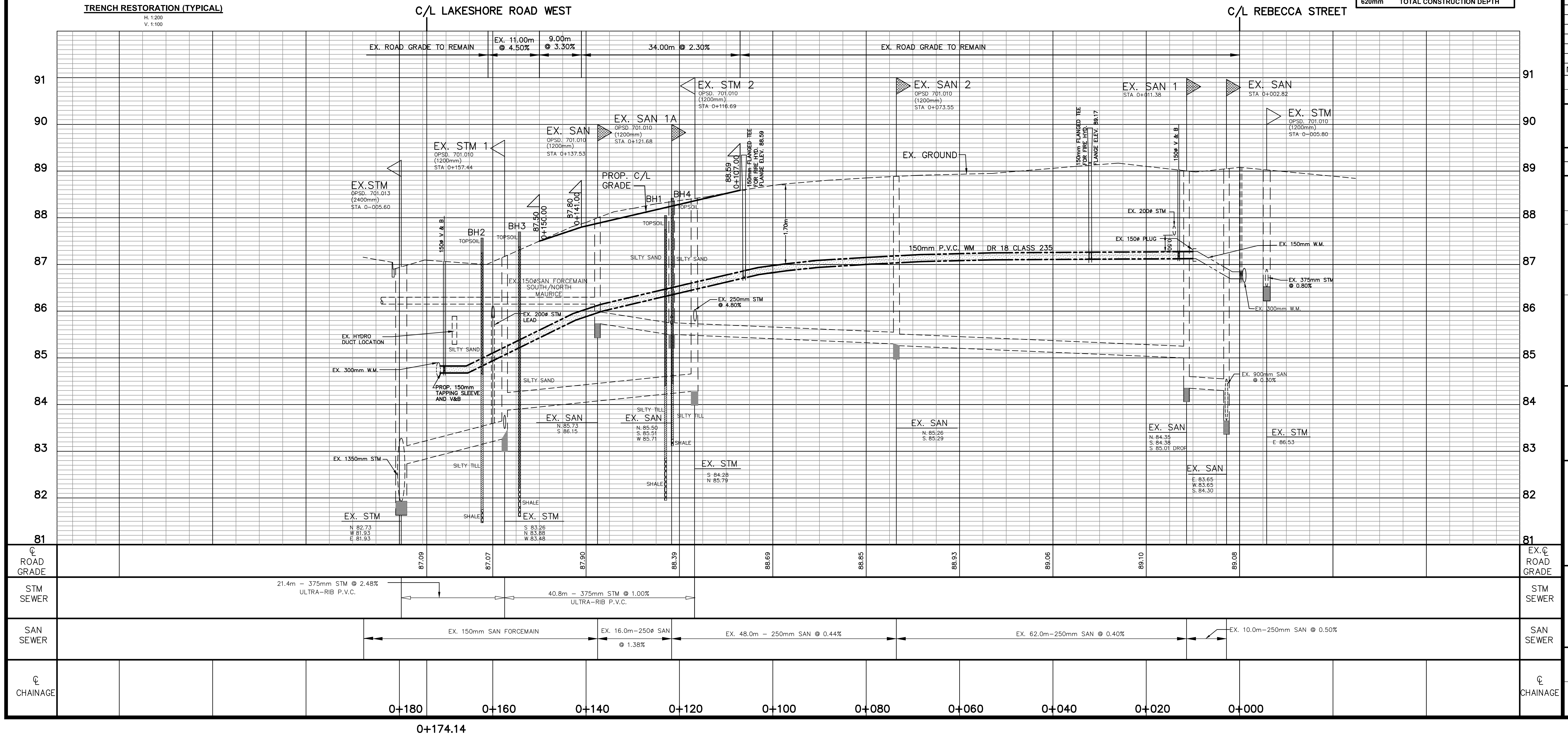


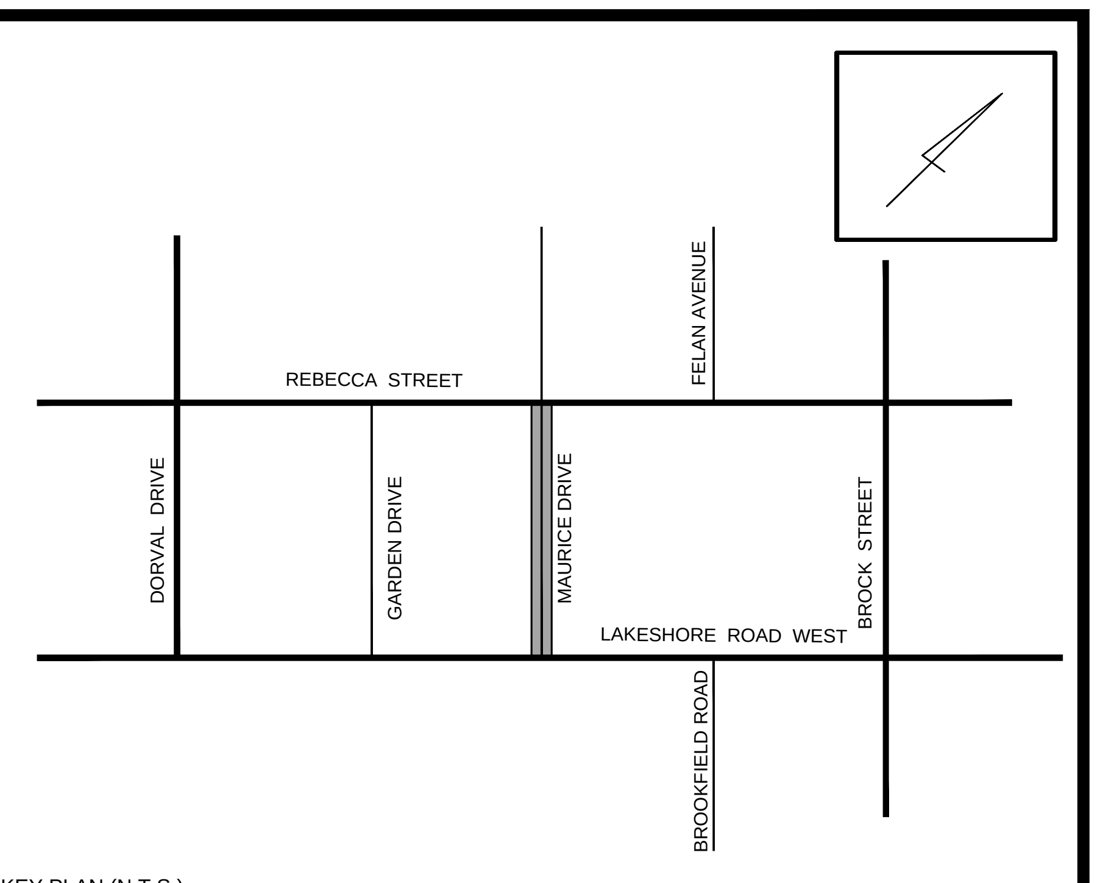
TRENCH RESTORATION (TYPICAL)
H. 1:200
V. 1:100

MAURICE DRIVE

PAVEMENT RESTORATION DESIGN

40mm	HL3 TOP ASPHALT
80mm	HL8 BASE ASPHALT
150mm	20mm CRUSHER-RUN LIMESTONE
350mm	50mm CRUSHER-RUN LIMESTONE
620mm	TOTAL CONSTRUCTION DEPTH





KEY PLAN (N.T.S.)

LEGEND

⊠	SIDE INLET CATCHBASIN
◪	SINGLE CATCHBASIN
◪◪	DOUBLE CATCHBASIN
▦	CATCHBASIN WITH SEDIMENT CONTROL WITH SILT FENCE
○	STORM MANHOLE
●	SANITARY MANHOLE
⊕	HYDRANT & VALVE
⊗	VALVE & BOX
≡	SANITARY & STORM DOUBLE CONNECTION & WATER SERVICE CONNECTION
━	CONCRETE ENCASEMENT
▽	LAND USE SIGN
✳	UNASSUMED ROAD SIGN
••	SIDEWALK BARRICADE
o—o	TRAFFIC SIGNAL DUCT & HANDWELL
Ⓣ	TRAFFIC SIGNAL POWER PEDESTAL
MB–A	SUPER MAILBOX LOCATION TYPE A
MB–B	SUPER MAILBOX LOCATION TYPE B
▨	DRIVEWAY LOCATION
▲	HYDRO TRANSFORMER
⊠	PAD MOUNTED SWITCHGEAR
⊗	V & B
○	STREET LIGHT POLES
P•B	HALTON BOARD OF EDUCATION (PUBLIC SCHOOL)
S•B	SEPARATE SCHOOL BOARD
■—■	ACOUSTICAL FENCE (REFER TO LANDSCAPE ARCHITECTS DWG).
✕ ✕	BLACK VINYL CHAIN LINK FENCE
□—□	WOOD SCREEN FENCE (REFER TO LANDSCAPE ARCHITECTS DWG).
‒ ‒ ‒	SILTATION CONTROL FENCE
100 S	SEMI-DETACHED DWELLING
●	EX.TREE TO REMAIN
⊗	EX.TREE TO BE REMOVED
○	EX.TREE TO BE RELOCATED
◐	BOREHOLE

NOTE :
FOR REGULATORY SIGN AND STREET NAME SIGN STANDARDS REFER TO TOWN STANDARDS.

□	STREET NAME SIGN
•	NO EXIT SIGN
⬡	STOP SIGN
⬡	STOP SIGN & STREET NAME
⬡	STOP SIGN, STREET NAME SIGN & NO EXIT SIGN
A	AIRCRAFT NOISE WARNING SIGN

NOTES

1. FOR GENERAL NOTES SEE DWG. No. 1.
2. FOR STANDARD DETAILS SEE DWG. No. 5 & 6.

CONTRACTOR TO BE RESPONSIBLE FOR LOCATION OF ALL EXISTING UNDERGROUND & OVERHEAD UTILITIES. VARIOUS UTILITIES CONCERNED TO BE GIVEN REQUIRED ADVANCE NOTICE PRIOR TO ANY DIGGING, FOR STAKE OUT. THE CONSULTANT ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE LOCATION OF EXISTING UTILITIES

No	DATE	BY	REVISIONS
2	JUN.05,2017	M.K.	AS CONSTRUCTED - WM
1	OCT.20,2016	M.J.	ISSUED FOR CONSTRUCTION

DESIGN	Z.S.	CHECKED	R.K.	DATE
DRAWN	M.B.	CHECKED	R.K.	

BENCHMARK No.: OBM-008 ELEV. 86.68m
DESCRIPTION: EASTERLY CORNER OF CONCRETE BASE OF LIGHT STANDARD ON THE NORTH SIDE OF SOUTHERLY DRIVEWAY TO ST. THOMAS AQUINAS HIGH SCHOOL (124 MARGARET DR.)

FIRST	SECOND	INTERIM	PRE-SER	FINAL
DATE JUNE 10/13	DATE JULY 16/15	DATE	DATE	DATE SEPT.28/16

SCALE
HOR 1:500 0 5 10 15 20 25
VER 1:50 0 0.5 1.0 1.5 2.0 2.5

REFERENCES

FIELD NOTES

APPROVALS

MUNICIPAL
APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS.
ORIGINAL SIGNED BY:
Signed ________ Date ________
DIR. OF PLANNING SERVICES - TOWN OF OAKVILLE

REGIONAL
DESIGN OF SANITARY AND WATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARD AND SPECIFICATIONS AND LOCATION APPROVAL FROM AREA MUNICIPALITY.
ORIGINAL SIGNED BY:
Signed RONALD MACKENZIE Date OCT.26,2016
LEGISLATIVE & PLANNING SERVICES

STAMP
REGISTERED PROFESSIONAL ENGINEER
ROMAN T. KERKUSZ
SEPT.28/16
PROVINCE OF ONTARIO

CONSULTANT
SKIRA & ASSOCIATES LTD.
CONSULTING ENGINEERS
3464 Semenyk Court, Suite 100, Mississauga, Ontario L5C 4P8
Tel. (905) 276-5100 Fax. (905) 270-1936 Email - info@skiraconsult.ca

MUNICIPALITY
TOWN OF OAKVILLE
The Regional Municipality Of Halton

TITLE
FERNBROOK HOMES (REBECCA) LIMITED
MAURICE DRIVE
PROPOSED WATERMAIN
STA 0+000.00 TO STA 0+174.14
FROM REBECCA STREET TO LAKESHORE ROAD WEST

MUNICIPAL DRAWING NO. R-	REGIONAL DRAWING NO. DO-1024

PROJECT NO. 212-OK86	DRAWING NO. 4	SHEET 4 OF 5

APPENDIX B

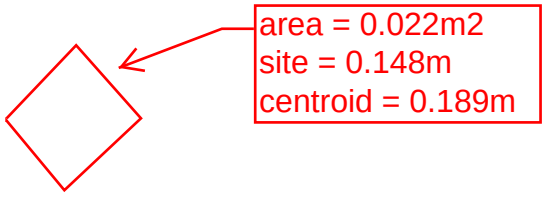
ORIFICE CONTROL CALCULATIONS
FLOW MASTER OUTUT FILE

Worksheet
Worksheet for Generic Orifice

Project Description	
Worksheet	Orifice - 1
Type	Generic Orifice
Solve For	Opening Area

Input Data		
Discharge	0.095100	m³/s
Headwater Elevat	86.55	m
Centroid Elevation	83.91	m
Tailwater Elevation	83.72	m
Discharge Coeffic	0.60	
Opening Area	2.2e-2	m²

Results		
Headwater Height Above	2.71	m
Tailwater Height Above C	-0.12	m
Velocity	4.37	m/s



APPENDIX C

QUALITY CONTROL OIL/GRIT SEPARATOR CALCULATIONS
& CATCHBASIN SHIELD INFORMATION

Hydroworks Sizing Summary

109 Garden Drive

Oakville, Ontario

05-30-2024

Recommended Size: HydroDome HD 6

Hydroworks Sizing Program Version 5.8.5

A HydroDome HD 6 is recommended to provide 80 % annual TSS removal based on a drainage area of .4989 (ha) with an imperviousness of 72 % and Toronto Central, Ontario rainfall for the ETV particle size distribution.

The recommended HydroDome HD 6 treats 100 % of the annual runoff and provides 83 % annual TSS removal for the Toronto Central rainfall records and ETV particle size distribution.

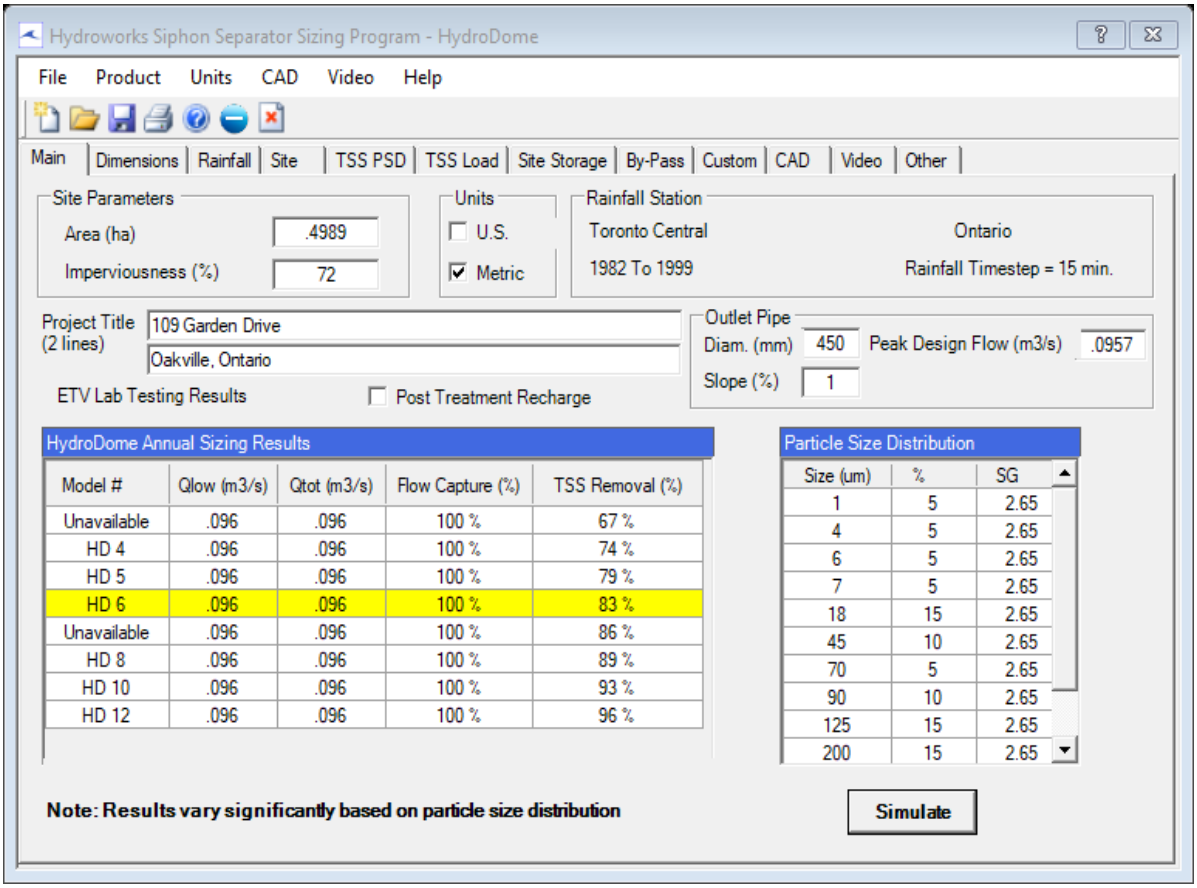
The HydroDome has a siphon which creates a discontinuity in headloss. The given peak flow of .096 (m3/s) Is less than the full pipe flow of .29 (m3/s) indicating free flow in the pipe during the peak flow assuming no tailwater condition. Partial pipe flow was assumed for the headloss calculations. The headloss was calculated to be 273 (mm) above the crown of the 450 (mm) outlet pipe.

This summary report provides the main parameters that were used for sizing. These parameters are shown on the summary tables and graphs provided in this report.

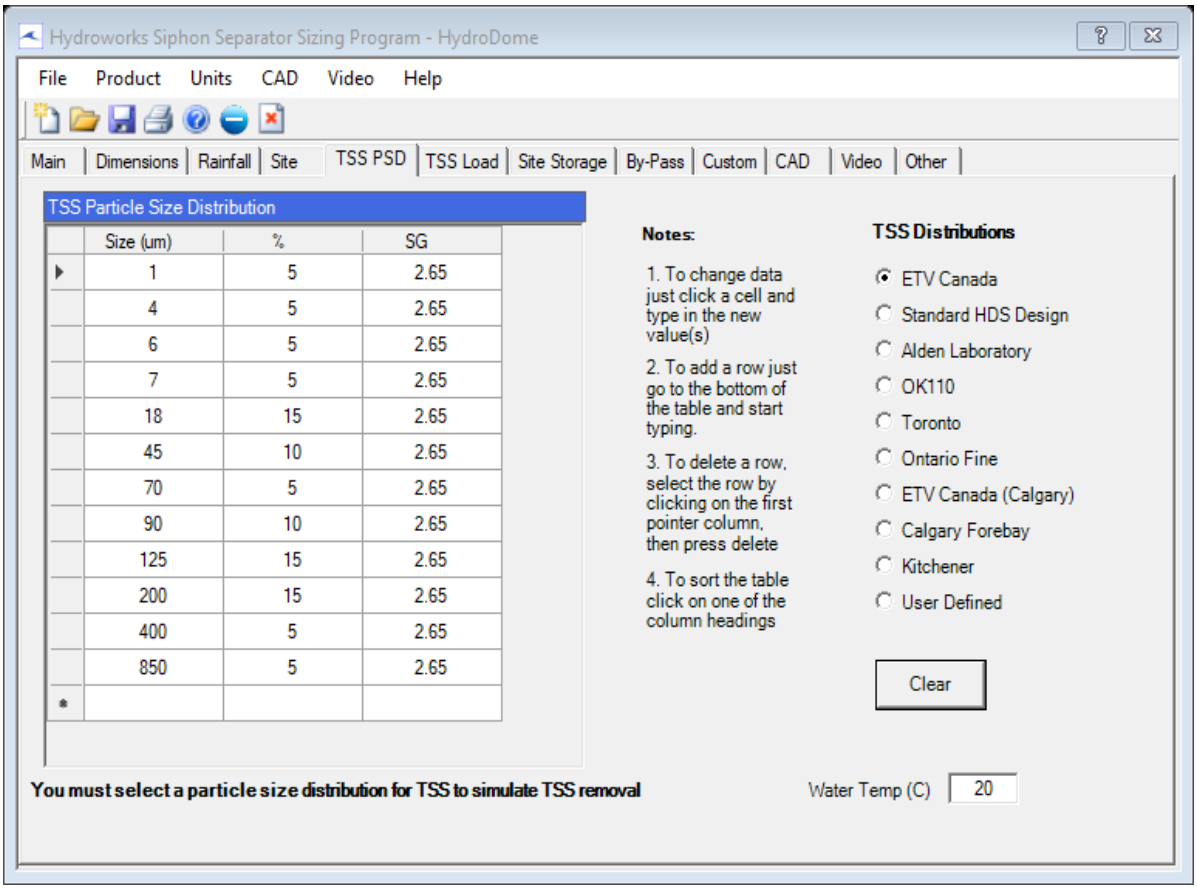
If you have any questions regarding this sizing summary please do not hesitate to contact Hydroworks at 888-290-7900 or email us at support@hydroworks.com.

The sizing program is for sizing purposes only and does not address any site specific parameters such as hydraulic gradeline, tailwater submergence, groundwater, soils bearing capacity, etc. Headloss calculations are not a hydraulic gradeline calculation since this requires a starting water level and an analysis of the entire system downstream of the HydroDome .

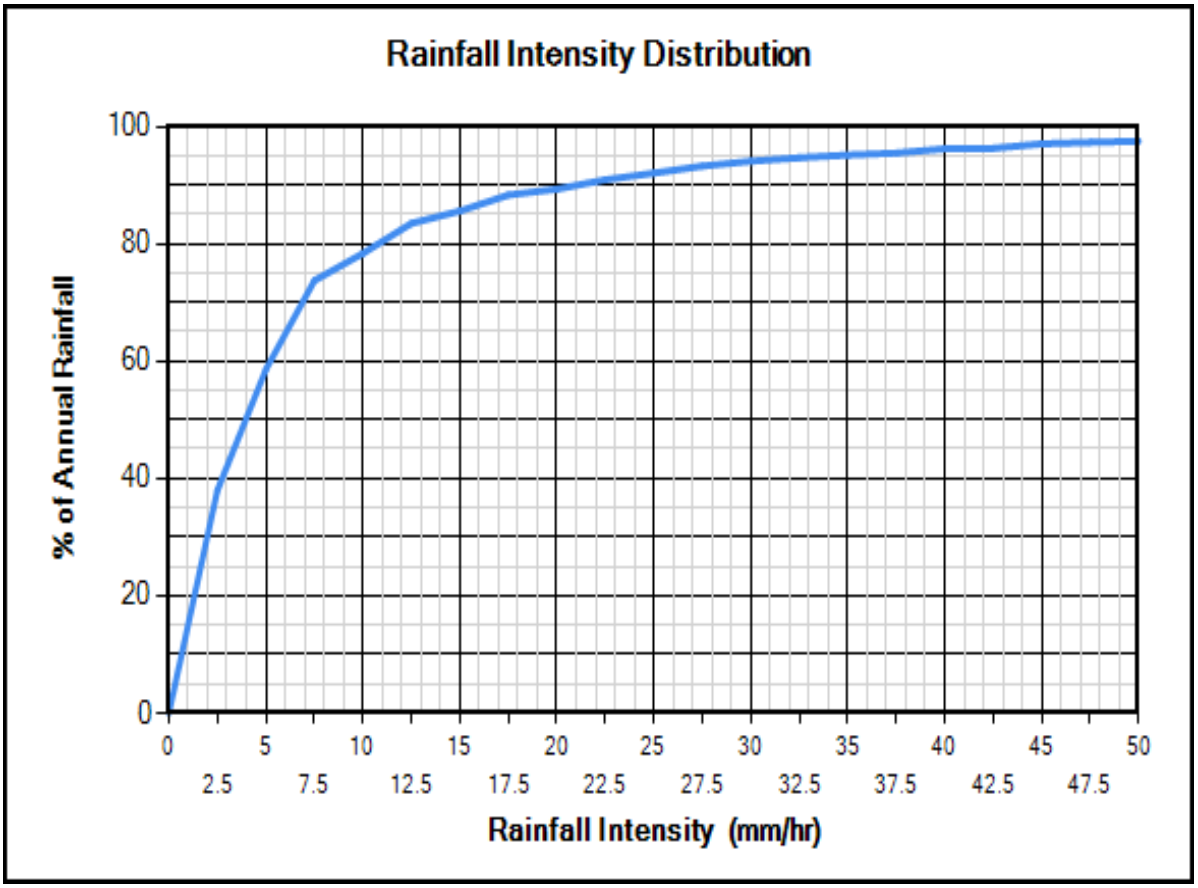
TSS Removal Sizing Summary



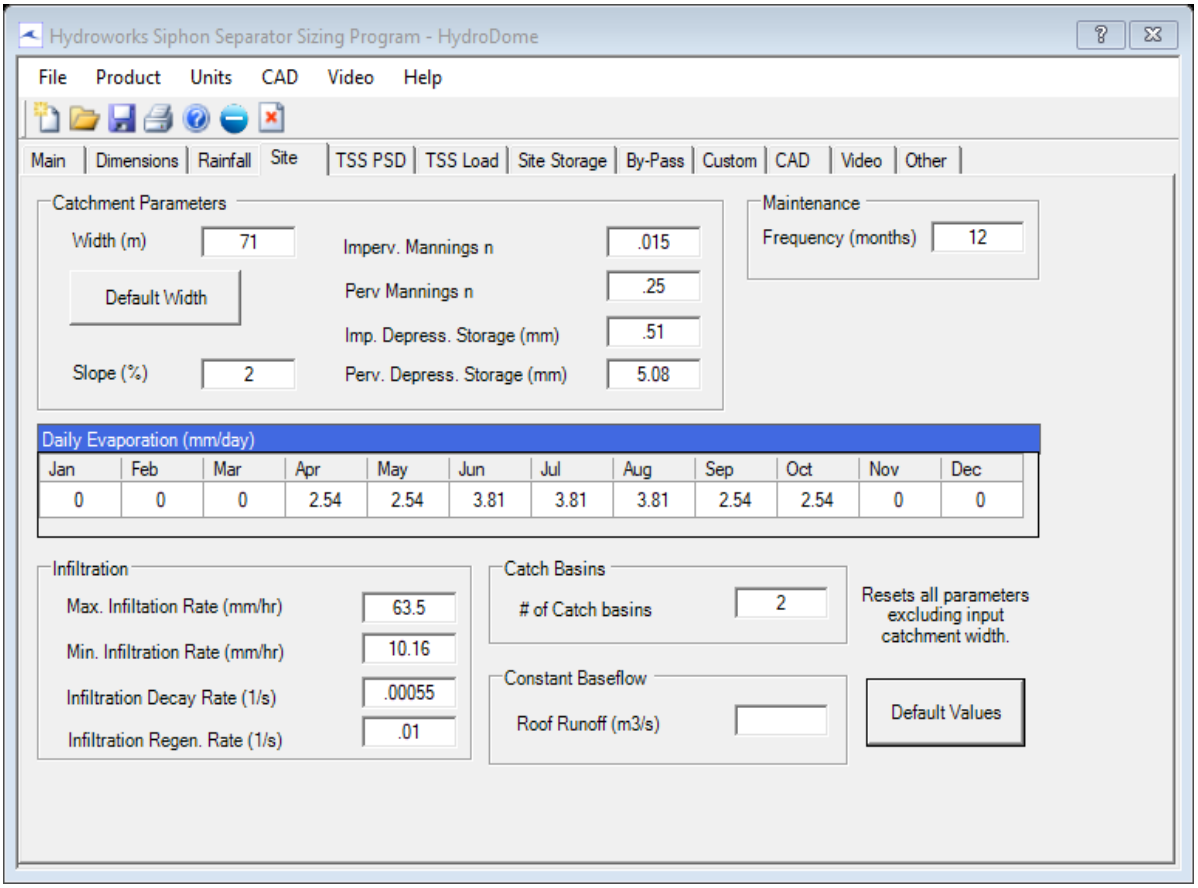
TSS Particle Size Distribution



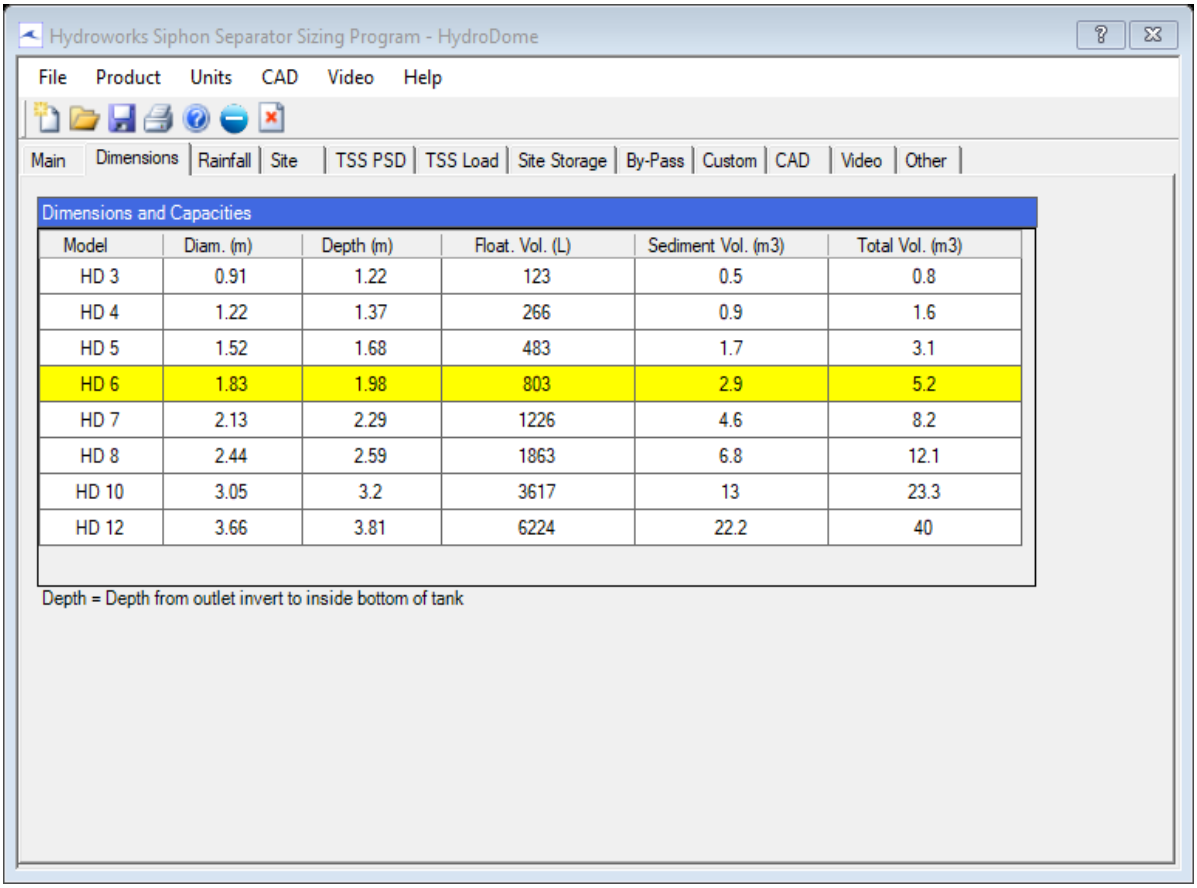
Rainfall Station - Toronto Central, Ontario(1982 To 1999)



Site Physical Characteristics



Dimensions And Capacities

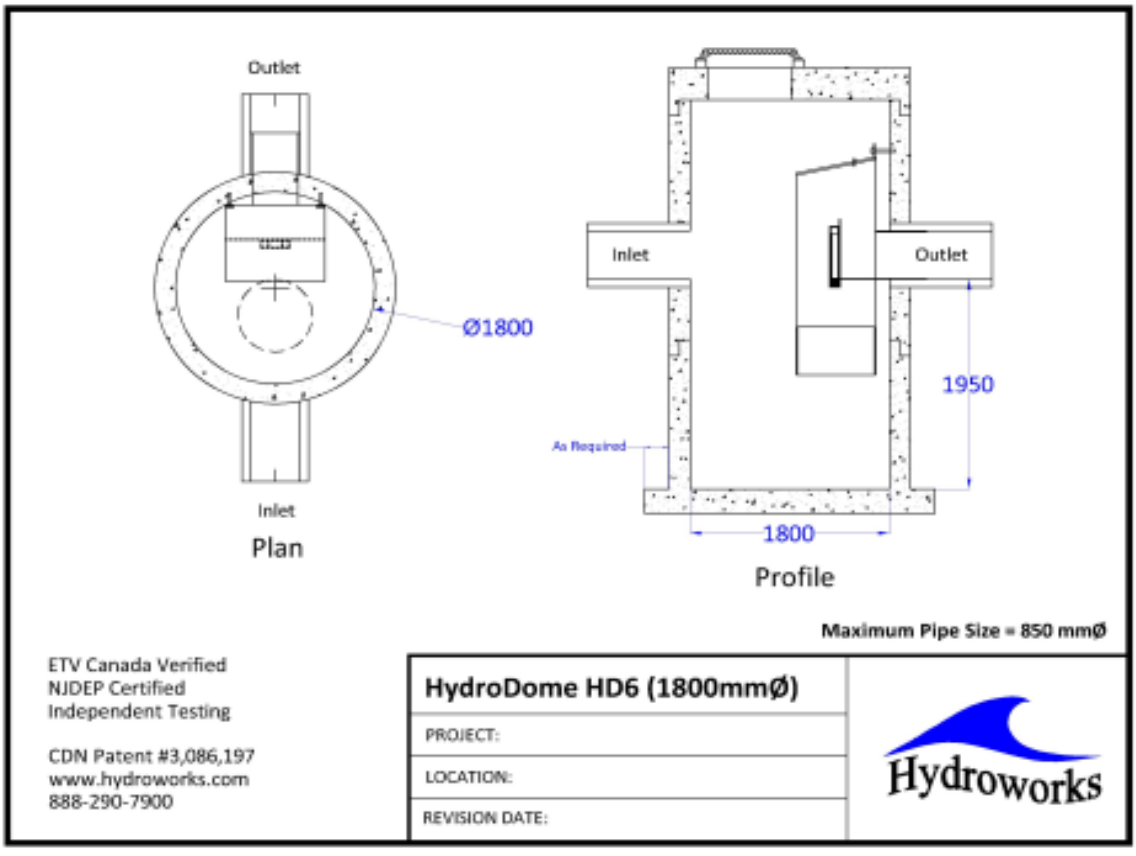


Dimensions and Capacities

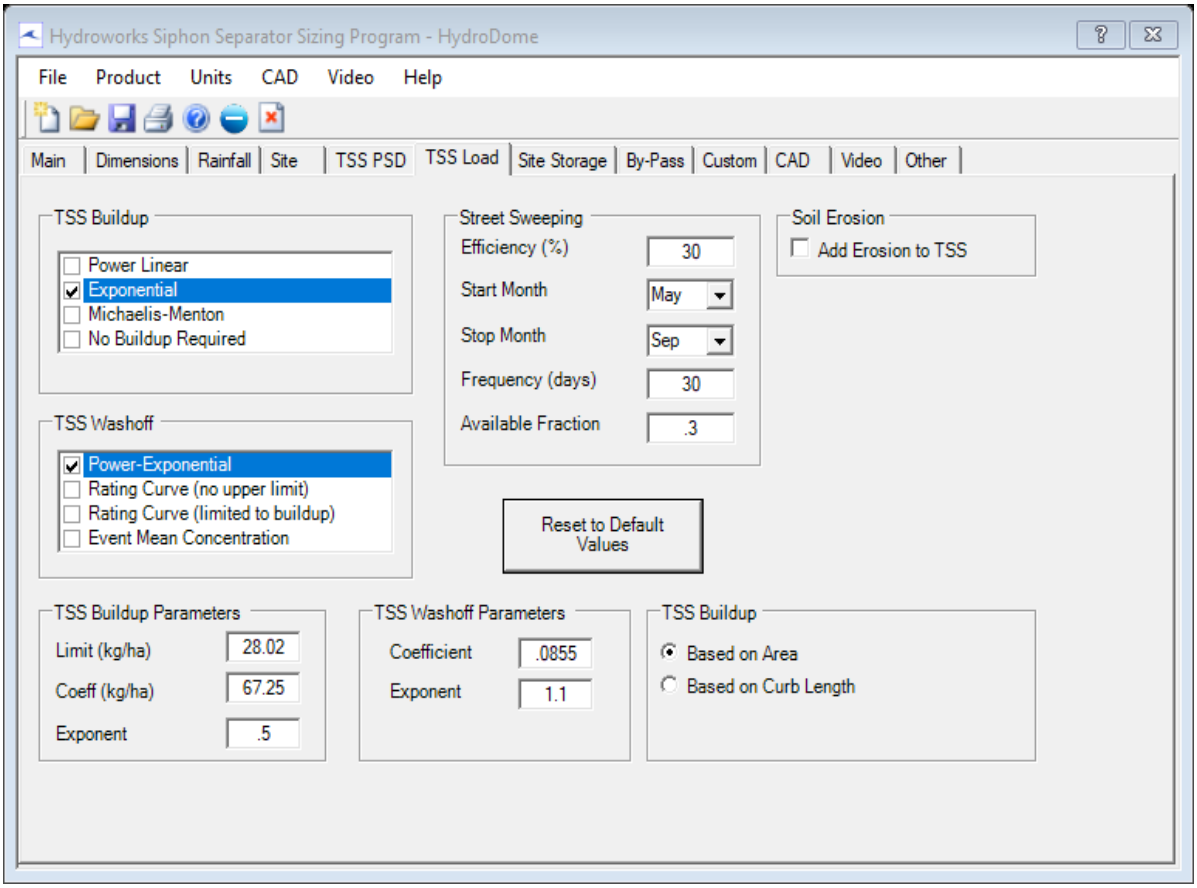
Model	Diam. (m)	Depth (m)	Float. Vol. (L)	Sediment Vol. (m3)	Total Vol. (m3)
HD 3	0.91	1.22	123	0.5	0.8
HD 4	1.22	1.37	266	0.9	1.6
HD 5	1.52	1.68	483	1.7	3.1
HD 6	1.83	1.98	803	2.9	5.2
HD 7	2.13	2.29	1226	4.6	8.2
HD 8	2.44	2.59	1863	6.8	12.1
HD 10	3.05	3.2	3617	13	23.3
HD 12	3.66	3.81	6224	22.2	40

Depth = Depth from outlet invert to inside bottom of tank

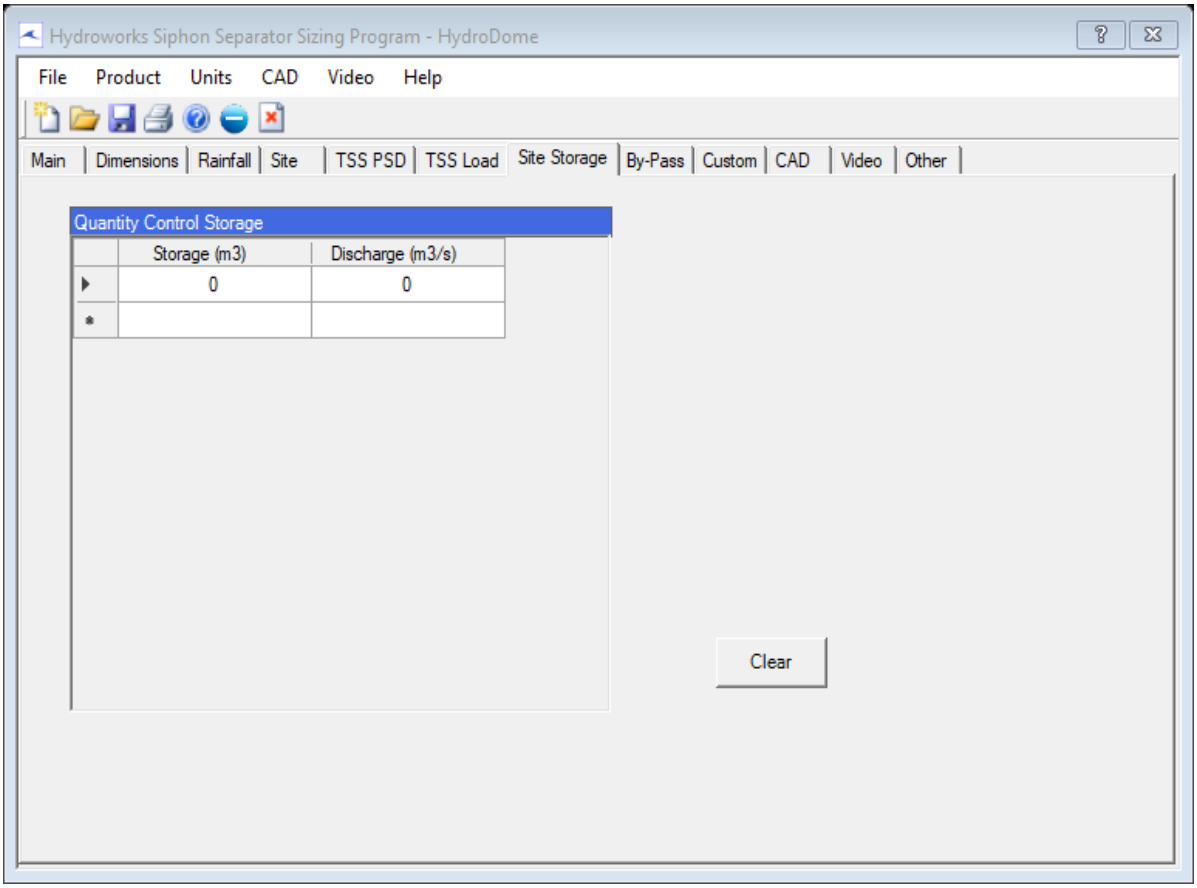
Generic HD 6 CAD Drawing



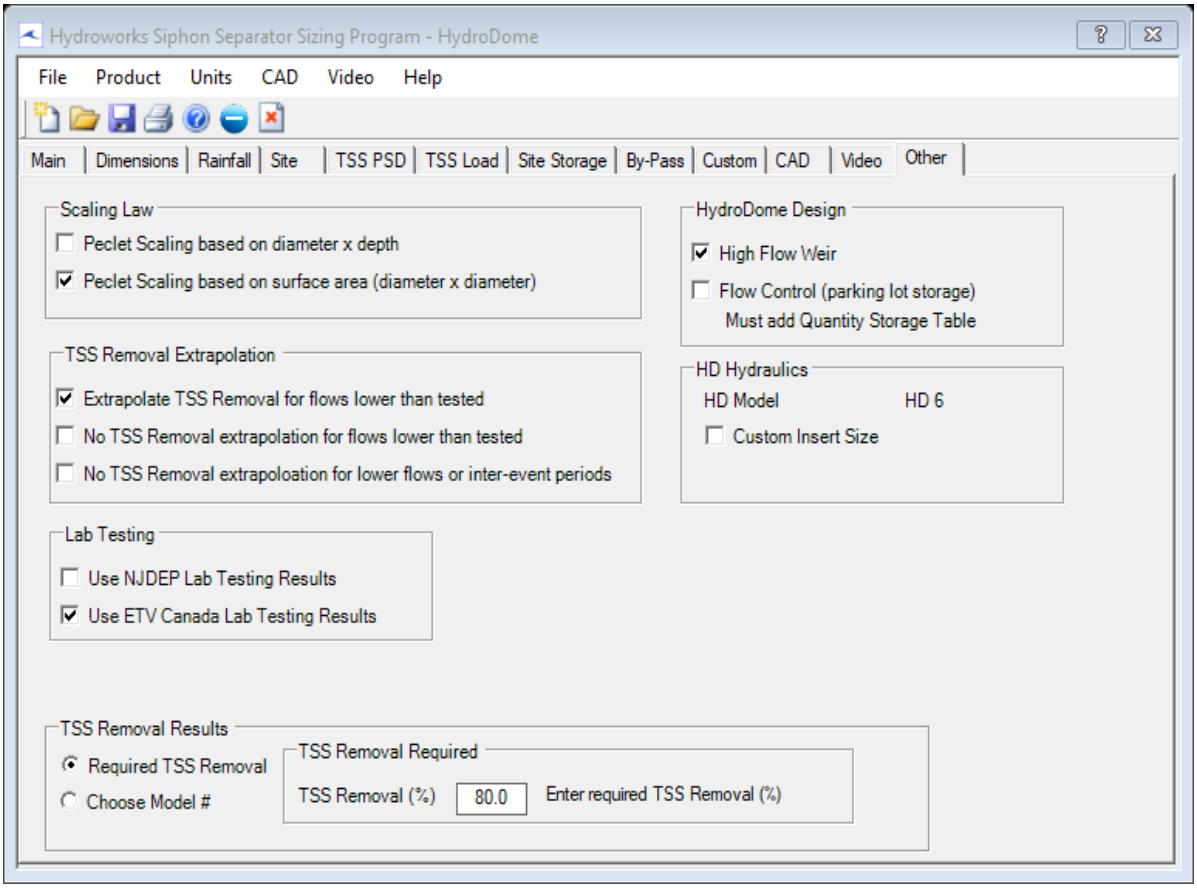
TSS Buildup And Washoff



Upstream Quantity Storage



Other Parameters



Flagged Issues

If there is underground detention storage upstream of the HydroDome please contact Hydroworks to ensure it has been modeled correctly.

Hydroworks Sizing Program - Version 5.8.5
Copyright Hydroworks, LLC, 2024
1-800-290-7900
www.hydroworks.com

Owned

ured

SWM Shield

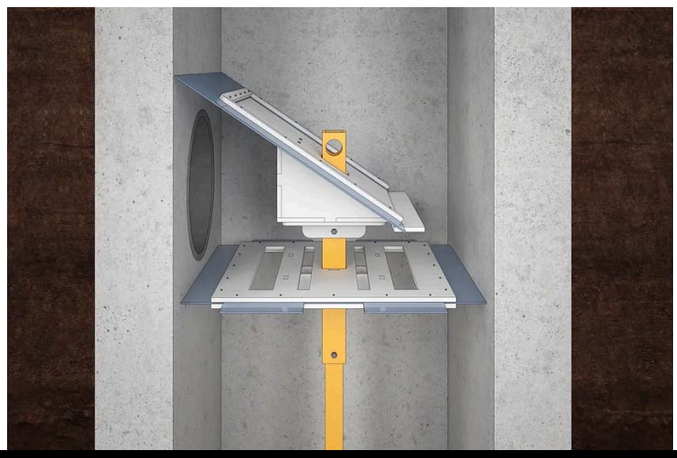
REQUEST A QUOTE

REMOVING AND REINSTALLING

15 SECONDS OUT & 15 SECONDS IN

We supply "Gandalf sticks" to hook
the CB Shields for removal and installation.
If you need any please contact us

<u>This is how the grate should look after being installed.</u>
Slots in grate are at 90 degrees to outlet pipe
The high side of the sloped plate goes over the outlet pipe.
The grate will be same elevation as outlet pipe.



For a Lunch and Learn
Contact Hal @ 226- 802 -1749

Contact us at info@cbshield.com
or call Mark @ 519-212-9161

APPENDIX D

CULTEC SYSTEM CALCULATIONS

CULTEC, Inc.
P.O. Box 280
Brookfield, CT 06804

Phone: 203-775-4416
Fax: 203-775-1462
www.cultec.com
custservice@cultec.com

Project Information: **Date:**

Number of Rows-	2	units
Total number of chambers -	36	units
HVLV FC-48 Feed Connectors -	4	units
Stone Void -	40	%
Stone Base -	152	mm
Stone Above Units -	152	mm
Area -	83.58	m^2
Base of Stone Elevation-	90.60	m

Click for Imperial

83.58 Min. Area Required

Note: Min. Area required is based on 305mm around the system and typ. spacing

CULTEC Recharger 360HD Incremental Storage Volumes

Height of System	End Cap Volume	Chamber Volume	HVLV FC-48 Feed Connector Volume	Stone Volume	Cumulative Storage Volume	Total Cumulative Storage Volume	Elevation
mm	m^3	m^3	m^3	m^3	m^3	m^3	m
1219	0.00	0.00	0.00	0.85	0.85	63.69	91.82
1194	0.00	0.00	0.00	0.85	0.85	62.84	91.79
1168	0.00	0.00	0.00	0.85	0.85	61.99	91.77
1143	0.00	0.00	0.00	0.85	0.85	61.14	91.74
1118	0.00	0.00	0.00	0.85	0.85	60.29	91.72
1092	0.00	0.00	0.00	0.85	0.85	59.44	91.69
1067	0.00	0.08	0.00	0.82	0.90	58.59	91.67
1041	0.00	0.17	0.00	0.78	0.95	57.69	91.64
1016	0.00	0.26	0.00	0.74	1.01	56.74	91.62
991	0.00	0.44	0.00	0.67	1.11	55.73	91.59
965	0.01	0.55	0.00	0.63	1.18	54.62	91.57
940	0.01	0.64	0.00	0.59	1.24	53.43	91.54
914	0.01	0.71	0.00	0.56	1.28	52.20	91.51
889	0.01	0.77	0.00	0.54	1.32	50.92	91.49
864	0.01	0.83	0.00	0.51	1.35	49.60	91.46
838	0.01	0.88	0.00	0.49	1.38	48.25	91.44
813	0.01	0.92	0.00	0.48	1.41	46.87	91.41
787	0.01	0.96	0.00	0.46	1.43	45.46	91.39
762	0.02	1.00	0.00	0.44	1.46	44.03	91.36
737	0.02	1.03	0.00	0.43	1.48	42.57	91.34
711	0.02	1.06	0.00	0.42	1.50	41.09	91.31
686	0.02	1.09	0.00	0.40	1.52	39.59	91.29
660	0.02	1.12	0.00	0.39	1.53	38.08	91.26
635	0.02	1.15	0.00	0.38	1.55	36.54	91.24
610	0.02	1.17	0.00	0.37	1.57	34.99	91.21
584	0.02	1.20	0.00	0.36	1.58	33.42	91.18
559	0.02	1.22	0.00	0.35	1.59	31.84	91.16
533	0.02	1.24	0.00	0.34	1.61	30.25	91.13
508	0.03	1.26	0.00	0.34	1.62	28.65	91.11
483	0.03	1.27	0.00	0.33	1.63	27.03	91.08
457	0.03	1.29	0.00	0.32	1.64	25.40	91.06
432	0.03	1.31	0.00	0.31	1.65	23.76	91.03
406	0.03	1.32	0.01	0.31	1.66	22.10	91.01
381	0.03	1.34	0.01	0.30	1.67	20.44	90.98
356	0.03	1.35	0.01	0.29	1.68	18.77	90.96
330	0.03	1.36	0.01	0.29	1.69	17.08	90.93
305	0.03	1.38	0.01	0.28	1.70	15.39	90.90
279	0.03	1.39	0.01	0.28	1.71	13.69	90.88
254	0.03	1.40	0.01	0.27	1.71	11.99	90.85
229	0.03	1.41	0.01	0.27	1.72	10.27	90.83
203	0.04	1.42	0.01	0.26	1.73	8.55	90.80
178	0.04	1.43	0.01	0.26	1.73	6.83	90.78
152	0.00	0.00	0.00	0.85	0.85	5.09	90.75
127	0.00	0.00	0.00	0.85	0.85	4.25	90.73
102	0.00	0.00	0.00	0.85	0.85	3.40	90.70
76	0.00	0.00	0.00	0.85	0.85	2.55	90.68
51	0.00	0.00	0.00	0.85	0.85	1.70	90.65
25	0.00	0.00	0.00	0.85	0.85	0.85	90.63
							90.60

APPENDIX E

HYDROGEOLOGICAL REPORT
BY: MCR ENGINEERING LTD.

MCR ENGINEERS LTD.
GEO-ENVIRONMENTAL CONSULTANTS

TABLE 1
CONSTRUCTION DETAILS AND ELEVATION OF MONITORING WELLS

MONITORING WELL ID	GROUND SURFACE ELEVATION (masl)	WATER LEVEL (mbgs)	GROUNDWATER ELEVATION (masl)	DATE OF MEASUREMENT (mm/dd/yyyy)	DEPTH OF WELL (mbgs)	DEPTH OF BENTONITE (mbgs)	LENGTH OF SCREEN (m)	INSIDE DIAMETER OF PIPE (mm)	TOP OF MONITORING WELL
Boreholes by Others									
BH 1	88.60	1.90	86.70	04/11/2017	5.20	1.70	3.05	50	FLUSH MOUNT
		DESTROYED	-	05/17/2021					
BH 4	87.30	2.30	85.00	04/11/2017	5.20	1.70	3.05	50	FLUSH MOUNT
		3.13		05/17/2021					
		3.08	84.22	05/20/2021					
BH 101	88.22	4.47	83.75	05/17/2021	8.30	4.70	3.05	50	FLUSH MOUNT
		4.49	83.73	05/20/2021					
Min	87.30	1.90	83.73	-	5.20	-	-	-	-
Max	88.60	4.49	86.70	-	8.30	-	-	-	-
Average	88.04	3.23	84.68	-	6.23	-	-	-	-

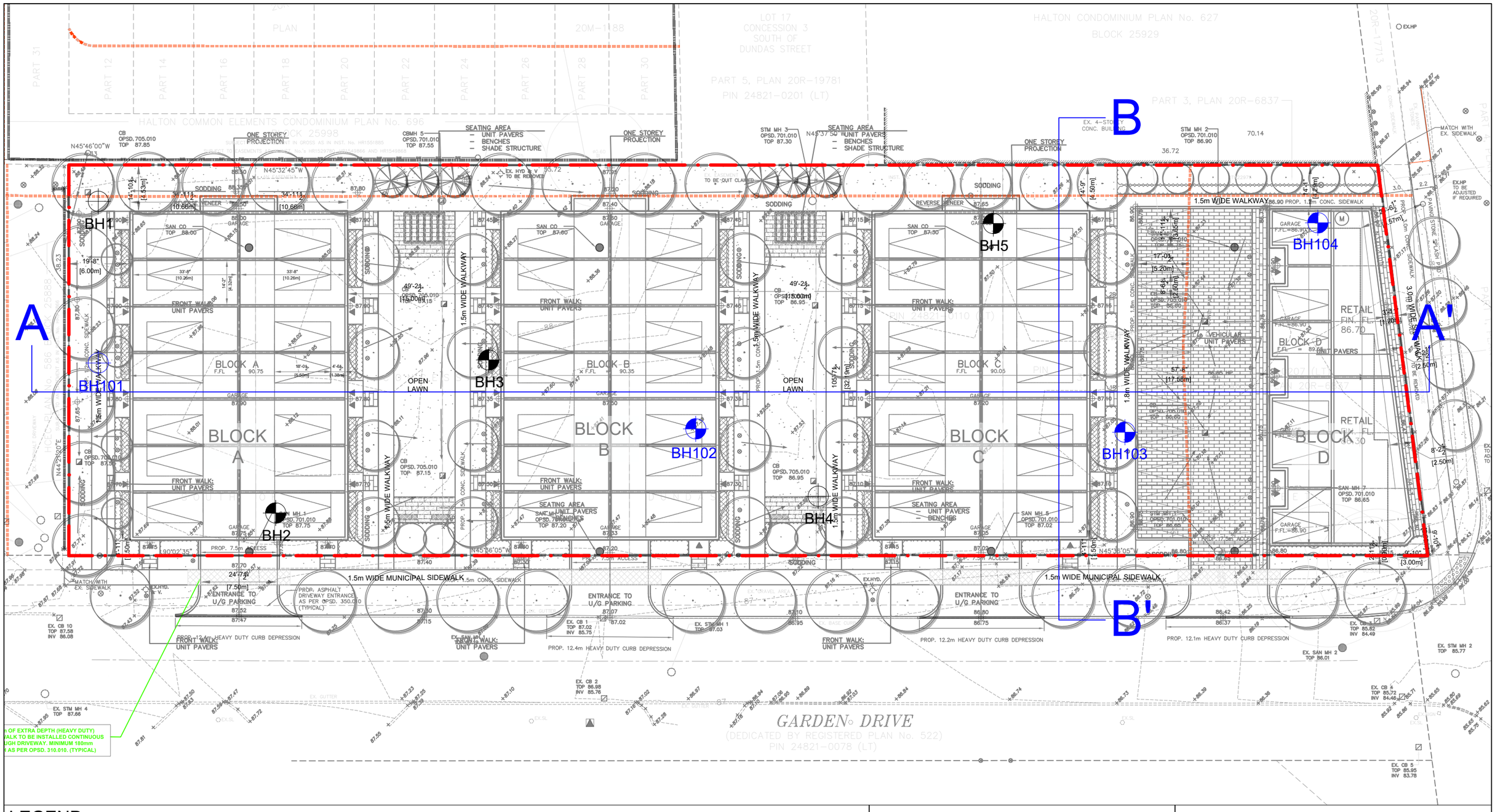
NOTE:

mbgs - meters below ground surface

masl - meters above sea level

N/A - Not Applicable

NF - Not Found



LEGEND:

- PROPERTY BOUNDARY
- ⊕ ⊕ BOREHOLE/MONITORING WELL INSTALLED BY EXP, 2021
- ⊕ ⊕ BOREHOLE/MONITORING WELL INSTALLED BY TERRAPROBE, 2017

PROJECT NORTH
TRUE NORTH

0 2 5 10 20
SCALE (m)

MCR ENGINEERS LTD.
GEO-ENVIRONMENTAL CONSULTANTS

103, 109, 113-131 GARDEN DRIVE, OAKVILLE, ONTARIO

BOREHOLE
LOCATION PLAN

Project No.	Date	Drawn by:	Checked by:	Drawing No.
G5865	JUNE 2024	CM	ST	1

Drawing Notes: Image drafted from property survey, Toronto Maps, Google Maps, and site inspections. Not for construction purposes.

APPENDIX F

WATERMAIN DESIGN CALCULATIONS &
FIRE FLOW TEST RESULTS
BY: APPLIED FIRE

Hazen-Williams Equation for Pressure Loss in Pipes

Specified Data

l = length of pipe (m)	184
c = Hazen-Williams roughness constant	140
q = volume flow (L/s)	150
dh = inside diameter (mm)	200

Calculated Pressure Loss

f = friction head loss in mm of water per 100 m of pipe (mm H20 per 100 m pipe)	8713.38
f = friction head loss in kPa per 100 m of pipe (kPa per 100 m pipe)	85.48
Head loss (mm H20)	16032.63
Head loss (kPa)	157.28
Head loss (psi)	22.81

Calculated Flow Velocity

v = flow velocity (m/s)	4.77

FIRE FLOW AT 20 PSI CALCULATION

From fire flow test, fill in ***info:*** Applied Fire

Static Pressure, Ps: 62 PSI

Test No.	# of Nozzles	Nozzle Diameter (inches)	Discharge Coeff.	Residual Pressure, Pr (PSI)	Pitot Pressure, Pp (PSI)	Discharge, Qr (US GPM)
1	1	2.5	0.9	61	58	792
2	2	2.5	0.9	60	36	1503

To calculate flow @ 20 PSI 20 PSI

Qf = Qr x {(Ps – 20)/(Ps – Pr)} ^0.54

Where, Qf = Fire flow in gpm at 20 psi

Qr = Actual flow in gpm	792
Ps = Static pressure	62
Pr = Residual pressure	61

Qf = 5960 Based on test No. 1

Qf = 11165 Based on test No. 2

Summary Chart

Flow Rat (US GPM)	Flow Rate (L/s)	Flow Rate (L/m)	Head (PSI)
0	0.0	0	62
792	50.0	2998	61
1503	94.8	5689	60
11165	704.4	**42264**	**20**

Applied
Fire Technology Inc.
Since 1987
Design • Consulting • Testing • Inspection

WATER SUPPLY TEST

Name of risk: ..... File No.: .....

Address: 109 GARDEN DR ..... Test by: AGTI

Municipality: OAKVILLE ONT. ..... Date: JULY 2. 2024

SYSTEM DATA:

Size of Main: 8" ..... Dead End: ..... Two Ways: ✓ ..... Loop: .....

Source Reliable: YES ..... If not explain: .....

Comments: .....

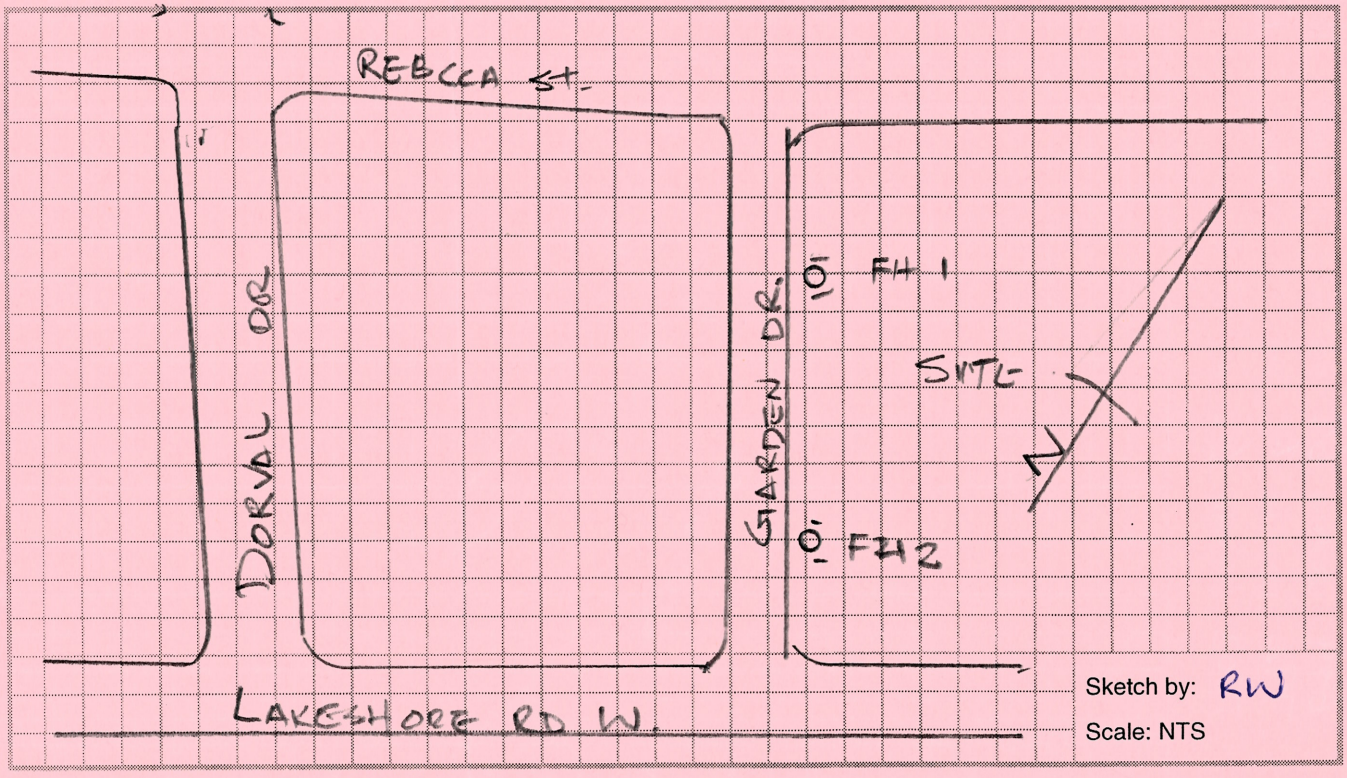
TEST DATA:

Location of test fire hydrants; Residual: #1 128 GARDEN DR OAKVILLE .....

Flow: #2 109 GARDEN DR. OAKVILLE .....

Static pressure 62 ..... psi Time: 8:02 ..... A.M. — ..... P.M.

Test No.	No. of Outlets	Orifice Size (in.)	Pitot Reading (psi)	Equivalent Flow gpm (U.S.)	Total Flow gpm (U.S.)	Residual Pressure (psi)	Comments
1	1	1¾	58	696	694	62	0.997
2	1	2½	20	834	792	61	0.95
3	2	2½	18, 18	791, 791	1503	60	0.95
4							



Name and address of municipal authority who should receive a copy.

..... PUC .....

STATIC: 63 PSI

(1) 694 USGPM@ 62 PSI

(2) 792 USGPM@ 61 PSI

(3) 1503 USGPM@ 60 PSI

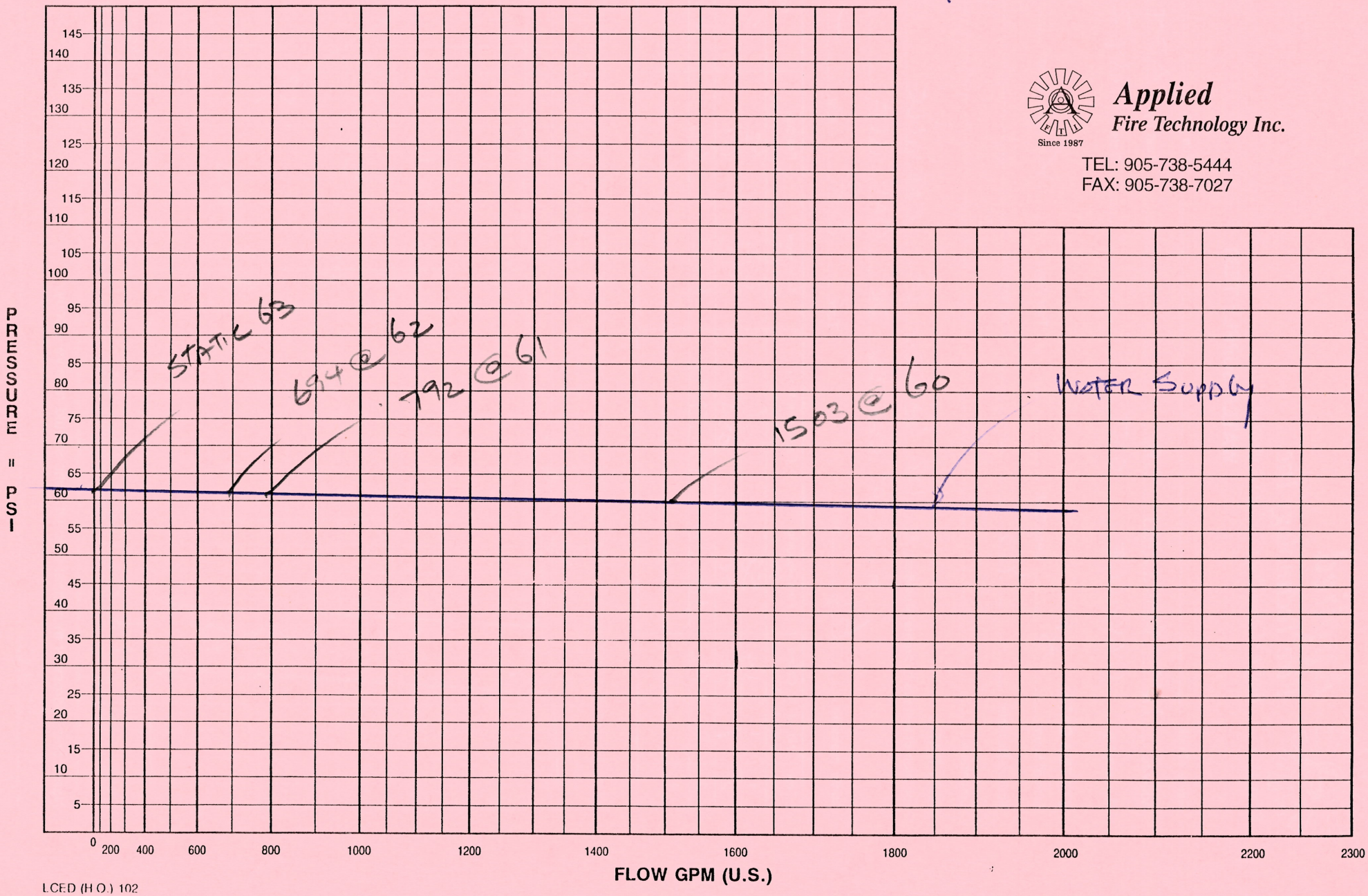
NAME OF RISK: _____ FILE NO.: _____

STREET: 109 GARDEN DRIVE,

CITY: OAKVILLE, ON.

DATE: July 2, 2024 BY: AFTI

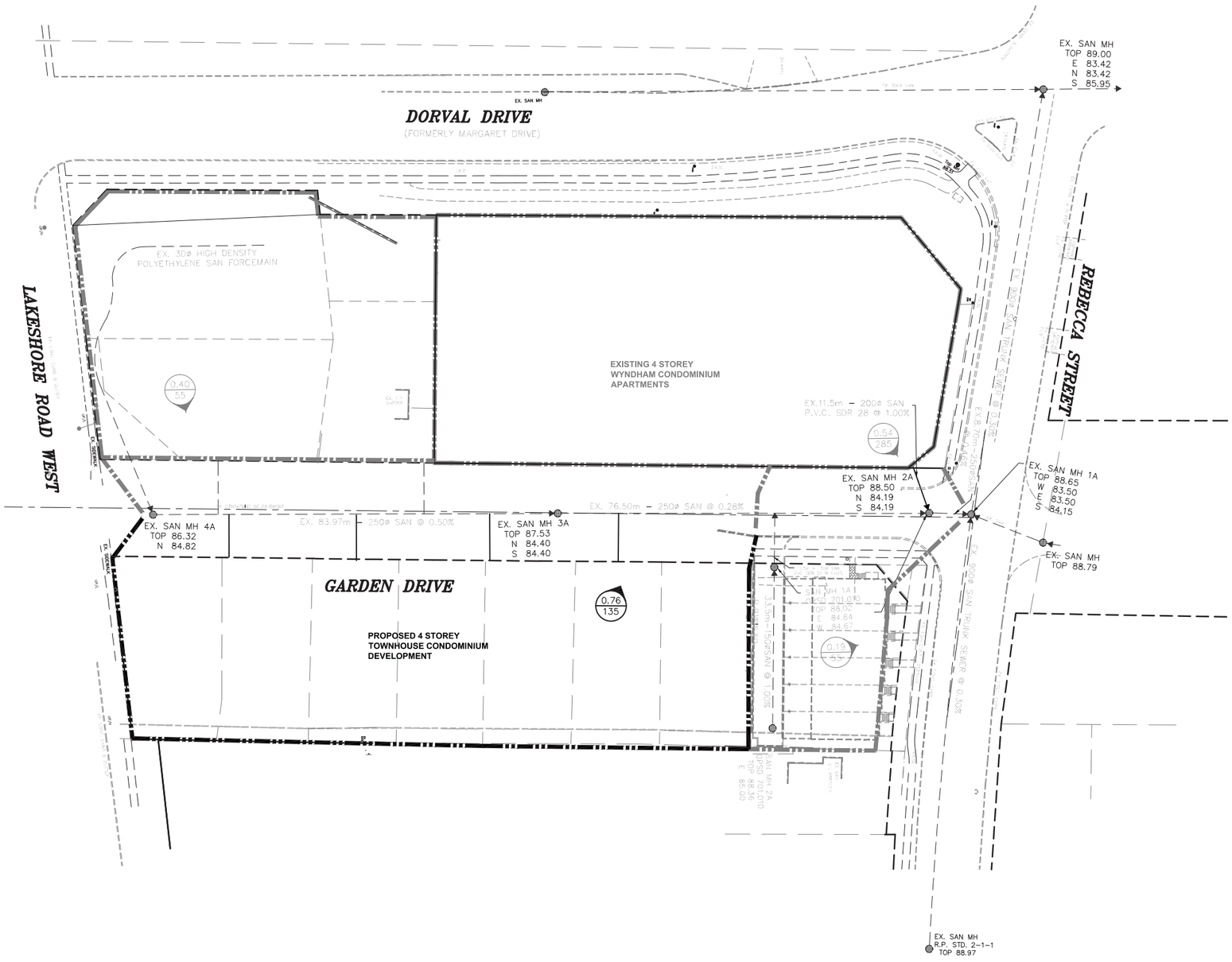
Applied
Fire Technology Inc.
Since 1987
TEL: 905-738-5444
FAX: 905-738-7027



LCED (H.O.) 102

APPENDIX G

SANITARY DRAINAGE PLAN &
SANITARY DESIGN SHEET



LEGEND

- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- DRAINAGE AREA BOUNDARY
- 3.19 / 12 — AREA (HECTARES) / POPULATION
- LIMIT OF PROPERTY

SKIRA & ASSOCIATES LTD.
CONSULTING ENGINEERS
3464 Semenyk Court, Suite 100, Mississauga, Ontario L5C 4P8
Tel. (905) 276-5100 Fax. (905) 270-1936 Email - info@skiraconsult.ca

SANITARY DRAINAGE SYSTEM

PROJECT No. 224-OK30	**FIGURE SAN**
DATE - OCT.2024	
SCALE - 1 : 1000 / DRAWN BY - A.A.	

SUBDIVISION : **BRIGHTSTONE**
GARDEN DRIVE
MAJOR DRAINAGE AREA : **TOWN OF OAKVILLE**
SP
CONSULTANT : **SKIRA & ASSOCIATES LTD.**

REGION OF HALTON

SANITARY SEWER DESIGN CHART

As Constructed

q (m3/capita/day)= 0.275
I (L/s/Ha) = 0.286
n= 0.013

SHEET No. 1 of 1
PROJECT No. : 224-OK30
DESIGNED BY : M.J.
DATE : OCT.2024

LOCATION	FROM MH	TO MH	L	TRIBUTARY AREA (Ha) Increment Res	Comm	Ind	TOTAL	POPULATION TRIBUTARY (per Ha) Increment Res	Comm	Ind	TOTAL	Average L/s increment	Average L/s TOTAL	PEAK FACTOR	MAX L/s	INFIL-TRATION L/s	MAX FLOW EXPECT. L/s	SEWER SIZE	SLOPE	Q	V Full Flow	Va Actual Flow	PIPE Percent full		REMARKS
	MH#	MH#	m															mm	%	L/s	m/s	m/s			
GARDEN DR	TO	EX.4A		0.4			0.40	22			22.0	0.07002	0.07002	3.50	0.25	0.11	**0.36**								
PROP.TOWNS	EX.4A	EX.3A	83.97	0.76			1.16	102.6			124.6	0.39659	0.39659	3.37	1.34	0.33	**1.67**	250	0.50	**43.9**	0.87	0.56	3.80%		
	EX.3A	EX.2A	76.5	0.19			1.35	25.65			150.3	0.47823	0.47823	3.35	1.60	0.39	**1.99**	250	0.28	**32.9**	0.65	0.56	6.00%		
REBECCA ST	EX.2A	EX.1A	8.7	0.54			1.89	153.9			304.2	1.00679	1.00679	3.26	3.28	0.54	**3.82**	250	0.46	**42.2**	0.83	0.56	9.00%		
900 TRUNK CONNECTION																		**900**	**0.30**	**1033.0**	0.67	0.56			