STORMWATER MANAGEMENT IMPLEMENTATION REPORT

Creditmills Development Corp

Type of Document:
Final Report

Project Name:
1295 Sixth Line, Oakville

Project Number:
ALL-23015173-A0

Prepared and Reviewed By:
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Approved By:
Scott Passmore

Date + Time Submitted:
2024-01-25

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1. Introduction

EXP Services Inc. has been retained by Rosethorn Developments ("Owner") to prepare a Stormwater Management Report (SWM) in support of a site plan application on approximately 0.38 ha of land in the Town of Oakville, Region of Halton. The subject land is municipally known as 1295 Sixth Line, located on the east side of Sixth Line. Refer to Figure 1 for the site location plan.

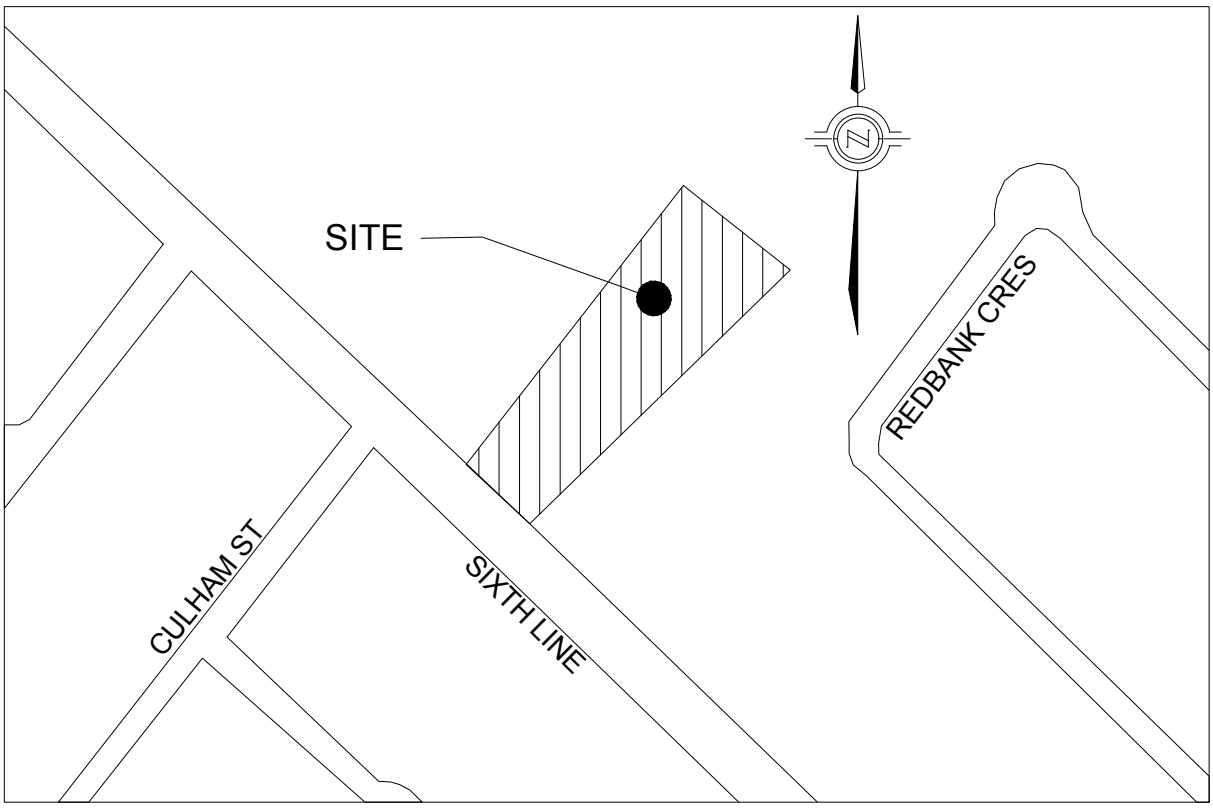
The subject lot is currently occupied by a residential unit with driveway access from Sixth Line. The proposed development will include a six-storey apartment building with 70 units within 6,160.4 m^2 of Gross Floor Area (GFA). A total of 80 parking spaces will be provided through one level of underground parking. Refer to the Owner's Site Plan located in Appendix A for reference.

Finally, the objective of this SWM Report is to give an overview of the proposed SWM strategy while demonstrating how the Town of Oakville drainage criteria have been met.

2. Site Characteristics

The development site is 0.38 hectares in size and is bound by Sixth line to the west, a residential apartment building to the south, and the White Oaks secondary school park block to the north and east. The site is located within the Sixteen Mile Creek watershed outside of Conservation Halton's (CH) regulated area. It has also been confirmed to be outside of the Ministry of Transportation Ontario (MTO) controlled area. Refer to figure 1 for Site Location Plan

The application proposed is to redevelop the site into a six (6) storey residential apartment building with 70 new units including one level of underground parking. Driveway access for the proposed residential apartment building will be to Sixth Line. Refer to the Preliminary Site Plan (prepared by Rick Brown and Associates Inc) in Appendix A for additional information.



Project:	1295 SIXTH LINE, OAKVILLE, ON		
Title:	LOCATION PLAN		
Approved by: S.P	Date: JAN, 2024	Project No.: ALL-23015173-A0	
Drawn by: N.M	Scale: N.T.S.	Figure no.: FIG-01	

E:\MRK\ALL-23015173-A0\60 Execution\65 Drawings\Civil\xxxx-FIG-01 LOCATION PLAN.dwg

3. Existing Drainage Conditions

To assess the existing site topography within and surrounding the site, EXP staff reviewed Town Record Drawings, VuMap Software and Town of Oakville GIS Mapping software. The existing site topography shows elevations falling in the range of approx. 1.5 m from the northeast corner of the property to the southwest corner. Currently, there is a driveway access to the site on the west side to Sixth Line. Refer to the topographic information taken from Town of Oakville's GIS Mapping Software which is included in Appendix A for reference.

There is an existing 525 mm diameter storm sewer located on Sixth Line which flows in the southerly direction. Record drawings do not show any connection to the existing 525 mm diameter storm sewer from the property. Existing property service cards and internal plumbing have been requested but were not available at the time this report was submitted.

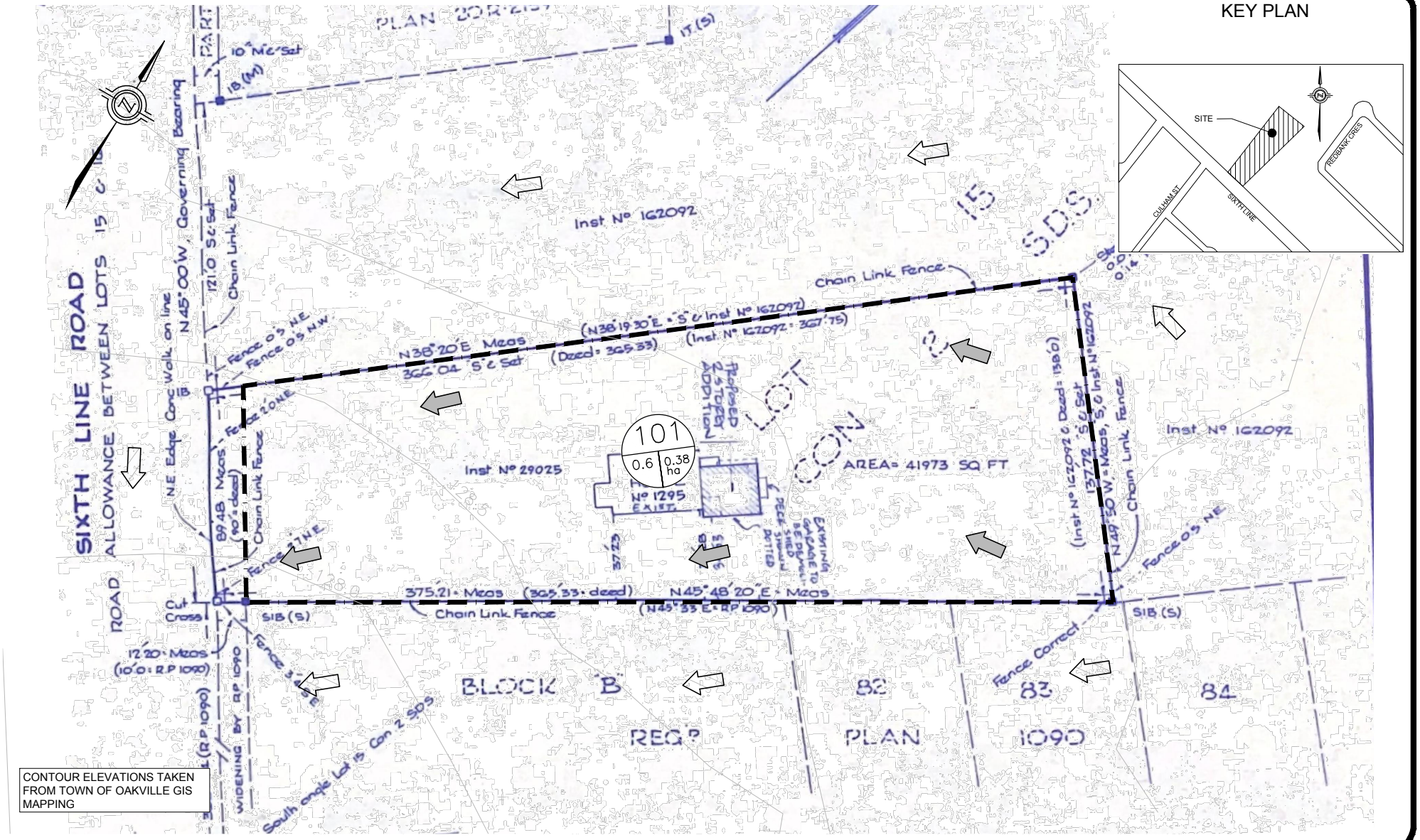
In order to calculate the theoretical peak flow runoff rates for the site under existing conditions, a runoff coefficient of C=0.60 was used. Refer to existing conditions drainage plan on Figure 2 for additional information.

Using the land area of 0.38 ha, a runoff coefficient of 0.60, and time of concentration of 10min, the following peak flows were calculated for the site and can be summarized in Table 1 below:

Table 1: Peak Flow Summary (Existing Conditions):

Contributing Area	ID#	Area (ha)	Peak Flow -5 Year (L/sec)	Peak Flow -25 Year (L/sec)	Peak Flow -100 Year (L/sec)
Entire Site	101	0.38	72.9	103.5	128.2

The peak flow runoff calculations can be found in Appendix B. After reviewing the Peak Flow Summary table and the information provided during the pre-consultation meetings, the maximum allowable release rate of the site is 72.9 L/s.



LEGEND

- PROPERTY LINE
- EXISTING CONTOUR (0.5m / 1.0m)
- EXISTING GRADE
- OVERLAND FLOW DIRECTION
- EXTERNAL FLOW DIRECTION
- STORM DRAINAGE ID NUMBER
- AREA (ha)
- RUNOFF COEFFICIENT
- CATCHMENT BOUNDARY

Project:	1295 SIXTH LINE OAKVILLE, ON		
Title:	EXISTING CONDITIONS DRAINAGE PLAN		
Approved by: S.P	Date: JAN. 2024	Project No.: ALL-23015173-A0	
Drawn by: N.M	Scale: N.T.S.	Figure no.: FIG-02	

4. Proposed Drainage Conditions

4.1 Proposed Grading

The proposed grading design generally maintains the existing drainage patterns for the site, while directing drainage away from building entrances and ensuring all major overland flow is conveyed in the southwesterly direction. High points within the parking areas have been positioned to minimize potential ponding within the parking and landscaped areas.

Overall, the preliminary grading design for the site is to be completed in concert with the proposed stormwater management (SWM) strategy for the site which includes a network of high and low points, and inlet designed to capture and attenuate the 100-year storm event. For additional grading details refer to the Preliminary site Servicing and Grading Plan provided in Appendix D.

4.2 Groundwater

After reviewing the Owner's Preliminary Site Plan it was noted that the plan is to incorporate one level of underground parking to service the parking needs of the proposed development. EXP staff reviewed the Town of Oakville's standards and recommend that a hydrogeological investigation be conducted as part of the detailed design process. Once completed, EXP Staff will review the findings of the investigation and provide a groundwater management strategy that is in accordance with the Town of Oakville Standards. It is noted that as per the Town Standards and the notes provided within the site's pre-consultation meeting that the Town of Oakville does not support the permanent dewatering of underground parking structures into municipal infrastructure.

4.3 Methodology

The following is a summary of the key design standards that have been referenced as part of the proposed SWM strategy for the site:

- Town of Oakville Development Engineering Procedures and Guidelines;
- Sixteen Mile Creek Subwatershed Study;
- MOE Stormwater Management Planning and Design Manual; and,
- Conservation Halton Policies and Guidelines for Administration of O.Reg. 162/06.

For the required peak storm runoff and SWM storage calculations, the Rational Method was selected which is deemed appropriate for the size of the subject site.

4.4 Proposed Conditions Peak Flows

Based on the proposed grading and servicing design for the site, each catchment area was reviewed and calculated with corresponding runoff coefficient. The runoff calculations can be found in Appendix C, where the corresponding drainage area and runoff coefficient is shown on Figure 3.

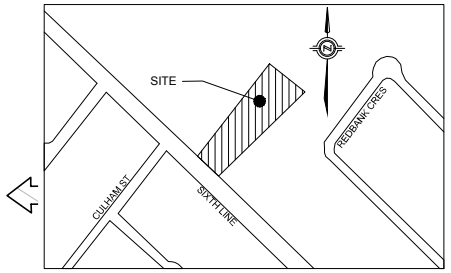
The theoretical peak flow runoff rates were then calculated for each year storm event using the conservatively estimated runoff coefficients and a time of concentration of 10 min, where the results are summarized in Table 2 below:

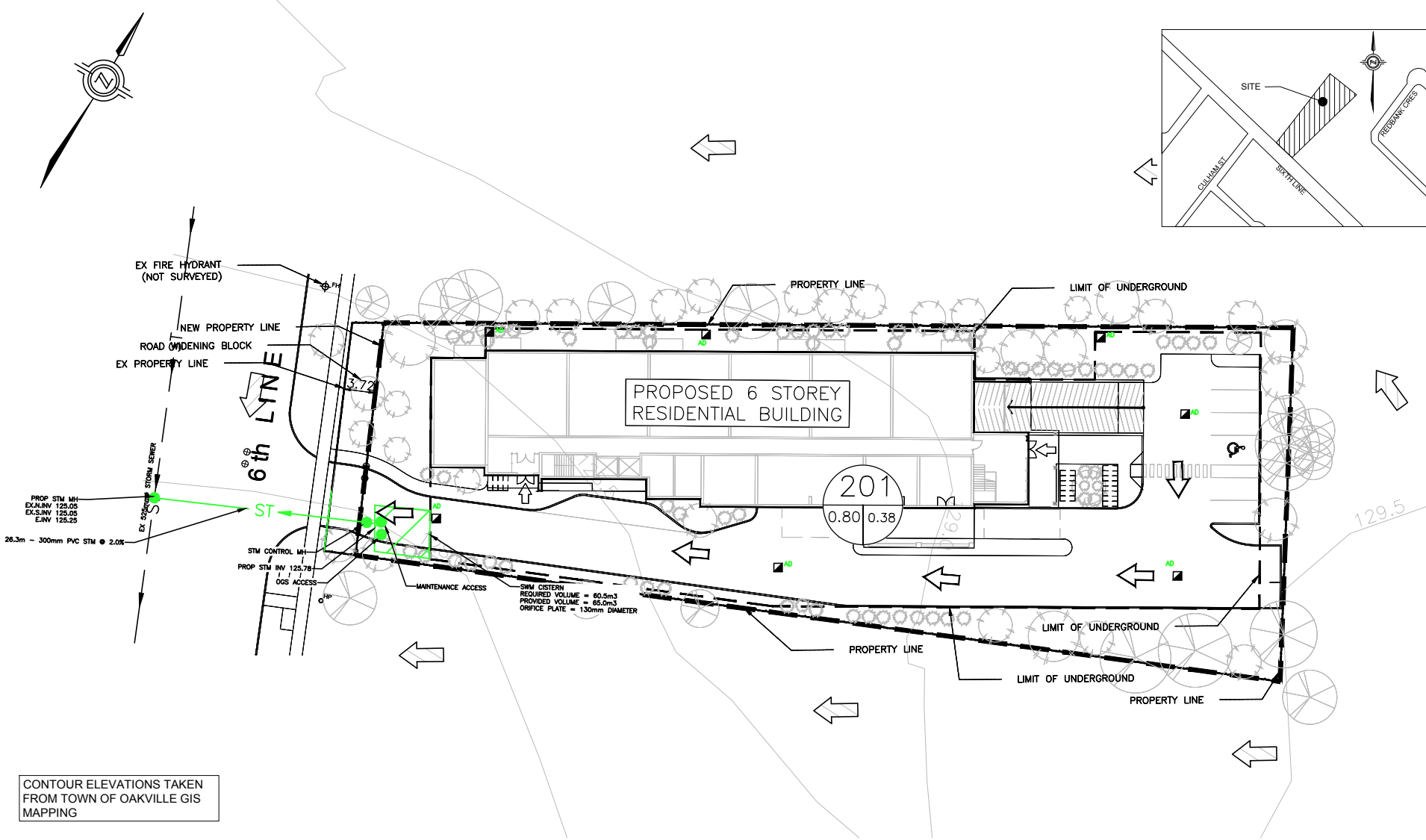
Table 2: Peak Flow Summary (Proposed Conditions – no SWM Controls)

Contributing Area	ID#	Area (ha)	Peak Flow -5 Year (L/sec)	Peak Flow -25 Year (L/sec)	Peak Flow -100 Year (L/sec)
Controlled Area	201	0.38	97.2	138.0	170.9
Total =		**0.38**	**97.2**	**138.0**	**170.9**

The above peak flows under proposed conditions were then reviewed to determine the SWM storage measures to attenuate flows to meet the maximum allowable release rate for the site. The peak flow runoff calculations can be found in Appendix C.

KEY PLAN





CONTOUR ELEVATIONS TAKEN FROM TOWN OF OAKVILLE GIS MAPPING

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR (0.5m / 1.0m)
- EXISTING GRADE
- OVERLAND FLOW DIRECTION
- EXTERNAL FLOW DIRECTION
- STORM DRAINAGE ID NUMBER
- AREA (ha)
- RUNOFF COEFFICIENT
- CATCHMENT BOUNDARY

Project:	1295 SIXTH LINE OAKVILLE, ON		
Title:	PROPOSED CONDITIONS DRAINAGE PLAN		
Approved by: S.P	Date: JAN. 2024	Project No.: ALL-23015173-A0	
Drawn by: N.M	Scale: N.T.S.	Figure no.: FIG-03	

4.5 Proposed SWM Quantity Controls

As previously mentioned, the proposed SWM design for the site requires all flows up to an including the 100-year storm event are to be controlled to the maximum allowable release rate of the pre-development 5-year flow (C=0.60) for all storm events. Therefore, in order to determine required the required SWM quantity controls for the site, the required SWM Cistern volume was calculated using the total controlled area.

Therefore, the 100-year peak flow for the controlled area was calculated using an orifice diameter of 130 mm which provides an actual release rate of 70.8 L/s resulting in a minimum required storage volume of 60.5 m^3. A summary of the SWM Cistern requirement is summarized in Table 3 below:

Table 3: SWM Cistern Summary

Phase	Area (ha)	100-year Flows to be Controlled (L/sec)	Net Release Rate for SWM Cistern (L/sec)	Groundwater Pumping Rate (L/sec)	SWM Cistern Actual Release Rate (L/sec)	SWM Cistern Required Storage (m^3)	SWM Cistern Provided Storage (m^3)
Total	0.38	170.9	72.9	0.0	70.8	60.5	65

The resultant storm runoff flows from the site with the proposed SWM quantity controls were calculated which can be summarized in Table 4 below:

Table 4: Peak Flow Summary (Proposed Conditions – with SWM Controls)

Contributing Area	ID#	Area (ha)	Peak Flow -5 Year (L/sec)	Peak Flow -25 Year (L/sec)	Peak Flow -100 Year (L/sec)
Controlled Area	201	0.38	70.8	70.8	70.8
Total =		**0.38**	**70.8**	**70.8**	**70.8**

Therefore, site area will be captured and conveyed to the SWM cistern with an outlet pipe of 300 mm diameter before outletting to the existing 525 mm diameter storm service and sewer on Sixth Line. The SWM storage calculations and additional servicing details have been provided in Appendix C.

4.6 Proposed SWM Quality Controls

The Town of Oakville requires that all developments fall into accordance with the applicable approved subwatershed Plan or the established criteria for the receiving body. This site falls within the Sixteen Mile Creek subwaterhed. The stormwater quality control strategy for this site will include on site quality control measures including Best Management techniques which include promoting infiltration within grassed areas and directing roof leaders to available softscape areas. All flows captured by the sites inlet system will be directed to the underground SWM Cistern where an Oil-grit Separator (OGS) has been proposed to provide SWM quality control prior to the

flows being discharged to the municipal system. The proposed OGS system will be sized using the ETV particle size distribution by the manufacturer as part of the detailed design process.

4.7 Water Balance

The objective of the providing water balance measures are to provide best efforts to preserve pre-development hydrology after development. This can be achieved through a combination of various stormwater management and Low Impact Development (LID) practices such as rainwater harvesting/reuse or promoting infiltration. EXP staff carefully assessed the site conditions and the proposed preliminary site plan to review the possible measures to optimize water balance for the site. However, based on the Owner's site plan any proposed measures intended to promote infiltration within the building and underground parking structure envelope are not deemed to be possible. Therefore, EXP staff came up with two alternative methods that will be implemented within the site to promote water reuse and infiltration. The first being a rainwater harvester being incorporated into the underground SWM cistern where the collected water can be reused within the buildings internal plumbing. The second method would be incorporating LID swales within the proposed landscape areas outside of the underground parking structure envelope where applicable to promote infiltration. In summary, any proposed rainwater re-use and LID methods are to be considered as part of the future detailed design process.

5. Erosion and Sediment Controls during Construction

During construction it is imperative that the contractor installs and maintains all the necessary erosion and sediment control (ESC) measures to ensure there is no negative impact to surrounding properties and the local municipal sewer systems.

Outside the site, sediment control measures such as catchbasin silt sacks are to be installed inside the existing catchbasins along Sixth Line immediately adjacent to the site. These silt sacks are to be monitored and maintained after all rainfall events. Within the site, silt fencing is required to be installed around the perimeter of the sediment to ensure during grading and building activity, that sediment is not transported overland during a rainfall event to neighbouring properties. Similar to the required silt sacks within the catchbasins along Sixth Line, the silt fence is to be monitored after every rainfall event and repaired as necessary. Mud tracking from construction truck transport is to be mitigated through the use of a proposed mud mat and any other maintenance requirements necessary by the contractor before driving back on municipal roads.

6. Conclusions

Overall, our findings outlined in this SWM report demonstrate that the proposed SWM strategy can meet the requirements of the proposed development and the Town of Oakville and Halton Region Drainage criteria, where the results can be summarized as follows:

- Based on the Town of Oakville's current SWM criteria, a pre-development runoff coefficient of C=0.60 will result in a maximum allowable release rate of approximately 75.9 L/s for the site under the 5-year storm event
- Based on the proposed grading and servicing design for the site, all post development runoff up to and including the 100-year storm event will be captured and controlled within a proposed underground SWM cistern before releasing flows to the existing 525 mm diameter storm sewer on Sixth Line
- The required SWM quantity controls can met with a minimum SWM cistern storage volume of 60.5 m^3 designed to attenuate all storm events up to and including the 100-year storm to allowable release rates
- The required SWM quality controls can be met with a proposed oil and grit filtration system positioned within the proposed SWM cistern
- Groundwater can be adequately managed in accordance to Town of Oakville standards where a hydrogeological investigation is recommended as part of the detailed process
- Emergency overland flow can be safely conveyed through the site to Sixth Line based on the proposed preliminary grading for the site

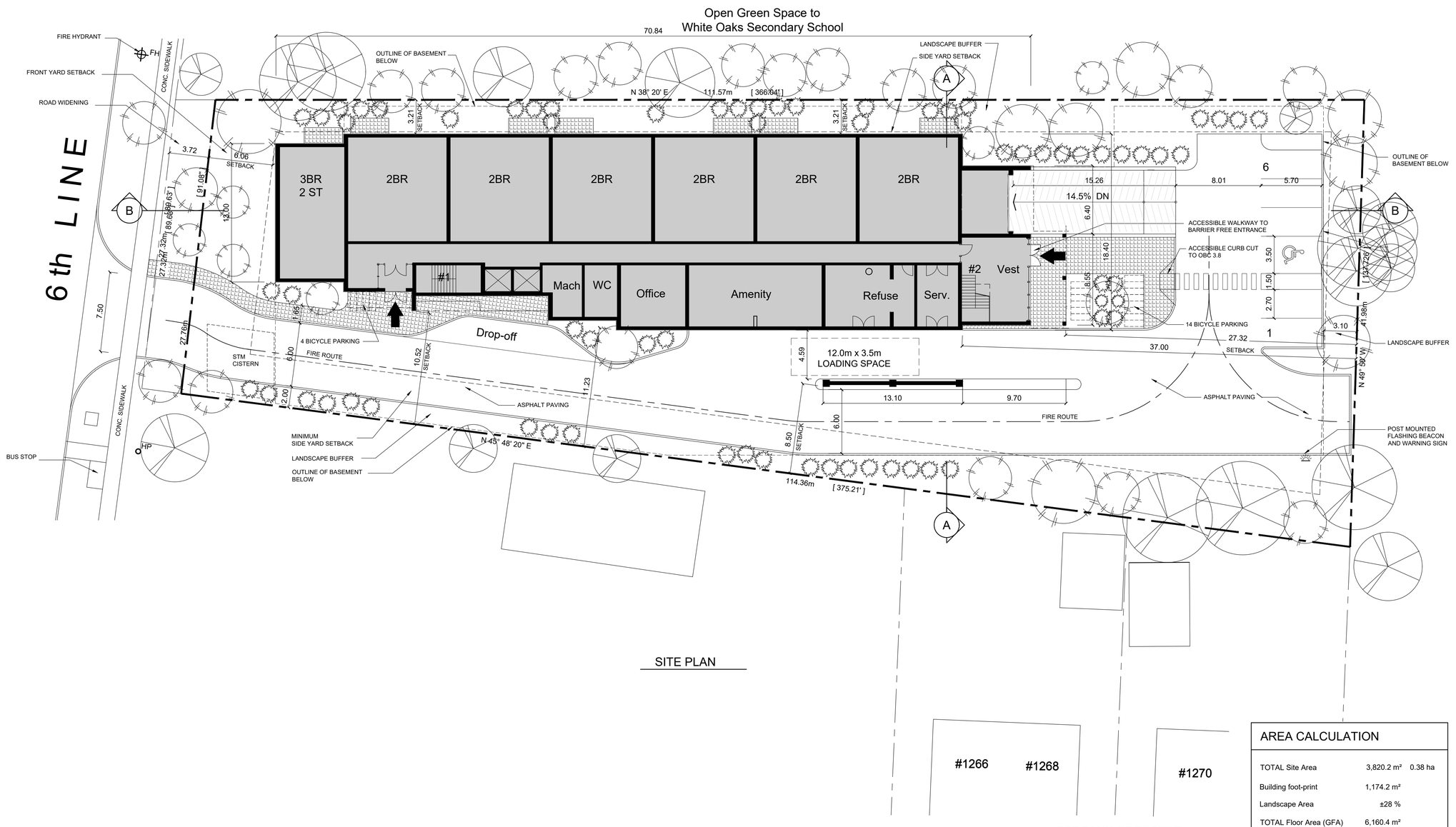
Sincerely,

EXP Services Inc.

Scott W. Passmore, P.Eng.
Vice President, Land Development

Nicholas Melatti, B.Eng.
Project Coordinator, Land Development

Appendix A – Site Plan and Topographic Survey



SITE PLAN

UNIT MIX

FLOOR	GFA	1 BR	2 BR	3 BR	TOTAL	NRA	PKG
GROUND	1128.6 m²	0	6	-	6	650.8 m²	9
SECOND	1113.9 m²	0	10	1	11	865.3 m²	15.5
THIRD	1025.0 m²	11	2	1	14	803.1 m²	14.5
FOURTH	1025.0 m²	11	2	1	14	803.1 m²	14.5
FIFTH	1025.0 m²	11	2	1	14	803.1 m²	14.5
SIXTH	842.6 m²	9	2	0	11	624.0 m²	11.5
TOTAL	6160.1 m²	42	24	4	70	4549.4 m²	80

AREA CALCULATION

TOTAL Site Area	3,820.2 m²	0.38 ha
Building foot-print	1,174.2 m²	
Landscape Area	±28 %	
TOTAL Floor Area (GFA)	6,160.4 m²	
No. of Units	70units	
Building Height	6 storeys	
TOTAL Parking required	80 spaces	
TOTAL Parking provided	80 spaces	
Bicycle Parking required	70 spaces	
Bicylcle Parking provided	52 + 18V = 70 spaces	
Units / hectare - proposed	184.2 units/ha	
Floor Space Index	1.61	
TOTAL Unit Area	4,605.7 m²	

#	ISSUED FOR	
1	ISSUED FOR PRELIMINARY REVIEW	07 /03/23
2	APARTMENT DESIGN REVIEW	14 /02 /23
3	REVISED DRIVEWAY ENTRANCE	17 /03 /23
4	ISSUED FOR PRELIMINARY REVIEW	11 /04/ 23
5	ISSUED FOR PRELIMINARY REVIEW	24 /11/23
6	ISSUED FOR O.P.A.	15 /12/23
7	ISSUED FOR O.P.A.	06 /02/24

GENERAL NOTES:

1. DO NOT SCALE THIS DRAWING. CHECK ALL DIMENSIONS ON SITE AND REPORT ANY DISCREPANCIES TO THE DESIGNER BEFORE PROCEEDING.
2. THIS IS AN METRIC DRAWING.
3. LAST APPROVED DRAWINGS ONLY TO BE USED FOR CONSTRUCTION.
4. SUBMIT ALL SHOP DRAWINGS (SUCH AS TRUSS ETC.) TO THE DESIGNER FOR REVIEW.
5. ALL CONSTRUCTION AND SERVICES MUST COMPLY WITH OBC (ONTARIO BUILDING CODE)

PRELIMINARY
NOT FOR
CONSTRUCTION

RICK BROWN & ASSOCIATES INC.
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SUITE 30, 2nd FLOOR
MISSISSAUGA, ON, L5C 4E5

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BUILDING NORTH

NORTH

PROJECT NAME & ADDRESS:

PROPOSED RESIDENTIAL INFILL DEVELOPMENT

1295 SIXTH LINE,
OAKVILLE, ON

SCALE:	DATE:	DRAWN BY:	JOB No.:
1 : 200	JUNE 27, 2022	RB / MS	202212

SITE PLAN

DRAWING No.: SP1

November 28, 2023 8:56:45 AM
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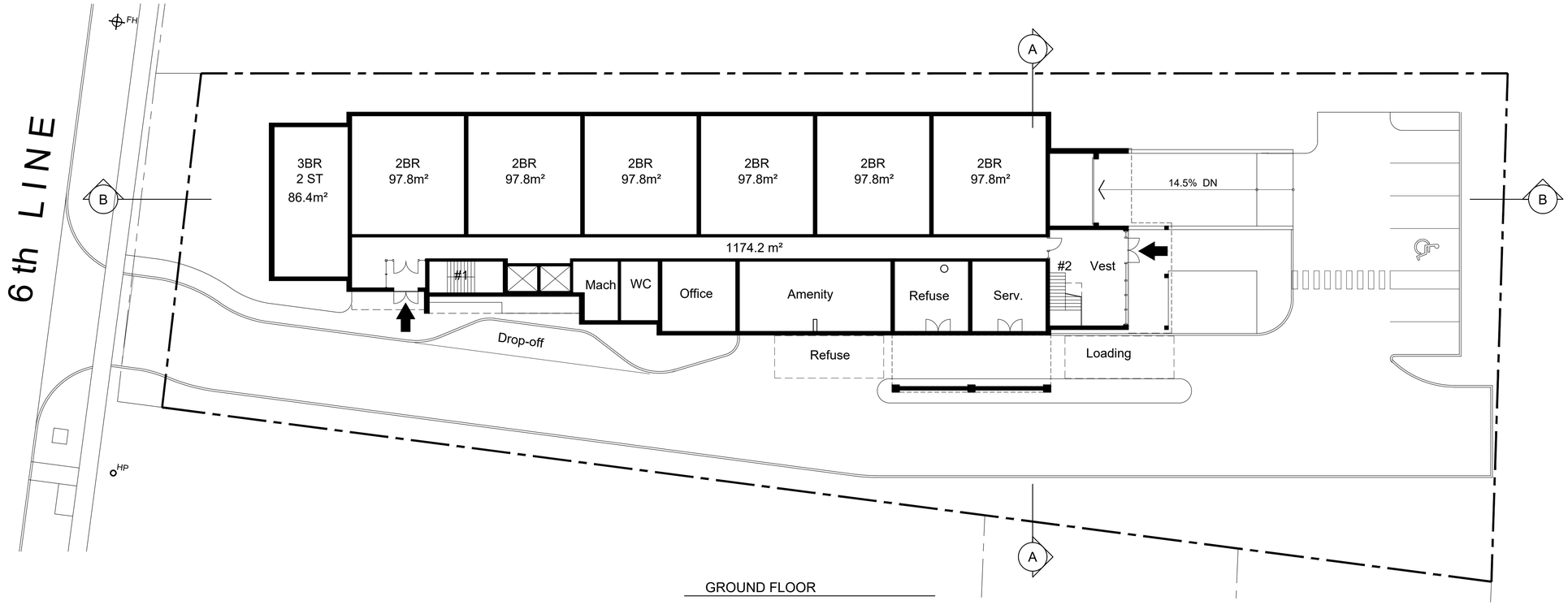
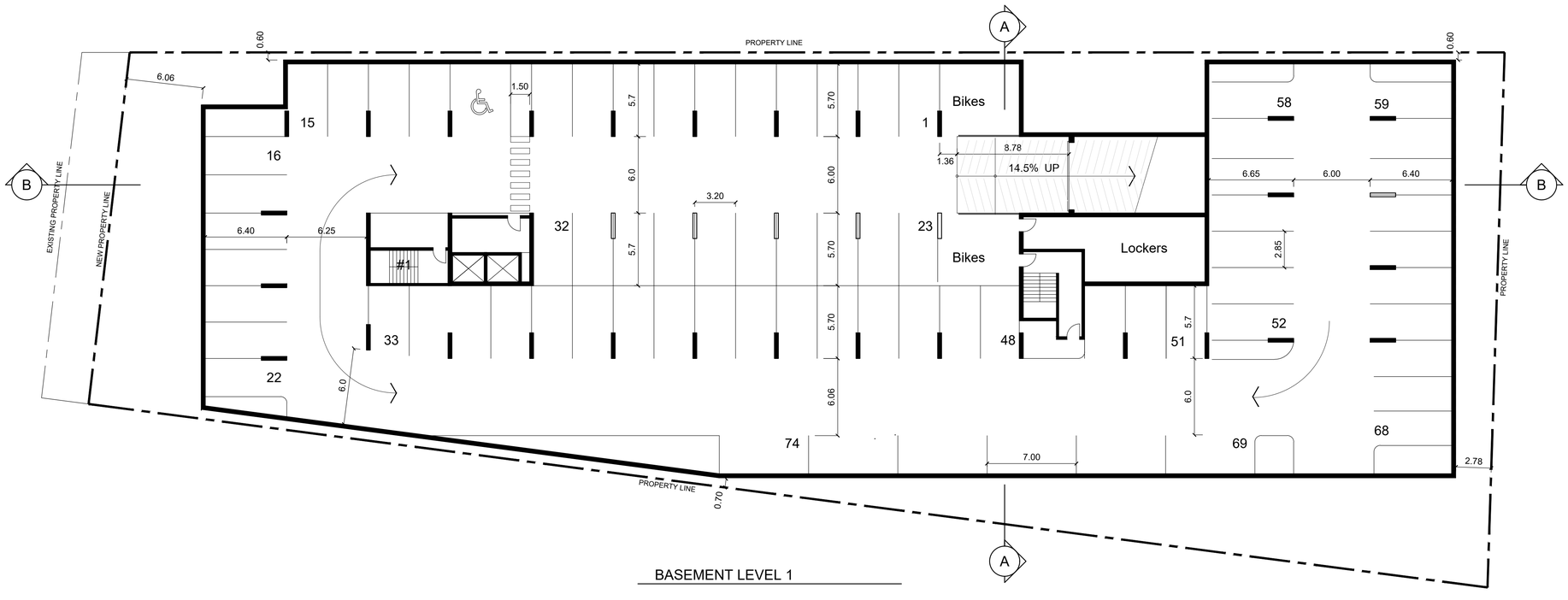


GROUND FLOOR



BASEMENT LEVEL 1

#	ISSUED FOR	
1	ISSUED FOR PRELIMINARY REVIEW	07 /03/23
2	APARTMENT DESIGN REVIEW	14 /02 /23
3	REVISED DRIVEWAY ENTRANCE	17 /03 /23
4	ISSUED FOR PRELIMINARY REVIEW	11 /04/ 23
5	ISSUED FOR PRELIMINARY REVIEW	24 /11/23
6	ISSUED FOR O.P.A.	15 /12/23

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BUILDING NORTH

NORTH

PROJECT NAME & ADDRESS:
PROPOSED RESIDENTIAL INFILL DEVELOPMENT
1295 SIXTH LINE,
OAKVILLE, ON

SCALE:	DATE:	DRAWN BY:	JOB No.:
1 : 200	JUNE 27, 2022	RB / MS	202212

SITE PLAN and GROUND FLOOR BASEMENT PARKING

DRAWING No.: P-01

November 28, 2023 8:56:45 AM
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OSBORNE CRES
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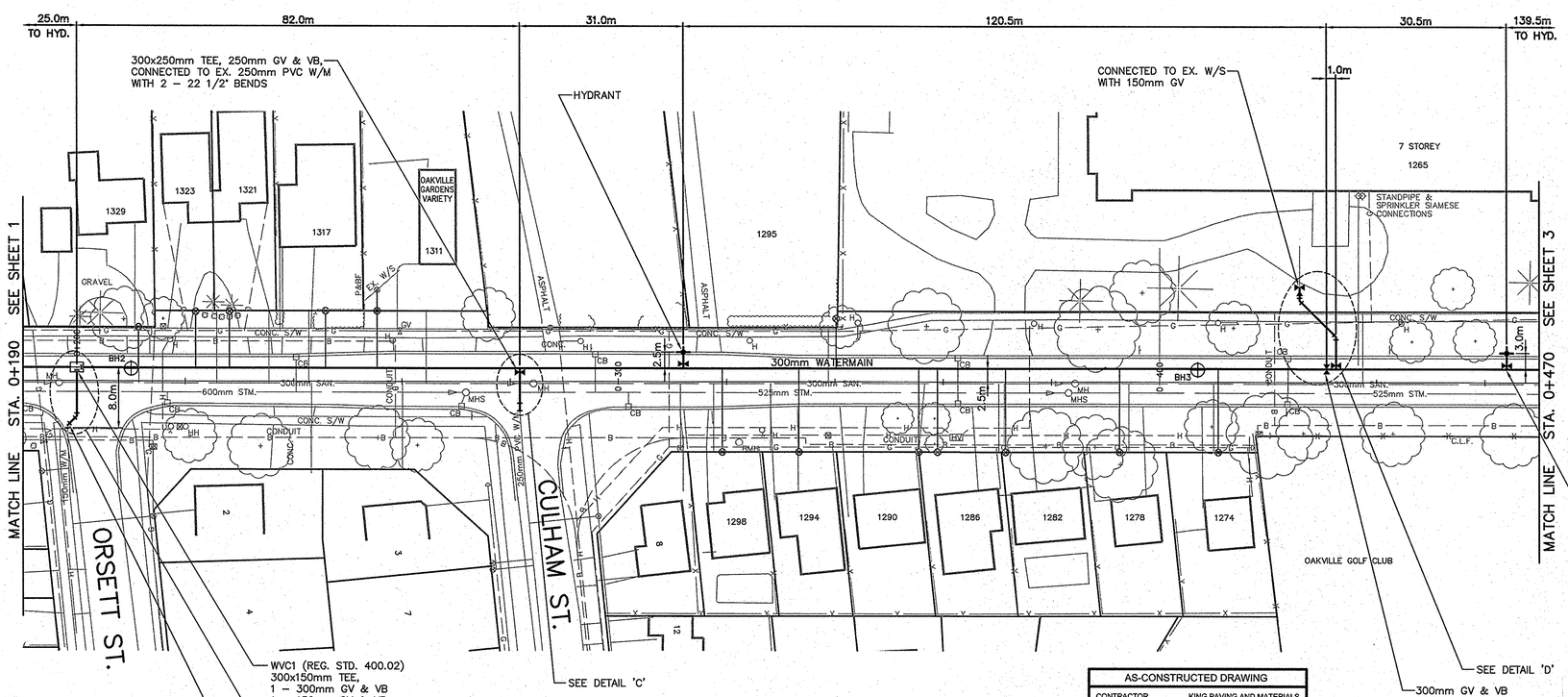
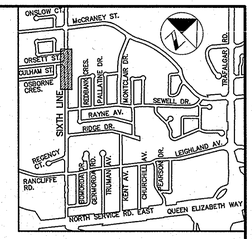
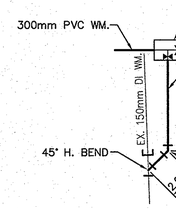
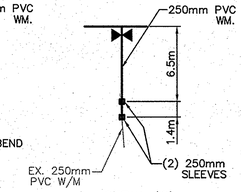
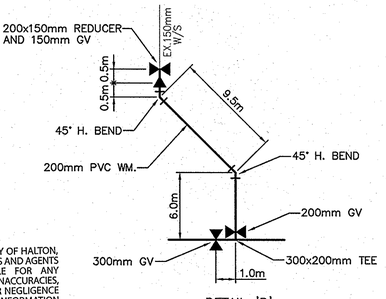
City of Hamilton, City of Toronto, Town of Oakville, Province of Ontario, Ontario MNR, Esri Canada, Esri, HERE, Garmin, INCREMENT P, USGS, EPA, USDA, AAFC, NRCan
Powered by Esri

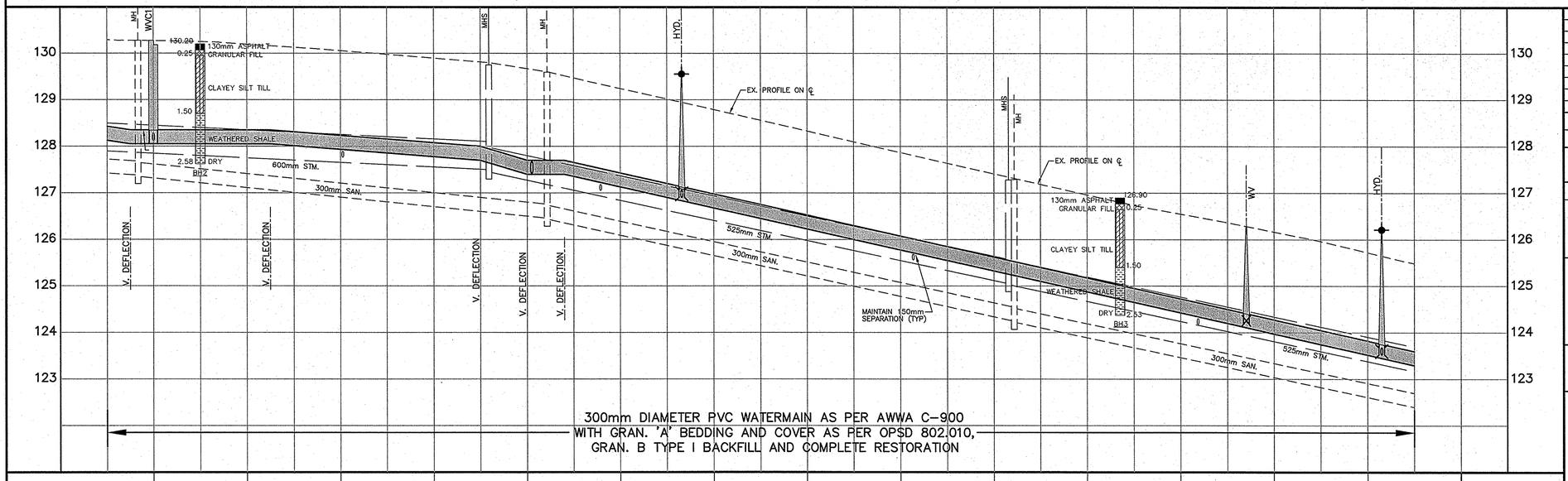












AS-CONSTRUCTED DRAWING

CONTRACTOR	KING PAVING AND MATERIALS
WORK COMMENCED	AUGUST 2011
WORK COMPLETED	JULY 2012
INSPECTOR	RYAN STONEMAN
INSPECTOR'S DIARIES	1105 / 1120

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FOR GENERAL NOTES AND ROAD RESTORATION DETAIL SEE SHEET 1.

300mm DIAMETER PVC WATERMAIN AS PER AWWA C–900
WITH GRAN. 'A' BEDDING AND COVER AS PER OPSD 802.010,
GRAN. B TYPE I BACKFILL AND COMPLETE RESTORATION

NO	Date	By	REVISIONS	MANU	CAD
1	FEB 2013	RWB	AS CONSTRUCTED		X

Design	R.R.	Ch'kd		Date JUNE 2011
Drawn	EWS/RWB	Ch'kd		

Scale 1:500 Horiz. 1:50 Vert.

References

APPROVALS

Field Notes

Municipal

Stamp

Regional

SEE SHEET W1 FOR ORIGINAL SIGNATURE
Director

SEE SHEET W1 FOR ORIGINAL SIGNATURE
Manager

Halton REGION

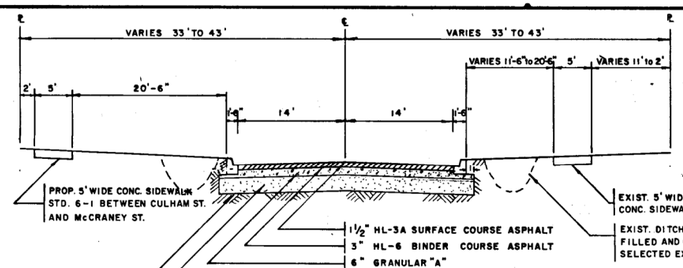
WATERMAIN REPLACEMENT ON
SIXTH LINE
IN THE TOWN OF OAKVILLE
FROM 15m N. OF ORSETT DR. TO
185m S. OF CULHAM DR.

Consultant File NO **O-18657**

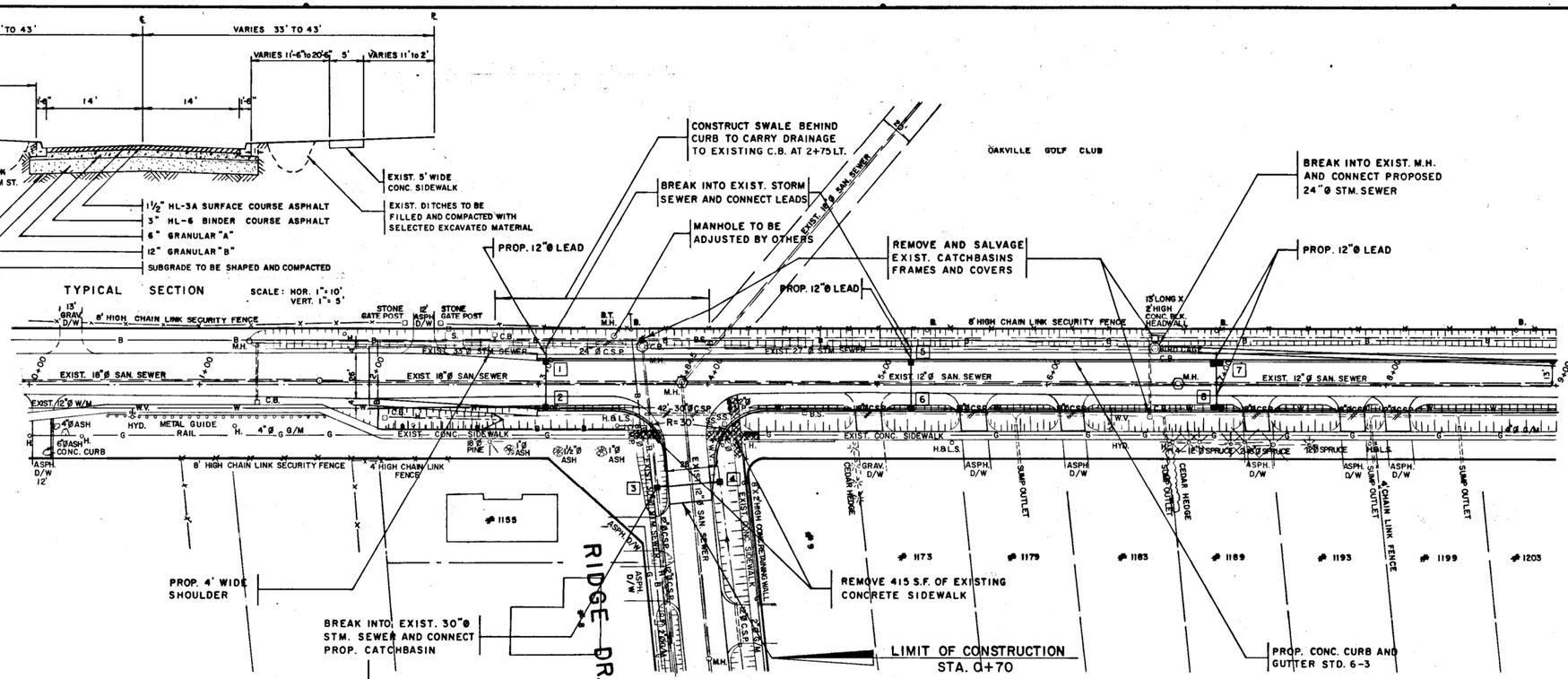
CONTRACT NO (PR2432–11) R–465–10

Drawing NO SHEET W2 OF W7

SIXTH LINE R-139-77 5



TYPICAL SECTION SCALE: HOR. 1"=10' VERT. 1"=5'



CATCHBASIN DATA - SYMBOL ☐

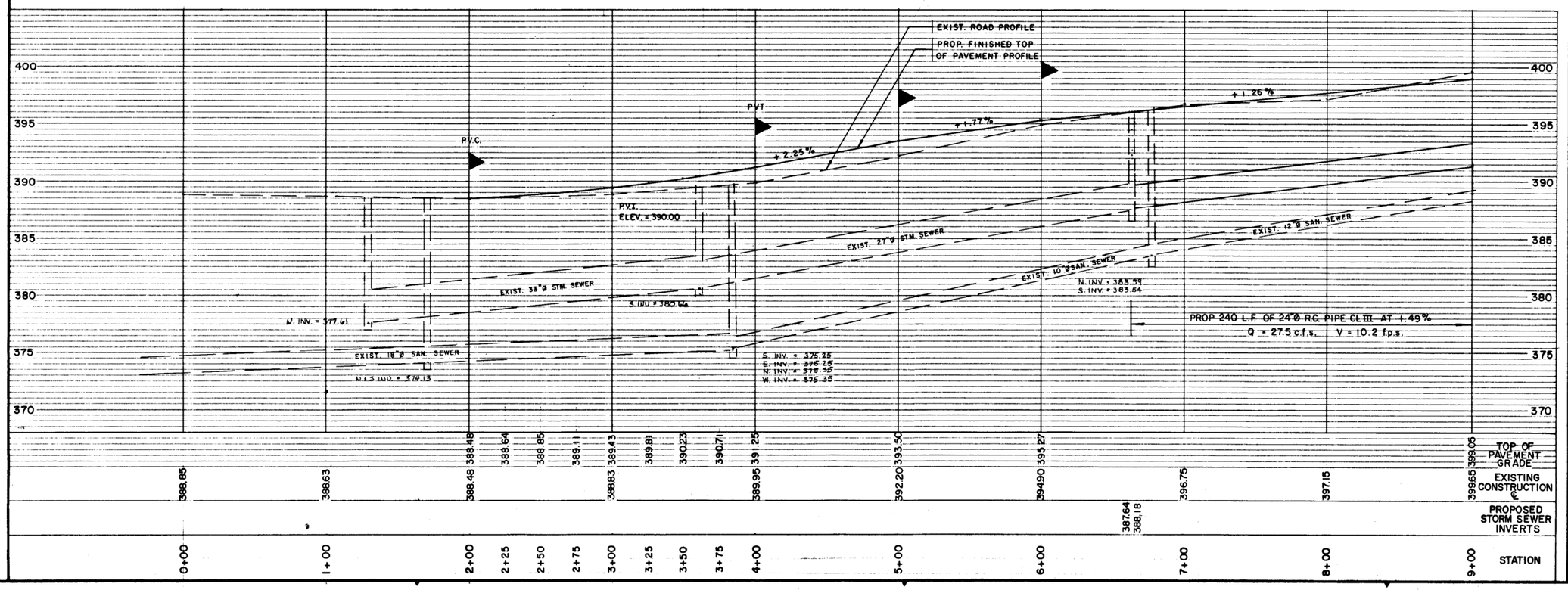
NO.	STATION	OFFSET FROM ℄	STRUCTURE	COVER	COMMENTS
1	3+05	IN CURB	3-1	5-4	
2	3+05	IN CURB	3-1	5-4	
3		℄ DITCH	3-1	5-2	RIDGE DR.
4		℄ DITCH	3-1	5-2	RIDGE DR.
5	5+20	IN CURB	3-1	5-4	
6	5+20	IN CURB	3-1	5-4	
7	7+00	IN CURB	3-2	5-4	
8	7+00	IN CURB	3-2	5-4	

NOTES:

1) ALL CATCHBASIN LEADS TO BE 10"Ø E.S. CONCRETE PIPE AT 1% UNLESS OTHERWISE SHOWN.
2) ALL SIGNS TO BE RELOCATED BY OTHERS.
3) ADJUST EXISTING MANHOLE FRAMES AND COVERS, AND WATER VALVES TO SUIT FINISHED GRADE. SYMBOL ◯
4) ALL DRIVEWAYS TO BE PAVED BETWEEN SIDEWALK AND CURB OR BETWEEN CURB AND PROPERTY LINE.

CONSTRUCTION BENCH MARKS

1) TOP OF NORTH STONE PILLAR AT OAKVILLE GOLF CLUB ENTRANCE ELEV'N 389.65



GENERAL NOTES

- ALL DRIVEWAYS GRAVEL UNLESS OTHERWISE NOTED.
- ALL SERVICE LOCATIONS ARE APPROXIMATE AND MUST BE LOCATED ACCURATELY IN THE FIELD.
- U/G HYDRO AS SHOWN
- WATER AS SHOWN
- U/G BELL AS SHOWN
- SAN. SEWERS AS SHOWN
- STM. SEWERS AS SHOWN
- GAS AS SHOWN

LEGEND

STM. MH.	DENOTES BENCH MARK ELEVATION
SAN. MH.	STORM SEWER & MANHOLE
	SANITARY SEWER & MANHOLE
W W W W W	WATERMAIN & VALVE
G G G G G	GASMAIN & VALVE
B B B B B	BELL TELEPHONE BURIED CABLE
H.P.	HYDRO POLE & GUY ANCHOR
HYD.	HYDRANT

TOWN OF OAKVILLE
DEPARTMENT OF PUBLIC WORKS

PROPOSED ROAD RECONSTRUCTION ON SIXTH LINE FROM STATION 0+00 TO STATION 9+00

FLD. BK. No. J.A.-

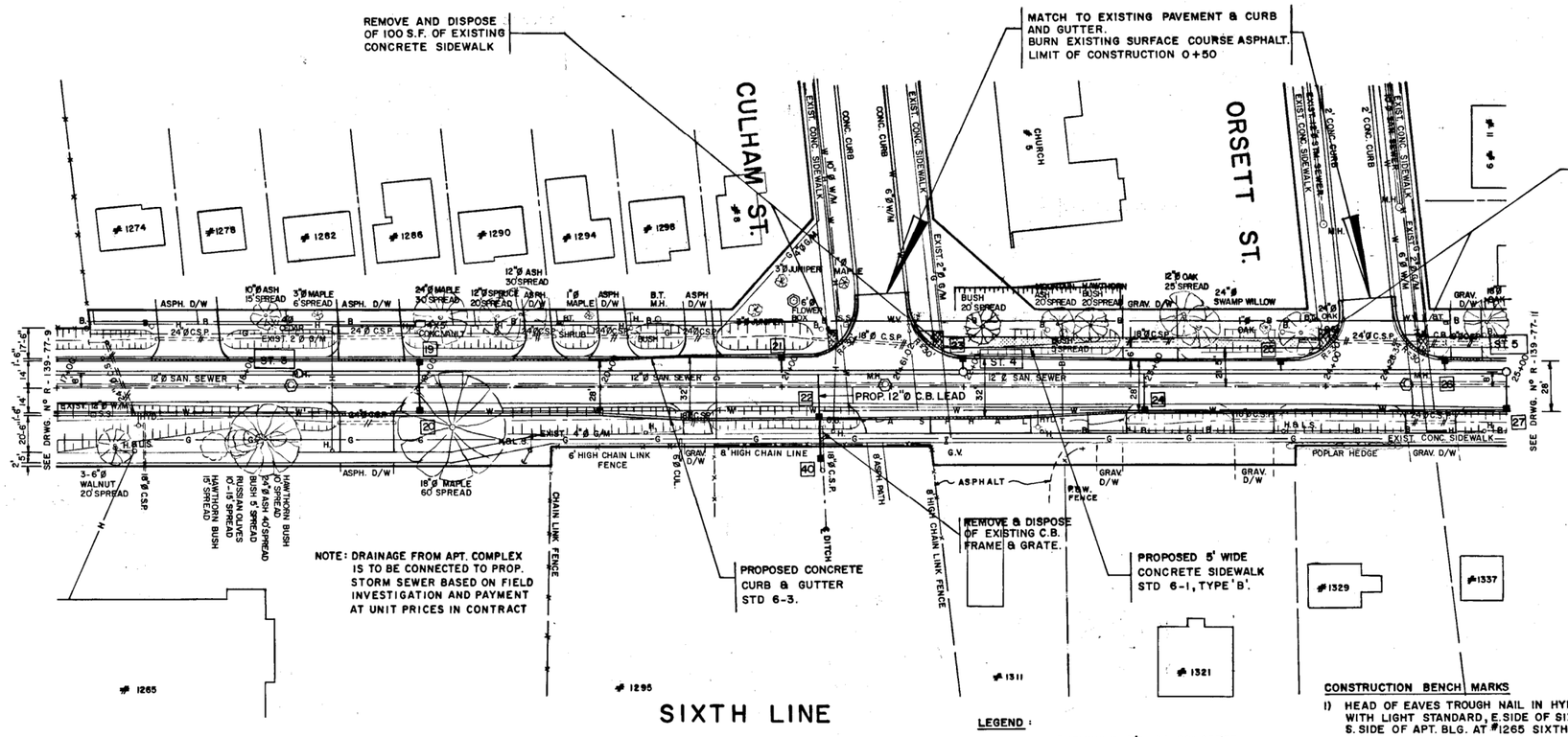
SCALES —	HOR.: 1"= 40' VERT.: 1"= 8'
DATE: MAY, 1977	DESIGN BY: R.G.G.
DRAWN BY: D.A.	SURVEY BY: J.A./M.D.
CH'KD BY: L.D. McL.	INSPECTOR:
FILE N°: R-139-77	CONTRACTOR:

PLAN N° R-139-77-5

SHEET 5 OF 26

REGISTERED PROFESSIONAL ENGINEER — CIVIL — O. H. ELLIS — PROVINCE OF ONTARIO

DATE	REVISIONS	BY
JAN. 4 1978	STM. INVERTS AS CONSTRUCTED	B.W.



STORM SEWER DATA - SYMBOL ST					
NO	STATION	OFFSET FROM ℄	STRUCTURE	COVER	COMMENTS
3	18+35	8'L	2-1	5-1	
4	22+00	8'L	2-1	5-1	
5	25+00	8'L	2-1	5-1	

CATCHBASIN DATA - SYMBOL □					
NO.	STATION	OFFSET FROM ℄	STRUCTURE	COVER	COMMENTS
19	19+00	IN CURB	3-1	5-4	
20	19+00	IN CURB	3-1	5-4	
21	21+00	IN CURB	3-1	5-4	
22	21+20	IN CURB	3-1	5-4	
23	22+00	IN CURB	3-1	5-4	
24	23+00	IN CURB	3-1	5-4	
25	23+75	IN CURB	3-1	5-4	
26	24+65	IN CURB	3-1	5-4	
27	25+00	IN CURB	3-1	5-4	
40	21+20	40'R	3-1	5-2	

NOTES:

1) ALL CATCHBASIN LEADS TO BE 10"Ø E.S. CONCRETE PIPE AT 1% SLOPE, UNLESS OTHERWISE SHOWN.
2) ADJUST EXISTING MANHOLE FRAMES & COVERS AND WATERVALVES TO SUIT FINISHED GRADE - SYMBOL ⬡.
3) ALL DRIVEWAYS TO BE PAVED BETWEEN SIDEWALK AND CURB OR BETWEEN CURB AND PROPERTY LINE.
4) ALL SIGNS TO BE RELOCATED BY OTHERS.
5) EXISTING BELL POLES TO BE REMOVED BY OTHERS.

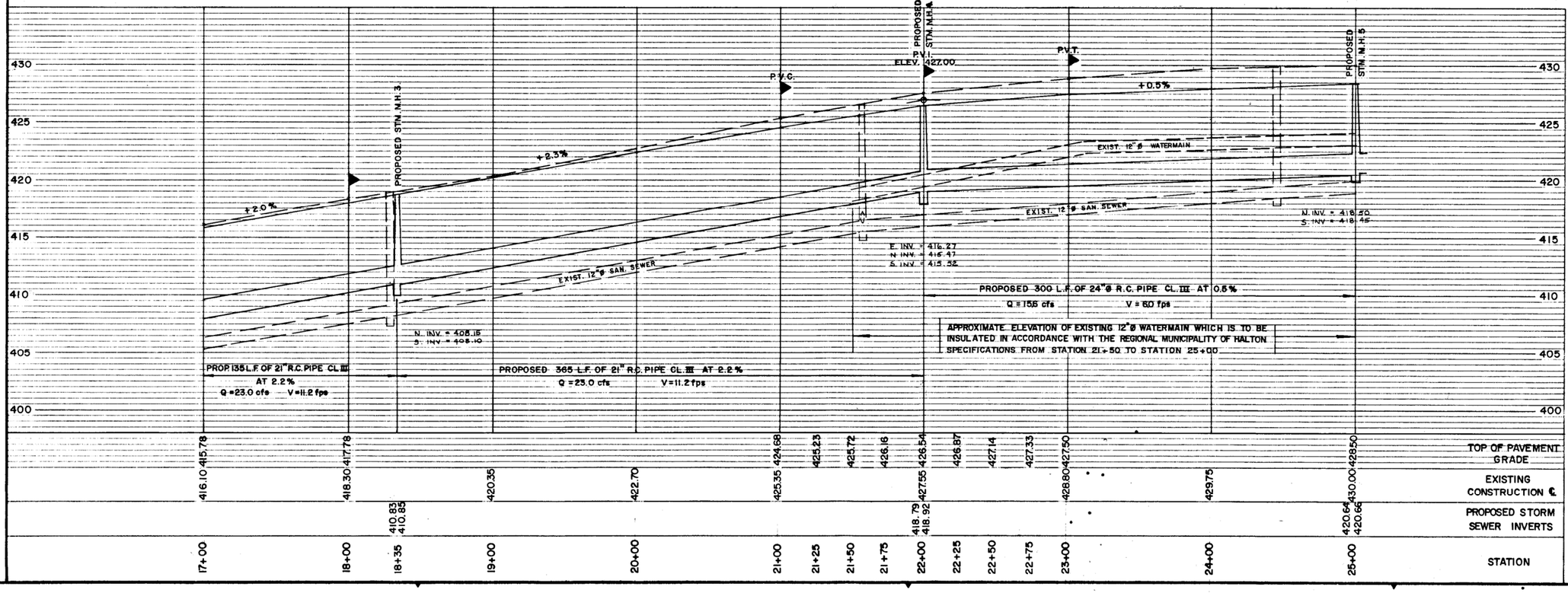
LEGEND:

PROPOSED 5' WIDE CONCRETE SIDEWALK.

PROPOSED DROP CURB & GUTTER.

CONSTRUCTION BENCH MARKS

1) HEAD OF EAVES TROUGH NAIL IN HYDRO POLE WITH LIGHT STANDARD, E. SIDE OF SIXTH LINE, S. SIDE OF APT. BLG. AT #1265 SIXTH LINE.
2) N.E. CORNER OF CONCRETE FOOTING AT ST. SIMONS CHURCH ON SIXTH LINE, JUST NORTH OF CULHAM ST.



GENERAL NOTES

- ALL DRIVEWAYS GRAVEL UNLESS OTHERWISE NOTED.
- ALL SERVICE LOCATIONS ARE APPROXIMATE AND MUST BE LOCATED ACCURATELY IN THE FIELD.
- U/G HYDRO AS SHOWN
- U/G BELL AS SHOWN
- SAN. SEWER AS SHOWN
- STM. SEWER AS SHOWN
- GAS AS SHOWN
- WATER AS SHOWN

LEGEND

DENOTES BENCH MARK ELEVATION
STM. M.H. = STORM SEWER & MANHOLE
SAN. M.H. = SANITARY SEWER & MANHOLE
W W W W W = WATERMAIN & VALVE
G G G G G = GASMAIN & VALVE
B B B B B = BELL TELEPHONE BURIED CABLE
H.P. = HYDRO POLE & GUY ANCHOR
HYD. = HYDRANT

TOWN OF OAKVILLE
DEPARTMENT OF PUBLIC WORKS

PROPOSED ROAD RECONSTRUCTION ON SIXTH LINE FROM STATION 17+00 TO STATION 25+00

FLD. BK. No. J.A. -

SCALES —	HOR: 1"= 40' VERT: 1"= 5'
DATE: MAY, 1977	DESIGN BY: R.G.G.
DRAWN BY: D.A.	SURVEY BY: J.A./M.D.
CH'KD BY: L. D. McL.	INSPECTOR:
FILE N°: R-139-77	CONTRACTOR:

PLAN N° R-139-77-7
SHEET 7 OF 11

REGISTERED PROFESSIONAL ENGINEER — CIVIL — O. H. ELLIS — PROVINCE OF ONTARIO

DATE	REVISIONS	BY
AUG. 10, 1977	- PROPOSED SIDEWALK LOCATION REVISED BETWEEN CULHAM ST. AND STA. 25+00. - NOTE 5 ADDED. - TREE AT STA. 22+10 TO BE SAVED.	R.G.G.
JAN. 4, 1978	- STM. SEWER INVERTS AS CONSTRUCTED	BW

Appendix B – Existing Conditions Storm Runoff Calculations

PROJECT: **1295 Sixth Line**
PROJECT No: **ALL-23015173-A0**
CREATED: **23-Jan-24**
PRINTED: **23-Jan-24**

Pre-Development Runoff Coefficients and Peak Flows (Existing Conditions)
Town of Oakville

Contributing Area	ID#	Runoff Coefficient	AREA (ha)
The Site	101	0.6	0.38

Pre-Development Flows for the Site

Time of Concentration	10	minutes			
5 Year Intensity	114.21	mm/hr	$Q_{(5\ Year)} = C*I*A*0.0028$	72.9	l/s
25 Year Intensity	162.17	mm/hr	$Q_{(25\ Year)} = C*I*A*0.0028$	103.5	l/s
100 Year Intensity	200.80	mm/hr	$Q_{(100\ Year)} = C*I*A*0.0028$	128.2	l/s

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Appendix C – Proposed Conditions SWM Calcs & Background Information

PROJECT: **1295 Sixth Line**
PROJECT No: **ALL-23015173-A0**
CREATED: **23-Jan-24**
PRINTED: **23-Jan-24**

Post-Development Runoff Coefficients and Peak Flows
Town of Oakville

Contributing Area	ID#	Runoff Coefficient	AREA (Ha)
Site area	201	0.80	0.38
Total Controlled Area		**0.80**	**0.38**
		Total	**0.38**

Post-Development Controlled Flows (201)

Time of Concentration	10	minutes		
5 Year Intensity	114.21	mm/hr	$Q_{(5\ Year)}$ = C*I*A*0.0028	97.2 l/s
25 Year Intensity	162.17	mm/hr	$Q_{(25\ Year)}$ = C*I*A*0.0028	138.0 l/s
100 Year Intensity	200.80	mm/hr	$Q_{(100\ Year)}$ = C*I*A*0.0028	170.9 l/s

PROJECT: **1295 Sixth Line**
PROJECT No: **ALL-00251531-A1**
CREATED: **23-Jan-24**
PRINTED: **23-Jan-24**

Required Storage Volume - SWM Cistern

Town of Oakville

Control 100 year Post Development to 5 Year Pre Development

Controlled Site Area	0.38	Ha
Allowable Release From Site	72.9	l/s
Uncontrolled Runoff From Site (100year)	0	l/s
Groundwater Pumping Rate	0.0	l/s
Net Allowable Release From Site	72.9	l/s
Orifice Release Rate	**70.8**	l/s
Composite Runoff Coefficient (Controlled Area)	0.8	
Time of Concentration	10	minutes

100 Year Storm I = 1114.2/(t+5)^0.761

Storm Duration (minutes)	Rainfall Intensity (mm/hr)	Total Runoff Q (l/s)	Required Storage Volume (m^3)
1	418.011	355.8	17.1
2	370.826	315.6	29.4
3	333.820	284.1	38.4
4	303.968	258.7	45.1
5	279.344	237.8	50.1
6	258.661	220.2	53.8
7	241.026	205.2	56.4
8	225.799	192.2	58.3
9	212.509	180.9	59.4
10	200.802	170.9	60.1
11	190.406	162.1	**60.2**
12	181.106	154.2	60.0
13	172.736	147.0	59.5
14	165.159	140.6	58.6
15	158.266	134.7	57.5
16	151.966	129.4	56.2
17	146.184	124.4	54.7
18	140.858	119.9	53.0
19	135.933	115.7	51.2
60.5 m^3 of Storage is required			

1295 Sixth Line
SWM Cistern

INPUT

Required Discharge (l/s) =	170.90
Max. Water Surface Elev. (m) =	128.240
Discharge Pipe Invert (m) =	125.910
Discharge Pipe Diameter (mm) =	300
Orifice Diameter (mm) =	130
Orifice Flow Loss (C) =	0.8

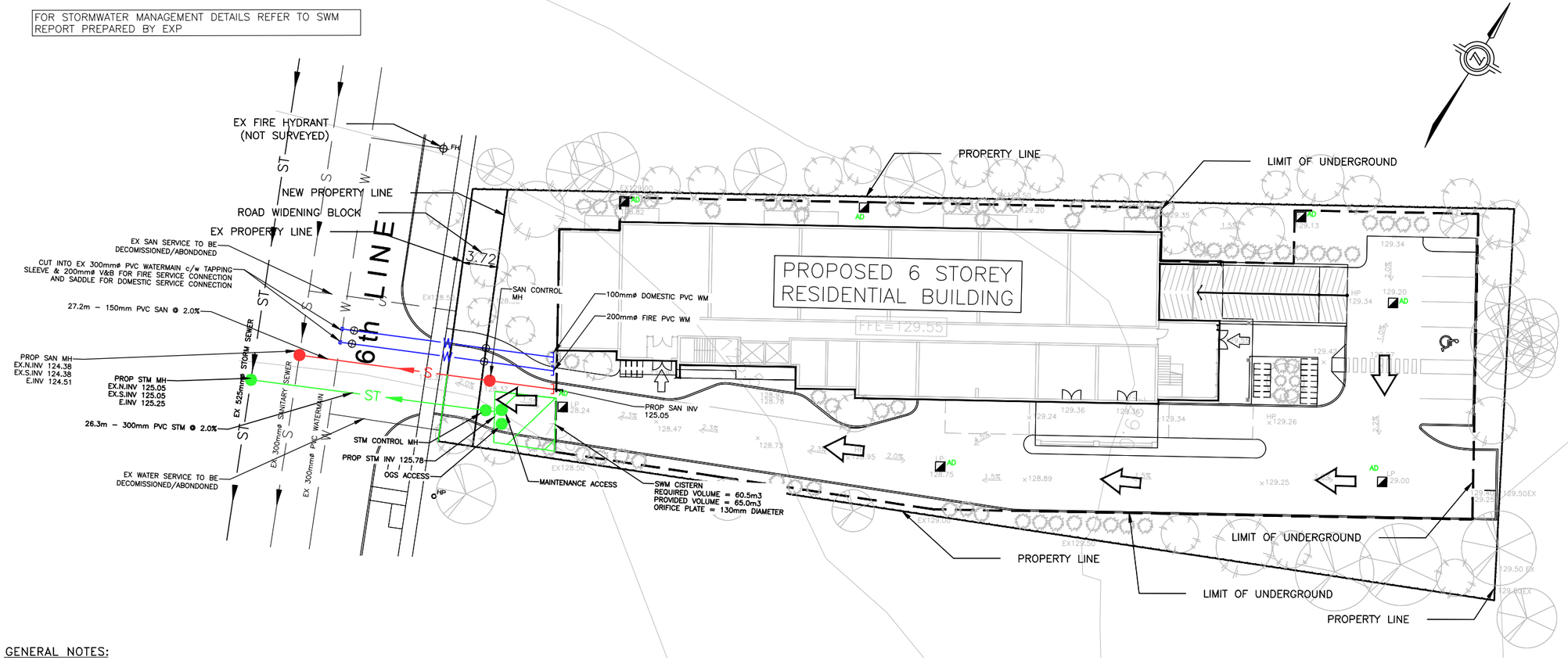
OUTPUT

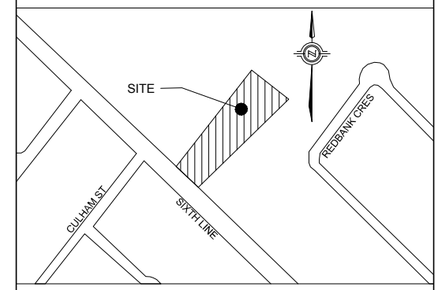
H =	2.265	m
g =	9.806	
V = (2*g*H)^0.5 =	6.665	m/s
A = X-section Area =	0.0133	m2

Orifice Flow = Q = C * A * V * 1000 =	**70.8**	**l/s**

Appendix D – Preliminary Site Servicing and Grading Plan

FOR STORMWATER MANAGEMENT DETAILS REFER TO SWM REPORT PREPARED BY EXP





LEGEND:

- PROPERTY LINE
- EXISTING WATER VALVE
- EXISTING HYDRO POLE
- EXISTING TREE
- EXISTING TREE DRIPLINE
- EXISTING OVERHEAD HYDRO WIRES
- EXISTING FENCELINE
- EXISTING CURBS
- EX. STORM M.H.
- EX. SANITARY M.H.
- EX. CATCH BASIN
- PROP. STORM M.H.
- PROP. SANITARY M.H.
- PROP. AREA DRAIN
- PROPOSED CURBS
- PROP. STORM SEWER
- PROP. WATERMAIN
- PROP. SANITARY SEWER
- EX. SANITARY SEWER
- EX. STORM SEWER
- EX. WATERMAIN
- EX. HIGH VOLTAGE CONDUIT
- EX. BELL AND FIBEROPTIC CONDUIT
- EX. GAS
- NEW / EXISTING WATER VALVE AND BOX
- PROPOSED / EXISTING HYDRANT
- MAJOR OVERLAND FLOW
- EX/PROPOSED ELEVATION

GENERAL NOTES:

UNLESS OTHERWISE NOTED ON THIS DRAWING THE FOLLOWING REQUIREMENTS SHALL APPLY.

GENERAL

1. CONSTRUCTION OF SEWERS, AND RELATED APPURTENANCES SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE CURRENT STANDARD DRAWINGS OF THE TOWN OF OAKVILLE, THE REGIONAL MUNICIPALITY OF HALTON, AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD).
2. ONTARIO PROVINCIAL STANDARD DRAWINGS TO BE READ IN CONJUNCTION WITH THE REGION OF HALTON REVISIONS.
3. ALL DIMENSIONS ARE IN METRES AND ALL DIAMETERS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.
4. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WTH "THE OCCUPATIONAL HEALTH & SAFETY ACT". THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE CONTRACTOR AS DEFINED IN THE ACT.
5. THE CONTRACTOR SHALL OBTAIN ALL PERMITS FOR CONSTRUCTION.
6. ALL TEMPORARY TRAFFIC CONTROL AND SIGNAGE DURING CONSTRUCTION, PERMANENT SIGNS AND LANE MARKINGS SHALL BE IN ACCORDANCE WITH ONTARIO TRAFFIC MANUAL FOR TEMPORARY CONDITIONS AND MTO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
7. FOR ALL SEWERS AND WATERMAIN IN FILL SECTIONS, THE COMPACTION SHALL BE VERIFIED PRIOR TO LAYING OF PIPE.
8. ALL EXCAVATIONS TO BE BACKFILLED WITH NATIVE MATERIAL, APPROVED BY THE ENGINEER, TO 95% SPD.
9. ALL UNDERGROUND SERVICE CONNECTIONS AND TRENCHES WITHIN PAVED PORTION OF AN EXISTING ROAD ARE TO BE BACKFILLED WITH UNSHRINKABLE MATERIAL.
10. ALTERNATIVE CONSTRUCTION MATERIALS MAY BE ACCEPTABLE, PROVIDED THAT APPROVAL HAS BEEN OBTAINED FROM THE REGIONAL ENGINEER, TOWN OF OAKVILLE AND THE ENGINEER .
11. MUNICIPAL APPROVAL OF THESE DRAWINGS IS FOR MATERIAL AND COMPLIANCE WITH TOWN OF OAKVILLE AND PROVINCIAL SPECIFICATIONS AND STANDARDS ONLY. APPROVAL AND INSPECTION OF THE WORKS BY THE TOWN OF OAKVILLE STAFF DOES NOT CERTIFY THE LINE AND GRADE OF THE WORKS NOR RELIEVE THE CONTRACTOR OF CERTIFICATION OF ALL WORKS BY THE OWNER'S ENGINEER.
12. ALL DIMENSIONS TO BE CHECKED BY THE CONTRACTOR FOR ACCURACY PRIOR TO CONSTRUCTION AND ANY DISCREPANCIES REPORTED TO THE ENGINEER.
13. ALL SERVICES TO MEET ALL REQUIREMENTS OF THE ONTARIO BUILDING CODE PART 7 CURRENT EDITION

LOCATES AND LIABILITY

1. THE CONTRACTOR SHALL RECTIFY ALL DISTURBED AREAS TO THE ORIGINAL CONDITION OR BETTER AND TO THE SATISFACTION OF THE TOWN
2. THE LOCATION OF ALL UNDER/ABOVE GROUND UTILITIES AND STRUCTURES ARE APPROXIMATE ONLY, AND WHERE SHOWN ON THE DRAWING(S) THE ACCURACY OF THE LOCATION OF SUCH UTILITIES ARE NOT GUARANTEED THE CONTRACTOR SHALL DETERMINE THE LOCATION OF ALL SUCH UTILITIES AND STRUCTURES BY CONSULTING THE APPROPRIATE AUTHORITIES OR UTILITY COMPANIES CONCERNED. THE CONTRACTORS SHALL PROVE THE LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE OR RESTORATION TO SAME.
3. THE OWNER SHALL BE NOTIFIED IMMEDIATELY OF ANY CONFLICTS WITH EXISTING SERVICES.
4. ANY UTILITY WHICH CONFLICTS WITH THE CONSTRUCTION IS TO BE RELOCATED BY THE PROPER AUTHORITY AT THE OWNER'S EXPENSE.

CONSTRUCTION RESPONSIBILITIES

1. LOCATION OF EXISTING UTILITIES SHOWN AND ALL OTHER EXISTING UTILITIES TO BE ESTABLISHED BY CONTRACTOR IN THE FIELD. THE CONTRACTOR HAVING UNCOVERED ANY UTILITIES THAT ARE NOT SHOWN ON THE PLAN OR STAKED OUT BY BELL, HYDRO, CABLE & GAS UTILITY COMPANIES WILL IMMEDIATELY ADVISE THE ENGINEER FOR APPROPRIATE ACTION. THE CONTRACTOR IS RESPONSIBLE FOR TRACING AND IDENTIFYING ALL EXISTING PRIVATE UTILITIES WTHIN THE WORK AREAS.
2. THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE FOR LOCATING, SUPPORTING AND PROTECTING ALL UTILITIES AND STRUCTURES EXISTING AT THE TIME OF CONSTRUCTION IN THE AREA OF HIS WORK, WHETHER SHOWN ON THE PLANS OR NOT, AND FOR ALL REPAIRS AND CONSEQUENCES RESULTING FROM DAMAGE TO SAME.
3. TWO LANES OF TRAFFIC ARE TO BE MAINTAINED AT ALL TIMES DURING THE PERFORMANCE OF THE WORK ON SIXTH LINE. THE CONTRACTOR SHALL ADVISE THE TOWN OF OAKVILLE IN WRITING NOT LESS THAN 48 HRS IN ADVANCE OF START OF CONSTRUCTION AND SHALL ACQUIRE THE APPROPRIATE PARTIAL ROAD CLOSURE PERMITS AS NECESSARY.
4. ALL EXISTING PAVEMENTS, CURBS, SIDEWALKS, DRIVEWAYS AND SODDED BOULEVARD AREAS DISTURBED BY THE WORK ARE TO BE REINSTATED EQUAL TO EXISTING AND TO THE SATISFACTORY OF THE TOWN OF OAKVILLE.
5. NEW MANHOLES AND VALVE BOXES, EXISTING VALVE AND CHAMBERS, HYDRANT AND BELL PEDESTALS AND UTILITIES TO BE SET TO FINAL BOULEVARD AND PAVEMENT GRADES.
6. THE CONTRACTOR SHALL NOTIFY IN ADVANCE, AS REQUIRED, THE APPROPRIATE AUTHORITY HAVING JURISDICTION FOR THE ROAD PRIOR TO COMMENCING ANY WORK AND SHALL ACQUIRE AND SATISFY THE REQUIREMENTS OF THE APPROPRIATE PERMITS (FEES, INSPECTIONS, SIGNAGE, TRAFFIC MAINTENANCE, DIVERSION, ETC) FROM THE AUTHORITY.
7. THE CONTRACTOR SHALL SUPPLY AND PLACE TRAFFIC SIGNAGE IN CONFORMANCE WITH THE MTO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PRIOR TO COMMENCING ANY WITHIN THE MUNICIPAL ROAD/LANE ALLOWANCE.

SANITARY SEWERS

1. SANITARY SEWERS SHALL BE PVC. PVC PIPE IS TO BE BELL AND SPIGOT AND COMPLY TO ASTM D-3034 WITH MINIMUM SDR 35.
2. MINIMUM BEDDING REQUIREMENTS FOR ALL SANITARY SEWER MAINS AND RELATED CONNECTIONS IN A SINGLE TRENCH SHALL BE CLASS B GRANULAR BEDDING AS PER OPSD 802.010 UNLESS OTHERWISE NOTED.
3. SANITARY SEWER MANHOLES FRAME AND COVER AS PER OPSD 401.01.
4. ALL PVC LATERALS TO BE SDR 28 AND SHALL BE ANY COLOUR EXCEPT WHITE. MINIMUM SLOPE OF LATERAL TO BE 2.0%.
5. SINGLE SERVICE CONNECTIONS TO BE MINIMUM 150mm DIA PIPE.
6. TAPPING AT EXISTING SANITARY SEWERS SHALL BE UNDERTAKEN IN ACCORDANCE WITH REGION OF HALTON REQUIREMENTS.
7. ALL SEWERS TO BE VIDEO INSPECTED.
8. ALL SEWERS TO BE FLUSHED PRIOR TO VIDEO INSPECTION.
9. ALL PVC SEWERS ARE TO BE TESTED FOR DEFLECTION (MANDREL PASSAGE) AFTER INSTALLATION. SANITARY SEWERS SHALL ALSO BE TESTED FOR LEAKAGE (LOW AIR PRESSURE). PRIOR TO ASSUMPTION BY THE TOWN, PIPE DEFLECTION TESTING SHALL BE REPEATED.

STORM SEWERS

1. ALL PIPES GREATER THAN 375mm DIA SHALL BE STEEL REINFORCED CONCRETE AND SHALL CONFORM TO OPSS 1820 MATERIAL SPECIFICATION.
2. ALL SEWER PIPE UP TO AND INCLUDING 375mm DIA SHALL BE PVC, BELL AND SPIGOT AND SHALL COMPLY TO ASTM D-3034 WITH MINIMUM SDR 35.
3. MINIMUM BEDDING REQUIREMTNS FOR ALL SINGLE STORM SEWER MAINS AND ALL RELATED CONNECTIONS SHALL BE HIGH PERFORMANCE CLEAR STONE (HL-8 GRADED) AS PER TOWN OF OAKVILLE STANDARD DRAWING S-188.
4. STORM SEWER MANHOLES SHALL BE IN ACCORANCE WITH OPSD 701.010 AND 703.010. FRAME AND COVER AS PER OPSD 401.01 TYPE A. FRAMES TO BE STAMPED "DANGER" AND "STORM".
5. MANHOLE TOPS SHALL BE INITIALLY SET TO BASE COURSE ASPHALT ELEVATION AND ADJUSTED TO GRADE PRIOR TO PLACEMENT OF TOP LIFT OF ASPHALT.
6. ALL TRENCH EXCAVATIONS ARE TO BE BACKFILLED WITH SELECT NATIVE MATERIAL PLACED IN MAXIMUM 200mm LIFT THICKNESS WITHIN 3% OF THE OPTIMUM MOISTURE CONTENT AND COMPACTED TO A MINIMUM OF 95% SPD, UNLESS OTHERWISE SPECIFIED.
7. ALL SEWERS TO BE VIDEO INSPECTED.
8. ALL SEWERS TO BE FLUSHED PRIOR TO VIDEO INSPECTION.
9. ALL PVC SEWERS ARE TO BE TESTED FOR DEFLECTION (MANDREL PASSAGE) AFTER INSTALLATION. PRIOR TO ASSUMPTION BY THE CITY, PIPE DEFLECTION TESTING SHALL BE REPEATED.

WATERMAINS

1. FLEXIBLE WATERMAIN PIPE UP TO 300mm DIAMETER TO BE PVC DR-18 AND CONFORM TO A.W.W.A. C-900 WITH MECHANICAL JOINTS AS PER A.W.W.A. C-110, AND TO BE INSTALLED WITH A 10 GAUGE TRACER WIRE.
2. FLEXIBLE PIPE BEDDING TO BE OPSD 802.010 WITH COMPACTED GRANULAR B MATERIAL.
3. MINIMUM COVER TO BE 1.7m TO TOP OF PIPE.
4. DEFLECTION AT JOINTS NOT TO EXCEED 2.5 DEGREES AND SHALL BE EQUAL AT ALL JOINTS.
5. GATE VALVES AND BOXES FOR 150mm DIAMETER WATERMAINS AS PER A.W.W.A. STANDARD C-500 AND ARE TO OPEN TO THE LEFT (COUNTER CLOCKWISE).
6. HYDRANTS SHALL MEET THE REQUIREMENTS OF A.W.W.A. STANDARD C-502 AND SHALL BE SET IN ACCORDANCE WITH REGION OF HALTON, AND TOWN OF OAKVILLE BUILDING DEPARTMENT STANDARDS, COMPLETE WITH STEAMER CONNECTIONS. THE 100mm STEAMER PORT SHALL FACE THE FIRE ROUTE AND SHALL BE UNOBSTRUCTED BY ANY PROPOSED LANDSCAPING.
7. ALL FITTINGS TO HAVE MECHANICAL RESTRAINTS THAT MEET UNI-B-13-92.
8. ALL TEMPORARY AND PERMANENT WATERMAIN PLUGS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH OPSD 1103.01.
9. TAPPING AT EXISTING WATERMAINS SHALL BE UNDERTAKEN IN ACCORDANCE WITH REGION OF HALTON REQUIREMENTS.
10. 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.
11. MINIMUM HORIZONTAL SEPARATION BETWEEN WATERMAINS (INCLUDING PRIVATE SERVICES) AND STORM AND SANITARY SEWERS SHALL BE 2.5m. WATERMAINS MUST HAVE A MINIMUM VERTICAL CLEARNACE OF 150mm OVER AND 500mm UNDER SEWERS AND ALL OTHER UTILITIES WHEN CROSSING.

NOTE:
- SITE PLAN PREPARED BY RICK BROWN & ASSOCIATES INC.
- EXISTING SERVICING INFORMATION TAKEN FROM TOWN RECORD DRAWINGS AND REGION RECORD DRAWINGS

SCALE: 1:500

	DRAWN BY	CHECKED BY
exp.	N.M	S.P.

PRELIMINARY SITE SERVICING AND GRADING PLAN

FIGURE 2

1295 SIXTH LINE
TOWN OF OAKVILLE

PROJECT NUMBER: ALL-23015173-A0

DATE: JANUARY 2024

End Document