APLIN MARTIN
ENGINEERING ARCHITECTURE PLANNING SURVEYING

INNOVATIVE SHS

1493 Sixth Line, Oakville, ON

Functional Servicing & Stormwater Management Report

354 Davis Road, Unit 403, Oakville, ON L6J 2X2
WWW.APLINMARTIN.COM | (905) 582-0630

Project No: 25-7018

August 29, 2025

Aplin & Martin Consultants Ltd.

Quality Information

Prepared By:
Aplin & Martin Consultants

Name: Ibraheem Alqadhi
Title: Engineering Designer

Approved By:
Aplin & Martin Consultants

Name: Julian Cesario
Title: Project Manager

Revision History

Revision	Date	Details	Name	Title
1	29 -Aug-2025	SPA	Chesley Blahut	Engineering Lead

Distribution List

# Hard Copies	PDF Submission	Company/Association
N/A	1	INNOVATIVE SHS

Statement of Limitations

Aplin & Martin Consultants Ltd. prepared this report for the Town of Oakville. The material in this report reflects the best judgment of Aplin & Martin Consultants Ltd. in the light of the information available at the time of preparation. Any use of, or reliance placed upon, the material contained in this report by third parties, or decisions based upon this report are the sole responsibility of those third parties. Aplin & Martin Consultants Ltd. accepts no responsibility for damages suffered by any third parties as a result of decisions made, or actions taken, based upon information contained within this report.

TABLE OF CONTENTS

APPENDICES

FIGURES

TABLES

1.0 INTRODUCTION

1.1 SITE DESCRIPTION

Aplin Martin has been retained by INNOVATIVE SHS to prepare a Functional Servicing and Stormwater Management Report (FSRSWM) in support of the Site Plan Approval (SPA) application for the proposed development of the grassy plain located at 1493 Sixth Line, Oakville, ON (the Site).

Currently, the 0.81 ha site is an open grassy plan with a single shed. It is bordered by Munn's Public School to the north, McCraney Valley Trail to the south, Sixth Line to the west, and wooded area to the east.

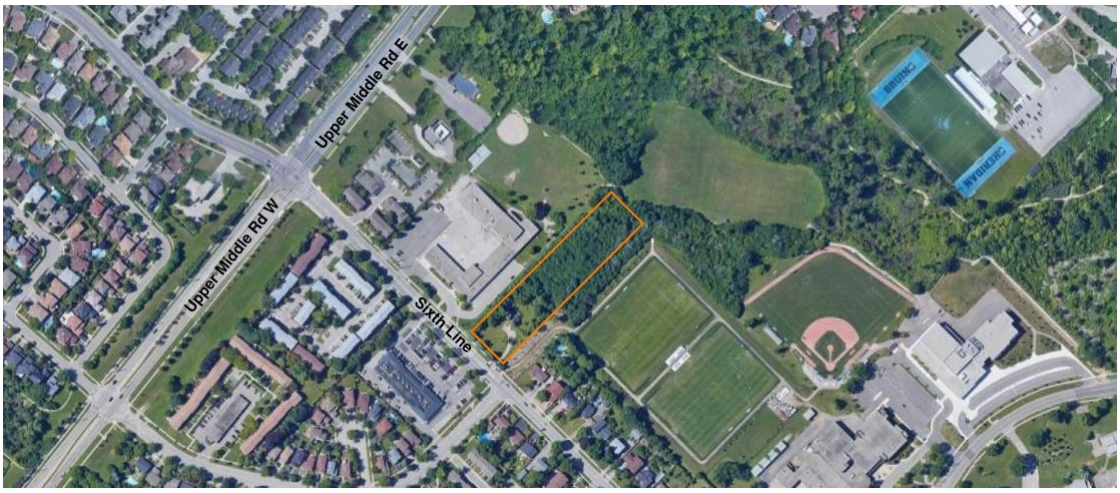


Figure 1: Aerial View (Source: Google Maps Imagery 2025)

1.2 PROPOSED DEVELOPMENT

The proposed development of the Site includes the removal of an existing shed and the construction of a mixed-use 6-storey residential building, a daycare at grade, an underground parking garage, and a laneway with surface parking spots. Vehicular access into the Site will maintain the existing driveway connection to Sixth Line following the 2.94 m road widening of Sixth Line towards the site. For the site plan, please refer to Appendix A.

1.3 BACKGROUND INFORMATION

The following documents and drawings were available for review and used to prepare this report. Relevant excerpts from these documents (denoted in *italics*) are included in Appendix A.

- *Topographic Survey prepared by David B. Searles Surveying Ltd. dated May 12, 2025*
- *Proposed Site Plan and Floor Plan prepared by Patrick Markus Luckie Architect dated June 17, 2025*
- *Geotechnical Investigation prepared by Forward Engineering and Associates Inc. dated June 05, 2025*
- *As-constructed drawings provided by Halton Region dated June 04, 2003*

2.0 DOMESTIC AND FIREFIGHTING WATER SUPPLY

2.1 EXISTING WATER SERVICING

Based on the as-constructed information provided by Halton Region, there is an existing operational 300 mm diameter watermain located on Sixth Line as well as an abandoned 300 mm diameter watermain. There is one existing fire hydrant located at the south corner of the site.

2.2 PROPOSED WATER SERVICING

Site statistics for the proposed expansions were used to determine the domestic water demands and fire flow requirements for the Site. Based on a water consumption of 265 L/cap/day for residential and 250 L/cap/day for commercial, the domestic water demands for the Site were calculated using the peaking factors listed below:

- 2.25 (Maximum Day)
- 4.00 for Residential and 2.25 for Commercial (Peak Hour)
- 0.85 (Minimum Hour)

A summary of domestic water consumption rates for the Site has been provided in *Table 1*. Detailed calculations for domestic water consumption rates can be found in Appendix B.

Peak Flows	Hotel Total
Maximum Day	2.94 L/s
Peak Hour	4.98 L/s
Minimum Hour	1.10 L/s

Table 1: Domestic Water Consumption Rate Summary

A hydrant flow test on the existing municipal water distribution system will be conducted to confirm that adequate pressures are available to service the site such that the maximum available water supply meets municipal criteria for minimum fire flow requirements.

The projected total water demands (Max Day + Fire Flow) total approximately **283 L/s** for the proposed development. Therefore, the existing municipal watermain has sufficient water supply. Refer to **Appendix B** for detailed calculations for fire flow requirements.

Proposed water servicing to the Site will consist of a single 200 mm connection to the existing 300 mm municipal watermain on Sixth Line. This service will be split using an "H" configuration (Region Standard Drawing 409.010) into a 200 mm fire service and a 150 mm domestic service.

Refer to **Appendix E** for the Site Servicing Plan for the existing and proposed watermain connections.

3.0 SANITARY SERVICING

3.1 EXISTING SANITARY SERVICING

Based on the as-constructed information provided by Halton Region, there is an existing 300 mm diameter municipal sanitary sewer located on Sixth Line.

Refer to **Appendix A** for the record drawings provided by Halton Region and **Appendix C** for detailed calculations.

3.2 PROPOSED SANITARY SERVICING

The peak sanitary flow from the Site has been determined in accordance with Halton Region's design guidelines, using the following criteria:

- Average Residential wastewater flow of 215 L/cap/day
- Average Commercial wastewater flow of 185 L/cap/day
- Residential density of 1.75 persons per unit
- Commercial population of 48 persons
- Infiltration and Inflow of 0.286 L/s/ha

The resulting peak sanitary discharge rate is estimated to be **4.67 L/s**. The sanitary service for the proposed building will be provided by a 200 mm diameter sewer with a slope of 2.00% which connects into a proposed control manhole, which then connects into a proposed manhole on top of the existing sanitary sewer.

Refer to **Appendix C** for detailed calculations and **Appendix E** for the Site Servicing Plan.

4.0 STORM DRAINAGE

4.1 EXISTING STORM SERVICING

Based on the as-constructed information provided by Halton Region, there is an existing 300 mm and 375 mm diameter municipal storm sewer located on Sixth Line.

Refer to Appendix A for record drawings provided by Halton Region.

4.2 PROPOSED STORM SERVICING

Catch basin manholes and catch basins are proposed within the site to collect drainage which will be conveyed via private storm sewers to a proposed underground stormwater management tank prior to being discharged into the municipal storm system.

Refer to Appendix E for the Site Servicing Plan.

5.0 STORMWATER MANAGEMENT

5.1 DESIGN CRITERIA

Stormwater Management for the proposed development is designed in accordance with the Oakville Development Engineering Procedures and Guidelines. The following is a summary of the Stormwater Management criteria applicable to this project:

- Quantity Control – post-development peak runoff from the site should be limited to 1:5-year pre-development levels for storms up to the 1:100-year level.
- Quality Control– the site shall treat stormwater runoff to enhanced level protection achieving 80% Total Suspended Solids (TSS) removal efficiency and 90% of the average annual runoff shall be treated without bypass.
- Water Balance - on-site retention of the 25 mm storm event to satisfy both water balance and erosion control measures through infiltration, evapotranspiration, or water re-use techniques.

5.2 QUANTITY CONTROL

5.2.1 PRE-DEVELOPMENT CONDITIONS

Under existing conditions, site runoff from area A1 Pre (uncontrolled) is conveyed overland and collected along Sixth Line, while site runoff from area A2 Pre (uncontrolled) are conveyed overland to the wooded area northeast of the site.

Refer to pre-development drainage area plan Fig-01 in Appendix D.

As noted above, Oakville design criteria require that post-development site runoff be controlled to the 1:5-year pre-development runoff rates. Refer to *Table 2* below for a summary of the target release rate established for this development using the Town of Oakville's IDF parameters.

Storm Event	A1 Pre-Flow (L/s)	A2 Pre-Flow (Uncontrolled) (L/s)	Total Site Release Rate (L/s)
5-Year	28.84	49.69	78.53
100-Year	50.70	87.37	138.06

Table 2: Pre-Development Peak Flow Summary

5.2.2 POST-DEVELOPMENT CONDITIONS

Proposed site conditions consist of two (2) catchment areas, namely:

- A1 Post consisting of paved areas, rooftop areas, and landscaped areas.
- A2 Post consisting of wooded area and a concrete walkway (uncontrolled flow).

Refer to the post-development drainage area plan (Fig-02) in Appendix D.

Rational method calculations were performed using the Town of Oakville's IDF parameters to determine the peak flows to be experienced from the catchment areas under post-development conditions. See *Table 3* below for a summary of the post-development peak flows.

Storm Event	A1 Post Flow (L/s)	A1 Post Controlled Flow (L/s)	A2 Post (Uncontrolled) Flow (L/s)	Total Site Release Rate (L/s)
100-Year	252.22	16.34	12.64	28.42

Table 3: Post-Development Peak Flow Summary

As indicated above, the proposed SWM scheme achieves the target release rates established for this development. Refer to Appendix D for detailed calculations.

The quantity control measures proposed include:

- 234.58 m^3 of storage provided in an underground storage tank located on the south side of the site.
- 75 mm orifice tube is proposed to restrict flows exiting the site.

See *Table 4* below for details on the proposed SWM strategy.

Storm Frequency (years)	Uncontrolled Release Rate (L/s)	Controlled Release Rate (L/s)	Total Release Rate (L/s)	Target Release Rate (L/s)	Storage Required (m^3)	Storage Provided (m^3)
5	9.72	2.53	28.42	28.86	205.91	234.58
100	12.07	16.34				

Table 4: Post-Development Discharge/Storage Summary

As indicated above in *Table 4*, the proposed 55mm orifice tube will restrict flows during all storm events to below the pre-development limits.

Refer to detailed calculations for each storm event in *Appendix D*.

5.3 WATER QUALITY

As previously noted, per the Town of Oakville's criteria, the water quality objective for the site is to achieve a minimum of 80% TSS removal. Controlled storm runoff will be conveyed through an Up-Flo Filter. Landscaped areas and rooftops have been deemed inherently clean and have been credited at an 80% removal efficiency. The specific removal efficiencies and their corresponding treatment train removal efficiencies for each catchment area are as follows:

- A1 Post has an 80.0% treatment train removal efficiency achieved by the proposed Up-Flo Filter

As a result of the proposed water quality measures noted above, the site will achieve a total TSS removal of 80.0% in the post-development conditions, satisfying the Town of Oakville's water quality control target.

Refer to Appendix D for detailed water quality calculations.

5.4 WATER BALANCE

Retention of the 25 mm design storm event by means of infiltration, evapotranspiration or reuse is required to achieve water balance requirements. After accounting for initial abstraction from pervious areas, the resulting total retention volume required is approximately 202.5 m^3 for the site. The following measures are proposed to provide the required volume control to meet the site-specific water balance requirements:

- Drainage directed to a bottomless tank
- Drainage directed to an infiltration gallery

A gravel infiltration gallery and bottomless tank are proposed to infiltrate drainage from the proposed building to meet the water balance requirement in accordance with applicable guidelines. See *Table 5* below for a detailed summary of the proposed infiltration gallery.

Refer to Appendix D for detailed water balance calculations.

LID	Retention Volume Required (m^3)	Infiltration Rate (mm/hr)	Area Provided to Infiltrate (m^2)	Infiltration Volume Provided (m^3)
Infiltration Gallery	172.1	15.0	305.4	122.2
Bottomless Tank		15.0	140.0	56.0

Table 5: Water Balance Summary

See Site Servicing Plan in **Appendix E** for details.

5.5 SWM SUMMARY

Refer to *Table 6* below for a site SWM summary of the quantity, quality and water balance design objectives for this development.

SWM Measure	Design Criteria	
	Required	Provided
Quantity - 100-Yr Peak Flow	211.03 m^3	**234.58 m^3**
	28.86 L/s	**28.42 L/s**
Water Balance – Infiltration Gallery and Bottomless Tank	172.1 m^3	**178.2 m^3**
Quality – Up-Flo Filter	80%	**80%**

Table 6: SWM Summary

6.0 ON-SITE HYDROGEOLOGICAL CONDITIONS

6.1 GROUNDWATER TABLE

A geotechnical investigation report was prepared by Forward Engineering & Associates Inc. dated June 05, 2025, to confirm sub-surface conditions and groundwater levels. No groundwater was observed beneath the site. Results from the field testing and monitoring wells confirmed that the sub-surface conditions are suitable for infiltration purposes.

Refer to Appendix A for the complete geotechnical investigation report prepared by Forward Engineering & Associates Inc. Borehole data from the geotechnical investigation report has been provided in Appendix D.

7.0 EROSION AND SEDIMENT CONTROL MEASURES

An Erosion and Sediment Control program will be implemented throughout the duration of the construction in accordance with GGHA Conservation Authorities' Erosion & Sediment Control Guidelines for Urban Construction (December 2006). The proposed Erosion and Sediment Control program for the site will include the following temporary measures:

- A siltation control barrier around the perimeter of the site;
- Sediment traps on catch basins or area drains internal to the site;
- Sediment traps on external catch basins adjacent to the site;
- Mud mat(s) at the access point(s) of construction to prevent / minimize mud tracking by construction vehicles;
- On-site dust control measures;
- Regular maintenance of the above-listed Erosion / Sediment Control measures; and,
- Inspection of the above-listed Erosion / Sediment Control measures before and after rainfall events.

Once all phases of construction have been completed, removal of the erosion and sediment control measures can take place.

9.0 CONCLUSION

Based on our analysis of the proposed redevelopment and supporting documentation, the following conclusions and recommendations are being made:

- Water servicing for the proposed site will be achieved via a 200mm water service connection into the existing 300 mm diameter municipal watermain on Sixth Line.

- Sanitary servicing for the proposed site will be achieved via a 200mm sanitary service connection into the existing 300mm diameter municipal sewer located on Sixth Line.

- Storm servicing for the proposed site will be achieved via a 375mm storm sewer connection into the existing 375mm diameter municipal sewer on Sixth Line.

- SWM quantity control objectives are satisfied by utilizing an underground stormwater chamber totaling 234.58m^3 and a 75 mm orifice tube.

- SWM quality control objectives are to be met via the use of an Up-Flo Filter unit for a Total Suspended Solids (TSS) removal of 80.0%, satisfying the minimum requirement of 80% TSS removal.

- SWM water balance objectives are to be achieved by retaining the 25 mm storm event in an infiltration gallery and bottomless tank.

APPENDIX A

Supporting Documentation

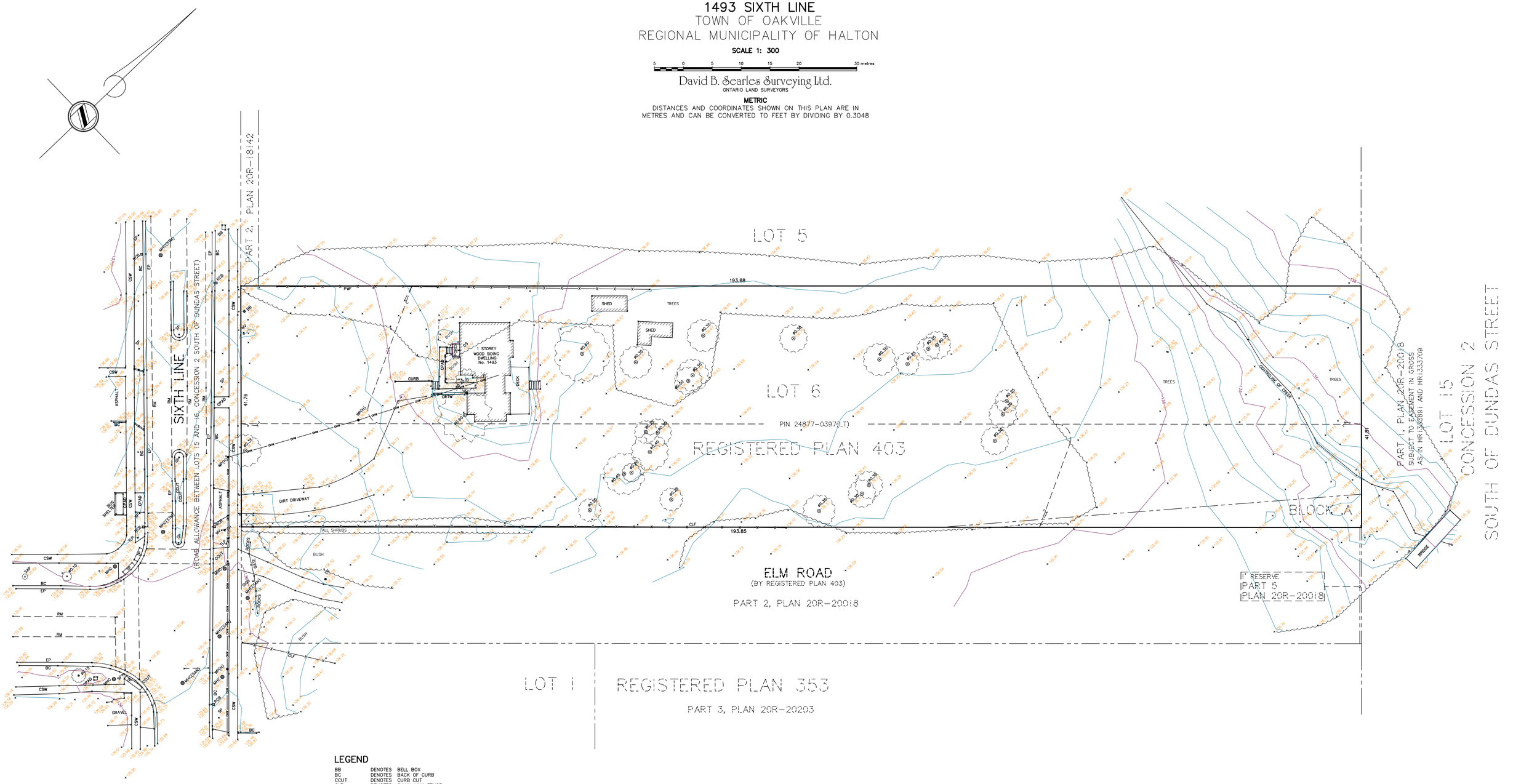
SKETCH ILLUSTRATING
TOPOGRAPHIC INFORMATION
FOR PURPOSE OF SITE DESIGN
1493 SIXTH LINE
TOWN OF OAKVILLE
REGIONAL MUNICIPALITY OF HALTON

SCALE 1: 300

5 0 5 10 15 20 30 metres

David B. Searles Surveying Ltd.
ONTARIO LAND SURVEYORS

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



BENCHMARK NOTE

ELEVATIONS ARE REFERRED TO THE TOWN OF OAKVILLE BENCHMARK No. 227, LOCATED ON SOUTH END OF CONCRETE DOOR SILL AT 1334 SIXTH LINE, HAVING AN ELEVATION OF 131.831 m.

VERTICAL DATUM: CANADIAN GEODETIC DATUM, 1928
(PRE: 1978 SOUTHERN ONTARIO READJUSTMENT)

CAUTION

LOCATIONS OF ALL UTILITIES ARE APPROXIMATE. ALL UTILITIES SHOULD BE CONTACTED PRIOR TO ANY DIGGING OR CONSTRUCTION.

THIS IS NOT A PLAN OF SURVEY AND SHALL NOT BE USED EXCEPT FOR THE PURPOSE INDICATED IN THE TITLE BLOCK.

BOUNDARY INFORMATION ILLUSTRATED HEREON HAS BEEN COMPILED FROM REGISTRY OFFICE INFORMATION AND HAS NOT BEEN VERIFIED BY FIELD MEASUREMENT.

LEGEND

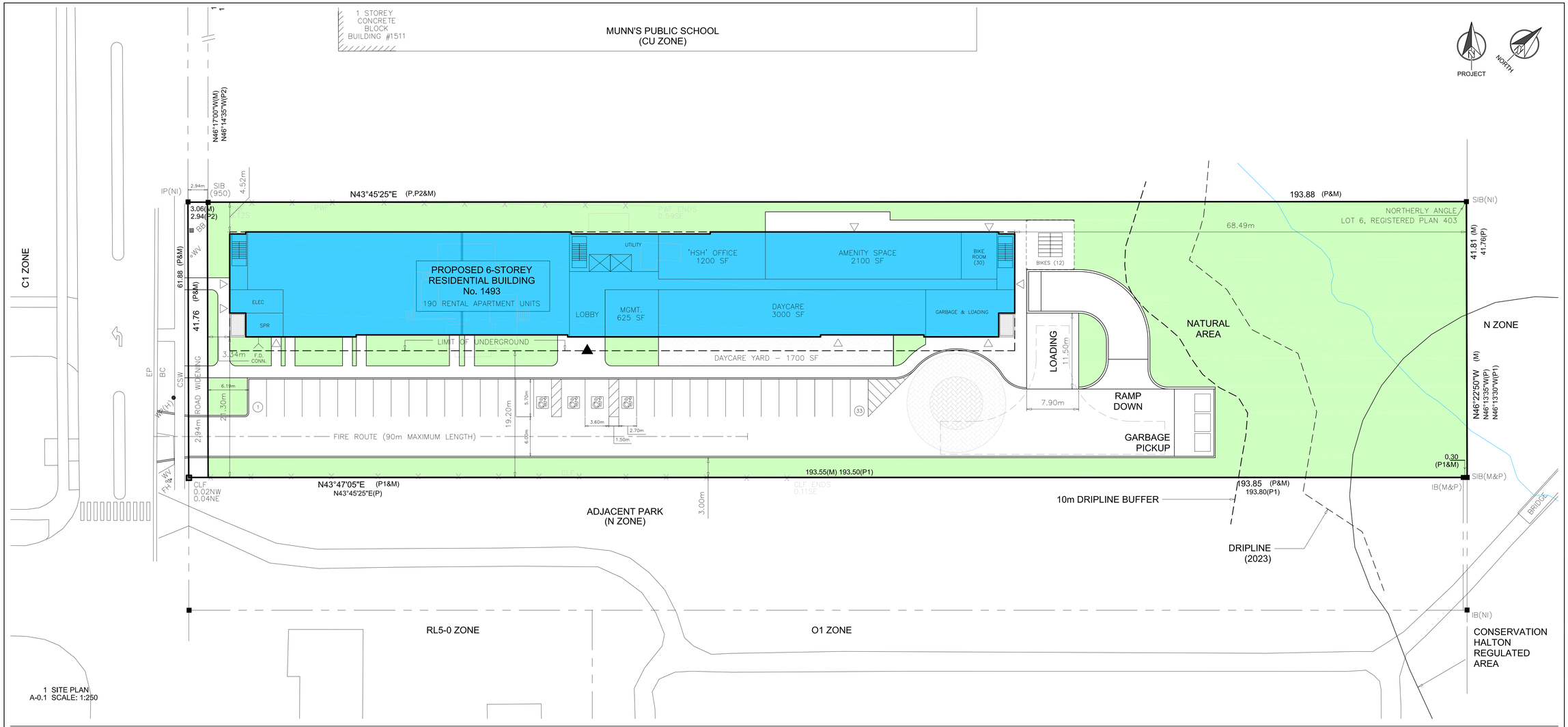
BB	DENOTES	BELL BOX
BC	DENOTES	BACK OF CURB
CCUT	DENOTES	CURB CUT
CLF	DENOTES	CHAIN LINK FENCE
CPAD	DENOTES	CONCRETE PAD
CRTW	DENOTES	CONCRETE RETAINING WALL
CSW	DENOTES	CONCRETE SIDEWALK
DS	DENOTES	DOOR SILL
EP	DENOTES	EDGE OF PAVEMENT
FH	DENOTES	FIRE HYDRANT
LS	DENOTES	LIGHT STANDARD
MHC	DENOTES	MAINTENANCE HOLE COVER
MHC(SAN)	DENOTES	MAINTENANCE HOLE COVER (SANITARY)
MHC(STM)	DENOTES	MAINTENANCE HOLE COVER (STORM)
PWF	DENOTES	POST AND WIRE FENCE
RCB	DENOTES	RECESSED CATCH BASIN
RM	DENOTES	ROAD MARKING
SP	DENOTES	SIGN POST
TLP	DENOTES	TRAFFIC LIGHT POLE
TP	DENOTES	TACTILE PLATE
WP(H)	DENOTES	WOODEN POLE (HYDRO)
WV	DENOTES	WATER VALVE
ø	DENOTES	DIAMETER
OHW	DENOTES	OVERHEAD WIRES
	DENOTES	CONIFEROUS TREE
	DENOTES	DECIDUOUS TREE
	DENOTES	TREE LINE

NOTE

FIELDWORK COMPLETED 12 MAY, 2025.

David B. Searles Surveying Ltd.
ONTARIO LAND SURVEYORS
4255 Sherwoodtowne Blvd., Suite 206, Mississauga, Ontario L4Z 1Y5
Tel: (905) 273-6840 Fax: (905) 896-4410
Email: info@dbsearles.ca

Calculator	Draftsperson
BJ	IV
Editor	Plan Index No.
BJ	F21
Calculation File	Drawing File
21-0-25CALC.DWG	21-1-25.DWG
File No.	
21-1-25	



1 SITE PLAN
A-0.1 SCALE: 1:250

RH ZONE REQUIREMENTS	REQUIREMENT	PROPOSED
Minimum lot area*	1,858.0 m2	7,969.8 m2
Minimum lot frontage	24.0 m	41.8 m
Minimum front yard*	7.5 m	3.34 m
Minimum interior side yard (north)	4.5 m	4.52 m
Minimum interior side yard (south)	4.5 m	21.30 m
Minimum rear yard	7.5 m	68.49 m
Maximum height	n/a	24.0 m
Maximum lot coverage*	35%	1,852.5 m2 (23%)
Minimum landscaping coverage*	10%	3,340 m2 (41%)
Landscape buffer adjacent parking area	3.0 m	3.0 m

*based on total lot area (less widening). No deduction for natural area or buffer.

PROPOSED 6-STOREY RESIDENTIAL HOUSING

LOT AREA

GROSS AREA	8,092.4 m2 (0.8092 ha)
ROAD WIDENING	122.6 m2 (0.0123 ha)
LOT AREA:	7,969.8 m2 (0.7969 ha)
NATURAL AREA + 10m BUFFER	1,803.6 m2 (0.1804 ha)
NET LOT AREA:	6,166.2 m2 (0.6166 ha)

GROSS FLOOR AREA

6th FLOOR	1,852.5 m2	19,940 sf
5th FLOOR	1,852.5 m2	19,940 sf
4th FLOOR	1,852.5 m2	19,940 sf
3rd FLOOR	1,852.5 m2	19,940 sf
2nd FLOOR	1,852.5 m2	19,940 sf
1st FLOOR	1,852.5 m2	19,940 sf
TOTAL	11,115.0 m2	119,640 sf

UNIT BREAKDOWN

6th FLOOR	27 1br,	7 2br,	1 3br = 35
5th FLOOR	27 1br,	7 2br,	1 3br = 35
4th FLOOR	27 1br,	7 2br,	1 3br = 35
3rd FLOOR	27 1br,	7 2br,	1 3br = 35
2nd FLOOR	27 1br,	7 2br,	1 3br = 35
1st FLOOR	11 1br,	4 2br,	0 3br = 15
TOTAL	146 1br, 39 2br, 5 3br = 190 UNITS @ 0.6166 ha = 308 uph		

ACCESSIBLE UNITS

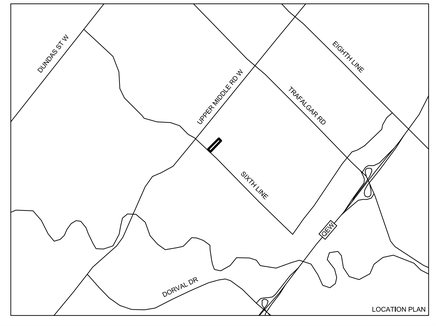
1br UNITS	40 (70%)
2br UNITS	17 (30%)
TOTAL	57 (30% OF 190)

RENTABLE AREA

146 1br @ 415 = 60,590 sf
39 2br @ 600 = 23,400 sf
5 3br @ 850 = 4,250 sf
TOTAL = 88,240 sf

PARKING

190 RENTAL UNITS @ 0.47 = 90 SPACES
450 m2 OFFICE & DAYCARE @ 1/35 = 13 SPACES
TOTAL = 103 PARKING SPACES
70 SPACES PROVIDED UNDERGROUND (2,142.0 m2, 23,055 sf)
33 SPACES ON SURFACE
ACCESSIBLE PARKING @ 1, PLUS 3% = 5 REQUIRED, 8 PROVIDED



pml.A

patrick markus luckie, Architect
7200 BENDIGO CIRCLE • MISSISSAUGA, ON • L5N 1Z4 • TEL: 416 895 0108

BLACK DOG DEVELOPMENT

PENALTA

Revisions:	
Date:	Particular:

Issue:	
Date:	Particular:
JUN.17.25	ISSUED FOR REVIEW

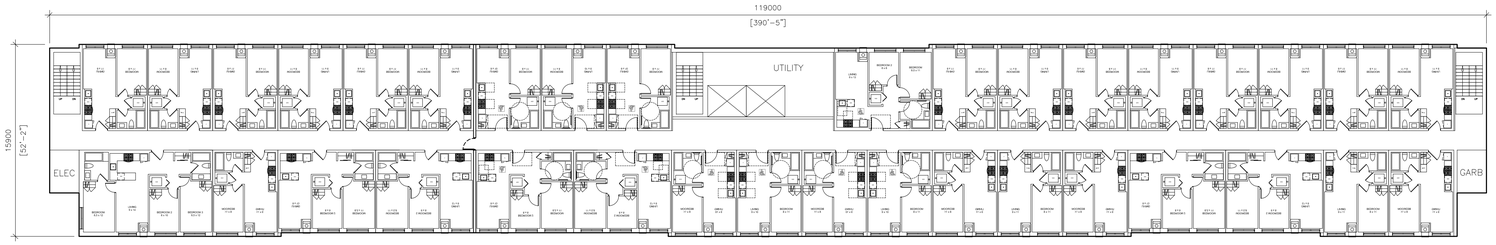
SIXTH LINE AFFORDABLE HOUSING

1493 SIXTH LINE, OAKVILLE

SITE PLAN

SCALE 1:250

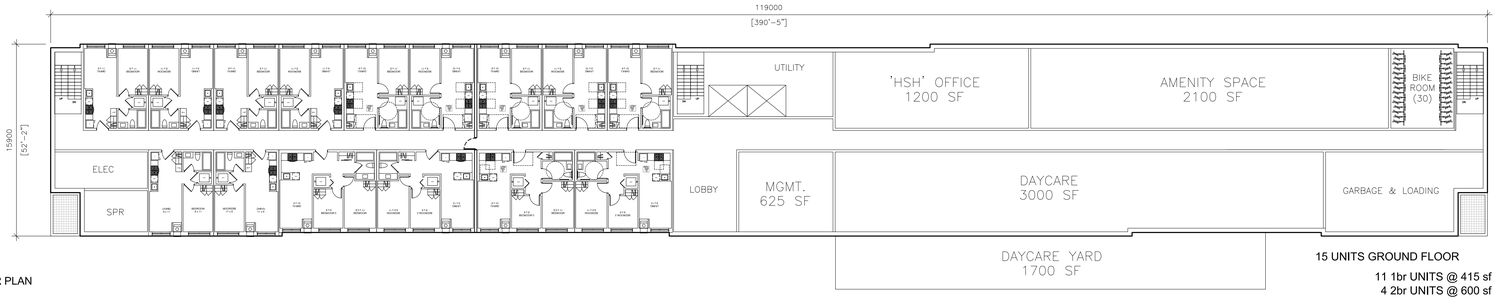
A-0.1



3 UPPER FLOOR PLAN (TYPICAL 2 to 6)
A-1.1 SCALE: 1:200

35 UNITS PER FLOOR

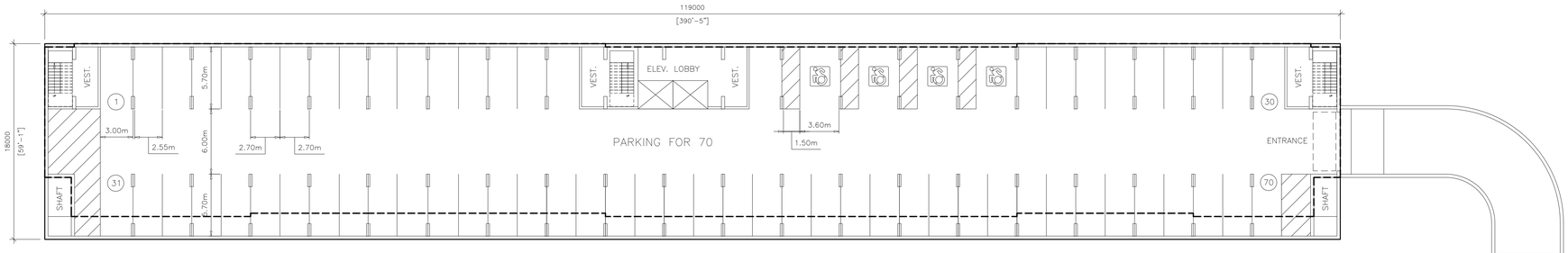
27 1br UNITS @ 415 sf	7 accessible
7 2br UNITS @ 600 sf	3 accessible
1 3br UNITS @ 850 sf	



2 GROUND FLOOR PLAN
A-1.1 SCALE: 1:200

15 UNITS GROUND FLOOR

11 1br UNITS @ 415 sf	5 accessible
4 2br UNITS @ 600 sf	2 accessible



1 BASEMENT (PARKING) PLAN
A-1.1 SCALE: 1:200

NORTH

PROJECT

pml.A

patrick markus luckie, Architect
7260 BENDIGO CIRCLE • MISSISSAUGA, ON • L5N 1Z4 • TEL: 416 895 0108

BLACK DOG DEVELOPMENT

PENALTA

Revisions:	
Date:	Particular:

Issue:	
Date:	Particular:
JUN.17.25	ISSUED FOR REVIEW

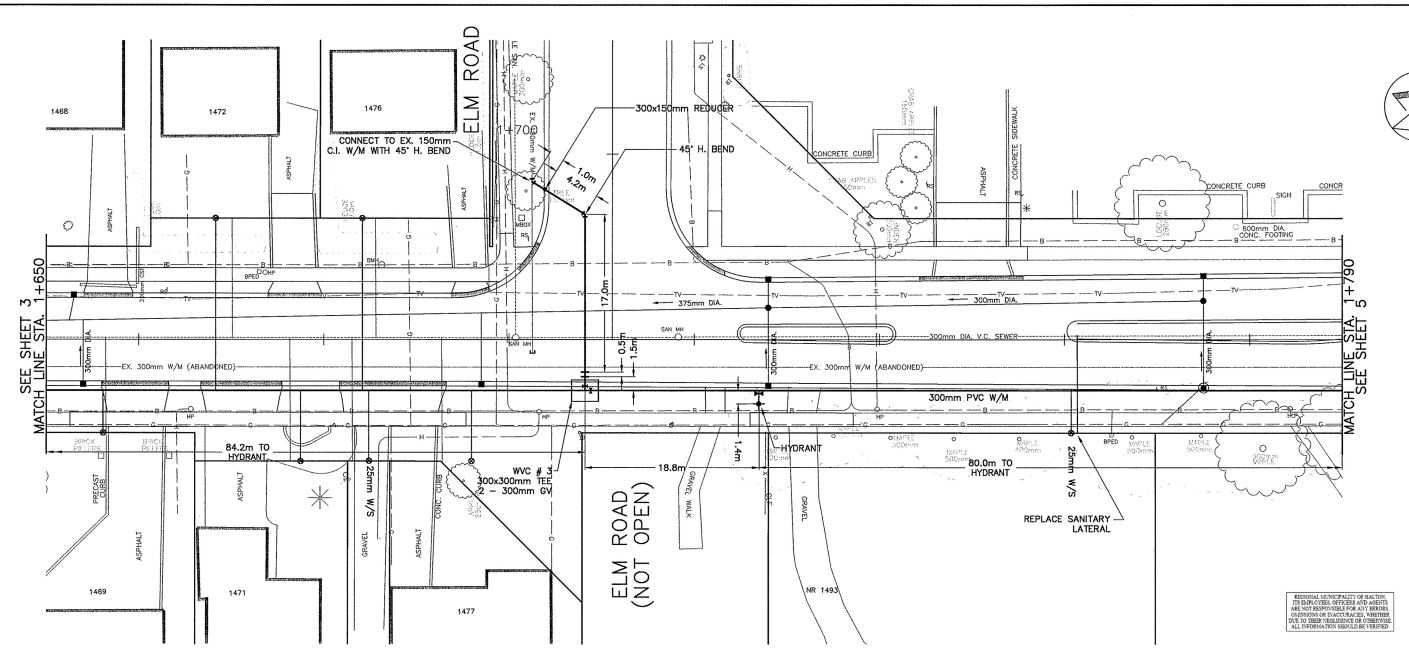
SIXTH LINE
AFFORDABLE HOUSING

1493 SIXTH LINE, OAKVILLE

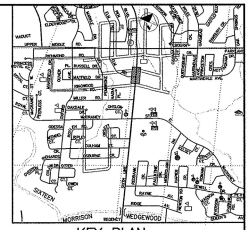
FLOOR PLANS

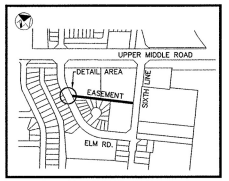
SCALE 1:200

A-1.1

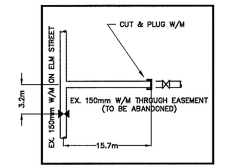


SIXTH LINE

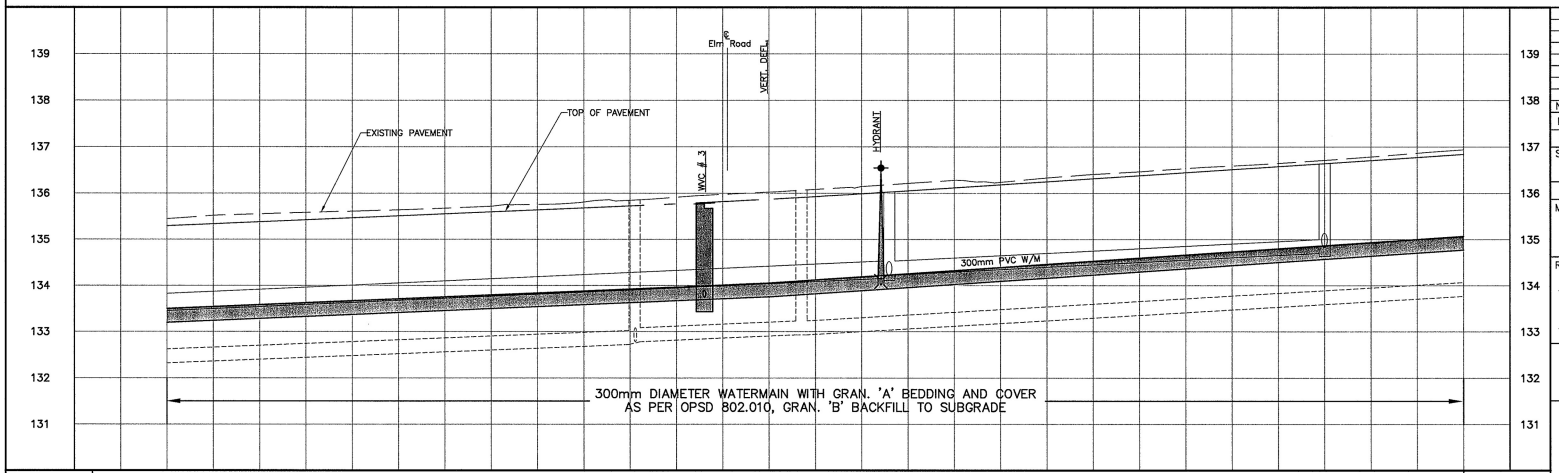




LOCATION OF W/M ABANDONMENT
N.T.S.



DETAIL OF W/M ABANDONMENT ON ELM STREET AT END OF EASEMENT
N.T.S.



CENTRELINE ELEVATIONS		CENTRELINE ELEVATIONS
WATERMAIN INVERTS	160.0m @ 0.85% — 133.75 — 165.0m @ 1.36%	WATERMAIN INVERTS
STORM SEWER INVERTS		STORM SEWER INVERTS
CHAINAGE	1+650, 1+660, 1+680, 1+700, 0+715, 1+720, 1+740, 1+760, 1+780	CHAINAGE

O- 12110

NO	Date	By	REVISIONS	MANU CAD
	JUNE '04	D.C.	AS CONSTRUCTED	X

Design	B.K.	Ch'kd	B.K.	Date APRIL, 2003
Drawn	D.C.	Ch'kd	B.K	
Scale	Horiz. 1:2.5 0 2.5 5			References
	Vert. 1:0.5 1.0 0 1.0			

APPROVALS

Municipal

Regional

Director, Engineering Services

Manager, Design Services

Field Notes

Stamp

MUNICIPALITY

REGIONAL MUNICIPALITY OF Halton

TOWN OF OAKVILLE

TITLE

WATERMAIN REPLACEMENT ON SIXTH LINE
FROM MCCRANEY STREET TO UPPER MIDDLE ROAD
IN THE TOWN OF OAKVILLE

Consultant File NO

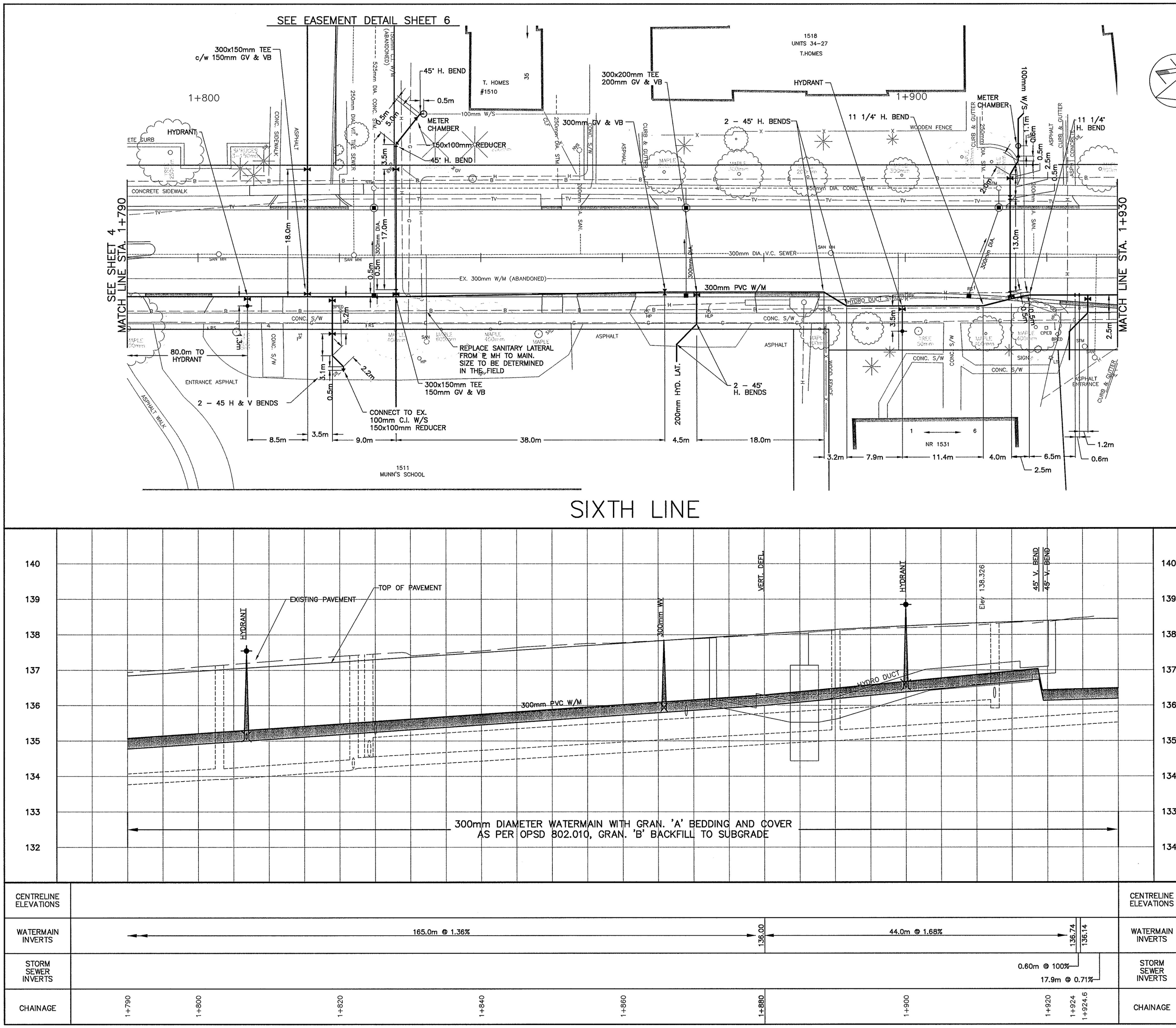
Regional Drawing NO O- 12110

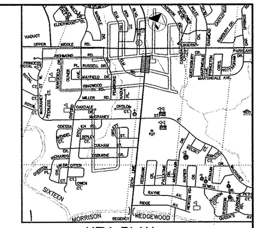
CONTRACT NO (PR-2199) R-375-02

Drawing NO

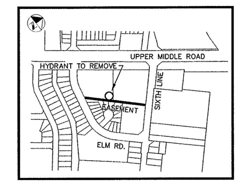
SHEET 4 OF 6

O- 12111





KEY PLAN



LOCATION OF EX. HYDRANT TO BE REMOVED
HALTON CONDO # 11
N.T.S.

NO	Date	By	REVISIONS	MANU	CAD
	JUNE 04	D.C.	AS CONSTRUCTED		X
1	JUNE 03	D.C.	PLAZA CON. LOCATION CHANGED		X

Design	B.K.	Ch'kd	B.K.	Date APRIL, 2003
Drawn	D.C.	Ch'kd	B.K	
Scale	Horiz. / Vert.			References

APPROVALS

Municipal

Regional

Director, Engineering Services

Manager, Design Services

Field Notes

Stamp

MUNICIPALITY

REGIONAL MUNICIPALITY OF Halton — JOINT CONTRACT — TOWN OF OAKVILLE

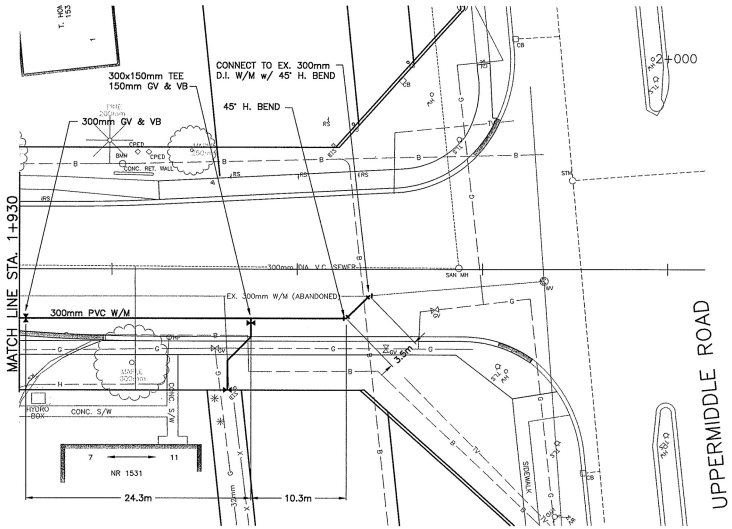
TITLE
WATERMAIN REPLACEMENT ON
SIXTH LINE
FROM MCCRANEY STREET
TO UPPER MIDDLE ROAD
IN THE TOWN OF OAKVILLE

Consultant File NO

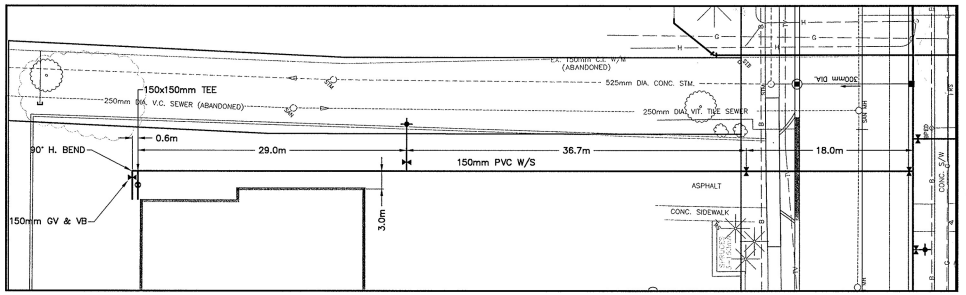
Regional Drawing NO O- 12111

CONTRACT NO (PR-2199) R-375-02

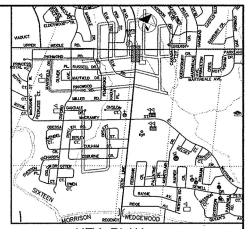
Drawing NO SHEET 5 OF 6



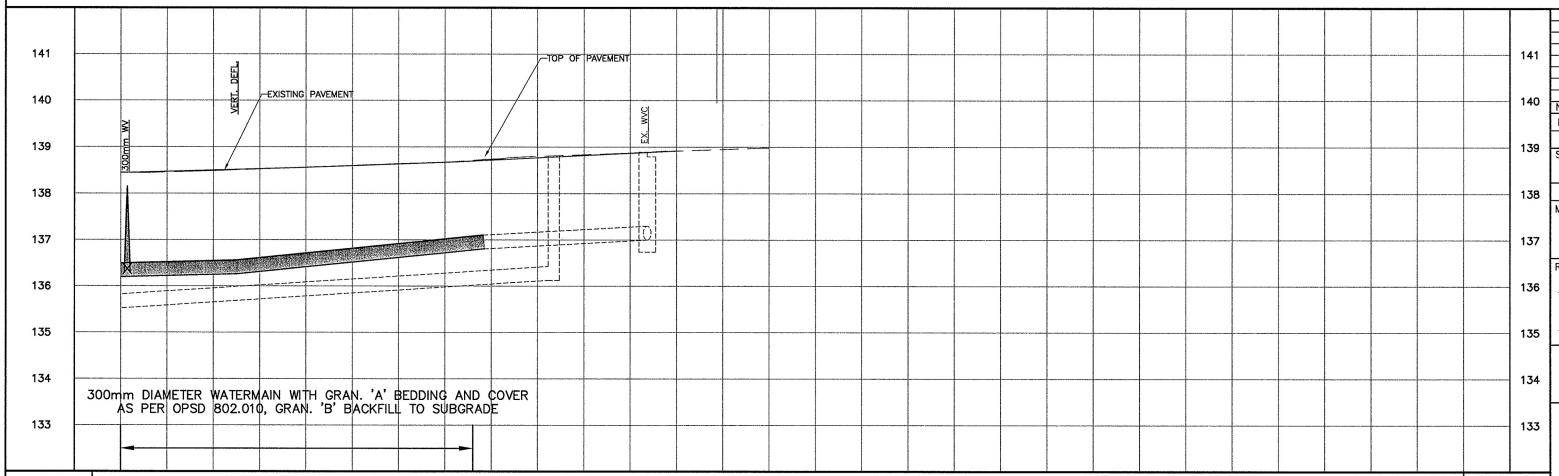
SIXTH LINE



DETAIL OF 150mm WATER SERVICE
FOR 1500 SIXTH LINE
FROM SHEET 5



KEY PLAN



CENTRELINE ELEVATIONS	
WATERMAIN INVERTS	17.9m @ 0.71% — 135.06 — 25.5m @ 1.73% — 135.70
STORM SEWER INVERTS	
CHAINAGE	1+930, 1+940, 1+942.5, 1+960, 1+968, 1+980, 2+000

NO	Date	By	REVISIONS	MANU CAD
	JUNE 04	D.C.	AS CONSTRUCTED	X
2	JUNE 03	D.C.	SIZE OF W/S HAS CHANGED	X
1	JUNE 03	D.C.	PLAZA CON. LOCATION CHANGED	X

Design B.K. Ch'kd B.K. Date APRIL, 2003
Drawn D.C. Ch'kd B.K
Scale Horiz. Vert.
References
Field Notes
Stamp

APPROVALS
Municipal
Regional
Director, Engineering Services
Manager, Design Services

MUNICIPALITY
REGIONAL MUNICIPALITY OF Halton
TOWN OF OAKVILLE

TITLE
WATERMAIN REPLACEMENT ON
SIXTH LINE
FROM MCCRANEY STREET
TO UPPER MIDDLE ROAD
IN THE TOWN OF OAKVILLE

Consultant File NO
Regional Drawing NO O- 12112
CONTRACT NO (PR-2199) R-375-02
Drawing No
SHEET 6 OF 6

O- 12112

FORWARD ENGINEERING
& ASSOCIATES INC.
Geotechnical, Environmental, Inspection & Material Testing Services
244 Brockport Drive, Unit 15, Toronto, Ontario, M9W 6X9, Tel: (416)798-3500, Fax:(416)798-8481

REPORT

GEOTECHNICAL INVESTIGATION

PROPOSED MULTI-STOREY RESIDENTIAL DEVELOPMENT
1493 SIXTH LINE
OAKVILLE, ONTARIO

PREPARED FOR:

PENALTA GROUP LTD.
504 Iroquois Shore Road, Unit 12B
Oakville, Ontario
L6H 3K4

June 05, 2025
Ref. No. G7481

Distribution: 1 PDF Copy – PENALTA GROUP LTD.
1 PDF Copy – FORWARD ENGINEERING & ASSOCIATES INC.

Contents

LIST OF ENCLOSURES:

BOREHOLE LOCATION PLAN - DRAWING NO. 1

PERMANENT DRAINAGE - DRAWINGS NOS. 2

LOG OF BOREHOLE SHEETS (1 to 12) - APPENDIX A

INTRODUCTION

This report presents the results of the geotechnical investigation carried out by Forward Engineering & Associates Inc. for the proposed residential development at 1493 Sixth Line in Oakville, Ontario.

The location of the proposed development in relation to the property boundaries, and adjacent roadways is shown on Drawing No. 1, which also depicts the proposed Site Plan as well. The locations of the boreholes carried out during this investigation are also presented on Drawing No. 1.

This investigation was authorized by Mr. Alen Ghaderi of Penalta Group Ltd.

PURPOSE AND SCOPE

The objectives (purpose) of this investigation were to determine the following:

- The extent, depth and properties of the predominant fill/soil strata as they affect the design and construction of the proposed development.
- The short-term groundwater levels, if encountered.
- The appropriate geotechnical design criteria for building foundations, excavations, backfill, slab construction, utilities and pavement.

To achieve the above noted objectives, the field program consisted of twelve [12] boreholes extended to a depth ranged from 1.65 to 4.67 m below the Existing Ground Surface Level (EGSL).

On completion of the field and laboratory work, an engineering analysis was carried out, and this summary report was prepared.

PROPOSED DEVELOPMENT

We understand, based on the reviewed Site Plan, that the proposed new development will consist of the following:

- Demolition of the existing detached wood-framed dwelling, with a basement and an attached garage, at 1493 Sixth Line property site in Oakville, ON.

- Construction of [five] 5-storey housing development, with a single level of basement.
- In addition, the first floor and remaining spaces will be utilized for amenity space, daycare, parking spaces, as well as landscaped and natural areas.

FIELD AND LABORATORY TESTING

Field Works

Borehole Investigation:

The field work for the borehole investigation consisted of twelve [12] boreholes (BH-1 to BH-12), drilled on March 27 and 28, 2025, under the supervision of a member of our staff.

The drilled boreholes were located at the approximate locations shown on Drawing No. 1 and extended to a depth ranging from about 1.60 to 4.67 m below the EGSL.

Soils were sampled in the boreholes following the Standard Penetration Test (SPT) method using a D-50 Track Mounted Auger Drill Rig using Rotary Drilling with Split Spoon Samplers.

The samples were logged in the field and appropriately stored in plastic bags and re-examined in more detail in the laboratory. The samples will be stored for a period of three months and then discarded, unless we are instructed differently.

Groundwater observations were made in the open boreholes, during and upon completion of the drilling operation. The results are recorded on the Log of Borehole sheets attached in Appendix A.

Elevations referred to in this report are metric and geodetic. The ground level elevations at the borehole locations were interpolated from the *Sketch Illustrating Topographic Information* drawing dated May 12, 2025, by David B. Searles Surveying Ltd., and provided to us by the client.

Laboratory Testing

Laboratory testing consisted of determination of the in-situ moisture content of the retrieved and representative soil samples.

SITE CONDITIONS

Surface Conditions

The site is located at 1493 Sixth Line, Oakville, Ontario.

For this description it will be assumed that the north bearing is parallel to the nearest road which is Sixth Line. At the time of this investigation the dwelling on site was vacant.

The site condition, as observed during our site visit April 27, 2025, is presented in the following *Table No. 1*.

Table 1 - Site Surface Observations

East Boundaries:	Oakville Park.
North Boundaries:	Institutional building (Munn's Public School).
West Boundaries:	Sixth Line.
South Boundaries:	Oakville Park.
Surface Coverage:	The site predominantly consists of landscaping. A small portion consists of a gravel driveway and house footprint. The landscaping at the rear contains mature trees.
Ground Level:	The topography of the site is generally flat. *It should be noted that the east side of the property (rear of existing house), which previously contained significant number of mature trees, recently had trees removed resulting in uneven ground.*
Ditches:	None observed.
Berms/Stockpiles:	None observed.
Existing Structures:	Vacant residential dwelling with single level basement.
Proposed/Intended Land Use:	Residential.

Subsurface Conditions

Borehole Investigation Findings:

The subsurface conditions encountered at the borehole locations are shown on the

Log of Borehole sheets, presented in Appendix A, and can be summarized as follows:

Topsoil/Organic Soil	A layer of topsoil/organic soil was encountered at the surface of all the boreholes, except BH-6 and BH-9, with a thickness ranging from about 150 to 350 mm. *The east side of the property (rear of existing house), which had a significant number of mature trees removed, had uneven ground with varying organic soil thicknesses. It should be noted that the measurements of this layer are not considered accurate to be used for estimate purposes.*
Fill/Disturbed Soil	A layer of Fill/Disturbed soil was found at the surface or below the topsoil layer in all the boreholes and extended to a depth ranging from about 0.76 to 1.52 m below the EGSL. This stratum generally consisted of reddish-brown clayey silt/silty clay with minor traces of rootlets and occasional organics and gravel in the upper zone. This stratum was observed in mostly very moist to wet state and in very loose to loose state of packing. *For more accurate description of this layer, and for a more accurate depth, test pits are required.*
Shale Till	Shale Till was encountered below the fill/disturbed soil in all the boreholes, except BH-6, BH-8, BH-9 and BH-12, and extended to a depth ranging from about 1.52 to 3.05 m below the EGSL. Occasionally in some of the boreholes this till encountered shale fragments. This red till was observed in moist state and found in hard consistency.
Highly Weathered Shale	Hard, red, and moist Highly Weathered Shale was below the fill/disturbed soil or shale till layers, and it extended to the maximum explored depth

Groundwater	Groundwater level observations were made during and immediately upon the completion of the drilling investigation. The results are summarized in the following *Table 2*, as shown:

Table 2a: Groundwater &Cave-in Observations Upon Completion of Drilling

Borehole No.	Borehole Depth (m)	Cave-in Depth Below EGSL (m)	Groundwater Depth Below EGSL (m)
BH-1	3.10	Open	Dry
BH-2	2.34	Open	Dry
BH-3	2.41	Open	Dry
BH-4	2.36	Open	Dry
BH-5	4.67	4.3	Dry
BH-6	1.60	Open	Dry
BH-7	1.65	Open	Dry
BH-8	1.91	Open	Dry
BH-9	1.65	Open	Dry
BH-10	1.98	Open	Dry
BH-11	1.65	Open	Dry
BH-12	1.65	Open	Dry

It should be noted, however, that the groundwater levels are subject to seasonal fluctuations. Consequently, definitive information on the long-term groundwater levels could not be obtained at the present time.

GEOTECHNICAL DISCUSSION AND RECOMMENDATIONS

Foundations

We understand that the proposed multi-storey building will consist of [five] 5-storey housing units and commercial building levels with a single basement/underground level. The ground Finished Floor Elevation (FFE), basement/underground) finished floor level, and structural loads are not known at this stage.

Conventional Spread/Strip Footings

The proposed building(s) can be supported on the conventional strip/spread footings established mainly within the native undisturbed, hard weathered shale [bedrock] at/or below the founding depths/elevations presented in Table 3, shown below.

The size of the footings can be proportioned to the following bearing resistances**:**

Factored Bearing Resistance at Ultimate Limit State (ULS) = 1050 kPa

Bearing Resistance at Serviceability Limit State (SLS) = 750 kPa

Table 3 –Founding Depth/Elevation of Strip/Spread Footings

Borehole No.	*Borehole Ground Surface Elevation (m)*	*Founding Depth Below EGSL at/or below*	*Founding Elevation (at/or below)*
1	136.55	2.30 m	134.25 m
2	136.75	1.50 m	135.25 m
3	136.65	1.50 m	135.15 m
4	136.5	1.50 m	135.00 m
5	136.47	3.05 m	133.42 m
6	137.25	1.50 m	135.75 m
7	136.65	1.50 m	135.15 m
8	136.29	1.50 m	134.79 m

Foundations Notes

When exposed to weathering and atmospheric actions, the otherwise freshly excavated intact and sound shale surfaces will suffer from degradation/deterioration and time-dependent loss of strength/stiffness. Therefore, it is imperative to place the concrete for readily excavated footings without delay or applying a high compressive strength concrete levelling layer/mud mat, at least 75 mm thick, to be poured on approved bearing surface of the sound bedrock prior to actual footing construction. In summary exposure of the shale bedrock should be kept to a minimum.

Adjacent footings founded at different elevations should be stepped at 10 horizontal to 7 vertical. For frost protection requirements, all exterior footings and footings unheated areas, must have a minimum soil cover of 1.2 m.

Maximum total settlements of conventional strip/spread footings designed and constructed in accordance with the above recommendations should be less than the total tolerable limit of 25 mm. The differential settlements are expected to be less than 19 mm.

Furthermore, the recommended bearing capacity and foundation depths have been calculated from the limited borehole information and are intended for design purposes only.

More specific information, with respect to founding conditions between the boreholes will become available when the proposed construction is underway. Therefore, the encountered founding conditions must be verified in the field, and all footings must be inspected by this office, before placement of concrete.

Earthquake Considerations

For structural design seismic consideration, the seismic provisions of the Ontario Building Code (**OBC** 2024) outline the Classification of sites for Seismic Site Response in Table 4.1.8.4.-B of the National Building Code of Canada (**NBC**) 2020.

According to Table 4.1.8.4.-B of the code, and this investigation findings, the subject Seismic Site Class is selected as Class “C”.

Basement and Underground Walls

Basement and underground/retaining walls should be designed to resist a pressure "p", at any depth, "h" below the surface, as given by the expression **:**

$$p = 0.45 [\gamma h + q]$$

where; 0.45 is the earth pressure coefficient considered applicable

$\gamma = 21.0$ kN/m^3 is the unit weight of granular backfill

q = an allowance for surcharge.

The foregoing equation assumes that perimeter drains will be provided and that the backfill against the subsurface walls would be a free draining granular material.

Excavation and Backfill

No major problems should be encountered for the anticipated depth of excavation. The excavation should be back sloped at 45 degrees or flatter in accordance with the current Ontario Occupational Health and Safety Act.

The excavation in the till and weathered shale can be carried out with a heavy duty back-hoe. Some of the relatively harder limestone slabs or seams, interbedded in the weathered shale (shale till), may require the use of jack hammer or hoe ram.

The anticipated water seepage, if any, into the excavations from the more permeable seams/lenses or surface run-off can be handled by conventional pumping methods.

The material to be used for backfilling under floor slab or in-service trenches should be suitable for compaction, i.e., free of organics and with natural moisture content, which is within 2 percent of its optimum moisture content, and no pieces larger than 100 mm in size. The backfill material should be compacted to at least 98 percent of the SPMDD. However, the excavated materials will be very sensitive to moisture content, and the use of Granular B/C is preferred.

The backfill against the subsurface walls, and confined spaces, should be free draining granular fill, preferably conforming to the Ontario Provincial Standard Specification for granular base course, Granular B.

Slab Construction and Permanent Drainage

The floor slabs can be supported and constructed following the standard slab-on-grade technique, provided that any vegetation, organic soil and/or fill with organics must be removed and the base should be thoroughly proof-rolled. Any soft spots revealed during proof-rolling should be sub-excavated and backfilled with suitable materials, compacted to at least 98 % SPMDD.

The ground surface should be adequately and thoroughly compacted to densify the near surface disturbed and loose soils. If needed, raising the grades thereafter should be achieved using suitable fill free of organics and any other deleterious materials or Granular B material, and to be placed in shallow lifts i.e., ±200 mm thick and thoroughly compacted to 98 % SPMDD i.e. "engineered fill"

The floor slabs should rest on a well compacted layer of "19 mm clear stone" at least 200 mm thick when compacted. The stone bed would act as a barrier and prevent capillary rise of moisture from the subgrade to the floor slab.

Permanent perimeter and sub-floor drainage system, as shown in Drawing No. 2, shall be provided. The sub-floor system may be eliminated based on observations during construction.

Underground Utilities

The problem areas of pavement settlement largely occur adjacent to manholes, catch basins and service crossings. The on-site materials would generally be difficult to compact in these areas, and it is therefore recommended that a sand backfill be used in confined areas.

The upper 1.0 m of the trench backfill should be compacted to 98 % SPMDD. Below this zone, a 95 % SPMDD compaction is considered acceptable.

Pavement Design

In the proposed pavement areas any vegetation, topsoil/organic soil and/or fill with noticeable amount of organics should be removed, and the base should be thoroughly proof-rolled. Any soft spots revealed during proof-rolling should be sub-excavated and backfilled with suitable materials, compacted to at least 98 % SPMDD.

The subgrade soil is frost susceptible. The design of pavement is therefore mainly influenced by the need to minimize the effects of freezing and thawing. Consequently, the ground must not be unnecessarily disturbed.

The subgrade should be sloped to facilitate drainage towards catch basins and the final subgrade should be compacted before pavement is constructed.

It should be noted that the subgrade should be dry and firm, not spongy, during compaction and during the construction of the [sub] base. Soft or spongy subgrade areas should also be sub-excavated and properly replaced with suitable approved backfill compacted to 98 % SPMDD.

The subgrade will suffer strength regression if water is allowed to infiltrate into the mantle. Therefore, sub-drains should be installed along the edge of all pavement areas to prevent surface water from infiltrating into the subgrade.

Based on the engineering properties of the subgrade soil, climatic conditions and the anticipated use of the pavement, typical flexible asphaltic pavement designs for this development are as shown in the following Table:

Table 3 - Typical Flexible Asphaltic Pavement Design

Pavement Components	Heavy Duty	Medium Duty
Asphaltic Concrete	40 mm HL3	40 mm HL3
	60 mm HL8	40 mm HL8
19 mm Crushed Limestone	150 mm	150 mm
Granular B Sub-base	300 mm	200 mm

All granular materials used in the construction of pavement should be compacted to 98 % of Standard Proctor maximum dry density.

If the proposed pavements are to be constructed during wet seasons, the moisture content in the subgrade will probably be above the optimum, and this will render its shear strength inadequate to support paving equipment traffic. In this case, the granular sub/base should consist of 50 mm Crusher-Run Limestone.

It should be noted that all pavement materials should meet their relevant OPSS, Halton Region, and Town of Oakville Standard Specification requirements for placement and quality.

General Comments

This geotechnical report is provided based on the terms of reference provided above and, on the assumption, that the design will be in accordance with the applicable codes and standards.

If there is any change in the design features relevant to the geotechnical analyses, or if any questions arise regarding the geotechnical aspects of the codes and standards, this office should be contacted to review the design.

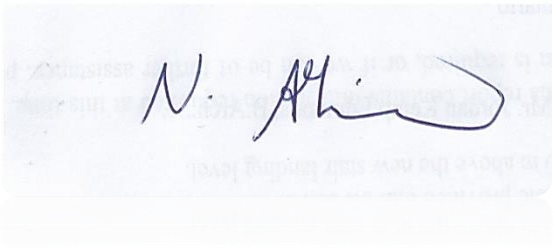
The comments given in this report are intended only for the guidance of design engineers.

Contractors bidding on or undertaking the works should, in this light, decide on their own investigations, as well as their own interpretations of the factual borehole results. This concern specifically applies to the classification of the fill/organic/topsoil cover and the potential reuse of these soils on/off site.

The prospective contractors must draw their own conclusions as to how the near surface and subsurface conditions may affect them.

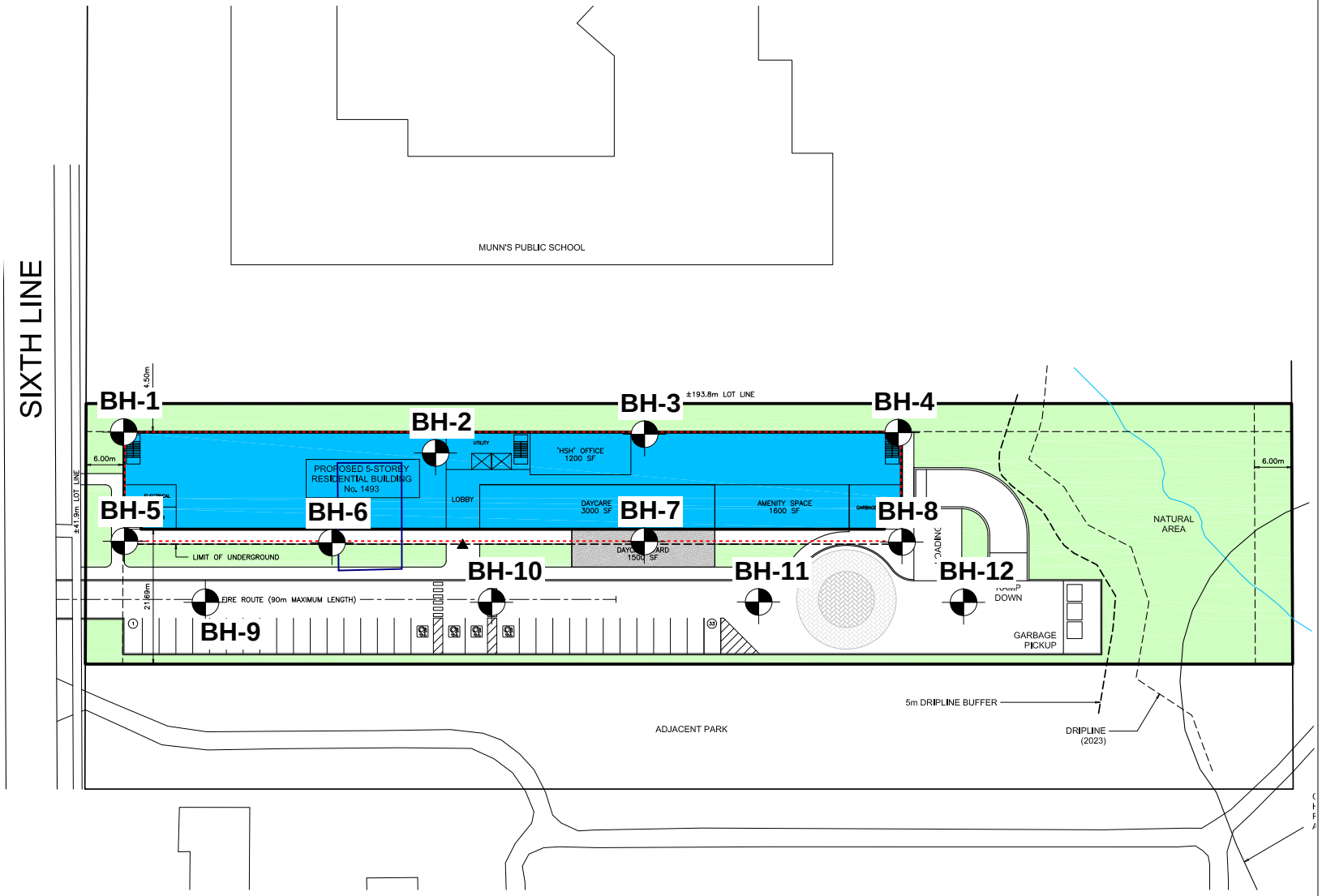
We trust this report contains information requested at this time. However, if any clarification is required, or if we can be of further assistance, please contact this office.

Yours truly,
Forward Engineering & Associates Inc.



Nasser Abdelghani, M.Sc., P.Eng.
Project Geotechnical Engineer

G. S. Semaan, M.Eng., P.Eng.
Principal



NOTES:

BH = BOREHOLE LOCATION

DRAWING No. 1
BOREHOLE LOCATION PLAN

Rev.	DATE	REVISION / ISSUE
04		
03		
02		
01		

Project Name: PROPOSED RESIDENTIAL DEVELOPMENT

Address: 1493 SIXTH LINE, OAKVILLE, ONTARIO

PROJECT No.	:7481
DRAWING DATE	:APR. 14, 2025
DRAWN BY: P.R.	PAGE 1 of 1
CHECKED BY: G.S.	

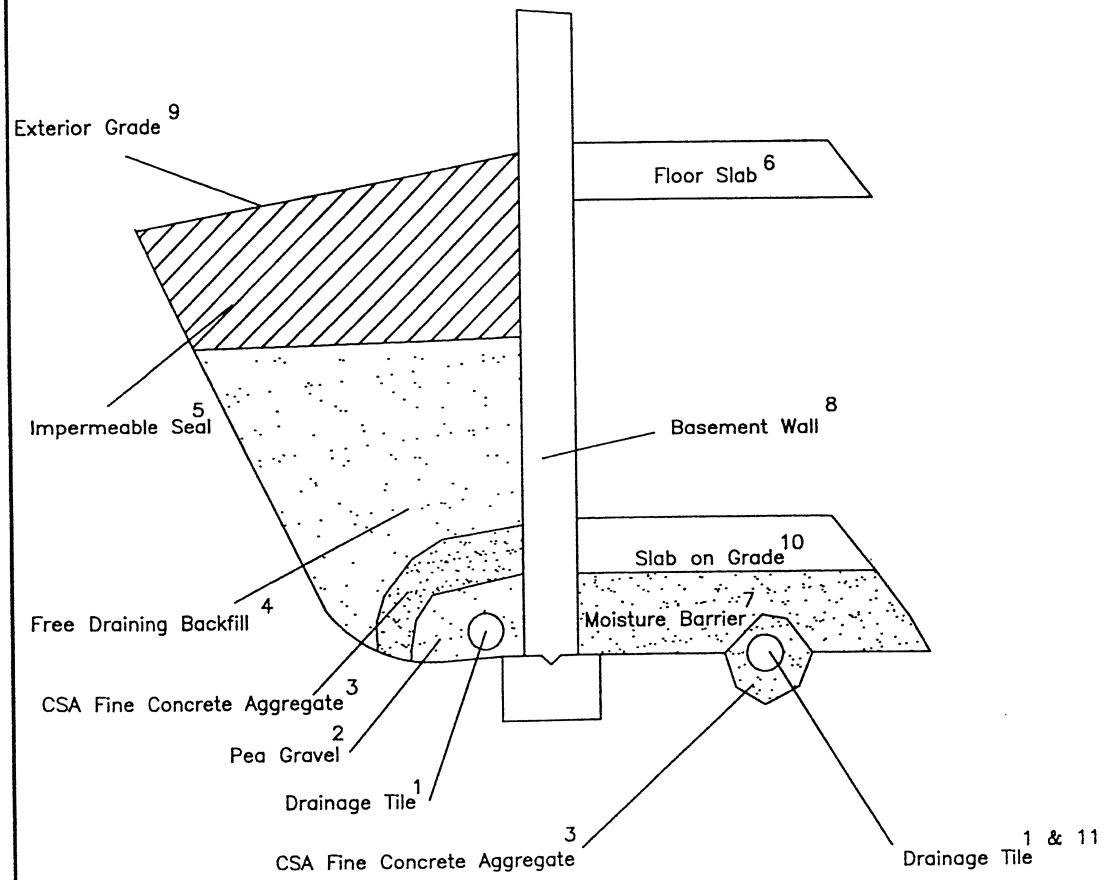
FORWARD ENGINEERING & Associates Inc.

Forward Engineering & Associates Inc.
244 Brockport Drive, Unit 15
Toronto, Ontario M9W 6X9
Tel: 416-798-3500 Fax: 416-798-8481

www.forwardengineering.ca

DRAINAGE AND BACKFILL RECOMMENDATIONS

(Not to Scale)



TYPICAL SECTION

NOTES:

1. Drainage tile to consist of 100 (4") diam. Weeping tile or equivalent perforated pipe leading to a positive sump or outlet. Invert to be minimum 150mm (6") below underside of floor slab.
2. Pea gravel 150mm (6") top and sides of drain. If drain is not on footing, 100 mm (4") of pea gravel below drain. Clear 20mm (3/4") crushed stone may be used provided it is covered by an approved porous membrane (Terrafix 270R or equivalent).
3. C.S.A. Fine aggregate to act as filter material. Minimum 300 mm (12") top and sides of tile drain. This may be replaced by an approved porous plastic membrane as indicated in 2.
4. Free draining backfill - Class B pit-run gravel or equivalent compacted to 93 – 95 % Standard Proctor Maximum Dry Density (SPMDD).
5. Impermeable backfill seal compacted clay, clay silt or equivalent. If original soil is free draining seal may be omitted.
6. Do not backfill until wall is supported by basement and floor slab or adequate bracing.
7. Moisture barrier to consist of 20mm (3/4") compacted crushed stone. Layer to be 200mm (8") thick.
8. Basement walls to be damp proofed.
9. Exterior grade to slope away from wall.
10. Slab on grade should not be structurally connected to wall or footing.
11. Underfloor drain invert to be at least 300 (1') below underside of floor slab. Tiles to be placed in parallel rows 6-8m (20' – 25') centres one way.
12. do not connect the underfloor drains to perimeter drains.
13. If the 20mm (3/4") stone requires surface blinding, use 6mm (1/4") stone chips.

DRAWING NO. 2

APPENDIX A

BOREHOLE LOG SHEETS
(1 – 12)

Project No: 7481

Log of Borehole BH-1

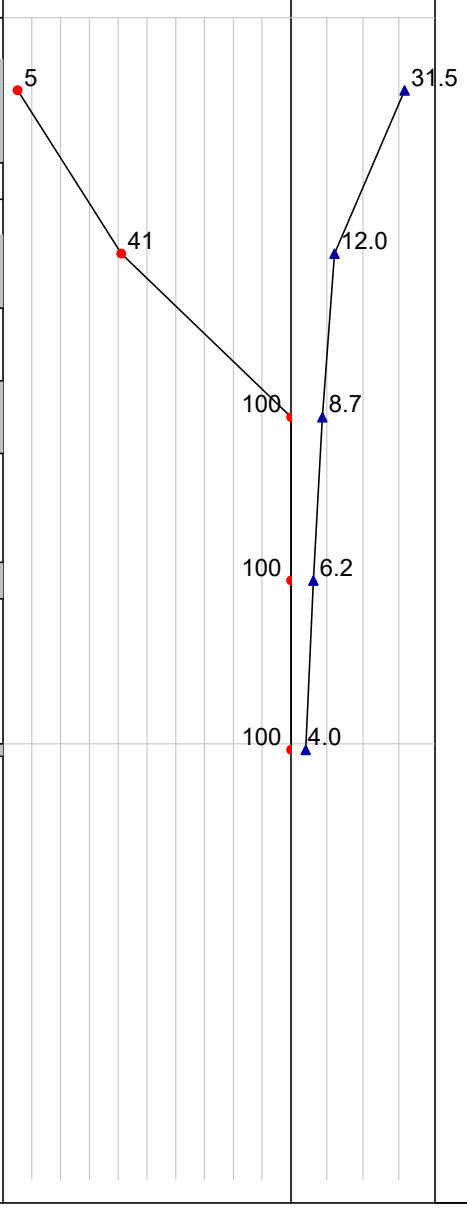
Project: PROPOSED RESIDENTIAL DEVELOPMENT

Client: PENALTA GROUP LTD.

Enclosure: 2

Location: 1493 SIXTH LINE, OAKVILLE, ONTARIO

Depth (m)	Description of strata	Elevation (m)	Sample No.	Type	Blows/ft	Recovery
0	Ground Surface	136.55				
	TOPSOIL/ORGANIC SOIL (±300 mm)	0.00	1	SS	5	
	FILL/DISTURBED SOIL reddish brown clayey silt and silty clay, loose, very moist to wet.	136.25 0.30				
		135.79 0.76	2	SS	41	
1	SHALE TILL with occasional shale fragments. hard, red, moist.		3	SS	100	
2		134.26 2.29	4	SS	100	
	HIGHLY WEATHERED SHALE hard, red, damp to moist.					
3		133.45 3.10	5		100	
	End of Borehole					
4						



Monitoring Well

Remarks: Upon completion of drilling, the borehole was open and dry.

Drill Method: D-50

Drill Date: 27 MARCH 2025

Datum: GEODETIC

FORWARD ENGINEERING & ASSOCIATES INC.
244 Brockport Drive, Unit 15, Toronto, Ontario, M9W 6X9

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7481

Log of Borehole BH-2

Project: PROPOSED RESIDENTIAL DEVELOPMENT

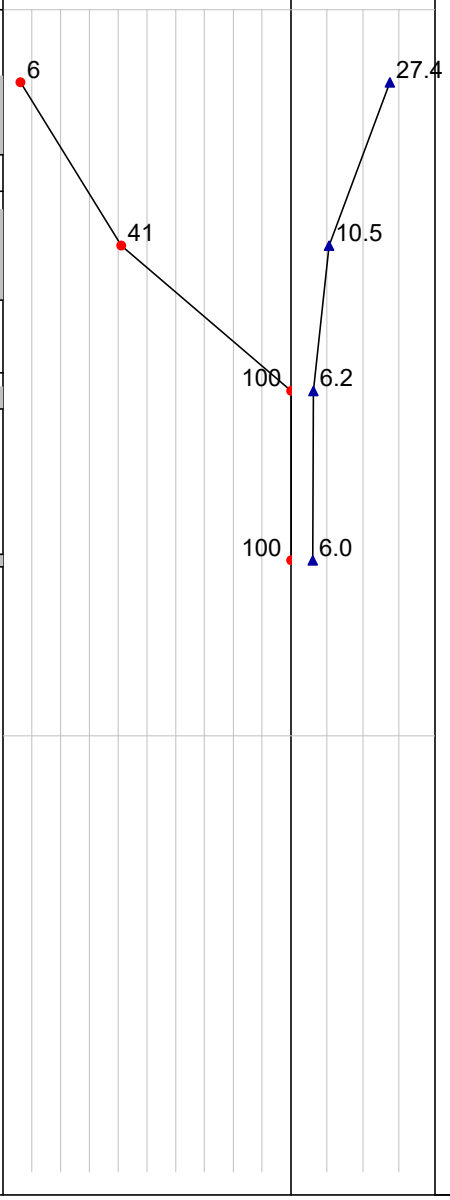
Client: PENALTA GROUP LTD.

Enclosure: 3

Location: 1493 SIXTH LINE, OAKVILLE, ONTARIO

Depth (m)	Description of strata	Elevation (m)	Sample No.	Type	Blows/ft	Recovery
0	Ground Surface	136.75				
	TOPSOIL/ORGANIC SOIL (±230 mm)	0.00				
	FILL/DISTURBED SOIL reddish brown clayey silt with traces of rootlets, loose, very moist to wet.	136.52 0.23	1	SS	6	
		135.99 0.76				
1	SHALE TILL hard, red, moist.		2	SS	41	
		135.22 1.52	3	SS	100	
2	HIGHLY WEATHERED SHALE hard, red, moist.					
		134.41 2.34	4		100	
3	End of Borehole					
4						

Blows/ft: 20 40 60 80 — Water Content %: 10 20 30 — Monitoring Well



Remarks: Upon completion of drilling, the borehole was open and dry.

Drill Method: D-50

Drill Date: 27 MARCH 2025

Datum: GEODETIC

FORWARD ENGINEERING & ASSOCIATES INC.
244 Brockport Drive, Unit 15, Toronto, Ontario, M9W 6X9

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7481

Log of Borehole BH-3

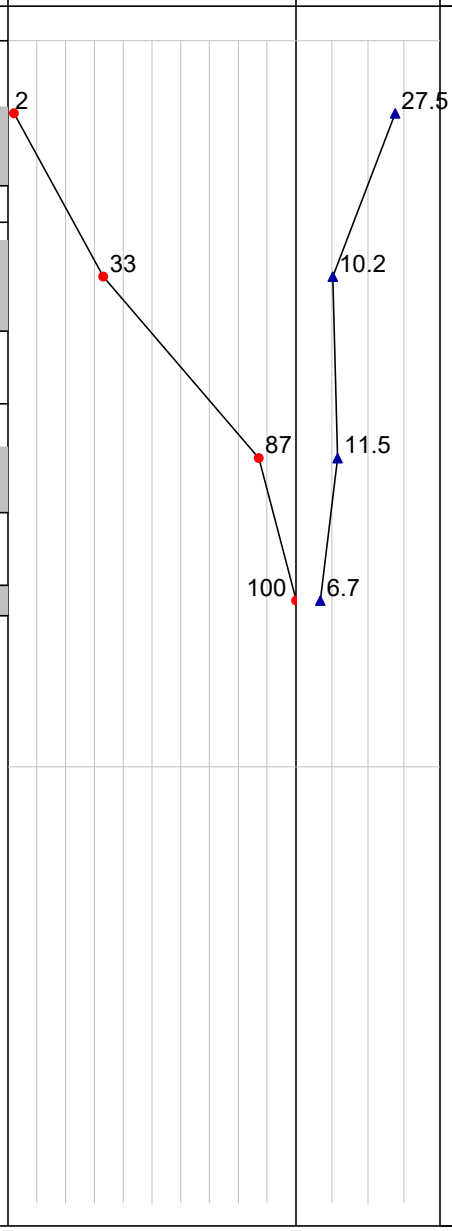
Project: PROPOSED RESIDENTIAL DEVELOPMENT

Client: PENALTA GROUP LTD.

Enclosure: 4

Location: 1493 SIXTH LINE, OAKVILLE, ONTARIO

Depth (m)	Description of strata	Elevation (m)	Sample No.	Type	Blows/ft	Recovery
0	Ground Surface	136.65				
	TOPSOIL/ORGANIC SOIL (±150 mm)	0.00	1	SS	2	
	FILL/DISTURBED SOIL reddish brown clayey silt with traces of rootlets, very loose, very moist to wet.	135.89				
1	SHALE TILL hard, red, moist.	0.76	2	SS	33	
	HIGHLY WEATHERED SHALE hard, red, moist.	135.13	3	SS	87	
2		1.52	4	SS	100	
	End of Borehole	134.24				
3		2.41				
4						



Monitoring Well

Remarks: Upon completion of drilling, the borehole was open and dry.

Drill Method: D-50

Drill Date: 28 MARCH 2025

Datum: GEODETIC

FORWARD ENGINEERING & ASSOCIATES INC.
244 Brockport Drive, Unit 15, Toronto, Ontario, M9W 6X9

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7481

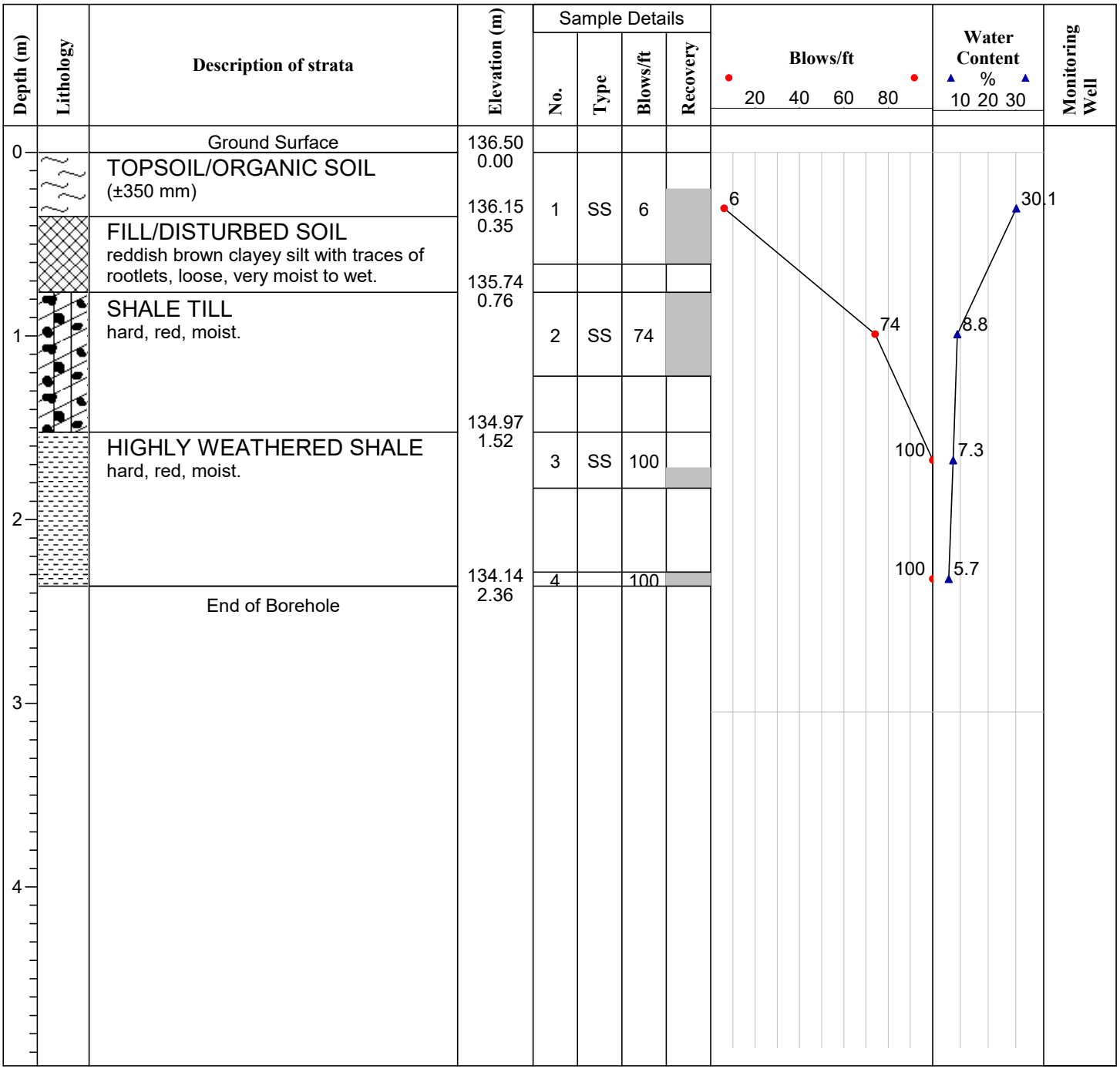
Log of Borehole BH-4

Project: PROPOSED RESIDENTIAL DEVELOPMENT

Client: PENALTA GROUP LTD.

Enclosure: 5

Location: 1493 SIXTH LINE, OAKVILLE, ONTARIO



Remarks: Upon completion of drilling, the borehole was open and dry.

Drill Method: D-50

Drill Date: 28 MARCH 2025

Datum: GEODETIC

FORWARD ENGINEERING & ASSOCIATES INC.
244 Brockport Drive, Unit 15, Toronto, Ontario, M9W 6X9

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7481

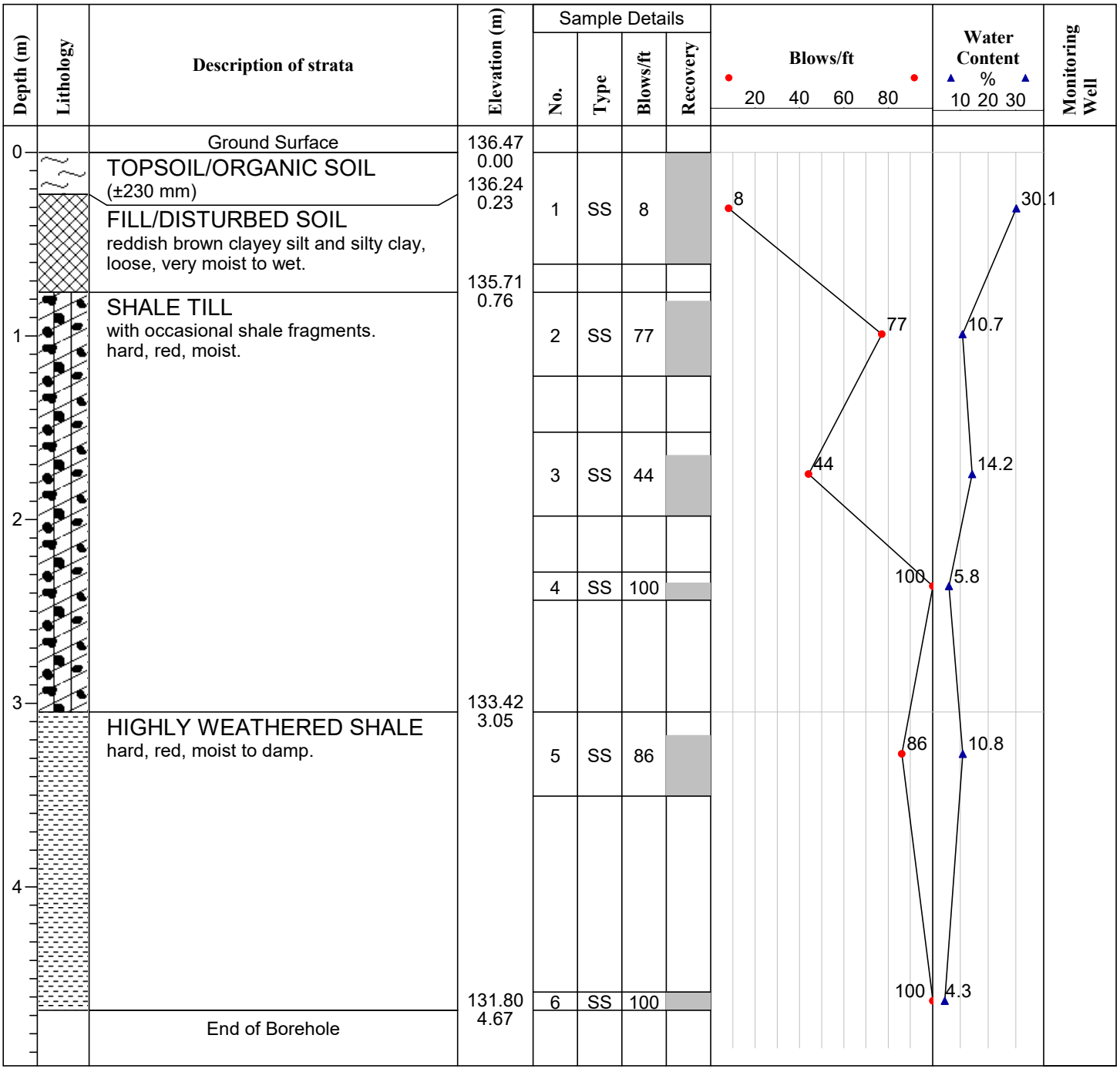
Log of Borehole BH-5

Project: PROPOSED RESIDENTIAL DEVELOPMENT

Client: PENALTA GROUP LTD.

Enclosure: 6

Location: 1493 SIXTH LINE, OAKVILLE, ONTARIO



Remarks: Upon completion of drilling, the borehole was open to 4.3 m below EGSL and dry.

Drill Method: D-50

Drill Date: 27 MARCH 2025

Datum: GEODETIC

FORWARD ENGINEERING & ASSOCIATES INC.
244 Brockport Drive, Unit 15, Toronto, Ontario, M9W 6X9

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7481

Log of Borehole BH-6

Project: PROPOSED RESIDENTIAL DEVELOPMENT

Client: PENALTA GROUP LTD.

Enclosure: 7

Location: 1493 SIXTH LINE, OAKVILLE, ONTARIO

Depth (m)	Description of strata	Elevation (m)	Sample Details: No.	Type	Blows/ft	Recovery	Blows/ft (20 40 60 80)	Water Content % (10 20 30)	Monitoring Well
0	Ground Surface	137.25							
	FILL/DISTURBED SOIL ±180 mm of crushed granular followed by reddish brown clayey silt with traces of rootlets, very loose, moist.	0.00	1	SS	3		3	12.0	
1	HIGHLY WEATHERED SHALE hard, red, moist.	136.49 0.76	2	SS	100		100	7.9	
		135.65	3		100		100	8.1	
	End of Borehole	1.60							
2									
3									
4									

Remarks: Upon completion of drilling, the borehole was open and dry.

Drill Method: D-50

Drill Date: 28 MARCH 2025

Datum: GEODETIC

FORWARD ENGINEERING & ASSOCIATES INC.
244 Brockport Drive, Unit 15, Toronto, Ontario, M9W 6X9

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7481

Log of Borehole BH-7

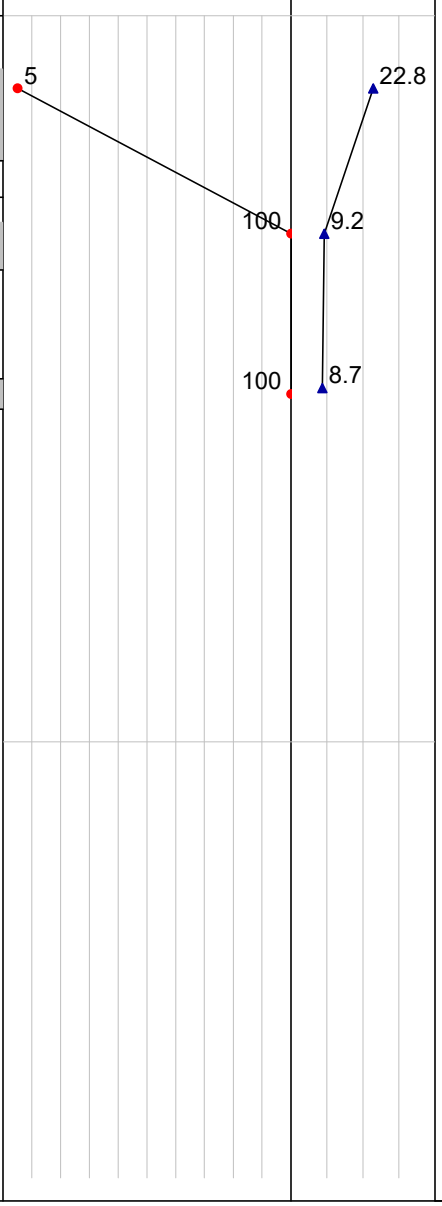
Project: PROPOSED RESIDENTIAL DEVELOPMENT

Client: PENALTA GROUP LTD.

Enclosure: 8

Location: 1493 SIXTH LINE, OAKVILLE, ONTARIO

Depth (m)	Description of strata	Elevation (m)	Sample Details: No.	Type	Blows/ft	Recovery
	Ground Surface	136.65				
0	TOPSOIL/ORGANIC SOIL (±350 mm)	0.00				
		136.30	1	SS	5	
	FILL/DISTURBED SOIL reddish brown clayey silt with traces of rootlets, loose, very moist.	0.35				
		135.89				
	SHALE TILL hard, red, moist.	0.76	2	SS	100	
1						
		135.13				
	HIGHLY WEATHERED SHALE hard, red, moist.	1.52	3	SS	100	
	End of Borehole					
2						
3						
4						



Remarks: Upon completion of drilling, the borehole was open and dry.

Drill Method: D-50

Drill Date: 28 MARCH 2025

Datum: GEODETIC

FORWARD ENGINEERING & ASSOCIATES INC.
244 Brockport Drive, Unit 15, Toronto, Ontario, M9W 6X9

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7481

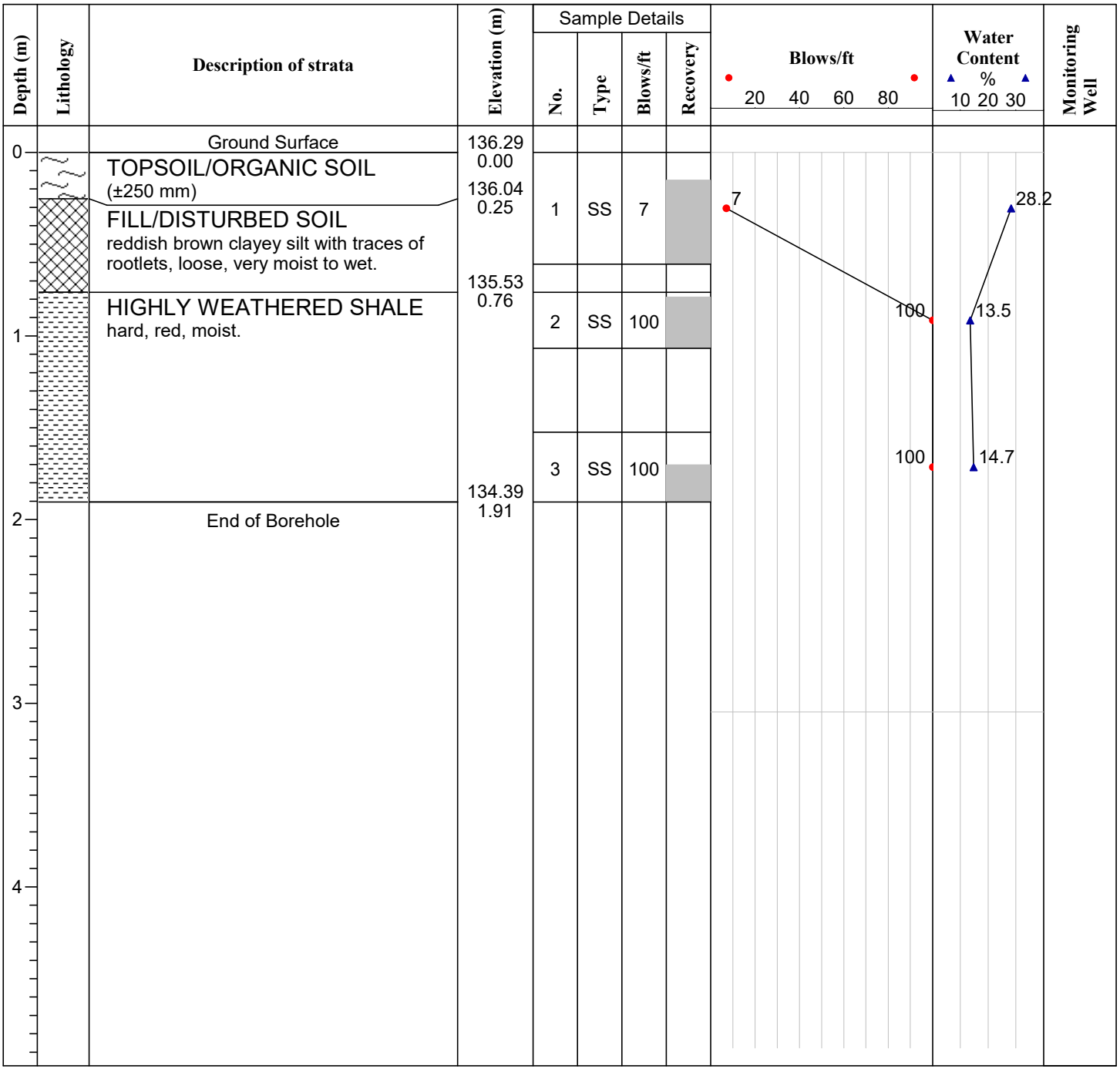
Log of Borehole BH-8

Project: PROPOSED RESIDENTIAL DEVELOPMENT

Client: PENALTA GROUP LTD.

Enclosure: 9

Location: 1493 SIXTH LINE, OAKVILLE, ONTARIO



Remarks: Upon completion of drilling, the borehole was open and dry.

Drill Method: D-50

Drill Date: 28 MARCH 2025

Datum: GEODETIC

FORWARD ENGINEERING & ASSOCIATES INC.
244 Brockport Drive, Unit 15, Toronto, Ontario, M9W 6X9

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7481

Log of Borehole BH-9

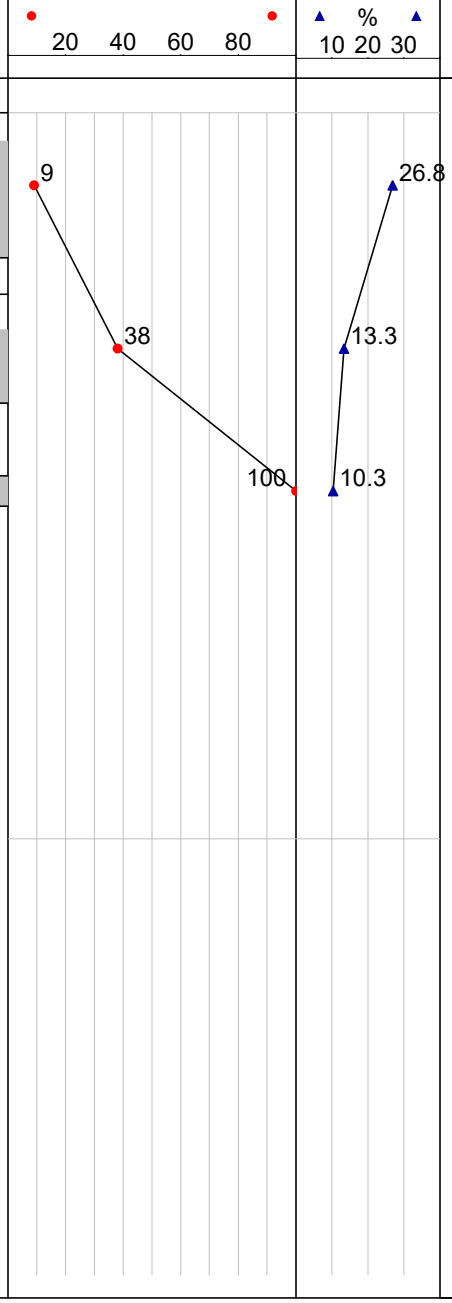
Project: PROPOSED RESIDENTIAL DEVELOPMENT

Client: PENALTA GROUP LTD.

Enclosure: 10

Location: 1493 SIXTH LINE, OAKVILLE, ONTARIO

Depth (m)	Description of strata	Elevation (m)	Sample No.	Type	Blows/ft	Recovery
	Ground Surface	136.48				
0	FILL/DISTURBED SOIL reddish brown clayey silt with organics in the upper ±230 mm and occasional gravel, loose, very moist.	0.00	1	SS	9	
1	with minor plastic fragments, moist.		2	SS	38	
	HIGHLY WEATHERED SHALE hard, red, moist.	134.96 1.52	3	SS	100	
2	End of Borehole					
3						
4						



Remarks: Upon completion of drilling, the borehole was open and dry.

Drill Method: D-50

Drill Date: 27 MARCH 2025

Datum: GEODETIC

FORWARD ENGINEERING & ASSOCIATES INC.
244 Brockport Drive, Unit 15, Toronto, Ontario, M9W 6X9

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7481

Log of Borehole BH-10

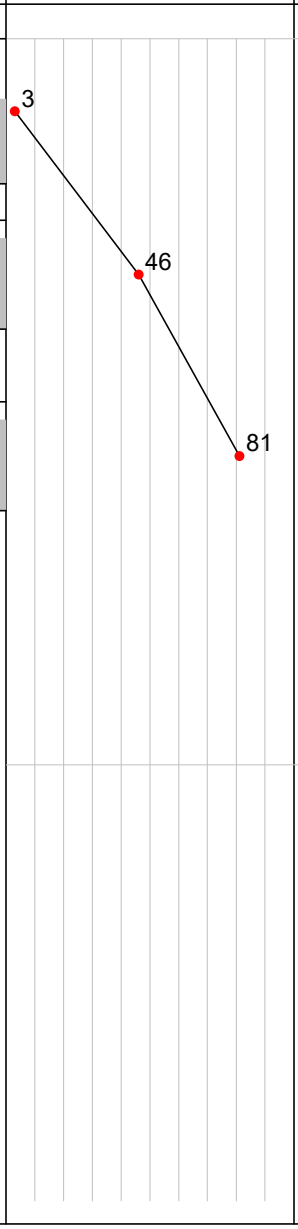
Project: PROPOSED RESIDENTIAL DEVELOPMENT

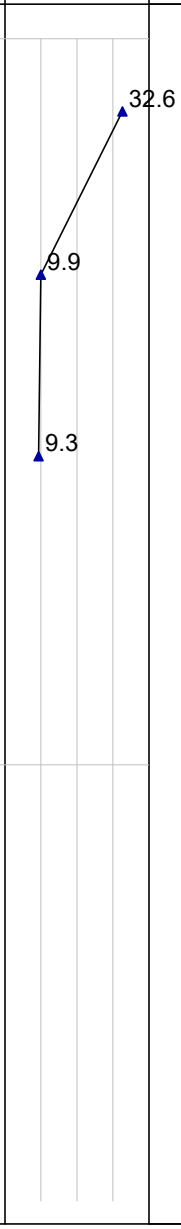
Client: PENALTA GROUP LTD.

Enclosure: 11

Location: 1493 SIXTH LINE, OAKVILLE, ONTARIO

Depth (m)	Description of strata	Elevation (m)	Sample No.	Sample Type	Blows/ft	Recovery
	Ground Surface	136.50				
0	TOPSOIL/ORGANIC SOIL (±300 mm)	0.00				
		136.19	1	SS	3	
	FILL/DISTURBED SOIL reddish brown clayey silt, very loose, very moist to wet.	0.30				
		135.74				
1	SHALE TILL hard, red, moist.	0.76	2	SS	46	
		134.97				
	HIGHLY WEATHERED SHALE hard, red, moist.	1.52	3	SS	81	
2		134.52				
	End of Borehole	1.98				
3						
4						





Monitoring Well

Remarks: Upon completion of drilling, the borehole was open and dry.

Drill Method: D-50

Drill Date: 27 MARCH 2025

Datum: GEODETIC

FORWARD ENGINEERING & ASSOCIATES INC.
244 Brockport Drive, Unit 15, Toronto, Ontario, M9W 6X9

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7481

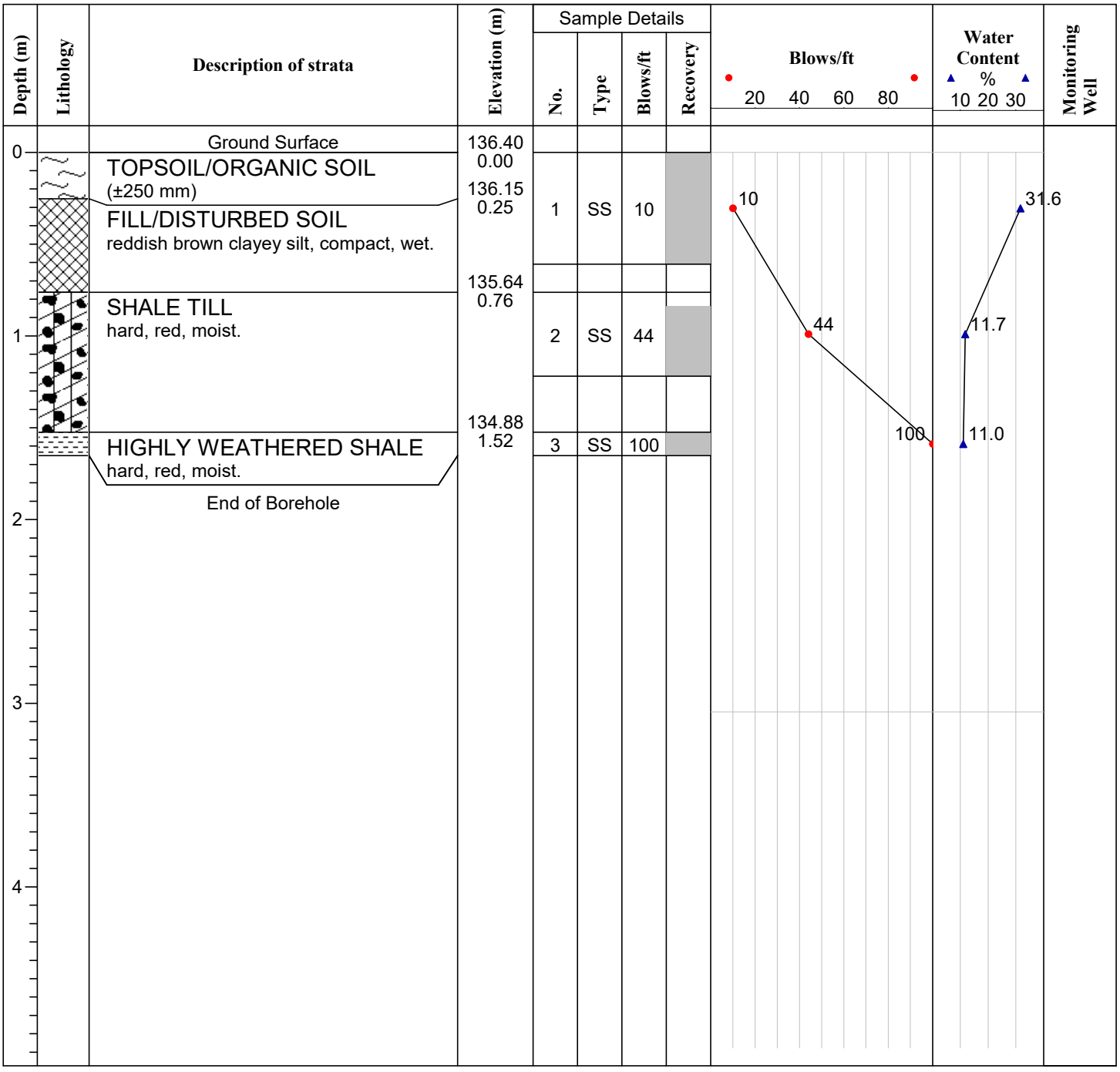
Log of Borehole BH-11

Project: PROPOSED RESIDENTIAL DEVELOPMENT

Client: PENALTA GROUP LTD.

Enclosure: 12

Location: 1493 SIXTH LINE, OAKVILLE, ONTARIO



Remarks: Upon completion of drilling, the borehole was open and dry.

Drill Method: D-50

Drill Date: 28 MARCH 2025

Datum: GEODETIC

FORWARD ENGINEERING & ASSOCIATES INC.
244 Brockport Drive, Unit 15, Toronto, Ontario, M9W 6X9

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7481

Log of Borehole BH-12

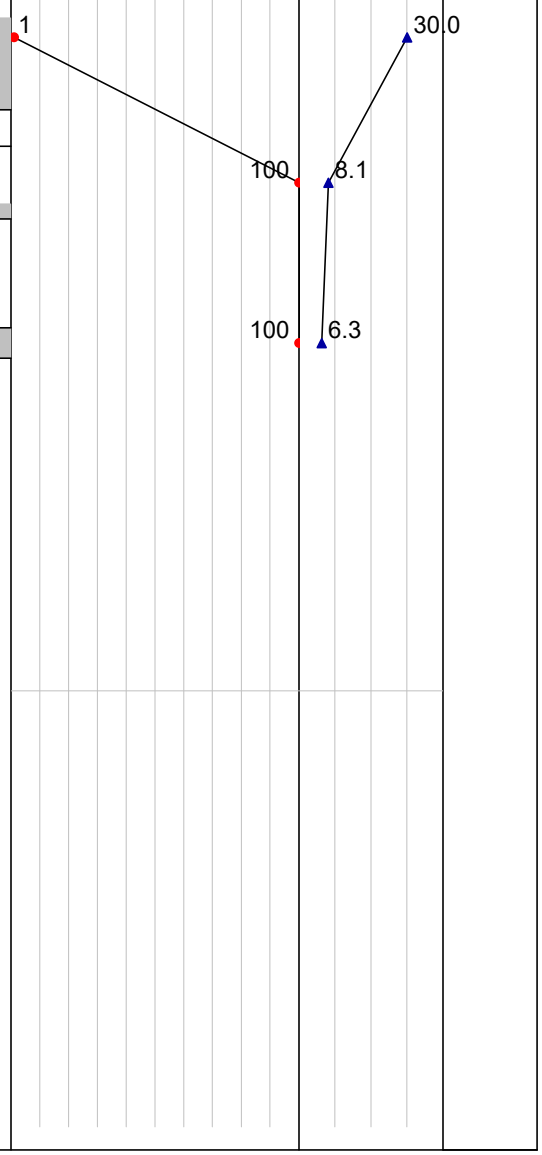
Project: PROPOSED RESIDENTIAL DEVELOPMENT

Client: PENALTA GROUP LTD.

Enclosure: 13

Location: 1493 SIXTH LINE, OAKVILLE, ONTARIO

Depth (m)	Description of strata	Elevation (m)	Sample No.	Type	Blows/ft	Recovery
0	Ground Surface	136.19				
	TOPSOIL/ORGANIC SOIL (±150 mm)	0.00	1	SS	1	
	FILL/DISTURBED SOIL reddish brown clayey silt, very loose, wet.	135.43				
1	HIGHLY WEATHERED SHALE hard, red, moist.	0.76	2	SS	100	
		134.54	3	SS	100	
	End of Borehole	1.65				
2						
3						
4						



Monitoring Well

Remarks: Upon completion of drilling, the borehole was open and dry.

Drill Method: D-50

Drill Date: 28 MARCH 2025

Datum: GEODETIC

FORWARD ENGINEERING & ASSOCIATES INC.
244 Brockport Drive, Unit 15, Toronto, Ontario, M9W 6X9

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

APPENDIX B

WATER SUPPLY DESIGN

APLIN MARTIN

Project Description: Mixed-Use Residential
A&M File: 25-7018

Date: July 18, 2025
By: IA

MIXED-USE WATER DEMAND SUPPLY

Region of Halton

Occupancy Data

Gross Floor Area (GFA)

Lot Area	0.81	ha
Building Area	0.19	ha

Residential Occupancy Density

Apartments

1BR, 2BR, and 3BR	1.75	persons per unit (PPU)

Average Day Consumption

Residential	265.00	L/cap/day
Commercial	250.00	L/cap/day

Site Statistics

Land Use	No of Units	Population	Water Demand (L/day)	Water Demand (L/s)
Residential				
Apartments 1BR, 2BR, and 3BR	190	333	88113	1.02
Commercial				
Commercial	N/A	48	12000	0.14
	Total	381		

Peaking Factors

Land Use	Maximum Day	Peak Hour	Minimum Hour
Residential	2.25	4.00	0.85
Commercial	2.25	2.25	0.85

Peak Demand (L/cap/day)

Land Use	Maximum Day	Peak Hour
Residential	596.25	1060
Commercial	562.5	562.5

Peak Flows

Criterias	L/d	L/hr	L/s
Average Day	100,113	4171.4	1.16
Maximum Day	253,873	10578.0	2.94
Peak Hour	430,330	17930.4	4.98
Minimum Hour	95,296	3970.7	1.10

APLIN MARTIN

Project: Mixed-Use Development
A&M File: 23-7015

Date: 18-Jul-25
By : IA

FIRE FLOW CALCULATION SHEET

1 Type of Construction: Type V - Wood Frame

Level	Area
1st Floor =	1852.5 sq.m.
2nd Floor=	1852.5 sq.m.
3rd Floor=	1852.5 sq.m.
4th Floor=	1852.5 sq.m.
5th Floor=	1852.5 sq.m.
6th Floor=	1852.5 sq.m.
Effective Floor Area	11,115 sq.m.
Coefficient (C) - based on type of construction =	1.5

Fire Flow From Formula ($F=220\ CA^{0.5}$): (rounded) 35000 l/min (a)

2 Type of Occupancy: Limited Combustible Residential

Hazard Allowance:	-15%	x (a) =	-5250	l/min
		Sub-Total:	29750	l/min (b)

3 Automatic Sprinklers:

1. None		No
2. Automatic Sprinklers - NFPA 13		Yes
3. Water supply is standard for both system and Fire Department		No
4. Fully Supervised System		Yes

Sprinkler Allowance: (System is fully alarmed)	40%	x (b) =	11900	l/min.

4 Exposures:

	m	%
North	27.4	10%
East	>30	0%
South	>30	0%
West	>30	0%

Exposure Allowance: (Not to exceed 75%)	10%	x (b) =	2975	l/min.(c)

TOTAL FIRE FLOW REQUIRED (rounded):	21000	l/min
TOTAL FIRE FLOW REQUIRED:	350	l/s
REQUIRED FIRE FLOW DURATION:	4.75	hrs

Notes:

Fire flow required as per the Fire Underwrites Survey of Canada 2020 guidelines

1. Total floor area and building construction as per architectural drawing pml.A, SITE PLAN, dated JUNE, 2025
2. Type of Occupancy information as per pml.A CORRESPONDENCE, dated JULY, 2025
3. Automatic sprinklers information as per pml.A CORRESPONDENCE, dated JULY, 2025
4. Exposures distances are calculated per existing conditions via Google Maps, refer to the Exposure Distance Sketch

APPENDIX C

SANITARY DESIGN

APLIN MARTIN

Project: Mixed-Use Residential Development
A&M File: 25-7018

Date: 18Jul/25
By: IA

SANITARY FLOW - CALCULATION SHEET

Region of Halton

Peaking Factor = Harmon Equation

P = Population

$$PF = 1 + \frac{14}{4 + P^{0.5}}$$

Sanitary Design Criteria		
Residential Average Day Consumption	215	L/cap/day
Commercial Average Day Consumption	185	L/cap/day
Infiltration & Inflow	0.286	**L/s/Ha**

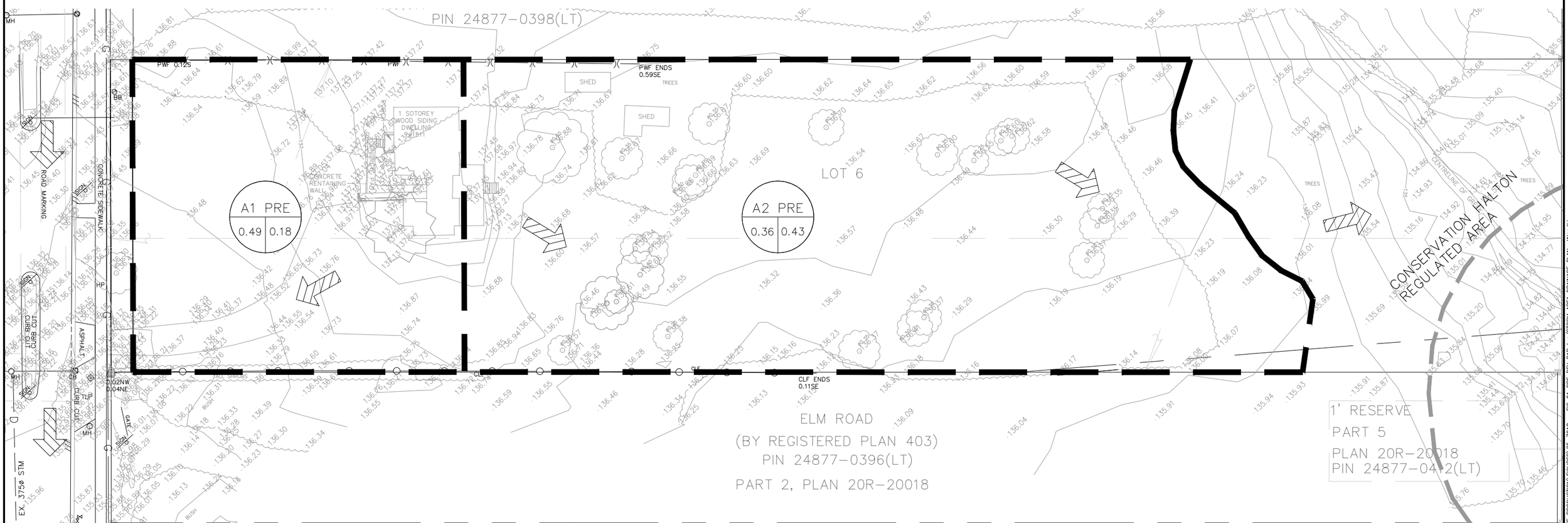
Gross Floor Area	0.19	(ha)
Gross Drainage Area	0.80	(ha)
Residential Population	333.00	people
Commercial Population	48.00	people
Average Flow	0.93	l/sec
Peaking Factor	2.00	
Peak Flow	1.86	
Infiltration	0.23	l/sec
Peak Extraneous Flows	0.46	l/sec
Total Peak Design Flow	2.32	l/sec

Notes:

*Person/unit from Oakville Planning Dept. Memo to Mayor Burton "Persons per Unit (PPU)"
*Added 48 persons accounting for Daycare
*Infiltration allowance = 0.000286 m^3/s/ha

APPENDIX D

Stormwater Management Design



APLIN MARTIN
ENGINEERING ARCHITECTURE PLANNING SURVEYING

CLIENT: **PENALTA GROUP LTD.**
504 IROQUOIS SHORE ROAD, UNIT 12B,
OAKVILLE, ON, L6H 3K4

PROJECT:
MIXED USE RESIDENTIAL DEVELOPMENT
1493 SIXTH LINE, OAKVILLE, ON, L6H 1X8

LEGEND:

PRE-DEVELOPMENT DRAINAGE AREA

EX. GRADE ×168.25

EX. OVERLAND FLOW DIRECTION

A1 PRE (DRAINAGE AREA ID)
0.25 (RUN OFF COEFFICIENT) 0.27 (DRAINAGE AREA (ha))

TITLE:
PRE-DEVELOPMENT DRAINAGE AREA PLAN

PROJECT NO. 25-7018	DRAWING DATE: JUNE, 2025
FIGURE NO. FIG. -01	SCALE : 1:500

Jul 10 2025 - 2:24pm M:\TOR\2025\25-7018\DWG\ONSITE PRODUCTION\FIGURES\25-7018 - FIG 01 PRE DEV DAP.dwg/STORM AREA DRAINAGE PLAN jdpphi

LOT 5

PIN 24877-0398(LT)

A1 POST
0.80 | 0.58

A2 POST
0.50 | 0.05

ELEC

SBR

F.D CONN

UTILITY

'HSH' OFFICE

AMENITY SPACE

BIKE ROOM (30)

BIKES

LOBBY

MGMT.

LOT 6

DAYCARE

GARBAGE & LOADING

NATURAL AREA

CONSERVATION HALTON REGULATED AREA

RAMP DOWN

GARBAGE PICK UP

FIRE ROUTE (90 M MAX. LENGTH)

EX. 47.54m Ø 300ø STM @ 0.80%

MH

ELM ROAD
(BY REGISTERED PLAN 403)
PIN 24877-0396(LT)

1' RESERVE
PART 5
PLAN 20R-20018

APLIN MARTIN
ENGINEERING ARCHITECTURE PLANNING SURVEYING

CLIENT: **PENALTA GROUP LTD.**
504 IROQUOIS SHORE ROAD, UNIT 12B,
OAKVILLE, ON, L6H 3K4

PROJECT:
MIXED USE RESIDENTIAL DEVELOPMENT
1493 SIXTH LINE, OAKVILLE, ON, L6H 1X8

LEGEND:
POST-DEVELOPMENT DRAINAGE AREA
EX. GRADE ×168.25
EX. OVERLAND FLOW DIRECTION
PR. OVERLAND FLOW DIRECTION

A1 POST (DRAINAGE AREA ID)
0.25 | 0.27 (RUN OFF COEFFICIENT | DRAINAGE AREA (ha))

TITLE: **POST-DEVELOPMENT DRAINAGE AREA PLAN**

PROJECT NO.	DRAWING DATE:
25-7018	JUNE, 2025
FIGURE NO.	SCALE :
FIG.-02	1:500

Sep 01 2025 - 11:15am M:\TOR\2025\25-7018\DWG\ONSITE PRODUCTION\FIGURES\25-7018 - FIG 02 POST DEV DAP.dwg/STORM AREA DRAINAGE PLAN jcesario

Project: Mixed-Use Residential Development
A&M File: 25-7018

Date: 02Sep/25
By: AH

Pre-Development Runoff Coefficient

A1 Pre	Total Area	0.18	C (2-10 YR)	C (25-50 YR)	C (100 YR)
	Pervious	0.14	0.35	0.35	0.35
	Impervious	0.05	0.90	0.90	0.90
	Composite 'C'		0.49	0.49	0.49

A2 Pre	Total Area	0.43	C (2-10 YR)	C (25-50 YR)	C (100 YR)
	Pervious	0.42	0.35	0.35	0.35
	Impervious	0.01	0.90	0.90	0.90
	Composite 'C'		0.36	0.36	0.36

Pre-Development Peak Flows

Area ID	A (ha)	C	Tc (min)
A1 Pre	0.18	0.49	10.00
A2 Pre	0.43	0.36	10.00

City/Town of: Oakville

Storm Frequency (Yr)	a	b	c
2	725	4.80	0.81
5	1170	5.80	0.84
10	1400	5.80	0.85
25	1680	5.60	0.85
50	1960	5.80	0.86
100	2150	5.70	0.86

Storm Frequency: 5 Year

Area ID	AC	I (mm/hr)	Q (m^3/s)	Q (L/s)
A1 Pre	0.09	114.21	0.03	28.84
A2 Pre	0.16	114.21	0.05	49.69
A1 + A2 Pre	0.25	114.21	0.08	78.53

Storm Frequency: 100 Year

Area ID	AC	I (mm/hr)	Q (m^3/s)	Q (L/s)
A1 Pre	0.09	200.80	0.05	50.70
A2 Pre	0.16	200.80	0.09	87.37
A1 + A2 Pre	0.25	200.80	0.14	138.06

Project: Mixed-Use Residential Development
A&M File: 25-7018

Date: 02Sep/25
By: AH

Post-Development Runoff Coefficient

A1 Post	Total Area	0.58	C (2-10 YR)	C (25-50 YR)	C (100 YR)
	Pervious	0.10	0.35	0.35	0.35
	Impervious	0.47	0.90	0.90	0.90
	Composite 'C'		0.80	0.80	0.80
A2 Post	Total Area	0.05	C (2-10 YR)	C (25-50 YR)	C (100 YR)
	Pervious	0.03	0.35	0.35	0.35
	Impervious	0.01	0.90	0.90	0.90
	Composite 'C'		0.50	0.50	0.50

Post-Development Peak Flows

Area ID	A (ha)	C	Tc (min)
A1 Post	0.58	0.80	10.00
A2 Post	0.05	0.50	10.00

City/Town of: Oakville

Storm Frequency (Yr)	a	b	c
2	725	4.80	0.81
5	1170	5.80	0.84
10	1400	5.80	0.85
25	1680	5.60	0.85
50	1960	5.80	0.86
100	2150	5.70	0.86

Storm Frequency: 5 Year

Area ID	AC	I (mm/hr)	Q (m^3/s)	Q (L/s)
A1 Post	0.46	114.21	0.15	146.24
A2 Post	0.02	114.21	0.01	7.50
A1 + A2 Post	0.48	114.21	0.15	153.74

Storm Frequency: 100 Year

Area ID	AC	I (mm/hr)	Q (m^3/s)	Q (L/s)
A1 Post	0.46	200.80	0.26	257.10
A2 Post	0.02	200.80	0.01	13.19
A1 + A2 Post	0.48	200.80	0.27	270.29

100 Year Peak Flow Calculations

	Tc min	Runoff Coefficient	Area Ha	Intensity mm/hour	n	Q cms
$Q_{pre\ (5\text{-}YR)}$	10.0	0.49	0.18	114.2	0.00278	0.029
Q100-YR $_{Post}$	10.0	0.80	0.58	200.8	0.00278	0.257

Storage Volume Required (Modified Rational Method)

A2 Post (Uncontrolled)

Area	0.04	ha
C	0.50	
AC	0.022	
Release Rate	0.012	m^3/s
	12.073	
	16.34	
	28.42	

A1 Post (Controlled)

Area	0.58	ha
C	0.80	
AC	0.46	
Allowable Release Rate	0.029	m^3/s
Uncontrolled Release Rate	0.012	m^3/s
Controlled Release Rate	0.016	m^3/s
Total Release Rate	0.028	m^3/s
Storage Required	211.03	m^3
Storage Provided	234.58	m^3

City's IDF Data		Uncontrolled Runoff			Controlled Runoff			
Rainfall Duration Tr min	Rainfall Intensity I mm/hour	Storm Runoff cms	Runoff Volume cm	Released Volume cm	Storm Runoff cms	Runoff Volume cm	Released Volume cm	Required Storage cm
10	200.80	0.01	7.24	7.24	0.26	154.26	9.81	144.46
15	158.27	0.01	8.56	10.87	0.20	182.38	14.71	167.67
20	131.37	0.01	9.48	14.49	0.17	201.84	19.61	182.23
25	112.72	0.01	10.17	18.11	0.14	216.49	24.52	191.98
30	98.99	0.01	10.71	21.73	0.13	228.14	29.42	198.72
35	88.43	0.01	11.17	25.35	0.11	237.76	34.32	203.43
40	80.03	0.00	11.55	28.98	0.10	245.92	39.23	206.70
45	73.19	0.00	11.88	32.60	0.09	253.00	44.13	208.87
50	67.49	0.00	12.17	36.22	0.09	259.25	49.03	210.22
55	62.68	0.00	12.44	39.84	0.08	264.83	53.94	210.89
60	58.55	0.00	12.67	43.46	0.07	269.87	58.84	211.03
65	54.97	0.00	12.89	47.09	0.07	274.47	63.74	210.72
70	51.82	0.00	13.09	50.71	0.07	278.69	68.65	210.05
75	49.05	0.00	13.27	54.33	0.06	282.60	73.55	209.05
80	46.57	0.00	13.44	57.95	0.06	286.23	78.45	207.78
85	44.35	0.00	13.60	61.57	0.06	289.63	83.36	206.28
90	42.35	0.00	13.75	65.20	0.05	292.82	88.26	204.56
95	40.53	0.00	13.89	68.82	0.05	295.83	93.16	202.67
100	38.88	0.00	14.03	72.44	0.05	298.67	98.07	200.61
105	37.36	0.00	14.15	76.06	0.05	301.37	102.97	198.41
110	35.97	0.00	14.27	79.69	0.05	303.94	107.87	196.07
115	34.68	0.00	14.39	83.31	0.04	306.39	112.78	193.62
120	33.49	0.00	14.50	86.93	0.04	308.73	117.68	191.05
125	32.38	0.00	14.60	90.55	0.04	310.97	122.58	188.39
130	31.35	0.00	14.70	94.17	0.04	313.13	127.49	185.64
135	30.39	0.00	14.80	97.80	0.04	315.20	132.39	182.81
140	29.49	0.00	14.90	101.42	0.04	317.19	137.29	179.90
145	28.65	0.00	14.99	105.04	0.04	319.11	142.20	176.91
150	27.85	0.00	15.07	108.66	0.04	320.97	147.10	173.87
155	27.11	0.00	15.16	112.28	0.03	322.76	152.00	170.76
160	26.40	0.00	15.24	115.91	0.03	324.50	156.90	167.59
165	25.73	0.00	15.32	119.53	0.03	326.18	161.81	164.37
170	25.10	0.00	15.39	123.15	0.03	327.81	166.71	161.10
175	24.50	0.00	15.47	126.77	0.03	329.40	171.61	157.79
180	23.93	0.00	15.54	130.39	0.03	330.94	176.52	154.42

APLIN MARTIN
ENGINEERING ARCHITECTURE PLANNING SURVEYING

AM Proj #	25-7018
Project Title:	Mixed-Use Residential Development
Project Location:	Oakville, Ontario
Developer:	Penalta Group

Orifice Calculations

Orifice Equation: $$Q = C \times A \times \sqrt{2 \times g \times h}$$

Storm Frequency	Coefficient	Post-Development Flowrate	Pre-Development Target	Head	Proposed Diameter	Area	Release Rate
Yr		m^3/s	m^3/s	m	mm	m^2	m^3/s
5	0.8	0.154	0.029	0.09	75	0.004	0.005
100	0.8	0.26	0.029	1.09	75	0.004	0.0163

*Target release rate based on 5-YR Pre-Devlopment flow minus post-dev uncontrolled

APLIN MARTIN

Project: Mixed Use Residential Development
A&M File: 25-7018

Date: 02Sep/25
By: AH

Water Balance Volume Retention Requirement

Site Area (ha)	Depth (mm)	Volume (m^3)
0.81	25.0	202.5

Initial Abstraction Volume

Landuse	Area (m^2)	Depth (mm)	IA Volume (m^3)
Green Roof	1842.00	5.0	9.2
Aspahlt	1715.00	1.0	1.7
Concrete	800.00	1.0	0.8
Landscape	3743.00	5.0	18.7
		Sum	30.4
		Water Balance Volume Required	172.1

Infiltration Rate

Borehole/ Monitoring Well ID	Soil Description*	Hydrualic Conductivity* (cm/s)	Infiltration Rate** (mm/hour)	Safety Correction Factor	Design Infiltration Rate (mm/hour)
-	-	-	37.6	2.50	15.0

* Assumed

Reference - CVC/TRCA LID SWM Planning and Design Guide Version 1.0

Bottomless Tank

Infiltration Facility - Required			Infiltration Facility - Provided		
Required Volume (WQV)	122.2	m^3	Infiltration Facility Depth (d)	1.00	m
Infiltration Rate (I)	15.0	mm/hr	Infiltration Facility Area (A)	305.4	m^2
Porosity (n)	0.4		Infiltration Facility Volume (V)	122.2	m^3
Drawdown Time (T)	72.0	hr	Drawdown Time (T)	66.5	hr
Max. Stone Resevoir Depth (d)	2.71	m $d = \frac{IT}{1000n}$			$A = \frac{WQV}{(d * n)}$

Secondary Gallery

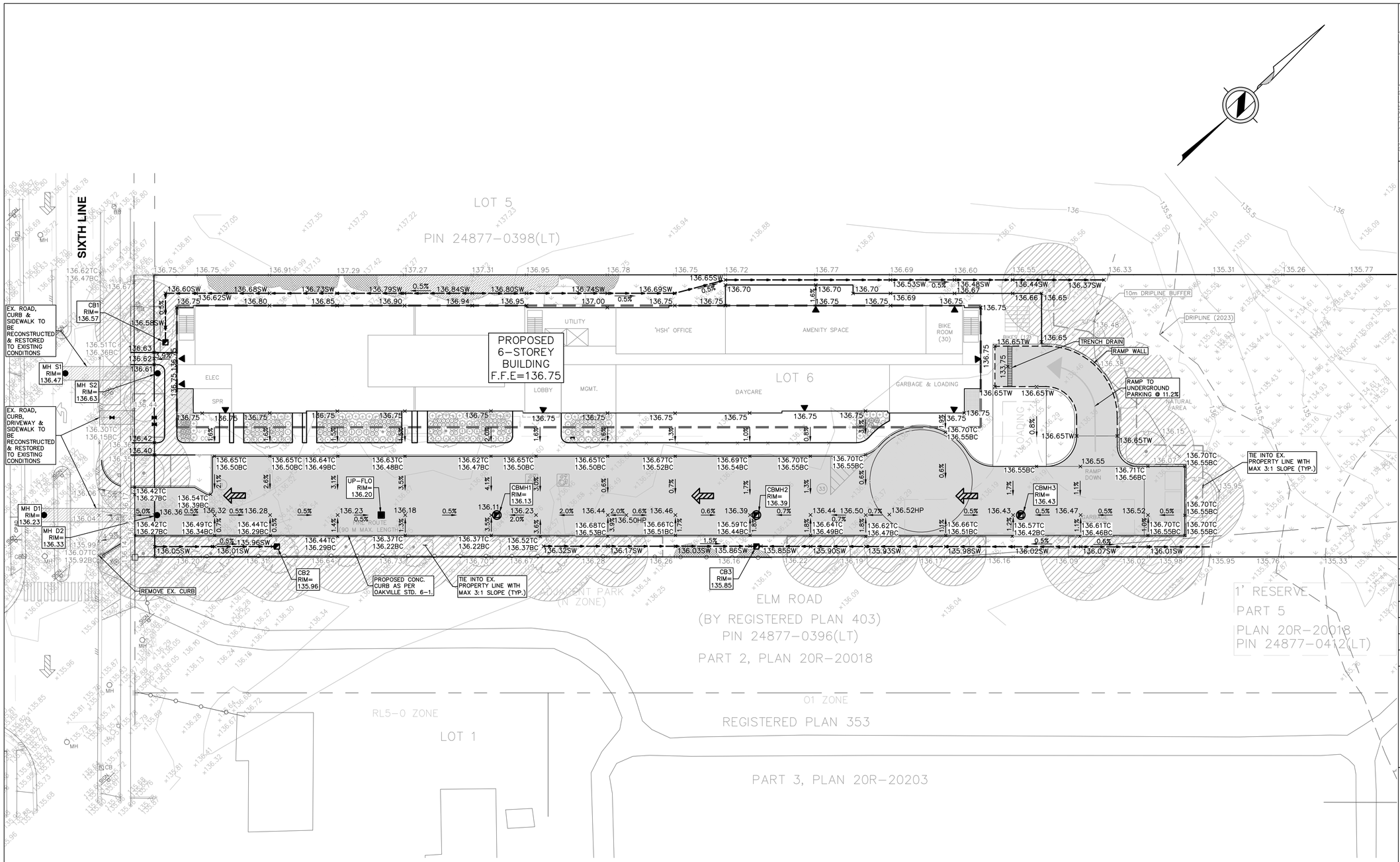
Infiltration Facility - Required			Infiltration Facility - Provided		
Required Volume (WQV)	49.9	m^3	Infiltration Facility Depth (d)	1.00	m
Infiltration Rate (I)	15.0	mm/hr	Infiltration Facility Area (A)	140.0	m^2
Porosity (n)	0.4		Infiltration Facility Volume (V)	56.0	m^3
Drawdown Time (T)	72.0	hr	Drawdown Time (T)	59.2	hr
Max. Stone Resevoir Depth (d)	2.71	m $d = \frac{IT}{1000n}$			$A = \frac{WQV}{(d * n)}$

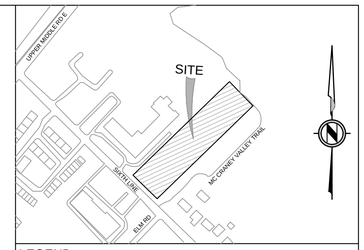
APLIN MARTIN
ENGINEERING ARCHITECTURE PLANNING SURVEYING

AM Proj #	25-7018
Project Title:	Mixed-Use Residential Development
Project Location:	Oakville, Ontario
Developer:	Penalta Group

Water Quality

Catchment	Process	TSS Removal Efficciency	Area of Site	% Area of Site	TSS Removal
		(%)	(ha)	(%)	(%)
A1 Post	Up-Flo Filter	80	0.58	92	80
A2 Post	Uncontrolled (existing vegetation)	80	0.05	8	Inherently Clean
		Total	0.62	100	80





LEGEND

PROPERTY LINE	
BARRIER CURB	
EX. EDGE OF ASPHALT	
PROPOSED ASPHALT	
PROPOSED SWALE	
ROAD RESTORATION	
EXISTING ELEVATION	135.00 ×
PROPOSED ELEVATION	135.00 ×
PROPOSED TOP OF CURB	135.00 TC ×
PROPOSED BOTTOM OF CURB	135.00 BC ×
PROPOSED SWALE ELEVATION	135.00 SW ×
PROPOSED HIGH POINT	135.00 HP ×
PROPOSED GRADE	2.0%
BUILDING ENTRANCE	
EXISTING OVERLAND FLOW ROUTE	
PROPOSED OVERLAND FLOW ROUTE	
EXISTING/PROPOSED CATCH BASIN	
EXISTING/PROPOSED CATCH BASIN MANHOLE	
EXISTING/PROPOSED MANHOLE	

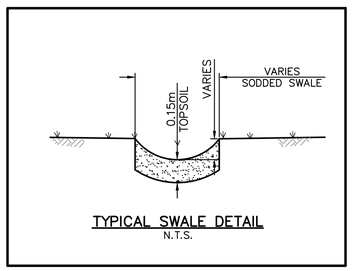
REV	MM/DD/YY	DESCRIPTION	BY	APP
2	08/29/2025	FIRST SPA SUBMISSION	IA	JC
1	07/04/2025	ISSUED FOR COORDINATION	IA	JC

GENERAL NOTES:

1. CONTRACTOR TO VERIFY THE LOCATION AND INVERTS OF EXISTING WATER, STORM AND SANITARY CONNECTIONS TO THE SITE. REPORT TO THE ENGINEER ANY DISCREPANCIES PRIOR TO START OF CONSTRUCTION.
2. ALL BUILDINGS & ROADS ARE TO BE LOCATED BY CO-ORDINATES AS CALCULATED BY A ONTARIO LAND SURVEYOR.
3. THE CONTRACTOR MUST CONTACT THE ENGINEER PRIOR TO CONSTRUCTION TO SCHEDULE AN ON-SITE PRE-CONSTRUCTION MEETING DURING WHICH CONSTRUCTION METHODS, TIMING, AND INSPECTION WILL BE DISCUSSED.
4. NO ROOFTOP STORAGE PROPOSED
5. THE DEPTH OF PONDING AND DEPTH OF FLOW WILL NOT EXCEED 0.3m.

SITE GRADING:

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. ALL ELEVATIONS ARE TO GEODETIC DATUM.
3. ALL EXCAVATION, FILL PLACEMENT AND COMPACTION TO BE IN ACCORDANCE WITH GEOTECHNICAL CONSULTANTS REPORT.
4. CONTRACTOR TO EMPLOY GEOTECHNICAL CONSULTANT FOR PERFORMANCE OF IN PLACE TESTING DURING THE PREPARATION OF THE SUBGRADE AND CONSTRUCTION OF THE ROAD STRUCTURE TO VERIFY THE ADEQUACY OF PROPOSED ROAD STRUCTURE AND SUBGRADE.
5. CHANGES TO GRADE SHALL BE FORMED BY SMOOTH CURVES.
6. IT IS THE RESPONSIBILITY OF THE APPLICANT TO ENSURE COMPLIANCE WIT ALL APPLICABLE PROVINCIAL STANDARDS AND TO OBTAIN ALL PROVINCIAL APPROVALS, INCLUDING BUT NOT LIMITED TO ENVIRONMENTAL COMPLIANCE APPROVALS.



TYPICAL SWALE DETAIL
N.T.S.

NOTICE TO CONTRACTOR

IT IS THE RESPONSIBILITY OF THE CONTRACTOR'S SURVEYOR TO VERIFY THAT ALL LEGAL SURVEY DIMENSIONS SHOWN ON THE ENGINEERS DRAWINGS AGREE WITH THOSE ON THE REGISTERED LEGAL SURVEY PLAN. SHOULD THERE BE ANY DISCREPANCIES, THEN IMMEDIATELY NOTIFY THE ENGINEER OF RECORD

THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY & HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

PLAN OF SURVEY OF LOT 6 AND BLOCK A, REGISTERED PLAN 403
TOWN OF OAKVILLE
REGIONAL MUNICIPALITY OF HALTON

LEGAL DESCRIPTION

ELEVATIONS ARE REFERRED TO THE TOWN OF OAKVILLE BENCHMARK No 227, LOCATED ON SOUTH END OF CONCRETE DOOR SILL AT 1334 SIXTH LINE, HAVING AN ELEVATION OF 131.831m; VERTICAL DATUM: CANADIAN GEODETIC DATUM, 1928 (PRE: 1978 SOUTHERN ONTARIO READJUSTMENT)

BENCHMARK

LICENSED PROFESSIONAL ENGINEER — J.M. CESARIO — 100525531 — 2025-09-02 — PROVINCE OF ONTARIO

ENGINEER STAMP

APLIN MARTIN
Aplin & Martin Consultants Ltd.
354 Davis Road, Suite 403, Oakville, ON, L6J 2X2
Tel: (905) 582-0630, Fax: (416) 644-1889, Email: general@aplinmartin.com

CLIENT
innovative s|h|s

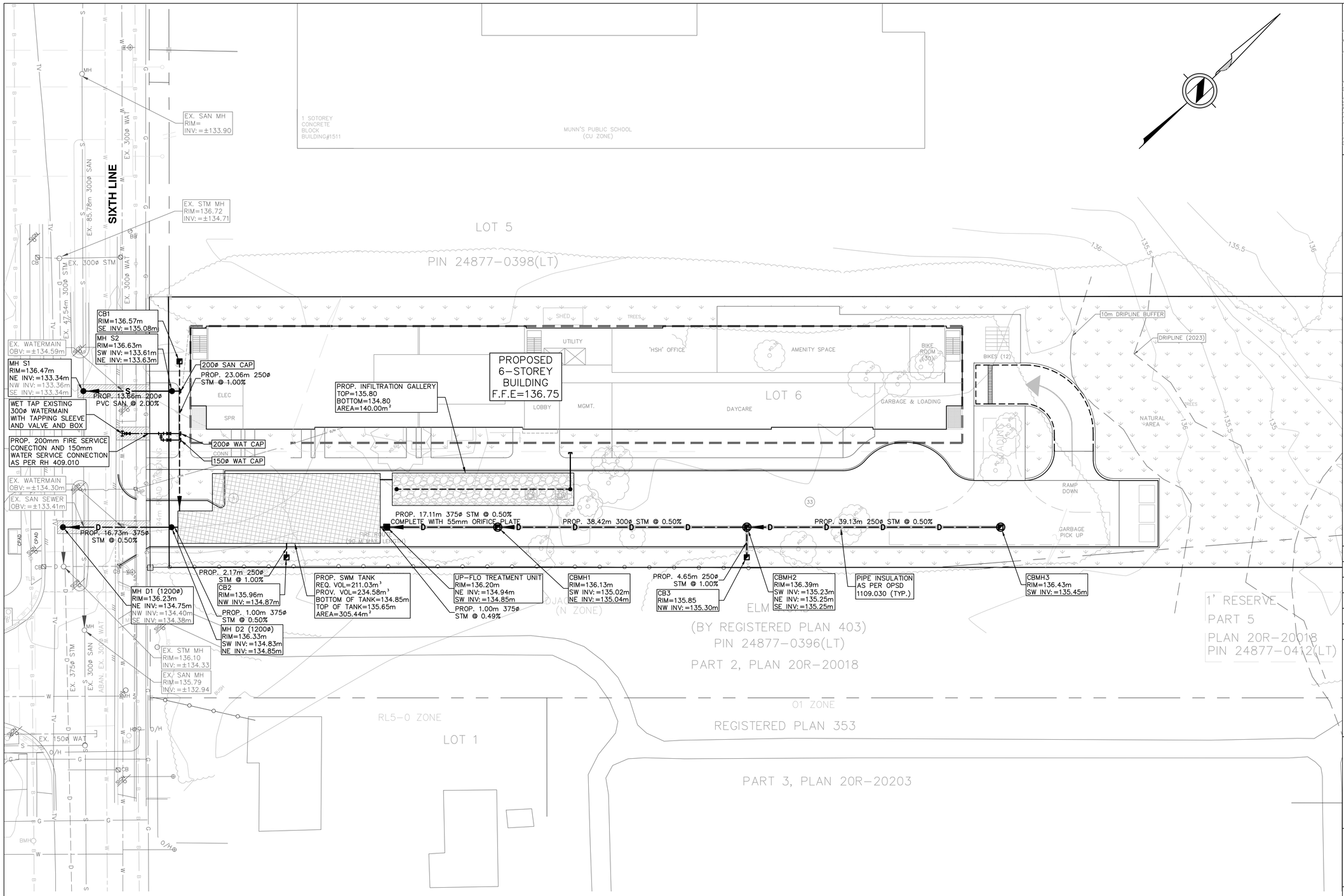
PROJECT
MIXED USE RESIDENTIAL DEVELOPMENT
1493 SIXTH LINE, OAKVILLE, ON, L6H 1X8

DRAWING TITLE
GRADING PLAN

DESIGN IA	DATE JUNE 2025	SCALE 1:300	
DRAWN HS	PROJECT NO. 25-7018		
CHECKED JC	DRAWING NO. C01	REV. 2	
APPROVED JC			

0 3 1:300 15m

Aug 29, 2025 - 10:55am M:\25\7018\DWG\PLOT PRODUCTION\25-7018_C01_GRADING PLAN.dwg



LEGEND

- PROPERTY LINE
- EXISTING SANITARY
- EXISTING STORM
- EXISTING WATER
- PROPOSED STORM
- PROPOSED SANITARY
- PROPOSED WATER SERVICE
- EXISTING OVERHEAD HYDRO
- PROPOSED PIPE INSULATION
- EXISTING/PROPOSED SAN MANHOLE
- EXISTING/PROPOSED STM MANHOLE
- EXISTING/PROPOSED CATCH BASIN
- PROPOSED CATCH BASIN MANHOLE
- EXISTING HYDRO POLE
- EXISTING FIRE HYDRANT
- EXISTING METER CHAMBER
- EXISTING GATE VALVE
- PROPOSED GATE VALVE
- EXISTING GAS
- EXISTING UG BELL NETWORK
- EXISTING UG TV NETWORK
- EXISTING WATERMAIN
- ABANDONED WATERMAIN
- PROPOSED WATERMAIN
- PROPOSED WATER SERVICE
- PROPOSED BARRIER CURB
- EXISTING CONCRETE SIDEWALK

REV	MM/DD/YY	DESCRIPTION	BY	APP
2	08/29/2025	FIRST SPA SUBMISSION	IA	JC
1	07/04/2025	ISSUED FOR COORDINATION	IA	JC

LICENSED PROFESSIONAL ENGINEER
J.M. CESARIO
100525531
2025-09-02
PROVINCE OF ONTARIO

ENGINEER STAMP

PLAN OF SURVEY OF LOT 6 AND BLOCK A, REGISTERED PLAN 403 TOWN OF OAKVILLE REGIONAL MUNICIPALITY OF HALTON

LEGAL DESCRIPTION

ELEVATIONS ARE REFERRED TO THE TOWN OF OAKVILLE BENCHMARK No 227, LOCATED ON SOUTH END OF CONCRETE DOOR SILL AT 1334 SIXTH LINE, HAVING AN ELEVATION OF 131.831m; VERTICAL DATUM: CANADIAN GEODETIC DATUM, 1928 (PRE: 1978 SOUTHERN ONTARIO READJUSTMENT)

BENCHMARK

APLIN MARTIN

Aplin & Martin Consultants Ltd.
354 Davis Road, Suite 403, Oakville, ON, L6J 2X2
Tel: (905) 582-0630, Fax: (416) 644-1889, Email: general@aplinmartin.com

CLIENT

innovative s|h|s

PROJECT

MIXED USE RESIDENTIAL DEVELOPMENT

1493 SIXTH LINE, OAKVILLE, ON, L6H 1X8

DRAWING TITLE

SERVICING PLAN

NOTICE TO CONTRACTOR

IT IS THE RESPONSIBILITY OF THE CONTRACTOR'S SURVEYOR TO VERIFY THAT ALL LEGAL SURVEY DIMENSIONS SHOWN ON THE ENGINEERS DRAWINGS AGREE WITH THOSE ON THE REGISTERED LEGAL SURVEY PLAN. SHOULD THERE BE ANY DISCREPANCIES, THEN IMMEDIATELY NOTIFY THE ENGINEER OF RECORD

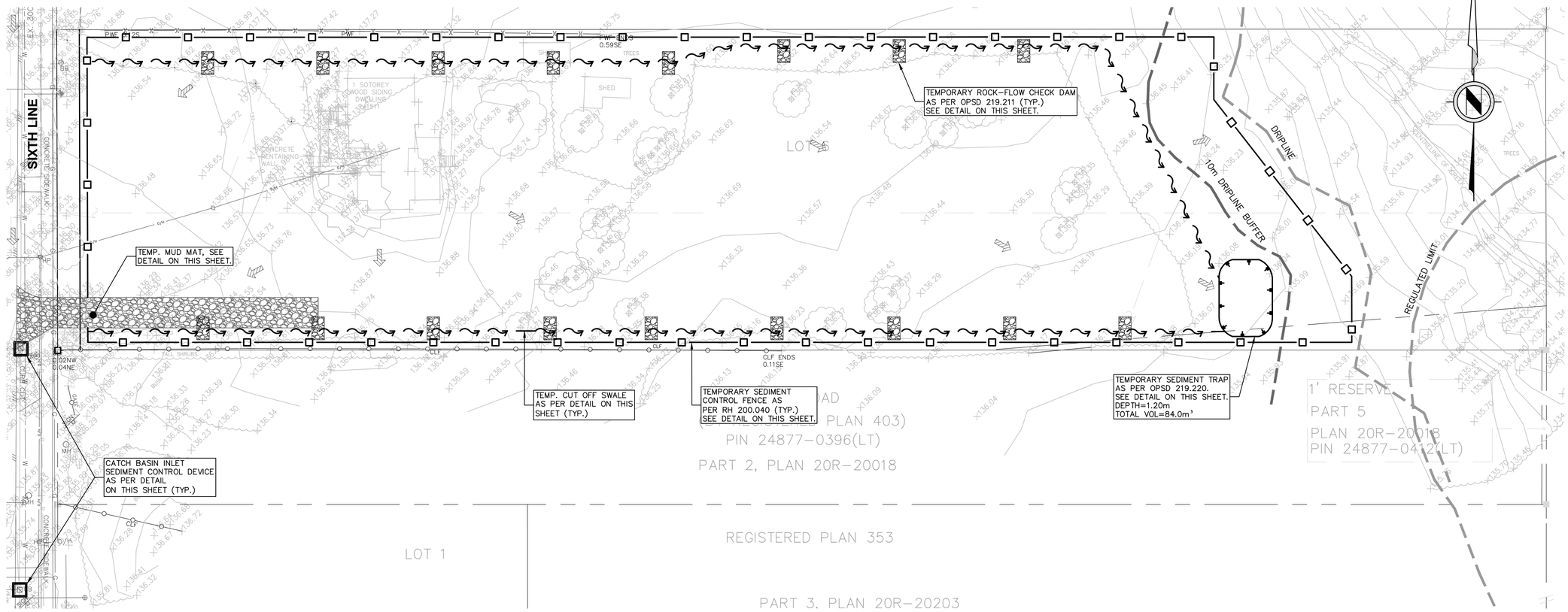
THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY & HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

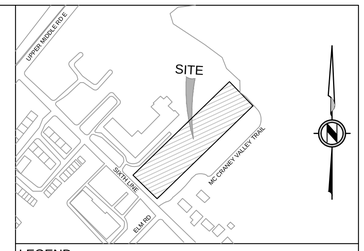
DESIGN	IA	DATE	JUNE 2025
DRAWN	HS	PROJECT NO.	25-7018
CHECKED	JC	DRAWING NO.	C02
APPROVED	JC	REV.	2

SCALE 1:300

0 3 1:300 15m

Sep 01, 2025 - 11:17am - M:\JOBS\2025\25-7018\DWG\ONSITE PRODUCTION\25-7018_C02_SERVICING PLAN.dwg, SERVICING PLAN, pmarin



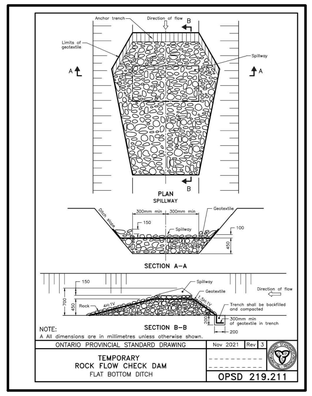


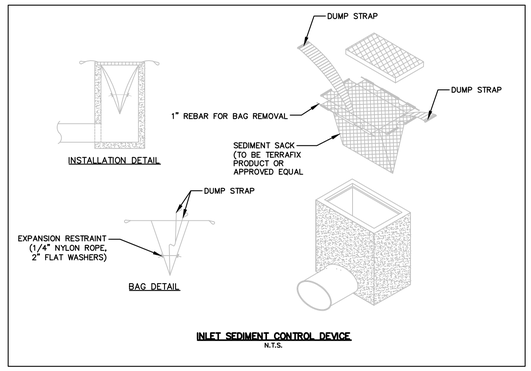
LEGEND

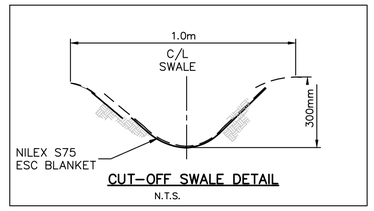
- PROPERTY LINE
- PROPOSED SILT FENCE
- PROPOSED SWALE
- PROPOSED TOP OF BANK
- PROPOSED BOTTOM OF BANK
- CULVERT
- EXISTING CONTOURS — 250.5
- EXISTING CATCH BASINS PROTECTION
- EXISTING OVERLAND FLOW ROUTE
- EXISTING ELEVATION — ×136.04
- TEMPORARY MUD MAT

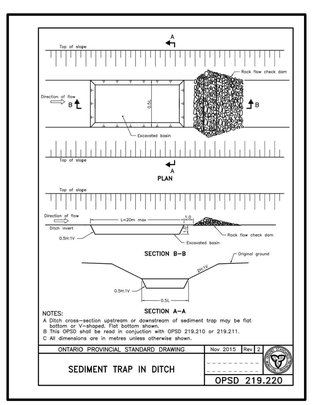
EROSION & SEDIMENT CONTROL NOTES:

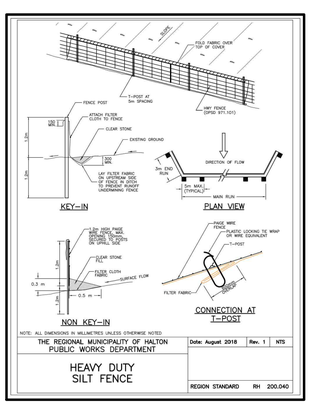
1. THE CONTRACTOR SHALL ENDEAVOUR TO PREVENT MUD TRACKING ONTO EXISTING RIGHTS-OF WAY AND SHALL PROVIDE FOR CLEAN UP AT HIS OWN EXPENSE AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE TO CONTROL DUST IN THE PROJECT AND HE SHALL PROVIDE, AT HIS OWN EXPENSE, CONTROLLING MEASURES AS DIRECTED BY THE ENGINEER AND THE TOWN.
2. ALL EXTERNAL AREAS DISTURBED DUE TO CONSTRUCTION SHALL BE RESTORED TO THEIR ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE TOWN.
3. PRIOR TO THE COMMENCEMENT OF SITE GRADING WORKS, ALL SILTATION CONTROL DEVICES SHALL BE INSTALLED AND OPERATIONAL. THE EXACT LOCATION TO BE DETERMINED IN THE FIELD AND APPROVED BY THE TOWN OF OAKVILLE. THE CONTRACTOR SHALL MAINTAIN ALL WORKS UNTIL SERVICING CONSTRUCTION IS COMPLETED TO THE SATISFACTION OF THE ENGINEER AND THE TOWN OF OAKVILLE.
4. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE ROUTINELY INSPECTED AND MAINTAINED IN PROPER WORKING ORDER AND CLEANED PERIODICALLY AS REQUIRED BY THE COMISSIONER OF ENGINEERING.
5. ALL CONSTRUCTION VEHICLES SHALL EXIT THE SITE VIA THE TEMPORARY CONSTRUCTION ACCESS.
6. SILT CONTROL FENCE TO REMAIN IN PLACE UNTIL THE WORKING AREA HAS BEEN STABILIZED AND VEGETATED, TO THE SATISFACTION OF THE TOWN OF OAKVILLE.
7. CONTRACTOR TO CLEAN ADJACENT ROADS ON A REGULAR BASIS OF THE SATISFACTION OF THE AFFECTED AUTHORITY.
8. THE LOCATION AND ELEVATION OF ALL EXISTING SERVICES AND UTILITIES ARE TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR AT THEIR EXPENSE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESTORATION AND / OR REPAIR OF EXISTING UTILITIES DISTURBED DURING CONSTRUCTION.
9. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS." THE GENERAL CONTRACTOR SHALL BE DESIGNATED AS THE CONSTRUCTOR AS IN THE ACT.
10. IF ANY AREA OF THE SITE IS SCHEDULED TO REMAIN UNTOUCHED FOR THE MORE THAN 30 DAYS, IT SHOULD BE SEEDED IMMEDIATELY.
11. ALL WORKS TO BE IN ACCORDANCE WITH TOWN OF OAKVILLE BY-LAW 2003-021
12. THE EROSION AND SEDIMENT CONTROLS SHALL BE MODIFIED AS NECESSARY AND IN AN APPROPRIATE FASHION TO ENSURE ADEQUATE PROTECTION OF THE RECEIVING WATERCOURSE AND NATURAL HERITAGE SYSTEM.
13. EROSION & SEDIMENT CONTROLS WITHIN THE REGULATED AREA MUST BE INSTALLED, MAINTAINED AND REMOVED TO THE SATISFACTION OF CONSERVATION AHLTON. CONSERVATION HALTON DOES NOT REQUIRE THAT THE EXACT LOCATION BE DETERMINED IN THE FIELD IN CONSULTATION WITH CH STAFF.
14. ALL EROSION AND SEDIMENT CONTROLS ARE TO BE INSTALLED ACCORDING TO THE APPROVED PLANS PRIOR TO COMMENCEMENT OF ANY EARTH MOVING WORK ON THE SITE AND SHALL REMAIN IN PLACE UNTIL ALL DISTURBED AREAS ARE STABILIZED WITH THE INTENDED GROUND COVER.
15. EROSION AND SEDIMENT CONTROLS SHALL BE INSPECTED BY THE BUILDER/DEVELOPER:
    - i. WEEKLY
    - ii. BEFORE AND AFTER ANY PREDICTED RAINFALL EVENT
    - iii. FOLLOWING AN UNPREDICTED RAINFALL EVENT
    - iv. DAILY, DURING EXTENDED DURATION RAINFALL EVENTS
    - v. AFTER SIGNIFICANT SNOW MELT EVENTS
16. EROSION AND SEDIMENT CONTROLS SHALL BE MAINTAINED IN PROPER WORKING ORDER AT ALL TIMES. DAMAGED OR CLOGGED DEVICES SHALL BE REPAIRED WITHIN 48 HOURS.
17. 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 SHLAL FREELY RELEASE TO A SUITABLE RECEIVER THAT DOES NOT CREATE DOWNSTREAM ISSUES INCLUDING BUT NOT LIMITED TO EROSION, FLOODING – NUISANCE OR OTHERWISE, INTERFERENCE ISSUES, ETC.
18. 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 15 AND 16 ABOVE.
19. IN THE EVENT OF A SPILL (RELEASE OF DELETERIOUS MATERIAL) ON OR EMANATING FROM THE SITE, THE OWNER OR OWNERS AGENT SHALL IMMEDIATELY NOTIFY THE MOECC AND FOLLOW ANY PRESCRIBED CLEAN UP PROCEDURE. THE OWNER OF OWNERS AGENT WILL ADDITIONALLY IMMEDIATELY NOTIFY THE TOWN.





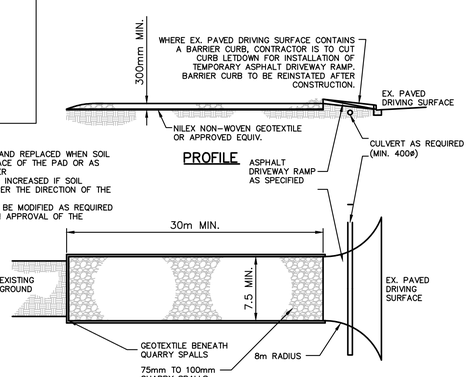






NOTES:

1. PAD SHALL BE REMOVED AND REPLACED WHEN SOIL IS EVIDENT ON THE SURFACE OF THE PAD OR AS DIRECTED BY THE ENGINEER
2. PAD THICKNESS SHALL BE INCREASED IF SOIL CONDITIONS DICTATE OR PER THE DIRECTION OF THE ENGINEER.
3. MINIMUM DIMENSIONS MAY BE MODIFIED AS REQUIRED BY SITE CONDITIONS UPON APPROVAL OF THE ENGINEER.



REV	MM/DD/YY	DESCRIPTION	BY	APP
2	08/29/2025	FIRST SPA SUBMISSION	IA	JC
1	07/04/2025	ISSUED FOR COORDINATION	IA	JC

PLAN OF SURVEY OF LOT 6 AND BLOCK A, REGISTERED PLAN 403 TOWN OF OAKVILLE REGIONAL MUNICIPALITY OF HALTON

LEGAL DESCRIPTION

ELEVATIONS ARE REFERRED TO THE TOWN OF OAKVILLE BENCHMARK No 227, LOCATED ON SOUTH END OF CONCRETE DOOR SILL AT 1334 SIXTH LINE, HAVING AN ELEVATION OF 131.83m. VERTICAL DATUM: CANADIAN GEODETIC DATUM, 1928 (FRE: 1978 SOUTHERN ONTARIO READJUSTMENT)

BENCHMARK

LICENSED PROFESSIONAL ENGINEER — J. M. CESARIO — 100525531 — 2025-09-02 — PROVINCE OF ONTARIO

ENGINEER STAMP

APLIN MARTIN

Aplin & Martin Consultants Ltd.
354 Davis Road, Suite 403, Oakville, ON, L6J 2X2
Tel: (905) 582-0630, Fax: (416) 644-1889, Email: general@aplinmartin.com

CLIENT

innovative s|h|s

PROJECT

MIXED USE RESIDENTIAL DEVELOPMENT

1493 SIXTH LINE, OAKVILLE, ON, L6H 1X8

DRAWING TITLE

EROSION & SEDIMENT CONTROL PLAN

NOTICE TO CONTRACTOR

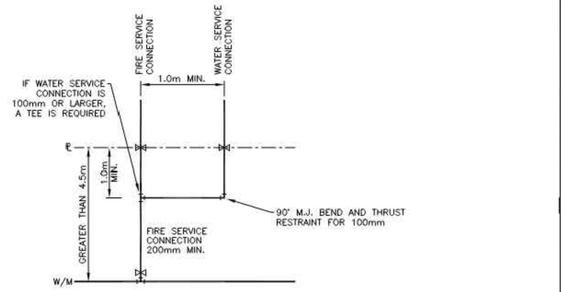
IT IS THE RESPONSIBILITY OF THE CONTRACTOR'S SURVEYOR TO VERIFY THAT ALL LEGAL SURVEY DIMENSIONS SHOWN ON THE ENGINEERS DRAWINGS AGREE WITH THOSE ON THE REGISTERED LEGAL SURVEY PLAN. SHOULD THERE BE ANY DISCREPANCIES, THEN IMMEDIATELY NOTIFY THE ENGINEER OF RECORD

THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY & HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

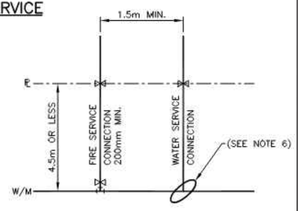
DESIGN	IA	DATE	JUNE 2025
DRAWN	HS	PROJECT NO.	25-7018
CHECKED	JC	DRAWING NO.	C03
APPROVED	JC	REV.	2

SCALE 1:300

0 3 1:300 15m



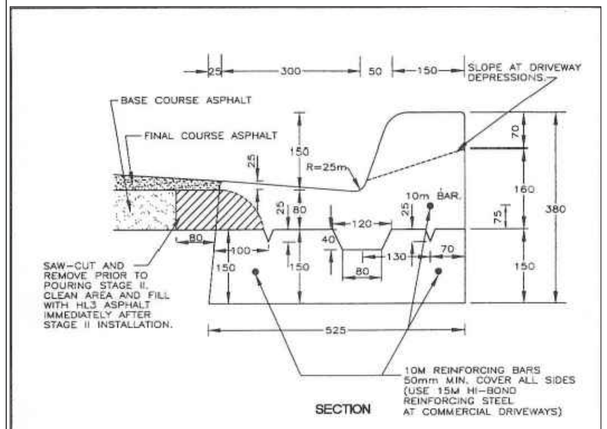
GREATER THAN 4.5m SERVICE



LESS THAN 4.5m SERVICE

NOTES
1. COMPRESSION TYPE FITTINGS ONLY. NO SOLDERED JOINTS ARE PERMITTED BEFORE THE WATER METER.
2. WATER SERVICE CONNECTION 25, 38, 50 TO BE TYPE 'K' SOFT COPPER, 100 AND LARGER TO BE PVC OR DI.
3. FIRE SERVICE CONNECTION TO BE MIN. 200mm.
4. IF THE WATERMAIN IS 4.5m OR LESS FROM THE PROPERTY LINE, THEN 2 SEPARATE CONNECTIONS ARE REQUIRED.
5. TAPPING SLEEVE TO BE PRESSURE TESTED BY CONTRACTOR BEFORE MAIN IS TAPPED.
6. ALL SERVICE CONNECTIONS TO PVC PIPE REQUIRE SADDLES. ALL SERVICE CONNECTIONS 50mm OR LESS TO HAVE A MAIN STOP, CURB STOP AND BOX. ALL SERVICES GREATER THAN 50mm REQUIRE A TAPPING SLEEVE AND VALVE OR AN ANCHOR TEE WITH A GATE VALVE AND BOX AT THE MAIN IN ADDITION TO A PROPERTY LINE GATE VALVE AND BOX.
7. ALL GATE VALVES TO HAVE VALVE BOXES.
8. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.

THE REGIONAL MUNICIPALITY OF HALTON PUBLIC WORKS DEPARTMENT	Date: August 2018	Rev. 2	NTS
WATER SERVICE AND FIRE SERVICE CONNECTION INSTALLATIONS	REGION STANDARD	RH 409.010	



NOTES:
1.–PRIOR TO CATCH–BASIN FINAL ADJUSMENT, SAWCUT BOTH TOP & BOTTOM STAGE CURB ALONG SAME VERTICAL PLANE 500mm FROM EDGE OF CATCH–BASIN. DOWEL TWO (2) 10m BARS 150mm INTO EXISTING BASE CURBS. HAND FORM AND POUR FULL CURB SECTION AT CATCH–BASIN.
2.–CONCRETE AS PER OPSS 1350

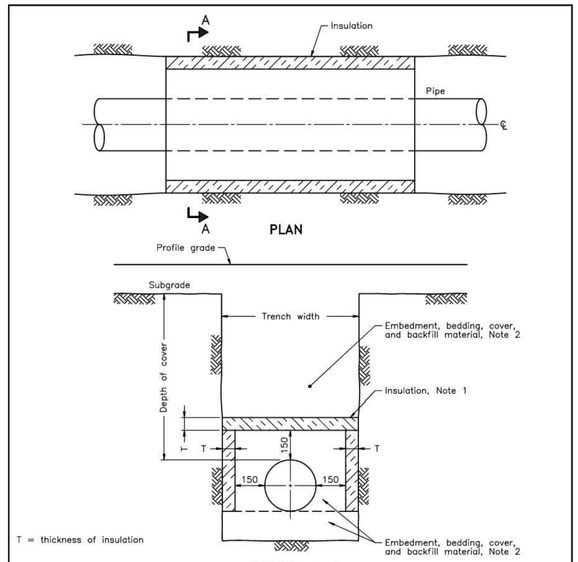
DIMENSIONS IN mm EXCEPT AS NOTED

MUNICIPALITY: TOWN OF OAKVILLE

TWO STAGE EXTRUDED CONCRETE CURB AND GUTTER

APPROVED
DIRECTOR OF PUBLIC WORKS

STD. 6-1
REVISION DATE FEBRUARY 1998



SECTION A–A
TYPICAL PIPE INSULATION DETAIL

NOTES:
1 The insulation material shall be extruded polystyrene according to OPSS 1605 with a minimum compressive strength of 275 kPa.
2 Pipe embedment or bedding, cover, and backfill shall be according to:
a) Flexible OPSD 802.010, 802.013, 802.020, and 802.023.
b) Rigid – OPSD 802.030, 802.031, 802.032, 802.033, 802.050, 802.051, 802.052, and 802.053.
A Minimum insulation thickness shall be 50mm.
B Joints shall be staggered for multiple insulation sheets.
C This OPSD is to be read in conjunction with OPSD 3090.100 and 3090.101.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2020	Rev	1
INSULATION FOR SEWERS AND WATERMAINS IN SHALLOW TRENCHES			
	OPSD 1109.030		

GENERAL NOTES:

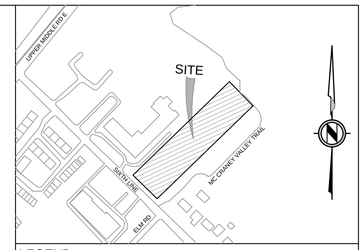
1. STANDARD DRAWINGS AND SPECIFICATIONS OF THE TOWN OF OAKVILLE AND THE REGION OF HALTON SHOULD BE READ IN CONJUNCTION WITH THE INFORMATION HEREIN.
2. MATERIAL SUBSTITUTIONS MUST HAVE PRIOR APPROVAL OF THE ENGINEER, TOWN OF OAKVILLE & REGION OF HALTON AND ANY OTHER REGULATORY AGENCIES HAVING JURISDICTION.
3. NO BLASTING IS REQUIRED OR ALLOWED.
4. COMPACTION OF GRANULAR BACKFILL AROUND CATCHBASINS AND MANHOLES TO BE 95% S.P.M.D.D. AND SHALL BE COMPACTED MECHANICALLY.
5. SEWER BEDDING TO BE AS PER TOWN OF OAKVILLE STANDARDS.
6. FILL AREAS GREATER THAN 0.3m WITHIN MUNICIPAL RIGHT–OF–WAY ARE SUBJECT TO COMPACTION TESTS TO ACHIEVE 100% S.P.M.D.D.
7. SET MANHOLE AND CATCHBASIN TOPS FLUSH WITH HL8 ASPHALT AND ARE TO BE ADJUSTED TO FINAL GRADE PRIOR TO PLACING FINAL LIFT OF ASPHALT.
8. TOWN OF OAKVILLE STANDARD 6–1 TO BE USED FOR CURB AND GUTTER WITHIN THE RIGHT–OF–WAY UNLESS OTHERWISE NOTED.
9. TOWN OF OAKVILLE STANDARD 6–3 TO BE USED FOR ALL SIDEWALK WITHIN THE RIGHT–OF–WAY. SIDEWALK DEPRESSIONS TO BE INSTALLED AT INTERSECTIONS. INTERSECTION RADII TO BE 7.50m UNLESS OTHERWISE NOTED.
10.
11. PAVEMENT STRUCTURES ARE AS PER SOIL INVESTIGATION REPORT TO BRONTE GREEN CORPORATION "PROPOSED RESIDENTIAL DEVELOPMENT" BY SOIL ENGINEERS LTD., REFERENCE NO. 1611–S034(A), DATED APRIL 2017: 40mm HL3 ASPHALT SURFACE COURSE 50mm HL8 ASPHALT BINDER COURSE 150mm GRANULAR 'A' BASE 350mm – 50mm CRUSHER–RUN LIMESTONE GRANULAR SUB–BASE
12. ANY ORGANIC MATERIAL OR TOPSOIL WITHIN FUTURE ROAD ALLOWANCES SHALL BE STRIPPED PRIOR TO CONSTRUCTION.
13. ALL TRENCHES WITHIN EXISTING R.O.W. TO BE BACKFILLED WITH GRANULAR MATERIAL AND COMPACTED TO 95% S.P.M.D.D.
14. ALL TRENCHES WITHIN A REGIONAL R.O.W. TO BE BACKFILLED WITH GRANULAR MATERIAL AND COMPACTED TO 98% S.P.M.D.D.
15. SUBDRAINS TO BE INSTALLED AS PER TOWN OF OAKVILLE STD. 6–2 UNLESS OTHERWISE NOTED.
16. ALL MATERIALS SHALL MEET OR EXCEED ONTARIO PROVINCIAL STANDARD AND TOWN STANDARD SPECIFICATIONS
17.
18. WATERMAINS AND SANITARY SEWERS TO CONFORM TO LATEST REGIONAL MUNICIPALITY OF HALTON SPECIFICATIONS AND REQUIREMENTS.
19. REFER TO ONTARIO BUILDING CODE SECTION 7.2.4.4 REGARDING FITTINGS RESTRICTED IN USE.
20. REFER TO ONTARIO BUILDING CODE SECTION 7.2.10.5 REGARDING SADDLE HUBS.
21. REFER TO ONTARIO BUILDING CODE SECTION 7.3.5.4 REGARDING FROST PROTECTION OF SERVICES.
22. REFER TO ONTARIO BUILDING CODE SECTION 7.3.5.7 REGARDING SPATIAL SEPARATION OF SERVICES

WATERMAINS:

1. 150mm DIA. TO 300mm DIA. WATERMAIN TO BE PVC CL.235 (DR–18) WITH GASKETED JOINTS PER AWWA C–900, C–905 & C–907..
2. MINIMUM HORIZONTAL SEPARATION OF 2.5m BETWEEN WATERMAINS AND SEWERS. A 0.5m SEPARATION BETWEEN WATERMAINS AND SEWERS MUST BE MAINTAINED AT ALL CROSSING LOCATIONS.
3. BEDDING TO BE SUITABLE GRANULAR 'A' MATERIAL WITH MINIMUM 150mm DEPTH AND SHALL CONFORM TO OPSS 514
4. ALL WATERMAIN WILL BE SUBJECT TO PRESSURE TESTING AND FIRE FLOW TESTING AS DIRECTED BY HALTON REGION
5. SACRIFICIAL ANODES SHALL CONFORM TO ASTM B–418 TYPE II AND SHALL BE MADE OF HIGH GRADE ELECTROLYTIC ZINC, 99.99% PURE.
6. ALL METALLIC WATERMAINS, FITTING, HYDRANTS AND RESTRAINERS TO HAVE ONE ZINC ANODE PER LENGTH OF PIPE IN SIZES IN ACCORDANCE WITH TABLE IN OAKVILLE GENERAL ENGINEERING NOTES AND INSTALLED IN ACCORDANCE WITH REGION OF HALTON STANDARD DRAWING RH 420.01 AND RH 420.02.
7. ANODES ARE NOT REQUIRED WITHIN VALVE–CHAMBERS, DRAIN CHAMBERS OR AIR RELEASE CHAMBER.
8. WELD CONNECTIONS TO BE COATED WITH "TC MASTIC" OR APPROVED EQUIVALENT.
9. 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 MANUFACTURERS INSTRUCTIONS.
10. WHERE NEW PIPE IS TO BE CONNECTED TO EXISTING DUCTILE IRON OR CAST IRON PIPE A 14.5 KG MAGNESIUM ANODE IS TO BE CONNECTED TO THE FIRST LENGTH OF EXISTING PIPE, AS PER REGION OF HALTON STANDARD DRAWING RH 420.01.
11. VALVES TO OPEN LEFT (COUNTER CLOCKWISE) AND HAVE A STANDARD 50mm SQUARE OPERATION NUT.
12. ALL PLUGS, CAPS, TEES & HYDRANTS AND BENDS WILL HAVE APPROVED MECHANICAL THRUST RESTRAINTS. CONCRETE THRUST BLOCKS SHALL ONLY BE USED IN SPECIAL CIRCUMSTANCES WITH THE APPROVAL OF THE REGION OF HALTON.
13. WATERMAIN INSTALLATION WITHIN EXISTING R.O.W. SHALL BE BACKFILLED WITH GRANULAR 'A'.
14. GATE VALVES CONFORMING TO AWWA C500 AND THE REGION OF HALTON SPECIFICATIONS SHALL BE PROVIDED ON WATERMAINS UP TO AND INCLUDING 300mm DIA.
15. WATERMAIN FITTINGS TO HAVE MECHANICAL JOINTS.
16. VERTICAL OR HORIZONTAL PIPE DEFLECTION TO BE IN ACCORDANCE WITH THE MANUFACTURES SPECIFICATIONS.
17. TRACER WIRE SHALL BE INSTALLED ON ALL NEW PVC AND POLYETHYLENE PIPE. A SOLID GAUGE TWU COPPER WIRE SHALL BE INSTALLED ALONG THE TOP OF THE PIPE STRAPPED TO THE PIPE AT 6m INTERVALS. THE WIRE SHALL BE INSTALLED BETWEEN EACH VALVE AND/OR THE END OF THE NEW PVC WATERMAIN. JOINTS IN THE WIRE ARE NOT PERMITTED. AT EACH VALVE, A LOOP OF WIRE IS TO BE BROUGHT UP INSIDE THE VALVE BOX TO THE TOP OF THE BOX AS PER HALTON STD DRAWING RH 4––4.04 OR RH 400.05
18. HYDRANTS TO BE INSTALLED SUCH THAT THE LOWER ROD STEM SHALL NOT EXCEED 1.7m MEASURED FROM THE BREAKOFF FLANGE.
19. ALL HYDRANTS AS PER O.P.S.D. 1105.010 AND RH400.02 TO HAVE STEAMER CONNECTIONS.
STORZ PUMPER CONNECTIONS
TWO (2) 63.5mm (2 1/2") WITH CSA STANDARD THREAD, 63.5mm I.D., 79.4mm O.D., 5 THREADS PER 25mm, 31.75mm SQUARE OPERATING NUT; AND
ONE (1) 100mm (4") STORZ PUMPER CONNECTION AS PER CAN/ULC #S–520, 31.75mm SQUARE OPERATING UNIT, AND STORE CAP PAINTED GLOSS BLACK.
20. MINIMUM DEPTH OF COVER OVER WATERMAIN SHALL BE 1.70m MEASURED FROM THE ROAD CENTERLINE ELEVATION.
21. MINIMUM SEPARATION DISTANCE BETWEEN THE EDGE OF DRIVEWAY AND FACE OF FIRE HYDRANT IS 1.0

STORM SEWERS:

1. MANHOLES TO BE AS PER O.P.S.D. 701.010 – 701.015 WITH COVER AND FRAME AS PER O.P.S.D.
2. CONCRETE PIPE TO BE CLASS 65–D AS PER CSA A257.2, PVC SDR 35 OR RIBBED PVC CONFORMING TO CSA B.182.2 (MAX PVC = 600mm DIA).
3. CATCHBASINS TO BE AS PER O.P.S.D. 705.01 FOR SINGLES AND 705.02 FOR DOUBLES. GRATES TO BE AS PER O.P.S.D. 400.11. CATCHBASINS LEADS TO BE 250mm DIA. FOR SINGLES AND 300mm DIA FOR DOUBLES AS PER CSA B182.2 SDR–35.
4. ALL POLYVINYL CHLORIDE (PVC.) PIPE SHALL MEET THE C.S.A. REQUIREMENTS AS NOTED WITHIN THE OPSS 1841, THE PIPE MATERIAL SHALL HAVE A CELL CLASSIFICATION OF 12454–B OR 12454–C OR ASTM STD. D–3034 AND OPSS 1841.
5. SILT TRAPS WITH FILTER FABRIC TO BE INSTALLED ON ALL CATCHBASINS AS PER THE EROSION AND SEDIMENT CONTROL PLAN. TRAPS TO BE CLEANED REGULARLY BY THE CONTRACTOR. TRAPS ARE NOT TO BE REMOVED UNTIL CURBS ARE CONSTRUCTED AND BOULEVARDS ARE SODDED AND BACKYARDS ARE GRADED AND SODDED.
6. RUBBER GASKETED JOINTS ARE TO BE USED ON ALL STORM SEWER.
7. CONNECTIONS TO MAIN SEWERS SHALL BE ACHIEVED USING 'Y' FITTINGS ONLY.
8. THE AREA DRAIN SPECIFIED BY THE MECHANICAL ENGINEER IS AS FOLLOWS: ZURN Z–610–H–ADJ 12" [305] SQUARE TOP ADJUSTABLE FLOOR DRAIN, DURA–COATED CAST IRON BOTTOM OUTLET BODY, CLAMPING COLLAR, ADJUSTABLE LEVELING FRAME, WITH HEAVY–DUTY CAST IRON HINGED SLOTTED GRATE.



LEGEND

REV	MM/DD/YY	DESCRIPTION	BY	APP
2	08/29/2025	FIRST SPA SUBMISSION	IA	JC
1	07/04/2025	ISSUED FOR COORDINATION	IA	JC

LICENSED PROFESSIONAL ENGINEER J.M. CESARIO 100525531 2025-09-02 PROVINCE OF ONTARIO
ENGINEER STAMP

PLAN OF SURVEY OF LOT 6 AND BLOCK A, REGISTERED PLAN 403 TOWN OF OAKVILLE REGIONAL MUNICIPALITY OF HALTON

LEGAL DESCRIPTION

ELEVATIONS ARE REFERRED TO THE TOWN OF OAKVILLE BENCHMARK No 227, LOCATED ON SOUTH END OF CONCRETE DOOR SILL AT 1334 SIXTH LINE, HAVING AN ELEVATION OF 131.831m. VERTICAL DATUM: CANADIAN GEODETIC DATUM, 1928 (PRE: 1978 SOUTHERN ONTARIO READJUSTMENT)

BENCHMARK

APLIN MARTIN
Aplin & Martin Consultants Ltd.
354 Davis Road, Suite 403, Oakville, ON, L6J 2X2
Tel: (905) 582-0630, Fax: (416) 644-1889, Email: general@aplinmartin.com

CLIENT
innovative shls

PROJECT
MIXED USE RESIDENTIAL DEVELOPMENT
1493 SIXTH LINE, OAKVILLE, ON, L6H 1X8

DRAWING TITLE
ESC - NOTES & DETAILS

NOTICE TO CONTRACTOR
IT IS THE RESPONSIBILITY OF THE CONTRACTOR'S SURVEYOR TO VERIFY THAT ALL LEGAL SURVEY DIMENSIONS SHOWN ON THE ENGINEERS DRAWINGS AGREE WITH THOSE ON THE REGISTERED LEGAL SURVEY PLAN. SHOULD THERE BE ANY DISCREPANCIES, THEN IMMEDIATELY NOTIFY THE ENGINEER OF RECORD

THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY & HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

DESIGN	DATE	SCALE
IA	JUNE 2025	1: 300
DRAWN	PROJECT NO.	
HS	25–7018	
CHECKED	DRAWING NO.	REV.
JC	**C04**	2
APPROVED		
JC		

0 3 1:300 15m