FUNCTIONAL SERVICING REPORT

Times Group Corp.

Type of Document:
Final Report

Project Name:
1544 & 1546 Four Mile Creek Road, Niagara on the Lake

Project Number:
ALL-24011473-A0

Prepared and Reviewed By:
Roshawn Nunes and Scott Passmore, P.Eng.
EXP
220 Commerce Valley Drive West, Suite 110
Markham, ON, L3T 0A8
t: +1.905.695.3217
f: +1.289.695.2411

Approved By:
Scott Passmore, P.Eng.

Date Submitted:
2025-04-21
2025-12-23 (Revision 1)

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1. Introduction

EXP Services Inc. has been retained by Times Group Corp. ("Owner") to prepare a Functional Servicing Report (FSR) ("Report") in support of an application (ZBA) requesting the removal of the Holding Provision for the redevelopment of the site located at 1544 & 1546 Four-Mile Creek Road, ("site") in the Town of Niagara-on-the-Lake.

This report has been updated to address the 1st engineering submission comments received from the Town of Niagara-on-the-Lake dated August 15th, 2025 and minor site plan changes.

The subject site is approximately 1.07 ha in area and is located on the west side of Four Mile Creek Road, just north of the Line 2 Road and Four Mile Creek Road intersection. The site is currently occupied with a residential home and commercial garage with driveway access to Four Mile Creek Road. The site is bound by Four Mile Creek Road to the east, existing residential homes to the south, woodlot lands and reservoir (Lower Virgil Reservoir) to the west and north. Finally, due to various hazards associated with the woodlot and reservoir lands to the west a small portion of the site is regulated by the Niagara Peninsula Conservation Authority (NPCA). Refer to Figure 1 for the Location Plan.

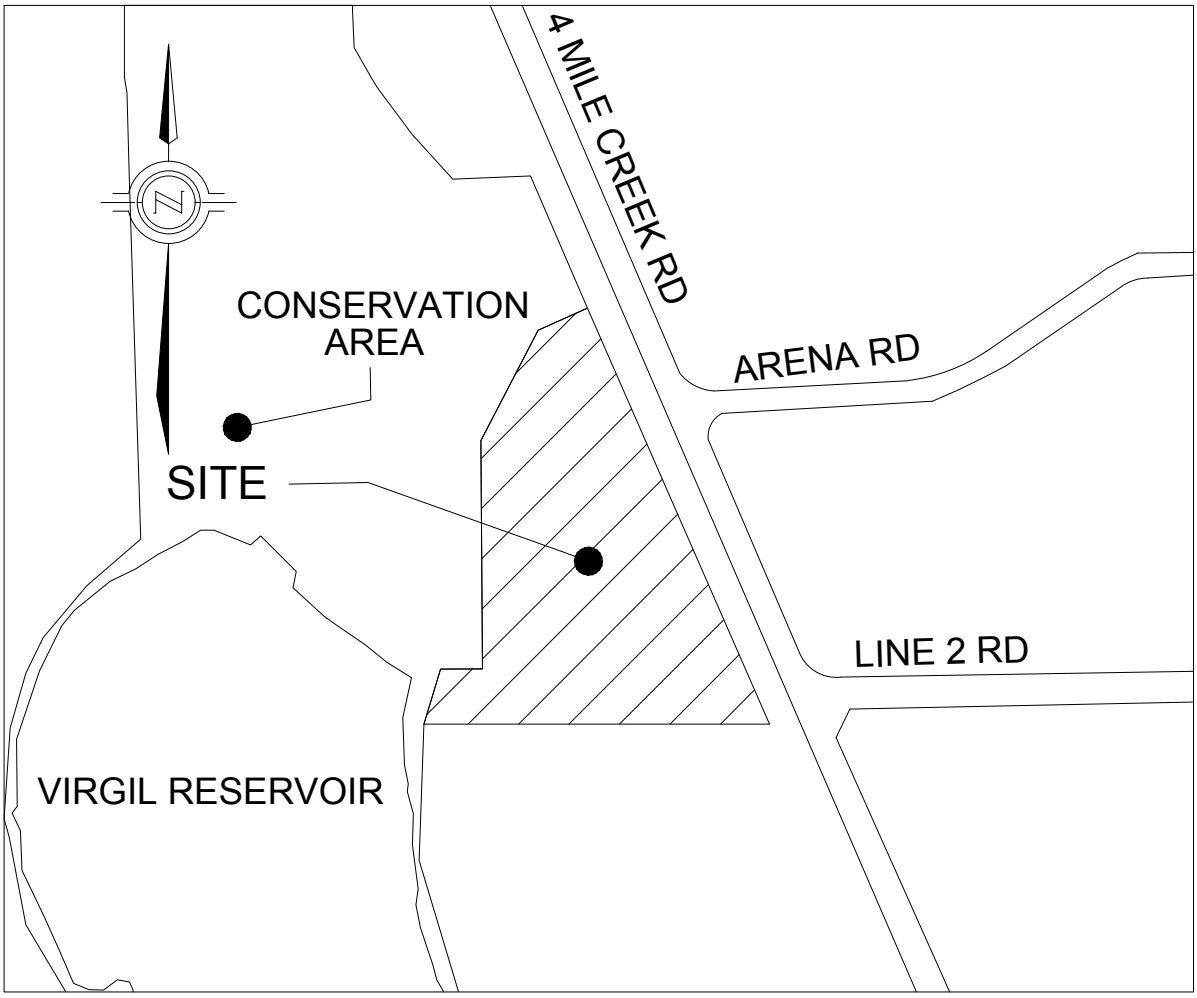
The objective of this FSR is to give an overview of the proposed servicing strategy for the site including outlining the required demands on the municipal system while addressing any corresponding capacity concerns.

2. Proposed Development

The proposed redevelopment of site includes mixed commercial and residential use with two (2) separate buildings as follows:

- One (1) 2-storey commercial building of 3,600 m^2 GFA on the east side of the site;
- One (1) 4-storey residential building of 3,622 m^2 GFA and 31 units on the west side of the site;
- A shared underground parking structure with an envelope of approx. 6,367 m^2;
- Two (2) driveway access locations to Four Mile Creek Road; and,
- Various above ground parking and landscaping across the site including boulevard improvements along Four Mile Creek Road.

Each building is to be designed with separate servicing allowances and easements for separate ownership of each building. Finally, at the southwest corner of the site there is an existing irrigation pump house connected to the Lower Virgil Reservoir where an existing irrigation line spans the south side of the site across to Four Mile Creek Road which is to be maintained. For additional details refer to the Site Plan prepared by the Icke Brochu Architects Inc in Appendix A.



Project: 1544 & 1546 FOUR MILE CREEK RD, NIAGARA-ON-THE-LAKE, ON			
Title: LOCATION PLAN			
Approved by: S.P	Date: FEB, 2025	Project No.: ALL-24011473-A0	
Drawn by: R.N	Scale: N.T.S.	Figure no.: FIG-01	

E:\MRK\ALL-24011473-A0\60 Execution\65 Drawings\Civil\24011473-FIG-01 LOCATION PLAN.dwg

3. Existing Topography and Site Grading

To assess the existing site topography within and surrounding the site, EXP staff reviewed topographic survey information and Town record drawings for the surrounding municipal roads. A site visit was then completed by EXP staff on February 14th, 2025 to further review existing conditions. After the review, some of the key characteristics of the existing topography can be summarized as follows.

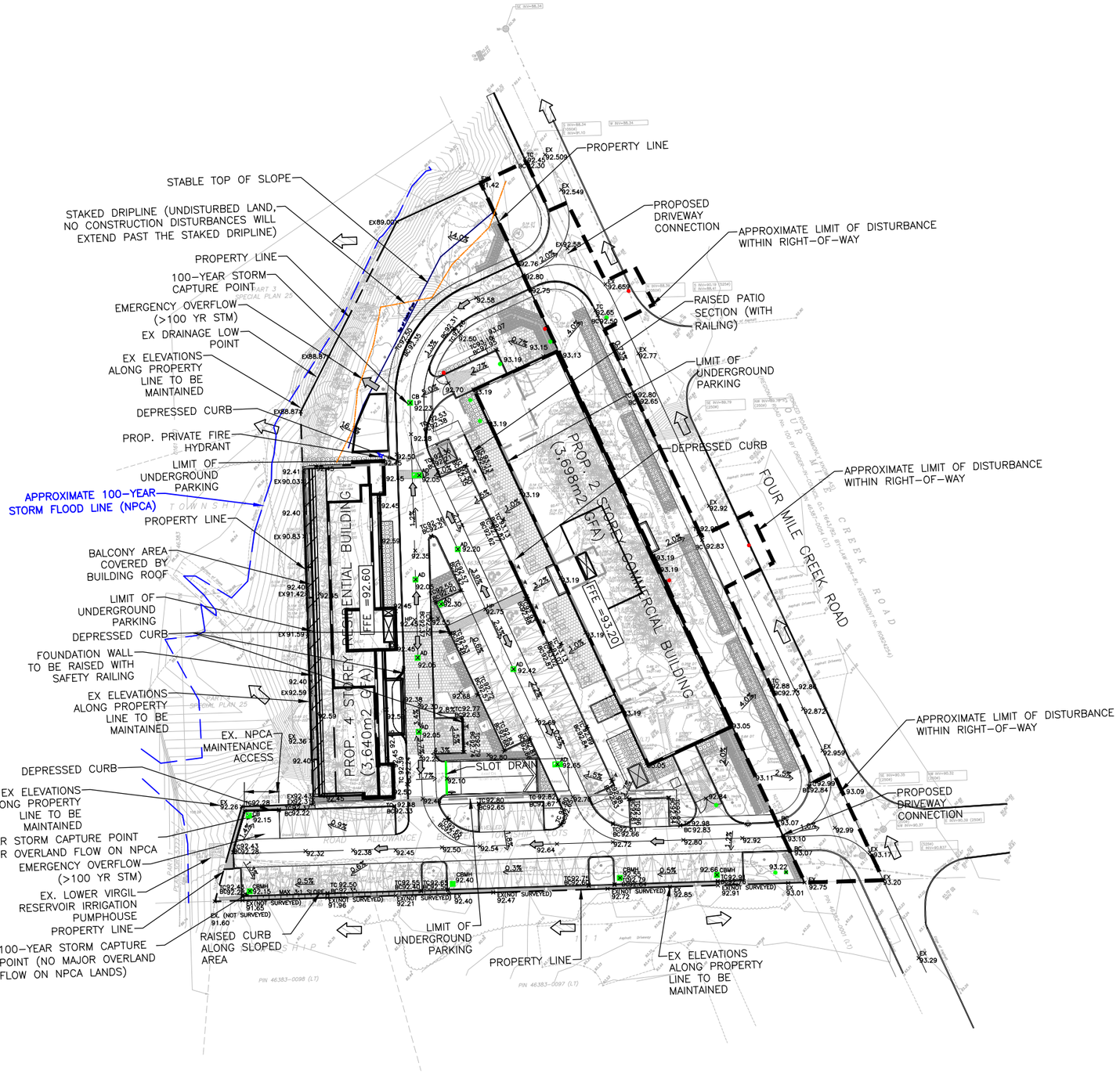
- The majority of the site shows existing elevations generally falling in the westerly and northwesterly direction where grades fall in the approx range of 1 to 3 m;
- Along the west side of the site there is an existing steep slope with a grade change in the range of 2 m;
- A small portion of the site shows existing elevations falling in the easterly direction towards Four Mile Creek Road with shallow slopes; and,
- There is very minimal to no external drainage is observed to be conveyed across the site.

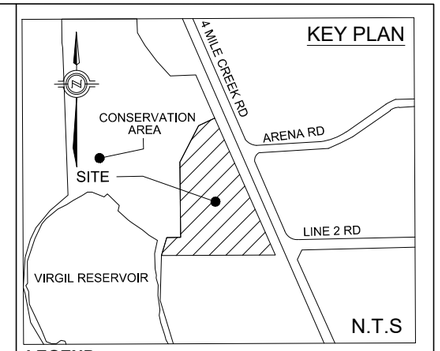
As previously mentioned, a small portion of the west side of the site is regulated by the NPCA for various hazards including floodplain and erosion setback requirements. EXP staff contacted the NPCA to obtain the most current floodplain mapping and flood elevations and transposed the elevations against the actual topographic survey completed for the site. The floodplain mapping review showed that all flood elevations (and 7.5 m development setbacks) were clear of the proposed building locations. Finally, as part of the various studies prepared by the owner a slope stability study was completed by EXP to ensure the appropriate setbacks are maintained. For the stable top of bank information please refer to the Preliminary Site Grading Plan in Figure 2, and for the remaining NPCA background information refer to Appendix A.

The proposed preliminary grading design for the site was completed in concert with the proposed stormwater management strategy for the site which included various pre-consultations with the owner. Some of the key features of the preliminary grading design can be summarized as follows:

- Meeting all existing elevations along the south, west and north property lines adjacent to the site;
- Modifying existing elevations along the east side of the site adjacent to the Four Mile Creek Road right of way to ensure positive drainage as part of boulevard improvement works;
- Maintaining maintenance access to the existing Lower Virgil Reservoir gates and irrigation pumphouse located at the southwest corner of the site while ensuring no major overland flow is conveyed onto the maintenance access with a 100-year storm capture design;
- Incorporating a network of high and low points with various inlets designed to capture and convey the 100-year storm event; and,
- Site grading such that major overland flow is directed away from the buildings to the Four Mile Creek Road right of way or NPCA lands in accordance to allowable release rates ensuring positive drainage across the site.

For additional grading details refer to the Preliminary Grading Plan in Figure 2.





LEGEND:

- PROPERTY LINE
- NEW / EXISTING WATER VALVE AND BOX
- EXISTING HYDRANT
- 109.42 — PROPOSED ELEVATION
- 109.42 — EXISTING ELEVATION
- DRAINAGE ARROW / SLOPE (MAX 3:1)
- MAJOR EXTERNAL OVERLAND FLOW
- MAJOR INTERNAL OVERLAND FLOW
- APPROXIMATE LIMIT OF DISTURBED AREA WITHIN CITY RIGHT-OF-WAY
- HEAVY DUTY PAVEMENT AREA FOR FIRE TRUCK ACCESS
- EX. STORM/SANITARY M.H.
- EX. CATCH BASIN
- LIMIT OF UNDERGROUND PARKING
- AD — PROP. AREA DRAIN
- CB — PROP. CATCHBASIN
- PROP. STORM ACCESS LID
- PROP. SANITARY ACCESS LID

NOTES

- TOPOGRAPHIC SURVEY PROVIDED BY BARICH GRENKIE SURVEYING LTD. COMPLETED ON JANUARY 25, 2024.
- SITE PLAN PROVIDED BY ICKE BROCHU ARCHITECTS INC

SCALE: 1:1000

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

PRELIMINARY SITE GRADING PLAN

FIGURE 2

1544 & 1546 FOUR MILE CREEK RD
NIAGARA ON THE LAKE, ONTARIO

PROJECT NUMBER: ALL-24011473-A0

DATE: APRIL 2025

4. Water Servicing

Available record drawings show the following existing municipal watermain adjacent to the site:

- 250 mm diameter watermain on the east side of Four Mile Creek Road

The Town's record drawings also show two existing fire hydrants on the east side of Four Mile Creek Road adjacent to the northerly and southerly limits of the site. It is believed that there are two existing water service connections to the existing 250 mm diameter watermain on Four Mile Creek Road for each of the properties within the site. The Town's record drawings showing the watermain information can be found in Appendix A for reference.

Based on the Owner's site plan, it is confirmed that the site will proceed in a single phase with each building under separate ownership. Therefore, the proposed preliminary water servicing design is to consist of the following:

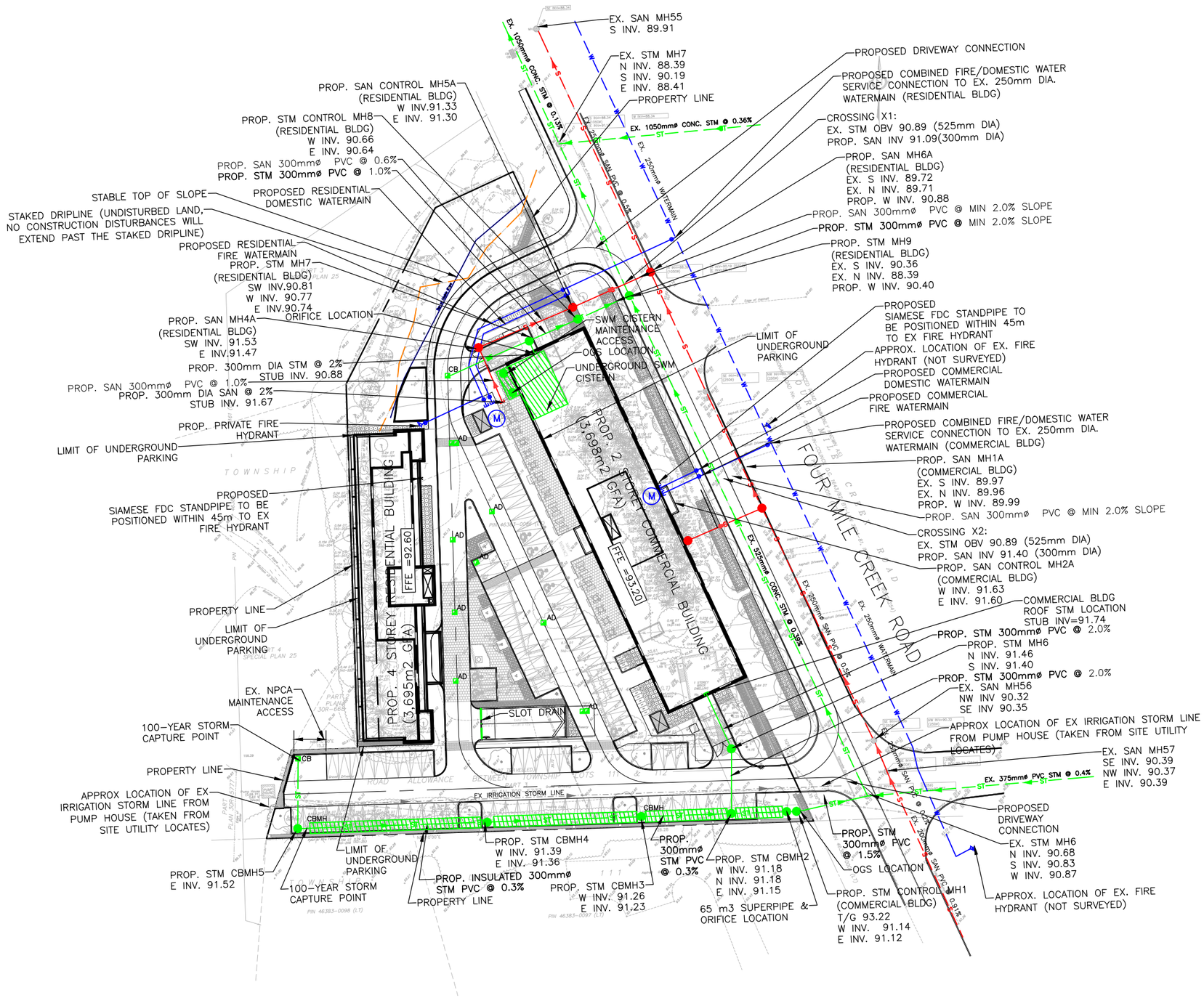
- One (1) new combined fire/domestic water service connection for the commercial building to the existing 250 mm diameter watermain on Four Mile Creek Road;
- One (1) new combined fire/domestic water service connection for the residential building to the existing 250 mm diameter watermain on Four Mile Creek Road;
- One (1) new private hydrant adjacent to the residential building within the site; and,
- Abandoning any existing water services in accordance to municipal standards.

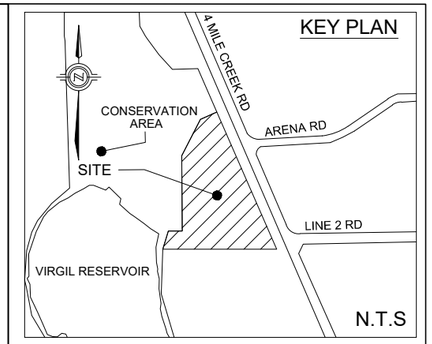
For additional details regarding the proposed preliminary water servicing strategy refer to the Preliminary Servicing Plan in Figure 3.

To determine the domestic water demand for the proposed development, the water consumption calculations were prepared in accordance with the standards outlined within the Niagara Region 2021 Master Servicing Plan. The calculations showed that under maximum day demand conditions, a demand of 0.40 L/s should be considered for the commercial Building, and 0.20 L/s for the residential building for a total site demand of 0.60 L/s for the site. For the water demand calculations please refer to Appendix B.

For calculating the required fire protection requirements, the Fire Underwriter's Survey (FUS) was used where the theoretical demand was determined to be governed by the commercial building and calculated to be 250 L/s. Therefore, for the purposes of assessing the proposed water demand calculations for the site, a maximum day demand plus fire demand of 250.60 L/s should be considered for the site. For additional details on the proposed fire demands refer to calculations provided in Appendix B.

Finally, to verify existing flows and pressures within the municipal watermain against the proposed demands, EXP staff coordinated a hydrant flow test on the closest hydrants on Four Mile Creek Road. The flow test results showed that adequate flows and pressures can be obtained to meet the FUS requirements while still maintaining the minimum required 20 psi for the surrounding system. Refer to Appendix B for the hydrant flow test results completed on November 8th, 2024.





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- PROP. SANITARY M.H.
- EX. STORM SEWER
- PROP. STORM SEWER
- EX. SAN SEWER
- PROP. SANITARY SEWER
- EX. WATERMAIN
- PROP. WATERMAIN
- PROP. SWM QUANTITY STORAGE FACILITY
- WATER METER LOCATION
- EXISTING IRRIGATION LINE

NOTES

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SCALE: 1:1000

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

PRELIMINARY SITE SERVICING PLAN

FIGURE 3

1544 & 1546 FOUR MILE CREEK RD
NIAGARA ON THE LAKE, ONTARIO

PROJECT NUMBER: ALL-24011473-A0

DATE: APRIL 2025

5. Sanitary Servicing

Available record drawings show the following existing municipal sanitary sewer adjacent to the site:

- 250 mm diameter sanitary sewer located on the east side of Four Mile Creek Road flowing in the northerly direction

Based on the review of the available records, it is believed that there is only one existing sanitary service connection to the existing 250 mm diameter sanitary sewer on Four Mile Creek Road for the residential home (1544 Four Mile Creek Road property). The Town's record drawings showing the sanitary information can be found in Appendix A for reference.

Based on the Owner's site plan, it is confirmed that the site will proceed in a single phase with each building under separate ownership. Therefore, the proposed preliminary sanitary servicing design is to consist of the following:

- One (1) new sanitary service connection for the commercial building to the existing 250 mm diameter sanitary sewer on Four Mile Creek Road;
- One (1) new sanitary service connection for the residential building to the existing 250 mm diameter sanitary sewer on Four Mile Creek Road; and,
- Abandoning any existing sanitary services in accordance to municipal standards.

For additional details regarding the proposed preliminary sanitary servicing strategy refer to the Preliminary Servicing Plan in Figure 3.

In order to determine the existing sanitary demand for the site, the standards outlined within the Niagara Region 2021 Master Servicing Plan were referenced to determine the estimated equivalent population for the residential home (1544 Four Mile Creek Road property). Based on the total estimated population of 3 persons the peak sanitary flow for the site under existing conditions was calculated to be 0.06 L/s including infiltration.

For calculating the peak sanitary demand for the site under proposed development conditions, a similar approach was taken using the Niagara Region standards where the total estimated equivalent population was calculated to be 80 persons for the commercial building and 56 persons for the residential building. After applying the infiltration rates and peaking factors, a peak sanitary demand of 1.29 L/s was calculated for the commercial building and 0.80 L/s for the residential building. Therefore, the overall post development peak sanitary demand was calculated to be 2.03 L/s (2.09 L/s – 0.06 L/s) for the site. Refer to Appendix C for the sanitary demand calculations.

As per the municipal standards for new developments, any post development increases on the municipal sanitary system must assess the available capacity in the downstream system. EXP staff were then in contact with Town engineering staff to confirm the terms of reference for the required downstream sanitary analysis where the findings are discussed further below.

Downstream Sanitary Capacity Analysis

To commence the downstream sanitary capacity analysis of the municipal system, EXP first reviewed all publicly available reports and drawings in regards to the existing sanitary system and the corresponding demands. After

consulting with Town of Niagara on the Lake Engineering Staff, it was confirmed that the termination point for the analysis is to be located at the intersection of Four Mile Creek Road and Niagara Stone Road, and any other capacity reviews are to be completed separately through the Town's ongoing infrastructure studies. The results from the analysis showed that the most critical section of the existing municipal sanitary sewer was running at approximately 58% full flow capacity including the existing demand (0.06 L/s) from the site. Under post development conditions, the post development increase of 2.03 L/s was included and the capacity was decreased to 63% flowing full at the critical section. Typical industry standards require that any municipal sanitary sewer system run below 80% of the full flow capacity to ensure safe conveyance of flows while not backing up connecting private sanitary service connections during peak conditions. Therefore, after reviewing the results from the analysis, the post development increase can easily be accommodated within the downstream municipal system to the termination point without any required infrastructure upgrades. For the downstream sanitary capacity analysis calculations please refer to Appendix C.

6. Storm Servicing

Available record drawings showing the following existing municipal storm sewers and drainage features surrounding the site:

- 525 to 1050 mm diameter storm sewers located on the west side of Four Mile Creek Road flowing in the northerly direction;
- Various roadside ditches and culverts under driveways within the Four Mile Creek Road right of way conveying flows in the northerly direction; and,
- An existing storm sewer concrete headwall outlet located within the NPCA lands adjacent to the north side of the site discharging the flows from the municipal storm sewer system on Four Mile Creek Road.

Based on the review of the available records, it is believed that there aren't any existing storm sewer service connections to the existing storm sewer on Four Mile Creek Road for each of the properties within the site. The Town's record drawings showing the storm sewer information can be found in Appendix A for reference.

Based on the Owner's site plan, it is confirmed that the site will proceed in a single phase with each building under separate ownership. Therefore, the proposed preliminary storm servicing design is to consist of the following:

- One (1) new storm service connection for the commercial building to the existing 525 mm diameter storm sewer on Four Mile Creek Road;
- One (1) new storm service connection for the residential building to the existing 525 mm diameter storm sewer on Four Mile Creek Road;
- One (1) underground stormwater management (SWM) cistern as part of the underground parking structure design for SWM quantity controls;
- One (1) oversized superpipe system along the south side of the site as part of the commercial building site storm sewer system for SWM quantity controls;
- A network of various area drains and catchbasin inlets design to capture and convey the 100-year storm event;
- Two (2) oil and grit separators within the site storm servicing design for SWM quality controls; and,

- Abandoning any existing storm services (should they existing) in accordance to municipal standards.

For additional details regarding the proposed preliminary storm servicing strategy refer to the Preliminary Servicing Plan in Figure 3. For additional details regarding the proposed SWM measures, please refer to the separate SWM Report prepared by EXP.

7. Conclusions

In summary, based on the findings outlined in this report the proposed development can be adequately serviced where some of the key results can be summarized as follows:

- Proposed grading can be accommodated to generally maintain the existing drainage patterns for the site and perimeter elevations without any negative impact to neighbouring properties
- Adequate flood protection can be provided to the proposed buildings based on the proposed preliminary grading design all in accordance with NPCA standards and MNRF technical guidelines
- Domestic water servicing for each building can be provided with the two (2) proposed water service connections to the existing 250 mm diameter municipal watermain on Four Mile Creek Road
- Fire protection for each building can be provided based on the calculated maximum day plus fire flow demands and the completed hydrant flow testing results dated November 2024
- Sanitary servicing for each building can be provided with the two (2) proposed sanitary service connections to the existing 250 mm diameter municipal sanitary sewer system on Four Mile Creek Road
- Based on the completed external sanitary capacity analysis the proposed demand from the site can be accommodated within the downstream municipal sanitary system without any infrastructure upgrades pending the review by Town staff
- Storm servicing can be provided with the two (2) proposed storm service connections to the existing 525 mm diameter municipal storm sewer on Four Mile Creek Road
- Stormwater management can be provided with the proposed SWM measures outlined within the SWM Report prepared by EXP

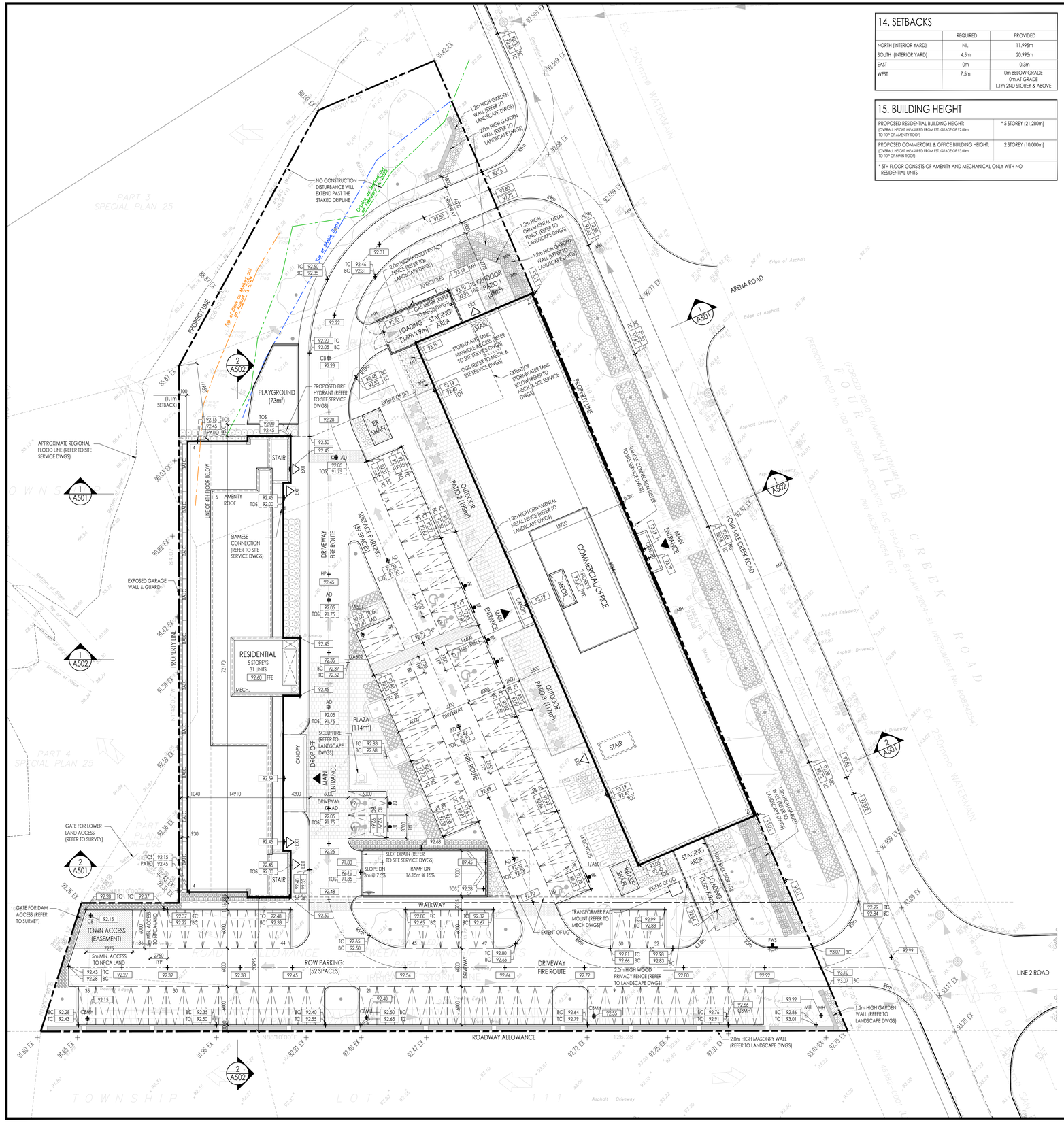
Sincerely,

EXP Services Inc.

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

FOR
Roshawn Nunes
Project Designer, Land Development

Appendix A – Background Information



14. SETBACKS

	REQUIRED	PROVIDED
NORTH (INTERIOR YARD)	NIL	11.995m
SOUTH (INTERIOR YARD)	4.5m	20.995m
EAST	0m	0.3m
WEST	7.5m	0m BELOW GRADE 0m AT GRADE 1.1m 2ND STOREY & ABOVE

15. BUILDING HEIGHT

PROPOSED RESIDENTIAL BUILDING HEIGHT: (OVERALL HEIGHT MEASURED FROM EST. GRADE OF 92.00m TO TOP OF AMENITY ROOF)	* 5 STOREY (21.280m)
PROPOSED COMMERCIAL & OFFICE BUILDING HEIGHT: (OVERALL HEIGHT MEASURED FROM EST. GRADE OF 93.00m TO TOP OF MAIN ROOF)	2 STOREY (10.000m)

* 5TH FLOOR CONSISTS OF AMENITY AND MECHANICAL ONLY WITH NO RESIDENTIAL UNITS

1. ZONING

ZONING

2. SITE AREA

	SQ. FEET (ft²)	SQ. METER (m²)	ACRES (ac)	HECTARES (ha)
DEVELOPABLE AREA	83,022ft²	7,713m²	1.906 ac	0.771 ha
ROAD	23,950ft²	2,225m²	0.550 ac	0.223 ha
CONSERVATION AREA	8,077.2ft²	750.4m²	0.185 ac	0.075 ha
TOTAL	115,049.0ft²	10,688.4m²	2.64 ac	1.07 ha

3. UNIT MIX

	STUDIO	1B	1B+D	2B	2B+D	3B/3B+D	TOTAL
GROUND FLOOR	-	3	1	5	-	-	9
2ND FLOOR	-	4	-	4	-	-	8
3RD FLOOR	-	4	-	4	-	-	8
4TH FLOOR	-	-	-	4	-	2	6
TOTAL	-	11	1	17	-	2	31

* OF WHICH 15% ARE BARRIER FREE

4. GROSS FLOOR AREA

"GROSS FLOOR AREA" - MEANS THE SUM TOTAL OF THE GROSS HORIZONTAL AREAS OF ALL FLOORS OF ALL BUILDINGS OR STRUCTURES ON A LOT, MEASURED FROM THE INTERIOR FACES OF THE EXTERIOR WALLS OR FROM THE CENTRE LINE OF THE COMMON WALL SEPARATING TWO BUILDINGS, AND THE "GROSS FLOOR AREA" OF A BUILDING OR STRUCTURE SHALL ALSO INCLUDE:
A) BASEMENT FLOOR AREA WHERE THE BASEMENT CEILING HEIGHT IS 2.1m OR MORE, UNLESS OTHERWISE SPECIFIED;
B) ATTIC SPACE HAVING HEADROOM OF 2.1m OR MORE FOR AT LEAST HALF THE ATTIC FLOOR AREA, UNLESS OTHERWISE SPECIFIED;
C) INTERIOR BALCONIES AND MEZZANINES;
D) ENCLOSED PORCHES AND ENCLOSED VERANDAS;
E) ELEVATOR SHAFTS AND STAIRWELLS AT EACH FLOOR, AND FLOOR AREA USED FOR MECHANICAL EQUIPMENT;
F) GROUND FLOOR AREA DEVOTED TO SECONDARY USES IN THE MAIN BUILDING.

	NO. FLS x SQ METER (m²)	SQ METER (m²)		SQ FEET²)
RESIDENTIAL				
P1 UNDERGROUND		2,191m²		
GROUND FLOOR		1,006m²		
2ND FLOOR		873m²		
3RD-4TH FLOOR	2 FLRS x 873m²	1,746m²		
5TH FLOOR (AMENITY & MECH)		*617m²		
TOTAL		* 6,433m²	45%	69,244ft²
COMMERCIAL & OFFICE				
P1 UNDERGROUND		4,176m²		
GROUND FLOOR		1,800m²		
COMMERCIAL		761m²		
RESTAURANT		745m²		
SERVICE SPACE		294m²		
2ND FLOOR (OFFICE)		1,800m²		
ROOFTOP MECH		209m²		
TOTAL		7,985m²	55%	85,950ft²
TOTAL		14,418m²		155,194ft²

* OF WHICH 170m2 IS INDOOR AMENITY AND 450m2 IS OUTDOOR AMENITY TERRACE

5. LEASABLE AREA SQ METER m²

	UNIT	PATIO	TOTAL
COMMERCIAL			
RESTAURANT	720m²	234m² (PATIO 1&2)	963m²
RETAIL UNIT 1	392m²	117m² (PATIO 3)	509m²
RETAIL UNIT 2	344m²		344m²
OFFICE	1,566m²		1,566m²
TOTAL	3,022m²	351m²	3,373m²

6. RESIDENTIAL NET DENSITY

RESIDENTIAL UNIT / TOTAL SITE AREA (EXCLUDING ROADS AND CONSERVATION AREA)	31 UNITS / 0.771ha (7,713m2) 41 UNIT/ha

7. PARKING

TOTAL PARKING REQUIRED:	80 (1/9m²)	40 (1/18.5m²)	56 (1/28m²)	12 (1/30m²)	31 (1 SP/U)		219 *
	RESTAURANT	COMMERCIAL	OFFICE	PATIO	VISITOR	RESIDENTIAL	TOTAL
SURFACE	75	0	0	14	2	0	91
P1 UNDERGROUND	5	40	56	0	5	44	150
TOTAL PROVIDED	80 (1/9m²)	40 (1/18.5m²)	56 (1/28m²)	14 (1/30m²)	51 (1.64 SP/U)		*241

* OF WHICH 7 ARE REQUIRED AND PROVIDED TO BE BARRIER-FREE (CITY BY-LAW REQUIREMENTS) *** OF WHICH ARE 19 OPTIONAL EV CHARGERS
** OF WHICH 2 ARE COMPACT SPACES (2.6m x 5.0m) & 8 MOTORCYCLE PARKING SPACES (3 RESIDENTIAL & 5 COMMERCIAL)(1.2m x 3.0m)

8. LOCKER STORAGE

P1 UNDERGROUND	31 (1 LOCKER/U)

9. BICYCLE PARKING

TOTAL BICYCLE PARKING REQUIRED:	15 (2/100m²)	4 (1/200m²)	7 (1/250m²)	8 (2/100m²)			33
	RESTAURANT	COMMERCIAL	OFFICE	PATIO	VISITOR	RESIDENTIAL	TOTAL
SURFACE	20	8	0	14	0	0	42
P1 UNDERGROUND	0	0	7	0	0	17	24
TOTAL PROVIDED	20	8	7	14	17		66

10. INDOOR & OUTDOOR AREA

REQUIRED AMENITY SPACE : 980m² (10,603 ft²)
(8 1B/1B+D @10m² + 19 2B @35m² + 4 3B/3B+D @40m²)

	SQ METER (m²)	SQ FEET²)
RESIDENTIAL		
INDOOR AMENITY	170m²	
OUTDOOR AMENITY TERRACE	450m²	
GROUND FLOOR	18m²	
ROOFTOP AMENITY	432m²	
PLAYGROUND	73m²	
PLAZA	114m²	
RESIDENTIAL BALCONIES/PATIOS	877m²	
TOTAL AMENITY SPACE PROVIDED	1,684m²	18,126ft²
COMMERCIAL		
OUTDOOR PATIO 1	39m²	
OUTDOOR PATIO 2	195m²	
OUTDOOR PATIO 3	117m²	
TOTAL	351m²	3,778ft²

11. COVERAGE

	SQ. METER (m²)	SQ. FEET (ft²)	%
BUILDING	3,065m²		29%
RESIDENTIAL	1,258m²		12%
COMMERCIAL/OFFICE	1,807m²		17%
LANDSCAPED AREAS	3,599.4m²		33%
PAVED AREAS	4,024m²		38%
DRIVEWAY AREAS	2,257m²		21%
PARKING AREAS	1,767m²		17%
TOTAL	10,688.4m²		100%

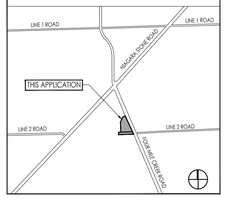
12. LOT FRONTAGE

LOT FRONTAGE (FOUR MILE CREEK DRIVE)	88.84m

13. LOADING AREA

LOADING AREAS (3.6m x 9m)	2

KEY PLAN NTS



SURVEY INFORMATION

PLAN OF SURVEY (DATE: FEB 18, 2025)	PART OF TOWNSHIP LOT 112 & PART OF ROAD ALLOWANCE BETWEEN TOWNSHIP LOTS 111 & 112 IN THE TOWN OF NIAGARA-ON-THE-LAKE REGIONAL MUNICIPALITY OF NIAGARA
NOTES	DISTANCES, ELEVATION AND CO-ORDINATES SHOWN ON THIS PLAN ARE IN METERS AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048 ELEVATIONS ARE GEODETIC ORIGIN (CGVD1-1928: 78), AND ARE DERIVED FROM REAL TIME NETWORK, (RTN) OBSERVATIONS AND NATURAL RESOURCES CANADA'S GEOID MODEL HT2.0 REVISED TO SHOW REMOVED BERM & CURBS ON EAST SIDE OF FOUR MILE CREEK ROAD & NEW DRIPLINE AS MARKED OUT THIS PLAN WAS PREPARED FOR REZEN HOLDING CORPORATION AND THE UNDERSIGNED ASSUMES NO RESPONSIBILITY FOR USE BY OTHER PARTIES.
SURVEYOR CONTACT INFORMATION	BARICH GRENKIE SURVEYIING LTD. 301 HWY NO.8 (2ND FLOOR) - STONEY CREEK, ON L8G 1E5 TEL: (905) 662-6767

SITE PLAN LEGEND NTS

- MAIN ENTRANCE
- EXISTING GRADE DATUM
- FINISH FLOOR ELEVATION
- ESTABLISHED GRADE
- PROPOSED GRADE DATUM
- EXISTING TREE (REFER TO SURVEY) CANOPY NOT TO SCALE
- PROPOSED TREE (REFER TO LANDSCAPE DWGS)
- EXISTING HYDRANT (REFER TO SURVEY)
- SIAMESE CONNECTION (REFER TO MECH/CIVIL DWGS)
- SANITARY MANHOLE (REFER TO CIVIL DWGS)
- STORM SEWER MANHOLE (REFER TO CIVIL DWGS)
- CATCHBASIN SEDIMENT TRAP (REFER TO CIVIL DWGS)
- CATCHBASIN (REFER TO CIVIL DWGS)
- EXISTING STREET LIGHT (REFER TO SURVEY/ELEC)
- EXISTING UTILITY POLE (REFER TO SURVEY/ELEC)
- EXISTING GUY WIRE (REFER TO SURVEY/ELEC)
- AREA DRAIN
- HOSE BIB (REFER TO MECH/CIVIL DWGS)
- SIGNAGE (REFER TO TRAFFIC REPORT)
  BF = BARRIER FREE PARKING
  FWS = FLASHING WARNING SYSTEM
  CM = WALL MOUNTED CONVEX MIRROR

PARKING LEGEND NTS

- DRIVE ISLE - 6M MINIMUM
- PROPOSED HORIZONTAL BICYCLE PARKING (600X1800) - ALSO REFER TO LANDSCAPE DWGS
- PROPOSED MOTORCYCLE PARKING SPACE (1200X3000)
- PROPOSED COMPACT PARKING SPACE (2600X5000)
- PROPOSED PARKING SPACE (2750X6000) - TYPICAL PARKING SPACE
- PROPOSED VISITOR PARKING SPACE (2750X6000) - TYPICAL PARKING SPACE
- PROPOSED BARRIER-FREE PARKING SPACE (3700X6000) PARKING SPACE
- PROPOSED LOADING SPACE (3600X9000)

GENERAL NOTES

1. LOADING SPACE AND STAGING PAD TO BE LEVEL (+ - 2%) AND CONSTRUCTED OF MINIMUM 200mm REINFORCED CONCRETE. MINIMUM 4.1m UNOBSTUMBERED VERTICAL CLEARANCE REQUIRED
2. ACCESS DRIVEWAYS TO BE USED BY COLLECTION VEHICLES TO HAVE A MINIMUM VERTICAL CLEARANCE OF 4.4m THROUGHOUT
3. ANY DRIVEWAY OR COLLECTION AREA REQUIRING A COLLECTION VEHICLE TO DRIVE ONTO OR OVER A SUPPORTED STRUCTURE TO BE RATED TO SAFELY SUPPORT THE REQUIRED LOADS

ANDRÉ BROCHU
DIPL. ARCH., OAA MRAIC DATE

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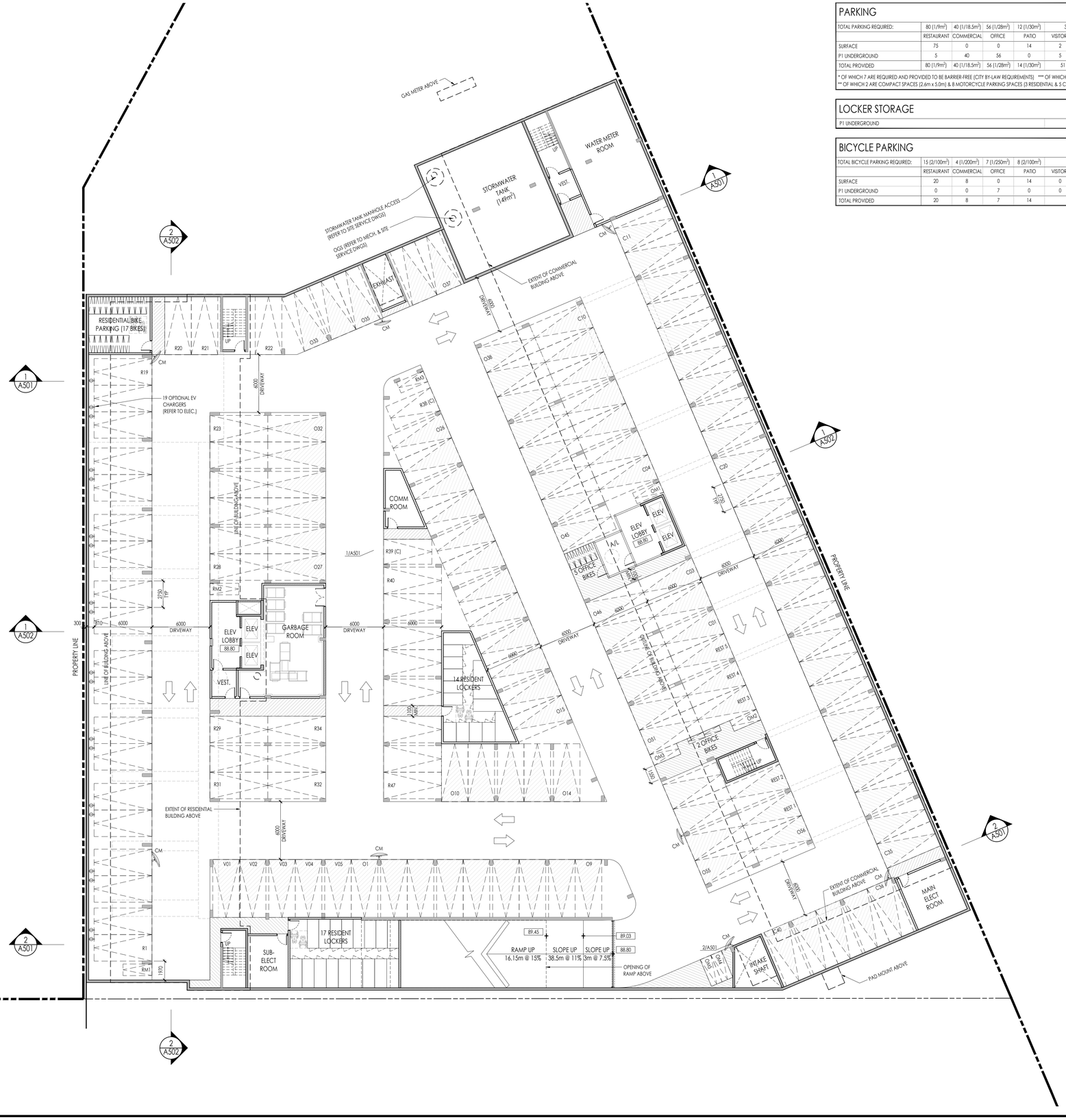
LICENCE 6471

1544 & 1546 FOUR MILE CREEK RD RESIDENTIAL DEVELOPMENT

FOUR MILE CREEK — NIGARA-ON-THE-LAKE, ONTARIO

Drawing title
SITE PLAN

Date	MARCH, 2025	Drawn By	PL/YL
Scale	1:300	Reviewed By	AB
Project No.	23.11	Drawing No.	A102
Plot Date	December 09, 2025		



PARKING

TOTAL PARKING REQUIRED:	80 (1/9m²)	40 (1/18.5m²)	56 (1/28m²)	12 (1/30m²)	31 (1 SP/U)		219 *
	RESTAURANT	COMMERCIAL	OFFICE	PATIO	VISITOR	RESIDENTIAL	TOTAL
SURFACE	75	0	0	14	2	0	91
P1 UNDERGROUND	5	40	56	0	5	**144	150
TOTAL PROVIDED	80 (1/9m²)	40 (1/18.5m²)	56 (1/28m²)	14 (1/30m²)	51 (1.64 SP/U)		*241

* OF WHICH 7 ARE REQUIRED AND PROVIDED TO BE BARRIER-FREE (CITY BY-LAW REQUIREMENTS) *** OF WHICH ARE 19 OPTIONAL EV CHARGERS
** OF WHICH 2 ARE COMPACT SPACES (2.6m x 5.0m) & 8 MOTORCYCLE PARKING SPACES (3 RESIDENTIAL & 5 COMMERCIAL)(1.2m x 3.0m)

LOCKER STORAGE

P1 UNDERGROUND	31 (1 LOCKER/U)

BICYCLE PARKING

TOTAL BICYCLE PARKING REQUIRED:	15 (2/100m²)	4 (1/200m²)	7 (1/250m²)	8 (2/100m²)			33
	RESTAURANT	COMMERCIAL	OFFICE	PATIO	VISITOR	RESIDENTIAL	TOTAL
SURFACE	20	8	0	14	0	0	42
P1 UNDERGROUND	0	0	7	0	0	17	24
TOTAL PROVIDED	20	8	7	14	17		66

SITE PLAN LEGEND NTS

- MAIN ENTRANCE
- EXISTING GRADE DATUM
- FINISH FLOOR ELEVATION
- ESTABLISHED GRADE
- PROPOSED GRADE DATUM
- EXISTING HYDRANT (REFER TO SURVEY)
- SIAMESE CONNECTION (REFER TO MECH/CIVIL DWGS)
- SANITARY MANHOLE (REFER TO CIVIL DWGS)
- STORM SEWER MANHOLE (REFER TO CIVIL DWGS)
- CATCHBASIN SEDIMENT TRAP (REFER TO CIVIL DWGS)
- CATCHBASIN (REFER TO CIVIL DWGS)
- AREA DRAIN
- HOSE BIB (REFER TO MECH/CIVIL DWGS)
- SIGNAGE (REFER TO TRAFFIC REPORT)
  BF = BARRIER FREE PARKING
  FWS = FLASHING WARNING SYSTEM
  CM = WALL MOUNTED CONVEX MIRROR

PARKING LEGEND NTS

- DRIVE ISLE - 6M MINIMUM
- PROPOSED HORIZONTAL BICYCLE PARKING (600X1800) - ALSO REFER TO LANDSCAPE DWGS
- PROPOSED MOTORCYCLE PARKING SPACE (1200X3000)
- PROPOSED COMPACT PARKING SPACE (2600X5000)
- PROPOSED PARKING SPACE (2750X6000) - TYPICAL PARKING SPACE
- PROPOSED VISITOR PARKING SPACE (2750X6000) - TYPICAL PARKING SPACE
- PROPOSED BARRIER-FREE PARKING SPACE (3700X6000) PARKING SPACE
- PROPOSED LOADING SPACE (3600X9000)

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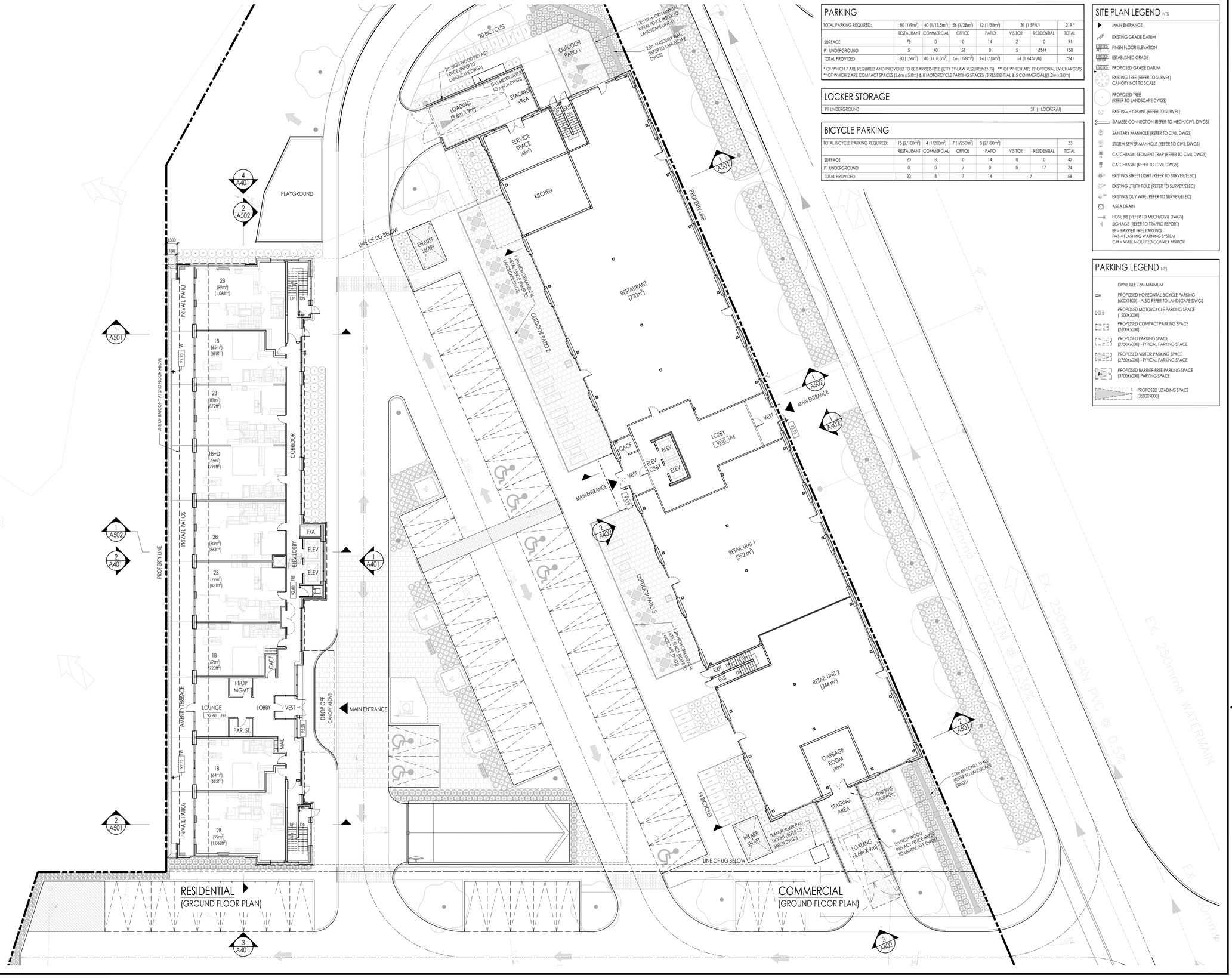
1544 & 1546 FOUR MILE CREEK RD RESIDENTIAL DEVELOPMENT

FOUR MILE CREEK NIAGARA-ON-THE-LAKE, ONTARIO

Drawing title
UNDERGROUND P1 PLAN

Date	MARCH, 2025	Drawn By	PL/YL
Scale	1:200	Reviewed By	AB
Project No.	23.11	Drawing No.	A201
Plot Date	December 09, 2025		



PARKING

TOTAL PARKING REQUIRED:	80 (1/9m²)	40 (1/18.5m²)	56 (1/28m²)	12 (1/30m²)	31 (1 SP/U)		219 *
	RESTAURANT	COMMERCIAL	OFFICE	PATIO	VISITOR	RESIDENTIAL	TOTAL
SURFACE	75	0	0	14	2	0	91
P1 UNDERGROUND	5	40	56	0	5	±144	150
TOTAL PROVIDED	80 (1/9m²)	40 (1/18.5m²)	56 (1/28m²)	14 (1/30m²)	51 (1.64 SP/U)		*241

* OF WHICH 7 ARE REQUIRED AND PROVIDED TO BE BARRIER-FREE (CITY BY-LAW REQUIREMENTS) *** OF WHICH ARE 19 OPTIONAL EV CHARGERS
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LOCKER STORAGE

P1 UNDERGROUND	31 (1 LOCKER/U)

BICYCLE PARKING

TOTAL BICYCLE PARKING REQUIRED:	15 (2/100m²)	4 (1/200m²)	7 (1/250m²)	8 (2/100m²)			33
	RESTAURANT	COMMERCIAL	OFFICE	PATIO	VISITOR	RESIDENTIAL	TOTAL
SURFACE	20	8	0	14	0	0	42
P1 UNDERGROUND	0	0	7	0	0	17	24
TOTAL PROVIDED	20	8	7	14	17		66

SITE PLAN LEGEND NTS

- MAIN ENTRANCE
- EXISTING GRADE DATUM
- FINISH FLOOR ELEVATION
- ESTABLISHED GRADE
- PROPOSED GRADE DATUM
- EXISTING TREE (REFER TO SURVEY) CANOPY NOT TO SCALE
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- HOSE BIB (REFER TO MECH/CIVIL DWGS)
- SIGNAGE (REFER TO TRAFFIC REPORT)
  BF = BARRIER FREE PARKING
  FWS = FLASHING WARNING SYSTEM
  CM = WALL MOUNTED CONVEX MIRROR

PARKING LEGEND NTS

- DRIVE ISLE - 6M MINIMUM
- PROPOSED HORIZONTAL BICYCLE PARKING (600X1800) - ALSO REFER TO LANDSCAPE DWGS
- PROPOSED MOTORCYCLE PARKING SPACE (1200X3000)
- PROPOSED COMPACT PARKING SPACE (2600X5000)
- PROPOSED PARKING SPACE (2750X6000) - TYPICAL PARKING SPACE
- PROPOSED VISITOR PARKING SPACE (2750X6000) - TYPICAL PARKING SPACE
- PROPOSED BARRIER-FREE PARKING SPACE (3700X6000) PARKING SPACE
- PROPOSED LOADING SPACE (3600X9000)

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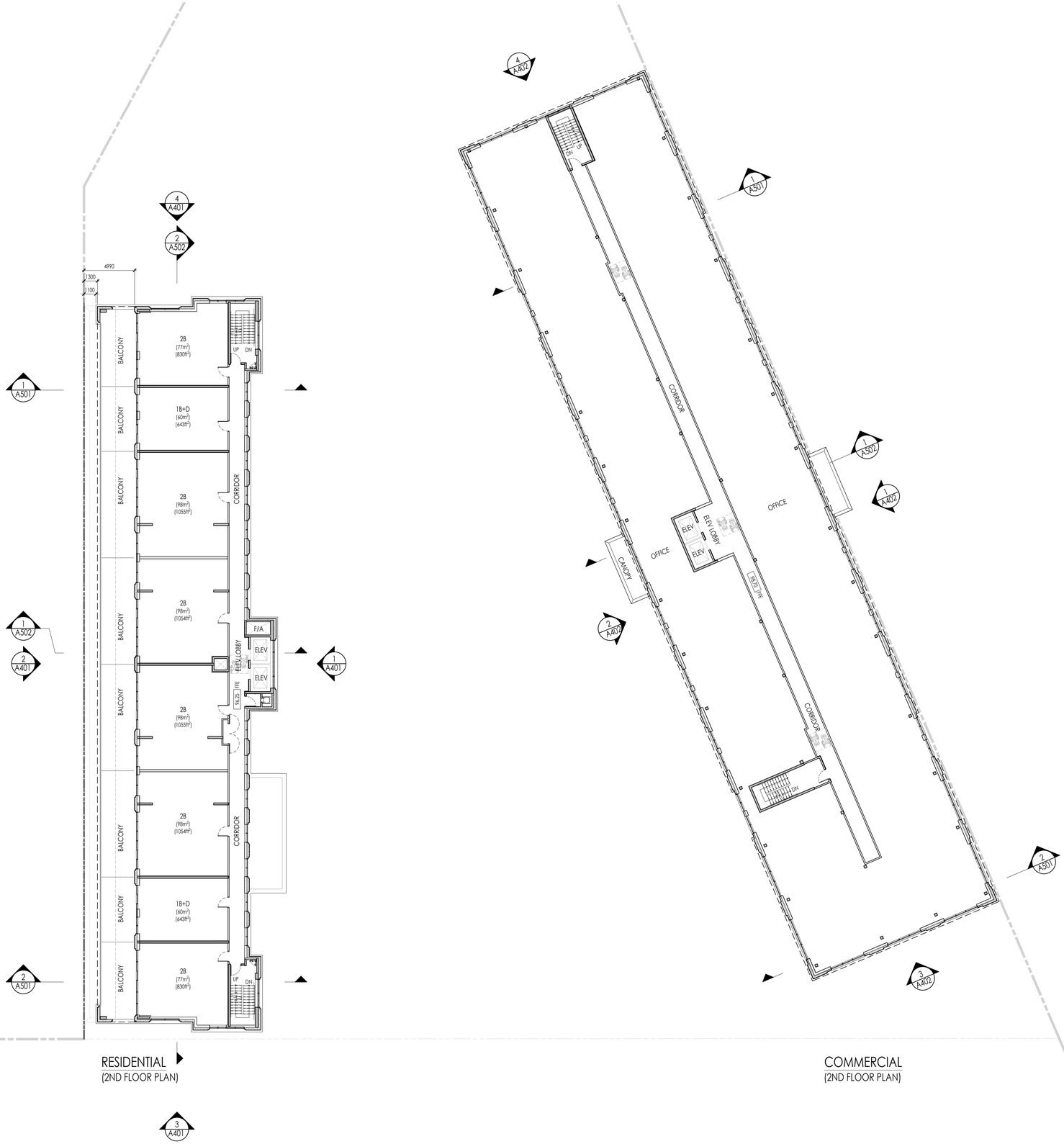
1544 & 1546 FOUR MILE CREEK RD RESIDENTIAL DEVELOPMENT

FOUR MILE CREEK NIAGARA-ON-THE-LAKE, ONTARIO

Drawing title
GROUND FLOOR PLAN

Date	MARCH, 2025	Drawn By	PL/YL
Scale	1:200	Reviewed By	AB
Project No.	23.11	Drawing No.	A301
Plot Date	December 09, 2025		



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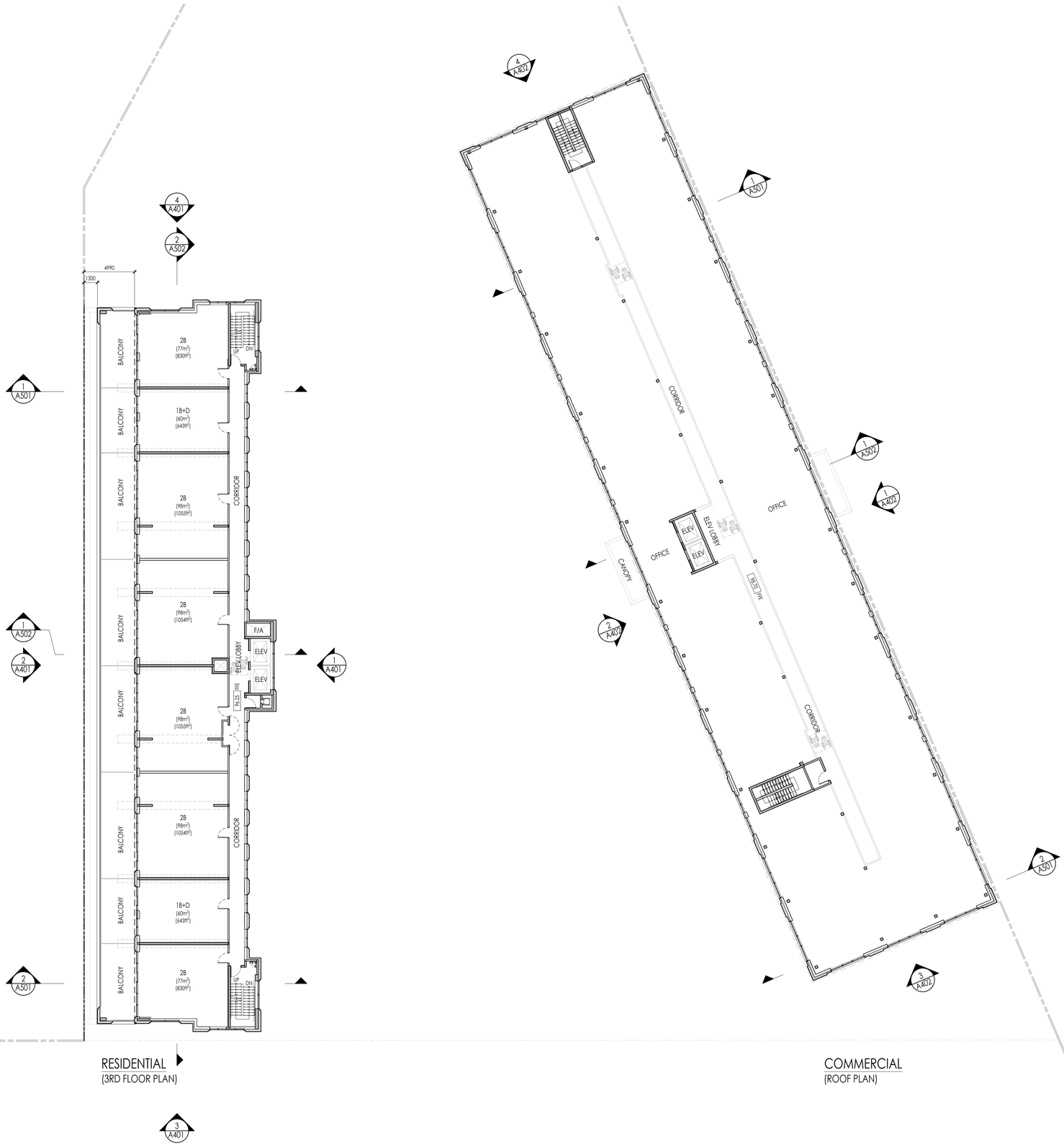
1544 & 1546 FOUR MILE CREEK RD RESIDENTIAL DEVELOPMENT

FOUR MILE CREEK NIAGARA-ON-THE-LAKE, ONTARIO

Drawing title
2ND FLOOR PLAN

Date	MARCH, 2025	Drawn By	PL/YL
Scale	1:200	Reviewed By	AB
Project No.	23.11	Drawing No.	A302
Plot Date	December 09, 2025		



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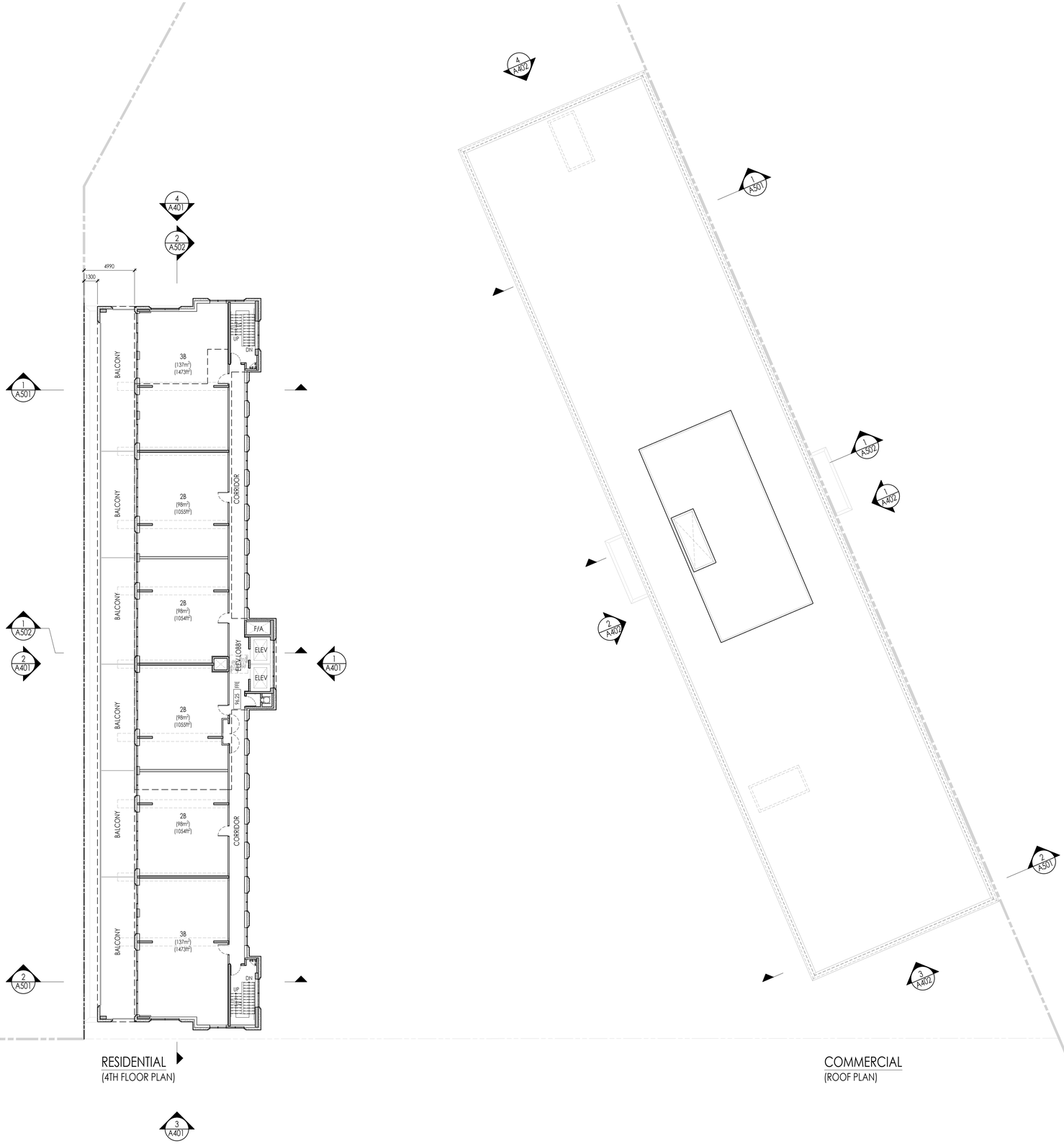
1544 & 1546 FOUR MILE CREEK RD RESIDENTIAL DEVELOPMENT

FOUR MILE CREEK NIAGARA-ON-THE-LAKE, ONTARIO

Drawing title

3RD FLOOR PLAN

Date	MARCH, 2025	Drawn By	PL/YL
Scale	1:200	Reviewed By	AB
Project No.	23.11	Drawing No.	A303
Plot Date	December 09, 2025		



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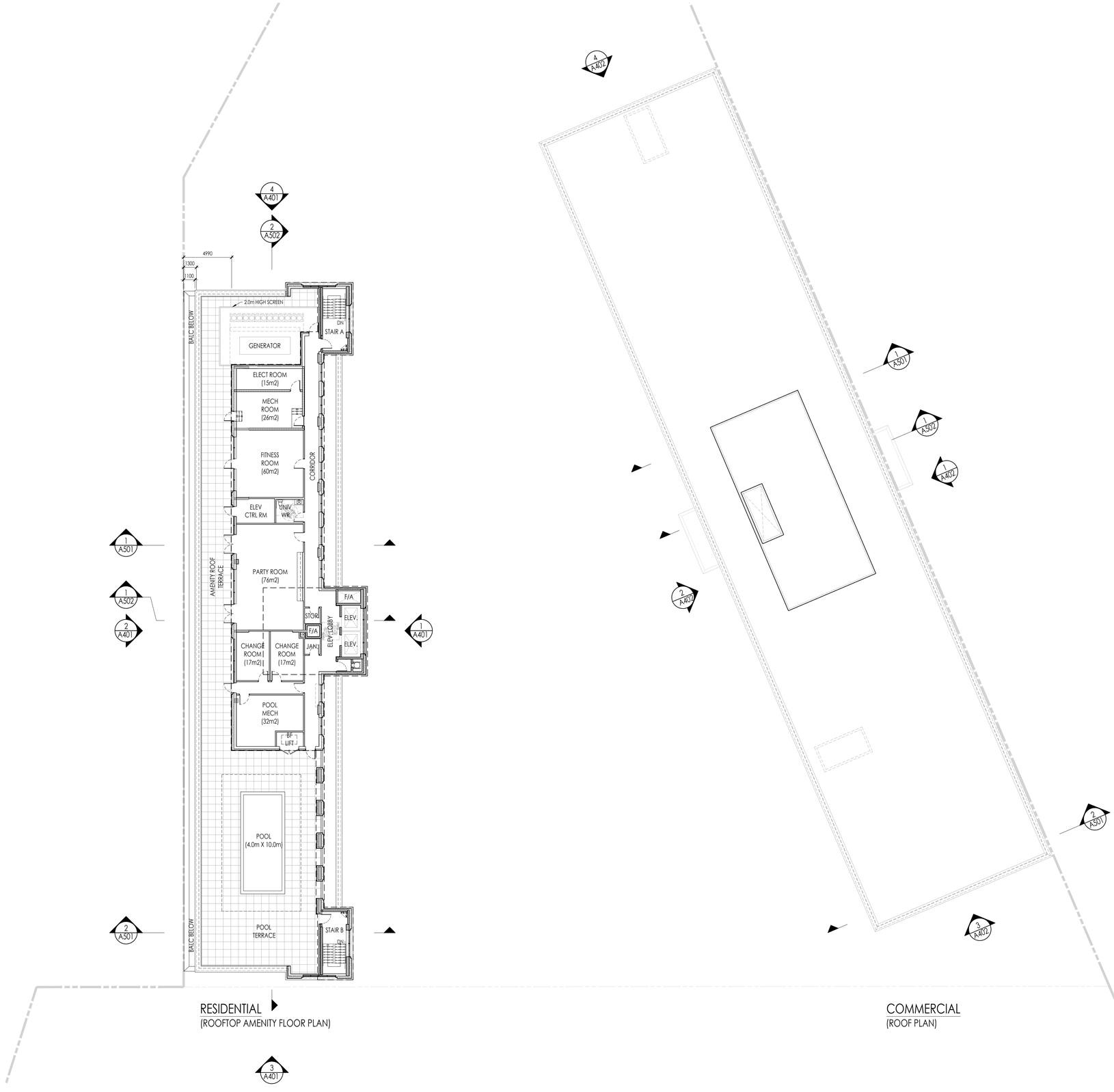
1544 & 1546 FOUR MILE CREEK RD RESIDENTIAL DEVELOPMENT

FOUR MILE CREEK NIGARA-ON-THE-LAKE, ONTARIO

Drawing title

4TH FLOOR PLAN

Date	MARCH, 2025	Drawn By	PL/YL
Scale	1:200	Reviewed By	AB
Project No.	23.11	Drawing No.	A304
Plot Date	December 09, 2025		



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FOUR MILE CREEK NIAGARA-ON-THE-LAKE, ONTARIO

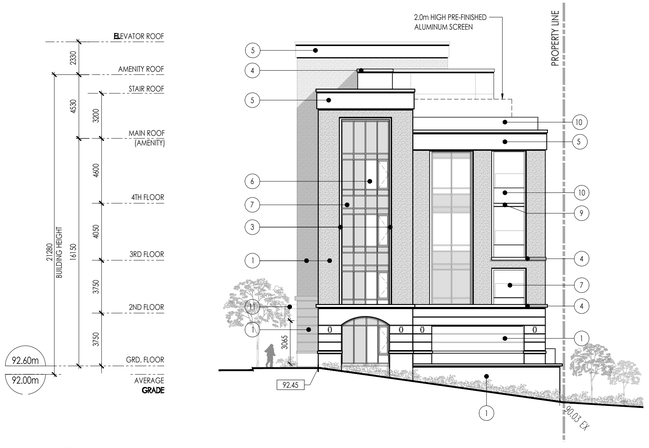
Drawing title

ROOFTOP AMENITY FLOOR PLAN & ROOF PLAN

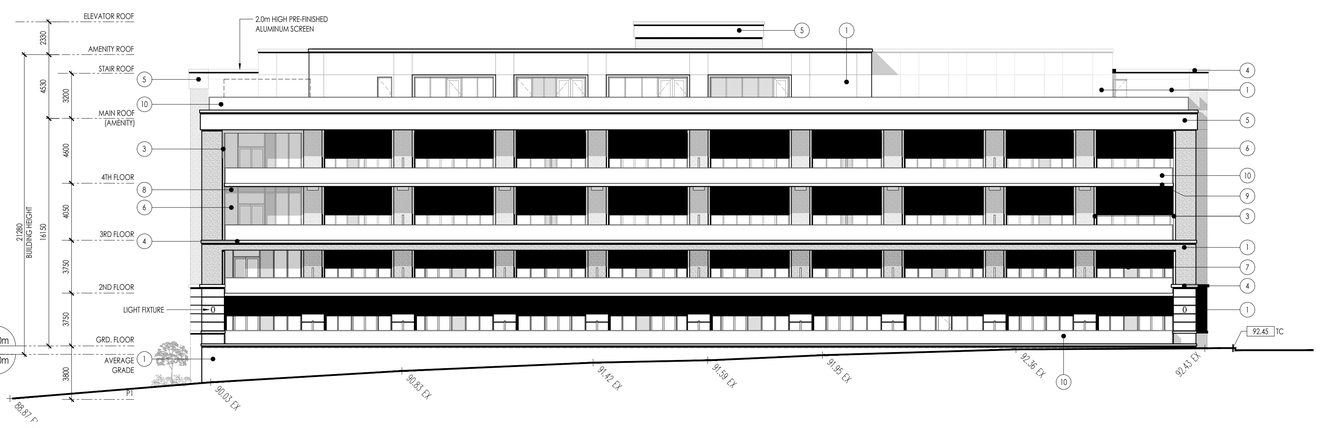
Date	MARCH, 2025	Drawn By	PL/YL
Scale	1:200	Reviewed By	AB
Project No.	23.11	Drawing No.	A305
Plot Date	December 09, 2025		

MATERIAL LIST

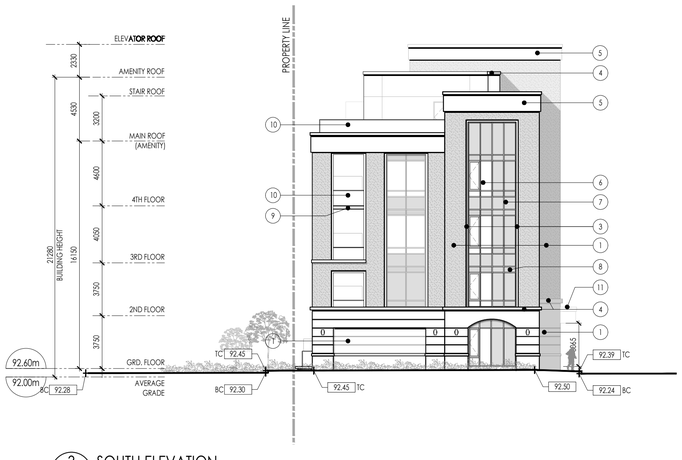
1. - BRICK OR PRECAST PANELS
2. - PRECAST WINDOW SILL
3. - PRECAST SURROUND
4. - PRECAST COPING
5. - ARCHITECTURAL CORNICE
6. - DOUBLE GLAZED VISION GLASS IN PREFINISHED ALUM. FRAMING
7. - BACK-PAINTED SPANDREL GLASS PANEL IN PREFIN. ALUM. FRAMING
8. - PREFINISHED ALUMINUM LOUVRE (TO MATCH WINDOW FRAME)
9. - PREFINISHED ALUMINUM SLAB COVER (TO MATCH WINDOW FRAME)
10. - RAILING: PREFINISHED ALUMINUM FRAMING, WITH CLEAR GLASS BALCONY PANEL
11. - PREFINISHED ALUMINUM CANOPY
12. - CANVAS RETAIL CANOPY



4 A401 NORTH ELEVATION
SCALE: 1:200 REFERENCE DWG.



2 A401 WEST ELEVATION
SCALE: 1:200 REFERENCE DWG.



3 A401 SOUTH ELEVATION
SCALE: 1:200 REFERENCE DWG.

1 A401 EAST ELEVATION
SCALE: 1:200 REFERENCE DWG.

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1544 & 1546 FOUR MILE CREEK RD RESIDENTIAL DEVELOPMENT

FOUR MILE CREEK NIAGARA-ON-THE-LAKE, ONTARIO

Drawing title
BUILDING ELEVATIONS RESIDENTIAL

Date	MARCH, 2025	Drawn By	PL/YL
Scale	1:200	Reviewed By	AB
Project No.	23.11	Drawing No.	A401
Plot Date	December 09, 2025		

MATERIAL LIST

1. - BRICK OR PRECAST PANELS
2. - PRECAST WINDOW SILL
3. - PRECAST SURROUND
4. - PRECAST COPING
5. - ARCHITECTURAL CORNICE
6. - DOUBLE GLAZED VISION GLASS IN PREFINISHED ALUM. FRAMING
7. - BACK-PAINTED SPANDREL GLASS PANEL IN PREFIN. ALUM. FRAMING
8. - PREFINISHED ALUMINUM LOUVRE (TO MATCH WINDOW FRAME)
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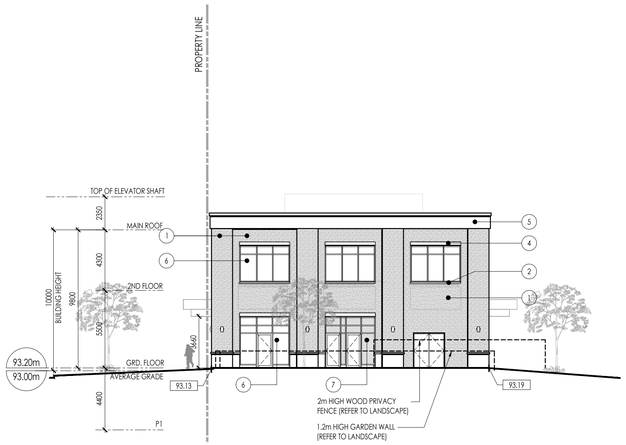
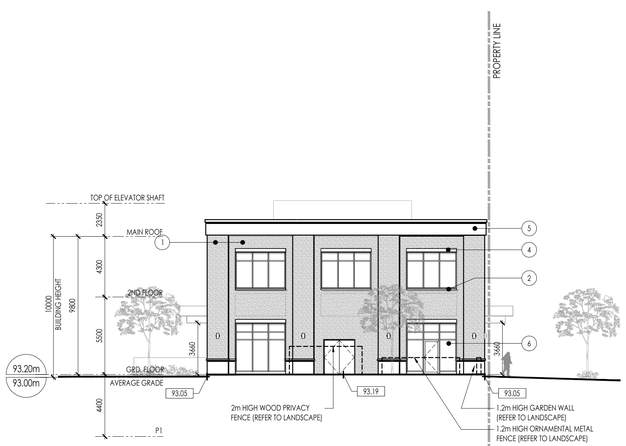
11. - PREFINISHED ALUMINUM CANOPY
12. - CANVAS RETAIL CANOPY



4 A402 NORTH ELEVATION
SCALE: 1:200 REFERENCE DWG.

2 A402 WEST ELEVATION
SCALE: 1:200 REFERENCE DWG.



3 A402 SOUTH ELEVATION
SCALE: 1:200 REFERENCE DWG.

1 A402 EAST ELEVATION
SCALE: 1:200 REFERENCE DWG.

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DIPL. ARCH., OAA MRAIC DATE

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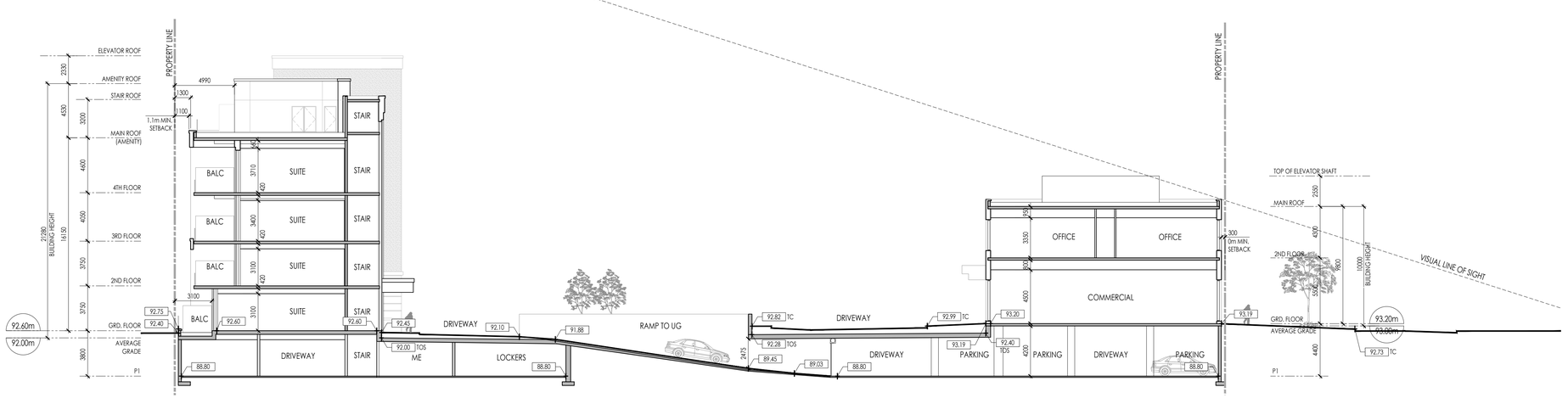
1544 & 1546 FOUR MILE CREEK RD RESIDENTIAL DEVELOPMENT

FOUR MILE CREEK NIAGARA-ON-THE-LAKE, ONTARIO

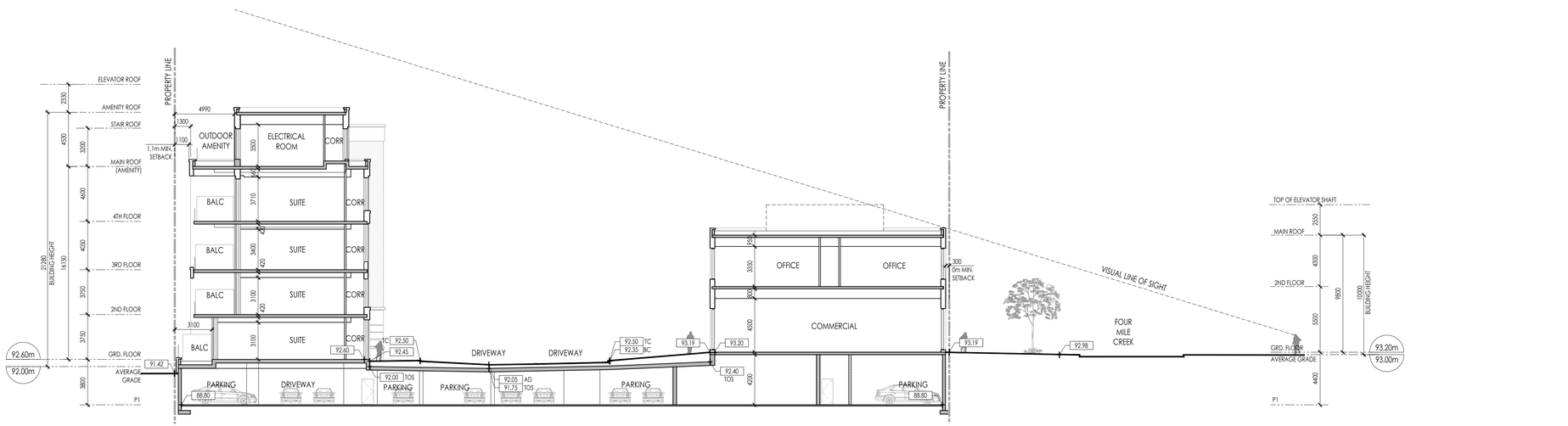
Drawing title

BUILDING ELEVATIONS COMMERCIAL

Date	MARCH, 2025	Drawn By	PL/YL
Scale	1:200	Reviewed By	AB
Project No.	23.11	Drawing No.	A402
Plot Date	December 09, 2025		



2 BUILDING SECTION
A501 SCALE: 1:200 REFERENCE DWG.



1 BUILDING SECTION
A501 SCALE: 1:200 REFERENCE DWG.

ANDRÉ BROCHU

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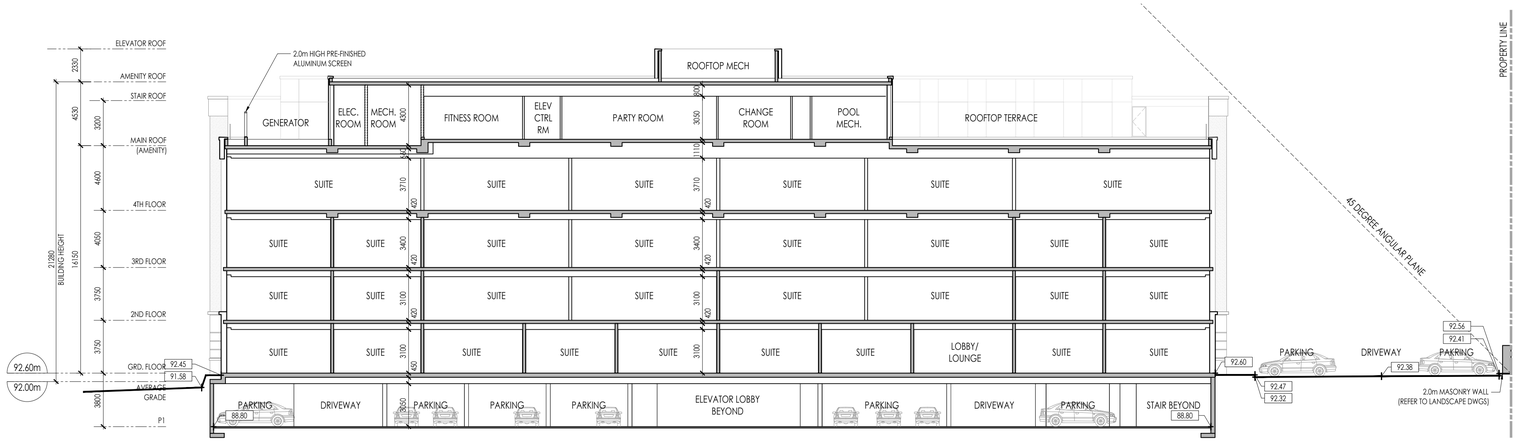
6471

1544 & 1546 FOUR MILE CREEK RD RESIDENTIAL DEVELOPMENT

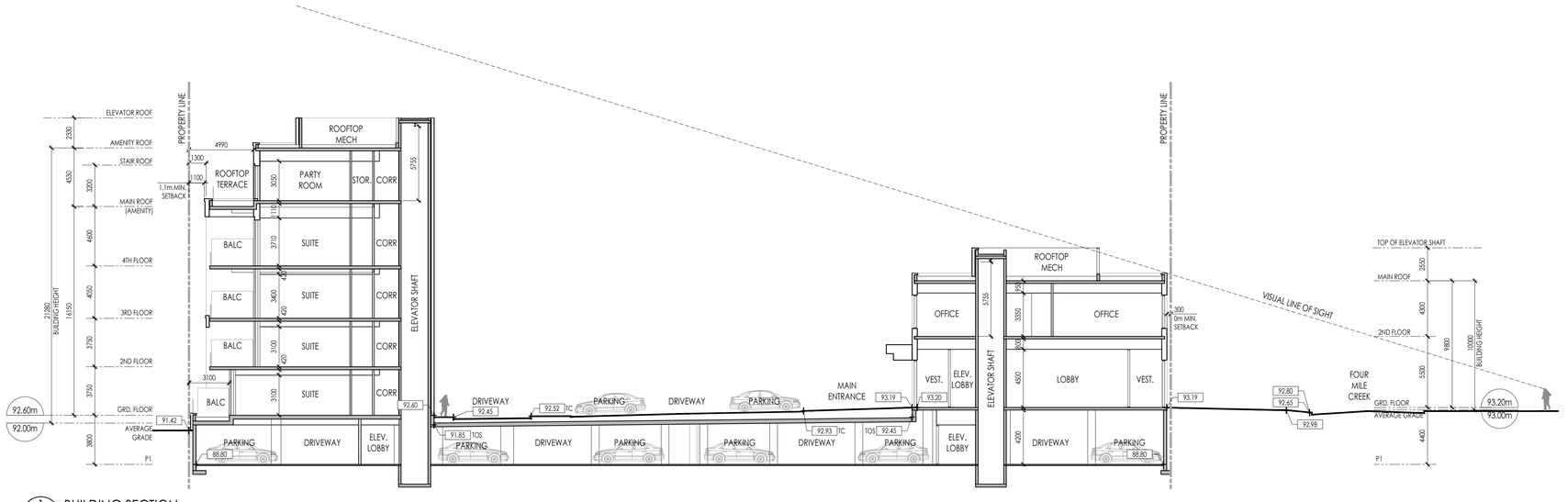
FOUR MILE CREEK NIAGARA-ON-THE-LAKE, ONTARIO

Drawing title
BUILDING SECTIONS

Date	MARCH, 2025	Drawn By	PL/YL
Scale	1:200	Reviewed By	AB
Project No.	23.11	Drawing No.	A501
Plot Date	December 09, 2025		



2 BUILDING SECTION
A502 SCALE: 1:200 REFERENCE DWG.



1 BUILDING SECTION
A502 SCALE: 1:200 REFERENCE DWG.

ANDRÉ BROCHU

DIPL. ARCH., OAA MRAIC DATE

NO.	DATE	ISSUE	BY
2	DEC 12, 2025	RE-ISSUED FOR REZONING AND OPA	AB
1	APRIL 10, 2025	ISSUED FOR REZONING	AB

Issued

ICKE | BROCHU
ARCHITECTS INC
517 Wellington St W., Suite 201, Toronto, Ontario, M5V 1G1
T 647 288 1800 ibarchitects.net

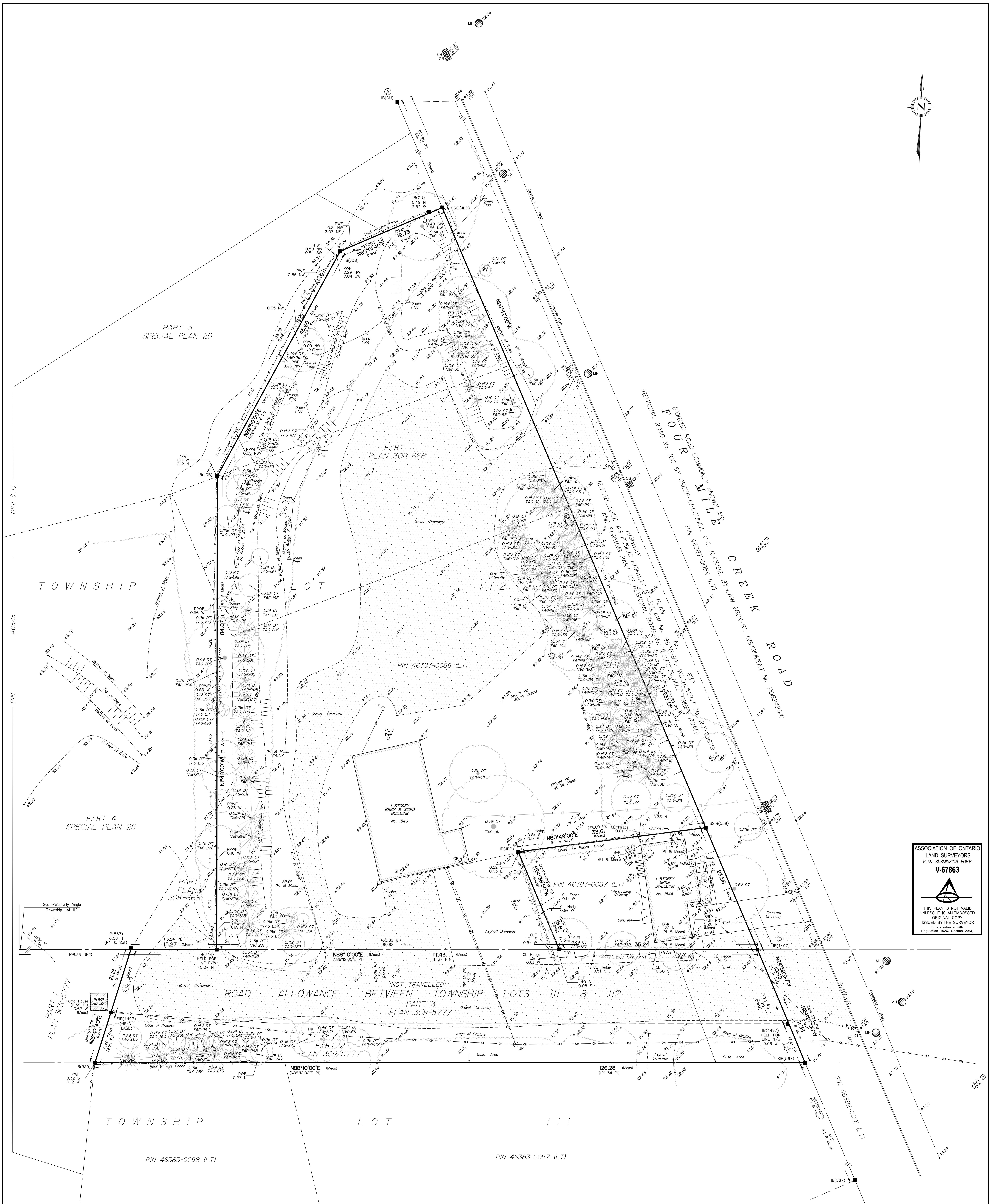
ONTARIO ASSOCIATION OF ARCHITECTS
ANDRE EMILIEN BROCHU
LICENCE 6471

1544 & 1546 FOUR MILE CREEK RD RESIDENTIAL DEVELOPMENT

FOUR MILE CREEK NIAGARA-ON-THE-LAKE, ONTARIO

Drawing title
BUILDING SECTIONS

Date	MARCH, 2025	Drawn By	PL/YL
Scale	1:200	Reviewed By	AB
Project No.	23.11	Drawing No.	A502
Plot Date	December 09, 2025		



PLAN OF SURVEY
(WITH TOPOGRAPHIC DETAIL) OF

PART OF TOWNSHIP LOT 112 & PART OF ROAD ALLOWANCE BETWEEN TOWNSHIP LOTS 111 & 112

(GEOGRAPHIC TOWNSHIP OF NIAGARA)
IN THE

TOWN OF NIAGARA–ON–THE–LAKE

REGIONAL MUNICIPALITY OF NIAGARA

SCALE & NOTES
Scale 1:300
5 0 5 10 15 20 METRES

BARICH GRENKIE SURVEYING LTD.
A DIVISION OF GEOMAPLE

METRIC
DISTANCES, ELEVATIONS AND CO–ORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

ELEVATION NOTE
ELEVATIONS ARE GEODETIC ORIGIN (CGVD–1928:78), AND ARE DERIVED FROM REAL TIME NETWORK (RTN) OBSERVATIONS AND NATURAL RESOURCES CANADA'S GEOID MODEL HT2.0

BEARING NOTE
BEARINGS ARE UTM GRID, DERIVED FROM GPS OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17 (81° 00' WEST LONGITUDE) NAD83 (CSRS) (2010.0).

HORIZONTAL DATUM NOTE
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR (UTM, ZONE 17, CM 81°00'W)

DATUM: NAD83 (CSRS)(2010.0)

GRID SCALE CONVERSION
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999872.

OBSERVED REFERENCE POINTS (ORPs) DERIVED FROM GPS OBSERVATIONS USING REAL TIME NETWORK (RTN) OBSERVATIONS UTM ZONE 17, NAD83 (CSRS)(2010.0).
COORDINATES TO URBAN ACCURACY PER SEC 14(2) OF O.REG. 216/10

OBSERVED REFERENCE POINTS		
MONUMENT ID	NORTHING	EASTING
Ⓐ IB	4786944.166	652494.398
Ⓑ IB	4786733.649	652592.005

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE–ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

THIS PLAN WAS PREPARED FOR REZEN HOLDING CORPORATION AND THE UNDERSIGNED ASSUMES NO RESPONSIBILITY FOR USE BY OTHER PARTIES.

LEGEND

■	DENOTES	SURVEY MONUMENT FOUND
□	DENOTES	SURVEY MONUMENT PLANTED
IB	DENOTES	IRON BAR
SIB	DENOTES	STANDARD IRON BAR
SSIB	DENOTES	SHORT STANDARD IRON BAR
OU	DENOTES	ORIGIN UNKNOWN
539	DENOTES	D. G. URE, O.L.S.
567	DENOTES	R. B. ERWIN, O.L.S.
744	DENOTES	R. J. MATTHEWS, O.L.S.
1497	DENOTES	J. P. NOUWENS, O.L.S.
JDB	DENOTES	J. D. BARNES, O.L.S.
P1	DENOTES	PLAN BY J. D. BARNES LTD. DATED JULY 19, 2022
P2	DENOTES	SPECIAL PLAN 85
MH	DENOTES	MANHOLE
CB	DENOTES	CATCHBASIN
LS	DENOTES	LIGHT STANDARD
TC	DENOTES	TOP OF CURB ELEVATION
GUT	DENOTES	GUTTER ELEVATION
OH	DENOTES	OVERHEAD UTILITY CABLES
DT	DENOTES	DECIDUOUS TREE
CT	DENOTES	CONIFEROUS TREE
UP	DENOTES	UTILITY POLE
FF	DENOTES	FINISHED FLOOR ELEVATION
GF	DENOTES	GARAGE FLOOR ELEVATION
CLF	DENOTES	CHAIN LINK FENCE
PWF	DENOTES	POST & WIRE FENCE
RPWF	DENOTES	REMAINS OF POST & WIRE FENCE
GL	DENOTES	GASLINE
BRK	DENOTES	BRICK
TNFH	DENOTES	TOP NUT OF FIRE HYDRANT
CRW	DENOTES	CONCRETE RETAINING WALL

REVISED NOTE
CONNECT FLAGS

AUGUST 22, 2024 — ERIC G. SALZER, O.L.S., O.L.I.P

REVISED NOTE
REVISED TO REVISE ELEVATIONS OF ORANGE FLAGS

AUGUST 20, 2024 — ERIC G. SALZER, O.L.S., O.L.I.P

REVISED NOTE
REVISED TO SHOW ELEVATIONS OF ORANGE FLAGS

AUGUST 16, 2024 — ERIC G. SALZER, O.L.S., O.L.I.P

REVISED NOTE
REVISED TO SHOW TREES WITH TAGS & FLAGS

AUGUST 14, 2024 — ERIC G. SALZER, O.L.S., O.L.I.P

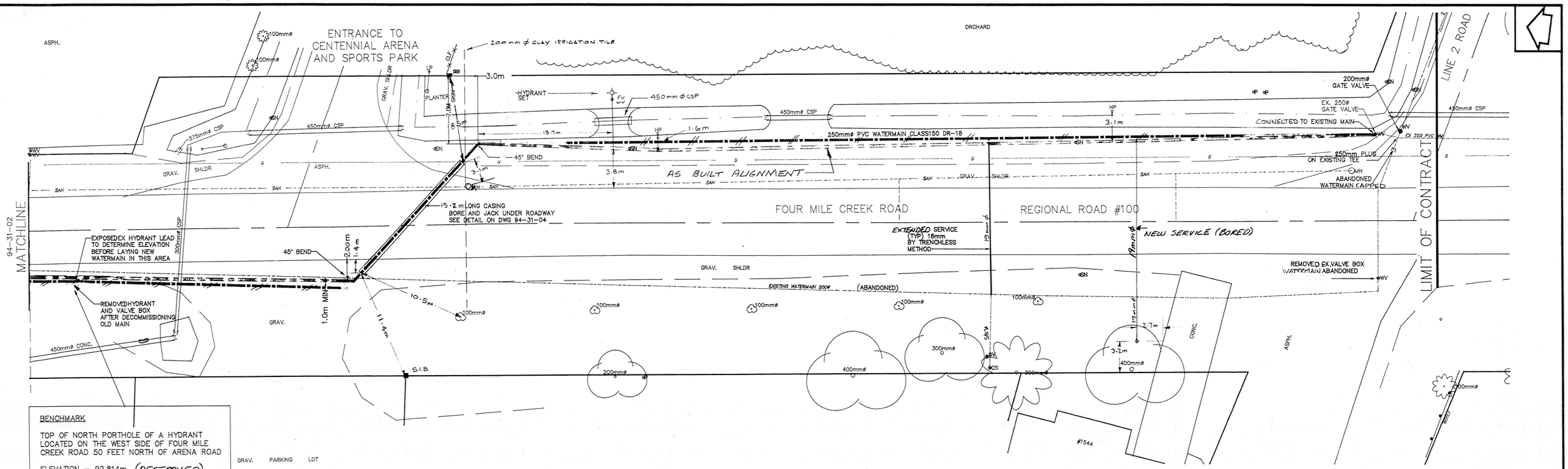
SURVEYOR'S CERTIFICATE
I CERTIFY THAT
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON JANUARY 25, 2024

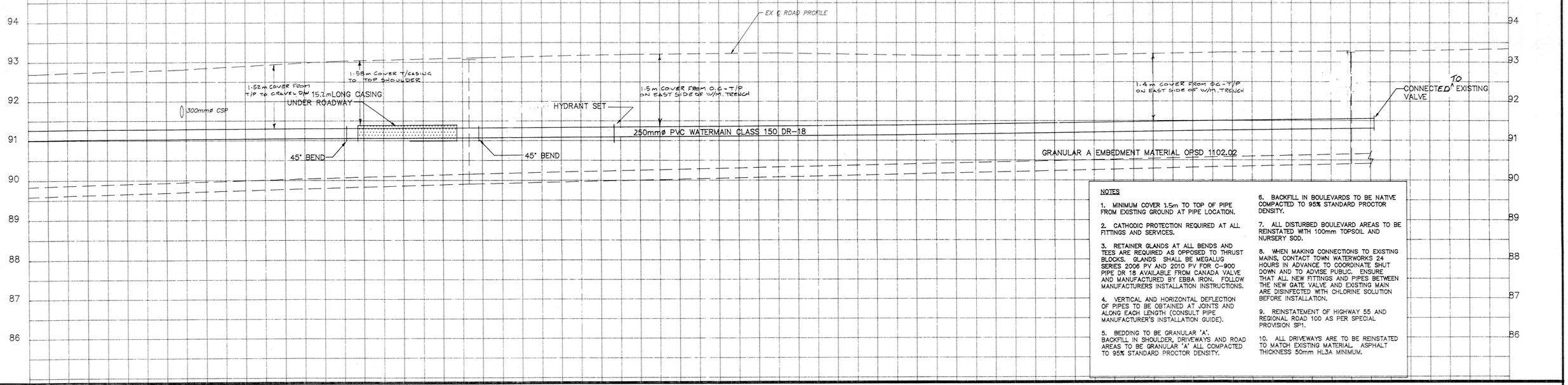
JANUARY 26, 2024 — ERIC G. SALZER, O.L.S., O.L.I.P

Barich Grenkie Surveying Ltd.
301 HWY No. 8 (2ND FLOOR) - STONEY CREEK, ON
L8G 1E5 (905) 662-6767
A DIVISION OF GEOMAPLE

DWN BY: EGS
CHK BY: EWA
JOB No. 23–3200

Z:\PROJECTS\Jobs 2023\23-3200 - 1544 & 1546 Four Mile Creek Rd, Virgil\Surveying\23-3200 TOPO_CURRENT_REVISEDFORTREES.dwg





NOTES

1. MINIMUM COVER 1.5m TO TOP OF PIPE FROM EXISTING GROUND AT PIPE LOCATION.
2. CATHODIC PROTECTION REQUIRED AT ALL FITTINGS AND SERVICES.
3. RETAINER GLANDS AT ALL BENDS AND TEES ARE REQUIRED AS OPPOSED TO THRUST BLOCKS. GLANDS SHALL BE MEGALUG SERIES 2006 PV AND 2010 PV FOR C-900 PIPE DR 18 AVAILABLE FROM CANADA VALVE AND MANUFACTURED BY EBBA IRON. FOLLOW MANUFACTURERS INSTALLATION INSTRUCTIONS.
4. VERTICAL AND HORIZONTAL DEFLECTION OF PIPES TO BE OBTAINED AT JOINTS AND ALONG EACH LENGTH (CONSULT PIPE MANUFACTURER'S INSTALLATION GUIDE).
5. BEDDING TO BE GRANULAR 'A'. BACKFILL IN SHOULDER, DRIVEWAYS AND ROAD AREAS TO BE GRANULAR 'A' ALL COMPACTED TO 95% STANDARD PROCTOR DENSITY.
6. BACKFILL IN BOULEVARDS TO BE NATIVE COMPACTED TO 95% STANDARD PROCTOR DENSITY.
7. ALL DISTURBED BOULEVARD AREAS TO BE REINSTATED WITH 100mm TOPSOIL AND NURSERY SOD.
8. WHEN MAKING CONNECTIONS TO EXISTING MAINS, CONTACT TOWN WATERWORKS 24 HOURS IN ADVANCE TO COORDINATE SHUT DOWN AND TO ADVISE PUBLIC. ENSURE THAT ALL NEW FITTINGS AND PIPES BETWEEN THE NEW GATE VALVE AND EXISTING MAIN ARE DISINFECTED WITH CHLORINE SOLUTION BEFORE INSTALLATION.
9. REINSTATEMENT OF HIGHWAY 55 AND REGIONAL ROAD 100 AS PER SPECIAL PROVISION SP1.
10. ALL DRIVEWAYS ARE TO BE REINSTATED TO MATCH EXISTING MATERIAL. ASPHALT THICKNESS 50mm HL3A MINIMUM.

No.	REVISION	DATE	INIT.
1	CONSTRUCTION RECORD	JAN 11/96	G.R.

GENERAL NOTES:

1) THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND ABOVE-GROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME LIABILITY FOR DAMAGE TO THEM.
2) CHECK ALL DIMENSIONS AND REPORT ANY INCONSISTENCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK – DO NOT SCALE DRAWINGS.
3) THIS DRAWING IS AN INSTRUMENT OF PROFESSIONAL SERVICE AND IS INTENDED FOR USE ONLY IN CONNECTION WITH THE PROJECT COVERED BY THE ENGINEERING AGREEMENT.
4) ROBERT M. MARTIN ENGINEERING & PROJECT MANAGEMENT INC. DOES NOT ASSUME ANY RESPONSIBILITY FOR LOSSES, DAMAGES AND COSTS ARISING FROM USE OR REUSE OF THIS DRAWING BY PERSONS, FIRMS OR CORPORATIONS WITHOUT PRIOR WRITTEN CONSENT OF ROBERT M. MARTIN ENGINEERING INC.
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6) BOREHOLE DATA SHOWN ON THE DRAWINGS IS TAKEN FROM THE GEOTECHNICAL REPORT PREPARED BY THE GEOTECHNICAL ENGINEERING CONSULTANTS. ROBERT M. MARTIN ENGINEERING INC. ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.

DRAFTING AK
DESIGN TW
CHECKED BY TW

LICENSED PROFESSIONAL ENGINEER J. T. WINSTONE PROVINCE OF ONTARIO

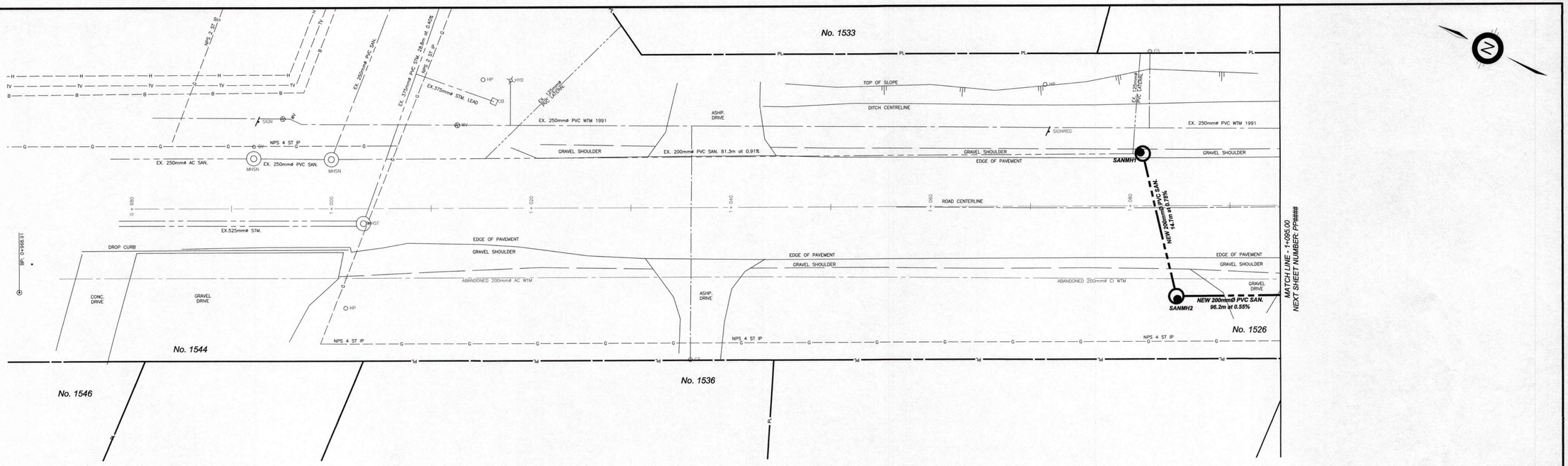
Robert M. Martin Engineering & Project Management Inc.
8 Centre Street, St. Catharines
Ontario. L2R 3A7
Phone (905) 687-4020
Fax (905) 687-4164

TOWN OF NIAGARA ON THE LAKE

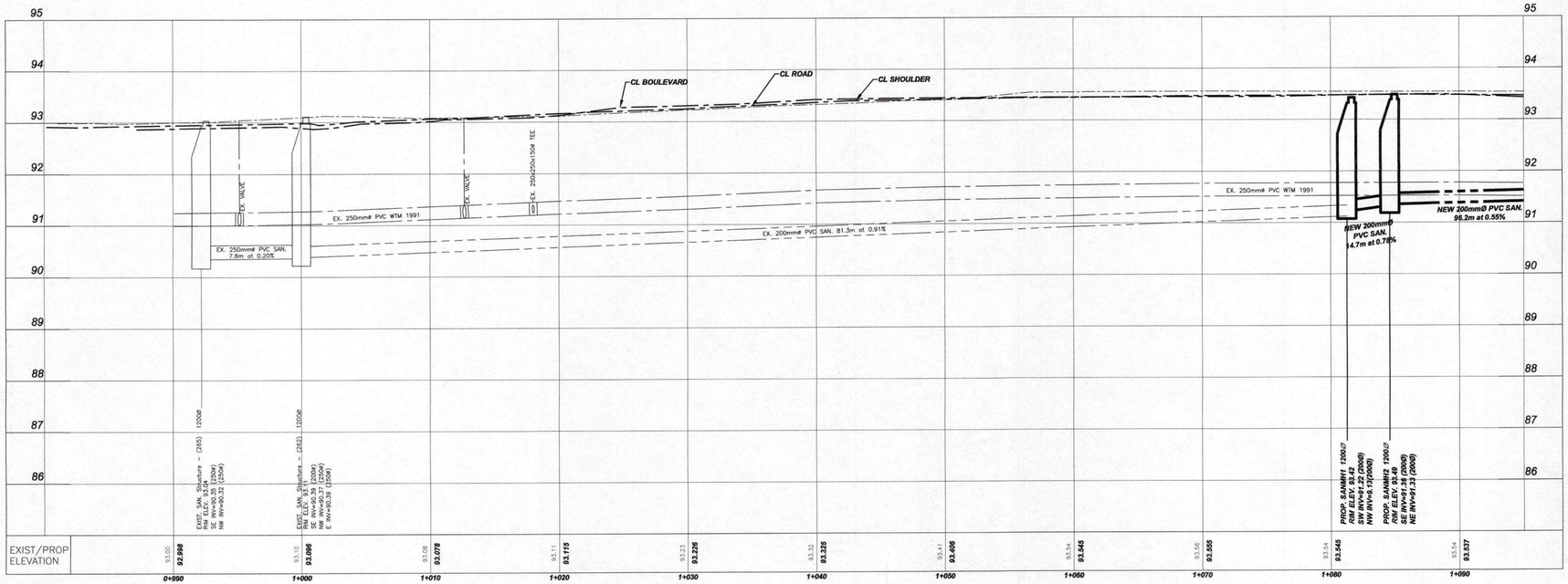
FOUR MILE CREEK ROAD WATERMAIN REPLACEMENT

VIRGIL

FILENAME	94-31\NOTL-3
DATE	JUNE 1995
SCALE	1:200 1:50
DWG. No.	94-31-03
MUN. REF. No.	
REV.	1



FOUR MILE CREEK ROAD (RR NO. 100)



NO.	REVISION	DATE	INIT.
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6	RECORD OF CONSTRUCTION	JULY/15	LB
5	ISSUED FOR TENDER	APR/15	LB
4	REISSUED FOR MOE	MAR/15	JH
3	REISSUED FOR MOE	MAR/15	LB
2	ISSUED FOR MOE	JAN/15	LB
1	ISSUED FOR REVIEW	NOV/14	LB

NOTES/LEGEND

1 THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWER AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

2 PROPERTY LINES WERE PLOTTED USING REGISTERED PLANS AND BARS LOCATED IN THE FIELD. TO VERIFY THE ACCURACY OF THESE PROPERTY LINES, A LEGAL SURVEY SHOULD BE PERFORMED PRIOR TO CONSTRUCTION.

BENCHMARK

VERTICAL MONUMENT: ----- ELEV. -----
DATUM: ---- ELEV. ----
GEOGRAPHIC PROJECTION: U.T.M. NAD 83 ZONE 17

DRAFTING	LB/JH
DESIGN	KH
CHECKED BY	SK
APPROVED BY	KH

LICENSED PROFESSIONAL ENGINEER
K. T. S. HOWE
100139209
PROVINCE OF ONTARIO

KERRY T. HOWE ENGINEERING LTD.
CONSULTING ENGINEERS
88 Church Street St.
Catharines, Ontario
(905) 688-5550

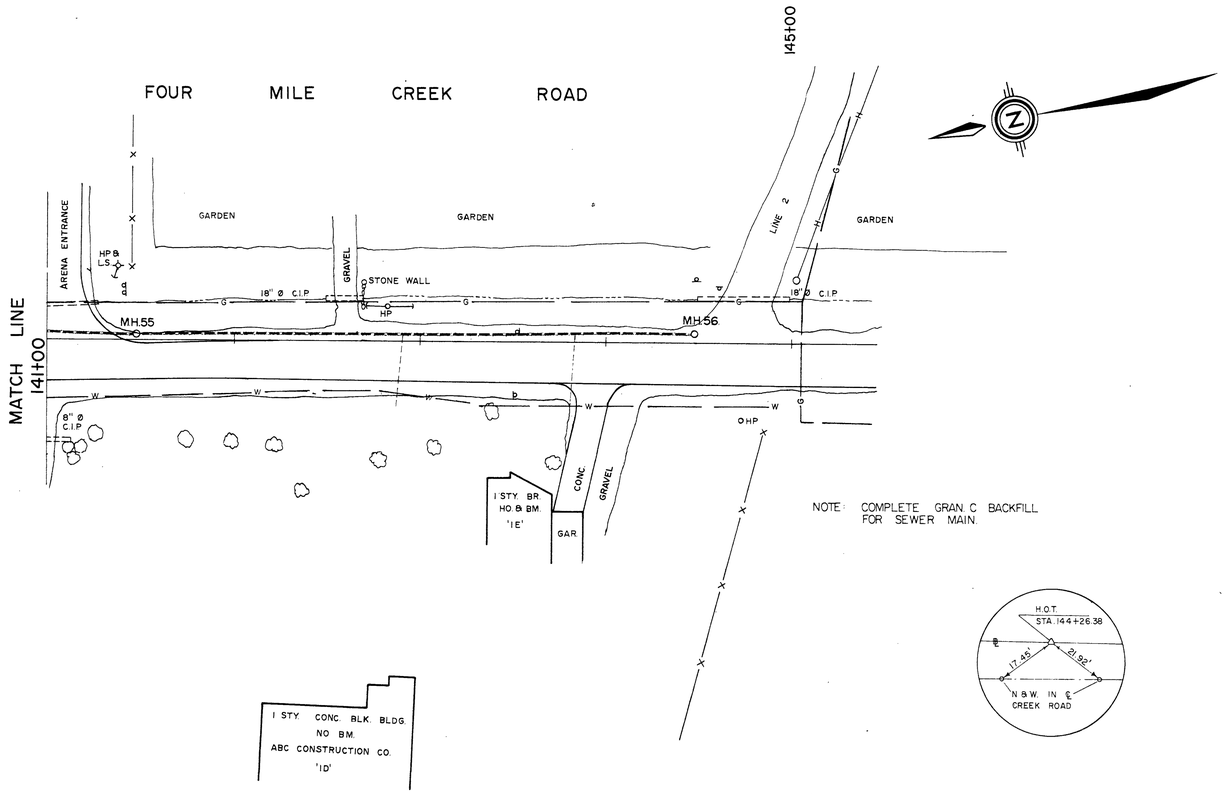
NIAGARA-ON-THE-LAKE

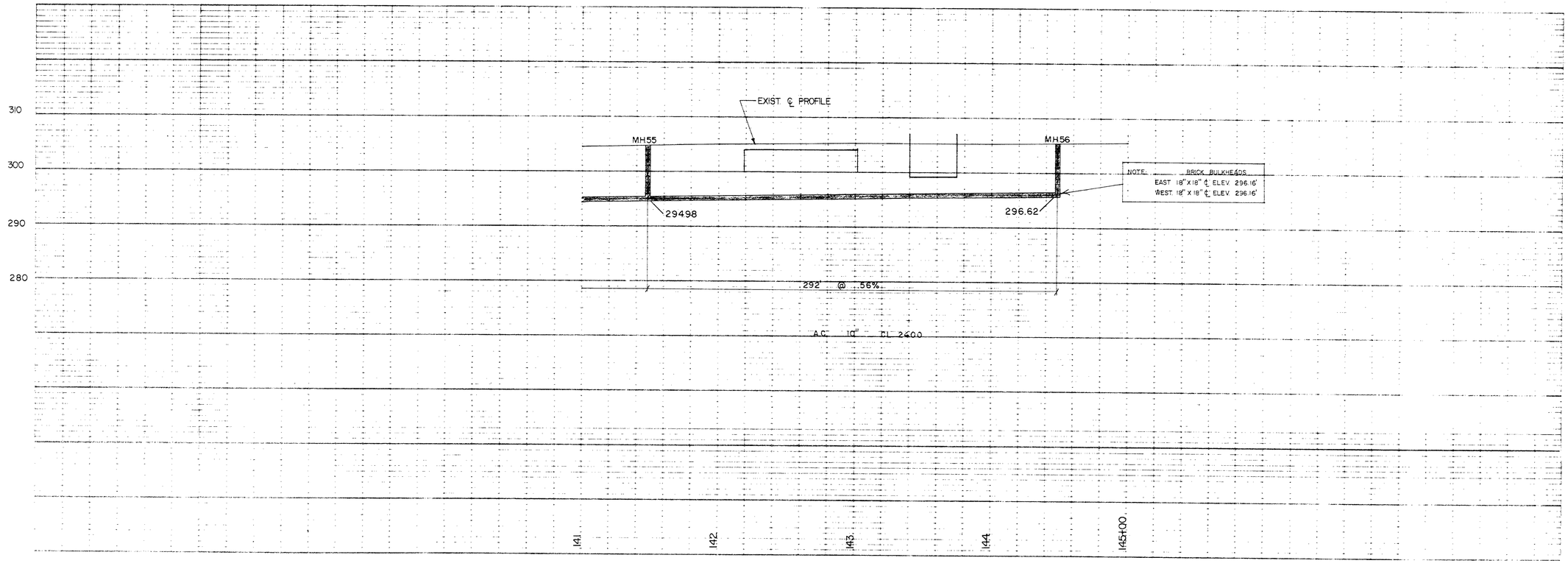
FOUR MILE CREEK ROAD (RR NO. 100)

SANITARY SEWER EXTENSION
TOWN OF NIAGARA-ON-THE-LAKE
PLAN AND PROFILE

CONSULTANT FILE No.	14-030
DATE	JULY 24, 2015
SCALE	HOR 1:200 VER: 1:50
REF. No.	---
DWG No.	14-030-PP1
REV.	6

DRAWING FILE: W:\2014\14-030 1512 Four mile Creek Rd\dwg\...Record of Construction\1512 – ROC.dwg PLOTTED: Jul 24, 2015 – 11:51am PLOTTED BY: lbeaudoin





M.H.№	BASELINE CHAINAGE	OFFSET
55	141+51	3'S
56	144+47	5'S

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1	AS CONSTRUCTED	D.H.	AUG., 1978	
	APPROVED FOR CONSTRUCTION		Dec. 8, 1978 W.J.F.	

CLIENT
MINISTRY OF THE ENVIRONMENT

MUNICIPALITY
NIAGARA-ON-THE-LAKE

PROJECT
PROVINCIAL SEWAGE WORKS PROGRAMME

SHEET TITLE
FOUR MILE CREEK ROAD
STA. 141+00 — STA. 145+00

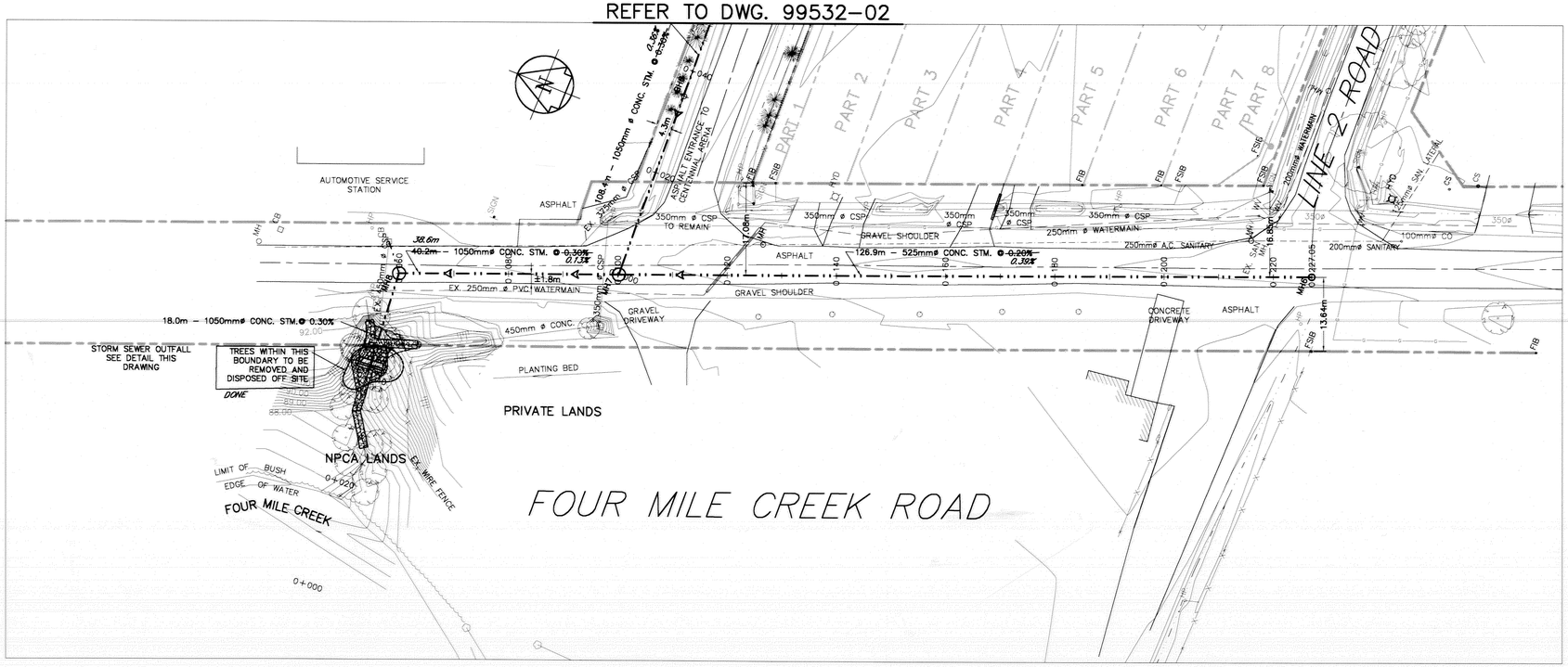
WILLIAM L. SEARS
AND ASSOCIATES LIMITED
CONSULTING PROFESSIONAL ENGINEERS
STONEY CREEK ONT.

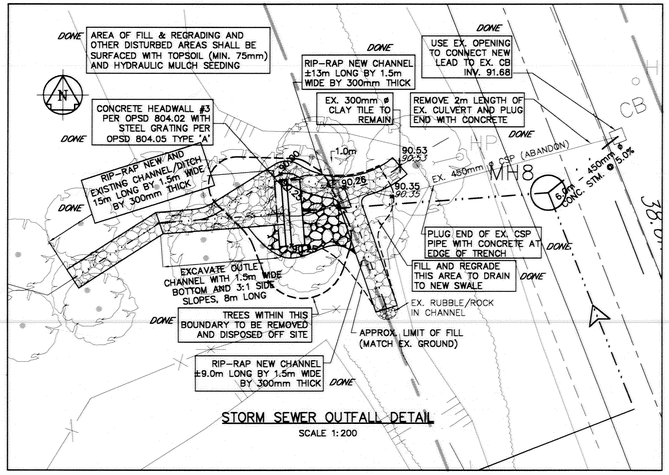
DESIGNED BY	DRAWN BY	CHECKED BY
W.J.F.		DAY

SCALE	DATE	SHEET
HOR. 1"=40' VER. 1"=10'	NOV. 1974	

PROJECT No.	JOB No.	SHEET
1-0265/71	7411	7

REFER TO DWG. 99532-02





STORM SEWER OUTFALL DETAIL

SCALE 1:200

LEGEND

- PROJECT BASELINE
- PROPERTY LINE
- PROPOSED STORM SEWER
- PROPOSED GRANULAR BACKFILL
- PROPOSED RIP-RAP
- EXISTING ROAD CENTRELINE
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING DITCH/SWALE
- EXISTING STORM SEWER
- EXISTING CULVERT
- EXISTING U/G BELL LINE
- EXISTING U/G HYDRO LINE
- EXISTING U/G CABLE TV
- EXISTING U/G GAS
- EXISTING FENCE
- EXISTING GAS VALVE
- EXISTING HYDRO POLE
- EXISTING LIGHT POLE
- EXISTING CURB STOP
- EXISTING HYDRANT
- EXISTING WATER VALVE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- EXISTING STORM MANHOLE
- EXISTING CATCHBASIN
- PROPOSED STORM MANHOLE
- PROPOSED DITCH INLET CATCHBASIN
- EX. STREET SIGN
- EX. BELL PEDESTAL
- EX. BELL MANHOLE
- EX. DECIDUOUS TREE
- EX. BUSH/HEDGE
- FOUND IRON BAR
- FOUND STANDARD IRON BAR
- FOUND CONCRETE MONUMENT
- HORIZONTAL CONTROL POINT
- BENCHMARK
- BOREHOLE
- PROPOSED ELEVATION
- EXISTING ELEVATION

GENERAL NOTES:

1) THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN AND WHERE SHOWN, THE ACCURACY OF THE LOCATION SHOWN OF SUCH UTILITIES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL CONTACT ALL SUCH UTILITIES INVOLVED AND INFORM HIMSELF AS TO THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME LIABILITY FOR DAMAGE TO THEM.

2) ALL MEASUREMENTS ARE IN METRES UNLESS OTHERWISE NOTED.

3) ALL WORK SHALL BE IN ACCORDANCE WITH THE RELEVANT SECTIONS OF THE ONTARIO PROVINCIAL STANDARD SPECIFICATIONS AND DRAWINGS AND THE NIAGARA PENINSULA STANDARD CONTRACT DOCUMENT UNLESS OTHERWISE NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS.

4) COMPUTER DRAWING FILE CO-ORDINATES FOR THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION LAYOUT.

5) ALL GRANULAR MATERIAL SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY (SPD) AND ALL NATIVE BACKFILL SHALL BE COMPACTED TO 95% SPD UNLESS OTHERWISE NOTED.

6) ALL CONSTRUCTION SHALL BE CARRIED OUT IN SUCH A WAY THAT SILTATION OR OTHER DAMAGE TO WATERCOURSES DOES NOT OCCUR. THE REQUIREMENTS, REGULATIONS AND GUIDELINES OF THE MINISTRY OF NATURAL RESOURCES ARE TO BE ADHERED TO IN THIS RESPECT.

7) CONTRACTOR SHALL EXPOSE EXISTING WATERMAIN AND SANITARY SEWER IN VICINITY OF PROPOSED STORM SEWER CROSSING AND VERIFY EXACT LOCATION AND ELEVATION PRIOR TO CONSTRUCTION.

8) ALL TRENCHES, EXCEPT IN DRIVEWAYS, ROADWAYS OR PARKING AREAS, SHALL BE BACKFILLED WITH SELECT NATIVE MATERIAL UNLESS OTHERWISE NOTED. ALL TRENCHES IN DRIVEWAYS, ROADWAYS AND PARKING AREAS SHALL BE BACKFILLED WITH GRANULAR 'A'.

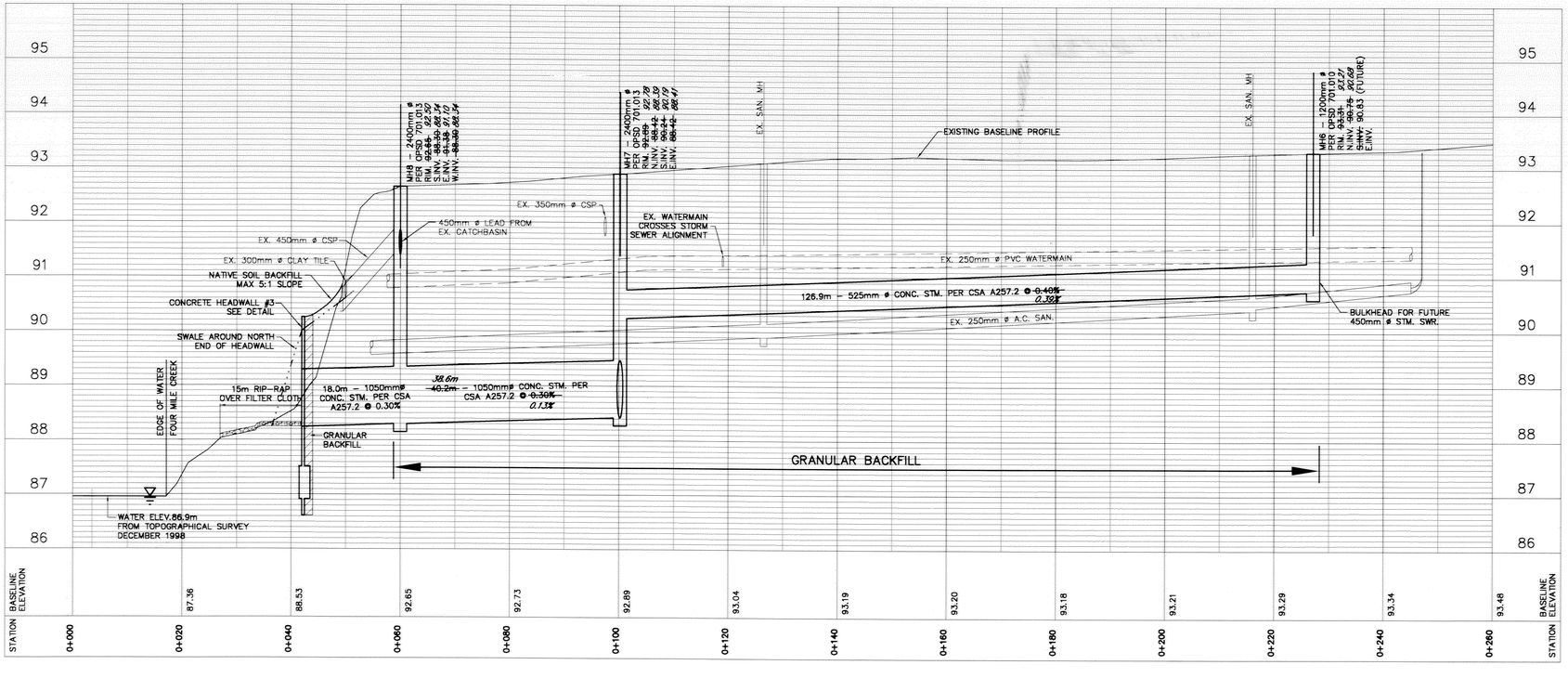
9) A MINIMUM CLEAR VERTICAL SEPARATION OF 0.5m SHALL BE MAINTAINED AT CROSSINGS OF THE STORM SEWER OVER WATERMAINS

10) REMOVE AND REINSTATE STREET FURNITURE, SIGNS, MAIL BOXES, GUIDE RAILS, CULVERTS, HEADWALLS ETC. AS NECESSARY. REINSTATEMENT TO BE TO EXISTING CONDITION OR BETTER, AND TO THE SATISFACTION OF THE ENGINEER AND THE PROPERTY OWNER.

11) PIPE BEDDING FOR ALL CONCRETE PIPE SHALL BE GRANULAR 'A', CLASS 'B' PER OPSD 802.030. PIPE BEDDING AND COVER FOR ALL PVC PIPE SHALL BE GRANULAR 'A' PER OPSD 802.010.

12) ALL MAINTENANCE HOLES SHALL BE BENCHED PER OPSD 701.021 UNLESS OTHERWISE NOTED. CATCHBASIN MAINTENANCE HOLE #4 SHALL HAVE 300mm DEEP SUMP PER OPSD 701.01.

13) ALL MAINTENANCE HOLES SHALL HAVE FRAME & COVER PER OPSD-401.01 TYPE 'A' UNLESS OTHERWISE NOTED.



NO.	REVISION	DATE	INIT.
1	ISSUED FOR CONSTRUCTION RECORD	14 MAR 01	APM
0	ISSUED FOR CONSTRUCTION	07 MAR 00	SEN
C	ISSUED FOR TENDER	27 JAN 00	HEK
B	ISSUED FOR APPROVAL	14 JAN 00	SEN
A	ISSUED FOR TOWN REVIEW	10 JAN 00	SEN

cad file: 99532-AB

plot scale: 1:0.001

NOTE:
FOR STORMWATER MANAGEMENT POND DETAILS REFER TO DWG. 99532-01.

FOR PARK/POND/PRIVATE LAND STORM SEWER ALIGNMENT INFORMATION REFER TO DRAWING 99532-02

drawn by: S.E.N.
design by: S.E.N./D.K.P.
approved by: D.K.P.
date: 10 JAN 00

MPS REINDERS
MPS Reinders Niagara Inc.
Engineers, Architect, & Planners
phone: (905) 984-8676
fax: (905) 682-5896

drawing title: OUTLET STORM SEWER FOUR MILE CREEK ROAD STA 0+000 TO STA 0+240

project title: LINE 2 / CONCESSION 4 DEVELOPMENT AREA STORMWATER MANAGEMENT

VIRGIL, ONTARIO

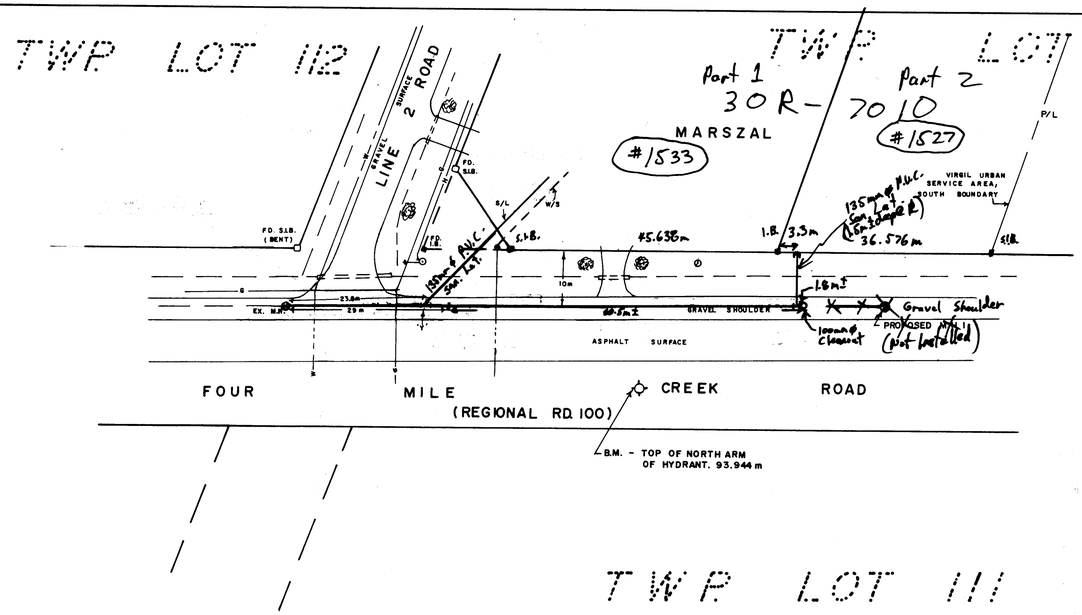
scale: 1:500 1:50

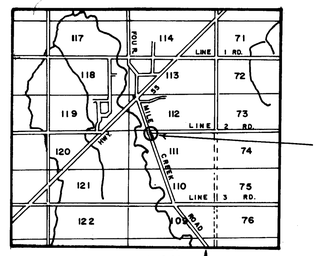
job #: 99532

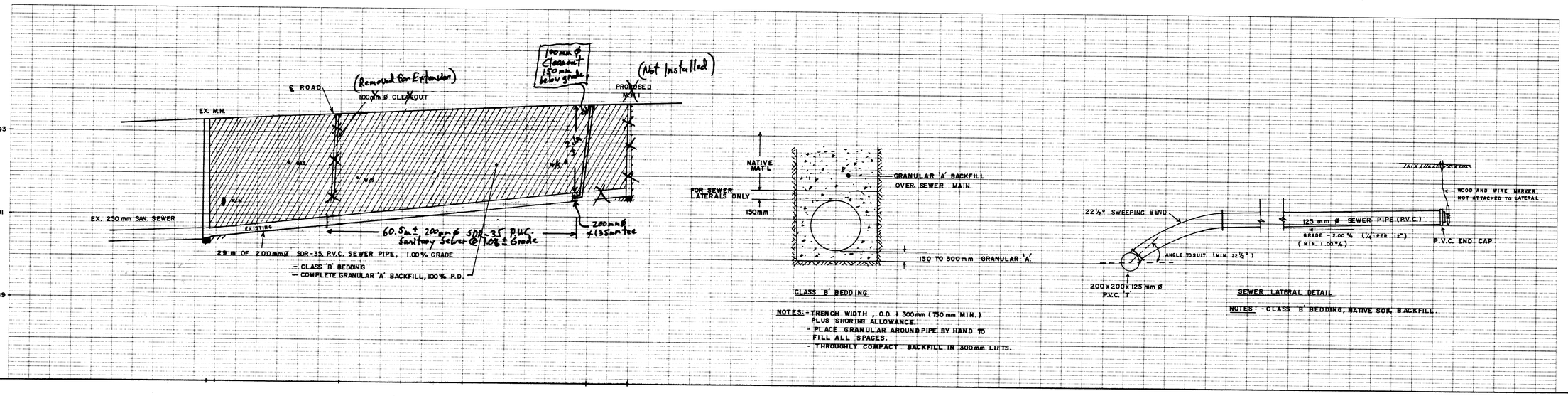
revision #: 1

drawing number: 99532-01

7a. 7b.







SANITARY INVERT	S. 90.39 N. 90.42	90.76	91.06	91.36	91.46
℄ ROAD	93.32		93.56		
STATION	0+040	0+060	0+080	0+100	0+120

NO.	REVISION	DATE	INIT.
2	As constructed, 60.5m Ext. + Cleanout (7b.)	1992 06 22	L.H.
1	AS CONSTRUCTED, 29m EXT. & CLEANOUT (7a.)	1983 10 21	R.B.

NOTES

DRAFTING R.B.
DESIGN R. B.
CHECKED BY N.A.

REGISTERED PROFESSIONAL ENGINEER D. L. PATAKY PROVINCE OF ONTARIO
PROCTOR & REDFERN LTD.

TOWN OF NIAGARA-ON-THE-LAKE
ENGINEERING DEPARTMENT

SANITARY SEWER EXTENSION
FOUR MILE CREEK RD. AT LINE 2 RD.

IN THE REGIONAL MUNICIPALITY OF NIAGARA

FIELD NOTES	R.B.
DATE	1983 08 04
SCALE	HOR. 1 = 500 VER. 1 = 50
DWG. No.	1 OF 1
MUN. REF. No.	L – 2 – 67
REV.	0

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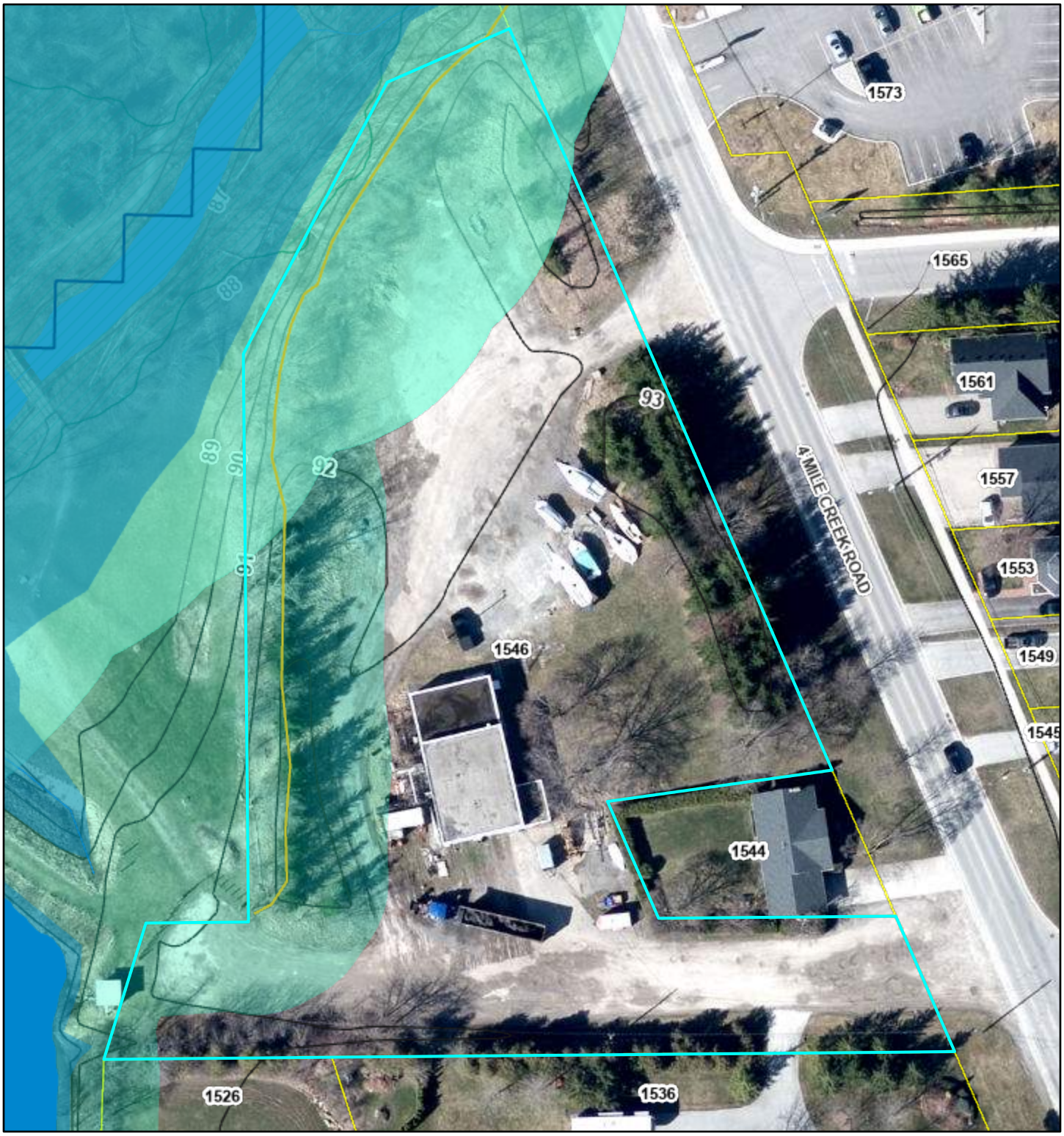

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PL

NP

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:HE $SS%XLOGHU IRU $U

&LW\ RI :HOODQG 1LDJDUD 5HJLRQ 5HJLRQDO 0XQLFLSDOLW\ RI 1LDJDUD 3URYLQFH RI 2QWDULR 2QWDULR 015 (VUL &DQD

From: Nicholas Bradley <nbradley@npca.ca>
Sent: Thursday, October 17, 2024 12:04 PM
To: Roshawn Nunes
Subject: 1544 & 1546 Four Mile Creek Road
Attachments: 1544 & 1546 Four Mile Creek Road - Regulated Features Map.pdf

Good afternoon,

Thank you for reaching out. The mapping of the two subject properties has been attached to this email. Please note that 1544 Four Mile Creek Road is not impacted by any NPCA regulated features. The information provided below only pertains to 1546 Four Mile Creek Road.

With reference to the attached mapping, part of 1546 Four Mile Creek Road is impacted by a Non-Provincially Significant Wetland Complex known as the Virgil Conservation Area Wetland Complex (seen in light green in the attached map). As such, new development and/or site alterations on 1546 Four Mile Creek Road would be subject to the policies under **Ontario Regulation 41/24**. Wetlands provide for natural flood attenuation during storm events and, as such, it is important to maintain the hydrologic function of wetlands to assist in minimizing flooding impacts downstream. In accordance with NPCA policies and regulations, no new development or site alterations are permitted within a wetland. Also, the NPCA uses a 30-meter buffer in which new development and site alterations may be permitted in accordance with NPCA Policies on development within the wetland buffer.

Additionally, given the topography of 1546 Four Mile Creek Road, the west side of the property would be subject to the NPCA's Valleyland Policies. The NPCA regulates all development and site alterations within 15 meters of a steep riverine valley for slope stability purposes. In accordance with current NPCA policies, new buildings and structures, accessory buildings and additions to existing buildings and structures shall provide an appropriate setback from the stable top of slope to ensure the long-term stability of the valley slope and safety of buildings or structures. This setback shall be based on a geotechnical study, approved by the NPCA. In no case shall any portion of a building or structure extend beyond the physical or stable top of slope (whichever is more restrictive).

Further, the Four Mile Creek flows adjacent to 1546 Four Mile Creek Road. This creek has an associated 1-in-100-year floodplain (seen in blue in the attached map). Current NPCA policies prohibit the placement of new structural development or fill within riverine floodplain areas. The regulatory floodplain elevation for this section of the creek is 88.78m CGVD28:78 on the north side of the property and 90.22m CGVD28:78 on the south side of the subject property. All new structures and site alterations must take place above these respective elevations to be located outside of the riverine flood hazard.

Finally, any work that encroaches on the areas of the properties that have regulated features, would fall within the jurisdiction of the NPCA and be subject to the policies under O. Reg. 41/24. Following the permitting process, applicable policies and fees would apply. Please note that depending on the scope, nature, and location of any proposed works, further supporting studies and/or plans may be required.

Thank you,
Nick

Nicholas Bradley
Planning Technician
Niagara Peninsula Conservation Authority (NPCA)
3350 Merrittville Highway, Unit 9, Thorold, Ontario L2V 4Y6

905.788.3135 ext. 279
www.npca.ca
nbradley@npca.ca

Appendix B – Water Servicing Information

Domestic Water Demand Calculations

PROJECT: **1544 & 1546 Four mile Creek Road**
PROJECT No: **ALL-24011473-A0**
CREATED BY: **R.N**
CHECKED BY **S.P**
Date: **23-Dec-25**

Residential Building

Average Day & Max Day Flow

Niagara Region 2021 Master Servicing Plan Update Volume 3 Pg.15
Residential Average Day Demand 198 L/cap/day 0.00229 L/cap/s

Niagara Region 2021 Master Servicing Plan Update Volume 3 Table 3.4

Max Day Peaking Factor 1.6

Development Charges Backgroud Study Regional Municipality of Niagara (2022)
Equivalent population for 1 Bedroom or less 1.214 persons per unit
Equivalent population for 2 Bedroom or more 1.991 persons per unit

Type of Development	No. of Units	Population per unit	Population	Avg Flow (L/s)	Max. Day Flow (L/s)
1 Bedroom or less	8	1.214	10	0.02	0.04
2 Bedroom or more	23	1.991	46	0.10	0.17
TOTAL	**31**	**-**	**56**	**0.13**	**0.20**

Domestic Water Demand Calculations

PROJECT: **1544 & 1546 Four mile Creek Road**
PROJECT No: **ALL-24011473-A0**
CREATED BY: **R.N**
CHECKED BY **S.P**
Date: **23-Dec-25**

Commercial Building

Average Day & Max Day Flow

Niagara Region 2021 Master Servicing Plan Update Volume 3 Pg.15
Employment Average Day Demand 266 L/emp/day 0.00308 L/emp/s

Niagara Region 2021 Master Servicing Plan Update Volume 3 Table 3.4
Max Day Peaking Factor 1.6

Development Charges Backgroud Study Regional Municipality of Niagara (2022)
Equivalent population project for commercial 500 Sqft per person

Type of Development	GFA Sqft	Sqft per person	Population	Avg Flow (L/s)	Max. Day Flow (L/s)
Commercial Building	40,020	500	80	0.2	0.4
TOTAL	**40020**	**-**	**80**	**0.2**	**0.4**

Fire Flow Calculation
Residential Building

PROJECT: **1544 & 1546 Four mile Creek Road**
PROJECT No: **ALL-24011473-A0**
CREATED BY: **R.N**
CHECKED BY **S.P**
DATE: **23-Dec-25**

Fire Underwriters Survey 2020 Water Supply for Public Fire Protection - Page 23

1 **Estimate of the required fire flow for a given area can be determined by the formula:**

$$F = 220C\sqrt{A}$$

Where F = required fire flow in litres/minute
C = coefficient related to the type of construction
A = total floor area in square meters

Type of Construction & Coefficient: C = 0.8 Non-Combustible

Considcered Openings protected
Single Largest Floor Area plus 25% of each adjoinging floor

Area = *1412 m²* 974m2+(25%*974)+(25%*778)

Therefore F = 220 x **0.8** x (A)½ =	***6,613***	***L/m***

Fire Underwriters Survey 2020 Water Supply for Public Fire Protection - Page 25

2 **Occupancy and Contents Adjustment Factor**

Free Burning Contents	15%	
(1) *15% =	**992**	**L/m**

3 **Automated Sprinkler Protection Adjustment Factor**

Automatic Sprinkler Protection	-30%	
Standard Water Supply	-10%	
Fully Supervised	-10%	
	(496)	**L/m**

4 **Exposure Adjustment Charge**

East: 20.1 to 30m	10%	
West:	0%	
North:	0%	
South:	0%	
	99	**L/m**

5 **Total Estimated Fire flow** **7,209** **L/m**
(1)+(2)+(3)+(4)

Total Flow Required	**7,000**	**L/m**
	117	**L/s**

Fire Flow Calculation
Commercial Building

PROJECT: **1544 & 1546 Four mile Creek Road**
PROJECT No: **ALL-24011473-A0**
CREATED BY: **R.N**
CHECKED BY **S.P**
DATE: **23-Dec-25**

Fire Underwriters Survey 2020 Water Supply for Public Fire Protection - Page 23

1 **Estimate of the required fire flow for a given area can be determined by the formula:**

$$F = 220C\sqrt{A}$$

Where F = required fire flow in litres/minute
C = coefficient related to the type of construction
A = total floor area in square meters

Type of Construction & Coefficient: C =	1	Ordinary Construction
Area =	*3699*	*m²*
Therefore F = 220 x **1** x (A)½ =	***13,380***	***L/m***

Fire Underwriters Survey 2020 Water Supply for Public Fire Protection - Page 25

2	**Occupancy and Contents Adjustment Factor**		
	Free Burning Contents	15%	
	(1) *15% =	**2,007**	**L/m**
3	**Automated Sprinkler Protection Adjustment Factor**		
	Automatic Sprinkler Protection	-30%	
	Standard Water Supply	-10%	
	Fully Supervised	0%	
		(803)	**L/m**
4	**Exposure Adjustment Charge**		
	West: 20.1 to 30m	10%	
	East:	0%	
	North:	0%	
	South:	0%	
		201	**L/m**
5	**Total Estimated Fire flow**	**14,785**	**L/m**
	(1)+(2)+(3)+(4)		

Total Flow Required	**15,000**	**L/m**
	250	**L/s**

Hydrant Flow Test Report

SITE ADDRESS / MUNICIPALITY: **1544 Four Mile Creek Road Niagara on the Lake, ON**

Nov 08 2024

TEST HYDRANT LOCATION : **1561 Four Mile Creek Road** (Municipal ID: 0819)

BASE HYDRANT LOCATION: **Across from 1579 Four Mile Creek Road** (Municipal ID: 0414)

TEST TIME: 9:50AM

TEST BY: Luzia Wood

TEST DATA

FLOW HYDRANT — Pipe Diam. (in / mm): 250mm

	PITOT 1	PITOT 2
SIZE OPENING (inches):	2.5	2.5
COEFFICIENT (**note 1**):	0.90	0.90
PITOT READING (psi):	52	34 / 34
FLOW (usgpm):	**1210**	**1957**

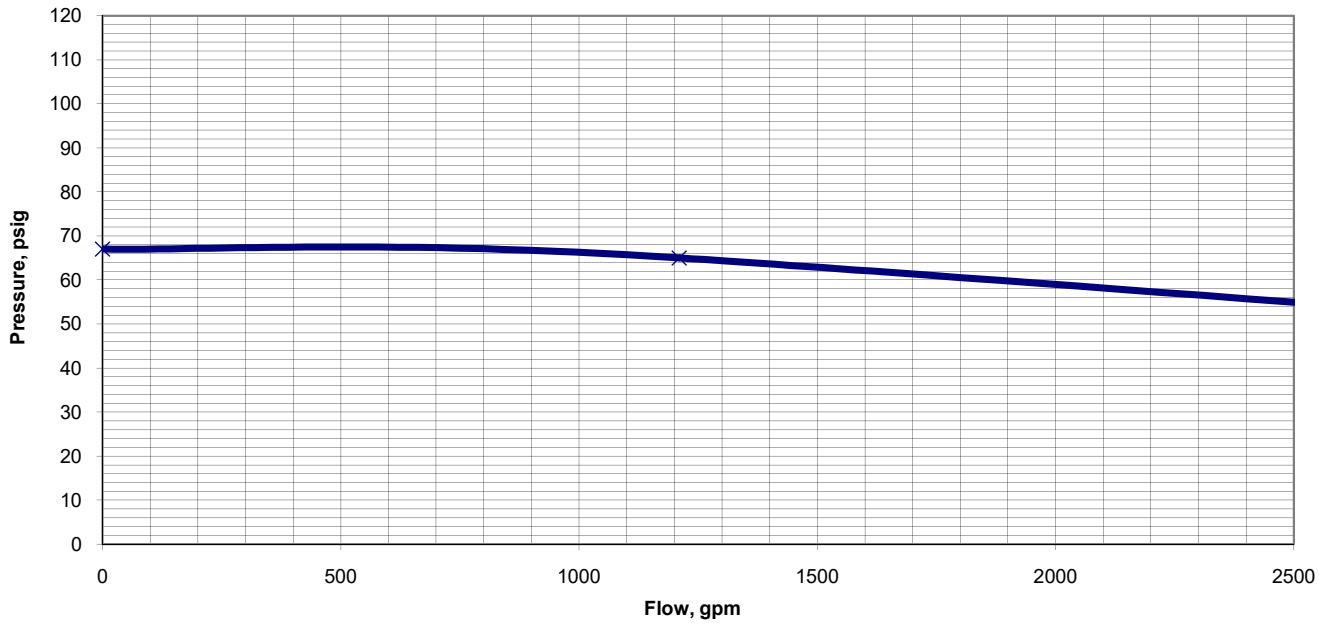
THEORETICAL FLOW @ 20 PSI 6655

BASE HYDRANT — Pipe Diam. (in / mm): 250mm

STATIC READING (psi): 67 RESIDUAL 1 (psi): 65 RESIDUAL 2 (psi): 62

REMARKS:

NOTE 1: Conversion factor of .90 used for flow calculation based on rounded and flush internal nozzle configuration. No appreciable difference in pipe invert between flow and base hydrants.



L & D Waterworks Inc.
491 Port Maitland Rd
Dunnville, ON N1A 2W6
Ph: 289.684.6747

Appendix C – Sanitary Servicing Information

Sanitary Flow Calculations

PROJECT: **1544 & 1546 Four mile Creek Road**
PROJECT No: **ALL-24011473-A0**
CREATED BY: **R.N**
CHECKED BY **S.P**
Date: **21-Apr-25**

Existing Residential Building

1 Average Day

Niagara Region - 2021 Master Servicing Plan Update Volume IV page 12
Residential Average Day Demand= 255 L/cap/d
0.00295 L/cap/s

Development Charges Backgroud Study Regional Municipality of Niagara (2022)
Equivalent population for Single & Semi Detached 2.929 persons per unit

Phase	Type of Development	Units	Population per unit	Population	Avg Flow (L/s)
1	Singles & Semi Detached	1	2.929	3	0.01
TOTAL		**1**	**-**	**3**	**0.01**

2 Peaking Factor

Ontario Ministry of the Environment and Climate Control's Design Guidelines for Sewage Works
Peaking Factor = 1+(14/(4+(P/1000)^1/2))
Cumulative Population = 3
Peaking Factor = 4.00

3 Infiltration allowance

Niagara Region - 2021 Master Servicing Plan Update Volume IV page 15
Infiltration allowance 0.286 L/s/ha New Developments
Total Area 0.07 ha Portion of site allocated to Residential Building
Infiltration 0.020 L/s

4 *Design Flow*
Design Flow = average flow x peaking factor + infiltration allowance
Design Flow = 0.055 L/s

Sanitary Flow Calculations

PROJECT: **1544 & 1546 Four mile Creek Road**
PROJECT No: **ALL-24011473-A0**
CREATED BY: **R.N**
CHECKED BY **S.P**
Date: **23-Dec-25**

Residential Building

1 Average Day

Niagara Region - 2021 Master Servicing Plan Update Volume IV page 12
Residential Average Day Demand= 255 L/cap/d
0.00295 L/cap/s

Development Charges Backgroud Study Regional Municipality of Niagara (2022)
Equivalent population for 1 Bedroom or less 1.214 persons per unit
Equivalent population for 2 Bedroom or more 1.991 persons per unit

Phase	Type of Development	Units	Population per unit	Population	Avg Flow (L/s)
1	1 Bedroom or less	8	1.214	10	0.03
2	2 Bedroom or more	23	1.991	46	0.14
TOTAL		**31**	**-**	**56**	**0.16**

2 Peaking Factor

Ontario Ministry of the Environment and Climate Control's Design Guidelines for Sewage Works
Peaking Factor = 1+(14/(4+(P/1000)^1/2))
Cumulative Population = 56
Peaking Factor = 4.00

3 Infiltration allowance

Niagara Region - 2021 Master Servicing Plan Update Volume IV page 15
Infiltration allowance 0.286 L/s/ha New Developments
Total Area 0.58 ha Portion of site allocated to Residential Building
Infiltration 0.166 L/s

4 *Design Flow*
Design Flow = average flow x peaking factor + infiltration allowance
Design Flow = 0.8 L/s

Sanitary Flow Calculations

PROJECT: **1544 & 1546 Four mile Creek Road**
PROJECT No: **ALL-24011473-A0**
CREATED BY: **R.N**
CHECKED BY **S.P**
Date: **23-Dec-25**

Commercial Building

1 Average Day

Niagara Region - 2021 Master Servicing Plan Update Volume IV page 12
Commercial Average Day Demand= 310 L/cap/d
0.00359 L/cap/s

Development Charges Backgroud Study Regional Municipality of Niagara (2022)
Equivalent population project for commercial 500 Sqft per Person

Phase	Type of Development	GFA Sqft	Sqft per person	Population	Avg Flow (L/s)
1	Commercial/Office	40020	500	80	0.3
TOTAL		**40020**	**-**	**80**	**0.3**

2 Peaking Factor

Ontario Ministry of the Environment and Climate Control's Design Guidelines for Sewage Works
Peaking Factor = 1+(14/(4+(P/1000)^1/2))
Cumulative Population = 80
Peaking Factor = 4.00

3 Infiltration allowance

Niagara Region - 2021 Master Servicing Plan Update Volume IV page 15
Infiltration allowance 0.286 L/s/ha New Developments
Total Area 0.49 ha Portion of site allocated to Commercial Building
Infiltration 0.140 L/s

4 *Design Flow*
Design Flow = average flow x peaking factor + infiltration allowance
Design Flow = 1.29 L/s

Roshawn Nunes

From: Mike Komljenovic <Mike.Komljenovic@notl.com>
Sent: Monday, January 13, 2025 10:42 AM
To: Scott Passmore
Cc: Roshawn Nunes; Walter Toth; Stephen; Robert Alguire; Kiefer Paton, C.Tech.; Darrin Wills, C.Tech., rcji, mii; Darren MacKenzie, C.Tech., rcsi; Mike Komljenovic
Subject: RE: 1544 - 1546 Four Mile Creek Rd, NOTL - Sanitary Capacity Analysis

Hi Scott,

Thanks for your response and the additional information/clarity regarding the proposed submission.
I've spoken with the Director and we don't have any concerns with the approach at this time and will provide formal comments as part of the future submission when circulated.

Thanks

Mike Komljenovic
Engineering Supervisor
Mike.Komljenovic@notl.com

Town of Niagara-on-the-Lake
1593 Four Mile Creek Road
P.O. Box 100, Virgil, ON L0S 1T0
Telephone: (905) 468-3266
Website: www.notl.com

From: Scott Passmore <Scott.Passmore@exp.com>
Sent: Friday, January 10, 2025 3:18 PM
To: Mike Komljenovic <Mike.Komljenovic@notl.com>
Cc: Roshawn Nunes <Roshawn.Nunes@exp.com>; Walter Toth <Walter.Toth@exp.com>; Stephen <stephen@timesgroup.ca>; Robert Alguire <robert.alguire@notl.com>; Kiefer Paton, C.Tech. <Kiefer.Paton@notl.com>; Darrin Wills, C.Tech., rcji, mii <Darrin.Wills@notl.com>; Darren MacKenzie, C.Tech., rcsi <darren.mackenzie@notl.com>
Subject: RE: 1544 - 1546 Four Mile Creek Rd, NOTL - Sanitary Capacity Analysis

Hi Mike,
We had a team meeting on our end to discuss your suggestions below.

First, we want to thank you for your suggestion regarding this project. It is much appreciated and was carefully considered. In regard to the downstream municipal sanitary capacity analysis, we have already spent a significant amount of time, effort and client resources on completing the calculations to address the request outlined in the original pre-consultation meeting with municipal staff. Therefore, we seek to submit our completed analysis within our FSR as part of our client's application consistent with what City staff set out in the pre-consultation meeting. We think this analysis will be of assistance to the Town in understanding the merits of our client's development application from a sanitary capacity perspective, and since its almost ready to go, we think it makes sense to complete it and provide it to the Town.

It is notable that our client has lowered the density of its proposed development for the original pre-consultation concept of 149 residential units to 30 residential units. With this reduction, the proposed density of the subject site matches the permissible density for the subject site outlined in the Town's official plan. Given this change in density for the subject site, we don't think there is any need for a broad-based sanitary capacity analysis. The sanitary analysis that we will include in our FSR will show the calculations to the Niagara Stone Road termination point, which we believe is a reasonable termination point given that the proposed development now consists of 30 units, and is at the planned density for the subject site.

Overall, we believe this approach is appropriate, and believe our analysis will assist GM Blue Plan's work on the MSP.

If you have any concerns with what we have noted above, please let us know. Otherwise, we look forward to working with you, including addressing any comments you might have on our forthcoming FSR.

Thanks again,

Scott Passmore, P.Eng.
EXP | Vice President, Land Development, Central Canada E&E
t : +1.905.695.3217, 63697 | m : +1.905.512.7542 | e : scott.passmore@exp.com
exp.com | legal disclaimer
keep it green, read from the screen

From: Scott Passmore
Sent: Friday, January 3, 2025 11:29 AM
To: Mike Komljenovic <Mike.Komljenovic@notl.com>
Cc: Roshawn Nunes <Roshawn.Nunes@exp.com>; Walter Toth <Walter.Toth@exp.com>; Stephen <stephen@timesgroup.ca>; Robert Alguire <robert.alguire@notl.com>; Kiefer Paton, C.Tech. <Kiefer.Paton@notl.com>; Darrin Wills, C.Tech., rcji, mii <Darrin.Wills@notl.com>; Darren MacKenzie, C.Tech., rcsi <darren.mackenzie@notl.com>
Subject: RE: 1544 - 1546 Four Mile Creek Rd, NOTL - Sanitary Capacity Analysis

Hi Mike, Happy New Year to you as well. Thank you for this feedback. I will speak to the team and get back to you. Much appreciated.

Scott Passmore, P.Eng.
EXP | Vice President, Land Development, Central Canada E&E
t : +1.905.695.3217, 63697 | m : +1.905.512.7542 | e : scott.passmore@exp.com
exp.com | legal disclaimer
keep it green, read from the screen

From: Mike Komljenovic <Mike.Komljenovic@notl.com>
Sent: Friday, January 3, 2025 10:26 AM

SANITARY SEWER DOWNSTREAM CAPACITY ANALYSIS - EXISTING CONDITIONS (Dry Weather)

Town of Niagara-on-the-Lake

Project: 1544 & 1546 Four Mile Creek Rd

EXP Project No: ALL-24011473-A0

Checked By: S.P
Created by: R.N
Date: 2/21/2025

n ≥ 0.013 — Numbers in blue or text in red are equations — PF = 1 + 14/(4 + / P) — 7.3 L/s plug flow from Line 2 SPS

$M = 1 + (14 / (4 + (P / 1000)^{0.5})$ — (Harmon peaking factor Min = 2; Max = 4) — 55 persons/ha (EXTERNAL FLOW AREAS ONLY)

Population density (from 2022 niagara region dev. charges background study) — 2.929 persons/unit (Singles) — 90 persons/ha (industrial based on 1200sq ft per employee - BUILDING AREA

$Q_p = P*q*M/86400$ — Peak population flow — 310 litres/person/day (Industrial) — 255 litres/person/day (Residential)

$Q_i = I*A$ — Peak extraneous flow: — 0.4 litres/second/hectare (Existing) — 0.286 litres/second/hectare (New)

$Q_{tot} = Q_p + Q_i$ — Total peak flow as the sum of peak population flow and peak extraneous flow

FOUR MILE CREEK SANITARY SEWER	MAINTENANCE HOLE FROM	MAINTENANCE HOLE TO	Area (ha)	Res. Units	Residential Pop. (P)	Industrial Institut. Pop. (P)	Residential Pop. (CUMUL)	Industrial Institut. Pop. (CUMUL)	AREA (CUMUL) (ha)	M PEAKING FACTOR HARMON	Q_p (l/s)	Q_i (l/s)	Q_{tot} (l/s)	L (m)	D (mm)	S (%)	Qf FULL (l/s)	Velocity FULL (m/s)	PERCENT FULL (%)	d/D[3] >0.5 or >0.70	Velocity Partial[1] (m/s)	Velocity[4] > 0.6 (m/s)		Notes
UPSTREAM GRAVITY	EXT1	MH56	6.60	0	363	0	363	0	6.60	4.000	4.285	2.640	6.925											16 res
LINE 2 SAN PS	SPS	MH56	17.10	0	0	0	0	0	17.10	4.000	0.000	0.000	7.300	Note: Line 2 Catchment sent through analysis as plug flow										
(PLUG FLOW 7.3 L/S)																								
SITE	SITE	MH56	0.07	1	3	0	3	0	0.07	4.000	0.035	0.028	0.063	Note: Only property 1544 Four Mile Creek Road used for conservative approach.										
Confluence Point	MH56	MH55	0.60	6	18	0	384	0	7.27	4.000	4.527	2.908	14.735	89	250	0.56%	44.5	0.907	33.1%	Ok		Ok		
	MH55	MH54	0.70	0	0	13	384	13	7.97	4.000	4.708	3.188	15.196	92	250	0.72%	50.5	1.028	30.1%	Ok		Ok		12.6
	MH54	MH53	1.00	1	3	28	386	41	8.97	4.000	5.143	3.588	16.031	77	250	0.76%	51.8	1.056	30.9%	Ok		Ok		27.9
	MH53	MH52	4.30	4	12	86	398	126	13.27	3.964	6.449	5.308	19.057	81	250	0.33%	34.2	0.696	55.8%	Check				85.5
LORRAINE ST	EXT2	MH52	2.80	0	154	0	154	0	2.80	4.000	1.818	1.120	2.938											
NIAGARA STONE ROAD	MH52	MH51	1.80	4	12	25	564	151	17.87	3.889	8.582	7.148	23.030	62	250	0.44%	39.4	0.804	58.4%	Check		Ok		25.2

SANITARY SEWER DOWNSTREAM CAPACITY ANALYSIS - PROPOSED CONDITIONS (Dry Weather)

Town of Niagara-on-the-Lake

Project: 1544 & 1546 Four Mile Creek Rd

EXP Project No: ALL-24011473-A0

Checked by: S.P

Created by: R.N

Date: 2/21/2025

n ≥ 0.013 — Numbers in blue or text in red are equations — PF = 1 + 14/(4 + / P) — 7.3 L/s plug flow from Line 2 SPS

$M = 1 + (14 / (4 + (P / 1000)^{0.5})$ — (Harmon peaking factor Min = 2; Max = 4) — 55 persons/ha (EXTERNAL FLOW AREAS ONLY)

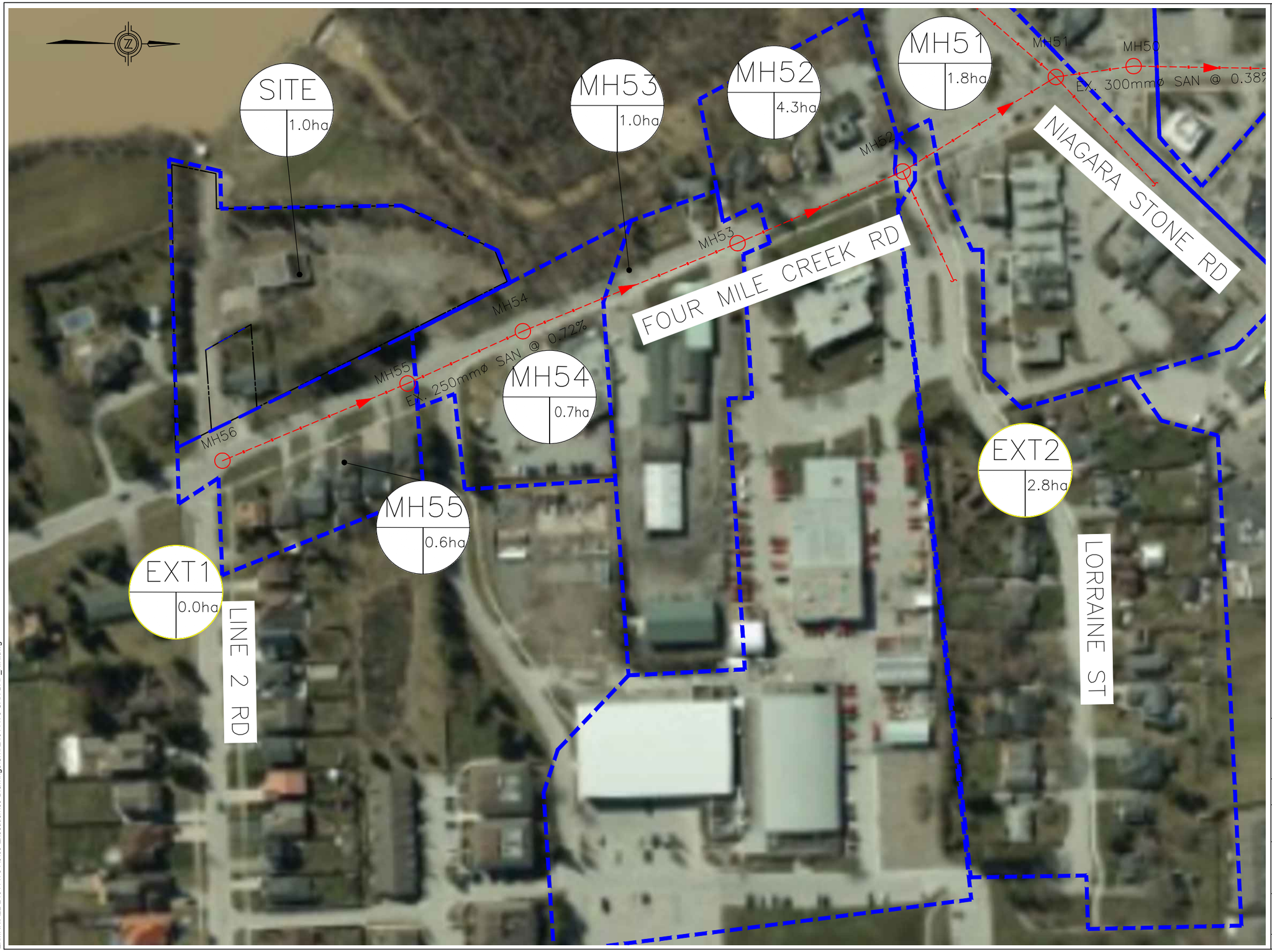
Population density (from 2022 niagara region dev. charges background study) — 2.929 persons/unit (Singles) — 90 persons/ha (industrial based on 1200sq ft per employee - BUILDING AREA

$Q_p = P*q*M/86400$ — Peak population flow — 310 litres/person/day (Industrial) — 255 litres/person/day (Residential)

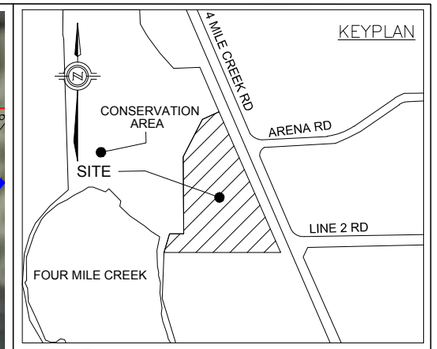
$Q_i = I*A$ — Peak extraneous flow: — 0.4 litres/second/hectare (Existing) — 0.286 litres/second/hectare (New)

$Q_{tot} = Q_p + Q_i$ — Total peak flow as the sum of peak population flow and peak extraneous flow

FOUR MILE CREEK SANITARY SEWER	MAINTENANCE HOLE FROM	MAINTENANCE HOLE TO	Area (ha)	Res. Units	Residential Pop. (P)	Industrial Institut. Pop. (P)	Residential Pop. (CUMUL)	Industrial Institut. Pop. (CUMUL)	AREA (CUMUL) (ha)	M PEAKING FACTOR HARMON	Q_p (l/s)	Q_i (l/s)	Q_{tot} (l/s)	L (m)	D (mm)	S (%)	Qf FULL (l/s)	Velocity FULL (m/s)	PERCENT FULL (%)	d/D[3] >0.5 or >0.70	Velocity Partial[1] (m/s)	Velocity[4] > 0.6 (m/s)		Notes
UPSTREAM GRAVITY	EXT1	MH56	6.60	0	363	0	363	0	6.60	4.000	4.285	2.640	6.925											16 res
LINE 2 SAN PS	SPS	MH56	17.10	0	0	0	0	0	17.10	4.000	0.000	0.000	7.300	Note: Line 2 Catchment sent through analysis as plug flow										
(PLUG FLOW 7.3 L/S)																								
SITE	SITE	MH56	1.07	30	49	80	49	80	1.07	4.000	1.572	0.428	2.000	Note: Site Flow input to match flow calcs in FSR										
Confluence Point	MH56	MH55	0.60	6	18	0	430	80	8.27	3.970	6.173	3.308	16.781	89	250	0.56%	44.5	0.907	37.7%	Ok		Ok		
	MH55	MH54	0.70	0	0	13	430	93	8.97	3.964	6.343	3.588	17.231	92	250	0.72%	50.5	1.028	34.1%	Ok		Ok		12.6
	MH54	MH53	1.00	1	3	28	433	121	9.97	3.951	6.752	3.988	18.040	77	250	0.76%	51.8	1.056	34.8%	Ok		Ok		27.9
	MH53	MH52	4.30	4	12	86	444	206	14.27	3.913	8.022	5.708	21.030	81	250	0.33%	34.2	0.696	61.6%	Check				85.5
LORRAINE ST	EXT2	MH52	2.80	0	154	0	154	0	2.80	4.000	1.818	1.120	2.938											
NIAGARA STONE ROAD	MH52	MH51	1.80	4	12	25	610	231	18.87	3.847	10.117	7.548	24.965	62	250	0.44%	39.4	0.804	63.3%	Check		Ok		25.2



KEYPLAN



LEGEND:

- PROPERTY LINE
- EX. SANITARY SEWER
- SANITARY DRAINAGE BOUNDARY
- EX. SANITARY M.H.
- 1 — CATCHMENT ID#
- 936 | 1.23 — DRAINAGE AREA (ha); ESTIMATED POPULATION

NOTES

- TOPOGRAPHIC SURVEY PROVIDED BY BARICH GRENKIE SURVEYING LTD. COMPLETED ON JANUARY 25, 2024.
- SITE PLAN PROVIDED BY ICKE BROCHU ARCHITECTS INC

SCALE: N.T.S

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

DOWNSTREAM SANITARY ANALYSIS CATCHMENT PLAN

FIGURE 3

1544 & 1546 FOUR MILE CREEK RD
NIAGARA ON THE LAKE, ONTARIO

PROJECT NUMBER: ALL-24011473-A0

DATE: FEBRUARY 2025

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