TRAFALGAR ENGINEERING

FUNCTIONAL SERVICING REPORT

Water, Sanitary, and Stormwater Management

PROPOSED 3-STOREY TOWNHOMES

71 WATER STREET & 106 ROBINSON STREET
TOWN OF OAKVILLE

OUR FILE: 1656

PREPARED FOR ROSEVILLE PROPERTIES INC

MAY 12, 2022

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

REVISION HISTORY

DATE	REVISION	SUBMISSION
May 12, 2022	1	Issued for Zoning Amendment Application

TABLE OF CONTENTS

APPENDICES

APPENDIX 'A' - Site Plan, Richard Wengle Architect Inc.
- Topographic Survey, Rady-Pentek & Edward Surveying LTD.
- Reference Plan, Cunningham McConnel Ltd.
- Oakville Air Photo History (2012 & 2015)

APPENDIX 'B' - Preliminary Servicing Plan, Dwg. S1
- Preliminary Grading Plan, Dwg. G1
- Record Drawings

APPENDIX 'C' - Estimated Sanitary Flow
- Water Street PS Flow Monitoring Data
- Daily Lake Ontario Levels

APPENDIX 'D' - Stormwater Management Calculations
- Record Drawings

1.0 INTRODUCTION

1.1 Scope of Functional Servicing Report

This report has been prepared in support of the zoning by-law amendment to permit the construction of a three- storey, ten-unit townhouse block located on Robinson Street between Water Street and Navy St in the Town of Oakville. This report may be updated and refined as the project moves through the planning approval process to support the Site Plan Application and Building Permit stages. A copy of the preliminary site plan is included in Appendix 'A' for reference.

1.2 Site Location and Description

The subject lands are Part 1, 2 and 3 on Reference Plan 20R-18998 (Appendix 'A'). The subject lands is known municipally as 71 Water Street and 106 Robinson Street in the Town of Oakville. The subject lands are currently vacant and have an area of 0.16 ha. The subject lands abut Water Street to the west, Robinson Street to the north and Navy Street to the east. An existing 2-storey dwelling and parking lot exists adjacent to the South property line. Two remnant retaining walls are present on the existing site to accommodate the significant grade changes within the eastern portion of the property. Slopes on the eastern portion of the subject lands range from approximately 8% to 25%. The western portion of the subject lands is relatively flat and has slopes ranging approximately 0.5% to 5.0%. A copy of the topographic survey can be found in Appendix 'A'. The subject lands formerly housed a 1 – storey commercial building with at grade parking and a 2-storey building that were demolished between 2012 and 2015 based on the Town of Oakville's Air Photo History (Appendix 'A').

1.3 Proposed Development

The development proposal is for a 10 unit 3-storey townhouse block with underground parking at the basement level. The subject site proposes amenity space (terraces) along the south portion of the subject site above the underground parking garage at ground level and on the roof level. The four units at the west end of subject site near the intersection of Water Street and Robinson also propose a sub-basement level with mechanical rooms.

2.0 MUNICIPAL WATER AND WASTEWATER

All proposed services must be in accordance with the Ontario Building Code, Town of Oakville, and Region of Halton standards and requirements. A copy of the Preliminary Servicing Plan is included in Appendix 'B' and should be read in conjunction with this report. Existing and proposed servicing is discussed in further detail in the following sections.

2.1 Water

The Region's record drawings and Operating Maps indicate the following watermains exist on the streets abutting the subject lands:

Navy Street:

- 300 mm dia. PVC watermain along the east side of the road.

Robinson Street:

- 900 mm dia. trunk CPP watermain beneath the pavement; the watermain bends southerly as it approached Water Street, clipping the north-west corner of the property.
- An ill-defined 19 mm dia. copper service along the north side of the road.

Water Street:

- 900 mm dia. trunk CPP watermain.
- An ill-defined 25 mm dia. copper service along the east side of the road.

The record drawings are provided in Appendix 'B' for reference purposes.

It is proposed that the site be serviced by the existing 300 mm dia. watermain on Navy Street for domestic water and fire protection as per the Region's std. dwg. no. 409.010. Final sizing of the connection will be determined at the detail design stage in conjunction with the mechanical and sprinkler consultant. Given the size of the development, we anticipate a connection size of 150 mm or smaller will be required.

Existing fire hydrants are available at the intersections of Navy Street and Robinson Street and Water Street and William Street. Fire hydrant flow tests have not been undertaken. Tests will be required at the detailed design stage.

2.2 Wastewater

The Region's record drawings and Operating Maps indicate the following wastewater mains exist on the streets abutting the subject lands:

Navy Street:

- 300 mm dia. PVC sanitary sewer draining in a southerly direction.

Robinson Street:

- 250 mm dia. PVC sanitary sewer draining in a westerly direction to Water Street.

Water Street:

- 250 mm dia. vitrified clay sanitary sewer draining in a northerly direction to the Water Street Pumping Station.

The record drawings are provided in Appendix 'B' for reference purposes.

The Water Street and Navy Street sewers convey flows to the Water Street pumping station on Water Street at the Rebecca Street overpass. It is proposed that the site be serviced by the existing 250 mm dia. sewer on Water Street.

2.2.1 Estimated Sanitary Flow

Using the development area of 0.16 ha and Region of Halton land use density for townhouses (135 persons per hectare) the equivalent population is determined to be 22 persons. Table 2 summarizes the proposed wastewater flows. Refer to Appendix 'C' for supporting calculations.

Table 1: Estimated Wastewater Flow (L/s)

Average Daily Dry Weather Flow	0.1
Modified Harmon Peaking Factor	4.38
Infiltration Allowance (0.286 L/s-ha)	negligible
Peak Flow	0.3

2.2.2 Water Street Wastewater Pumping Station (PS)

The Water Street pumping station has been identified as needing to be replaced because of its age and maintenance requirements. In light of this, the region commenced EAs in the past, however the findings were never implemented. We understand that a new EA process will be commenced.

Monitoring data (inflow) for the Water Street PS provided by the Region of Halton for the period January 2018 to December 2020 has been used to confirm if station capacity exists for the subject development.

Flows on average ranged from between 1.5–3.0 L/s in 2018 until the end of May 2019. A significant increase in sanitary flows for approximately 1.5 months occurs between the end of May 2019 and the beginning of July 2019. Peak flows during this period were approximately

10L/s. The high flow rates through the PS correlate to abnormally high-water levels in the nearby Lake Ontario for the same time period. Refer to Appendix 'C' for supporting data.

The flow rates from July 2019 to mid August 2020 flows returned to the average range of 1.5L/s-3.0L/s. For the remainder of 2020 from mid August 2020 through December 2020 the flow data indicates the flows ranged from 3.0–5.0 L/s with the expectation that on November 22, 2020, the Water Street Pumping Station reported a single flow rate of 19.45 L/s. The flow rate is likely a raw data error as peak flows for the pumping station are significantly lower for the period of data from 2018-2020. The flow of 5.0 L/s is considered the new baseline flow for determining if added flows from development could result in capacity issues at the PS. The flows for the proposed development will add approximately 0.3 L/s during peak flow conditions for a total of 5.3 L/s. The firm capacity of the Water Street pumping station is estimated to be 20 L/s.

Based on available information and expected site flows, we do not anticipate capacity issues resulting from this development.

3.0 STORM DRAINAGE AND STORMWATER MANAGEMENT

3.1 Existing Storm Drainage

The site is located within an established urban area. As mentioned in Section 2.1, the site previously housed a 1-storey commercial building with at grade parking and a 2-storey building that were demolished between 2012 and 2015. In the existing condition, the site has established poor grass cover on the presently vacant lands since the demolition. Storm drainage flows in the westerly direction towards Water Street and is conveyed along Water Street.

Record drawing information indicated that Robinson Street and Water Street are generally serviced by a local 250/300 mm dia. storm sewer located within the municipal road allowance. The record drawings are provided in Appendix 'D'.

The existing 300 mm dia. on Water Street ends immediately south of Robinson Street at a double catchbasin. As such, there is no available storm sewer adjacent to the west property line boundary. Flow from the subject lands is solely captured by catchbasins located on Water Street.

The Town of Oakville Stormwater Management Waster Master plan identifies the existing 5- Year Minor System Performance along Water Street as unsurcharged. The 100-year Major System Performance Assessment also indicated the flow was contained within the curbed area of the street.

3.3 Proposed Storm Drainage

Extension of the Water Street storm sewer is required to service the subject site. The existing double catchbasin on Water Street near the northwest corner of the property will be replaced with a double catchbasin manhole and the sewer extended in a southerly direction to a suitable location. A storm connection to the storm sewer extension is proposed.

With the exception of the small front yard area and the front portion of the roofs, all other surface drainage will be collected internally and conveyed to the proposed storm sewer connection on Water Street.

3.4 Stormwater Management

3.4.1 Quantity Control

The Town of Oakville generally requires developments to manage their drainage to pre-development levels for each event up to the 100-year storm.

Record drawings from the Town of Oakville indicate the storm sewer on Water Street was designed to capture stormwater runoff for approximately 0.09 ha of the total 0.16 ha site area. The record drawing depicting the drainage boundaries accounted for in the design of the Water Street storm sewer can be found in Appendix 'D'. The composite runoff coefficient for the 0.09 ha of land attributed to drain towards the Water Street storm sewer is C=0.79.

The allowable release rate is calculated using the Town of Oakville IDF curves and composite runoff coefficient from the record drawings. The 5-year allowable release rate based on 0.09 ha is determined to be 23 L/s. Supporting calculations are provided in Appendix 'D'.

Post-development flow rates are calculated using the same IDF data and a runoff coefficient of C=0.90. Approximately 0.05ha of the subject site is proposed to flow uncontrolled. Of the 0.05ha approximately 0.02 ha is softscape surfaces and the remaining 0.03 ha is uncontrolled roof drainage and hardscaped surfaces. The uncontrolled areas produce a flow rate of 18 L/s during the 100-year. The allowable release from subject site is reduced from 23 L/s to 5 L/s to account for the uncontrolled flows. Supporting calculations can be found in Appendix 'D'.

In order to control the post-development flow to the allowable release rate of 5 L/s, approximately 48.5 m^3 of storage is required for the 100-year event. Due to the inherently shallow elevation of the proposed storm sewer on Water Street stormwater stored on site will have to pumped. Pumps shall be designed by the mechanical consultant and must not exceed the allowable rate. Emergency backup power/auxiliary pump is recommended. Emergency overflow for the on-site storage facility must be detailed as designs progress, but generally consists of a mechanism to

spill to grade at Water Street. Building mechanical systems must be designed to withstand surcharge.

The method used to provide the required on-site storage can be determined at the detailed design stage.

3.4.2 Quality Control

Stormwater runoff from the proposed development consists primarily of roof drainage (including the roof top terrace) and drainage from private amenity space (terraces) at the ground level. Roof drainage from terraces, low traffic areas or pedestrian plaza areas can be considered moderately clean drainage. The ground level amenity space (terrace) is privately owned and can be considered a low traffic area with moderately clean drainage.

Given the site's proximity to Lake Ontario, drainage from the subject site will provide minimal opportunity to dilute stormwater from development upstream before discharge into Lake Ontario.

Due to moderately clean drainage produced by the site and the proximity to Lake Ontario, stormwater quality control is not proposed.

4.0 SITE GRADING

The proposed grading is constrained by the existing slopes on Robinson Street. Slopes range up to 10% along Robinson Street. The grading is also constrained by the existing residential and parking lot adjacent to the south property line. Additionally, slopes on the eastern portion of the subject lands range from approximately 8% to 25%. The western portion of the subject lands is relatively flat and has slopes ranging approximately 0.5% to 5.0%. Units will need to be stepped to generally follow the east/west profile of Robinson Street.

The proposed grading must ensure that drainage from the 100-year event is collected by the building's drains and conveyed to the stormwater storage facility. The amenity areas and any flat roof areas must be adequately scuppered if perimeter parapet walls are proposed.

The underground parking structure must extend above existing property line grades on the south property line to self-contain the site, maintain existing drainage patterns, and match the existing property line elevations. A copy of the Preliminary Grading Plan is provided in Appendix 'B' and should be read in conjunction with this report.

5.0 CONCLUSION

Adequate municipal infrastructure exists within the abutting road allowances to support the proposed zoning amendments. The information in this report provides the framework from which detailed designs can evolve as the development progresses through the planning approval and permitting process.

The development proposal results in a minor increase to water demands and sanitary flows from the site. Analysis of the flows to the existing Water Street sanitary PS indicate the subject site will have a minor impact on flows to the pumping station and there are no capacity concerns as a result of this development.

Stormwater quantity controls are proposed to control post-development flows from the 100-year event to the 5-year rate based on the storm drainage area plan for the Water Street sewer. Approximately 43.5 m^3 of storage is required to control discharge to the allowable rate of 0.05 m^3/s accounting for the uncontrolled flows.

Architectural stepping of the units is proposed to provide a desirable relationship between the building and the surrounding elevation constraints.

PREPARED BY TRAFALGAR ENGINEERING LTD.

P. Cifoni, P.Eng.
Principal

PC:ht

Enclosures

P:\1656 Roseville Properties\Reports\FSR\2022-05-09 FSR.docx

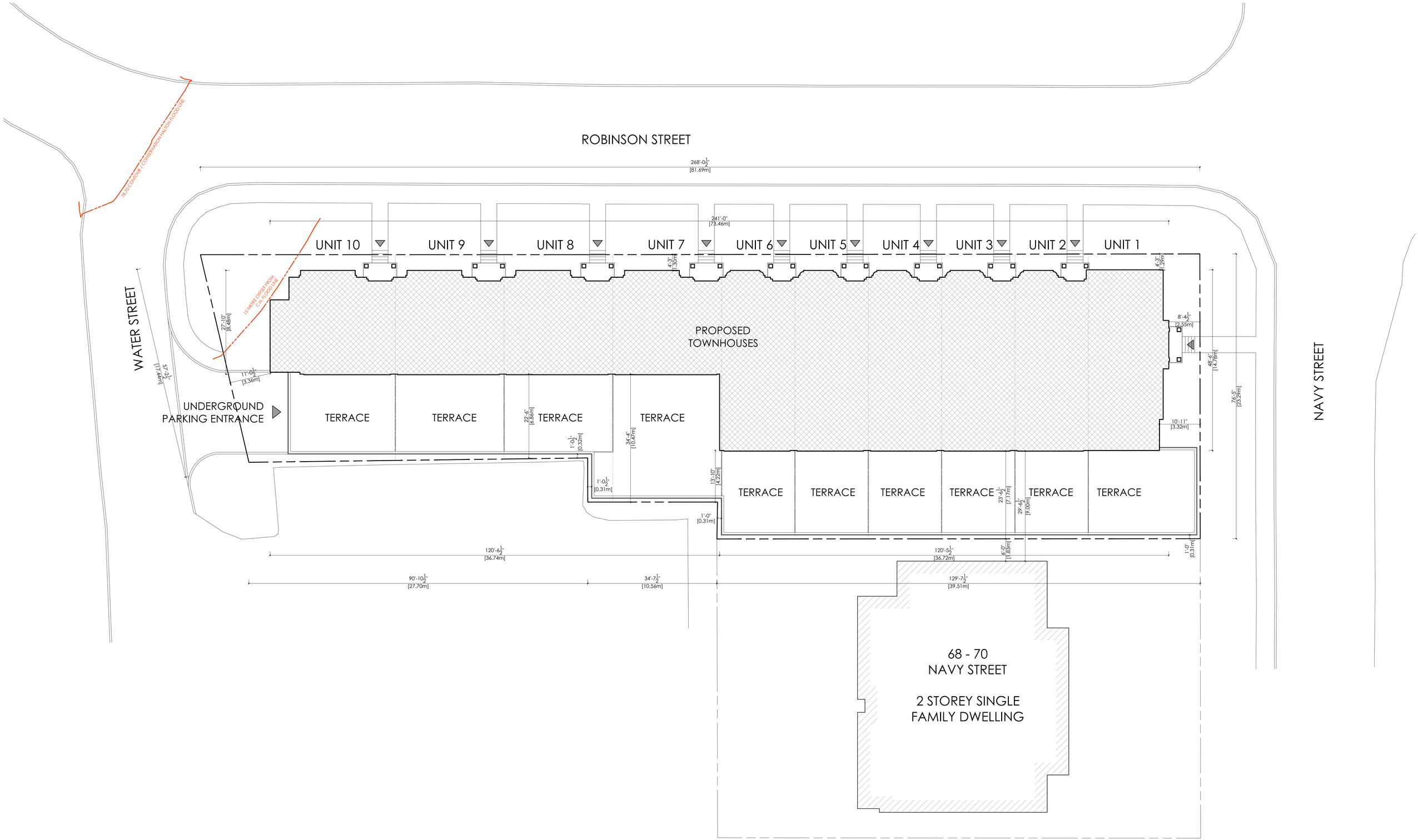
APPENDIX 'A'

Site Plan, Richard Wengle Architect Inc.

Topographic Survey, Rady-Pentek & Edward Surveying LTD.

Reference Plan 20R-18998, Cunningham McConnel Ltd.

Oakville Air Photo History (2012 & 2015)



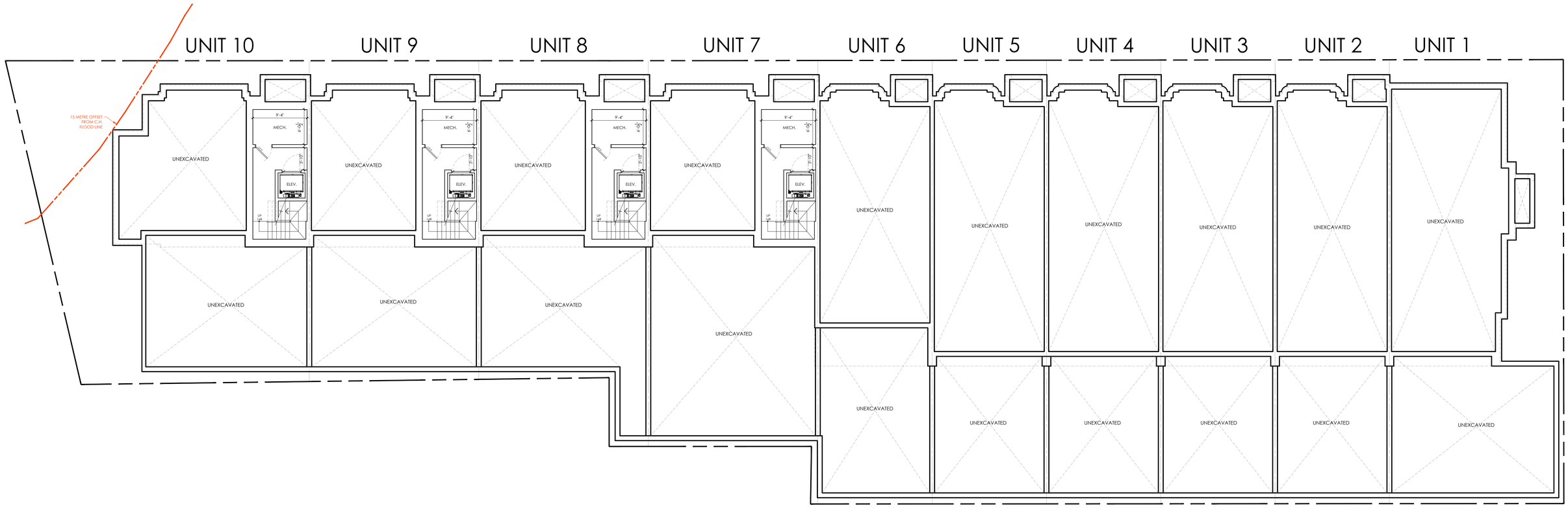
RICHARD WENGLE
ARCHITECT INC.

ROSEVILLE PROPERTIES INC.

ROBINSON STREET
OAKVILLE, ONTARIO
MARCH 22, 2022
2001

SITE PLAN
SCALE: 3/32" = 1'-0"

N



RICHARD WENGLE
ARCHITECT INC.

ROSEVILLE PROPERTIES INC.

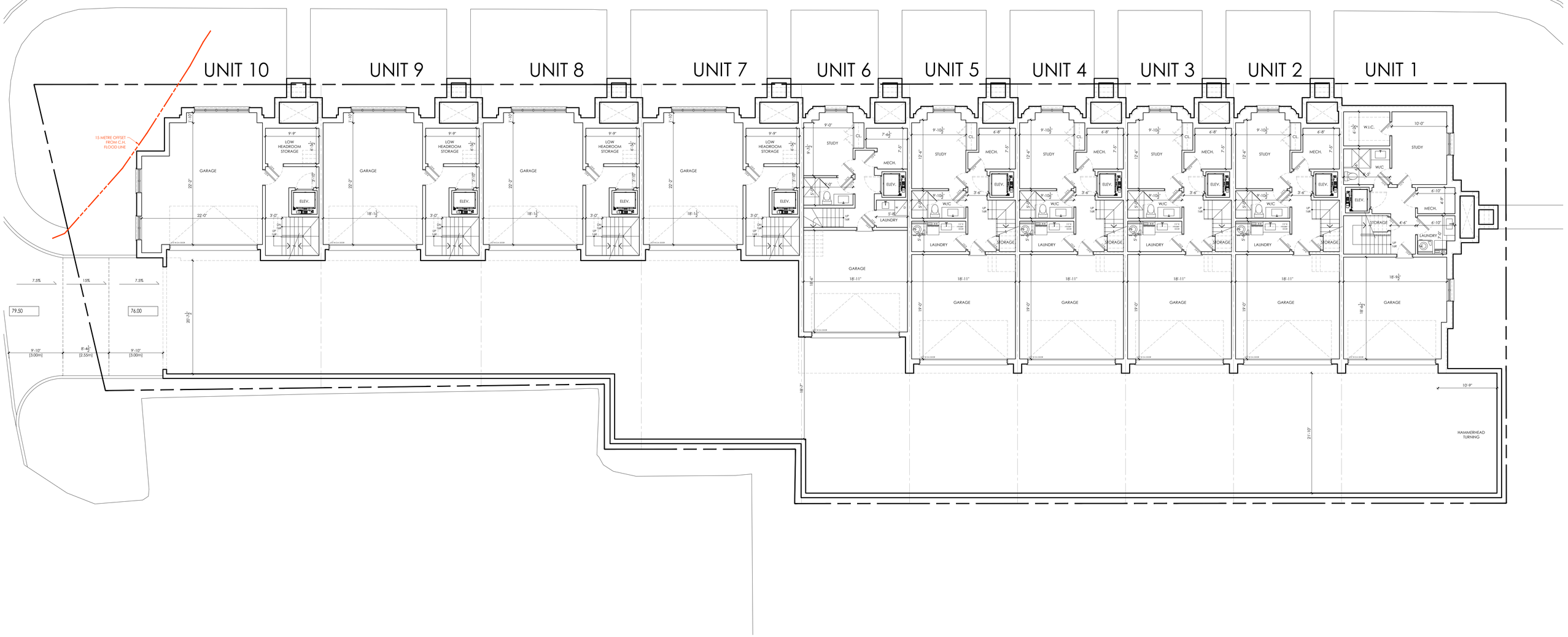
ROBINSON STREET
OAKVILLE, ONTARIO
MARCH 22, 2022
2001

SUB-BASEMENT PLAN

SCALE: 1/8" = 1'-0"

N

ROBINSON STREET



RICHARD WENGLE
ARCHITECT INC.

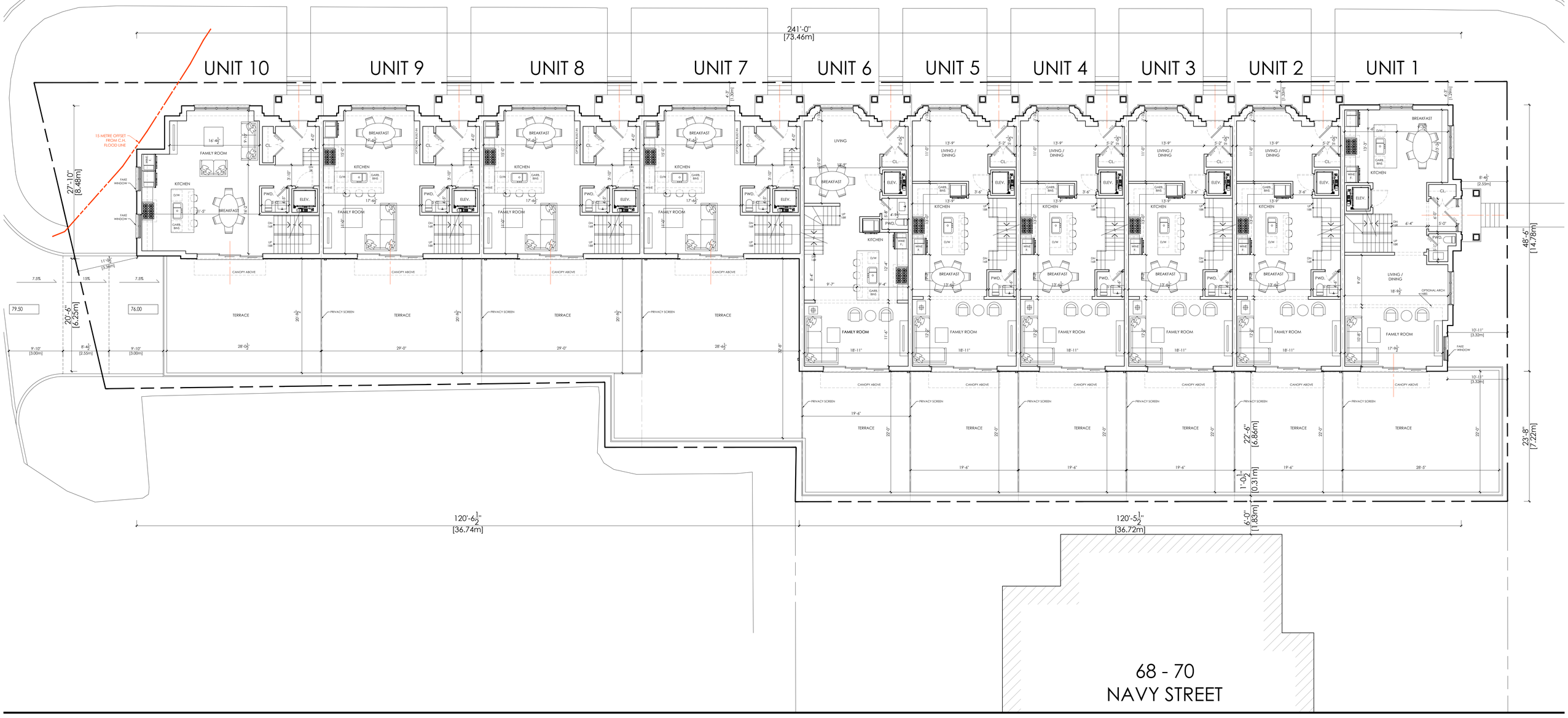
ROSEVILLE PROPERTIES INC.

ROBINSON STREET
OAKVILLE, ONTARIO
MARCH 22, 2022
2001

BASEMENT PLAN
SCALE: 1/8" = 1'-0"

N

ROBINSON STREET



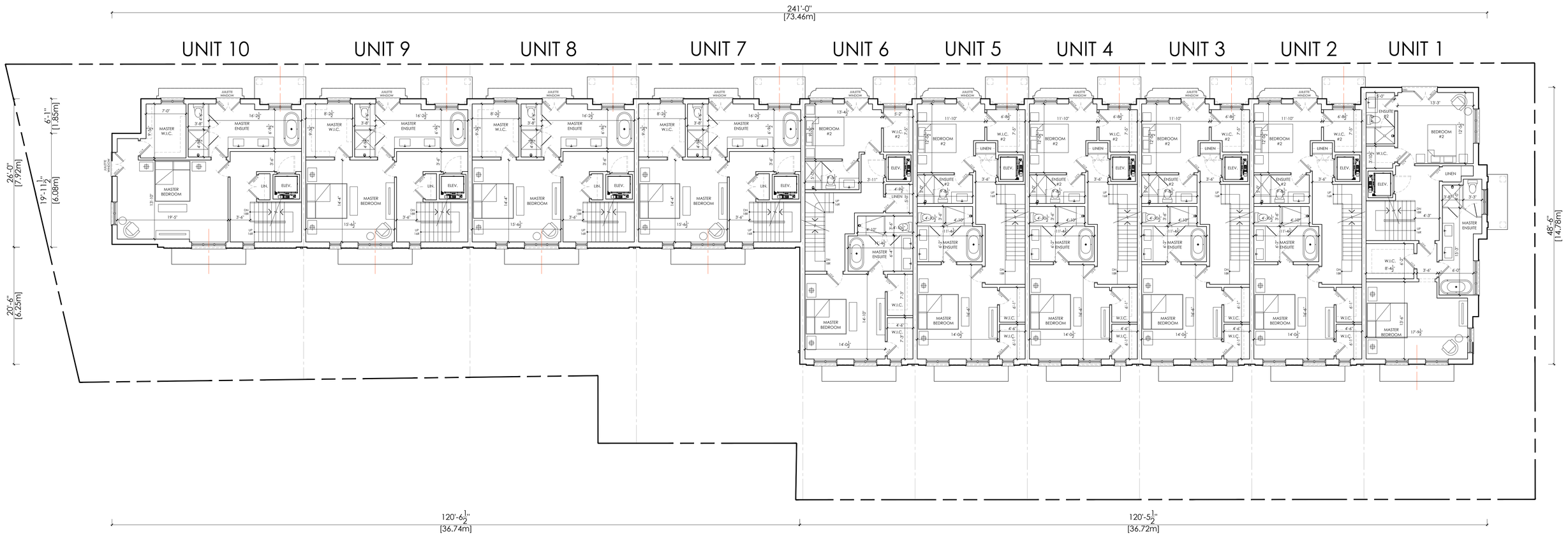
RICHARD WENGLE
ARCHITECT INC.

ROSEVILLE PROPERTIES INC.

ROBINSON STREET
OAKVILLE, ONTARIO
MARCH 22, 2022
2001

GROUND FLOOR PLAN
SCALE: 1/8" = 1'-0"

N



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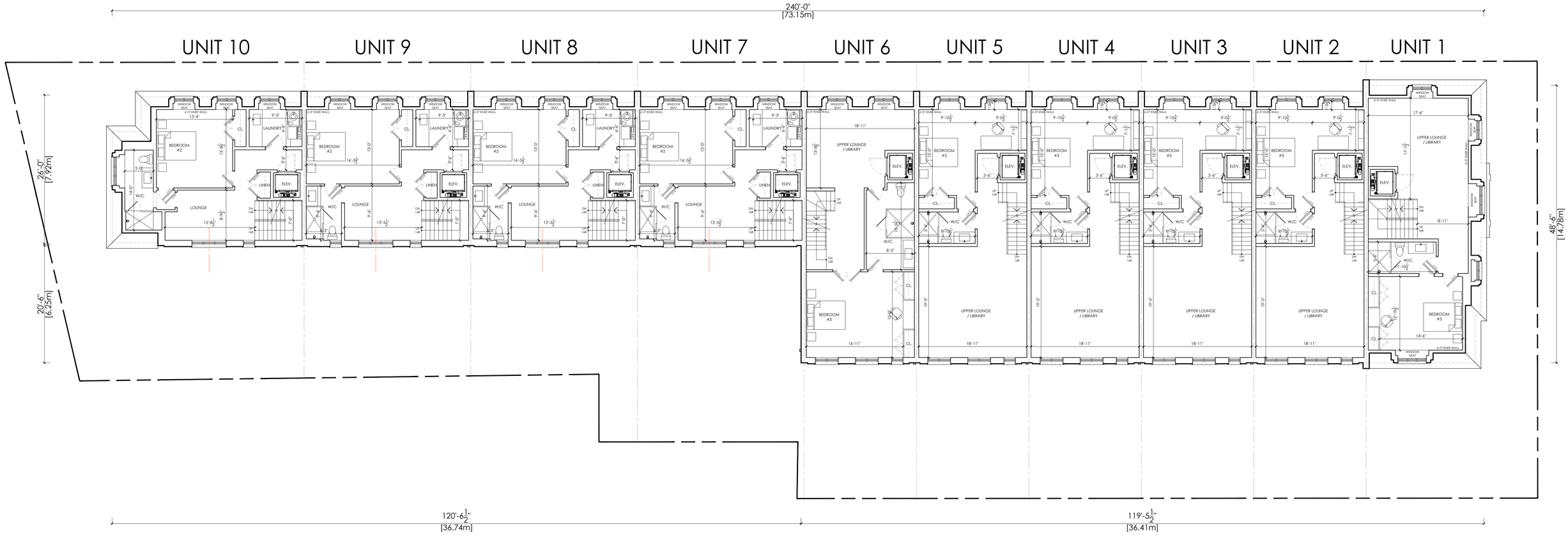
ROBINSON STREET
OAKVILLE, ONTARIO
MARCH 22, 2022
2001

SECOND FLOOR PLAN
SCALE: 1/8" = 1'-0"

N



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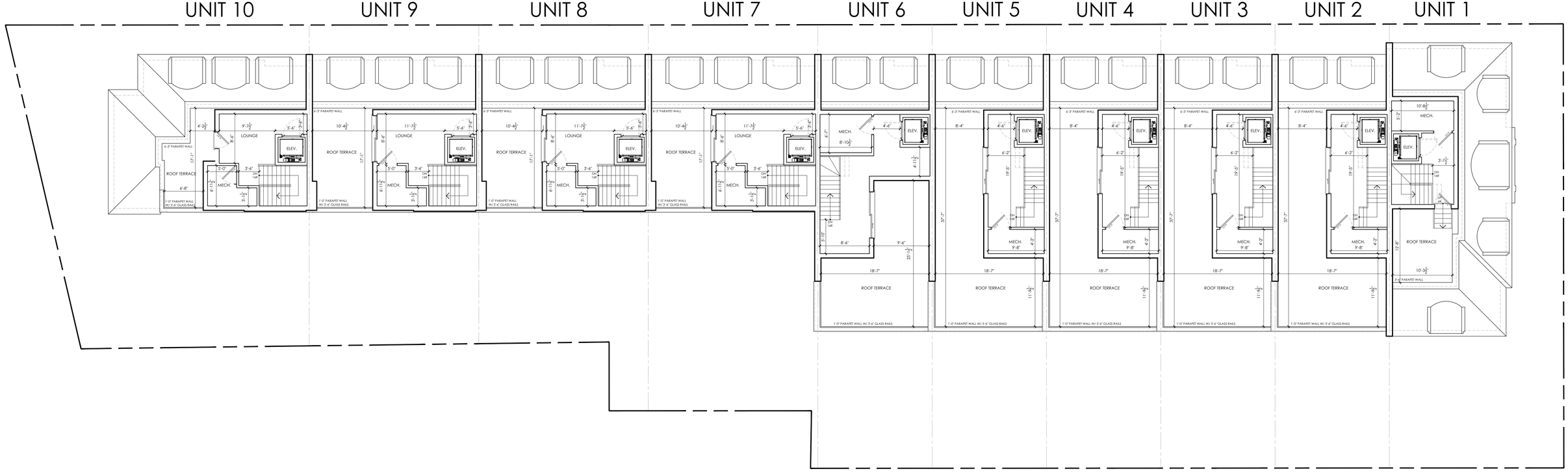
ROSEVILLE PROPERTIES INC.

ROBINSON STREET
OAKVILLE, ONTARIO
MARCH 22, 2022
2001

THIRD FLOOR PLAN
SCALE: 1/8" = 1'-0"

N



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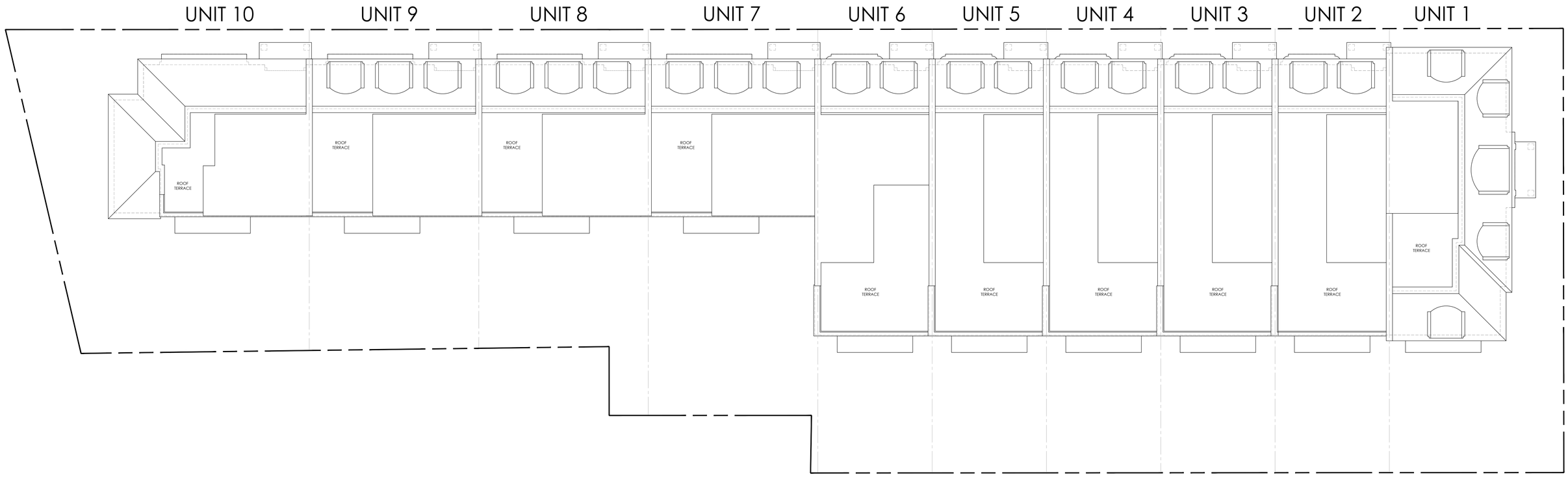
ARCHITECT INC.

ROSEVILLE PROPERTIES INC.
ROBINSON STREET
OAKVILLE, ONTARIO
MARCH 22, 2022
2001

ROOF TERRACE PLAN
SCALE: 1/8" = 1'-0"

N



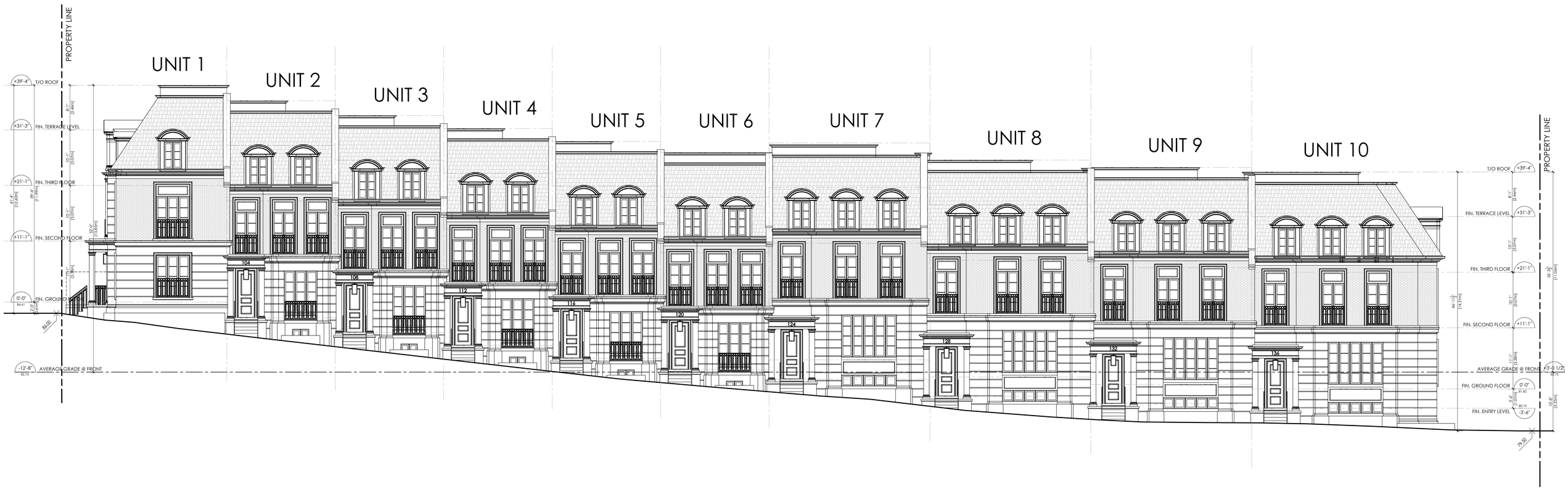
RICHARD WENGLE
ARCHITECT INC.

ROSEVILLE PROPERTIES INC.

ROBINSON STREET
OAKVILLE, ONTARIO
MARCH 22, 2022
2001

ROOF PLAN
SCALE: 1/8" = 1'-0"

N



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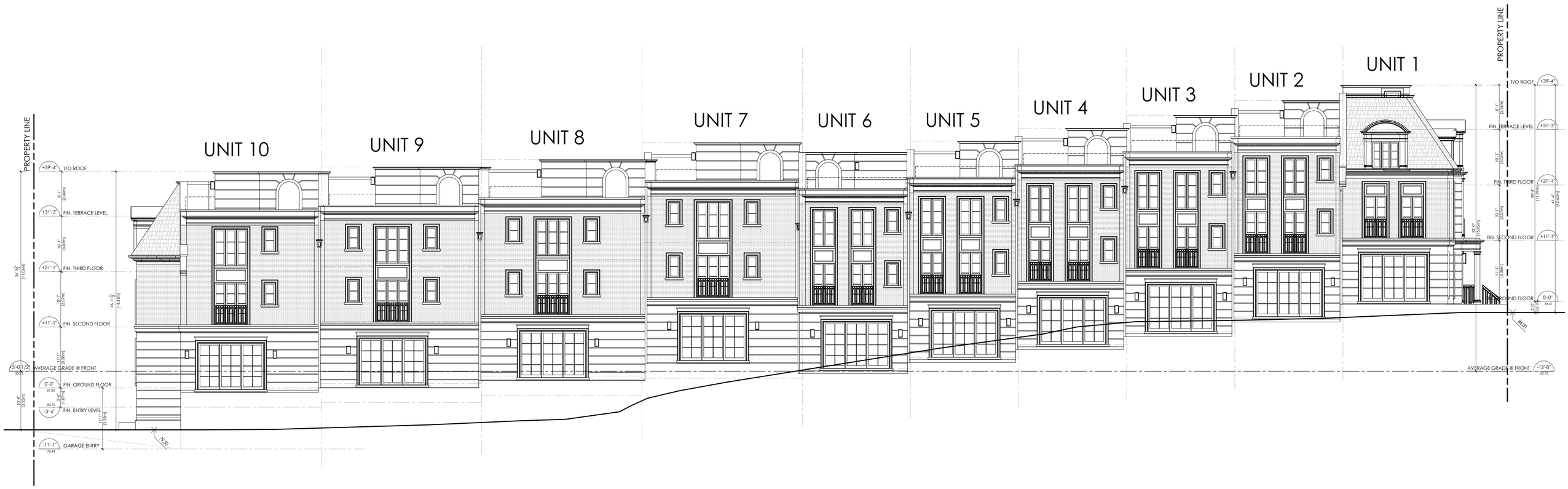
ROSEVILLE PROPERTIES INC.

ROBINSON STREET
OAKVILLE, ONTARIO
MARCH 22, 2022
2001

FRONT ELEVATION
SCALE: 1/8" = 1'-0"



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ARCHITECT INC.

ROSEVILLE PROPERTIES INC.

ROBINSON STREET
OAKVILLE, ONTARIO
MARCH 22, 2022
2001

REAR ELEVATION
SCALE: 1/8" = 1'-0"

UNIT 10

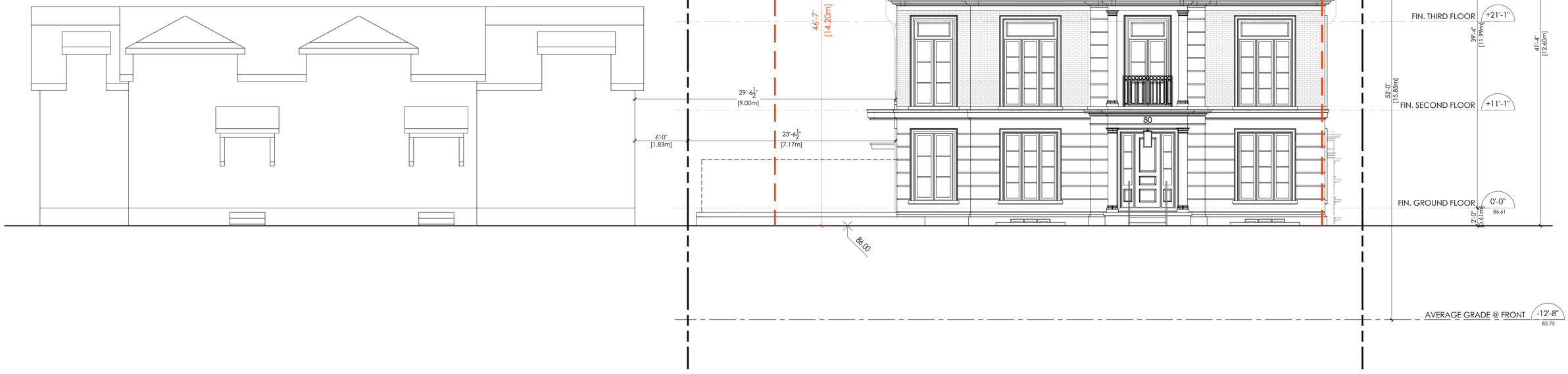
SOUTH ELEVATION

RICHARD WENGLE
ARCHITECT INC.

ROSEVILLE PROPERTIES INC.
ROBINSON STREET
OAKVILLE, ONTARIO
MARCH 22, 2022
2001

SOUTH ELEVATION
SCALE: 3/16" = 1'-0"

68 - 70 NAVY STREET



NORTH ELEVATION

RICHARD WENGLE
ARCHITECT INC.

ROSEVILLE PROPERTIES INC.
ROBINSON STREET
OAKVILLE, ONTARIO
MARCH 22, 2022
2001

NORTH ELEVATION
SCALE: 3/16" = 1'-0"

RICHARD WENGLE
ARCHITECT INC.

ROSEVILLE PROPERTIES INC.

ROBINSON STREET
OAKVILLE, ONTARIO
MARCH 22, 2022
2001

3D PERSPECTIVE
SCALE: NTS.

PLAN OF TOPOGRAPHY OF LOT A AND PART OF LOTS 1, 3 AND 4, BLOCK 51 REGISTERED PLAN 1 TOWN OF OAKVILLE REGIONAL MUNICIPALITY OF HALTON

SCALE 1:250

10m 5m 0 10m 20m 30 metres

RADY–PENTEK & EDWARD SURVEYING LTD., O.L.S.

METRIC

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

NOTES

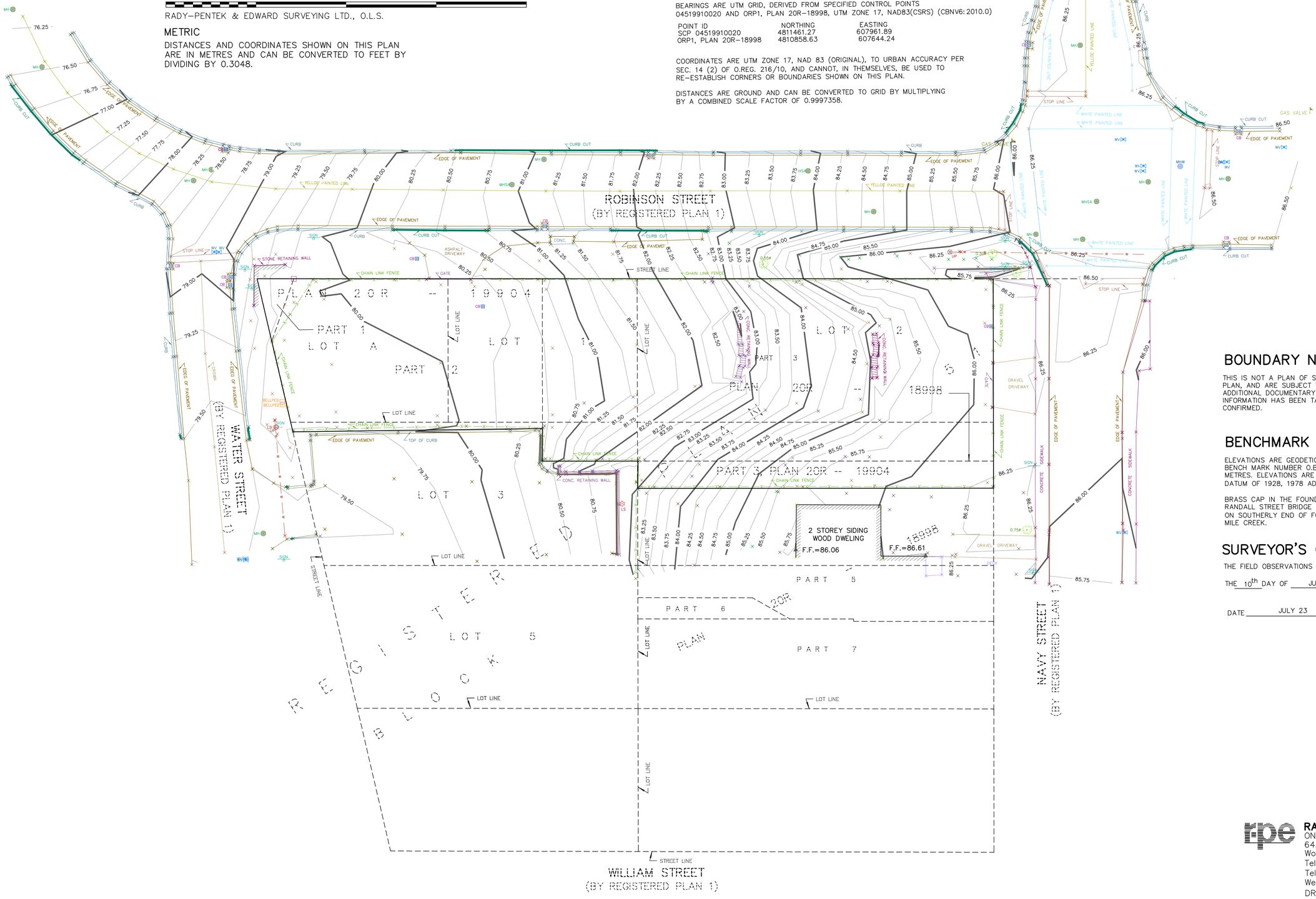
BX	DENOTES BELL BOX
CB	DENOTES CATCH BASIN
CONC	DENOTES CONCRETE
FF	DENOTES FINISHED FLOOR
P.I.N.	DENOTES PROPERTY IDENTIFIER NUMBER
LS	DENOTES LAMP STANDARD
MH	DENOTES MANHOLE
MHSAN	DENOTES MANHOLE SANITARY
MHSTM	DENOTES MANHOLE STORM
MHW	DENOTES MANHOLE WATER
UP	DENOTES UTILITY POLE
WV	DENOTES WATER VALVE
–W–	DENOTES OVERHEAD WIRE
ø	DENOTES DIAMETER
0.15ø	DENOTES DECIDUOUS TREE
0.50ø	DENOTES CONIFEROUS TREE
X	DENOTES FENCE LINE
HYDRANT	DENOTES HYDRANT
SCP	DENOTES SPECIFIED CONTROL POINT
ORP	DENOTES OBSERVED REFERENCE POINT

BEARINGS ARE UTM GRID, DERIVED FROM SPECIFIED CONTROL POINTS 04519910020 AND ORP1, PLAN 20R–18998, UTM ZONE 17, NAD83(CSRS) (CBNV6:2010.0)

POINT ID	NORTHING	EASTING
SCP 04519910020	4811461.27	607961.89
ORP1, PLAN 20R–18998	4810858.63	607644.24

COORDINATES ARE UTM ZONE 17, NAD 83 (ORIGINAL), TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10, AND CANNOT, IN THEMSELVES, BE USED TO RE–ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY A COMBINED SCALE FACTOR OF 0.9997358.



BOUNDARY NOTE

THIS IS NOT A PLAN OF SURVEY. BOUNDARIES ARE NOT CERTIFIED BY THIS PLAN, AND ARE SUBJECT TO CLARIFICATION UPON THE INCORPORATION OF ADDITIONAL DOCUMENTARY AND FIELD SURVEY EVIDENCE. THE BOUNDARY INFORMATION HAS BEEN TAKEN FROM PLAN 20R–19904 HAS NOT BEEN CONFIRMED.

BENCHMARK NOTES

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO TOWN OF OAKVILLE VERTICAL BENCH MARK NUMBER O.B.M. 252 HAVING AN ORTHOMETRIC ELEVATION OF 76.539 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD–1928:1978).

BRASS CAP IN THE FOUNDATION OF BRIDGE SUPPORT FOR REBECCA STREET/ RANDALL STREET BRIDGE OVER SIXTEEN MILE CREEK. BRASS CAP IS LOCATED ON SOUTHERLY END OF FOUNDATION (PIER 2) ON THE EASTERLY SIDE OF SIXTEEN MILE CREEK.

SURVEYOR'S CERTIFICATE

THE FIELD OBSERVATIONS REPRESENTED ON THIS PLAN WERE COMPLETED ON

THE 10th DAY OF JULY, 2018

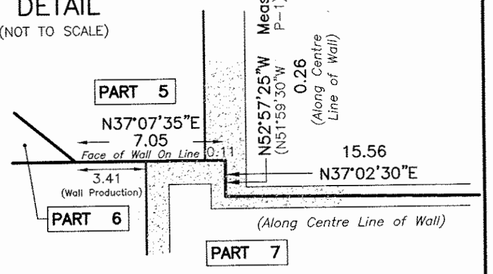
DATE JULY 23, 2018

PHILLIP S. SWIFT
ONTARIO LAND SURVEYOR

RADY–PENTEK & EDWARD SURVEYING LTD.
ONTARIO LAND SURVEYORS
643 Chrislea Road, Suite 7
Woodbridge, Ontario L4L 8A3
Tel.(416)635–5000 Fax (416)635–5001
Tel.(905)264–0881 Fax (905)264–2099
Website: www.r–pe.ca

DRAWN: P.S.S./S.L. CHECKED: P.S.S.
JOB No. 12–252 CAD FILE No. 12252tp1a

DETAIL
(NOT TO SCALE)



BLOCK 51 FABRIC NOTE

THERE ARE TWO PLANS REGISTERED TO AS PLAN N° 1 FOR BLOCK 51.

LOT FABRIC USED ON THIS PLAN AND IN THE LEGAL DESCRIPTIONS IS AS SHOWN ON PLAN 1 BEING HALTON COUNTY HISTORICAL ATLAS AND INCLUDES LOTS A AND 1 TO 8 BOTH INCLUSIVE.

LOT FABRIC AS SHOWN ON REGISTERED PLAN N° 1 AS CERTIFIED BY THE LAND REGISTRAR ON JUNE 3, 1969 INCLUDES NO DIVISION INTO LOTS IN BLOCK 51.

PARTS SCHEDULE

PART	LOT	BLOCK REGISTERED PLAN	PARCEL IDENTIFICATION NUMBER	AREA (m2)
1	PART OF LOT A	BLOCK 51 REGISTERED PLAN N° 1	ALL OF 24779–0144	14
2	PART OF LOT A PART OF LOTS 1 & 3			485
3	ALL OF LOT 2 PART OF LOTS 1,3 & 4		ALL OF 24779–0143	1013
4	PART OF LOT 4		ALL OF 24779–0146	118
5	PART OF LOT 4 & 6			541
6	PART OF LOT 6		ALL OF 24779–0147	36
7	PART OF LOT 6			390

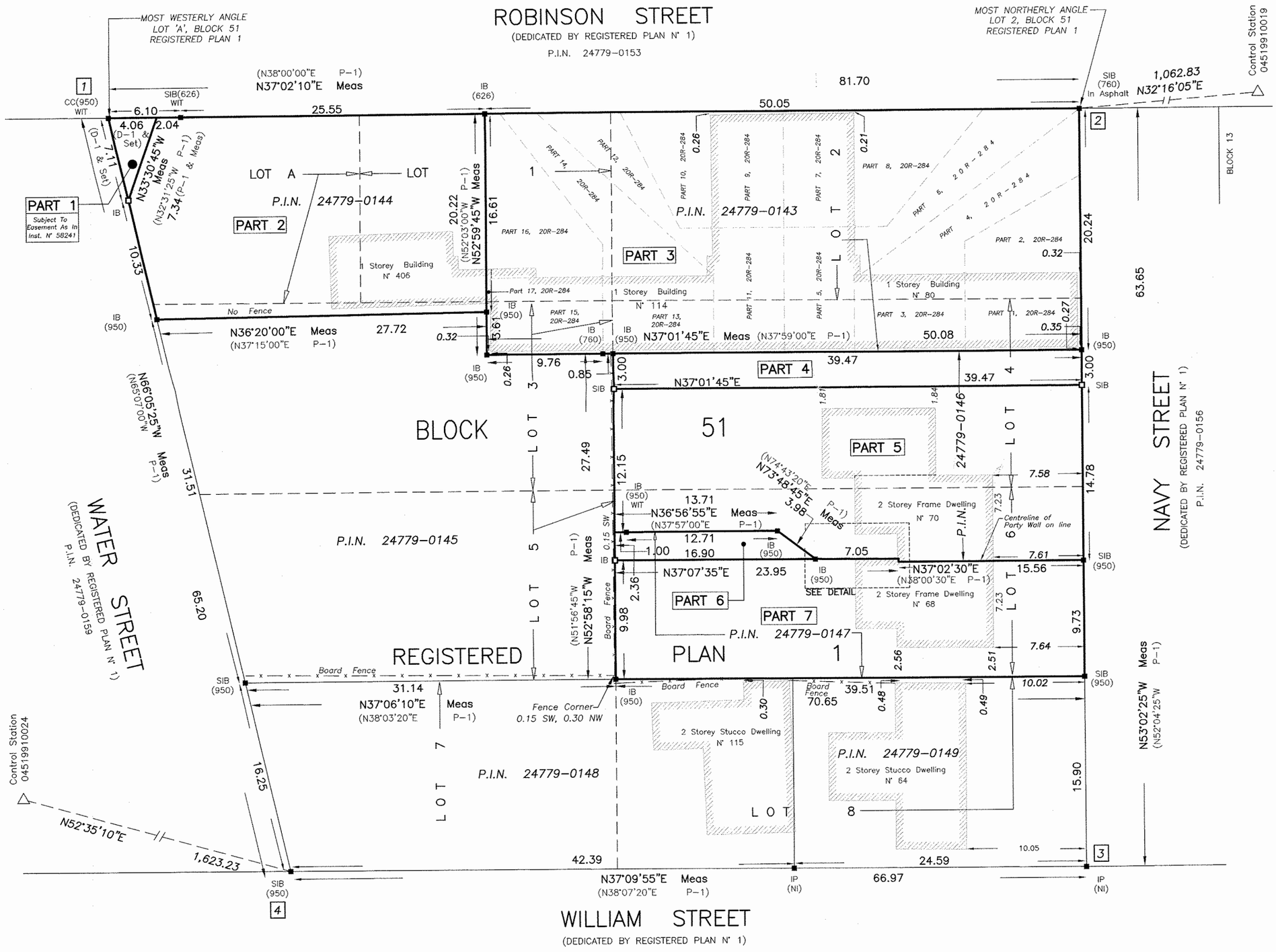
PART 1 – SUBJECT TO EASEMENT AS IN INSTRUMENT N° 58241.

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.

DATE: JULY 29, 2011

JARO A. LEGAT, M.Sc.
ONTARIO LAND SURVEYOR

PLAN 20R– 18998
RECEIVED AND DEPOSITED
DATE: AUG. 2ND, 2011
DEPUTY LAND REGISTRAR FOR THE LAND TITLES DIVISION OF HALTON (N° 20)



PLAN OF SURVEY OF

PART OF LOT 3
AND
ALL OF LOTS 'A', 1, 2, 4 AND 6
BLOCK 51
(LOT FABRIC AS SHOWN ON HALTON COUNTY HISTORICAL ATLAS)
REGISTERED PLAN N° 1
TOWN OF OAKVILLE
REGIONAL MUNICIPALITY OF HALTON

5 0 5 10 15
GRAPHIC SCALE – METRES
SCALE 1 : 250

BEARING NOTE

ALL BEARINGS SHOWN HEREON ARE UTM GRID, DERIVED FROM CONTROL MONUMENT N° 04519910019 AND 04519910024 BEING NAD 83 (ORIGINAL), 6° UTM PROJECTION, CENTRAL MERIDIAN 81° WEST LONGITUDE, ZONE 17.

SPECIFIED CONTROL POINTS (SCPs): UTM ZONE 17, NAD–83 (ORIGINAL).
CO–ORDINATES TO URBAN ACCURACY PER SEC. 14(2) OF O.REG. 216/10.

POINT N°	NORTHING	EASTING
04519910019	4,811,822.951	608,260.667
04519910024	4,809,846.543	606,414.821

CO–ORDINATES CAN NOT, IN THEMSELVES, BE USED TO RE–ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

DISTANCE NOTE

DISTANCES SHOWN HEREON ARE GROUND DISTANCES AND CAN BE CONVERTED INTO GRID DISTANCES BY MULTIPLYING BY A COMBINED SCALE FACTOR OF 0.99971227.

METRIC NOTE

DISTANCES AND CO–ORDINATES SHOWN HEREON ARE IN METRES AND CAN BE CONVERTED INTO FEET BY DIVIDING BY 0.3048.

LEGEND

■	DENOTES SURVEY MONUMENT FOUND
□	DENOTES SURVEY MONUMENT SET
SIB	DENOTES STANDARD IRON BAR
SSIB	DENOTES SHORT STANDARD IRON BAR
IB	DENOTES IRON BAR
IP	DENOTES IRON PIPE
CC	DENOTES CUT CROSS
WIT	DENOTES WITNESS
P.I.N.	DENOTES PROPERTY IDENTIFICATION NUMBER
(NI)	DENOTES NO IDENTIFICATION
(626)	DENOTES H.D. SEWELL, O.L.S.
(760)	DENOTES McCONNELL MAUGHAN LIMITED
(950)	DENOTES CUNNINGHAM McCONNELL LIMITED
P–1	DENOTES PLAN BY F.G. CUNNINGHAM MAY 1, 1998
D–1	DENOTES INSTRUMENT N° 58241

TABLE OF CO–ORDINATES

Point	Northing	Easting	Description
1	4810858.925	607644.186	CC
2	4810924.122	607693.378	SIB
3	4810885.863	607744.223	IP
4	4810832.506	607703.775	SIB

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 LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.

2) THE SURVEY WAS COMPLETED ON THE 26TH DAY OF JULY 2011.

DATE: JULY 26, 2011

JARO A. LEGAT, M.Sc.
ONTARIO LAND SURVEYOR

CUNNINGHAM McCONNELL LIMITED
ONTARIO LAND SURVEYORS

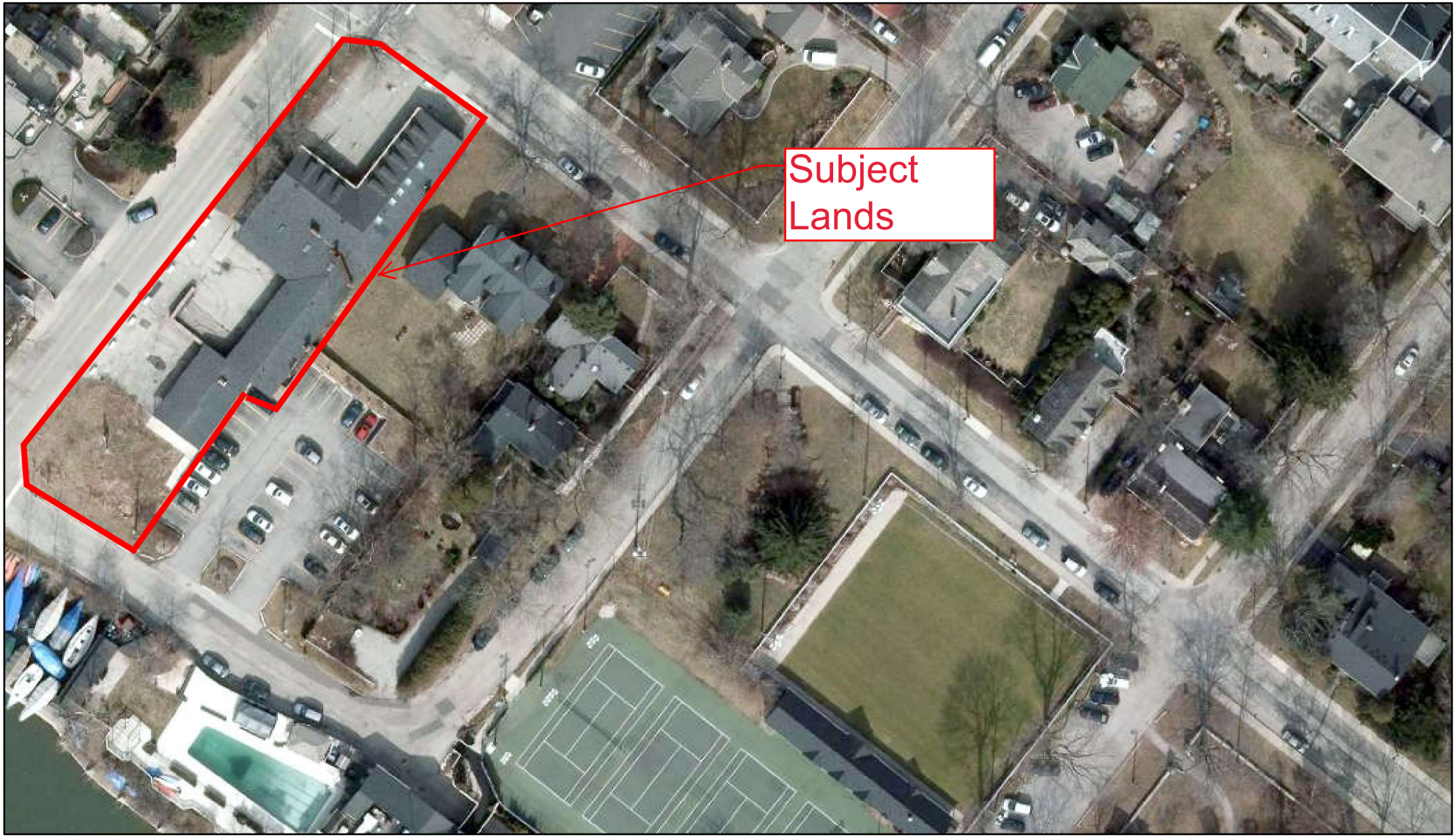
1200 SPEERS ROAD, UNIT 38
OAKVILLE, ONTARIO L6L 2X4
PHONE (905) 845–3497
FAX (905) 845–3519

205 MAIN STREET
MILTON, ONTARIO L9T 1N7
PHONE (905) 878–7810
FAX (905) 878–6672

PARTY CHIEF: SM
DRAWN BY: JAL

O.L.S. FILE N° 47–08UTM (BD–488)
PLAN N° 47–08–3

Town of Oakville Air Photo History 2012



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2012 Air Photo

Red: Red

Green: Green

Blue: Blue

1:1,128

0 37.5 75 150 ft

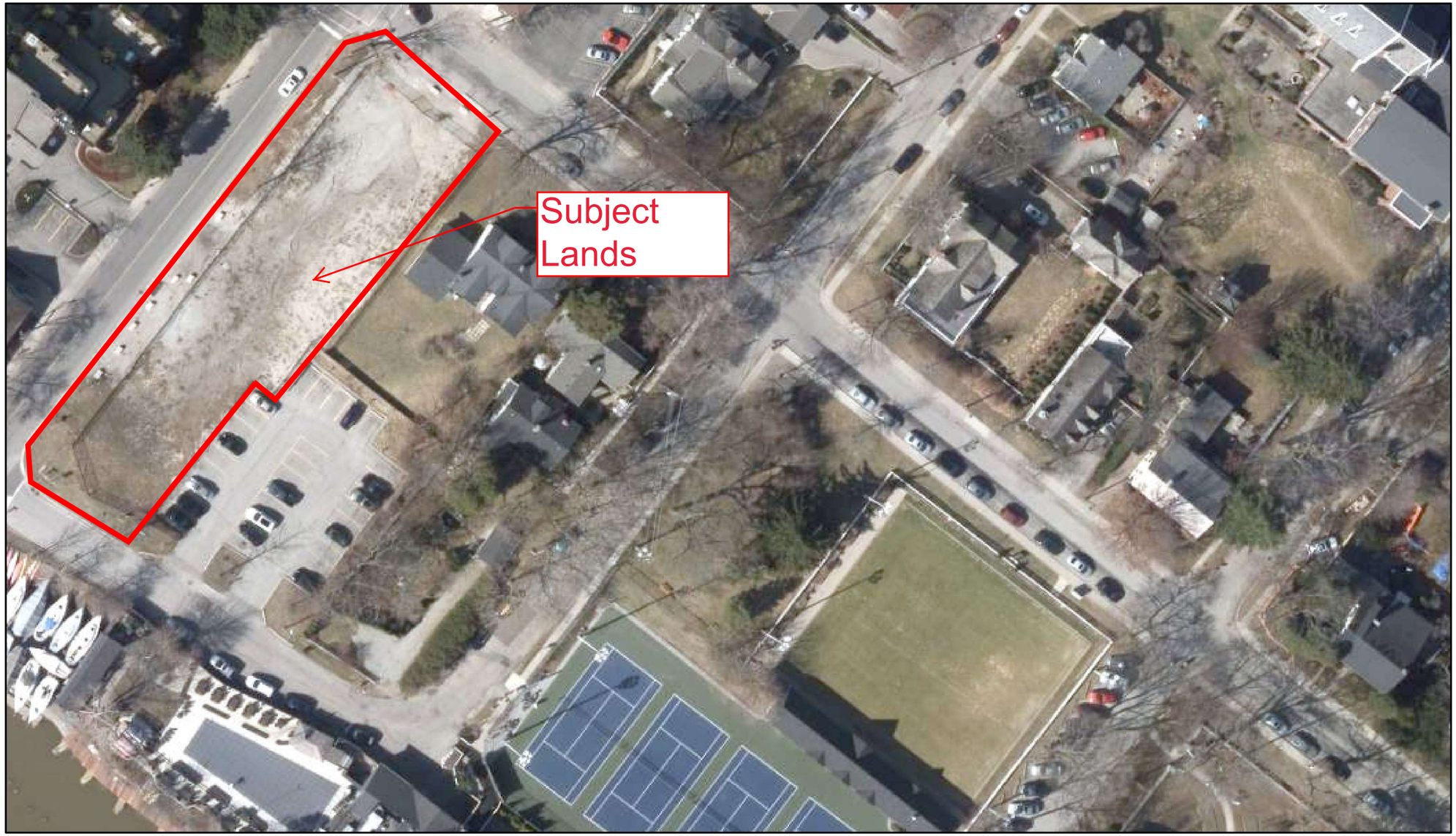
0 10 20 40 m

Town of Oakville, Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Town of Oakville

Sources: NRCan, Esri Canada, and Canadian Community Maps contributors. | Esri Canada | Esri Community Maps Contributors, City of Hamilton, Province of Ontario, Town of Oakville, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US

Town of Oakville Air Photo History 2015



5/11/2022, 5:57:45 PM

2015 Air Photo

Red: Red

Green: Green

Blue: Blue

1:1,128

0 37.5 75 150 ft

0 10 20 40 m

Town of Oakville, Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Town of Oakville

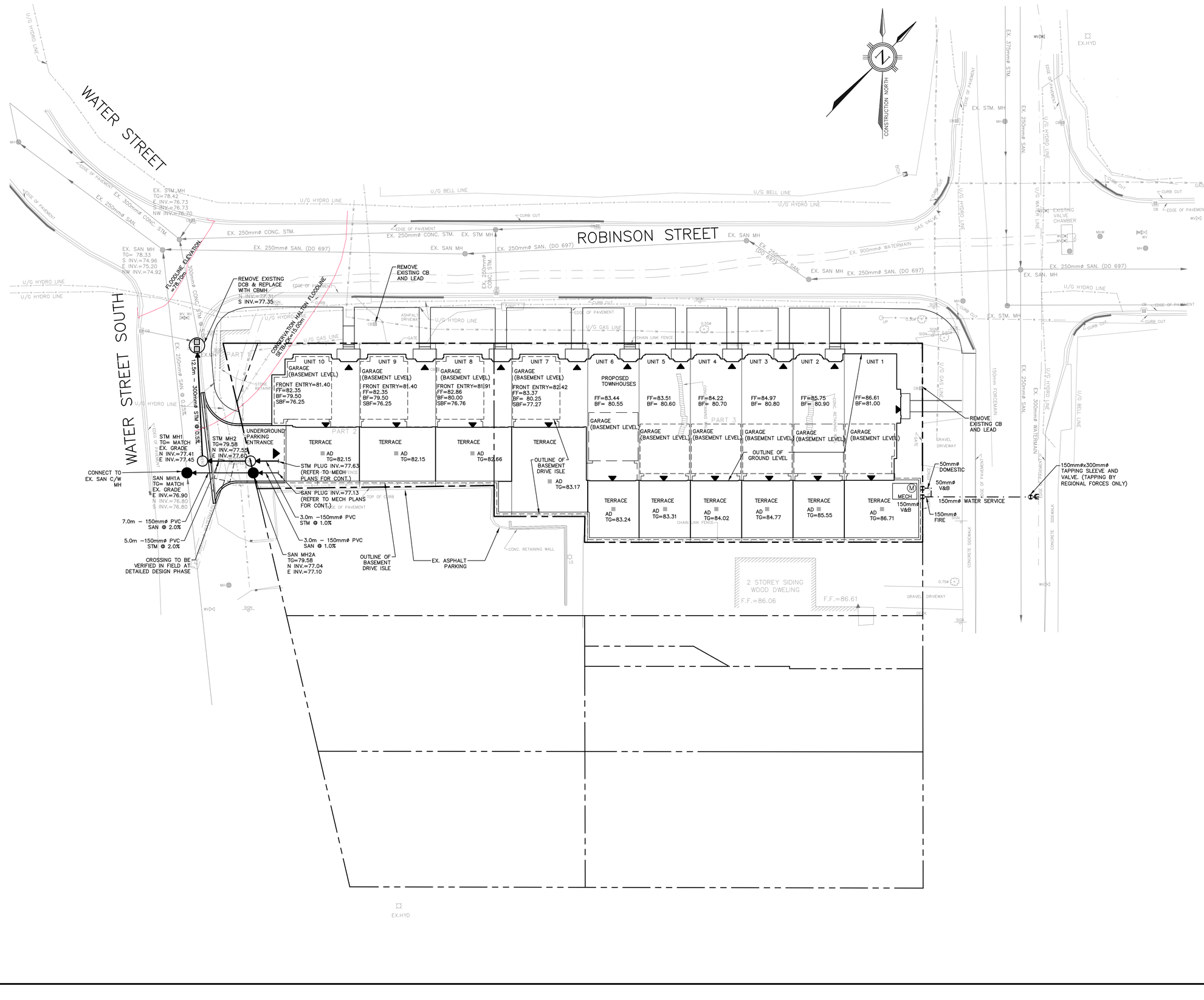
Sources: NRCan, Esri Canada, and Canadian Community Maps contributors. | Esri Canada | Esri Community Maps Contributors, City of Hamilton, Province of Ontario, Town of Oakville, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US

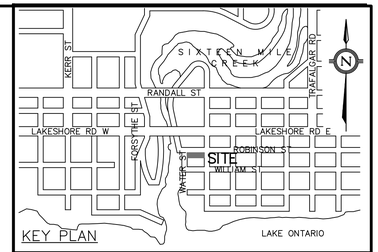
APPENDIX 'B'

Servicing Plan, Dwg. S1

Grading Plan, Dwg. G1

Record Drawings





LEGEND

- PROPOSED DOUBLE CATCHBASIN MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED VALVE & BOX
- PROPOSED AREA DRAIN
- PROPOSED WATER METER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- PROPERTY BOUNDARY

ISSUED FOR ZONING AMENDMENT
NOT FOR CONSTRUCTION

NO.	DATE	BY/DRAWN	REVISIONS
1	22/05/12	PC/KZ	ISSUED FOR ZONING AMENDMENT

CAD FILE: 1656GS.dwg | PLOT SCALE: 1:1 | PLOT DATE: May 12, 2022

BENCHMARK

ELEVATIONS ARE GEODETIC AND REFER TO THE TOWN OF OAKVILLE VERTICAL BENCH MARK NUMBER O.B.M. 252 HAVING AN ORTHOMETRIC ELEVATION OF 76.539 METRES. ELEVATIONS ARE REFERENCE TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD – 1928: 1978).

BRASS CAP IN THE FOUNDATION OF THE BRIDGE SUPPORT FOR REBECCA STREET/RANDALL STREET BRIDGE OVER SIXTEEN MILE CREEK. BRASS CAP IS LOCATED ON SOUTHERLY END OF FOUNDATION (PIER 2) ON THE EASTERLY SIDE OF SIXTEEN MILE CREEK.

NOTE

THE TOPOGRAPHIC DETAIL SHOWN HEREON WAS ACQUIRED ON MAY 26, 2020 BY RADY – PENTEK & EDWARD SURVEYING LTD., ONTARIO LAND SURVEYORS, FILE No. 12–252

LICENSED PROFESSIONAL ENGINEER
P. CIPONI
May 12 2022
PROVINCE OF ONTARIO

DESIGNED BY | APPROVED BY

CONSULTANT

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

PROJECT TITLE

PROPOSED TOWNHOUSES
ROSEVILLE PROPERTIES INC

LOCATION

TOWN OF OAKVILE
REGIONAL MUNICIPALITY OF HALTON

DRAWING TITLE

PRELIMINARY SITE SERVICING PLAN

SCALE 1:200	DESIGN BY PC	PROJECT No. 1656	
DRAWN BY KZ	CHECKED BY PC	PLAN No. S1	
DATE 2022/05/12	SHEET 1 OF 2		

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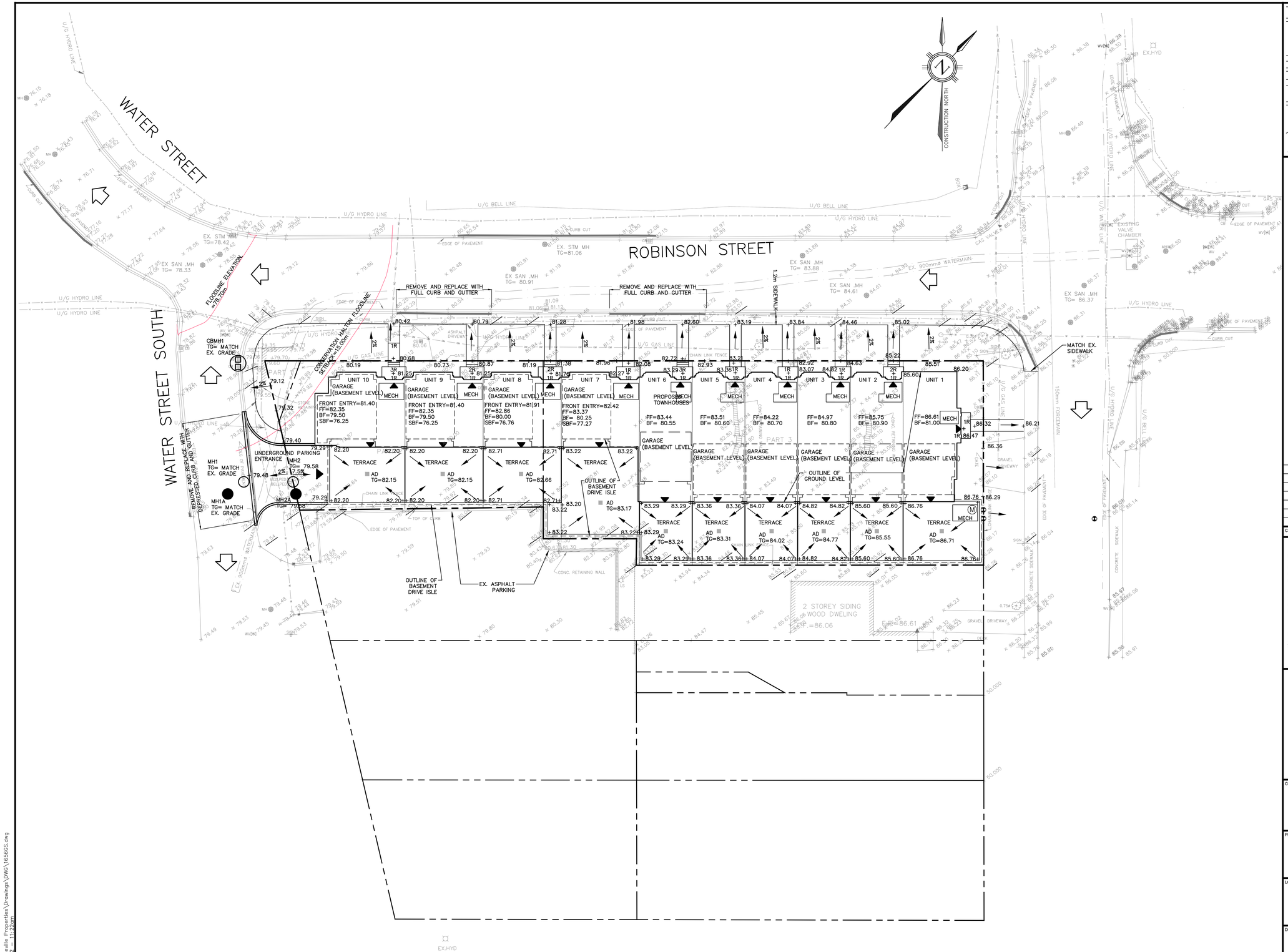

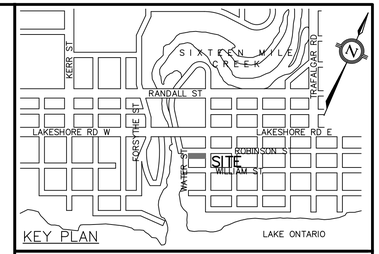

LEGEND

- PROPOSED DOUBLE CATCHBASIN MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED VALVE & BOX
- (M) PROPOSED WATER METER
- PROPERTY BOUNDARY
- 000.00 EXISTING ELEVATION
- 000.00 EXISTING ELEVATION TO REMAIN
- +100.00 PROPOSED FINISHED ELEVATION
- PROPOSED DRAINAGE DIRECTION
- PROPOSED OVERLAND FLOW DIRECTION
- PROPOSED AREA DRAIN

ISSUED FOR ZONING AMENDMENT
NOT FOR CONSTRUCTION

NO.	DATE	BY/DRAWN	REVISIONS
1	22/05/12	PC/KZ	ISSUED FOR ZONING AMENDMENT

CAD FILE: 1656GS.dwg | PLOT SCALE: 1:1 | PLOT DATE: May 12, 2022

BENCHMARK

ELEVATIONS ARE GEODETIC AND REFER TO THE TOWN OF OAKVILLE VERTICAL BENCH MARK NUMBER O.B.M. 252 HAVING AN ORTHOMETRIC ELEVATION OF 76.539 METRES. ELEVATIONS ARE REFERENCE TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD – 1928: 1978).

BRASS CAP IN THE FOUNDATION OF THE BRIDGE SUPPORT FOR REBECCA STREET/RANDALL STREET BRIDGE OVER SIXTEEN MILE CREEK. BRASS CAP IS LOCATED ON SOUTHERLY END OF FOUNDATION (PIER 2) ON THE EASTERLY SIDE OF SIXTEEN MILE CREEK.

NOTE

THE TOPOGRAPHIC DETAIL SHOWN HEREON WAS ACQUIRED ON MAY 26, 2020 BY RADY – PENTEK & EDWARD SURVEYING LTD., ONTARIO LAND SURVEYORS, FILE No. 12–252

PROFESSIONAL ENGINEER P. CIPONI May 12 2022 PROVINCE OF ONTARIO

DESIGNED BY | APPROVED BY

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

PROJECT TITLE
PROPOSED TOWNHOUSES
ROSEVILLE PROPERTIES INC

LOCATION
TOWN OF OAKVILE
REGIONAL MUNICIPALITY OF HALTON

DRAWING TITLE
PRELIMINARY GRADING PLAN

SCALE 1:200	DESIGN BY PC	PROJECT No. 1656	
DRAWN BY KZ	CHECKED BY PC	PLAN No. G1	
DATE 2022/05/12	SHEET 1 OF 2		

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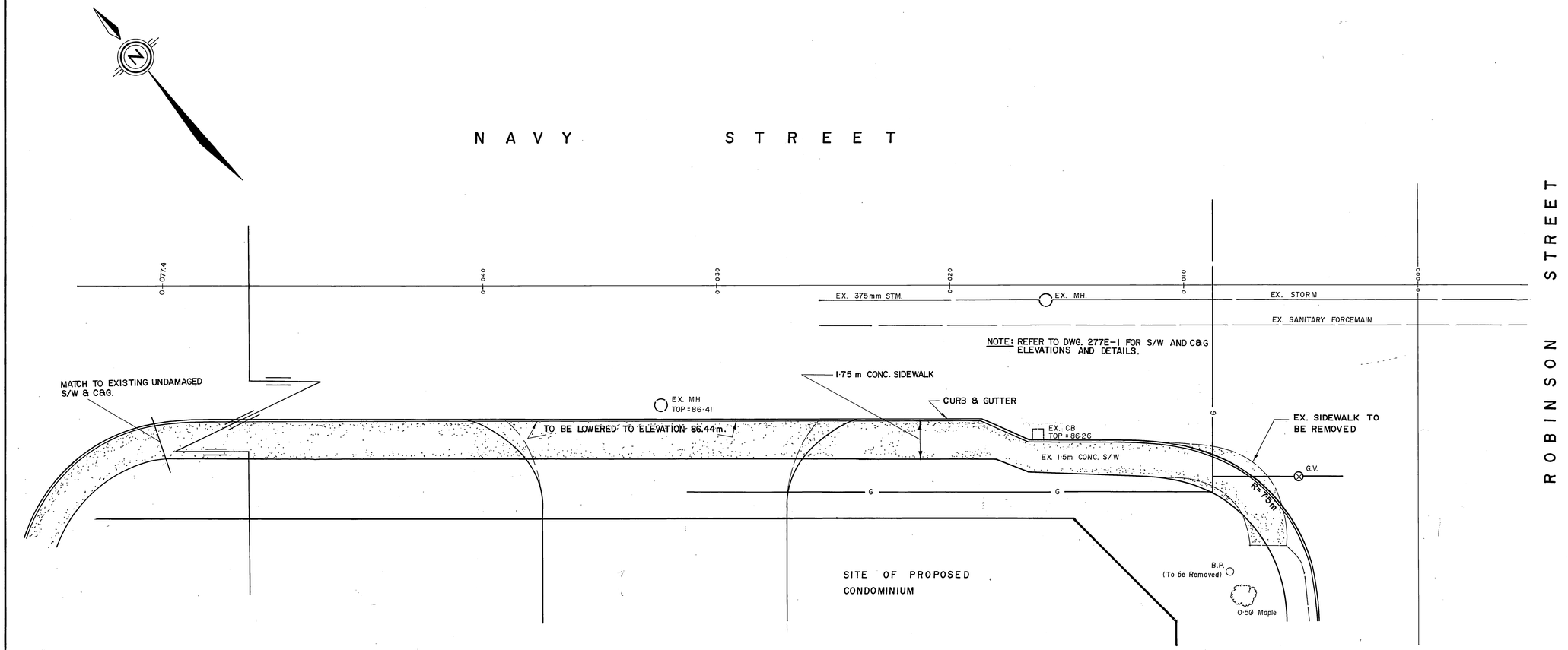
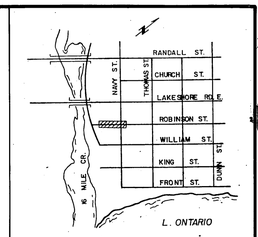
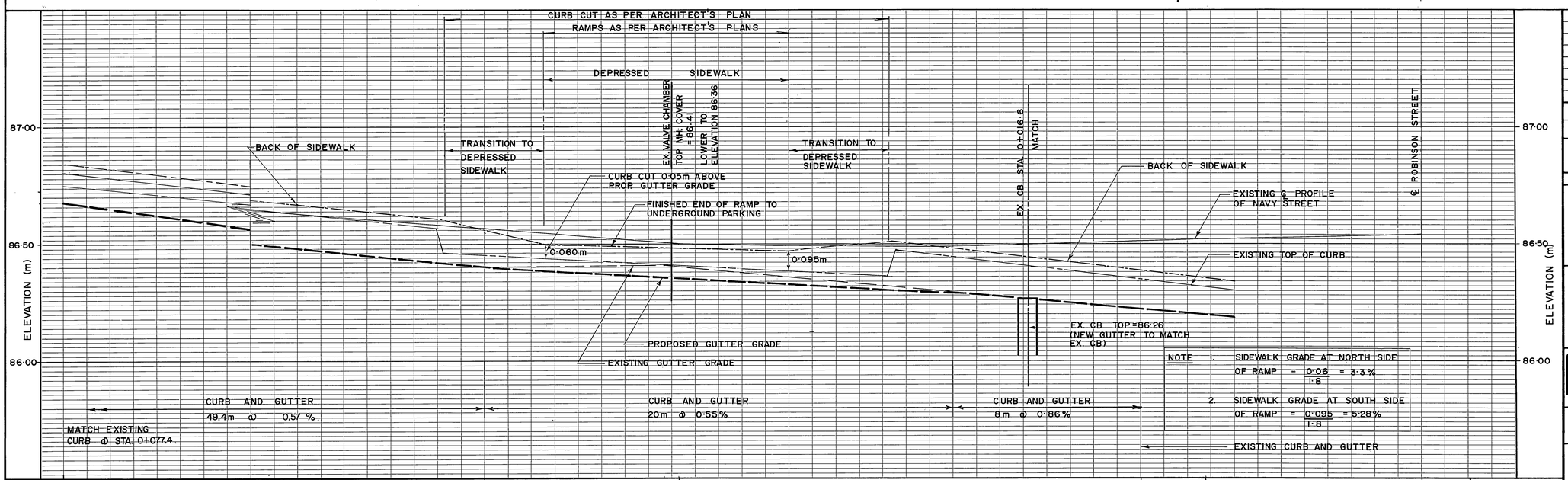




KEY PLAN Scale : N.T.S.

BENCHMARK: ELEV. = METRES
DESCRIPTION:



		±86.63		86.57		86.50			86.40			86.52		86.54	EXISTING ROAD CENTERLINE
86.68		86.50		86.40		86.41	86.38		86.29		82.22	86.20		EXISTING	EXISTING GUTTER GRADES
86.68		86.50		86.40	86373	86.36	86.345		86.323		86.29	MATCH EXISTING	86.20	EXISTING	PROPOSED GUTTER GRADES
0+077.4		0+050		0+040	0+035	0+031.7 ℄ RAMP	0+030		0+025		0+020	0+012	0+010	0+000	CHAINAGE

Nº	Date	By	REVISIONS		
Design	P. C.	Checked	E.P.C.	Date	JUNE, 1986
Drawn	A. R.	Checked	E.P.C.		

Scale 0 1 2 3 4 m 1:100 HORIZ.
0 0·1 0·2 0·3 0·4m 1:10 VERT.

REFERENCES

FIELD NOTES

APPROVALS

Municipal: APPROVED IN PRINCIPLE SUBJECT TO DETAILED CONSTRUCTION DESIGN CONFORMING TO TOWN STANDARDS AND SPECIFICATIONS.

Director of Public Works Date

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

Director of Public Works Date

STAMP

mc connell, maughan limited
CONSULTING ENGINEERS AND SURVEYORS
OAKVILLE – TORONTO
407 SPEERS ROAD, SUITE 209, OAKVILLE, L6K 3T5 TEL. (416) 845-3497

TOWN OF OAKVILLE
REGIONAL MUNICIPALITY OF HALTON

OAKVILLE GRANARY LTD.

PROPOSED SIDEWALK RE-CONSTRUCTION
NAVY STREET

MUNICIPAL DWG. Nº

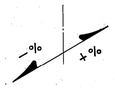
REGIONAL DWG. Nº

CONTRACT Nº

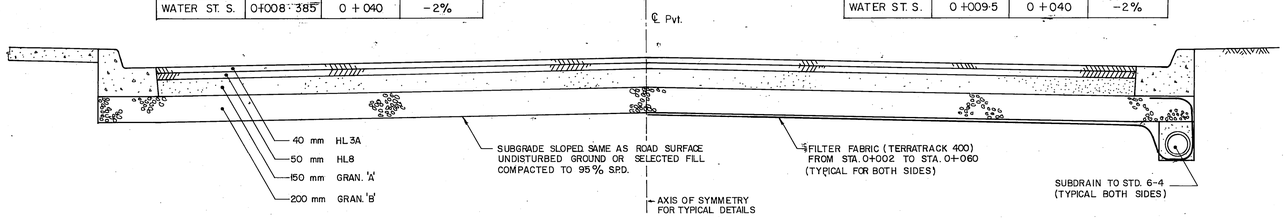
CONSULTANT'S DWG. Nº 277E-X

R-220-86-4

PAVEMENT CROSSFALL – N. EDGE OF PVT.			
STREET	FROM STA.	TO STA.	CROSSFALL
WATER ST.	0+002	0+040	−2%
	0+040	0+066	−2% to −4%
	0+066	0+078	−4%
ROBINSON ST.	0+078	0+092	−4%
	0+092	0+119	−4% to −2%
	0+119	0+170	−2%
WATER ST. S.	0+008·385	0+040	−2%

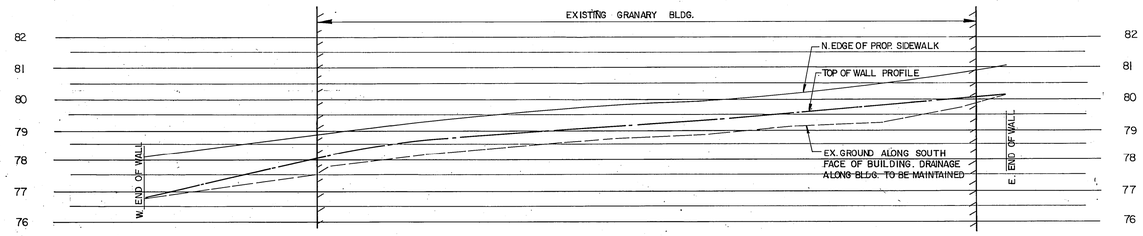


PAVEMENT CROSSFALL – S. EDGE OF PVT.			
STREET	FROM STA.	TO STA.	CROSSFALL
WATER ST.	0+002	0+040	−2%
	0+040	0+068	−2% to +4%
	0+068	0+076	+4%
ROBINSON ST.	0+076	0+092	+4%
	0+092	0+119	+4% to −2%
	0+119	0+170	−2%
WATER ST. S.	0+009·5	0+040	−2%



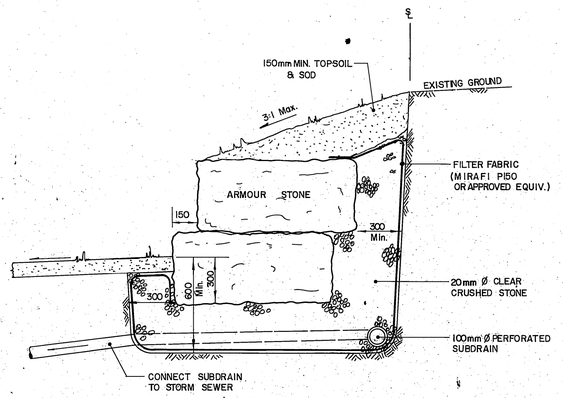
Typical Road Cross-Section

SCALE 1:25



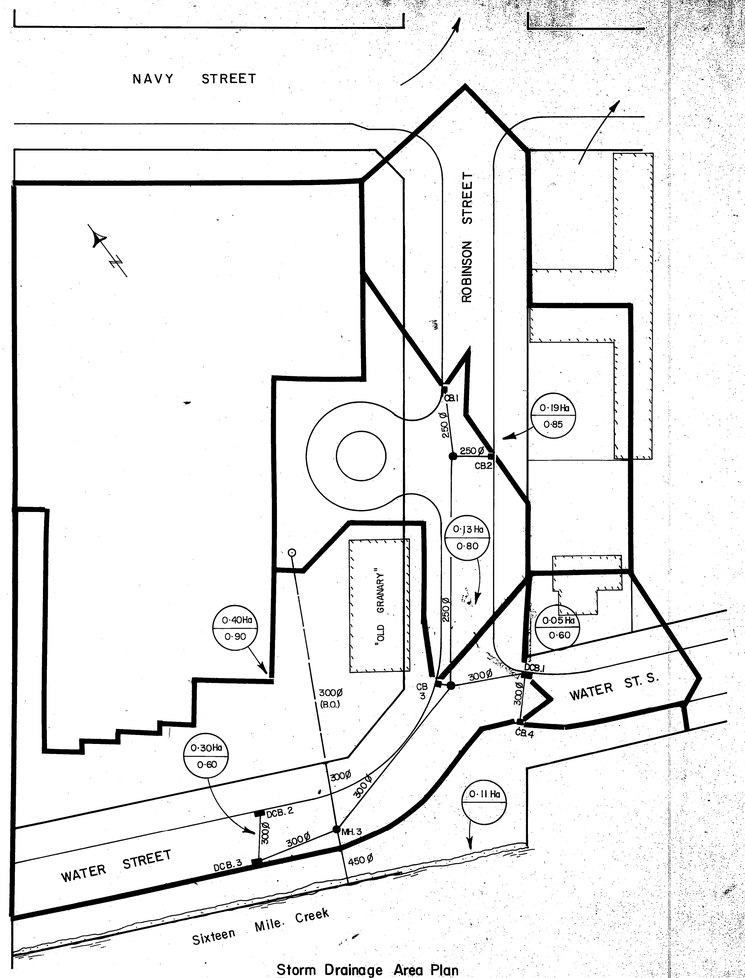
Armour Stone Wall Profile Along Old Granary

SCALE 1:100



Armour Stone Wall – Typical Section

SCALE 1:20



Storm Drainage Area Plan

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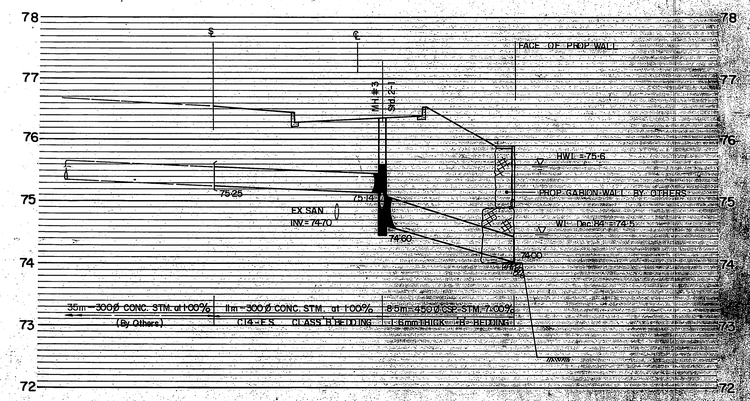


Profile of Storm Sewer Outlet

SCALE 1:50 Vert
1:200 Hor.

OAKVILLE GRANARY LTD.

REGISTERED PROFESSIONAL ENGINEER E. P. CHAJKA PROVINCE OF ONTARIO

CONSULTING ENGINEERS AND SURVEYORS

TOWN OF OAKVILLE
REGIONAL MUNICIPALITY OF HALTON

OAKVILLE GRANARY LTD.

TITLE

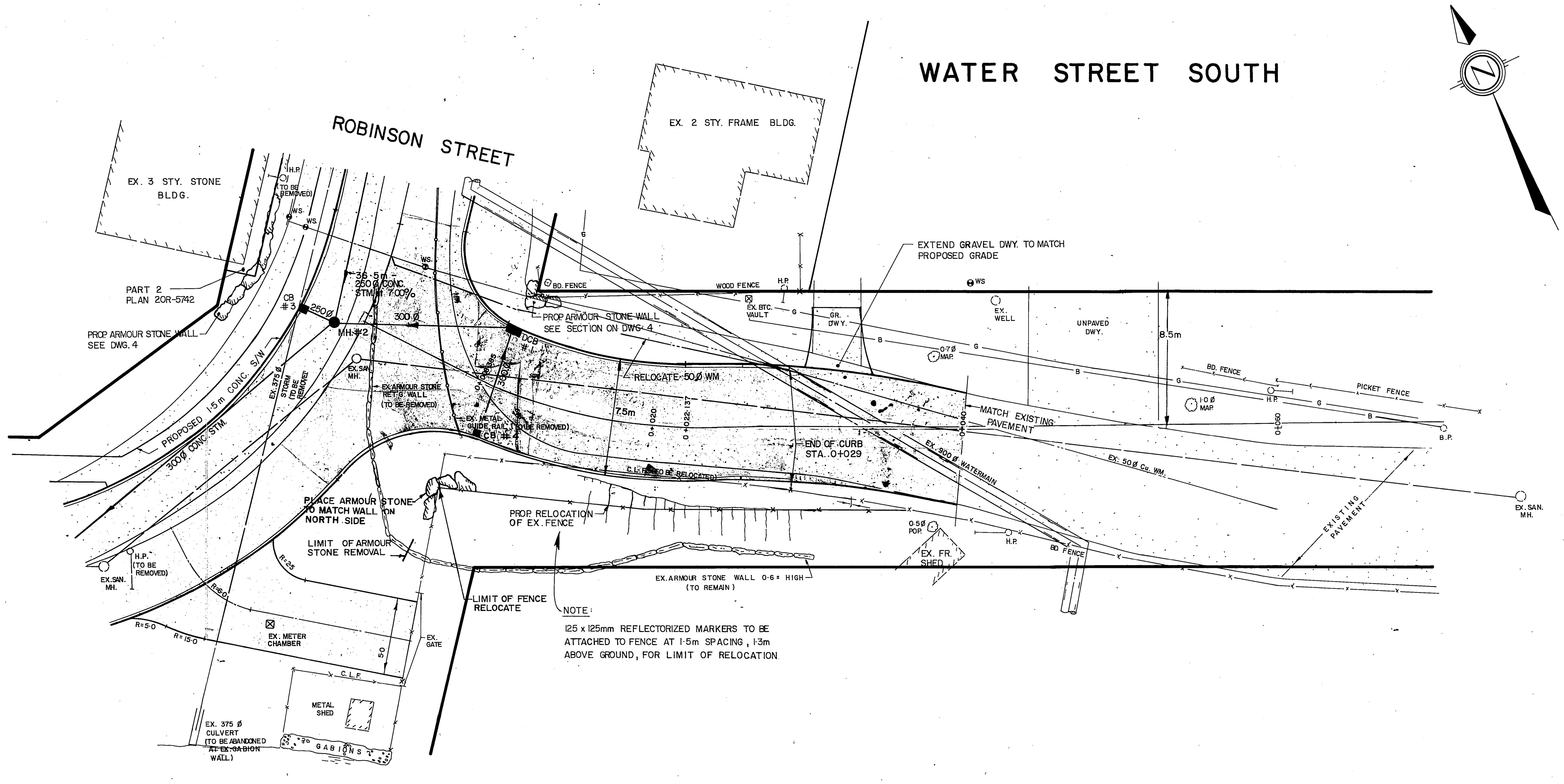
MISCELLANEOUS DETAILS

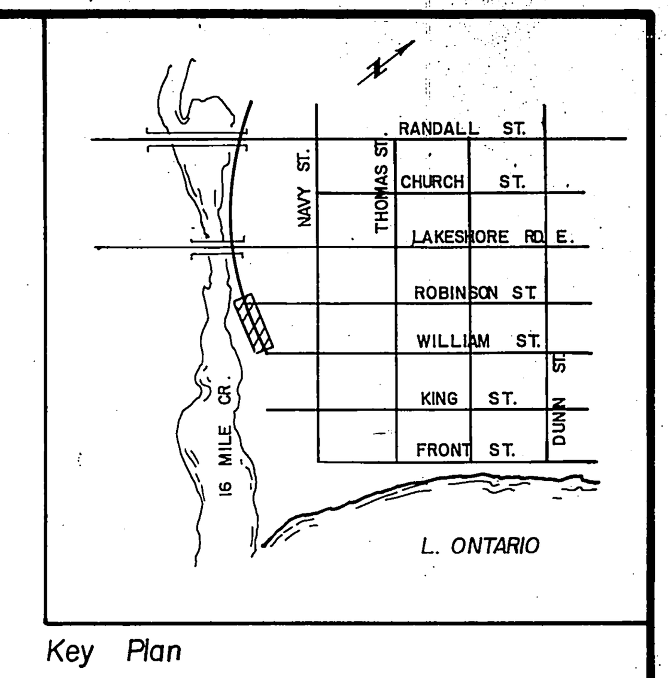
MUNICIPAL DRAWING NO.	REGIONAL DRAWING NO.
R-220-86	
CONTRACT NO.	SHEET 4 OF 4

1271E

R-220-86-3

METRIC





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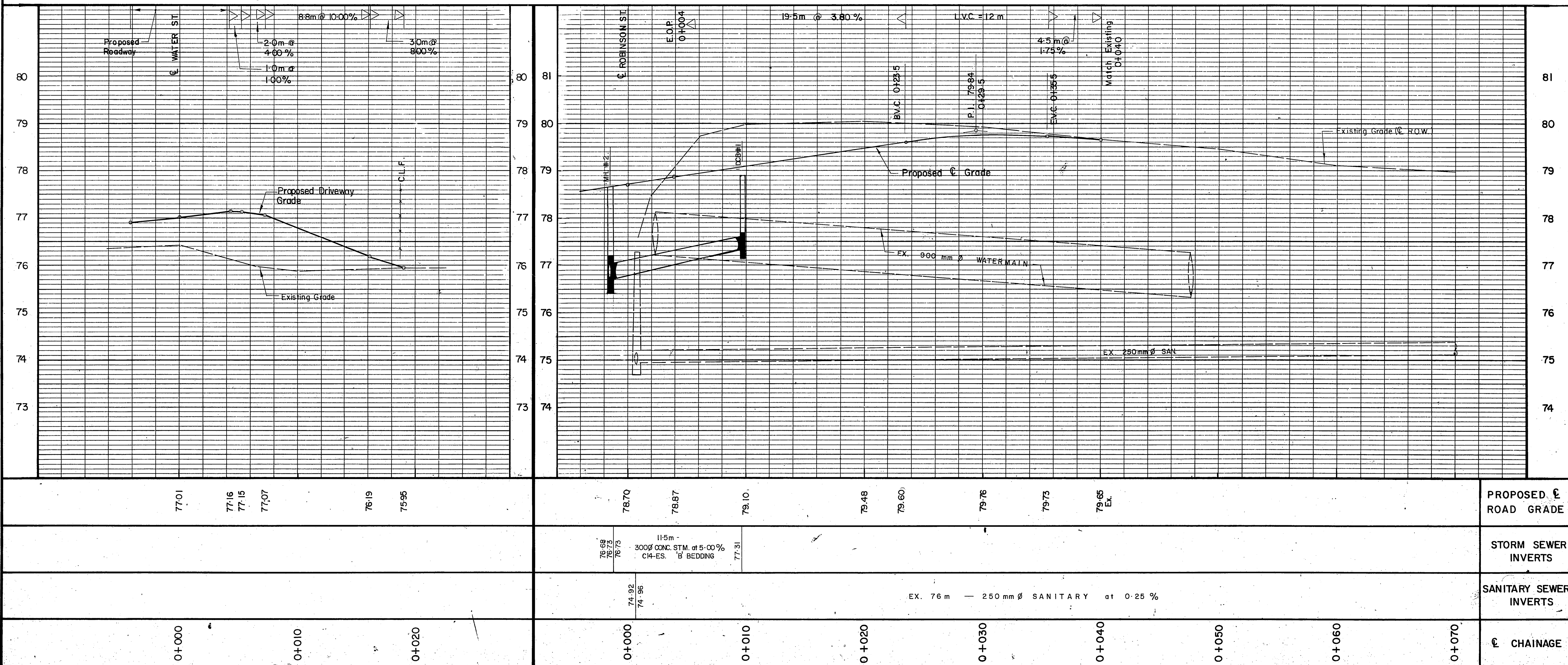


Nº	Date	By	REVISIONS
1	AUG/86	R.M	INTERSECTION @ WATER ST. S & ROBINSON

Design	D.B.	Checked	E.P.C.	Date
Drawn	D.B.	Checked	E.P.C.	OCTOBER, 1984

Scale 1:200 hor. 1:50 vert. 0 1 2 3 4 5 10 (m)

REFERENCES

FIELD NOTES

APPROVALS

Municipal APPROVED IN PRINCIPLE SUBJECT TO DETAILED CONSTRUCTION DESIGN CONFORMING TO TOWN STANDARDS AND SPECIFICATIONS.

[signature] 86-09-16
Director of Public Works — Date

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

Director of Public Works — Date

STAMP
REGISTERED PROFESSIONAL ENGINEER E. P. CHAJKA PROVINCE OF ONTARIO

mc connell, maughan limited — CONSULTING ENGINEERS AND SURVEYORS OAKVILLE - TORONTO
407 SPEERS ROAD, SUITE 209, OAKVILLE, L6K 3T5 TEL. (416) 845-3497

TOWN OF OAKVILLE
REGIONAL MUNICIPALITY OF HALTON

OAKVILLE GRANARY LTD.

TITLE
WATER STREET SOUTH
PLAN AND PROFILE
STA. 0+000 TO STA. 0+070

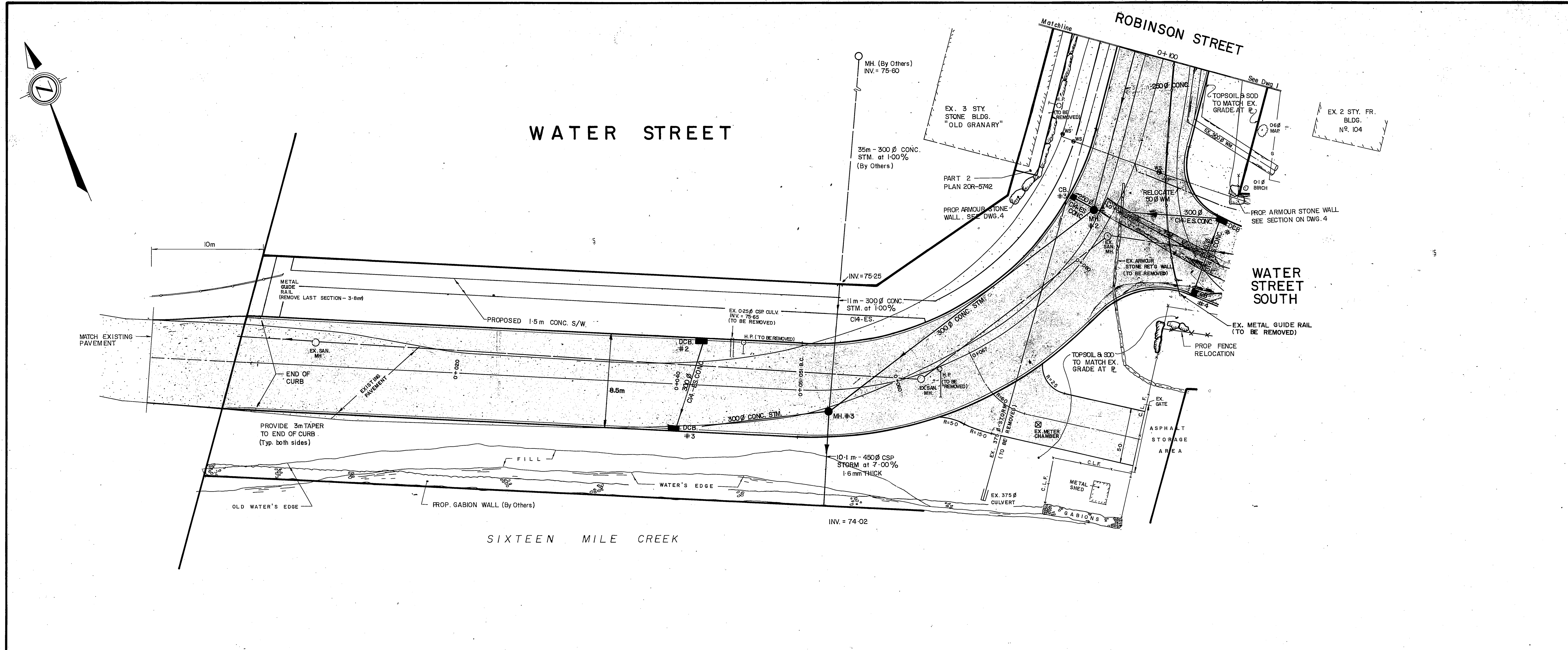
BOAT STORAGE ENTRANCE DWY.
PROFILE ALONG CENTRELINE OF DRIVEWAY

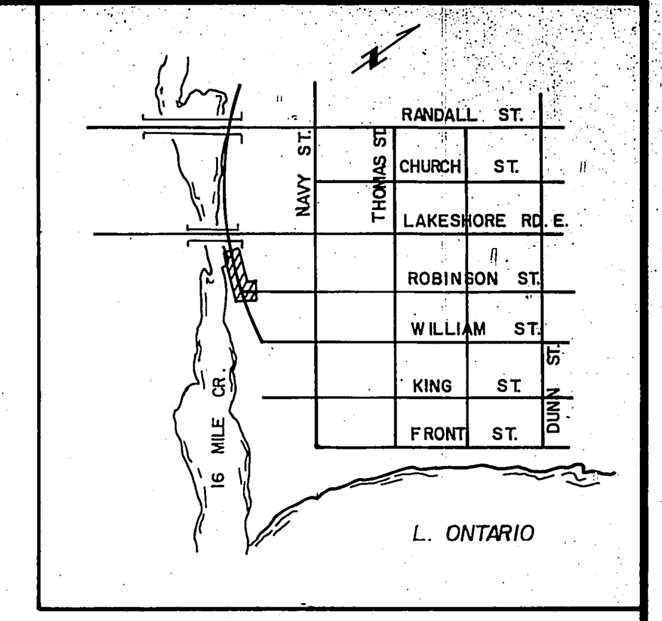
MUNICIPAL DRAWING Nº R-220-86
REGIONAL DRAWING Nº
CONTRACT Nº
PROJECT Nº 277E
SHEET 3 OF 4

OAKVILLE GRANARY LTD.

R-220-86-2

METRIC





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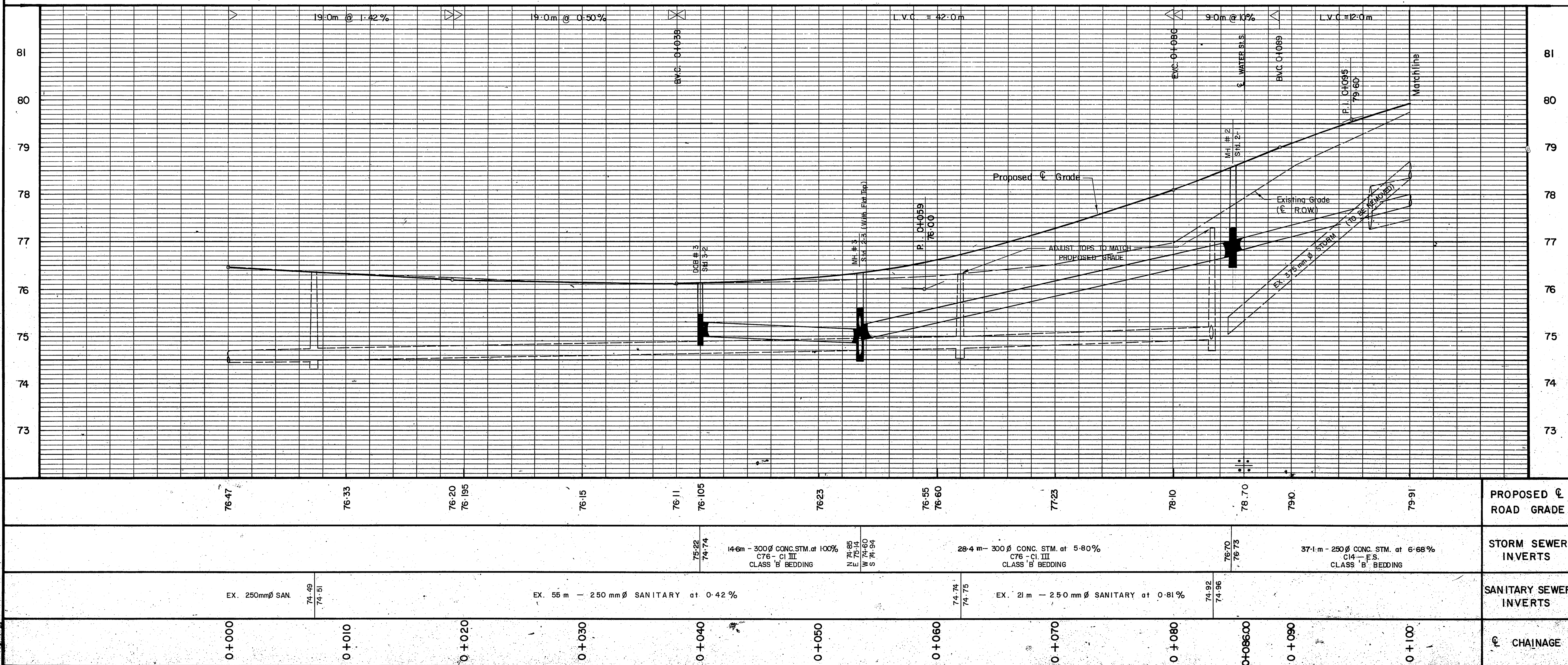


Nº	Date	By	REVISIONS
2	AUG/89	E.F.	REVISED AS PER CONSTRUCTION RECORDS
1	AUG/86	R.M	INTERSECTION @ WATER ST. S & ROBINSON

Design	D.B.	Checked	E.P.C.	Date
Drawn	D.B.	Checked	E.P.C.	OCTOBER, 1984

Scale 1:200 hor. 1:50 vert. 0 1 2 3 4 5 10 (m)

REFERENCES

FIELD NOTES

APPROVALS

Municipal APPROVED IN PRINCIPLE SUBJECT TO DETAILED CONSTRUCTION DESIGN CONFORMING TO TOWN STANDARDS AND SPECIFICATIONS.

[signature] 86-09-16
Director of Public Works Date

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

Director of Public Works Date

STAMP
REGISTERED PROFESSIONAL ENGINEER
E. P. CHAJKA
PROVINCE OF ONTARIO

mc connell, maughan limited
CONSULTING ENGINEERS AND SURVEYORS
OAKVILLE – TORONTO
407 SPEERS ROAD, SUITE 209, OAKVILLE, L6K 3T5 TEL. (416) 845-

TOWN OF OAKVILLE
REGIONAL MUNICIPALITY OF HALTON

OAKVILLE GRANARY LTD.

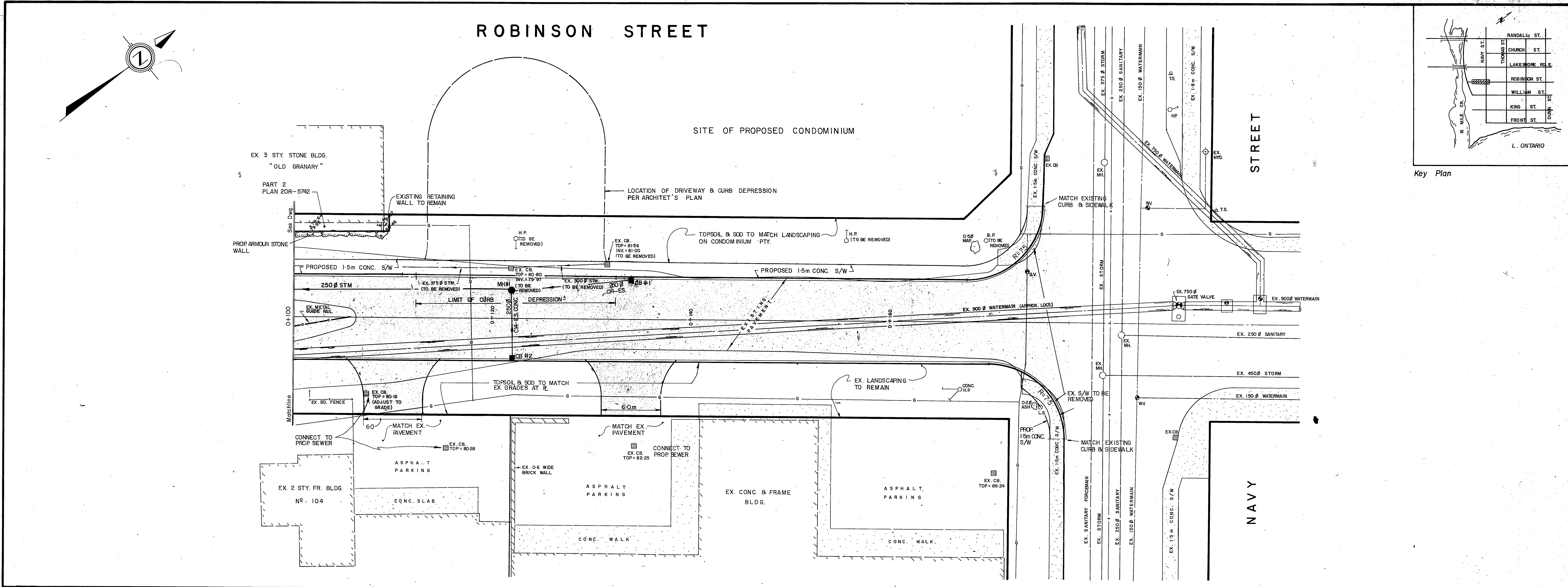
TITLE
WATER STREET
PLAN AND PROFILE
STA. 0+000 TO STA. 0+100

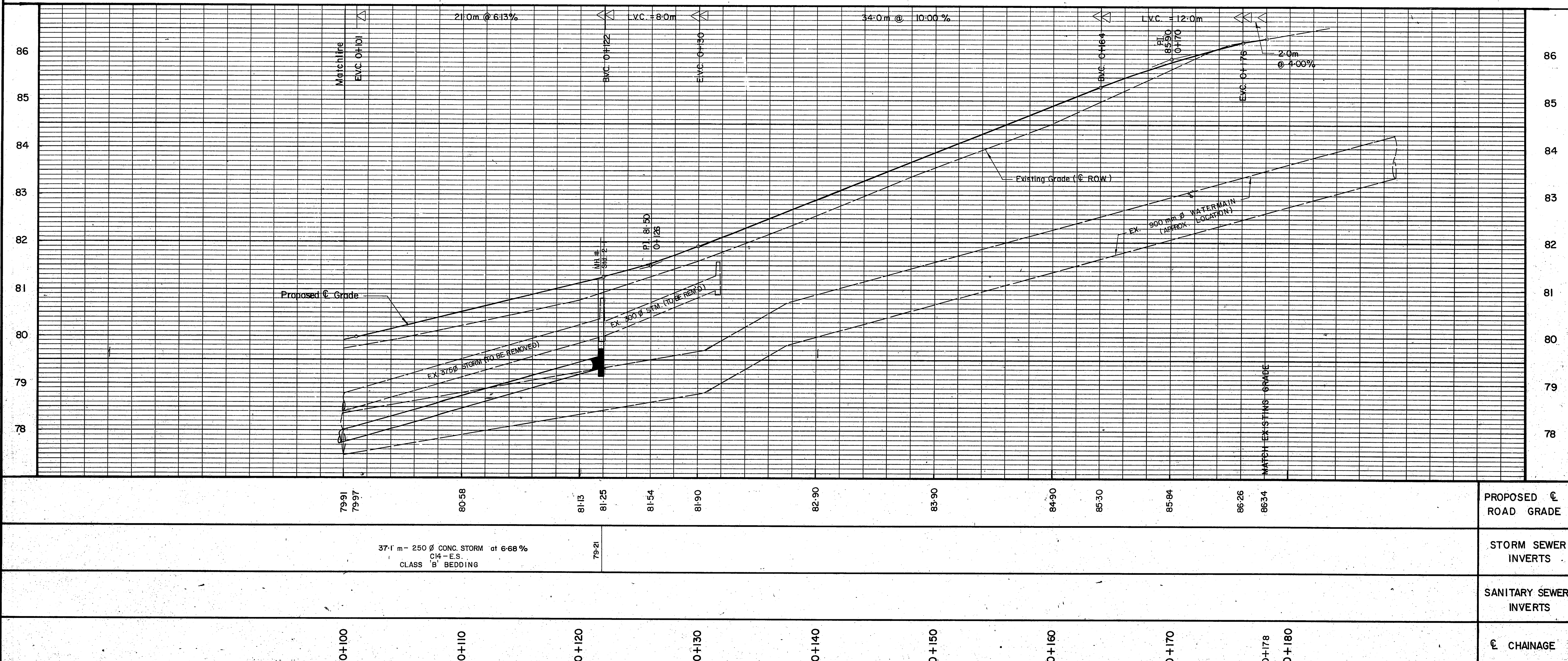
MUNICIPAL DRAWING Nº R-220-86
REGIONAL DRAWING Nº
CONTRACT Nº
PROJECT Nº 277E
SHEET 2 OF 4

OAKVILLE GRANARY LTD.

METRIC

R-220-86-1





No	Date	By	REVISIONS
1	AUG/89	E.F.	REVISED AS PER CONSTRUCTION RECORDS

Design	D.B.	Checked	E.P.C.	Date OCTOBER, 1984
Drawn	D.B.	Checked	E.P.C.	

Scale 1:200 hor 1:50 vert.

REFERENCES

FIELD NOTES

APPROVALS

Municipal APPROVED IN PRINCIPLE SUBJECT TO DETAILED CONSTRUCTION DESIGN CONFORMING TO TOWN STANDARDS AND SPECIFICATIONS.

86-09-16

Director of Public Works Date

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

Director of Public Works Date

STAMP: REGISTERED PROFESSIONAL ENGINEER E. P. CHAJKA PROVINCE OF ONTARIO

mcconnell, maughan limited CONSULTING ENGINEERS AND SURVEYORS

TOWN OF OAKVILLE

REGIONAL MUNICIPALITY OF HALTON

OAKVILLE GRANARY LTD.

TITLE

ROBINSON STREET

PLAN AND PROFILE

STA. 0+100·000 TO STA. 0+182·069

MUNICIPAL DRAWING No R-220-86

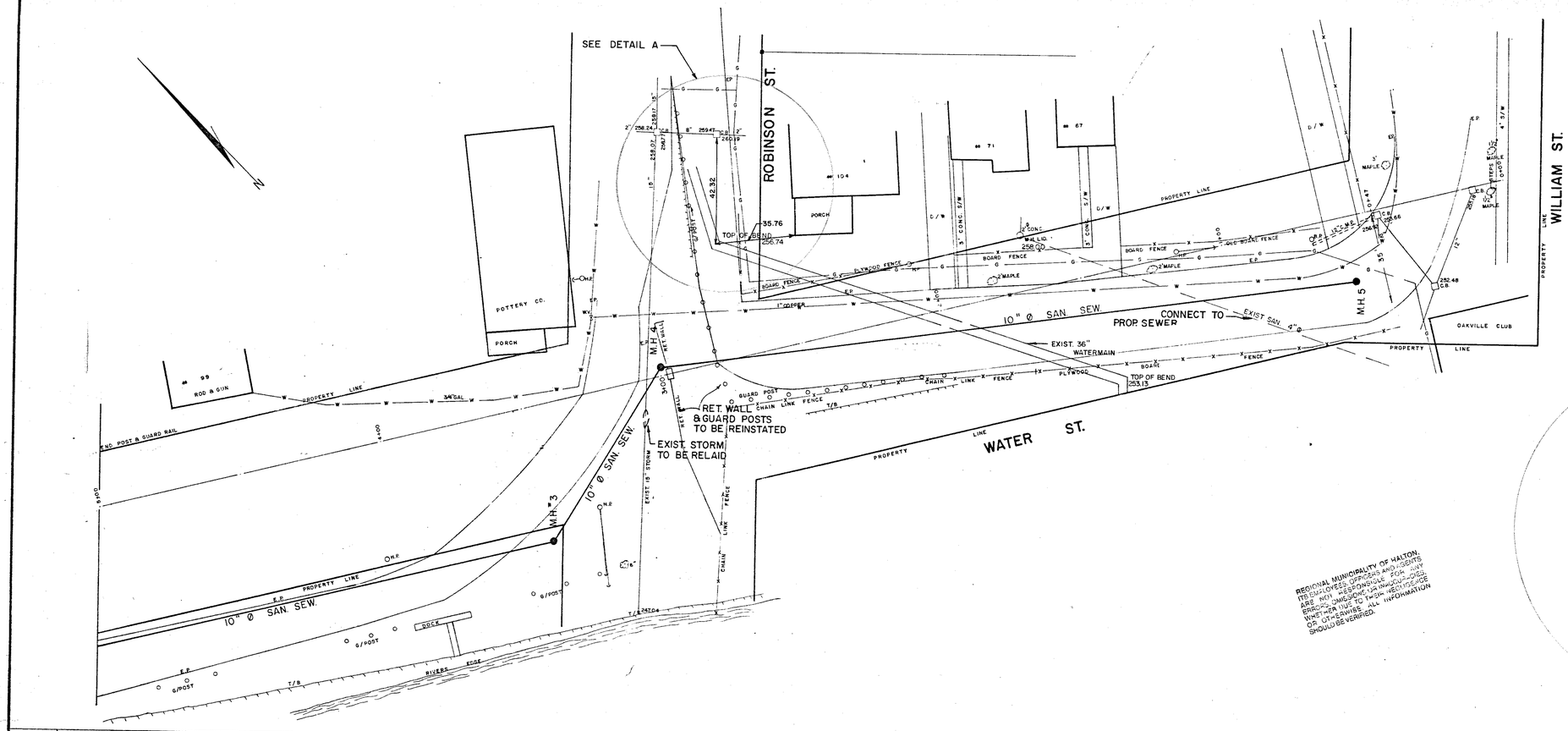
REGIONAL DRAWING No

CONTRACT No

PROJECT No 277E

SHEET 1 OF 4

OAKVILLE GRANARY LTD.



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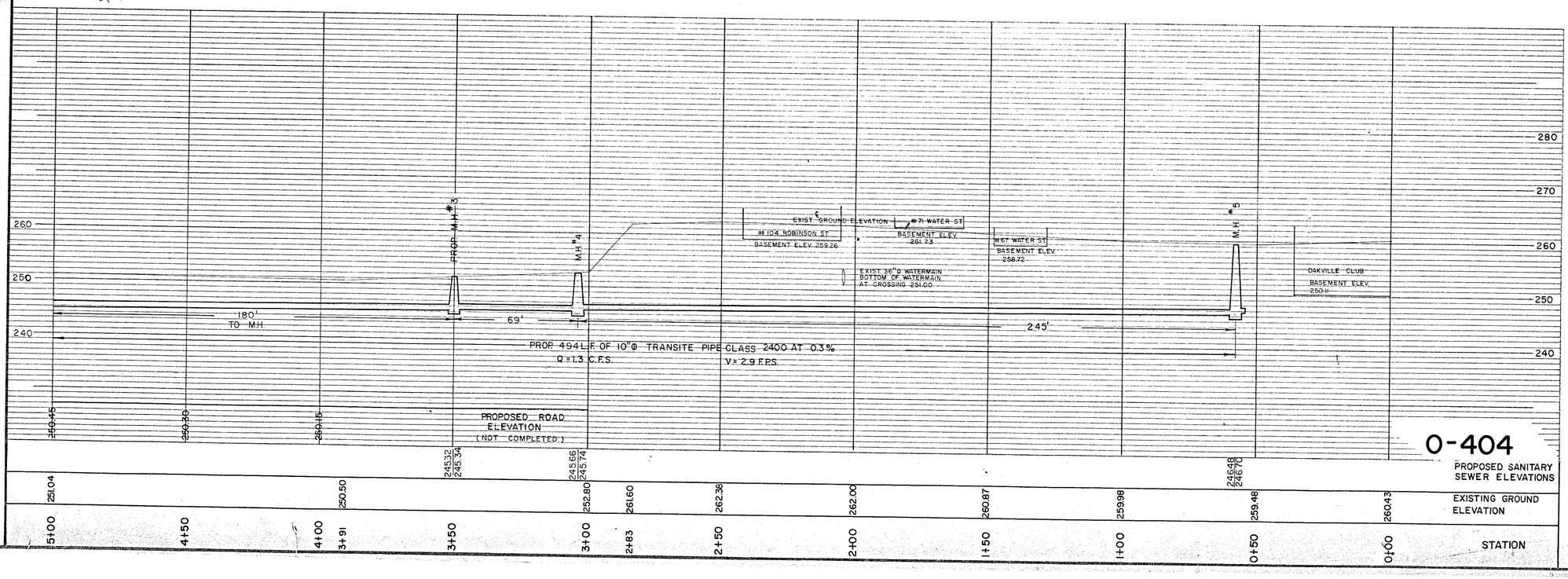


GENERAL NOTES

- ALL DRIVEWAYS GRAVEL UNLESS OTHERWISE NOTED.
- ALL SERVICE LOCATIONS ARE APPROXIMATE AND MUST BE LOCATED ACCURATELY IN THE FIELD.

LEGEND

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

TOWN OF OAKVILLE
ENGINEERING DEPARTMENT

PROPOSED 10"Ø SANITARY SEWER ON WATER STREET
FROM WILLIAM (STA. 0+47) STREET
TO WILLIAM ANDERSON BRIDGE (STA. 5+00)

FLOBK BCA #13

SCALES —	HOR: 1" = 20' VERT: 1" = 10'
DATE: 29/3/67	DESIGN BY: O.H.E.
DRAWN BY: K.A.J.	SURVEY BY: B.C.A.
CH'KD BY: L.D.M.	INSPECTOR:
FILE Nº: S-129	CONTRACTOR:

PLAN Nº S-129-67-1

G. N. BRISCO — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

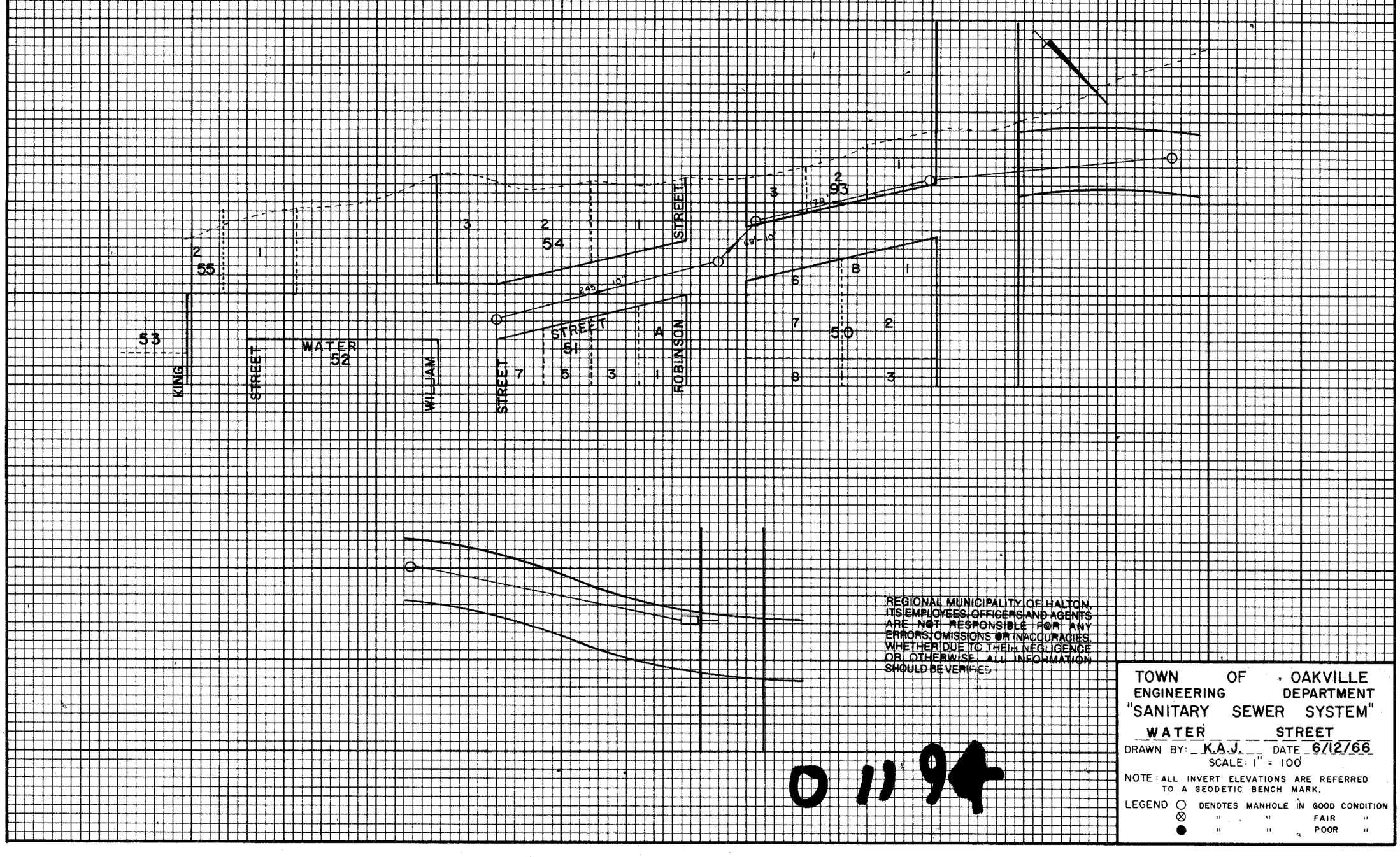
DATE	REVISIONS	BY
11/12/68	ALL PROP AS CONSTUCTED UNLESS OTHERWISE NOTED.	D.R.
11/12/68	PROP. ROAD NOT CONSTRUCTED	D.R.

0-404

PROPOSED SANITARY SEWER ELEVATIONS

0-404

0-1/94



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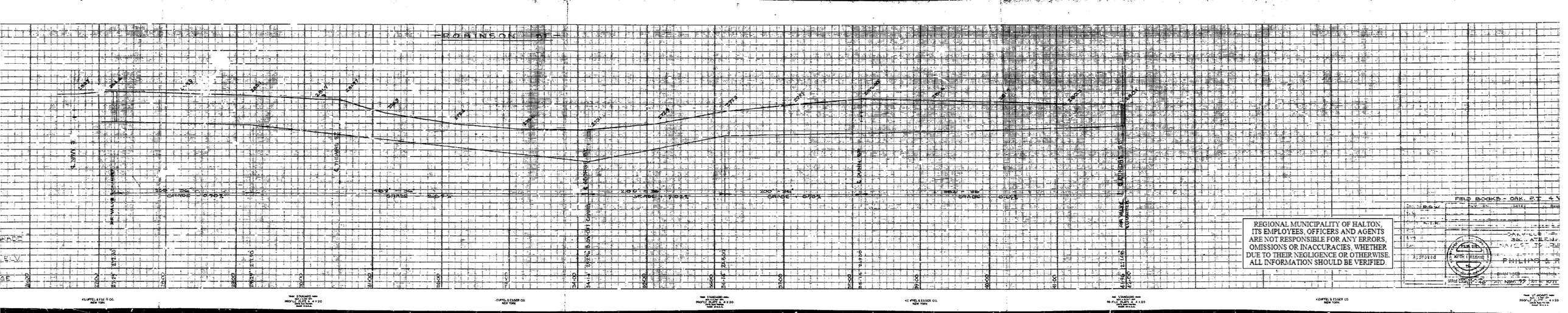
0 11 94

TOWN OF OAKVILLE
ENGINEERING DEPARTMENT
"SANITARY SEWER SYSTEM"
WATER STREET
DRAWN BY: K.A.J. DATE 6/12/66
SCALE: 1" = 100

NOTE: ALL INVERT ELEVATIONS ARE REFERRED TO A GEODETIC BENCH MARK.

LEGEND ○ DENOTES MANHOLE IN GOOD CONDITION
⊗ " " FAIR "
● " " POOR "


ROBINSON ST
S. JOHN ST
S. THOMAS ST
S. MEHRSE ST
S. DANIEL ST
GRADE - 0.50%
GRADE - 0.50%
GRADE - 0.70%
GRADE - 0.70%
PHILLIPS & JONES
REGIONAL MUNICIPALITY OF HALTON, ITS EMPLOYEES, OFFICERS AND AGENTS ARE NOT RESPONSIBLE FOR ANY ERRORS, OMISSIONS OR INACCURACIES, WHETHER DUE TO THEIR NEGLIGENCE OR OTHERWISE. ALL INFORMATION SHOULD BE VERIFIED.

LEGEND

EXIST. WM. & VALVE	PROP. WM. & VALVE
EXIST. HYDRANT & SECONDARY VALVE	PROP. HYDRANT & SECONDARY VALVE
EXIST. GASMAIN	
EXIST. BELL TEL. CABLE	
EXIST. HYDRO CONDUIT	
EXIST. BELL or HYDRO POLE	
EXIST. SIGN POST (TRAFFIC)	

BENCH MARK: SOUTH-WEST CORNER OF CONCRETE SLAB, 2'-0" WEST OF DOOR TO LADIES WASHROOM ON NORTH WALL OF OAKVILLE CLUB, WILLIAM STREET. EL. 255·80

REVISIONS	BY	DATE
AS BUILT	M.J.H.	JAN. 1979
TRANSFERRED TO OPERATING MAPS	GF	JAN 1980

APPROVED BY — DIRECTOR OF PUBLIC WORKS

APPROVED BY — MANAGER of DESIGN & CONSTRUCTION

THE REGIONAL MUNICIPALITY of HALTON
DEPARTMENT of PUBLIC WORKS
IN THE
TOWN OF OAKVILLE

DESIGN BY D.K.I
DRAWN BY M.J.H.
CHECKED BY

SCALE: HORIZONTAL 0' 10' 20' — VERTICAL 0' 2.5' 5'

WATER SUPPLY TO THE OAKVILLE CLUB

PROJECT TITLE

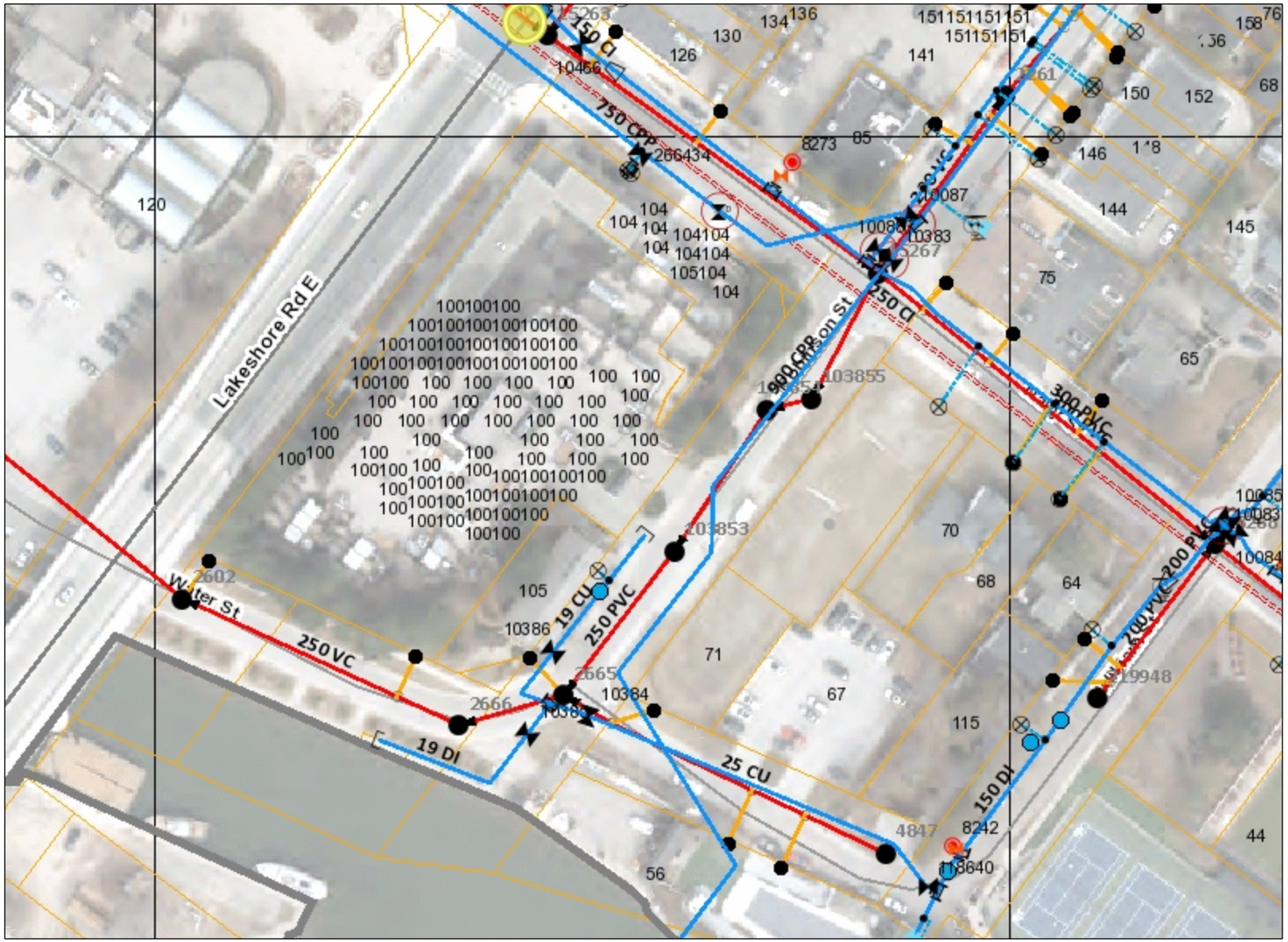
WILLIAM ST. 6" DIA. WATERMAIN FROM NAVY ST. TO WATER ST.

PAGE TITLE

CONTRACT No W-435-78
PROJECT No PR 435
DATE: DEC. 77
DWG. No O-PR435-78
SHT 1 OF 5

O-3537

Navy Street and Lakeshore road



Legend

Water Control Valve
- System
- SystemDP
- Zone
- ZoneDP

Water Service Valve
- CurbStop
- PropertyLine
- Secondary
- TappingValve

Water Hydrant

Water Fitting
- Cap
- Cross
- HBend
- MainStop
- Reducer
- Sleeve
- TappingSleeve
- Tee
- VBend

Water Chamber
- Chamber

Notes:

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Information Valid as of: 5/11/2022

58.5 0 29.27 58.5 Metres

1: 1,171

APPENDIX 'C'

Estimated Sanitary Flow

Water Street PS Flow Monitoring Data

Daily Lake Ontario Levels

TRAFALGAR ENGINEERING LTD.

ESTIMATED SANITARY FLOW

Project: Proposed Townhouse
Desc: Zoning Amendment

Project No.: 1656
Prepared By: KZ
Checked By: PC

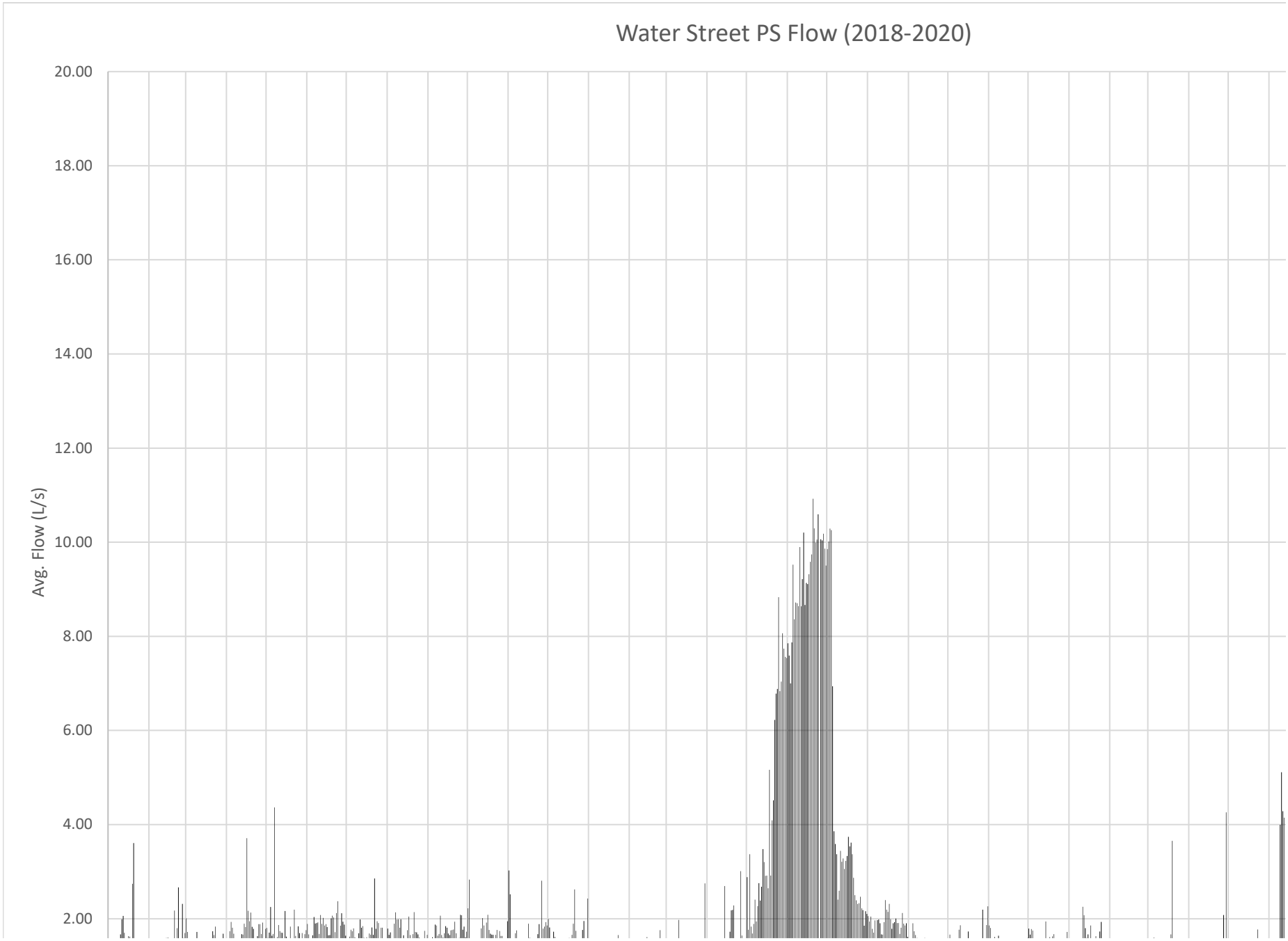
Residential

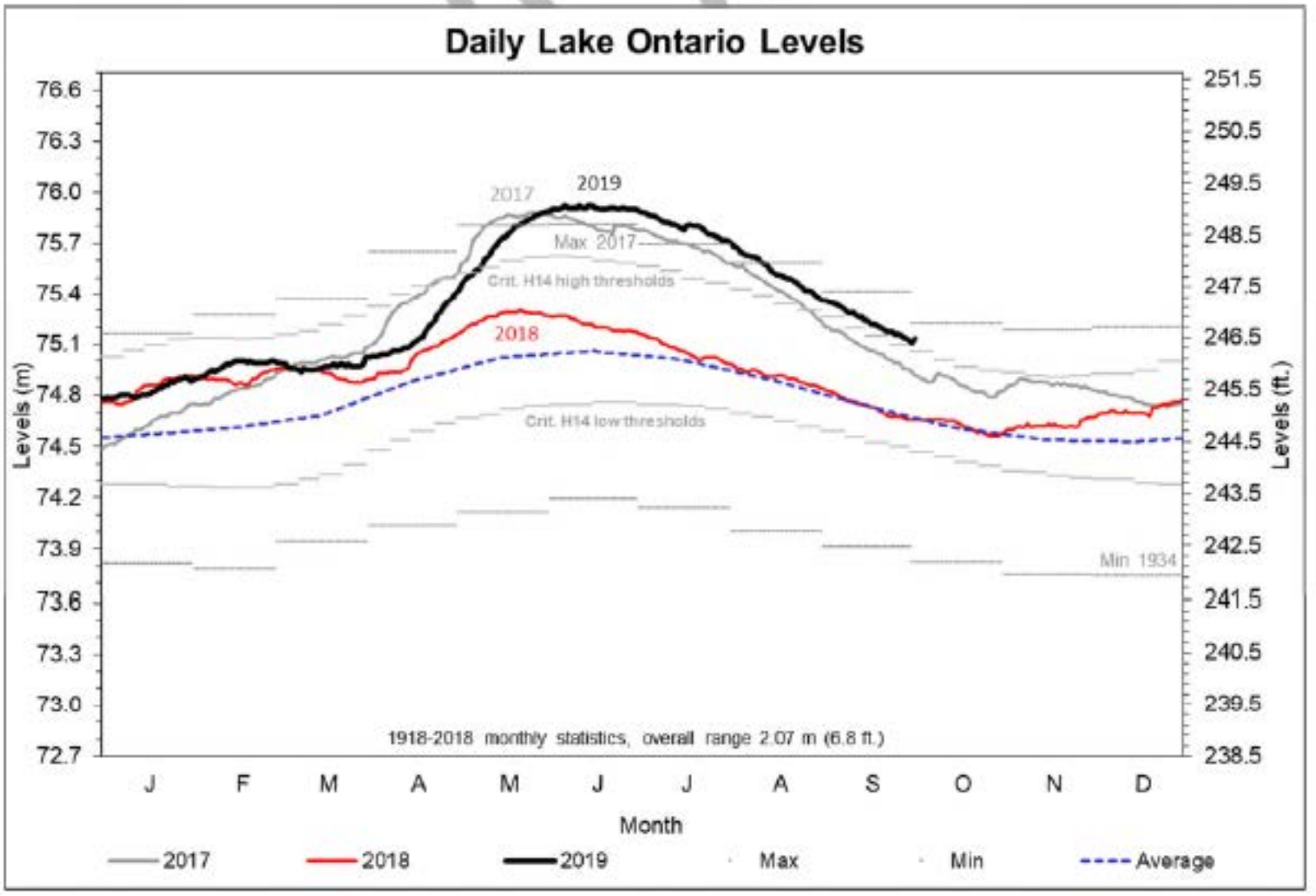
Land Use / Occupancy Type	Area (ha)	Population Density (pers/ha)	Eq. Population (cap.)	Per Cap. Demand (L/cap. Day)	Average Daily Dry Weather Flow (L/s)
Townhouses	0.16	135.0	22	275	0.1
TOTAL	**0**		**22**		**0.1**

Industrial / Commercial / Institutional

Land Use / Occupancy Type	GFA	Population Density (pers/ha)	Eq. Population (cap.)	Per Cap. Demand (L/Ha. Day)	Average Daily Dry Weather Flow (L/s)
					0.0
TOTAL	**0**		**0**		**0.0**

Residential Peaking Factor:	4.38	
ICI Peaking Factor:	4.50	
Include ICI Peaking?	No	
Tributary Area:	0.16	(ha)
Infiltration Allowance:	0.29	(L/s ha)
Foundation Drain Allowance:	0.00	(L/s ha)
Residential + Infiltration Flow:	0.1	(L/s)
ICI Average Flow:	0.0	(L/s)
Groundwater Discharge:	0.0	(L/s)
Total Average Flow:	**0.1**	**(L/s)**
Residential Peak Flow:	0.3	(L/s)
ICI Peak Flow:	0.0	(L/s)
Groundwater Discharge:	0.0	(L/s)
Total Peak Flow:	**0.3**	**(L/s)**


Water Street PS Flow (2018-2020)
Avg. Flow (L/s)
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00


Daily Lake Ontario Levels
76.6
76.3
76.0
75.7
75.4
75.1
74.8
74.5
74.2
73.9
73.6
73.3
73.0
72.7
Levels (m)
251.5
250.5
249.5
248.5
247.5
246.5
245.5
244.5
243.5
242.5
241.5
240.5
239.5
238.5
Levels (ft.)
2017
2019
Max 2017
Crit. H14 high thresholds
2018
Crit. H14 low thresholds
Min 1934
1918-2018 monthly statistics, overall range 2.07 m (6.8 ft.)
J
F
M
A
M
J
J
A
S
O
N
D
Month
2017
2018
2019
Max
Min
Average

APPENDIX 'D'

Stormwater Management Calculations

Record Drawings

TRAFALGAR ENGINEERING LTD.

COMPOSITE RUNOFF COEFFICIENT

Project: Proposed Townhouses
Desc: Zoning Amendment

Project No.: 1656
Prepared By: KZ
Checked By: PC

Pre-Development Composite Runoff Coefficient

Surface	'A' (m^2)	'C'	'AC'	% Imp	'AI'
Area A	700	0.85	595	0%	-
Area B	200	0.60	120		-
			-		-
			-		-
			-		-
Totals	**900**		**715**		**-**
		C = 'AC'/'A'= 0.79		**%I = 'AI'/'A' = -**	

External Drainage Area Composite Runoff Coefficient

Surface	'A' (m^2)	'C'	'AC'	% Imp	'AI'
			-	0%	
			-		-
			-		-
			-		-
			-		-
Totals	**-**		**-**		**-**
		C = 'AC'/'A'= -		**%I = 'AI'/'A' = -**	

Post-Development Controlled Area Composite Runoff Coefficient

Surface	'A' (m^2)	'C'	'AC'	% Imp	'AI'
Impervious	1100	0.90	990	100%	1100
			-		-
			-		-
			-		-
			-		-
Totals	**1100**		**990**		**1100**
		C = 'AC'/'A'= 0.90		**%I = 'AI'/'A' = 100%**	

Post-Development Uncontrolled Area Composite Runoff Coefficient

Surface	'A' (m^2)	'C'	'AC'	% Imp	'AI'
Pervious	200	0.25	50	0%	-
Impervious	300	0.90	270	100%	300
			-		-
			-		-
			-		-
Totals	**500**		**320**		**300**
		C = 'AC'/'A'= 0.64		**%I = 'AI'/'A' = 60%**	

TRAFALGAR ENGINEERING LTD.

RATIONAL METHOD FLOWS

Based on Town of Oakville IDF Data

Project: Proposed Townhouses
Desc: Zoning Amendment

Project No.: 1656
Prepared By: KZ
Checked By: PC

Pre-Development Parameters

	Site	External	Total
'C'	0.79	0.00	0.79
'A' (ha)	0.09	0.00	0.09
'AC'	0.07	0.00	0.07

Pre-Development Flow

Return	Intensity (mm/hr)	Site Flow (L/s)	External Flow (L/s)	Total Flow (L/s)
2-yr	82.2	16	0	16
5-yr	114.2	23	0	23
10-yr	134.8	27	0	27
25-yr	162.2	32	0	32
50-yr	182.1	36	0	36
100-yr	200.8	40	0	40

Post-Development Parameters

	Controlled	Uncontrolled	External	Total
'C'	0.90	0.64	0.00	0.82
'A' (ha)	0.11	0.05	0.00	0.16
'AC'	0.10	0.03	0.00	0.13

Post-Development Flow

Return	Intensity (mm/hr)	Peak Inflow (L/s)	Uncontrolled Flow (L/s)	Peak Rooftop Flow (L/s)	External Flow (L/s)	Total Flow (L/s)
2-yr	82.2	23	7	7	0	37
5-yr	114.2	31	10	8	0	49
10-yr	134.8	37	12	9	0	58
25-yr	162.2	45	14	9	0	68
50-yr	182.1	50	16	10	0	76
100-yr	200.8	55	18	10	0	83

Post-to-Pre Comparison*

Return	Pre-Dev Total (L/s)	Post-Dev Total (L/s)	Percent Change
2-yr	16	37	131%
5-yr	23	49	113%
10-yr	27	58	115%
25-yr	32	68	113%
50-yr	36	76	111%
100-yr	40	83	108%

*Storage may be required, refer to Modified Rational Method Storage Calculation and Summary sheets if applicable

TRAFALGAR ENGINEERING LTD.

MODIFIED RATIONAL METHOD STORAGE

Based on Town of Oakville IDF Data

Project: Proposed Townhouses
Desc: Zoning Amendment

Project No.: 1656
Prepared By: KZ
Checked By: PC

Pre-Development

Catchment Area (ha)	0.0900
Runoff Coefficient	0.79
TC (min)	10
Control Level	5-Yr

Pre-Development Peak Intensity: 114.2 mm/hr
Pre-Development Peak Discharge: 0.023 (cms)

Post-Development Uncontrolled

Catchment Area (ha)	0.0500
Runoff Coefficient	0.64
TC (min)	10
Control Level	100-Yr

Uncontrolled Peak Discharge: 0.018 (cms)

External Drainage

Catchment Area (ha)	0
Runoff Coefficient	0.00
TC (min)	10
Control Level	**100-Yr**

External Peak Discharge: 0 (cms)

Post-Development Controlled

Catchment Area (ha)	0.1100
Runoff Coefficient	0.90
Time of Concentration	10
Control Level	100-Yr

Post-Development Peak Intensity: 200.8 mm/hr
Post-Development Peak Discharge: 0.055 (cms)
Allowable Release Rate: 0.005 (cms)

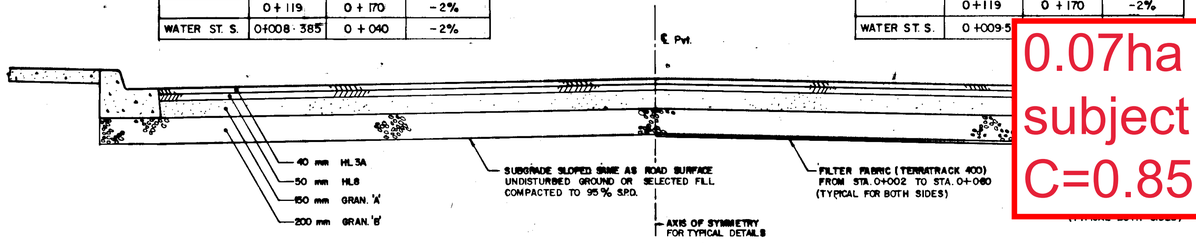
Storm Duration T_D (min)	Intensity $i = A \times T_D^{-C}$ (mm/hr)	Inflow Rate $Q_P = CiA/360$ (m^3/s)	Average Roof Discharge (m^3/s)	Max. Release Rate $Q_A = Ci_{2YR}A$ (m^3/s)	Inflow Volume $V_I = 60Q_PT_D$ (m^3)	Outflow Volume $V_O = 30Q_A(T_D+T_C)$ (m^3)	Storage $S = V_I - V_O$ (m^3)
10	200.80	0.055	0.000	0.005	33.1	2.9	30.2
15	158.27	0.044	0.000	0.005	39.2	3.6	35.5
20	131.37	0.036	0.000	0.005	43.4	4.4	39.0
25	112.72	0.031	0.000	0.005	46.5	5.1	41.4
30	98.99	0.027	0.000	0.005	49.0	5.8	43.2
35	88.43	0.024	0.000	0.005	51.1	6.5	44.5
40	80.03	0.022	0.000	0.005	52.8	7.3	45.6
45	73.19	0.020	0.000	0.005	54.3	8.0	46.4
50	67.49	0.019	0.000	0.005	55.7	8.7	47.0
55	62.68	0.017	0.000	0.005	56.9	9.4	47.5
60	58.55	0.016	0.000	0.005	58.0	10.2	47.8
90	42.35	0.012	0.000	0.005	62.9	14.5	48.4
120	33.49	0.009	0.000	0.005	66.3	18.9	47.5
150	27.85	0.008	0.000	0.005	68.9	23.2	45.7
180	23.93	0.007	0.000	0.005	71.1	27.6	43.5
210	21.04	0.006	0.000	0.005	72.9	31.9	41.0
240	18.81	0.005	0.000	0.005	74.5	36.3	38.2
270	17.03	0.005	0.000	0.005	75.9	40.6	35.3
360	13.35	0.004	0.000	0.005	79.3	53.7	25.7
720	7.40	0.002	0.000	0.005	87.9	105.9	0

R-220-86-4

METRIC

PAVEMENT CROSSFALL – N. EDGE OF PVT.			
STREET	FROM STA.	TO STA.	CROSSFALL
WATER ST	0+002	0+040	-2%
	0+040	0+066	-2% to -4%
	0+066	0+078	-4%
ROBINSON ST.	0+078	0+092	-4%
	0+092	0+119	-4% to -2%
	0+119	0+170	-2%
WATER ST. S.	0+008·385	0+040	-2%

PAVEMENT CROSSFALL – S. EDGE OF PVT.			
STREET	FROM STA.	TO STA.	CROSSFALL
WATER ST.	0+002	0+040	-2%
	0+040	0+068	-2% to +4%
	0+068	0+076	+4%
ROBINSON ST.	0+076	0+092	+4%
	0+092	0+119	+4% to -2%
	0+119	0+170	-2%
WATER ST. S.	0+009·5		

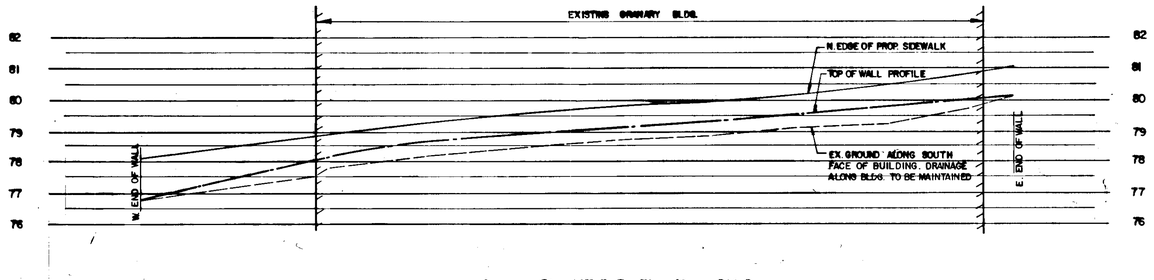


Typical Road Cross-Section

SCALE 1:25

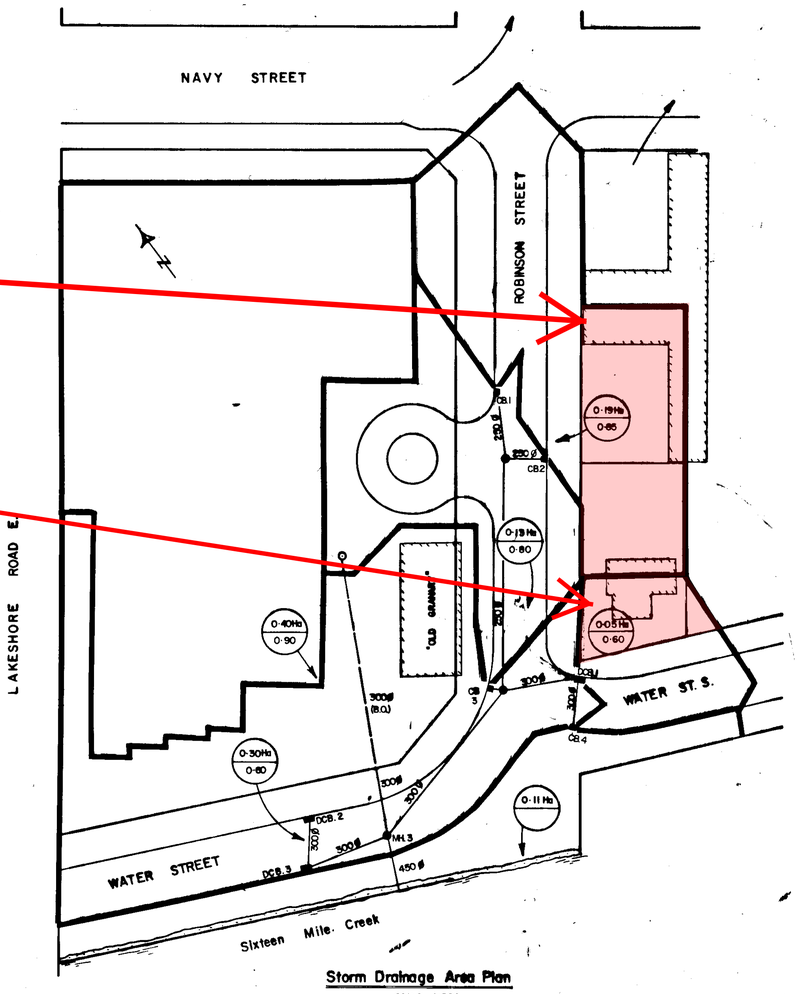
0.07ha of the subject lands- C=0.85

0.02ha of the subject lands- C=0.60



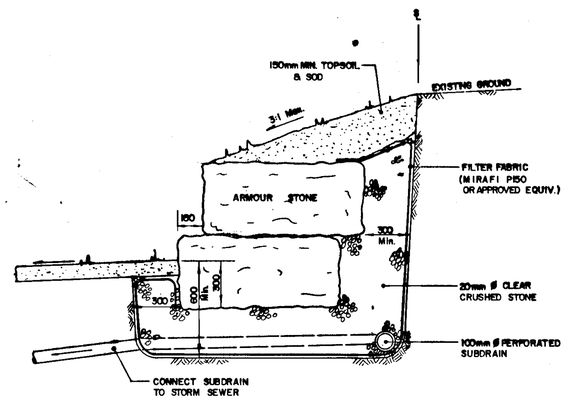
Armour Stone Wall Profile Along Old Granary

SCALE 1:100



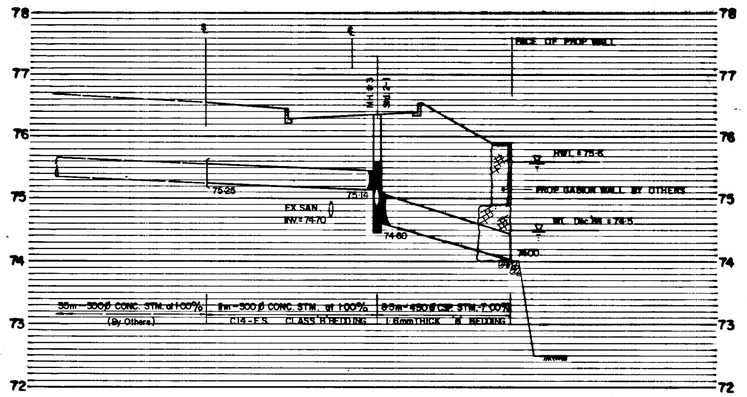
Storm Drainage Area Plan

SCALE 1:500



Armour Stone Wall – Typical Section

SCALE 1:20



Profile of Storm Sewer Outlet

SCALE 1:50 Vert
1:200 Hor.

mc connell, maughan limited
CONSULTING ENGINEERS AND SURVEYORS
OAKVILLE – TORONTO
407 SPEERS ROAD, SUITE 200, OAKVILLE, L6K 3T3 TEL. (416) 845-3497

TOWN OF OAKVILLE
REGIONAL MUNICIPALITY OF HALTON

OAKVILLE GRANARY LTD.

REGISTERED PROFESSIONAL ENGINEER E. P. CHAJKA PROVINCE OF ONTARIO

TITLE: **MISCELLANEOUS DETAILS**

MUNICIPAL DRAWING NO. R-220-86

REGIONAL DRAWING NO.

CONTRACT NO.

277E

SHEET 4 OF 4

OAKVILLE GRANARY LTD