FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT
IN SUPPORT OF REZONING & SITE PLAN APPROVAL

Northumberland Mall
Elgin St. West & Rogers Road
Cobourg, Ontario

counterpoint ENGINEERING

8395 Jane Street, Suite 100
Vaughan, Ontario L4K 5Y2
Tel: (905) 326-1404

File Number: 19046

Prepared For:

Trinity Development Group Inc.

No.	Revision	Date
2	Issued for Rezoning/Site Plan Approval	03/16/2020
1	Issued for Rezoning/Site Plan Approval	12/17/2019

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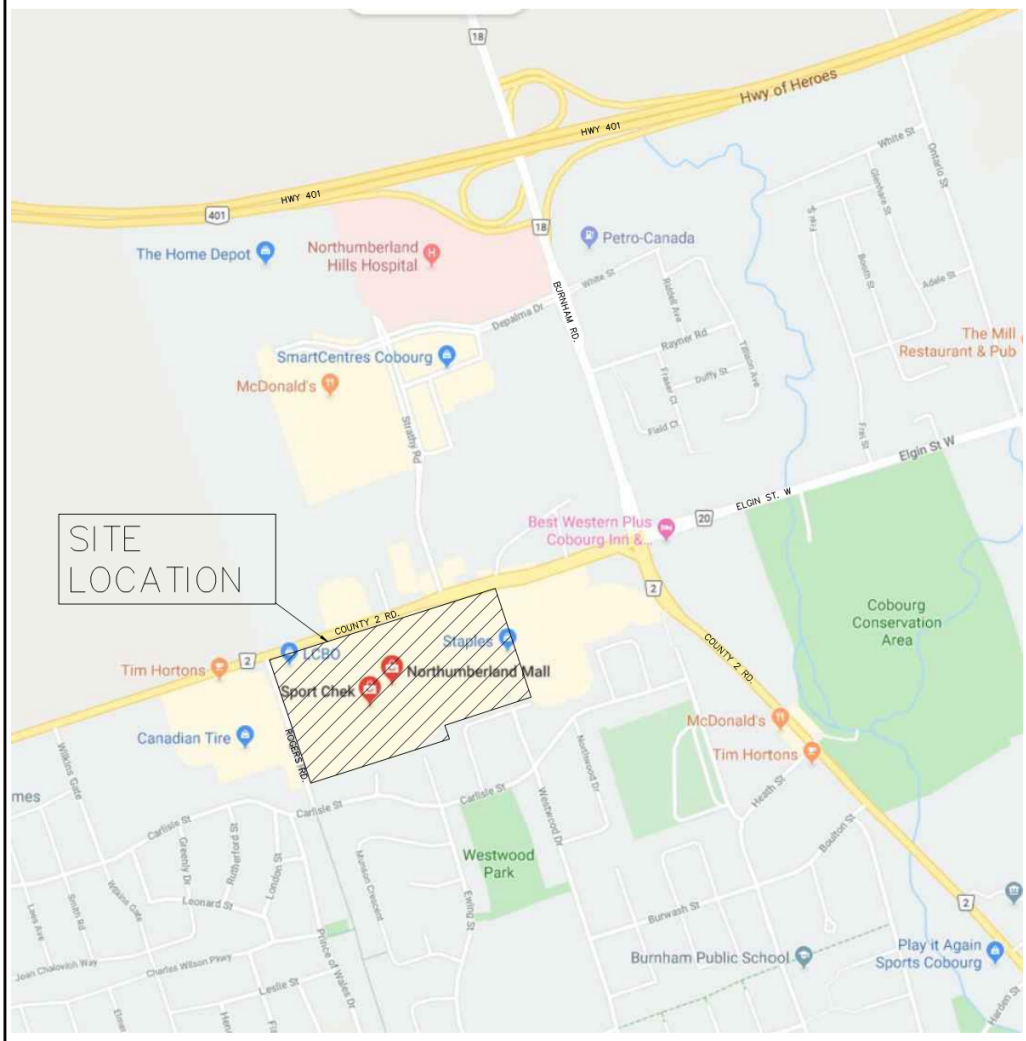
Introduction

1.1 Background

The Functional Servicing and Stormwater Management Report ('FSSWMR') has been prepared in support of rezoning and site plan approval for proposed retail unit and parking lot modifications as part of Northumberland Mall located on the south side of Elgin Street West, east of Rogers Road, in the Town of Cobourg. The limit of regrading is 0.81 Ha in size, consisting of 3 distinct areas:

1) Area 1: 0.39 Ha of area along the west side of the parking field including the existing entrance from Rogers Road;
2) Area 2: 0.39 Ha of Area east of the existing Boston Pizza and west of the signalized intersection/entrance from Elgin Street West. This includes a proposed multi-tenant unit, Building D;
3) 0.03 Ha of Area in the central area of the existing mall on the north side.

The proposed development will consist of relocating the Rogers Road entrance north and reconfiguring the parking layout (Area 1), and constructing a 929 m^2 building in Area 2. Area 3 consists of a slight expansion to the mall structure with required concrete apron and drive aisle regrading. Extension of water and sanitary services will be required from the existing infrastructure located within the property boundary east of the proposed building D. The proposed storm flows will be conveyed to the existing storm system in the subject site. Refer to **Figure 1 – Site Location Plan.**



SITE LOCATION PLAN

counterpoint ENGINEERING
COUNTERPOINT ENGINEERING INC.

NORTHUMBERLAND MALL
COBOURG, ONTARIO

DESIGNED BY: BJ	DATE: DEC. 2019
CHECKED BY: JY	PROJECT No. 19046
DRAWING BY: BJ	
CHECKED BY: JY	FIGURE No. 01
SCALE: NTS	

2 Stormwater Management

2.1 EXISTING CONDITIONS

The existing subject site consists mainly of asphalt area draining to site catchbasins and catchbasin manholes. Drainage characteristics in the pre-development condition for the areas of regrading is as follows:

2.1.1. Area 1

Stormwater in the existing condition is captured by catchbasins and catchbasin manholes connected to the 600 mm diameter storm sewer that runs north-south as per the Pre-Development SWM Plan (**Appendix B**). Drainage is conveyed south and east around the existing mall. Rogers Road is at a higher elevation relative to the mall, therefore no uncontrolled drainage contributes to the municipal Right-of-Way (ROW). The composite Runoff Coefficient is 0.85 for the 0.39 Ha of regraded area.

2.1.2. Area 2

Stormwater in the existing condition drains south to two (2) catchbasins on the north side of the main drive aisle encircling the mall (see Pre-Development SWM Plan in **Appendix B**). Drainage is conveyed downstream to the existing 450 mm diameter storm sewer and through the mall. Elgin Street is at a higher elevation relative to Area 2, therefore no uncontrolled drainage contributes to the municipal Right-of-Way (ROW). The composite Runoff Coefficient is 0.87 for the 0.39 Ha of regraded area.

See **Appendix B** for Pre-Development SWM Plan.

2.2 PROPOSED CONDITIONS

The proposed development will require regrading of the existing parking lot and entrances to accommodate the proposed layout as per the site plan by Petroff Partnership Architects (See

Appendix A). Drainage characteristics in the post-development condition for the areas of regrading is as follows:

2.2.1. Area 1

The proposed development for Area 1 consists of moving the existing entrance at Rogers Road to the north. New catchbasins (CB5 and CB6) are added due to the need to regrade the parking field, and are connected to the same 600 mm storm sewer as in the pre-development condition. As well, an existing catchbasin will be replaced with a double catchbasin (DCB7) and connected to the 600 mm storm sewer as a result of its increased tributary area.

For Area 1, all drainage in the existing and proposed condition is captured and conveyed to the same downstream 600 mm storm sewer. The runoff coefficient in the post-development condition decreased to 0.78 (0.85 in the pre-development condition) and therefore the contributing flow rate decreased as well. See **Appendix B** for **Detailed Pre** and **Post-Development Drainage Plans.**

2.2.2. Area 2

The proposed development for Area 2 consists of a new building D with a drive-thru, and various parking, concrete walkway, and landscaped areas. As is typical for this type of development, roof drainage from Building D will be controlled at 42 L/s/ha and conveyed to the existing storm manhole east of the entrance drive aisle from Elgin Street West. Additionally, drainage from catchbasins 1 to 3 and catchbasin manhole 4 will also be conveyed to the existing storm manhole, as there are no storm sewers in the vicinity of the proposed area of regrading. A portion of the concrete apron and parking area will continue to flow overland south to the same existing catchbasins as in the pre-development conditions. For Area 2, all drainage in the existing and proposed condition is captured and conveyed to the 450 mm storm sewer in the main drive aisle before flowing downstream through the mall. See Locates Plan by Mark-It Locates Inc. in **Appendix A** and **Post-Development Drainage Plan** in **Appendix B** for existing

servicing and proposed stormwater management plans. The runoff coefficient in the post-development condition is decreased to 0.76 (0.87 in the pre-development condition) and therefore the flow rate decreased as well.

The minor system capacity was analyzed for impacts resulting from regrading in Area 1 and 2 and concluded that the proposed condition provides an adequate level of service. In conclusion, downstream sewers will have improved capacity as a result of the increased landscaped area onsite and controlled rooftop drainage from building D. Grading in Area 3 does not require analysis as the 0.03 ha area is 100% impervious in both the pre- and post-development conditions. As well, any area where asphalt is removed and replaced without regrading was not analyzed as the drainage conditions do not change in the post-development condition (i.e. heavy-duty asphalt added in new fire routes).

Additionally, proposed stormwater sewer sizing has been reviewed as per OBC criteria and calculations are included in **Appendix B**. As per these calculations, the proposed storm sewers are adequately sized for the proposed development.

3 SANITARY SERVICING

3.1 EXISTING CONDITIONS

A 300 mm diameter sanitary sewer exists east of the Elgin Street South entrance, adjacent to the A&W. This sewer flows east and south around the existing mall.

3.2 PROPOSED CONDITIONS

A 150 mm diameter sanitary sewer will be connected to the existing sanitary manhole and extended across the north-south drive aisle as per the Site Servicing Plan. The MOE and Town of Cobourg do not have standards for calculating equivalent population of small commercial developments, so the City of Toronto's Design Criteria for Sewers and Watermains were used. Based on guidelines of 1.1 persons/100 m^2 of floor space, the proposed Building D has an

equivalent population of 10.2. Using an average domestic sewage flow of 450 litres/capita/day (the max as per MOE Sewage Works, page 5-10), the proposed building generates **4,590 litres/day** of sanitary flow or **0.053 l/s**. When including an infiltration allowance of 0.26 l/s/Ha (typical) and a peaking factor of 3.8 (maximum as per Town of Cobourg Design Guidelines, p.26), the site has a peak sanitary flow of **0.2985 l/s (See Appendix C)**.

The sanitary sewer immediately downstream of the connection to the existing manhole is a 150 mm diameter pipe with a slope of 0.77%. Typically, a pipe of this size has capacity for **13.364 L/s**. At peak hours, the building D peak sanitary flow (with infiltration) of 0.2985 l/s is **2.2%** of the full-flow capacity.

4 WATERMAIN SERVICING

4.1 EXISTING CONDITIONS

A 150 mm diameter watermain exists east of the Elgin Street South entrance, adjacent to the A&W.

4.2 PROPOSED CONDITIONS

A new 150 mm diameter PVC watermain is to be connected to the 150 mm diameter watermain via tee. The expected domestic water usage rate for the post-development condition of the site was calculated using the maximum **450 L/c/day** demand. Using a population of **10.2** the commercial demand is **4,590 l/day**. Applying a maximum day factor of 9.5 (maximum per MOE Design Guidelines for Drinking Water Systems, p. 3-9), the Total Maximum Daily water demand is 43,605 l/day or **30 l/min**. Applying a maximum hour factor of 14.13 (maximum as per MOE), the Peak Hour water demand is 64,857 L/day or **45 L/min**. Refer to Appendix C.1 for domestic usage calculations.

Fire flow demand was estimated using the Fire Underwriters Survey ('FUS') guidelines. Using an area of **929 m²** the fire flow was calculated as **6,705 l/min** before reductions. No reductions or charges results in a total Fire Flow demand of **7,000 l/min** (rounded to nearest 1,000 L/min).

As per the Town of Cobourg Design Guidelines page 48, watermains shall be sized to carry the greater of maximum day or maximum hour plus fire flow. Therefore, the total demand for the proposed development is **7,045 l/min** or **1,861 USGPM**. Refer to **Appendix D** for supporting FUS calculations. The FUS parameters for reductions utilized in this report must be re-visited during detailed building design to confirm any changes that may be required to the FUS calculations.

It is recommended that a hydrant flow test be completed during detailed building design to confirm that the existing system provides sufficient fire protection.

5 CONCLUSION

As indicated in the provided functional servicing and stormwater management report, the proposed storm, sanitary and water concept is capable to support the re-zoning and site plan of the subject site for the parking lot modifications and proposed building D.

We trust this report sufficiently addresses all aspects of the site servicing in support of re-zoning site plan approval.

Sincerely,

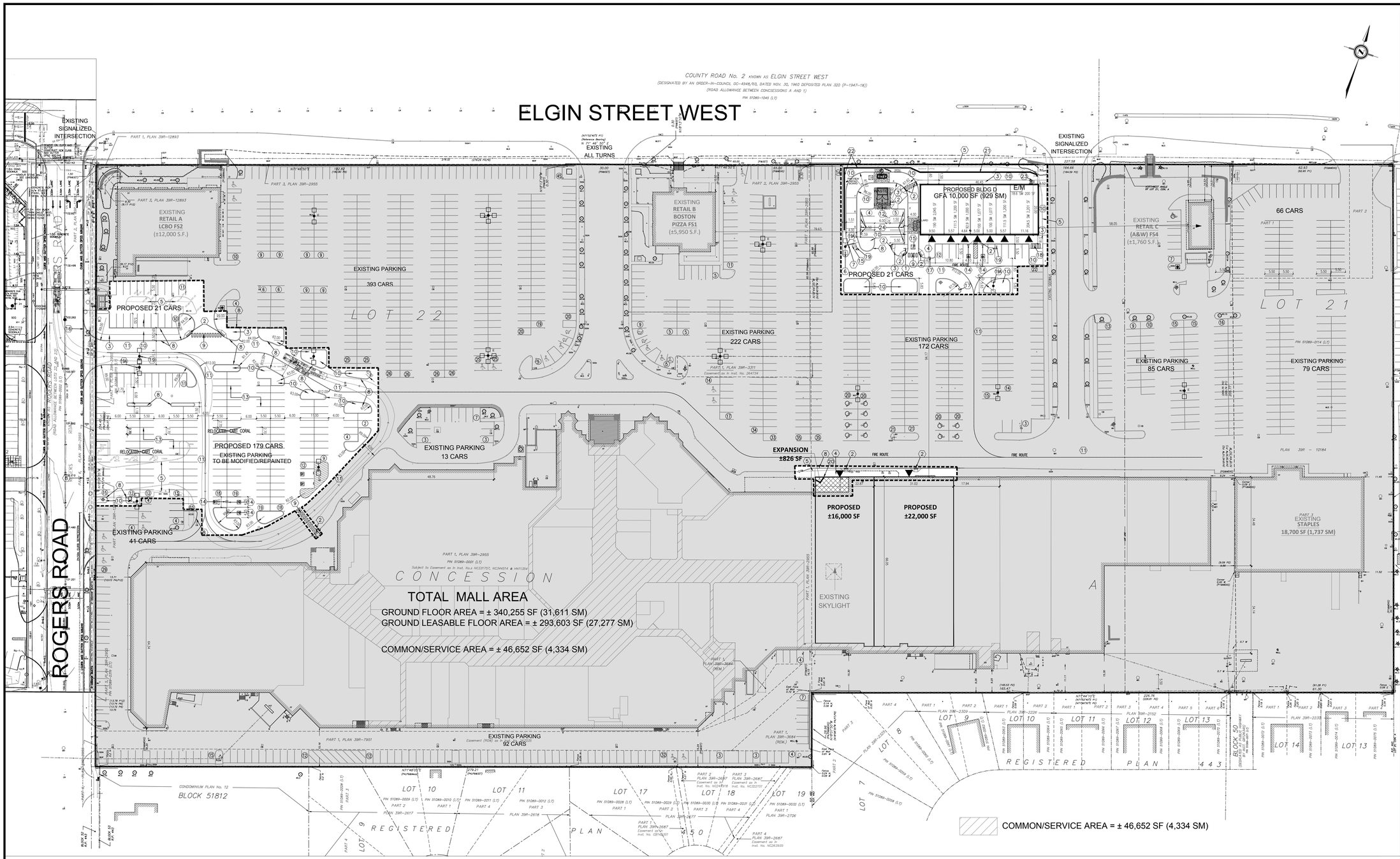
Jude Yoganathan, P.Eng
Direct: 905-326-3053
Email: jyoganathan@counterpointeng.com

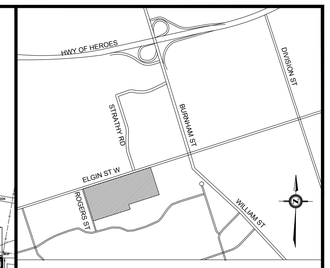
Ben Jackson, P.Eng
Direct: 416-702-1260
Email: bjackson@counterpointeng.com

APPENDICES

Appendix A

Site Plan and Surveys





KEY PLAN N.T.S

TOPOGRAPHIC SURVEY OF
PART OF LOTS 21 AND 22
CONCESSION A
(GEOGRAPHIC TOWNSHIP OF HAMILTON)
TOWN OF COBOURG
COUNTY OF NORTHUMBERLAND

GENERAL NOTES :

1. EXIT THANK YOU SIGN
2. DEPRESSED CONCRETE CURB AND RAMP MAX.1 to 10 SLOPE WITH MIN 0.61 M TACTILE WARNING SURFACE
3. CONCRETE SIDEWALK
4. CONCRETE SIDEWALK AT BUILDING SHALL BE CONSTRUCTED BY BUILDING CONTRACTOR REFER TO ARCH. DWGS. FOR EXTENT
5. EXISTING CURB/ISLAND TO BE REMOVED
6. DRIVETHRU DIRECTIONAL SIGN
7. HEIGHT CLEARANCE BAR
8. PROPOSED CONCRETE CURB
9. PEDESTRIAN CROSSING
10. LANDSCAPED ISLAND
11. HEAVY DUTY ASPHALT
12. CONCRETE PAD FOR GARBAGE ENCLOSURE
13. 90° PARKING STRIPING (TYP.)
14. ACCESSABLE PARKING SPACE AND SIGN (TYP.)
15. TRAFFIC ARROWS
16. STOP BAR
17. FIRE LANE MARKING SIGN AS CITY'S LATEST BYLAW
18. BIKE RACK
19. MLS (LIGHT STANDARD) TO BE RELOCATED
20. IRON FENCE TO BE REMOVED
21. RETAINING WALL BY OTHERS
22. ORNAMENTAL FENCE MOUNTED ON RETAINING WALL REFER TO LANDSCAPE DWG
23. CONCRETE STAIRCASE 4 RISERS WITH TACTILE WARNING SURFACE/RAILING
24. EMPLOYEES ONLY SIGN

10 0 10 20 30 40 60 75 metres

LEGENDS :

PHASE LINE
CONCRETE /LANDSCAPED ISLAND
PROPOSED MAIN BUILDING ENTRANCE

TRINITY

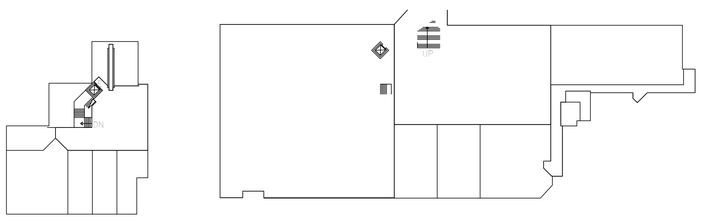
No.	REVISIONS MARK VOID ALL COPIES PREVIOUS FINAL DATE	DATE	BY
3.	REVISED AS PER CITY'S COMMENTS	MAR. 13, 2020	DR
2.	ISSUED FOR SITE PLAN APPROVAL	DEC. 18, 2019	DR
1.	ISSUED FOR ZONING REVIEW	JULY 30, 2019	DR

OVERALL SITE PLAN

SCALE: 1:600

NORTHUMBERLAND MALL
ELGIN ST. WEST & ROGERS RD.
COBOURG, ONTARIO

OVERALL SITE PLAN
SCALE: 1:600



SITE STATSTICS:			
TOTAL SITE AREA:	112,093.5 SM (27.70 ACRES)	BUILDING D:	
EXISTING MALL GFA:	340,255 SF (31,611 SM)	PHASE AREA:	42,553 SF 3,953.77 SM (0.98 ACRE)
EXISTING MALL GLFA:	± 293,603 SF (27,277 SM)	PROPOSED RETAIL D (GFA):	10,000 SF (929 SM) 23.50%
PROPOSED EXPANSION AREA:	826 SF (76.73 SM)	PROPOSED RETAIL D (GLFA):	9,800 SF (910.4 SM)
EXISTING OUT PARCELS AREA:	19,710 SF (1,831 SM)	PROPOSED PARKING PROVIDED:	21 CARS
EXISTING STAPLES AREA:	18,700 SF (1,737 SM)	LANDSCAPE AREA:	14,729 SF (1,368.35 SM) 34.61%
PROPOSED RETAIL D GFA:	10,000 SF (929 SM)	PAVED AREA:	17,824 SF (1655.42 SM) 41.89%
PROPOSED RETAIL D GLFA:	9,800 SF (910.4 SM)		
TOTAL EXISTING /PROPOSED GFA :	389,491 SF (36,184.73 SM)		
TOTAL EXISTING /PROPOSED GLFA :	324,639 SF (31,832.13 SM)		
TOTAL PARKING REQUIRED:	1,273 CARS (4/100 SM)		
TOTAL EXISTING PARKING:	1,163 CARS		
TOTAL PROPOSED PARKING PROVIDED:	221 CARS		
TOTAL PARKING PROVIDED:	1,384 CARS (4.35/100 SM)		
LOT COVERAGE:	32.29%		

PETROFF PARTNERSHIP ARCHITECTS
PETROFF
260 TOWN CENTRE BLVD. SUITE 300
MARKHAM ONTARIO CANADA L3R 8H8
TEL. 905. 470. 7000 FAX. 905. 470. 2500
ONTARIO ASSOCIATION ARCHITECTS
ALY HAMDY LICENCE 6768

DRAWN BY	DR
CHECKED BY	AH
DATE	MAY 16, 2019
ISSUED	MARCH 13, 2020

19060
SA-01.0

TOPOGRAPHIC SURVEY OF

PART OF LOTS 21 AND 22 CONCESSION A

(GEOGRAPHIC TOWNSHIP OF HAMILTON)

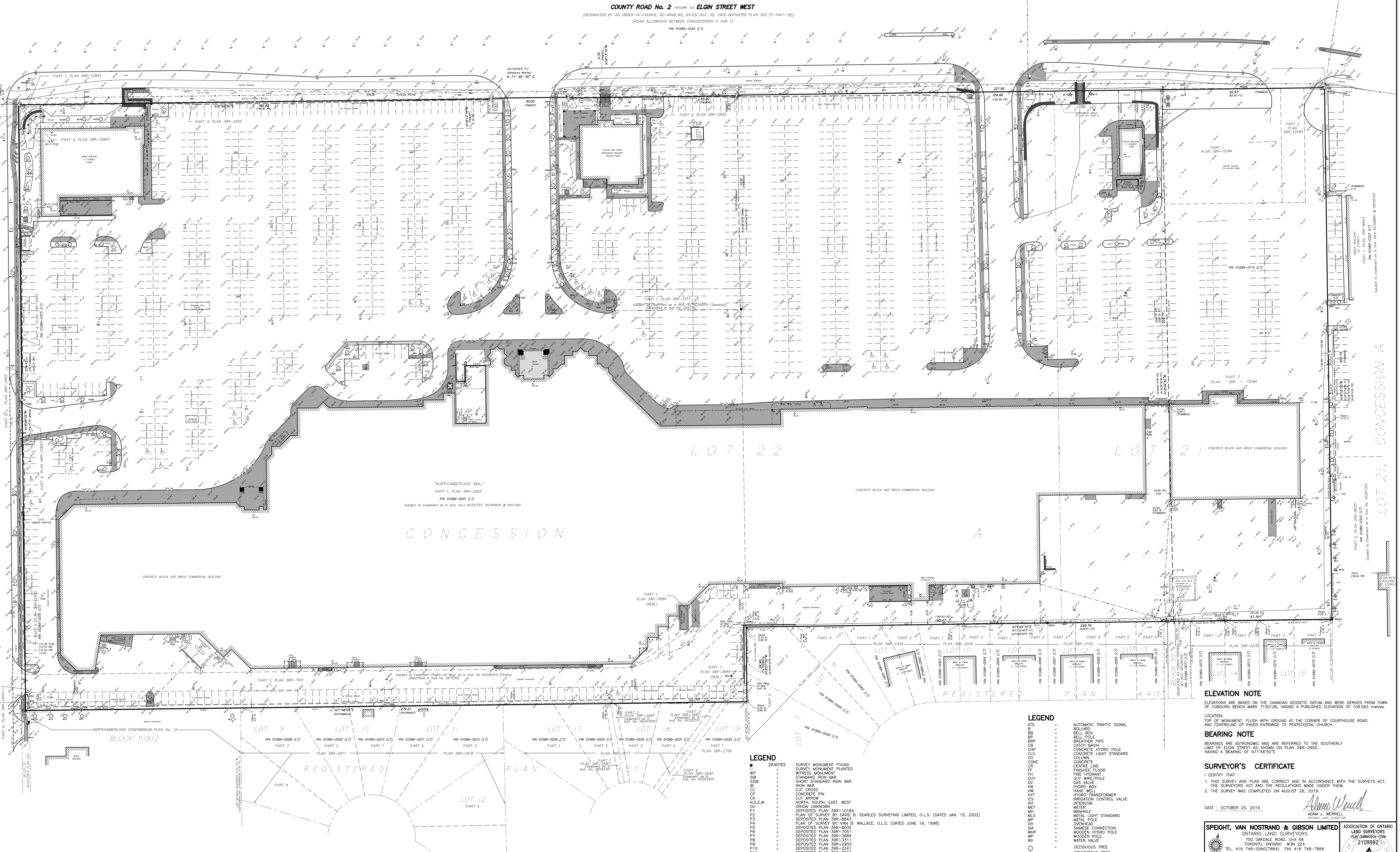
TOWN OF COBOURG

COUNTY OF NORTHUMBERLAND

SCALE 1 : 500

10 5 0 10 20 30 40 50 metres

SPEIGHT, VAN NOSTRAND & GIBSON LIMITED
ONTARIO LAND SURVEYORS
2019



LEGEND

	DENOTES	
■	"	SURVEY MONUMENT FOUND
□	"	SURVEY MONUMENT PLANTED
WIT	"	WITNESS MONUMENT
SIB	"	STANDARD IRON BAR
SSIB	"	SHORT STANDARD IRON BAR
IB	"	IRON BAR
CC	"	CUT CROSS
CP	"	CONCRETE PIN
CA	"	CUT ARROW
N,S,E,W	"	NORTH, SOUTH, EAST, WEST
OU	"	ORIGIN UNKNOWN
P1	"	DEPOSITED PLAN 39R-10184
P2	"	PLAN OF SURVEY BY DAVID B. SEARLES SURVEYING LIMITED, O.L.S. (DATED JAN. 15, 2002)
P3	"	DEPOSITED PLAN 39R-8843
P4	"	PLAN OF SURVEY BY IVAN B. WALLACE, O.L.S. (DATED JUNE 19, 1998)
P5	"	DEPOSITED PLAN 39R-8035
P6	"	DEPOSITED PLAN 39R-7051
P7	"	DEPOSITED PLAN 39R-3684
P8	"	DEPOSITED PLAN 39R-3311
P9	"	DEPOSITED PLAN 39R-2955
P10	"	DEPOSITED PLAN 39R-2241
P11	"	DEPOSITED PLAN 39R-2052
P12	"	PLAN OF SURVEY BY IVAN B. WALLACE, O.L.S. (DATED MAY 28, 2012)

LEGEND

ATS	"	AUTOMATIC TRAFFIC SIGNAL
B	"	BOLLARD
BB	"	BELL BOX
BP	"	BELL POLE
BRP	"	BREATHER PIPE
CB	"	CATCH BASIN
CHP	"	CONCRETE HYDRO POLE
CLS	"	CONCRETE LIGHT STANDARD
CO	"	COLUMN
CONC	"	CONCRETE
CR	"	CENTRE LINE
FF	"	FINISHED FLOOR
FH	"	FIRE HYDRANT
GUY	"	GUY WIRE/POLE
GV	"	GAS VALVE
HB	"	HYDRO BOX
HW	"	HAND WELL
HYT	"	HYDRO TRANSFORMER
ICV	"	IRRIGATION CONTROL VALVE
INT	"	INTERCOM
MET	"	METER
MH	"	MANHOLE
MLS	"	METAL LIGHT STANDARD
MP	"	METAL POLE
OH	"	OVERHEAD
SIA	"	SIAMESE CONNECTION
WHP	"	WOODEN HYDRO POLE
WP	"	WOODEN POLE
WV	"	WATER VALVE
(symbol)	"	DECIDUOUS TREE
(symbol)	"	CONIFEROUS TREE
(symbol)	"	CONCRETE
(symbol)	"	BRICK

ELEVATION NOTE

ELEVATIONS ARE BASED ON THE CANADIAN GEODETIC DATUM AND WERE DERIVED FROM TOWN OF COBOURG BENCH MARK 713012B, HAVING A PUBLISHED ELEVATION OF 109.563 metres.

LOCATION:
TOP OF MONUMENT, FLUSH WITH GROUND AT THE CORNER OF COURTHOUSE ROAD, AND CENTRELINE OF PAVED ENTRANCE TO PENTECOSTAL CHURCH.

BEARING NOTE

BEARINGS ARE ASTRONOMIC AND ARE REFERRED TO THE SOUTHERLY LIMIT OF ELGIN STREET AS SHOWN ON PLAN 39R-2955, HAVING A BEARING OF N71°46'50"E.

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 AUGUST 26, 2019.

DATE : OCTOBER 25, 2019

ADAM J. WERRELL
ONTARIO LAND SURVEYOR

SPEIGHT, VAN NOSTRAND & GIBSON LIMITED
ONTARIO LAND SURVEYORS
750 OAKDALE ROAD, Unit 66
TORONTO, ONTARIO M3N 2Z4
TEL. 416 749-SVNG(7864) FAX 416 749-7866
E-Mail : toronto@svng.on.ca

DRAWN :	F. P. B./A. T.	FILE NAME :	A1900222.DWG
CHECKED :	D.A.W./A.J.W.	PLOT SCALE :	MET. 1=0.50
JOB No. :	190-0222	PLOTTED :	OCT. 25, 2019
REF. No. :	4-Con A Hamilton	UPDATED :	

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2109992

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR
In accordance with Regulation 1026, Section 29(3)

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

4-Con A Hamilton

A0 (840x1188)

COUNTY ROAD No. 2 ELGIN STREET WEST

ROGERS ROAD

"NORTHUMBERLAND MALL"

CONCRETE BLOCK AND BRICK COMMERCIAL BUILDING

CONCRETE BLOCK AND BRICK COMMERCIAL BUILDING

CONCRETE BLOCK AND BRICK COMMERCIAL BUILDING

BRICK BUILDING (1 STOREY)

CONCRETE BUILDING (2 STOREY)

BRICK & FRAME DWELLING (1 1/2 STOREY)

BRICK & FRAME DWELLING (2 STOREY)

SYMBOLS LEGEND

- MANHOLE
- CATCH BASIN
- POLE
- CLEAN OUT
- STREET LIGHT
- HYDRANT
- VALVE
- TRANSFORMER
- HAND WELL
- PEDESTAL
- CONTROL BOX / PLUG
- VALVE CHAMBER
- TRAFFIC BOX (TB)
- AIR PUMP (AP)
- SIGN
- BUS SHELTER (BUS SHELTER)
- TRAFFIC CONTROL BOX (TRFC CTB)
- FLUSH TO GRADE VAULT (FGV)
- HEADWALL
- FLOW
- UTILITY CONTINUES
- TEST PIT

UTILITY CODES LEGEND

W	WATER
E	ELECTRIC
T	TELEPHONE
C	COMMUNICATION CABLES/DUCT
ALL	ALL STREAM
F/O	FIBER OPTIC
GS	GAS SERVICE
GM	GAS MAIN
DZL	DIESEL
TNPL	TRANS NORTHERN PIPELINE
FL	FUEL LINE
SAN	SANITARY SEWER
ST	STORM SEWER
WT	WEEPING TILE
COMB	COMBINATION SEWER
IR	IRRIGATION
U	UNKNOWN SERVICE
TC	TRAFFIC CONTROL

MARK IT LOCATES INC.

Utility Mapping Quality Levels as per ASCE C-I 38-02

QL-A – Locating exact vertical and horizontal position of underground utilities using appropriate safe excavation techniques and recording these data.

QL-B – Designating the horizontal position of underground utilities by the application of appropriate surface geophysical methods.
- Limited in scope to verification of provided level D information.
- Utilities may escape detection. (See Notes)

QL-C – Survey of surface features.

QL-D – Records and plans research including record collection and review.

Notes:

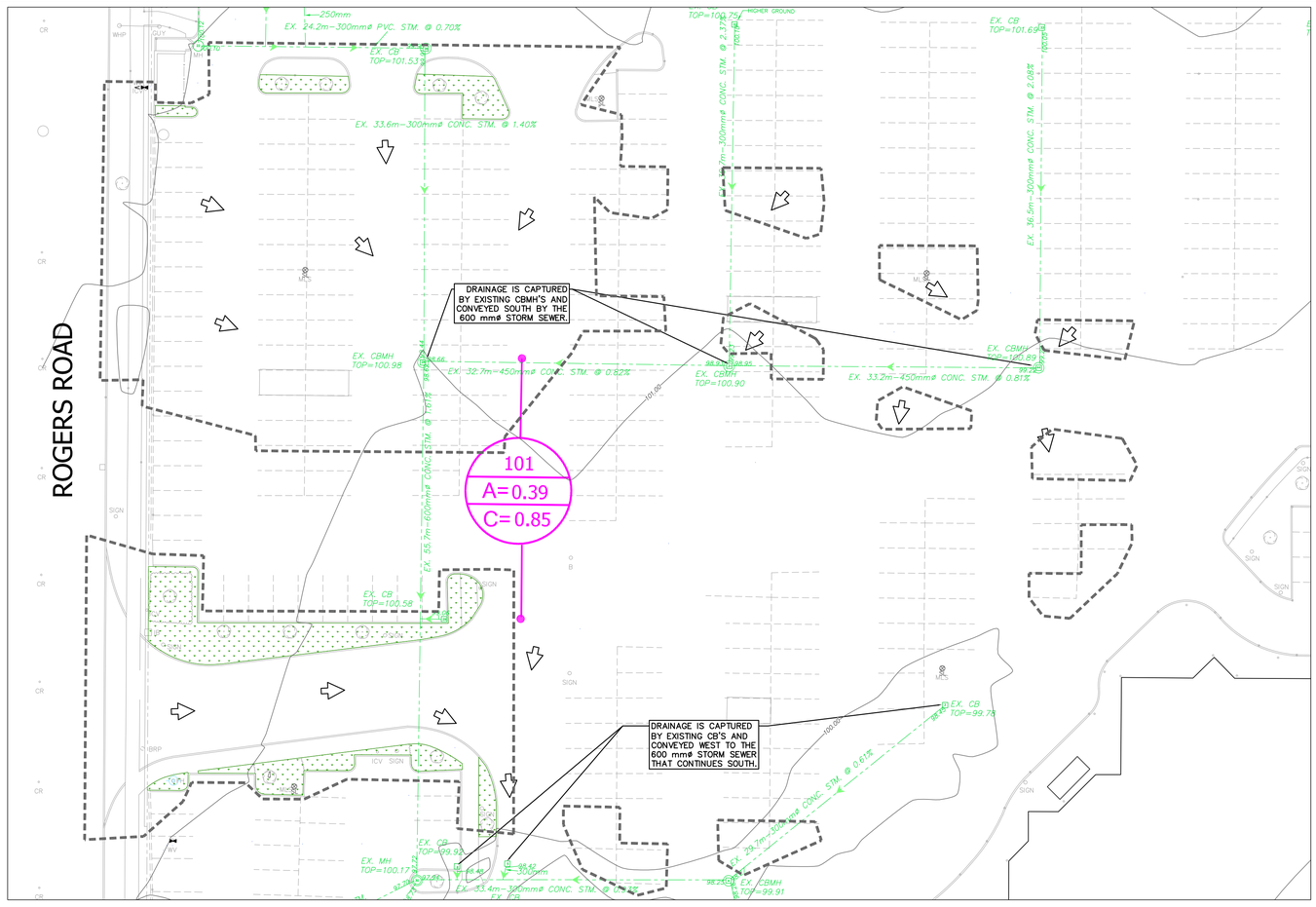
1. This information is provided for design purposes only.
2. This information is not a substitute for sanctioned locates as provided by the utility owner.
3. Prior to any excavation, all utility owners must be contacted to obtain sanctioned locates, as stipulated by the Occupational Health & Safety Act.
4. Inferred utility depths indicated on this drawing are only estimates and should be verified by direct physical exposure.
5. Underground infrastructure shown on this drawing was obtained on a best-effort, best-practices basis, within the technical limitations of the instrumentation.
6. The accuracy of the above ground information is dependent on the accuracy of the base map information as provided by others.
7. This information is provided on a best effort basis within the limitations of the technology. Consequently some utilities may escape detection (i.e. non-conductive, inaccessible, incomplete Level D information provided by the Client and/or physical expression not reasonably identifiable at the time of the survey, etc.)
8. The information herein documents the position of suspected or known utilities existing at this site as of the drawing date.
9. Quality Level "D" information was obtained by MARK IT Locates Inc. during the course of this investigation.

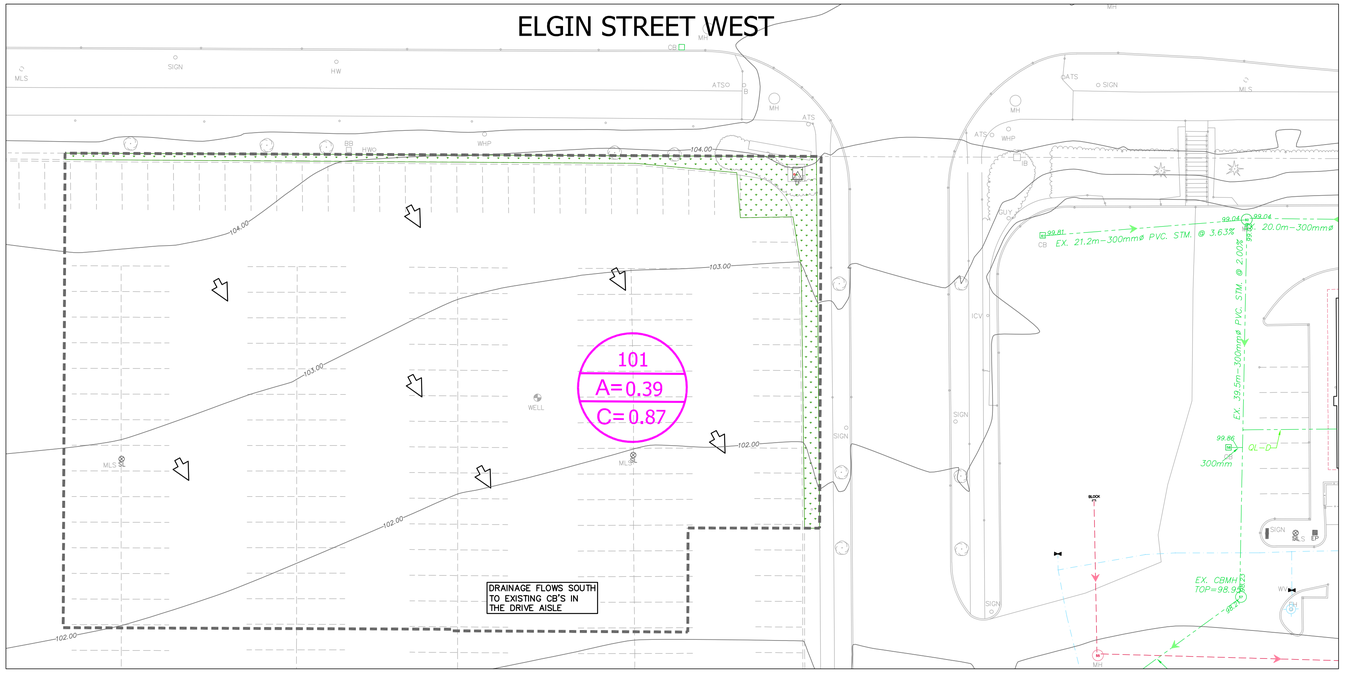
Buried Utility Map

For: Trinity Development Group	Site: 1111 Elgin Street West, Cobourg, ON
Project#2019-09268	Date: NOV 22, 2019 Checked: AC / SI

Appendix B

Stormwater Management Figures



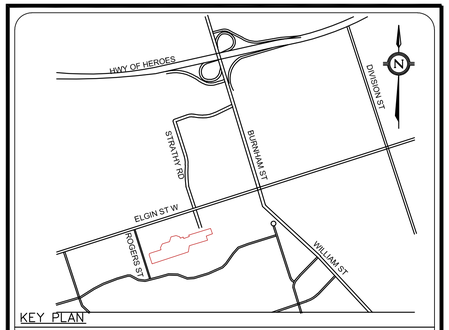


AREA 1: WEST ENTRANCE

LAND USE	AREA (Ha)	RUNOFF COEFFICIENT
LANDSCAPING AREA	0.03	0.25
CONCRETE/ASPHALT AREA	0.36	0.90
COMPOSITE (AFFECTED AREA)	0.39	0.85

AREA 2: PROPOSED CRU

LAND USE	AREA (Ha)	RUNOFF COEFFICIENT
LANDSCAPING AREA	0.02	0.25
CONCRETE/ASPHALT AREA	0.37	0.90
COMPOSITE (AFFECTED AREA)	0.39	0.87



KEY PLAN

LEGAL & TOPOGRAPHY

PROVIDED BY: SVNG LTD.
750 OAKDALE ROAD
UNIT 66
TORONTO, ONTARIO

BENCHMARK

NOTE: ELEVATIONS ARE BASED ON GEODETIC DATUM FROM TOWN BENCH MARK 713012B AT AN ELEVATION OF 109.563.

BEARING NOTE

BEARINGS ARE ASTRONOMIC AND ARE REFERRED TO THE SOUTHERLY LIMIT OF ELGIN STREET AS SHOWN ON PLAN 39R–2955, HAVING A BEARING OF N71°46'50"E.

SITE PLAN: SA–01.0: MARCH 13, 2020

LEGEND

AFFECTED AREA

LANDSCAPING AREA (C=0.25)

PROPERTY LINE

AREA 1
A=0.39
C=0.82

TRIBUTARY NAME
AREA (HA)
RUNOFF COEFFICIENT

EXISTING STM SEWER AND MH

OVERLAND FLOW DIRECTION

No.	REVISIONS/ISSUED	DATE	BY	CITY
2.	ISSUED FOR SPA/ZBA #2	03/16/20	BJ	
1.	ISSUED FOR SPA/ZBA	12/17/19	BJ	

counterpoint ENGINEERING
COUNTERPOINT ENGINEERING INC.
8395 Jane St., Suite 100, Vaughan, ON L4K 5Y2 Phone 905.326.1404 Fax 905.326.1405

LICENSED PROFESSIONAL ENGINEER
J. S. YOGANATHAN
100100545
MAR 16/20
PROVINCE OF ONTARIO
ENGINEER'S STAMP

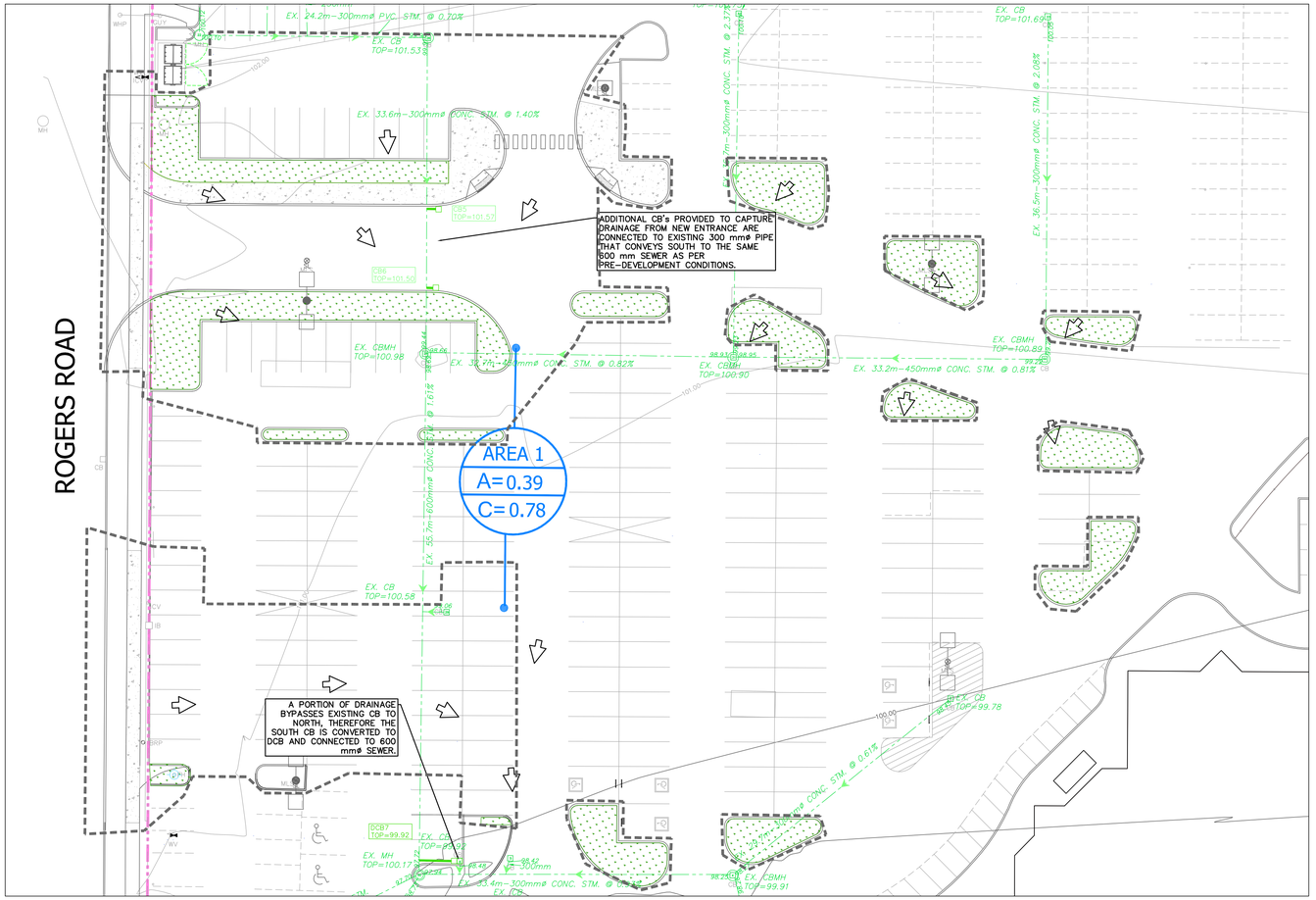
APPLICANT:
TRINITY DEVELOPMENT GROUP INC.
77 BLOOR STREET WEST
SUITE 1601
TORONTO, ON
M5S 1M2

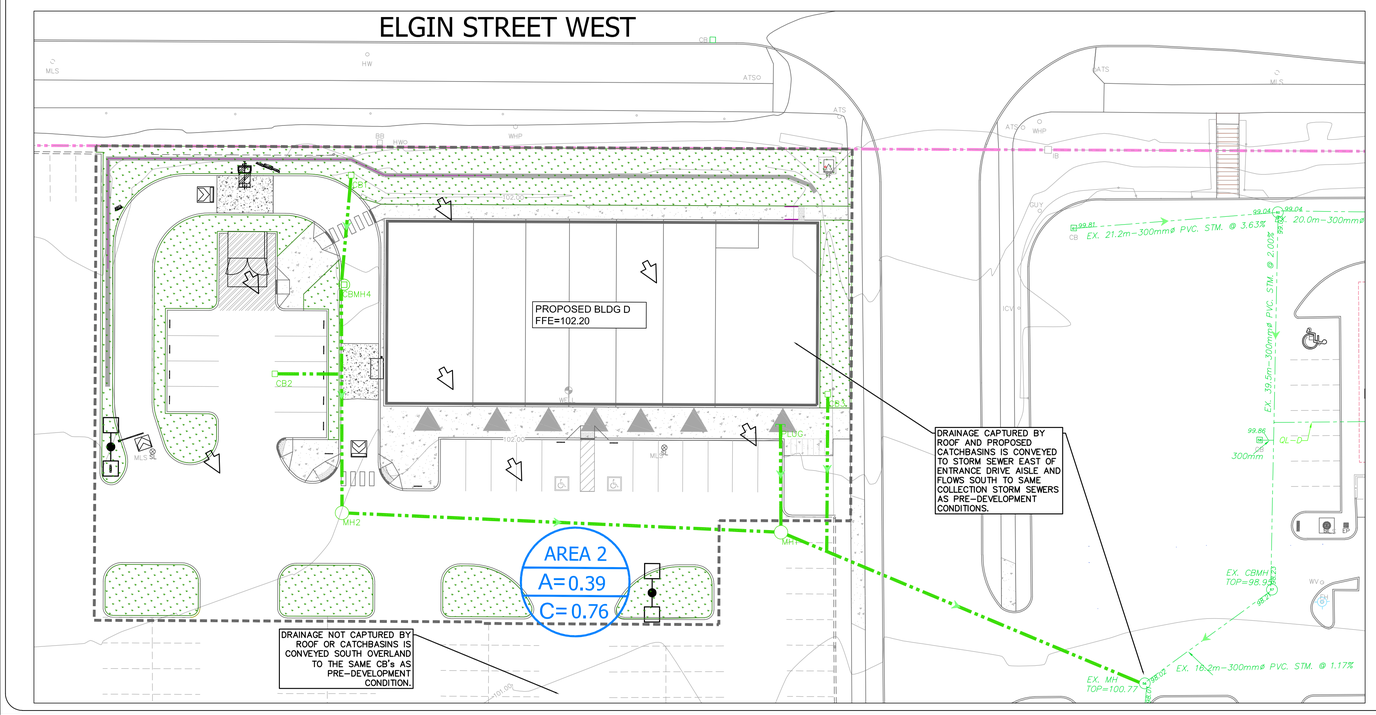
SITE LOCATION:
NORTHUMBERLAND MALL
ELGIN ST. WEST AND ROGERS ROAD
COBOURG, ON.

SITE PLAN FILE No.: SPA-01-20

PRE DEVELOPMENT SWM PLAN

DESIGNED BY: AL	CHECKED BY: JY	DATE: MAR, 2020
DRAWING BY: AL	CHECKED BY: JY	PROJECT NO. 19046
SWM BY: BJ	CHECKED BY: JY	
SCALE: 1: 300m (0m 5m 10m 15m)		DRAWING NO. SWM-PRE



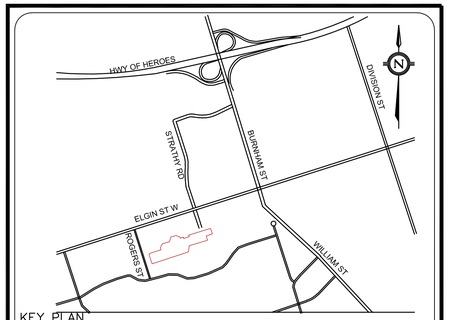


AREA 1: WEST ENTRANCE

LAND USE	AREA (Ha)	RUNOFF COEFFICIENT
LANDSCAPING AREA	0.07	0.25
CONCRETE/ASPHALT AREA	0.32	0.90
COMPOSITE (AFFECTED AREA)	0.39	0.78

AREA 2: PROPOSED CRU

LAND USE	AREA (Ha)	RUNOFF COEFFICIENT
LANDSCAPING AREA	0.09	0.25
CONCRETE/ASPHALT AREA	0.30	0.90
COMPOSITE (AFFECTED AREA)	0.39	0.76



KEY PLAN

LEGAL & TOPOGRAPHY

PROVIDED BY: SVNG LTD.
750 OAKDALE ROAD
UNIT 66
TORONTO, ONTARIO

BENCHMARK

NOTE: ELEVATIONS ARE BASED ON GEODETIC DATUM FROM TOWN BENCH MARK 713012B AT AN ELEVATION OF 109.563.

BEARING NOTE

BEARINGS ARE ASTRONOMIC AND ARE REFERRED TO THE SOUTHERLY LIMIT OF ELGIN STREET AS SHOWN ON PLAN 39R–2955, HAVING A BEARING OF N71°46'50"E.

SITE PLAN: SA–01.0: MARCH 13, 2020

LEGEND

AFFECTED AREA

LANDSCAPING AREA (C=0.25)

PROPERTY LINE

AREA 1
A=0.39
C=0.82

TRIBUTARY NAME
AREA (HA)
RUNOFF COEFFICIENT

EXISTING STM SEWER AND MH

OVERLAND FLOW DIRECTION

PROPOSED STM SEWER AND MH

No.	REVISIONS/ISSUED	DATE	BY	CITY
2.	ISSUED FOR SPA/ZBA #2	03/16/20	BJ	
1.	ISSUED FOR SPA/ZBA	12/17/19	BJ	

counterpoint ENGINEERING
COUNTERPOINT ENGINEERING INC.
8395 Jane St., Suite 100, Vaughan, ON L4K 5Y2 Phone 905.326.1404 Fax 905.326.1405

LICENSED PROFESSIONAL ENGINEER
J. S. YOGANATHAN
100100545
MAR 16/20
PROVINCE OF ONTARIO

ENGINEER'S STAMP

APPLICANT:
TRINITY DEVELOPMENT GROUP INC.
77 BLOOR STREET WEST
SUITE 1601
TORONTO, ON
M5S 1M2

SITE LOCATION:
NORTHUMBERLAND MALL
ELGIN ST. WEST AND ROGERS ROAD
COBOURG, ON.

SITE PLAN FILE No.: SPA-01-20

POST-DEVELOPMENT SWM PLAN

DESIGNED BY: AL	CHECKED BY: JY	DATE: MAR, 2020
DRAWING BY: AL	CHECKED BY: JY	PROJECT NO. 19046
SWM BY: BJ	CHECKED BY: JY	
SCALE: 1: 300m (0m 5m 10m 15m)		DRAWING NO. SWM-POST

OBC Calculations

The following calculations review the capacity of the proposed 300 mm storm sewer between MH1 and the ex. MH southwest of the existing A&W. The upstream stormwater contributions to this pipe consist of tributary areas to CB1, CB2, CB3, CBMH4 and roof area of proposed building D (including vertical projection of the building walls).

7.4.10.4

1) Except as provided in sentence (2), the hydraulic load from a roof or paved surface is the maximum 15 min rainfall determined in conformance with MMAH Supplementary Standard SB-1, "Climatic Seismic Data", Multiplied by the sum of,

a) the area in square metres of the horizontal projection of the surface drained, and

b) one-half the area in square metres of the largest adjoining vertical surface

15 min Rainfall for Cobourg: 23 mm

Area of horizontal surface draining to sewer: 2200 m^2 (includes roof of Building D, assumed no controlled roof drains for the purpose of these calculations)

Area of Building D vertical surface: 288 m^2

$$Load = 23mm \times \left(2200 + \frac{288}{2}\right)$$

$$Load = 53{,}912mm \cdot m^2$$

$$\boldsymbol{Load = 53{,}912\ litres}$$

As per Table 7.4.10.9, the maximum permitted hydraulic load drained to a horizontal storm drainage pipe is **78,700L** based on a 12-inch sewer at a slope of 1 in 100.

Since the load of 53,912 litres is less than the maximum permitted flow of 78,700 litres, the proposed sewer is acceptable.

Appendix C

Sanitary Flow Calculations

Counterpoint Engineering Inc.
Sanitary Design Calculations

Project:	Northumberland Mall	
Project No:	19046	
Location:	Cobourg, ON	
Site ID:	Northumberland Mall	
Site Area:	0.39	ha
Gross Floor Area:	0.09	ha

Average Flow

Commercial	450	L / capita / day

Equivalent Population (Typical - City of Toronto Design Criteria for Sewers and Watermains, p.34)

Land Use	Population Density (pp/100m^2 GFA)	Floor Area (m^2)	Equivalent Residential Population
Commercial	1.1	0.09	**10.2**

Peaking Factor

Town of Cobourg Design Guidelines, pg. 26

Residential

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

3.80 (Maximum)

Extraneous Flows **0.26** l/s/ha

Design Sanitary Flow**

$$Q(d) = \frac{PqM}{86{,}400} + IA$$

Summary	Peak Flow (l/s)
Average Sanitary Flows	**0.0532**
Flow From Infiltration	**0.1014**
Peak Sanitary Flow (With INF)	**0.3037**

Appendix D

Water Demand Calculations

counterpoint engineering

Water Demand Calculations

Project Name: Northumberland Mall
Project Number: 19046

Town of Cobourg Watermain Design Guidelines
Water Demand = Maximum Day Flow + Fire Flow or Peak Hour Flow

Commercial Water Demand

Per Capita Demand	450	L / c / day
Peak Hour Factor	14.13	
Maximum Day Factor	9.5	

Fire Demand

Fire Flow	7,000	L / min	- See FUS calculations.
Fire Flow Duration	1.5	hours	

Commercial Population:	10.2	persons	- See Sanitary Flow calculations.
Commercial Demand:	4,590	L / day	
Peak Hour Water Demand	64,857	L / day	
Total Peak Hour Demand:	**64,857**	**L / day**	
, or	**45**	**L / min**	
Maximum Day Water Demand - Residential:	43,605	L / day	
Total Maximum Day Water Demand:	43,605	L / day	
, or	30	L / min	
Total Fire Flow:	7,000	L / min	
Maximum Day + Fire Flow:	**7,045**	**L / min**	
	or		
	1,861	**GPM**	

- Since the Maximum Hour + Fire Flow demand is the highest demand value, this is the one that governs.

counterpoint engineering

Fire Underwriter Survey Fire Flow Calculation

Project Name: Northumberland Mall
Project Number: 19046

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

where

F = the required fire flow in litres per minute.

C = coefficient related to the type of construction.
= 1.5 for wood frame construction (structure essentially all combustible).
= 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior).
= 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls).
= 0.6 for fire-resistive construction (fully protected frame, floors, roof).

A = The total floor area in square metres (including all storeys, but excluding basements at least 50 percent below grade) in the building being considered.

Legend

Construction Class		Contents Factor	
WF	wood frame construction	NC	non-combustible
OC	ordinary construction	LC	limited combustible
NC	non-combustible construction	C	combustible
FC	fire-resistive construction	FB	free burning
		RB	rapid burning

Contents Factor:

Non-Combustible	-25%	Free Burning	+15%
Limited Combustible	-15%	Rapid Burning	+25%
Combustible	No Charge		

Separation	Charge	Separation	Charge
0 to 3m	25%	20.1 to 30 m	10%
3.1 to 10m	20%	30.1 to 45m	5%
10.1 to 20m	15%		

1) Fire Flow

Type of Construction: OC
C = 1
A = 929 m^2
F = 6,705 L/min

2) Occupancy Reduction

Contents Factor: C
Occupancy Reduction = 0%

0% of 6,705 L/min = 0 L/min
F = 3,646 L/min - 912 L/min = 6,705 L/min

3) System Type Reduction (to be reduced from result of Step 2)

NFPA 13 Sprinkler:	0%	No
Standard Water Supply:	0%	No
Fully Supervised:	0%	No
Total System Type Reduction =	**0%**	

0% of **6,705 L/min** = **0 L/min**
(to be reduced from result of Step 2)

4) Separation Charge (to be added to result of Step 2)

Building Face	Distance	Charge
North	>45m	0%
East	>45m	0%
South	>45m	0%
West	>45m	0%
Total		**0%**

(max exposure charge can be 75%)

0% of **6,705 L/min** = **0 L/min**
(to be added to result of Step 2)

F = 7,000 L/min (round to the nearest 1,000 L/min) (2,000 L/min < F < 45,000 L/min)
F = 1,849 GPM