STRIK BALDINELLI MONIZ
PLANNING · CIVIL · STRUCTURAL · MECHANICAL · ELECTRICAL

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Royal Premier Homes
509 Commissioners Road West #425
London, ON N6K 1J5

September 14, 2021
SBM-21-0466

Attn: Mr. Farhad Noory, President

Re: Servicing Feasibility Study
Fanshawe Park Midrise
517-525 Fanshawe Park Road East, London, Ontario

1. INTRODUCTION

This Servicing Feasibility Study (Study) has been prepared by Strik, Baldinelli, Moniz Ltd. (SBM) for Royal Premier Homes to address the servicing feasibility for the proposed residential development located at 517-525 Fanshawe Park Road East, London, Ontario. The area of the site is approximately 0.57 ha.

The subject lands consist of three (3) single-family lots along the southside of Fanshawe Park Road East at the southeast corner of the intersection with Geary Avenue. The site abuts the Fanshawe Park Road East Right-Of-Way (ROW) to the north, the Geary Avenue ROW to the west, and single-family residential lands to the south and east. The proposed development includes 99 units within the midrise building. Please refer to the proposed site plan by Zedd Architecture dated March 1, 2021, appended to this Study.

This Study is to determine the adequacy of the existing City services in support of a Zoning By-Law Amendment (ZBA), an Official Plan Amendment, and the Site Plan Approval (SPA) application for the proposed development.

Design requirements have been based on the City of London Design Specifications & Requirements Manual (DS&RM), updated March 2020.

2. WATER SERVICING

As per the City's record drawings WD136S5 dated April 5, 1965 and WD136S6 dated May 3, 1965, and the Record of Pre-Application Consultation comments dated January 26, 2021, there is an existing 400 mm cast iron watermain in the Fanshawe Park Road East ROW and a 150 mm cast iron watermain in the Geary Avenue ROW. The existing water services for 517, 521, and 525 Fanshawe Park Road East will need to be located on-site through a topographic survey, site investigation, or other investigative measures. At the time of construction, these services are required to be decommissioned at the main.

2.1 Domestic Water Demand

The domestic water supply will be provided via either the existing 400 mm cast iron watermain in the Fanshawe Park Road East ROW or the existing 150 mm cast iron watermain in the Geary Avenue ROW. The maximum hour and maximum day domestic demand, as per the DS&RM for the site's occupancy load of 159 people (99 units at 1.6 people per unit) are 3.66 L/s and 1.64 L/s, respectively. See the attached domestic water demand calculations.

2.2 Water Demand for Fire Protection

The proposed building will have a sprinkler system installed, therefore fire-fighting demand was determined as per NFPA-13, as outlined in the OBC, Section A-3.2.5.7.

Section 7.3.1 of the DS&RM, revised March 2020, requires the minimal residual pressure in a fire flow scenario plus domestic demand to be not less than 140 kPa (20 psi) at any hydrant lateral or fire service connection.

Using linear interpolation, the hydrant flow test at 109 Fanshawe Park Road East, dated December 24, 2014 shows that there is sufficient residual pressure within the system. At the required fire flow + maximum day demand rate of 1,991 L/min, the residual pressure at the building would be approximately 65.99 psi which exceeds the minimum required 20 psi in fire-flow scenarios. Please refer to the calculations attached to this Study.

Based on the above, the existing 400 mm cast iron watermain in the Fanshawe Park Road East ROW or the existing 150 mm cast iron watermain in the Geary Avenue ROW have sufficient capacity for fire-fighting for this development. Based on the current Ontario Building Code (OBC) requirements, a fire hydrant should be located 45 m from the fire-fighters' connection. There is an existing municipal hydrant on Geary Avenue, approximately 10 m from the subject property. As the location of the fire-fighters' connection is not know at this time, a new site hydrant may be required at the time of detailed design. The location of both the fire-fighters' connection and hydrant will be determined through detailed design for Site Plan Approval application.

2.4 Water Supply Conclusions

As shown in the attached Domestic and Fire-Flow Water Servicing Calculations (considering maximum day domestic demand combined with the NFPA-13 flow demand requirements for sprinkler systems), the water pressure at the proposed watermain connection will be approximately 65.99 psi. It can be concluded that adequate water supply is available for the proposed development with the residual pressures greater than the minimum requirement of 140 kPa (20 psi) and less than the maximum requirement of 550 kPa (80 psi) due to the hydraulic grade line of the system providing a pressure of 455.01 kPa (65.99 psi).

The site's proposed water service will be connected to either the watermain in the Fanshawe Park Road East ROW or the Geary Avenue ROW with the size and alignment to be determined at the time of detailed design for Site Plan Approval.

3. SANITARY SERVICING

As per the City's record drawing 4421 dated August 1974 and the Pre-Application Consultation comments, the site is tributary to the existing 200 mm sanitary sewer in the Geary Avenue ROW. 521 and 525 Fanshawe Park Road East residences are serviced via the existing 200 mm sanitary sewer in the Fanshawe Park Road East ROW and 517 Fanshawe Park Road East residence is serviced via the existing 200 mm sanitary sewer in the Geary Avenue ROW. All three (3) sanitary services are required to be decommissioned at the time of construction.

The proposed flows from the subject site are shown on the Sanitary Sewer Design Sheet appended to this Study. Using a flow of 230 L/capita/day as per the DS&RM for the site's occupancy load of 159 people (99 units at 1.6 people per unit), the anticipated peak sanitary flow for the proposed development is 1.95 L/s. When combined with infiltration, this results in a total peak flow of 2.01 L/s.

As per the City's record drawing 4421 dated August 1974 and the sanitary sewer design sheet appended to this study, the sanitary sewer in the Geary Avenue ROW has the capacity to convey the proposed flows from the development.

4. STORM SERVICING AND STORMWATER MANAGEMENT

As per the City's record drawing 12414 dated March 1990 and the Pre-Application Consultation Comments, the subject site is not tributary to the 450 mm storm sewer in the Fanshawe Park Road East ROW which only conveys the road runoff. It is proposed to connect a storm PDC to a existing 450 mm storm sewer on Geary Rd to convey 2-year pre-development storm levels, while flows greater than this will be managed (stored) on-site. Under pre-development conditions, the subject site has a runoff coefficient (C-value) of 0.38. The SWM calculations attached to this Study show that the post-development C-value of 0.69 for the entire site is greater than the pre-development C-value of 0.38. Therefore, storm water management

quantity controls are proposed for this development. Post-development major overland flows will be restricted to match pre-development levels. Accordingly, a hydraulic analysis of the Fanshawe Park Road East ROW was not undertaken since no increase in overland flows is anticipated.

The Storm Sewer Design Sheet appended to this Study was created using the site's pre-development C-value of 0.38 and the data from the City of London record drawing 4421. As shown on the design sheet, there is sufficient capacity in the receiving sewers immediately downstream of the proposed development on Geary Avenue if the development releases flows at pre-development levels. Stormwater management quantity controls for the subject site are proposed to be included as part of the detailed design, to ensure the site's post-development runoff does not exceed allowable levels.

Stormwater management quality controls demonstrating compliance with the SWM criteria and environmental targets identified will be addressed to the standards of the Ministry of the Environment, Conservation and Parks (MECP) (quality control of 80% TSS removal) will be assessed at the time of Site Plan Approval.

5. SUMMARY

Based on the above, the City's existing City water distribution sanitary sewer infrastructure have sufficient capacity to accommodate the proposed development. The existing City storm sewer does not have capacity for the site's flows at pre-development levels and stormwater management quantity controls will be required to mitigate the increased runoff due to site development. The Fanshawe Road Park East ROW appears to have sufficient capacity for the site's overland flows provided the flows do not exceed pre-development levels.

6. LIMITATIONS

This Study was prepared by SBM for Royal Premier Homes and the City of London. Use of this Study by any third party, or any reliance upon its findings, is solely the responsibility of that party. SBM accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions undertaken as a result of this Study. Third party use of this Study, without the express written consent of the Consultant, denies any claims, whether in contract, tort, and/or any other cause of action in law, against the Consultant.

All findings and conclusions presented in this Study are based on site conditions as they appeared in the information presented to SBM and related to in this document. This Study is not intended to be exhaustive in scope, or to imply a risk-free development. It should be recognized that the passage of time may alter the opinions, conclusions, and recommendations provided herein, as well as any changes in the layout of the development.

The design was limited to the documents referenced herein and SBM accepts no responsibility for the accuracy of the information provided by others. All designs and recommendations presented in this Study are based on the information available at the time of the review.

7. CLOSURE

We trust this Study meets your satisfaction. Should you have any questions or require further information, please do not hesitate to contact us.

Respectfully submitted,

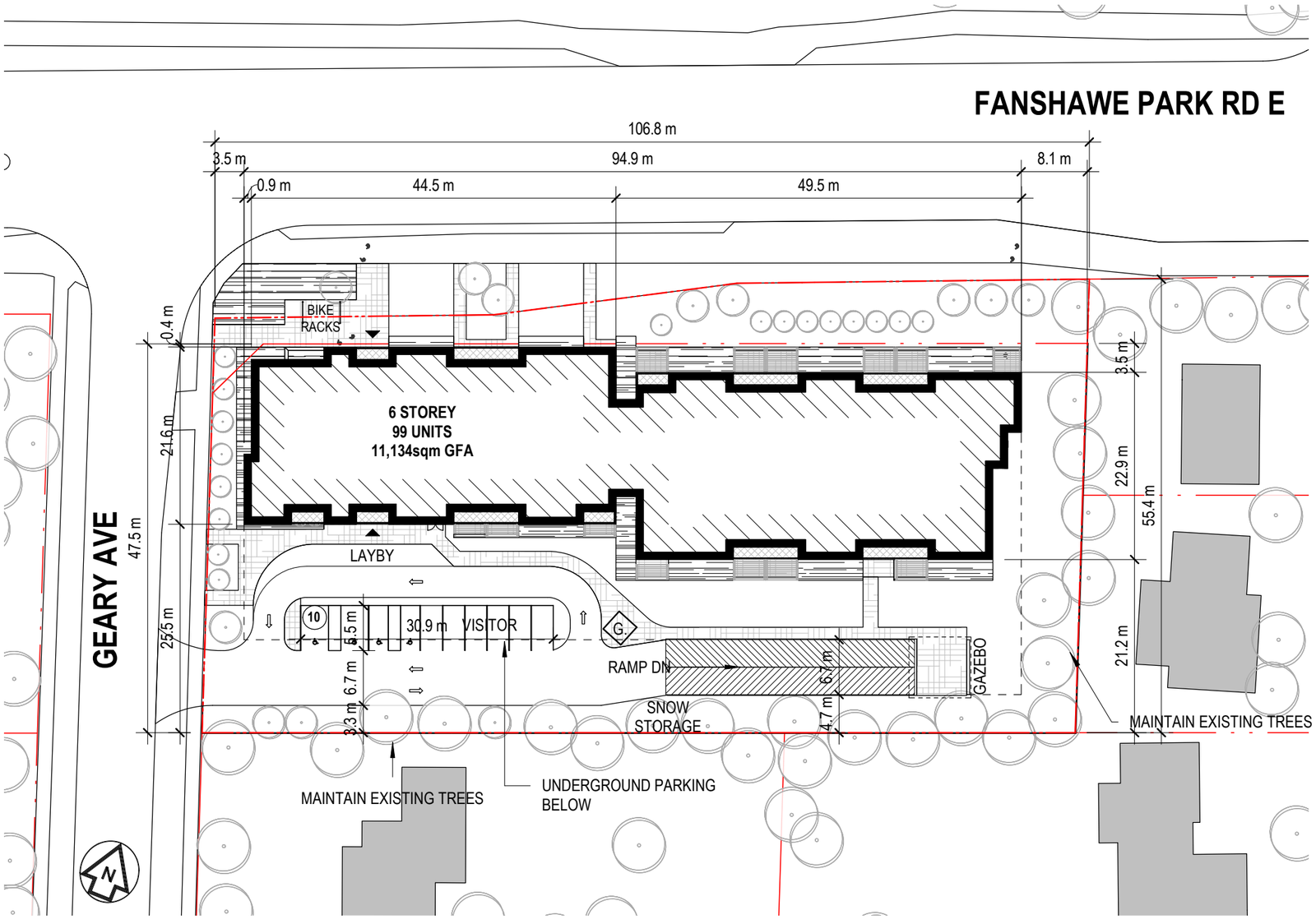
Strik, Baldinelli, Moniz Ltd.

Planning • Civil • Structural • Mechanical • Electrical

Nelson Guiot, P.Eng.
Eng IV., Civil Department Manager

Nicholas Paneras, BESc Candidate
Civil Engineering Designer

Encl:
- Site Plan by Zedd Architecture dated March 1, 2021
- City of London record drawing WD136S5 dated April 5, 1965
- City of London record drawing WD136S6 dated May 3, 1965
- Domestic Water Demand Calculations
- Hydrant Flow Test No. 14-110 dated December 29, 2014
- Fire-Fighting Flow (NFPA-13) Calculations
- City of London record drawing 4421 dated August 1974
- Sanitary Service Design Sheet
- City of London record drawing 12414 dated March 1990
- Runoff Coefficient Calculations
- Storm Sewer Design Sheet



Site Development Stats

517,521,525 Fanshawe Park Rd. E

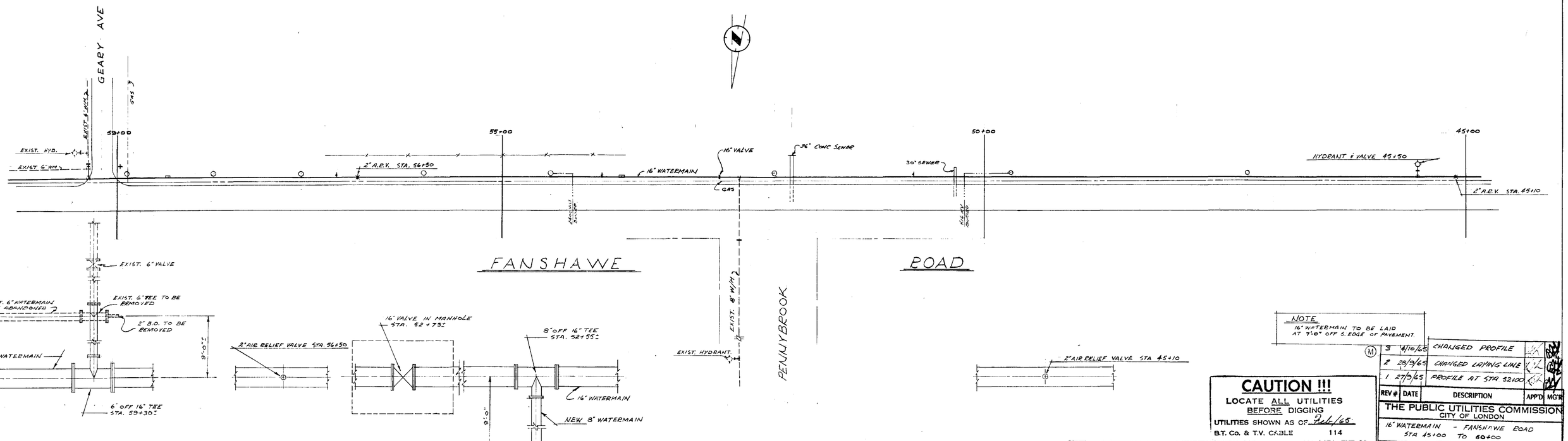
	ITEM	PROPOSED	ACTUAL
1	ZONE - PROPOSED BUILDING PERMITTED USES	R8-4 APARTMENT BUILDINGS	Appartment
2	LOT AREA (MINIMUM)	1,000 sqm	5,668 sqm
3	LOT FRONTAGE (MINIMUM)	30m	106.8 m
4	FRONT YARD SETBACK (MINIMUM)	6m + 1m per 10m of bldg above first 3m (7.73m req.)	0.4m
5	EXTERIOR SIDEYARD SETBACK (MINIMUM)	6m + 1m per 10m of bldg above first 3m (7.73m req.)	3.5m
6	REAR YARD DEPTH (MINIMUM)	1.2m per 3m of bldg above first 3m (4.5m min.) (6.9m req.)	21.2m
7	INTERIOR SIDEYARD DEPTH (MINIMUM)	1.2m per 3m of bldg above first 3m (4.5m min.) (6.9m req.)	8.1m
8	LANDSCAPE OPEN SPACE (% MINIMUM)	30%	2,762sqm (48%)
9	COVERAGE (% MAXIMUM)	30%	1,891sqm (33.4%)
10	HEIGHT (M MAXIMUM)	13m	20.3m
11	DENSITY (UPH MAXIMUM)	40uph	99 units (175uph)
12	COMMERCIAL ALLOWABLE (SQM MAXIMUM)	n/a	n/a
13	COMMERCIAL PARKING	n/a	n/a
14	RESIDENTIAL PARKING	1.25 per unit	118 (1 : 1.19)
15	RESIDENTIAL BIKE PARKING	0.75 per unit	75 spaces (1:0.75)

Scale : 1" = 50'-0"

zedd ARCHITECTURE
Z-627 maitland street london ontario N5Y 2V7 19 518 9333
www.zeddarchitecture.com o@zeddarchitecture.com

2021-03-01 4:41:49 PM
File: Z:\Projects\2020\20-052 -jkp H -5 17-525 Fanshawe\02 Drawings\20-052_RPH_Fanshawe_SD.rvt

WD 136 SHT. 5



NOTE
16" WATERMAIN TO BE LAID AT 7'0" OFF S. EDGE OF PAVEMENT.

CAUTION !!!
LOCATE ALL UTILITIES BEFORE DIGGING
UTILITIES SHOWN AS OF Dec/65

B.T. Co. & T.V. CABLE	114	
UNION GAS	439-2471	EXT.-69
CITY SEWERS	439-4211	EXT.-291
CITIES HEATING	434-3008	EXT.-
P.U.C.-ELEC. & WATER	433-1211	EXT.-

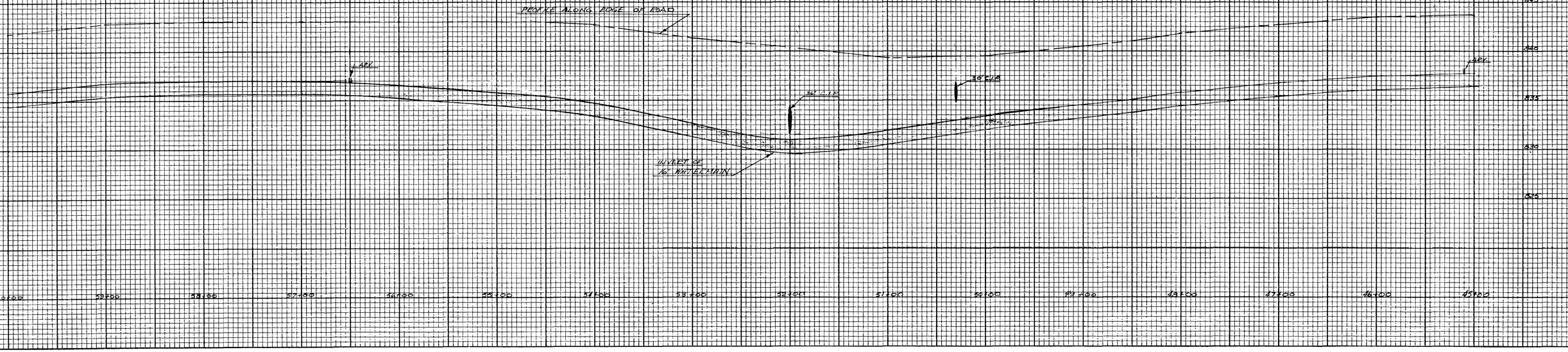
FIRE DEPARTMENT APPROVAL
BY: M. C. Mathers

REV #	DATE	DESCRIPTION	APP'D	M.O.T.
3	4/16/65	CHANGED PROFILE		
2	28/3/65	CHANGED LAYING LINE		
1	27/3/65	PROFILE AT STA 52100		

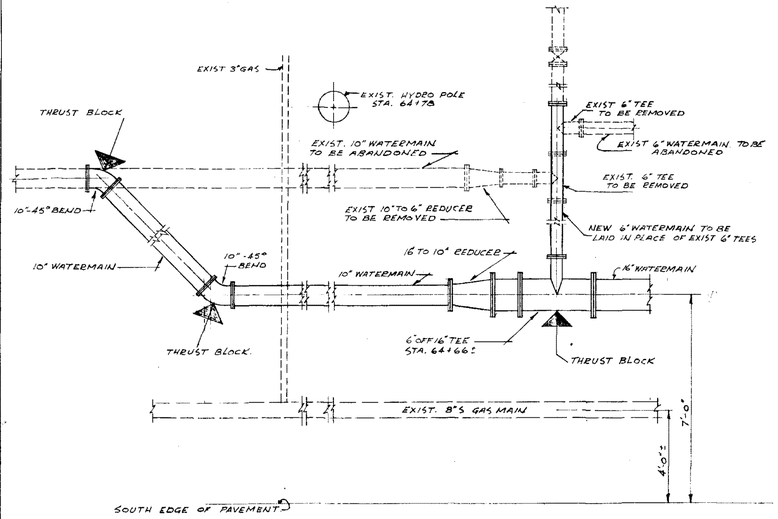
THE PUBLIC UTILITIES COMMISSION
CITY OF LONDON
16" WATERMAIN - FANSHAWE ROAD STA 45+00 TO 60+00

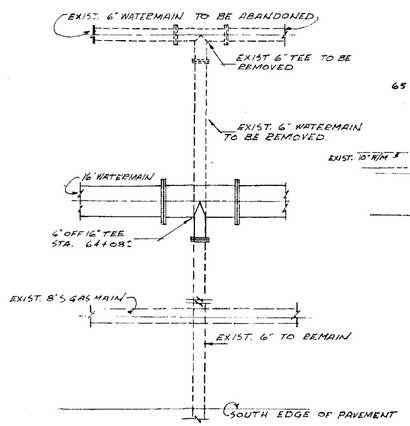
DRAWN	CHECKED	DATE	ORDER	SCALE
GAV		APR 5/65	6483	1" = 50'

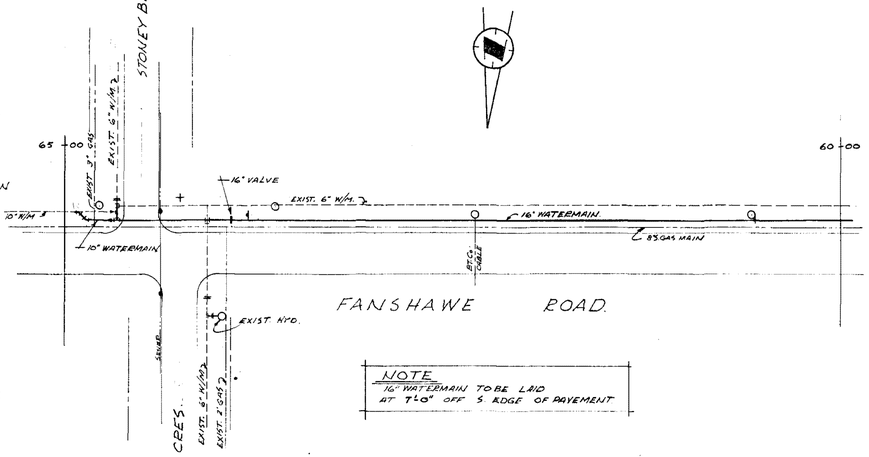
APPROVED: MANAGER OF ENGINEERING
DWG. WD-136 SHT 5



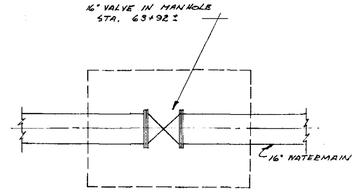
WD 136 SHT. 6







NOTE
16" WATERMAIN TO BE LAID AT 7'-0" OFF S. EDGE OF PAVEMENT



CAUTION !!!
LOCATE ALL UTILITIES BEFORE DIGGING

UTILITIES SHOWN AS OF Feb/65

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CITY SEWERS	439-4211 EXT.-291
CITIES HEATING	434-3003 EXT.-
P.U.C.-ELEC. & WATER	433-1211 EXT.-

FIRE DEPARTMENT APPROVAL
BY: M. E. Matthews

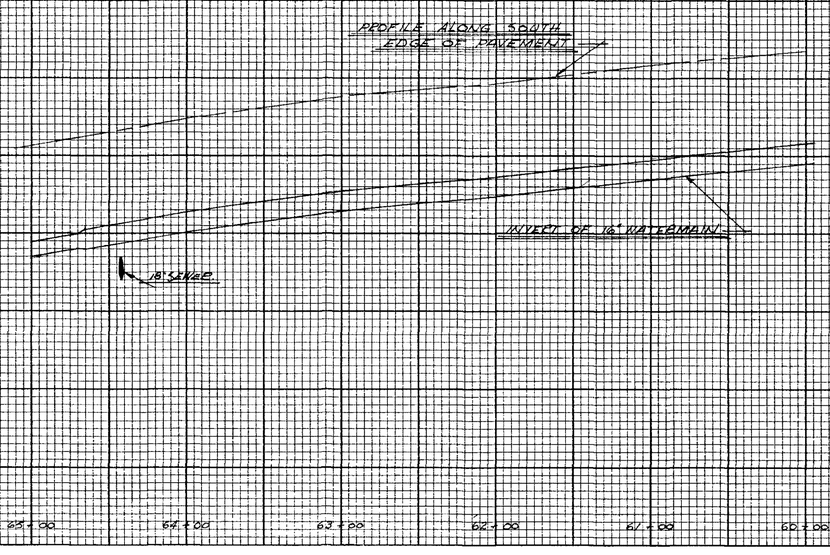
REV #	DATE	DESCRIPTION	APP'D	MGR
2	29/9/65	ADDED 18" SEWER		
1	28/9/65	CHANGED LAYING LINE		

THE PUBLIC UTILITIES COMMISSION
CITY OF LONDON

16" WATERMAIN - FANSHAWE ROAD
STA. 60+00 TO STA 65+00

DRAWN	CHECKED	DATE	ORDER	SCALE
JSV		MAY 3 '65	R429	1"=50'-0"

APPROVED MANAGER OF ENGINEERING DWG. WD-136 SHT. 6



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DOMESTIC WATER DEMAND, VELOCITY, AND TURNOVER CALCULATION

DATE:	March 15, 2021
JOB N0.:	SBM-21-0466

Client:	**Royal Premier Homes**
Project:	**Fanshawe Park Midrise**
Location:	**517-525 Fanshawe Park Road East**

DEMAND CALCULATION

Avg. Day Demand =	255	L/day/cap
Avg. Day Demand =	0.002951389	L/s/cap
Max. Day Peaking Factor =	3.5	
Max. Hour Peaking Factor =	7.8	
High Density Residential =	1.6	p/unit

	Units/Area	Population	Avg. Day (L/s)	Max. Hour (L/s)	Max. Day (L/s)
High Density Residential	99	159	0.47	3.66	1.64
Total			**0.47**	**3.66**	**1.64**

VELOCITY CALCULATION

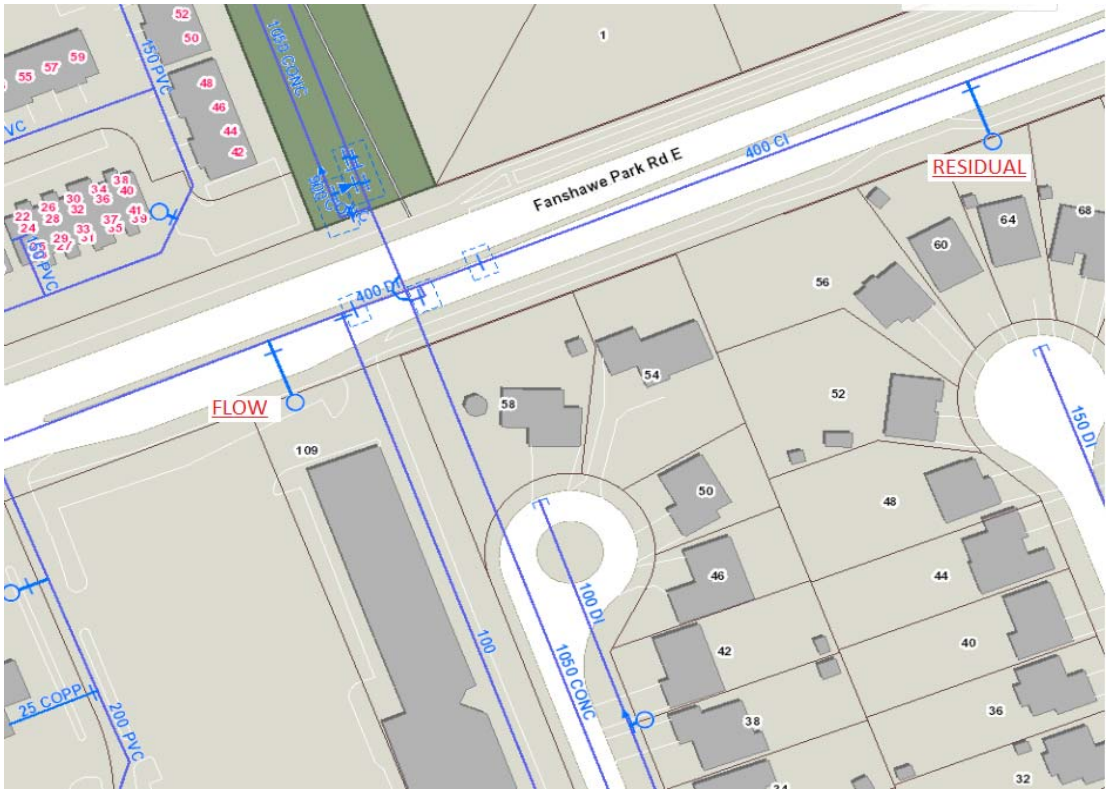
Diameter (mm)	Demand (L/s)	Velocity (m/s)
150	3.66	0.207
200	3.66	0.117

Maximum allowable velocity of 1.5 m/s under maximum hour domestic flow conditions as per Section 7.3.6 of the City of London Design Specifications and Requirements Manual.

WATER SUPPLY DEPARTMENT
FLOW TESTS

DATE:	Monday, December 29, 2014	FLOW TEST No.			**14-110**
TIME:	11:30 AM	HYDRANT ID			H4249
OPERATOR:	Dean Prentice	CHLORINE RESIDUAL mg/L			1.05
OPERATOR:	Dave Senay	WATER QUALITY AFTER TEST	POOR	GOOD	EXCELLENT
REQUESTED BY:	C&H Fire Suppression - Jamie Tomes				✔
LOCATION:	109 Fanshawe Pk Rd E	TIME USED FOR FLUSHING			0

	FLOW HYDRANT					RESIDUAL HYDRANT	
TEST NUMBER	STATIC PRESSURE P.S.I.	OUTLET SIZE IN.	PITOT READING P.S.I.	INDIVIDUAL FLOW U.S.G.P.M	TOTAL FLOW U.S.G.P.M.	RESIDUAL PRESSURE P.S.I.	STATIC PRESSURE P.S.I.
1	64				1190	61	62
		2 1/2	50	1190			
2		2 1/2	20	750	1500	60	
		2 1/2	20	750			
3							



Information contained in this report is representative of flows and pressure losses at the time of the test and depends on reservoir levels, pump operation and customer water demand. Results will vary throughout the day and time of year. Available pressure at other times should be based on a design hydraulic grade line for the pressure zone in which the hydrants are located. By issuing this information report, neither the City nor any of its employees makes any warranty, express or implied, concerning the location, type or extent of services described in this report. Furthermore, neither the City nor any of its employees shall be liable in any manner for any personal injury or property damage or loss of any kind arising from or connected with this information or incomplete information.

Version: 001
November 20, 2014

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Fire-Fighting Flow NFPA#13

	For data entry
	Calculated, not for data entry

Date:	March 15, 2021
Job No:	SBM-21-0466

Client:	**Royal Premier Homes**
Project:	**Fanshawe Park Midrise**
Location:	**517-525 Fanshawe Park Road East**

Table 1. NFPA#13 Flow Demand Requirements

Hazard	Sprinkler Flow (USGPM)	Hydrant Allowance (USGPM)	Total Flow (USGPM)
Light	175	100	275
Ordinary 1	250	250	500
ordinary 2	350	250	600
Extra 1	750	500	1250
Extra 2	1000	500	1500

Required Supply Flow Rate (Table 1) =	500	USGPM
Required Supply Flow Rate =	1893	L/min
Maximum Day Demand, L/min =	1.6	L/s (Refer to attached Domestic Water Demand calculation)
	98	L/min
Required Supply Fire Flow + Maximum Day Demand, L/min =	**1991**	

	62.00	*psi (427.48 kPa) =	**0**	*L/min (0 USGPM)
Provided Supply Flow Rate @	**61.00**	*psi (420.58 kPa) =	**4505**	*L/min (1190 USGPM)
	60.00	*psi (413.69 kPa) =	**5678**	*L/min (1500 USGPM)
Using linear interpolation, residual pressure at hydrant =	**61.44**	psi (423.64 kPa) =	**1991**	L/min (526 USGPM)
Pressure Drop =	**0.56**	psi (3.84 kPa)		

Largest Pressure Drop (most conservative) =	0.56	psi
Pressure Drop =	0.39	m head
****HGL from DS&RM (Low Level System) =**	301.8	m head
Total Head Under Fire Flow Conditions =	301.41	m head
Approximate Elevation of Proposed Connection to Hydrant =	255.00	m
Water Pressure at service entrance Under Firefighting Conditions =	46.41	m head (65.99 psi, 455.01 kPa)

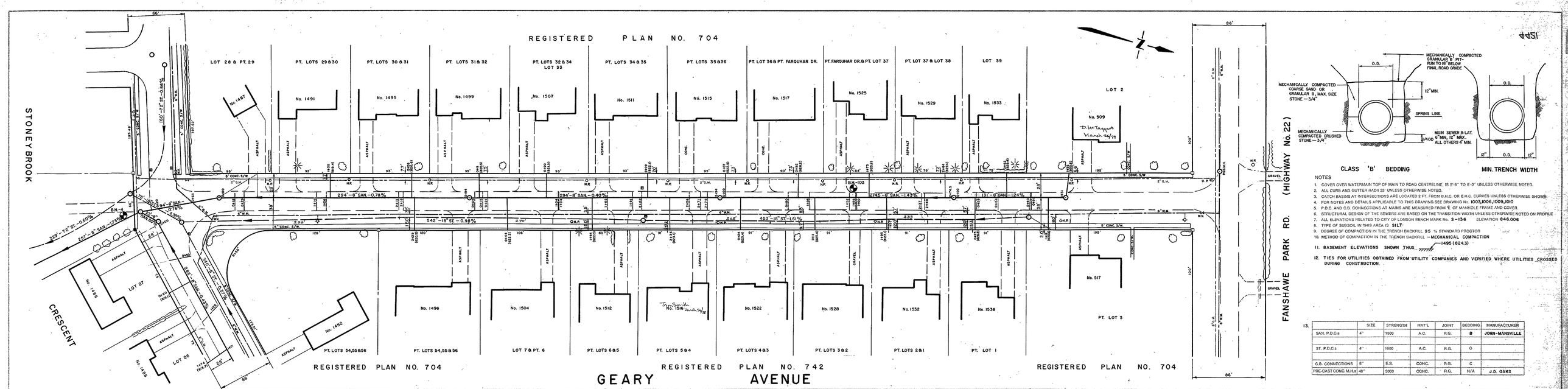
Therefore, water supply pressure at the proposed property under fire flow conditions not accounting for losses = 46.41 m head (65.99 psi, 455.01 kPa)

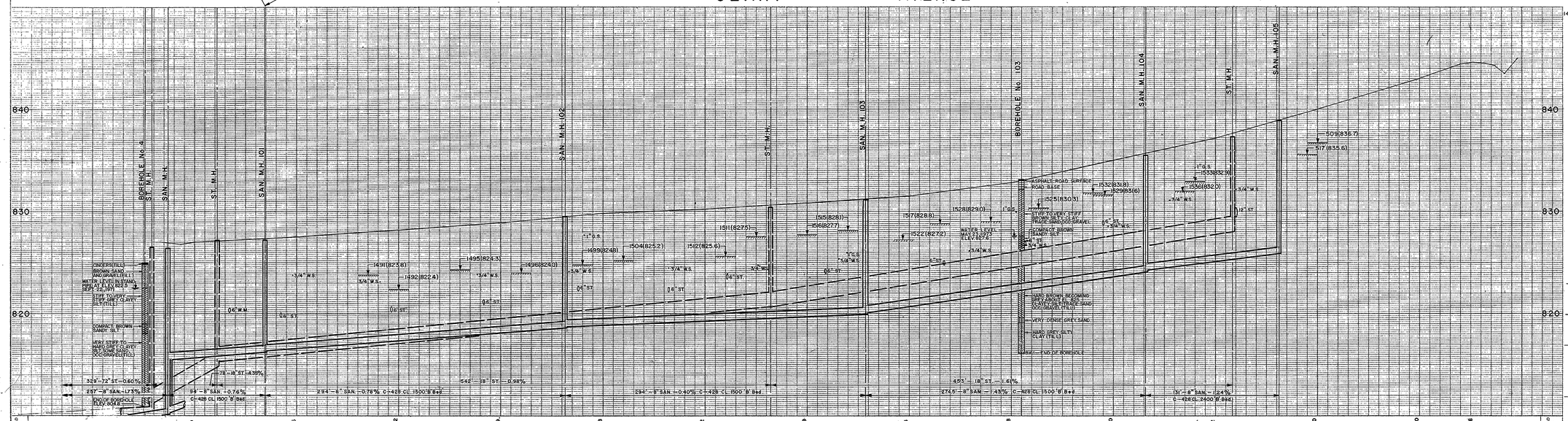
* Please refer to Hydrant Flow Test - 109 Fanshawe Park Road East Hydrant (H4249) Flow Test - 14-110

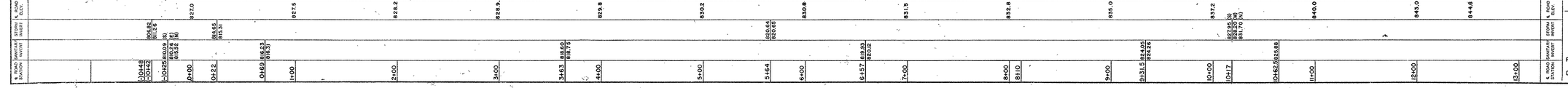
Table 1. Water Velocity Calculation

Diameter (mm)	Demand (L/min)	Velocity (m/s)
150	1991	1.878

Maximum allowable velocity of 2.4 m/s under fire flow conditions as per Section 7.3.6 of the City of London Design Specifications and Requirements Manual







NOTES

1. COVER OVER WATERMAIN TOP OF MAIN TO ROAD CENTRELINE, IS 5'-6" TO 6'-0" UNLESS OTHERWISE NOTED.
2. ALL CURB AND GUTTER RADII 25' UNLESS OTHERWISE NOTED.
3. CATCH BASINS AT INTERSECTIONS ARE LOCATED 2 FT. FROM B.H.C. OR E.H.C. CURVES UNLESS OTHERWISE SHOWN.
4. FOR NOTES AND DETAILS APPLICABLE TO THIS DRAWING SEE DRAWING No. 1003,1006,1009,1010
5. P.D.C. AND C.B. CONNECTIONS AT MAINS ARE MEASURED FROM ℄ OF MANHOLE FRAME AND COVER.
6. STRUCTURAL DESIGN OF THE SEWERS ARE BASED ON THE TRANSITION WIDTH UNLESS OTHERWISE NOTED ON PROFILE
7. ALL ELEVATIONS RELATED TO CITY OF LONDON BENCH MARK No. S-13.6 ELEVATION 846.006
8. TYPE OF SUBSOIL IN THIS AREA IS SILT.
9. DEGREE OF COMPACTION IN THE TRENCH BACKFILL 95 % STANDARD PROCTOR
10. METHOD OF COMPACTION IN THE TRENCH BACKFILL — MECHANICAL COMPACTION
11. BASEMENT ELEVATIONS SHOWN THUS — 1495 (824.3)
12. TIES FOR UTILITIES OBTAINED FROM UTILITY COMPANIES AND VERIFIED WHERE UTILITIES CROSSED DURING CONSTRUCTION.

13.

	SIZE	STRENGTH	MAT'L	JOINT	BEDDING	MANUFACTURER
SAN. P.D.C.s	4"	1500	A.C.	R.G.	B	JOHN-MANSVILLE
ST. P.D.C.s	4"	1500	A.C.	R.G.	C	
C.B. CONNECTIONS	8"	E.S.	CONC.	R.G.	C	
PRE-CAST CONC. M.H.s	48"	3000	CONC.	R.G.	N/A	J.D. OAKS

14.

SERVICES	COMPLETION	CONTRACTOR
SANITARY SEWERS P.D.C.'s & M.H.'s	OCTOBER 9,1973	DAVID L. COATSWORTH
STORM SEWERS, P.D.C.'s, M.H.'s & C.B.'s		
WATERMAINS & WATER SERVICES		
GRANULAR ROAD BASE		
CURB & GUTTER		
SIDEWALKS		
PAVING		

REGISTERED PROFESSIONAL ENGINEER D. J. YOUNG PROVINCE OF ONTARIO

NO.	REVISIONS	DATE	BY
	"AS CONSTRUCTED DRAWING"	AUG. 1974	D.F.W.A.

CITY OF LONDON

STONEYBROOK AREA SANITARY SEWERS PHASE V

GEARY AVENUE

FANSHAWE PARK ROAD TO STONEYBROOK CRESCENT

DESIGN BY : J.R. SPRIET
DRAWN BY : D. ARNOLD
CHECKED BY : D.J. YOUNG

FIELD BOOK : S-22,SC-14
SCALE : 1"=4' VERT., 1"=40' HORIZ.
DATE :

A. M. SPRIET & ASSOCIATES LTD.
CONSULTING ENGINEERS
LONDON — ONTARIO

PROJECT No. 7318 1
DRAWING No. 4

APPROVED BY :

SECTION HEAD

CITY ENGINEER

CITY ENGINEER'S DEPARTMENT
PROJECT NO.
DRAWING NO. 4421

STRIK BALDINELLI MONIZ
PLANNING • CIVIL • STRUCTURAL • MECHANICAL • ELECTRICAL

LONDON LOCATION
1599 Adelaide St. N., Units 301 & 203
London, ON N5X 4E8
P: 519-471-6667

KITCHENER LOCATION
1415 Huron Rd., Unit 225
Kitchener, ON N2R 0L3
P: 519-725-8093

www.sbmltd.ca

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Sanitary Service Design Sheet

City of London

Residential Population Densities

(A) Area Basis

Low Density Residential (Single Family/Semi-Detached) = 30 Units/hectare @ 3 people/unit
Medium Density Residential (Multi-Family/Townhouse) =75 Units/hectare @ 2.4 people/unt
High Density Residential (Apartment Buildings) **=150-300 Units/hectare @ 1.6 people/unit**
Commercial = 100 people/hectare

Design Parameters

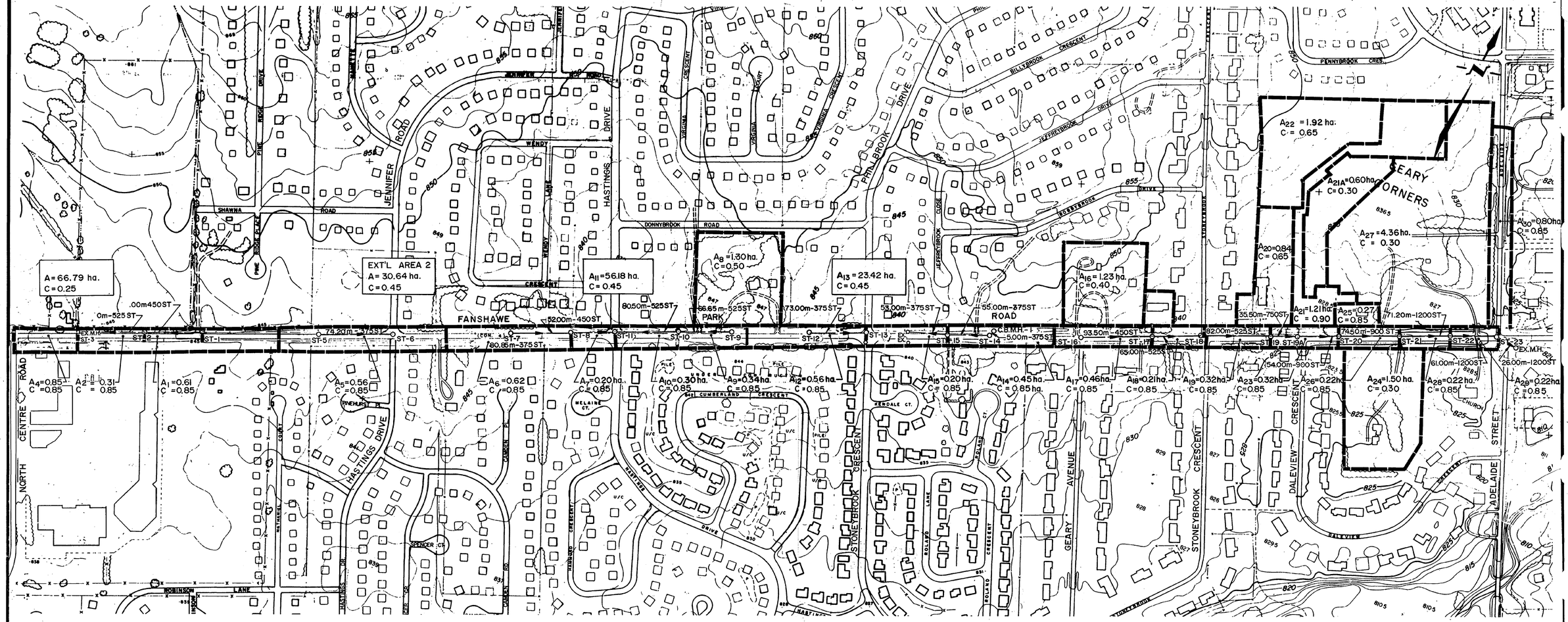
Daily Flow (L/cap/day) 230
Sewage Infiltration (Litres/hectare/day) 8640
Harmon Formula (Peaking Factor)
M = (1 + 14/(4+P^0.5))
Uncertainty Factor 1.1

Date: March 15, 2021
Job Number: SBM-21-0466
Client: Royal Premier Homes
Project: Fanshawe Park Midrise
Location: 517-525 Fanshawe Park Road East

Designed By: NEP
Reviewed By: NGu

Location			Area		Population					Sewage Flows				Sewer design				
Area No.	From MH	To MH	Delta Hectare	Total Hectare	*No. of Units	People Per Unit	People Per Hectare	Delta Pop.	Total Pop.	Harmon Peaking Factor	Infilt L/S	Sewage L/S	Total L/S	n	Pipe Slope %	Dia. mm	Capacity L/S	Velocity m/s
Upstream Conditions																		
A1	SAN 1	SAN 2	1.03	1.03				16	16	4.39	0.10	0.21	0.31	0.013	0.71%	200	27.65	0.88
A2	SAN 2	SAN 3	1.23	2.26				16	32	4.35	0.23	0.41	0.64	0.013	0.67%	200	26.86	0.86
A3	SAN 4	SAN 3	0.57	0.57				16	16	4.39	0.06	0.21	0.27	0.013	1.00%	200	32.82	1.04
	SAN 3	70	0.00	2.83				0	48	4.32	0.28	0.61	0.89	0.013	0.55%	200	24.34	0.77
Proposed Development	Site	70	0.57	0.57	99.0	1.6		158.4	159	4.18	0.06	1.95	**2.01**	0.013	1.00%	150	**15.24**	0.86
Downstream Conditions																		
62	70	69	0.61	4.00				8	215	4.14	0.40	2.60	3.00	0.013	1.24%	200	36.54	1.16
61	69	68	1.21	5.22				28	243	4.12	0.52	2.93	3.45	0.013	1.43%	200	39.24	1.25
60	68	67	1.51	6.73				20	263	4.10	0.67	3.16	**3.83**	0.013	0.40%	200	**20.76**	0.66

Refer to Site Plan prepared by Zedd Architecture, dated March 1, 2021
Design Parameters obtained from Section 3.8 in the City of London DS&RM
Upstream conditions based on City of London as-constructed drawing titled Sanitary Drainage Areas & Design Sheet (Sheet No. 12415), prepared by Delcan, dated March 1990
Downstream conditions based on City of London as-constructed drawings 5018S1, prepared by De Leuw Cather, dated February 1977 and 4421, prepared by A. M. Spriet & Associated Ltd., dated August 1974



STORM SEWER DESIGN SHEET

AREA NO.	STREET	FROM	TO	LAND USE	AREA ha.	TOTAL AREA	C	2.78 AxC	TOT. SEC'L AxC	TOT. CUM. AxC	TOTAL ΣAxC	TIME OF SLST.	TIME ACCUM.	INTEN I	PEAK FLOW	PIPE DIA.	n	CAPACITY	VEL. m/s	LENGTH m	FLOW TIME	SLOPE %	SLOPE F/A	PIPE DIF	FALL IN SEWER	INVERT UPSTREAM	INVERT DOWNSTREAM	FROM MANHOLE	TO MANHOLE	AVE. DEPTH TO INVERT	MANHOLES	OTHER
A16	FANSHAWE W.	ST-16	ST-17	RES	1.270	1.270	0.30	0.492	0.492	0.492	1.368	N/A	13.50	92	125.834	450	0.90	0.015	234.412	1.474	9.0	0.05	F/A	0.000	0.000	255.100		ST-16 (APPROX. 4.7 m W. OF CENTRELINE OF GEARY AVE.)	ST-17 (APPROX. 86.5 m E. OF CENTRELINE OF GEARY AVE.)	2.4	1	-
A17	FANSHAWE W.	ST-16	ST-17	ROW	0.460	1.690	0.95	0.391	0.883	0.883	2.455	0.00	13.50	92	225.836	450	0.90	0.015	234.412	1.474	93.50	1.02	0.000	0.000	0.824	255.122	254.298	ST-16 (APPROX. 4.7 m W. OF CENTRELINE OF GEARY AVE.)	ST-17 (APPROX. 86.5 m E. OF CENTRELINE OF GEARY AVE.)	-	-	-
A18	FANSHAWE W.	ST-17	ST-18	ROW	0.210	1.900	0.85	0.179	1.062	1.062	2.951	1.02	14.52	88	259.685	525	0.85	0.013	435.406	2.011	66.00	0.55	0.000	0.000	0.375	0.337	254.211	253.874	ST-17 (APPROX. 86.5 m E. OF CENTRELINE OF GEARY AVE.)	ST-18 (APPROX. 9.0 m W. OF CENTRELINE OF STONEYBROOK CRES.)	2.4	1	-
A19	FANSHAWE W.	ST-18	ST-19	ROW	0.320	2.220	0.85	0.272	1.334	1.334	3.707	0.55	15.01	87	322.520	525	1.77	0.013	599.008	2.767	52.00	0.31	0.000	0.000	1.426	253.462	252.036	ST-18 (APPROX. 9.0 m W. OF CENTRELINE OF STONEYBROOK CRES.)	ST-19 (APPROX. 48.5 m W. OF CENTRELINE OF DALEVIEW CRES.)	2.4	1	-
A20	FANSHAWE W.	ST-19	ST-19A	COM	0.840	3.060	0.65	0.546	1.880	1.880	5.225	0.54	15.56	85	444.126	750	0.88	0.013	1050.855	2.379	35.60	0.25	0.250	0.225	0.300	251.397	251.097	ST-19 (APPROX. 48.5 m W. OF CENTRELINE OF DALEVIEW CRES.)	ST-19A (APPROX. 13.5 m W. OF CENTRELINE OF DALEVIEW CRES.)	2.7	1	-
A21	FANSHAWE W.	ST-19A	ST-20	COM	1.210	4.270	0.90	1.089	2.969	2.969	8.252	0.25	15.80	85	701.457	900	0.40	0.013	1144.943	1.800	0.00	0.00	0.000	0.653	0.150	0.000	250.264	250.264	ST-19A (APPROX. 13.5 m W. OF CENTRELINE OF DALEVIEW CRES.)	ST-20 (APPROX. 41.5 m E. OF CENTRELINE OF DALEVIEW CRES.)	-	-	-
A21a	FANSHAWE W.	ST-19A	ST-20	COM	0.600	4.870	0.30	0.180	3.149	3.149	8.753	0.00	15.80	85	743.991	900	0.40	0.013	1144.943	1.800	0.00	0.00	0.000	0.000	0.000	0.000	250.264	250.264	ST-19A (APPROX. 13.5 m W. OF CENTRELINE OF DALEVIEW CRES.)	ST-20 (APPROX. 41.5 m E. OF CENTRELINE OF DALEVIEW CRES.)	-	-	-
A22	FANSHAWE W.	ST-19A	ST-20	T-HSE	1.920	6.790	0.65	1.248	4.397	4.397	12.222	0.00	15.80	85	1038.893	900	0.40	0.013	1144.943	1.800	0.00	0.00	0.000	0.000	0.000	0.000	250.264	250.264	ST-19A (APPROX. 13.5 m W. OF CENTRELINE OF DALEVIEW CRES.)	ST-20 (APPROX. 41.5 m E. OF CENTRELINE OF DALEVIEW CRES.)	-	-	-
A23	FANSHAWE W.	ST-19A	ST-20	ROW	0.320	7.110	0.85	0.272	4.669	4.669	12.978	0.00	15.80	85	1103.167	900	0.37	0.013	1144.943	1.800	54.20	0.51	0.000	0.000	0.198	250.247	250.049	ST-19A (APPROX. 13.5 m W. OF CENTRELINE OF DALEVIEW CRES.)	ST-20 (APPROX. 41.5 m E. OF CENTRELINE OF DALEVIEW CRES.)	2.5	1	-
A24	FANSHAWE W.	ST-20	ST-21	RES	1.500	8.610	0.30	0.450	5.119	5.119	14.229	0.51	16.31	83	1181.043	900	0.50	0.013	1280.086	2.012	76.50	0.63	0.000	0.000	0.600	250.049	249.449	ST-20 (APPROX. 41.5 m E. OF CENTRELINE OF DALEVIEW CRES.)	ST-21 (APPROX. 115.5 m E. OF CENTRELINE OF DALEVIEW CRES.)	2.7	1	-
A25	FANSHAWE W.	ST-20	ST-21	ROW	0.270	8.880	0.85	0.239	5.348	5.348	14.867	0.00	16.31	83	1233.998	900	0.50	0.013	1280.086	2.012	0.00	0.00	0.000	0.000	0.000	0.000	250.049	250.049	ST-20 (APPROX. 41.5 m E. OF CENTRELINE OF DALEVIEW CRES.)	ST-21 (APPROX. 115.5 m E. OF CENTRELINE OF DALEVIEW CRES.)	-	-	-
A26	FANSHAWE W.	ST-20	ST-21	ROW	0.220	9.100	0.85	0.187	5.535	5.535	15.387	0.00	16.31	83	1277.146	900	0.50	0.013	1280.086	2.012	76.50	0.63	0.000	0.000	0.608	249.987	249.379	ST-20 (APPROX. 41.5 m E. OF CENTRELINE OF DALEVIEW CRES.)	ST-21 (APPROX. 115.5 m E. OF CENTRELINE OF DALEVIEW CRES.)	-	-	-
A27	FANSHAWE W.	ST-21	ST-22	COM	4.360	13.460	0.30	1.308	6.843	6.843	19.024	0.61	16.92	81	1540.907	1200	0.55	0.013	2891.381	2.557	0.00	0.00	0.000	0.000	0.300	249.379	249.079	ST-21 (APPROX. 115.5 m E. OF CENTRELINE OF DALEVIEW CRES.)	ST-22 (APPROX. 65.5 m W. OF CENTRELINE OF ADELAIDE ST.)	3.5	1	1-600, PDC, 1-60
A28	FANSHAWE W.	ST-21	ST-22	COM	0.220	22.290	0.85	0.187	12.149	12.149	33.773	0.00	19.24	76	2566.735	1200	0.52	0.013	2891.381	2.557	71.20	0.46	0.000	0.000	0.361	249.051	248.690	ST-21 (APPROX. 115.5 m E. OF CENTRELINE OF DALEVIEW CRES.)	ST-22 (APPROX. 65.5 m W. OF CENTRELINE OF ADELAIDE ST.)	-	-	1-300 PDC
A29	FANSHAWE E.	ST-22	ST-23	COM	0.220	22.510	0.85	0.187	12.336	12.336	34.295	0.46	19.70	75	2571.952	1200	0.82	0.013	3445.479	3.046	61.00	0.33	0.000	0.000	0.488	248.690	248.202	ST-22 (APPROX. 65.5 m W. OF CENTRELINE OF ADELAIDE ST.)	ST-23 (APPROX. 4.5 m W. OF CENTRELINE OF ADELAIDE ST.)	3.2	1	1-300 PDC
A29	FANSHAWE E.	ST-23	EX.MH	ROW	0.000	22.510	0.90	0.000	12.336	12.336	34.295	0.33	20.03	74	2537.659	1200	0.52	0.013	3445.272	3.045	0.00	0.00	0.000	0.000	0.000	248.202	248.202	ST-23 (APPROX. 4.5 m W. OF CENTRELINE OF ADELAIDE ST.)	EX. MH (APPROX. 16.5 m E. OF CENTRELINE OF ADELAIDE ST.)	3.0	1	1-600 PDC
A30	ADELAIDE S.	ST-23	EX.MH.	COM	0.800	23.310	0.85	0.680	13.016	13.016	36.185	ERR	19.73	75	2713.732	1200	0.97	0.013	3443.272	3.045	26.00	0.14	F/A	0.000	0.234	248.180	247.970	ST-23 (APPROX. 4.5 m W. OF CENTRELINE OF ADELAIDE ST.)	EX. MH (APPROX. 16.5 m E. OF CENTRELINE OF ADELAIDE ST.)	-	-	-
A1	FANSHAWE	ST-1	ST-2	ROW	0.610	0.610	0.850	0.518	0.518	0.518	1.441	N/A	13.50	92	132.612	450	0.25	0.015	144.078	0.906	67.00	1.62	0.000	0.450	0.302	255.871	255.570	ST-1 (APPROX. 280.0 m E. OF CENTRELINE OF NORTH CENTRE RD.)	ST-2 (APPROX. 192.5 m E. OF CENTRELINE OF NORTH CENTRE RD.)	2.1	1	2-CB,2-CICB,1-DICB	-
A2	FANSHAWE	ST-2	EX. MH	ROW	0.310	0.920	0.850	0.264	0.782	0.782	2.174	1.62	15.12	87	199.135	525	0.16	0.013	197.060	0.910	96.00	1.56	0.000	0.675	0.153	255.480	255.347	ST-2 (APPROX. 192.5 m E. OF CENTRELINE OF NORTH CENTRE RD.)	EX. MH (APPROX. 109.0 m E. OF CENTRELINE OF NORTH CENTRE RD.)	2.5	1	2-CB,1-DICB	-
													1.56	23.21																	
A5	FANSHAWE	ST-5	ST-6	ROW	0.560	0.560	0.850	0.476	0.476	0.476	1.323	N/A	13.50	92	121.742	450	0.47	0.015	184.907	1.163	74.20	1.29	0.000	0.000	0.346	255.781	255.435	ST-5 (APPROX. 73.0 m E. OF CENTRELINE OF JENNIFER RD.)		ERR	2.8	1	1-CB,2-CICB	-
													1.29	28.44																	
A6	FANSHAWE	ST-7	ST-8	ROW	0.620	0.620	0.850	0.527	0.527	0.527	1.465	13.50	13.50	92	134.798	375	1.73	0.015	196.367	1.778	80.85	0.76	N/A	0.000	1.375	255.173	253.798	ST-7 (APPROX. 130.5 m E. OF CENTRELINE OF HASTINGS DR. E.)	ST-8 (APPROX. 51.0 m E. OF CENTRELINE OF HASTINGS DR. E.)	2.7	1	1-DICB	-
A7	FANSHAWE	ST-8	ST-11	ROW	0.200	0.820	0.850	0.170	0.697	0.697	1.939	0.76	14.28	89	172.452	450	1.60	0.015	282.693	1.852	52.00	0.53	0.000	0.075	0.085	253.703	253.618	ST-8 (APPROX. 51.0 m E. OF CENTRELINE OF HASTINGS DR. E.)	ST-9 (APPROX. 150.5 m W. OF CENTRELINE OF HASTINGS DR. E.)	3.2	1	2-DICB,1-DICB,1-CBMH	-
A8	FANSHAWE	ST-9	ST-10	RES	1.300	1.300	0.500	0.650	0.650	0.650	1.807	0.00	13.50	92	168.244	525	0.66	0.013	407.994	1.885	0.00	0.00	0.000	0.000	0.000	254.100	254.100	ST-9 (APPROX. 150.5 m W. OF CENTRELINE OF HASTINGS DR. E.)	ST-10 (APPROX. 83.5 m W. OF CENTRELINE OF HASTINGS DR. E.)	3.7	1	-	-
A9	FANSHAWE	ST-9	ST-10	ROW	0.340	2.220	0.850	0.299	1.229	1.229	2.610	0.00	13.50	92	240.159	525	0.94	0.013	407.994	1.885	66.65	0.59	0.000	0.000	0.633	254.108	253.497	ST-9 (APPROX. 150.5 m W. OF CENTRELINE OF HASTINGS DR. E.)	ST-10 (APPROX. 83.5 m W. OF CENTRELINE OF HASTINGS DR. E.)	-	-	-	-
A10	FANSHAWE	ST-10	ST-11	ROW	0.300	2.520	0.850	0.255	1.484	1.484	3.319	0.59	14.09	90	298.739	525	0.74	0.013	372.445	1.720	85.60	0.78	0.000	0.000	0.597	253.490	252.893	ST-10 (APPROX. 83.5 m W. OF CENTRELINE OF HASTINGS DR. E.)		ERR	3.5	1	1-CB,2-CICB	-
													0.78	30.01																	
A12	FANSHAWE	ST-12	ST-13	ROW	0.560	0.560	0.850	0.476	0.476	0.476	1.323	N/A	13.50	92	121.742	375	1.57	0.015	151.953	1.378	73.00	0.87	0.000	0.375	4.13	254.884	253.754	ST-12 (APPROX. 72.0 m E. OF CENTRELINE OF PHILLBROOK DR.)		ERR	2.5	1	2-CB,2-CICB	-
													0.67	27.99																	
A14	FANSHAWE	CB MH14	ST-15	ROW	0.450	0.450	0.850	0.383	0.383	0.383	1.063	N/A	13.50	92	97.828	375	0.55	0.015	112.691	1.020	55.00	0.89	0.000	0.375	0.300	255.164	254.864	ST-14 (APPROX. 112.0 m W. OF CENTRELINE OF GEARY AVE.)	ST-15 (APPROX. 108.5 m E. OF CENTRELINE OF PHILLBROOK DR.)	2.5	1	1-CB,1-CBMH	-
A15	FANSHAWE	ST-15	EX MH	ROW	0.200	0.650	0.850	0.170	0.553	0.553	1.536	0.89	14.38	89	136.700	375	0.52	0.015	140.094	1.268	53.00	0.71	0.000	0.000	0.425	254.697	254.392	ST-15 (APPROX. 108.5 m E. OF CENTRELINE OF PHILLBROOK DR.)	EX MH (APPROX. 54.0 m E. OF PHILLBROOK DR.)	2.4	1	2-CB,1-DICB	-
													0.71	15.09																	

12,414

AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION
1 SEE DRAWING No. ... FOR FURTHER DETAIL		
2 SEWER DESIGN, TRANSITION, LENGTH OR AS NOTED		
3 REFERENCE B.M. No. ELEVATION		
4		
5		

DESIGN	P.E./M.F.
DRAWN	S.M.
CHECKED	R.P.
APPROVED	K.W.H.
DATE	MARCH, 1990
DELCAN PROJECT No.	07-1742

NO	REVISIONS	DATE	BY

CONSULTANT OR DIVISION

DELCAN ENGINEERS PLANNERS ARCHITECTS

ENG'S STAMP

REGISTERED PROFESSIONAL ENGINEER K. W. HODGES PROVINCE OF ONTARIO

CORPORATION OF THE CITY OF LONDON

DIVISION HEAD

CITY ENGINEER

SCALE 30 m 0 50m Horizontal 1:2500

FANSHAWE PARK ROAD WIDENING

STORM DRAINAGE AREAS & DESIGN SHEET

PROJECT No. 90/TS 1341

SHEET No.

DRAWING No. 1

PLAN FILE No. 12,414

STRIK BALDINELLI MONIZ
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Runoff Coefficient Calculations

DATE: March 15, 2021
JOB N0.: SBM-21-0466

Client: **Royal Premier Homes**
Project: **Fanshawe Park Midrise**
Location: **517-525 Fanshawe Park Road East**

PRE-DEVELOPMENT CONDITIONS *

	Area (m^2)	C	A*C
Total Area:	5668.00		
Building Area:	867.00	0.9	780.30
Asphalt/Concrete:	589.00	0.9	530.10
Gravel:	0.00	0.9	0.00
Landscaped/Open Above Parking Garage:	0.00	0.4***	0.00
Landscaped/Open:	4212.00	0.2	842.40
Totals:	5668.00		2152.80
C_{eq} = Sum(A*C)/Sum(A) =	0.38		

POST-DEVELOPMENT CONDITIONS **

	Area (m^2)	C	A*C
Total Area:	5668.00		
Building Area:	1891.00	0.9	1701.90
Asphalt/Concrete:	1946.57	0.9	1751.91
Gravel:	0.00	0.9	0.00
Landscaped/Open Above Parking Garage:	459.42	0.4 ***	183.77
Landscaped/Open:	1371.01	0.2	274.20
Totals:	5668.00		3911.78
C_{eq} = Sum(A*C)/Sum(A) =	0.69		

The proposed development will have a C-value of 0.69 which is greater than the allowable C-value of 0.38, and therefore additional SWM quantity controls are required.

* Pre-Development Conditions were obtained from Google Maps Imaging and quantities will be verified at the time of Site Plan Approval Application
** Post-Development Conditions are based on the Site Plan prepared by Zedd Architecture, dated March 1, 2021
*** C-Value of 0.40 for landscape open space above parking structure obtained from guidelines for the Planning, Execution and Upkeep of Green-Roof Sites report dated January 2002, prepared by Forschungsgesellscheft Landschaftsentwicklung Landschaftsbau E.V. (FLL).

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P: 519-725-8093

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STORM SEWER DESIGN SHEET

City of London

RUNOFF COEFFICIENT 'C' VALUES
THE FOLLOWING 'C' VALUES WILL APPLY WHEN DESIGNING STORM SEWERS:

PARKS, OPEN SPACE:	0.20
SINGLE FAMILY / SEMI DETACHED:	0.50 - 0.55
TOWNHOUSE / ROWHOUSE:	0.65
APARTMENTS:	0.65 - 0.70
COMMERCIAL,& INDUSTRIAL:	0.70 - 0.90
DENSELY BUILT, PAVED:	0.90

PROJECT NAME: **Fanshawe Park Midrise**

Design Criteria

FLOW Q = 2.78 x C x A x I

WHERE Q=PEAK FLOW IN LITRES PER SECOND (L / s)
A=AREA IN HECTARES (Ha)
C=RUNOFF COEFFICIENT
I=RAINFALL INTENSITY (mm / hr)
RETURN PERIOD = 2 YEARS
MAXIMUM VELOCITY 4.5 m/s <825mm pipe
6.0m/s >=900mm pipe
MINIMUM VELOCITY 1.0m/s

Date: March 29, 2021
Job Number: SBM-21-0466
Client: Royal Premier Homes
Project: 517-525 Fanshawe Park Road East
Designed By: NEP
Reviewed By: NGu

LOCATION				AREA		TOTAL (A x C)					RAINFALL INTENSITY			Q	SEWER DESIGN							PROFILE				
											TIME ENTRY mm														INVERT ELEVATION	
AREA No.	STREET	FROM MANHOLE	TO MANHOLE	DELTA HECTARE	TOTAL HECTARES	C	AxC	TOTAL SECTION	TOTAL SEWER	TOTAL 2.78AxC	SECTION	ACCUM.	INTENSITY mm/hr	L / s	PIPE SIZE mm	n	SLOPE %	Q CAP l/s	VELOCITY m / s	LENGTH m	TIME OF FLOW	FALL IN SEWER	HEADLOSS IN D.S. MH	DROP IN DS MANHOLE	U.S.	D.S.
		Subject Site	Sewer	0.57	0.57	0.38	0.22	0.22	0.22	0.60		13.5	91.70	55.22	300	0.013	7.03	256.39	3.63	99.00	0.45					
	Geary Ave	STMH	STMH		0.00	0.40	0.00	0.00	0.00	0.00		13.5	91.70	0.00	450	0.013	1.61	361.75	2.27	138.07	1.01	0.000			253.50	253.50
	Geary Ave	STMH	STMH	0.46	0.46	0.95	0.44	0.44	0.44	1.21	0.0	13.5	91.70	111.40	450	0.013	0.98	282.23	1.77	165.20	1.55	0.824			252.37	251.55
	Geary Ave	STMH	STMH	0.21	0.67	0.85	0.18	0.18	0.62	1.71	1.0	14.5	88.60	151.60	450	0.013	4.35	594.62	3.74	23.77	0.11	0.337			254.21	253.87
	Geary Ave	STMH	STMH	0.21	0.88	0.85	0.18	0.18	0.79	2.21	1.6	15.1	88.60	195.57	1828.800	0.013	0.60	9288.40	3.54	100.28	0.47	0.337			254.21	253.87

REF: Reference City of London record drawing 4421 dated Aug 1974
Reference City of London DS&RM Section 5.8.2 Time of Concentration