May 15, 2024
File: LD-00330

VIA EMAIL

Municipality of Strathroy-Caradoc
43 Frank Street
Strathroy, ON N7G 2R4

Attention: **Mr. Jake Deridder**
Senior Development Co-ordinator

Reference: **SITE SERVICING BRIEF - MCDONALDS**
MN 22226 ADELAIDE ROAD, MOUNT BRYDGES

Introduction

Southside Group has retained LDS Consultants Inc. (LDS) to complete the engineering design that provides municipal services required to service the above-referenced project. This servicing brief is provided in support of a pending zoning by-law amendment application.

The subject site, located at MN 22226 Adelaide Road in the community of Mount Brydges, is proposed for the future development of a McDonald's restaurant and drive-thru. The existing 0.35-hectare parcel of land is located east of the Allen Road, Parkhouse Drive, and Adelaide Road intersection (see **Figure 1** for the Location Plan).

This servicing brief aims to understand the site characteristics comprehensively. It will also demonstrate how the stormwater conveyance system's design can effectively manage minor and major system flows. Furthermore, it will show that the necessary fire and domestic water supply and storm and sanitary sewers are readily available or can be made available to support the proposed development. This will ensure the project's compliance with municipal regulations and standards.

The following sections address our findings and conclusions for this project's provision of municipal services.

Background Information

The servicing strategy presented herein was developed using the following information:

- Geotechnical Investigation, prepared by LDS Consultants Inc., dated August 2023.
- Servicing Capacity and Constraints Study, prepared by WSP, dated 2022.
- Mount Brydges Sewage Works Phase 1 Drawing No. 15 & 30, prepared by BMROSS, dated Feb.25th, 2011.
- Stormwater Management Planning and Design Manual, prepared by MOE, dated March 2003.
- Servicing Standards, prepared by Strathroy-Caradoc, dated October 2021.

Sanitary Servicing

The proposed sanitary outlet is the 250 mm diameter sewer on Parkhouse Drive. This sewer drains southwest along Parkhouse Drive, connecting to the trunk sewer draining southeast along Adelaide Road, ultimately discharging to the pump station at the southwest quadrant of the Mill Road and Adelaide Road intersection. A 150 mm private drain connection (PDC) to the Parkhouse Drive sewer can be made by installing a pre-manufactured “Inserta Tee” or approved equivalent fitting on the existing sewer. The contractor must maintain existing flows at the time of construction. An inspection maintenance hole at the property line is also proposed.

The WSP analysis for the Mount Brydges sanitary sewer network shows that the most downstream existing trunk sanitary sewer will have 78% remaining capacity before the subject site is serviced while accounting for future

development within the town (see calculation spreadsheet in **Appendix B**). Therefore, based on this analysis, the existing sanitary sewers will sufficiently serve the proposed development.

Existing Water Servicing

The existing water network near the site includes a 250 mm PVC watermain along Adelaide Road and a 150 mm diameter watermain on the northeast side of Parkhouse Drive. In addition, there is an existing fire hydrant on the north quadrant of the Parkhouse Drive and Adelaide Road intersection across from the subject property.

Water Servicing

The site's proposed domestic water servicing strategy will consist of a 50 mm x 150 mm tapping sleeve providing a 50 mm water service connection from the main on Parkhouse Drive.

The proposed fire water servicing strategy will utilize the existing fire hydrant within the fronting intersection. As per the attached hydrant flow test results (**Appendix C**), the hydrant can supply 2,169 US gallons per minute at 20 psi. Another fire hydrant on Allen Road northeast of the site is also available for fire supply needs.

Stormwater Management Design

The subject development will utilize the future storm sewer southwest of the site as the stormwater outlet. On-site detention coupled with an established release rate will control post-development flows. Infiltration-based low-impact development (LID) strategies will be incorporated in the stormwater management (SWM) design to service the site in the interim development condition until the Parkhouse Drive sewer is constructed.

Pre-Development Conditions

Based on the Google Earth summer 2018 aerial photography, the site is occupied by an existing driveway made of asphalt and gravel and a concrete island on the west corner of the site adjacent to Adelaide Road. The landscaped area comprises grass with small to medium-sized trees scattered throughout the site's central portion and in line along the east perimeter. The available topographic mapping suggests that runoff from the site travels from north to southeast.

Post-Development Conditions

Through consultation with Municipal staff, the proposed outlet for stormwater from this site will be the future sewer on Parkhouse Drive. All flows will be contained on-site up to the 100-year storm event and controlled by the permeability of the subsurface soil in the interim development scenario and by an established release rate in the future when a connection to the municipal sewer is possible.

Stormwater Quantity Control

An ADS StormTech system, or approved equivalent, is proposed to store surface runoff generated by storms. Its location will be confirmed during the detailed design phase, but it will likely be placed on the east side of the proposed building beneath the parking area. The storage system will infiltrate all water under the interim development scenario and will combine infiltration and outlet control to the Parkhouse Drive sewer in the future. The design parameters required for the proper sizing of the system will be determined during the detailed design stage of the project. These calculations will be provided in the functional servicing report, which will be included as a supporting document with the site plan application.

Stormwater Quality Control

A commercial OGS unit will address water quality. The OGS device will treat any flows generated from the impervious surfaces by protecting the storm sewer system's outlet and the StormTech system's underlying soil. The stormwater management design will achieve the "Enhanced Protection Level". **Appendix D** contains the supporting details from the product manufacturer. In addition, the unit will provide 93% total suspended solids (TSS) removal, which is greater than the 80% prescribed by the servicing standards (Strathroy-Caradoc, 2021).

The StormTech system will include an isolator row and provide secondary water quality control. The isolator row, located at the inlet, isolates the bulk of sediment and associated pollutants and is designed for easy access by jet-flushing cleaning equipment. If this row becomes compromised and can not function as intended, the chambers are designed with a second row as a bypass so the system can still function as intended.

Conclusions

The analysis carried out by LDS yields the following conclusions:

- The external sanitary sewer system on Parkhouse Drive and Adelaide Road has sufficient capacity to support the proposed development.
- The watermain system on Parkhouse Drive has sufficient fire and domestic flow capacity to support the proposed development.
- In the interim, a StormTech system will provide stormwater quantity control. A combination of the StormTech system's infiltration capabilities and the Parkhouse Drive storm sewer will provide quantity control in the future. An OGS and the StormTech system will provide quality control for all stormwater.

We trust that the analysis and findings summarized herein provide sufficient details to support an application for the proposed development. However, should you have any questions concerning the findings presented herein, please do not hesitate to contact the undersigned.

Sincerely,

LDS CONSULTANTS INC.

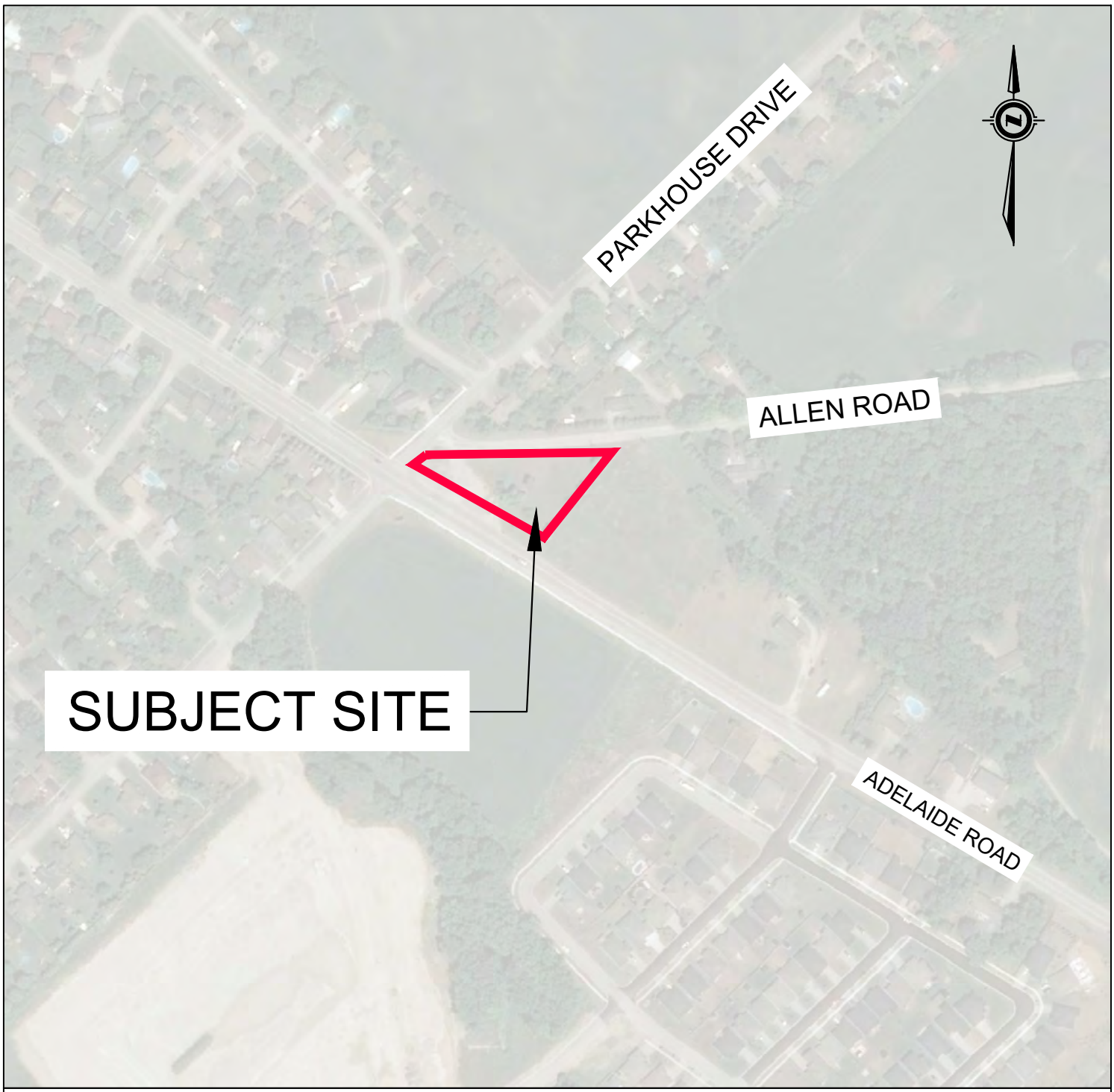
Luke Jesson, P.Eng.
Water Resources
O: 226.289.2952
C: 519.859.5942
luke.jesson@LDSconsultants.ca

Encl.

Appendix A – Location Plan, Existing and Proposed Conditions Drainage Area Plan
Appendix B – BM Ross Sanitary Sewer Drawings, WSP Sanitary Sewer Capacity Analysis - Future Condition
Appendix C – SCG Flowmetrix Fire Flow Test Results
Appendix D – OGS Sizing Sheet, Parkhouse Drive Storm Area Plan and Design Sheet, Allowable Release Rate

APPENDIX A

FIGURES



MN 22226 ADELAIDE ROAD, MT. BRYDGES
SOUTHSIDE GROUP (LONDON) LIMITED

LOCATION PLAN

PROJECT: LD-00330 SCALE: N.T.S. FIGURE 1

Z:\LD-00330 - MN 22226 ADELAIDE RD, MT.BRYDGES\DETAIL DESIGN\REPORTS\SWM\DRAWINGS\LD-00330 LOCATION PLAN.DWG
2024-05-08 9:07:23 AM by: ABE.HARDER

ALLEN ROAD

ADELAIDE ROAD

C101
0.35 | 52

FH

EX. HEDGE

EX. TREES

EX ASPHALT ISLAND

EX. DITCH

EX. 450 CULVERT

EX. HP

EX SIDEWALK

EX EDGE OF ASPHALT

EX EDGE OF SHOULDER

LEGEND:

EXISTING CATCHMENT AREA

EXISTING OVERLAND FLOW PATH

STORM DRAINAGE AREA DATA:

C101
1.46 | 82

AREA (ha) — CATCHMENT ID — CURVE NUMBER

LDS

MN 22226 ADELAIDE ROAD, MT. BRYDGES
SOUTHSIDE GROUP (LONDON) LIMITED

EXISTING CONDITIONS DRAINAGE AREA PLAN

PROJECT: LD-00330 SCALE: 1:1000 FIGURE 2

Z:\LD-00330 - MN 22226 ADELAIDE RD, MT.BRYDGES\DETAIL DESIGN\REPORTS\DWG\DRAWINGS\LD-00330 REPORT FIGURES.DWG
2024-05-13 8:14:29 AM by: LUKE.JESSON

ALLEN ROAD

ADELAIDE ROAD

C101
0.35 | 88

LEGEND:

PROPOSED CATCHMENT AREA

PROPOSED OVERLAND FLOW PATH

STORM DRAINAGE AREA DATA:

C101
1.46 | 82

AREA (ha) — CATCHMENT ID — CURVE NUMBER

LDS

MN 22226 ADELAIDE ROAD, MT. BRYDGES
SOUTHSIDE GROUP (LONDON) LIMITED

PROPOSED CONDITIONS DRAINAGE AREA PLAN

PROJECT: LD-00330 SCALE: 1:1000 FIGURE 3

Z:\LD-00330 - MN 22226 ADELAIDE RD, MT.BRYDGES\DETAIL DESIGN\REPORTS\SWM\DRAWINGS\LD-00330 REPORT FIGURES.DWG
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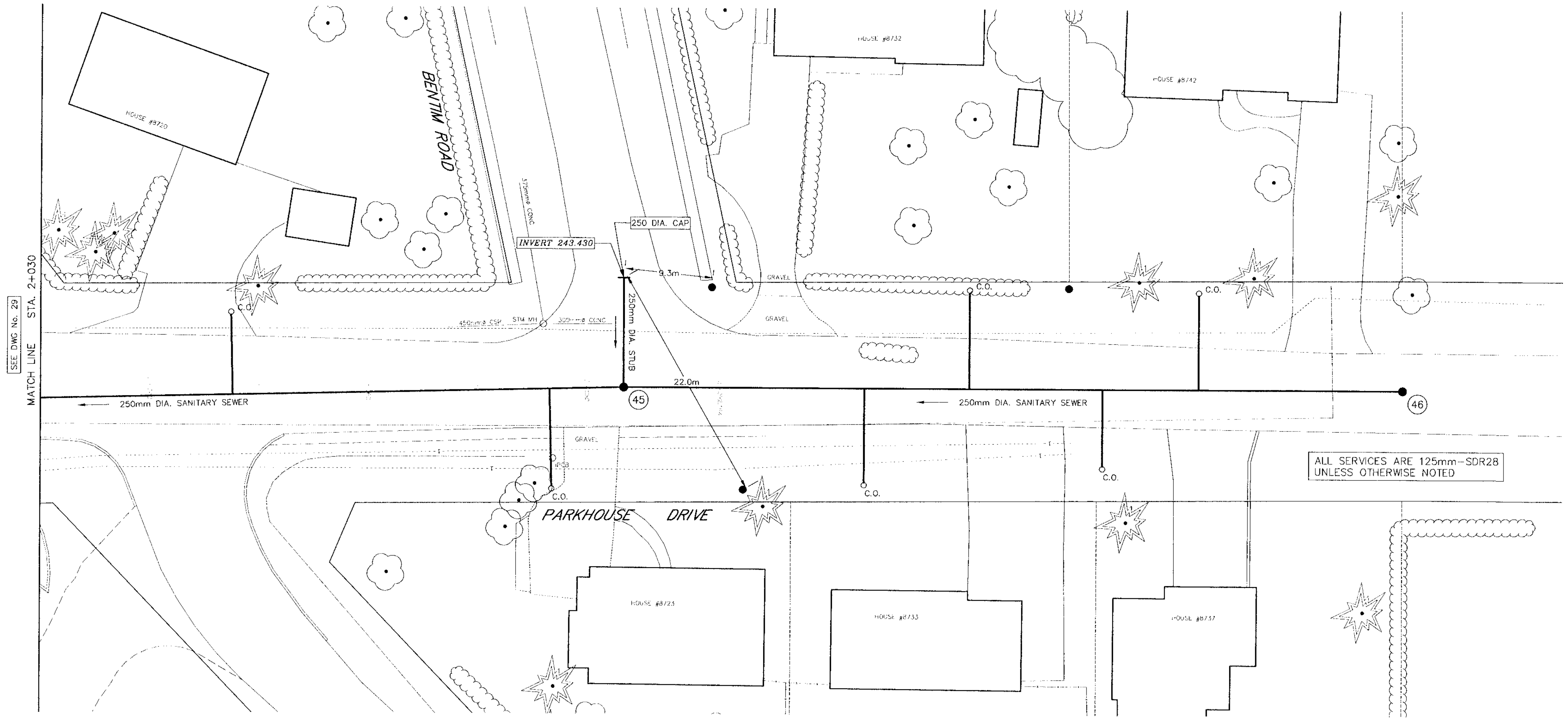
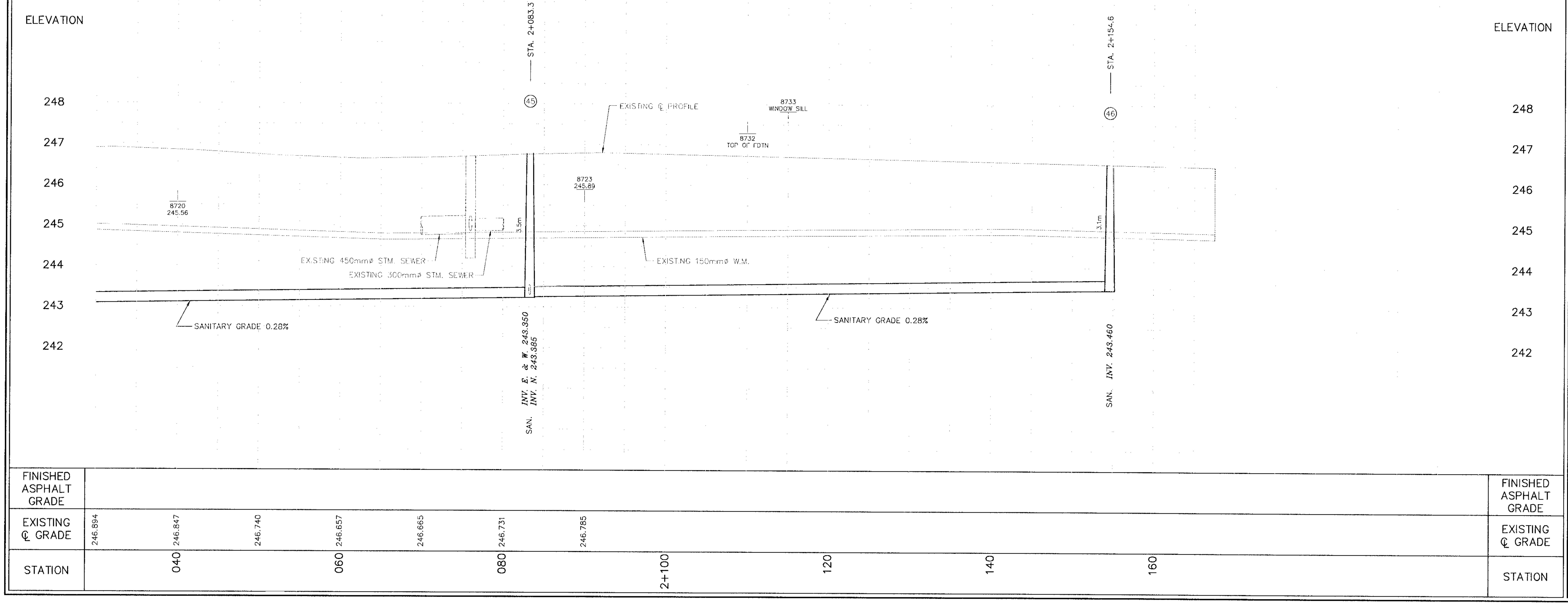
APPENDIX B

SANITARY SERVICING



SEWER	DATA			
No to No	Size	Type	Class	Length
46 – 45	250	PVC	SDR–35	71.0
STUB – 45	250	PVC	SDR–35	10.0



LEGEND

SAN. or STM.	EXISTING SEWERS SANITARY or STORM
MH. CB.	MANHOLE and CATCH-BASIN
W	WATERMAIN ⚲ FIRE HYDRANT
G	GASMAIN
T	UNDERGROUND TELEPHONE
H	UNDERGROUND HYDRO
TV	UNDERGROUND T.V. CABLE
H B T H-B T	UTILITY POLES
	GRUBBING
▨	REMOVE EXISTING CONC. SIDEWALK AND DRIVES
▨	REMOVE AND PLACE CONC. SIDEWALK AND DRIVES
▨	PLACE CONC. SIDEWALK AND DRIVES
▨	REMOVE EXISTING ASPHALT PAVT
▭	PLACE HOT MIX ASPHALT (DRIVES 50mm HL-3 HOT MIX M.SO.)
‐//‐//‐	REMOVE EXISTING CONC. CURB

TRUE NORTH

CONSTRUCTION NORTH

NOTE

The locations of existing underground utilities are shown in an approximate way only and have not been independently verified by the owner or its representative. The contractor shall determine the exact location of all existing utilities before commencing work and agrees to be fully responsible for any damages which might be occasioned by the contractor's failure to exactly locate and preserve any and all underground utilities.

BENCHMARK INFORMATION

B.M. Elev. 247.450
CST nail and flag in W. Face of hydro pole
@ E. corner of Adelaide & Parkhouse
See Dwg 29 for location

BENCHMARK INFORMATION

Design By: RMC
Checked By: SDB

AS RECORDED

The information on this record drawing is believed to be reliable, however it may be based, in part, upon information provided by others, which can not be verified by B.M. Ross and Associates Limited. Those relying on this record drawing are advised to obtain additional verification of its accuracy before applying it for any purpose.

Feb. 25, 2011
Date

No.	DATE	REVISION
1	May 14, 2010	Issued for MOE Approval
2	May 31, 2010	Issued for Tender
3	July 7, 2010	Issued for Construction
4	July 29, 2010	Re-issued for Construction
5	Feb. 25, 2011	As Recorded

ROSS
engineering better communities

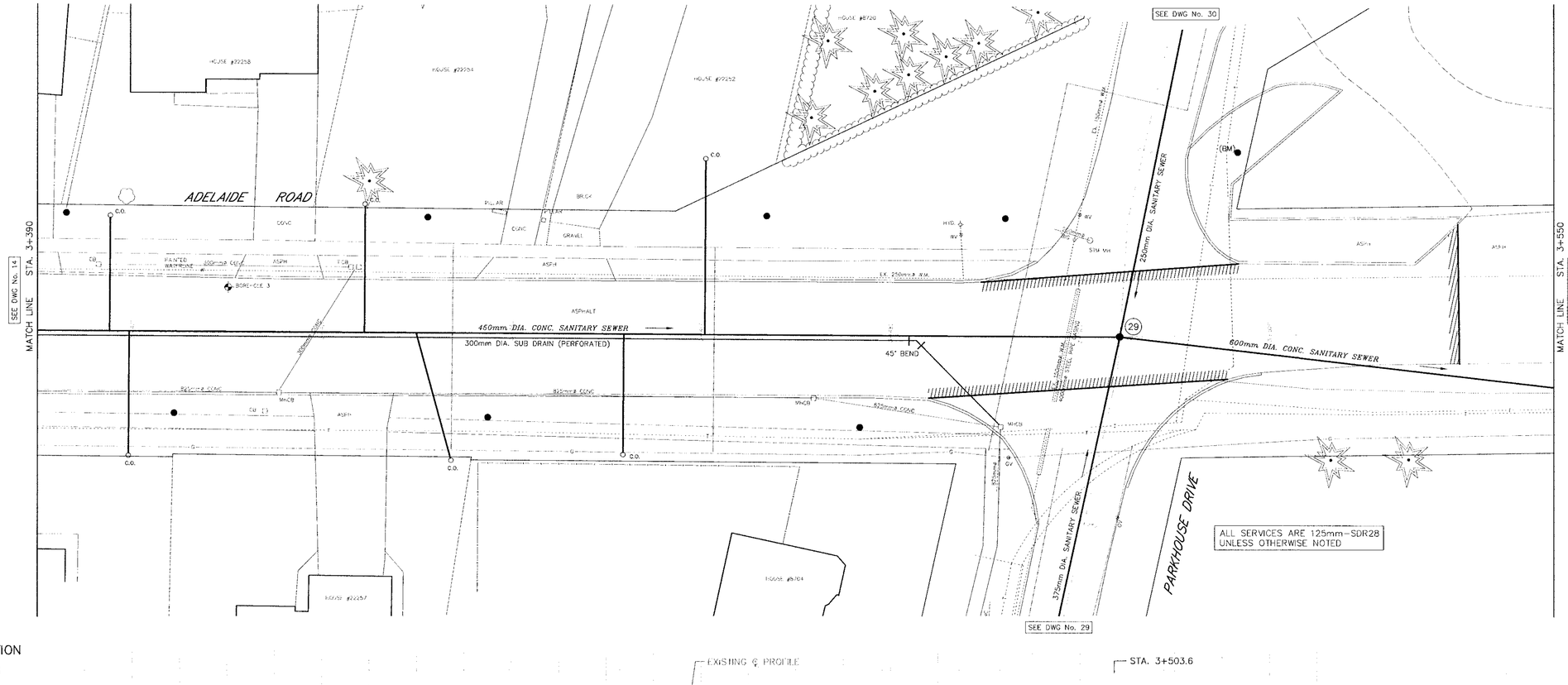
Goderich (519) 524 2641
Mount Forest (519) 323-2945

STRATHROY-CARADOC
URBAN OPPORTUNITY · RURAL HOSPITALITY

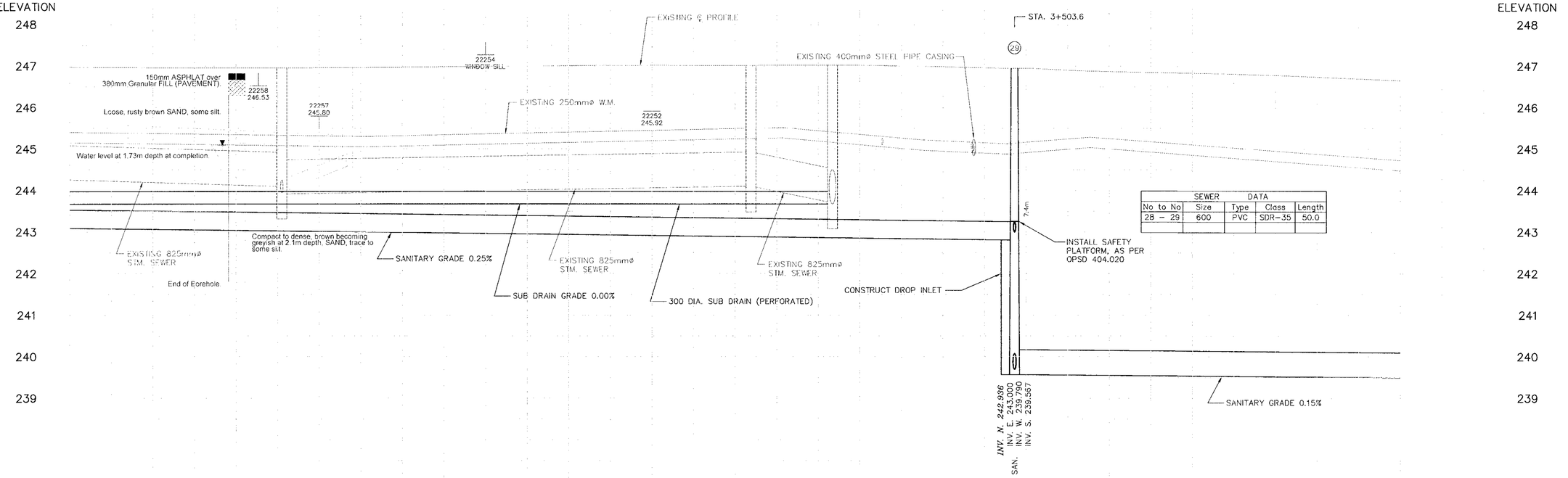
Municipality of Strathroy-Caradoc
Mount Brydges Sewage Works Phase 1

Parkhouse Drive
Plan & Profile of Sanitary Sewer
From Sta. 2+030 to Sta. 2+170

Contract No. 1B	Project No. 09112
Scale Horizontal : 1:250 Vertical : 1:50	Drawing No. 30



ELEVATION 248



ELEVATION 248

FINISHED ASPHALT GRADE																	FINISHED ASPHALT GRADE
EXISTING ℄ GRADE	246.972	246.958	246.955	246.960	246.974	246.983	247.010	247.019	247.015	247.024	247.006	246.960	246.903	246.848	246.809	246.739	246.655	EXISTING ℄ GRADE
STATION		3+400		420		440		460		480		3+500		520		540		STATION

LEGEND

- EXISTING SEWERS: SANITARY or STORM
- MH, CB, C B: MANHOLE and CATCHBASIN
- W: WATERMAIN; FIRE HYDRANT
- G: GASMAIN
- T: UNDERGROUND TELEPHONE
- UNDERGROUND HYDRO
- UNDERGROUND TV CABLE
- UTILITY POLES
- LIGHTING
- REMOVE EXISTING ROAD & SIDEWALK AND DRIVES
- REMOVE AND PLACE CONC. SIDEWALK & CURBS
- PLACE CONC. SIDEWALK AND DRIVES
- REMOVE EXISTING ASPHALT PAVT.
- PLACE ASPHALTIC CONCRETE (DRIVES 50mm THICK-OTTAWA MSC)
- REMOVE EXISTING CONC. CURB
- LIMITED ASPHALT PAVER ZONE

TRUE NORTH

CONSTRUCTION NORTH

NOTE

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BENCHMARK INFORMATION

B.M. Elev. 247.450
CST nail and flag in W. Face of hydro pole
@ E. corner of Adelaide & Parkhouse

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Design By: RMC Checked By: SDB

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B.M. ROSS
engineering better communities
Goderich (519) 524-2641 Mount Forest (519) 323-2945

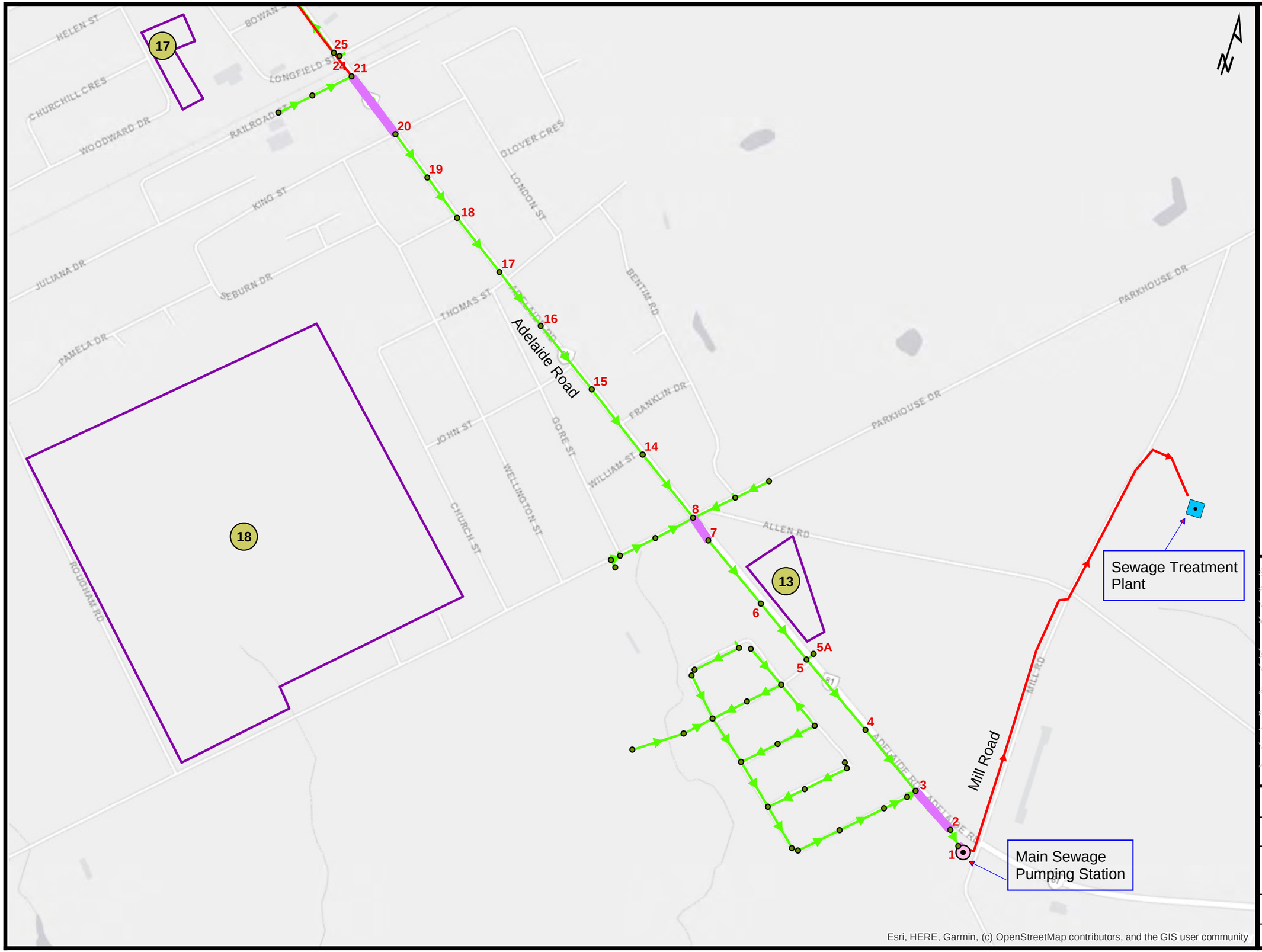
STRATHROY-CARADOC
ENDLESS OPPORTUNITY · RURAL HOSPITALITY

Municipality of Strathroy-Caradoc

Mount Brydges Sewage Works Phase 1

Adelaide Street
Plan & Profile of Sanitary Sewer
From Sta. 3+390 to Sta. 3+550

Contract No.	Project No.
1B	09112
Scale: Horizontal : 1:250, Vertical : 1:50	Drawing No. 15



wsp

Strathroy-Caradoc Official Plan

Figure A-2b Mount Brydges Sewer Network
Future Development
Page 2 of 2

0 0.15 0.3 Kilometers

20M-01349-00	October 2021

Table B-2 Scenario 2 Mount Brydges Sanitary Sewer Capacity Analysis - Future Condition

NOTES:

1) INFILTRATION 0.26 l/s/ha = 22.5 m3/ha/d
   INFILTRATION 0.52 l/s/ha = 45.0 m3/ha/d (includes foundation drains)
2) MANNING'S "n" : 0.013

		FLOW IN LITRES PER SECOND						EXISTING SEWER CAPACITY				% FULL	REMAINING CAPACITY	REMAINING CAPACITY
Sewer Segment	Polygon ID	GROSS AREA (Ha)	Estimated Contributing Area for RDII** (Ha)	PEAK FLOW FACTOR	RDII (Note 1) 0.26 l/s	ADWF l/s	PEAK FLOW l/s	ACT. PIPE SIZE (mm)	SLOPE %	Pipe Full Capacity l/s	V m/s		l/s	%
Sewers upstream of NW Sewage Pumping Station (North of Railway Track)														
ADELAIDE RD (45-44)	1,10,11,14,15	54.77	49.14	3.50	12.78	3.59	25.33		0.22	45.36	0.64			
					12.78	**3.59**	**25.33**	300		**45.4**	**0.64**	**56%**	**20.03**	**44%**
ADELAIDE RD (26-32)	5,16,17	10.04	7.81	3.50	2.03	1.17	6.12		0.28	31.47	0.64			
					2.03	**1.17**	**6.12**	**250**		**31.5**	**0.64**	**19%**	**25.35**	**81%**
ADELAIDE RD (34-36)	4	1.19	1.07	3.50	0.28	0.01	0.32		0.28	31.47	0.64			
					2.31	**1.18**	**6.44**	**250**		**31.5**	**0.64**	**20%**	**25.03**	**80%**
LIONS PARK DR (40-41)	2	0.86	0.73	3.50	0.19	0.10	0.53		0.15	110.42	0.69			
					15.27	**4.86**	**32.29**	**450**		**110.4**	**0.69**	**29%**	**78.13**	**71%**
LIONS PARK DR (41-42)	3	1.75	1.23	3.50	0.32	0.05	0.49		0.15	110.42	0.69			
					15.59	**4.91**	**32.78**	**450**		**110.4**	**0.69**	**30%**	**77.64**	**70%**
LIONS PARK DR (120-42)	12	15.52	15.52	3.50	4.04	0.16	4.58		0.25	29.73	0.61			
					4.04	**0.16**	**4.58**	**250**		**29.7**	**0.61**	**15%**	**25.15**	**85%**
LIONS PARK DR (42-43)		0.00	0.00	3.50	0.00	0.00	0.00		0.25	142.55	0.90			
Total Flow to NW PS					**19.63**	**5.07**	**37.36**	**450**		**142.6**	**0.90**	**26%**	**105.19**	**74%**
NW Pumping Discharge*							**31.30**							
Sewers downstream of NW Sewage Pumping Station (South of Railway Track)														
ADELAIDE RD (21-20)	6	0.56	0.51	3.50	0.13	0.06	0.34		0.25	142.55	0.90			
					19.76	**5.13**	**31.64**	450		**142.6**	**0.90**	**22%**	**110.91**	**78%**
ADELAIDE RD (8-7)	7,8,18	37.70	37.37	3.50	9.72	1.78	15.96		0.15	237.81	0.84			
					29.48	**6.91**	**47.60**	600		**237.8**	**0.84**	**20%**	**190.20**	**80%**

ADELAIDE RD (3-2)	9,13	12.77	10.46	3.50	2.72	0.28	3.69		0.15	237.81	0.84			
					32.20	**7.19**	**51.29**	600		**237.8**	**0.84**	**22%**	**186.52**	**78%**
ADELAIDE RD (1-PS1)		0.00	0.00	3.50	0.00	0.00	0.00		1.00	614.01	2.17			
Total Flow to Main PS					**32.20**	**7.19**	**51.29**	600		**614.0**	**2.17**	**8%**	**562.72**	**92%**

* - As mentioned in "Mount Brydges – Main Sewage Pumping Station and Northwest Sewage Pumping Station – Operation and Maintenance Manual", 20-year peak design flow for Northwest SPS (31.3 L/s) is used fo calculation.

** - Area estimated based on ariel basemap

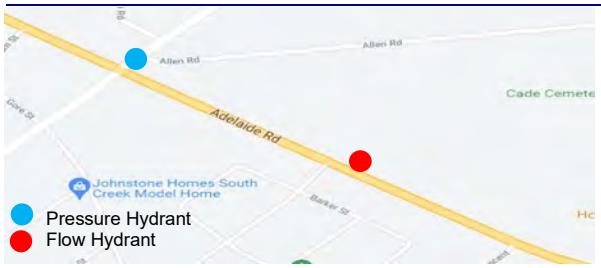
APPENDIX C

WATER SERVICING

Fire Flow Testing Report

FLOWMETRIX
INDU-TECH
PROCESS
WESTCAN

Residual Hydrant # **HY26**
NFPA Colour Code **BLUE**



DATE	September 23, 2021
TIME	10:00 AM
ADDRESS	22164 Adelaide Rd
	Mount Brydges, ON
	N0L 1W0
SIZE-inches/mm	9 250
MATERIAL	PVC
CONTACT INFO	Abe Harder
	LDS Consultants Inc.
	T: 226-289-2952
	E: abe.harder@LDSconsultants.ca

RESIDUAL HYDRANT INFO.

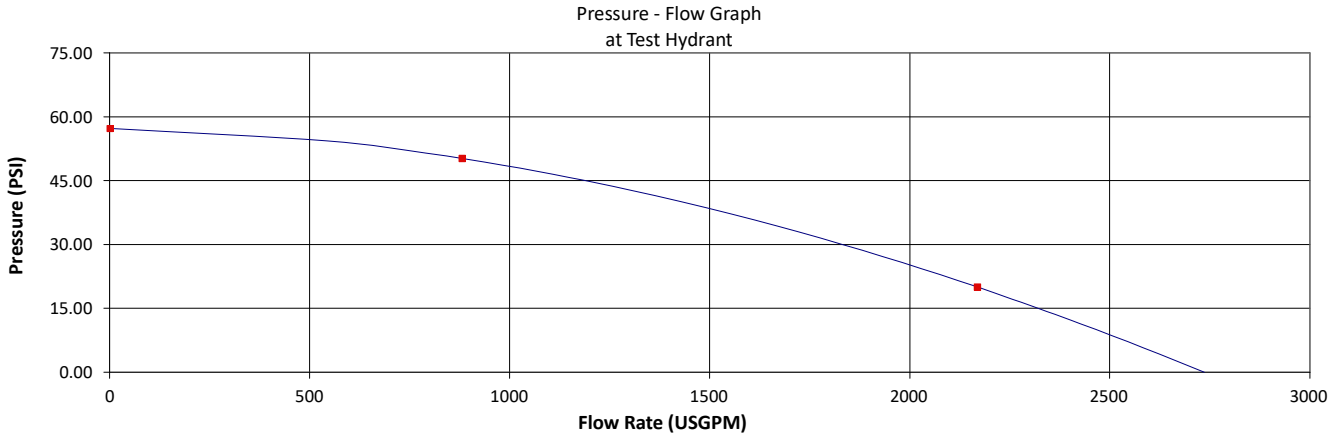
HYDRANT #	HY26	
N.F.P.A. COLOUR CODE	BLUE	
STATIC PRESSURE	57.2	psi
RESIDUAL PRESSURE	50.2	psi
PRESSURE DROP	7.0	psi
% PRESSURE DROP	12.3	% psi

Flow on Water Main At Test Hydrant - 20 psi 2169 USGPM

FLOW HYDRANT(S) INFO.

HYDRANT ASSET ID	HYD. # PORTS	OUTLET DIAMETER (INCHES)	NOZZLE COEFFICIENT	DIFFUSER TYPE	DIFFUSER COEFFICIENT	PITOT READING (psi)	PITOT FLOW (USGPM)	FLOW METER (USGPM)
HY24	1	2.5	Round	LPD250	0.90	**34.1**	882	0
		2.5	Round	LPD250	0.90			0
					Total Flow (USGPM)		882	0
					Total Flow (USGPM)		882	

FIRE FLOW CHART



COMMENTS

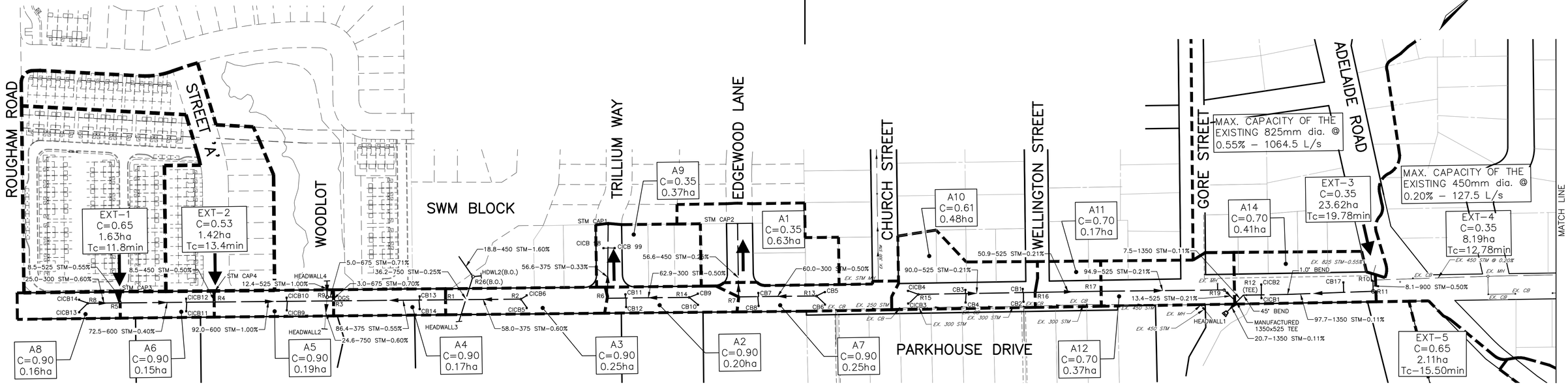
OPERATOR	FMX	Jordan Whitlock
OPERATOR	FMX	
OPERATOR		Strathroy-Caradoc Municipality

APPENDIX D

STORM SERVICING

FOREST VIEW SUBDIVISION
(SIFTON PROPERTIES LIMITED)

EDGEWOOD SUBDIVISION
(WESTDELL CORPORATION)


ROUGHAM ROAD
STREET 'A'
WOODLOT
SWM BLOCK
TRILLIUM WAY
EDGEWOOD LANE
CHURCH STREET
WELLINGTON STREET
GORE STREET
ADELAIDE ROAD
PARKHOUSE DRIVE
MATCH LINE
EXT-1 C=0.65 1.63ha Tc=11.8min
EXT-2 C=0.53 1.42ha Tc=13.4min
A1 C=0.35 0.63ha
A2 C=0.90 0.20ha
A3 C=0.90 0.25ha
A4 C=0.90 0.17ha
A5 C=0.90 0.19ha
A6 C=0.90 0.15ha
A7 C=0.90 0.25ha
A8 C=0.90 0.16ha
A9 C=0.35 0.37ha
A10 C=0.61 0.48ha
A11 C=0.70 0.17ha
A12 C=0.70 0.37ha
A14 C=0.70 0.41ha
EXT-3 C=0.35 23.62ha Tc=19.78min
EXT-4 C=0.35 8.19ha Tc=12.78min
EXT-5 C=0.65 2.11ha Tc=15.50min
MAX. CAPACITY OF THE EXISTING 825mm dia. @ 0.55% – 1064.5 L/s
MAX. CAPACITY OF THE EXISTING 450mm dia. @ 0.20% – 127.5 L/s
8.5-525 STM-0.55%
8.5-450 STM-0.50%
25.0-300 STM-0.60%
12.4-525 STM-1.00%
36.2-750 STM-0.25%
5.0-675 STM-0.71%
3.0-675 STM-0.70%
18.8-450 STM-1.60%
56.6-375 STM-0.33%
56.6-450 STM-0.25%
62.9-300 STM-0.50%
60.0-300 STM-0.50%
90.0-525 STM-0.21%
50.9-525 STM-0.21%
94.9-525 STM-0.21%
7.5-1350 STM-0.11%
13.4-525 STM-0.21%
8.1-900 STM-0.50%
97.7-1350 STM-0.11%
20.7-1350 STM-0.11%
72.5-600 STM-0.40%
92.0-600 STM-1.00%
86.4-375 STM-0.55%
24.6-750 STM-0.60%
58.0-375 STM-0.60%
1.0° BEND
45° BEND
MANUFACTURED 1350x525 TEE
HEADWALL1
HEADWALL2
HEADWALL3
HEADWALL4
HDWL2(B.O.) R26(B.O.)
STM CAP1
STM CAP2
STM CAP3
STM CAP4
CICB 98
CICB 99
OGS
EX. 825 STM
EX. 525 STM
EX. 450 STM
EX. 375 STM
EX. 300 STM
EX. 250 STM
EX. MH
EX. CB
EX. CICB
EX. 1.0m dia. CSP
EX. 1.2m dia. CSP
EX. 1.5m dia. CSP
EX. 1.8m dia. CSP
EX. 2.1m dia. CSP
EX. 2.4m dia. CSP
EX. 2.7m dia. CSP
EX. 3.0m dia. CSP
EX. 3.3m dia. CSP
EX. 3.6m dia. CSP
EX. 3.9m dia. CSP
EX.

RESIDENTIAL COMMERCIAL AND INSTITUTIONAL POPULATION DENSITIES

SANITARY SEWER DESIGN SHEET
MUNICIPALITY OF STRATHROY-CARADOC

THE FOLLOWING POPULATION ALLOWANCES WILL APPLY WHEN DESIGNING SANITARY SEWERS:

LOW DENSITY (SINGLE-FAMILY / SEMI-DETACHED)	= 30 UNITS / HECTARE @ 3 PEOPLE / UNIT
MEDIUM DENSITY (MULTI-FAMILY / TOWNHOUSE / ROWHOUSE)	= 75 UNITS / HECTARE @ 2.4 PEOPLE / UNIT
HIGH DENSITY (APARTMENTS)	= 150 - 300 UNIT / HECTARE @ 1.6 PEOPLE / UNIT
COMMERCIAL / INSTITUTIONAL	= 100 PEOPLE / HECTARE
SECONDARY SCHOOL	= 1500 PEOPLE
ELEMENTARY SCHOOL	= 400 PEOPLE

DESIGN CRITERIA
SEWAGE = 365 LITRE / CAPITA / DAY
INFILTRATION = 6740 LITRES / HECTARE / DAY
PEAKING FACTOR = $1 + \frac{14}{4 + P^{0.5}}$

DATE: January 31, 2023
DESIGNED BY: AH & CL

PROJECT NAME: PARKHOUSE DRIVE SANITARY SEWER

PROJECT FILE NO. LD-00188

LOCATION				AREA			POPULATION						SEWAGE FLOWS			SEWER DESIGN						PROFILE				
															Q										INVERT ELEVATION	
AREA No.	STREET	FROM MANHOLE	TO MANHOLE	NET OR GROSS	DELTA HECTARES	TOTAL HECTARES	PER HECTARE	PER LOT	NO. OF LOTS	DELTA POP.	TOTAL POP.	PEAKING FACTOR	INFILT L / s	SEWAGE L / s	TOTAL L / s	PIPE SIZE mm	n	SLOPE %	CAP L / s	VELOCITY m / s	LENGTH m	FALL IN SEWER	HEADLOSS IN U.S. MH	DROP IN MANHOLE	U.S.	D.S.
EXT-5b	Siftons South Block	CAP4	S8	N	1.64	1.64		-	-	130	130	4.21	0.13	2.54	2.67	200	0.013	0.33	18.84	0.60	11.5	0.038	0.000	-	241.705	241.667
A2	Parkhouse Dr	S8	S7	N	0.27	1.91		3	0	0	130	4.21	0.15	2.54	2.69	375	0.013	0.15	67.90	0.61	78.5	0.118	0.000	0.189	241.442	241.324
EXT-5a	Siftons South Block	CAP3	S7	N	9.50	9.50		-	-	388	388	4.03	0.74	7.26	8.00	250	0.013	0.25	29.73	0.61	11.5	0.029	0.000	-	241.383	241.354
A3	Parkhouse Dr	S7	S6	N	0.20	11.61		3	0	0	518	3.97	0.91	9.55	10.45	375	0.013	0.15	67.90	0.61	107.4	0.161	0.000	0.030	241.294	241.133
A4	Parkhouse Dr	S6	S5	N	0.26	11.87		3	0	0	518	3.97	0.93	9.55	10.47	375	0.013	0.15	67.90	0.61	118.1	0.177	0.000	0.030	241.103	240.926
A5	Parkhouse Dr	S5	S4	N	0.35	12.22		3	2	6	524	3.96	0.95	9.65	10.60	375	0.013	0.15	67.90	0.61	78.0	0.117	0.000	0.030	240.896	240.779
EXT-4	Trillium Way	CAP1	S9	N	0.00	0.00		-	-	0	0	4.50	0.00	0.00	0.00	300	0.013	0.20	43.24	0.61	4.2	0.008	0.000	-	240.959	240.951
A6	Parkhouse Dr	S9	S4	N	8.25	8.25		-	-	309	309	4.07	0.64	5.85	6.49	300	0.013	0.20	43.24	0.61	55.5	0.111	0.000	0.000	240.951	240.840
A6	Parkhouse Dr	S4	S3	N	0.58	12.80		3	4	12	12	4.41	1.00	0.25	1.24	375	0.013	0.15	67.90	0.61	100.9	0.151	0.000	0.091	240.749	240.597
EXT-3	Edgewood Lane	CAP2	S3	N	3.68	3.68		3	40	120	120	4.22	0.29	2.35	2.64	250	0.013	0.25	29.73	0.61	59.6	0.149	0.000	0.000	240.869	240.720
A7	Parkhouse Dr	S3	S2	N	0.69	17.17		3	4	12	144	4.20	1.34	2.81	4.15	375	0.013	0.15	67.90	0.61	112.5	0.169	0.000	0.153	240.567	240.399
EXT-2	Church St	-	S2	N	7.60	7.60		3	36	108	108	4.23	0.59	2.13	2.72	-	-	-	-	-	-	-	-	-	-	-
A8	Parkhouse Dr	S2	S1	N	1.40	26.17		3	9	27	279	4.09	2.04	5.30	7.35	375	0.013	0.15	67.90	0.61	118.5	0.178	0.000	0.030	240.369	240.191
EXT-1	Wellington St	-	S1	N	29.18	29.18		3	163	489	489	3.98	2.28	9.04	11.32	-	-	-	-	-	-	-	-	-	-	-
A10	Parkhouse Dr	S1	EX SANMH	N	0.97	56.32		3	5	15	783	3.87	4.39	14.07	18.46	375	0.013	0.15	67.90	0.61	96.5	0.145	0.000	0.000	240.191	240.046

STORM SEWER DESIGN SHEET
MUNICIPALITY OF STRATHROY-CARADOC

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

PARKS, OPEN SPACE	0.20
SINGLE FAMILY / SEMI DETACHED	0.35
TOWNHOUSE / ROWHOUSE	0.65
APARTMENTS	0.65
COMMERCIAL, INSTITUTIONAL & INDUSTRIAL	0.70
DENSELY BUILT, PAVED	0.70

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 = 5 YEARS

DATE: January 31, 2023
DESIGNED BY: AH

PROJECT NAME: PARKHOUSE DRIVE STORM SEWERS

PROJECT FILE NO. LD-00188

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 LATERAL	TOTAL SEWER	TOTAL 2.78AxC	SECTION	ACCUM.	INTENSITY mm/hr	L / s	PIPE SIZE mm	n	SLOPE %	CAP L / s	VELOCITY m / s	LENGTH m	TIME OF FLOW	FALL IN SEWER	HEADLOSS IN U.S. MH	DROP IN MANHOLE	U.S.	D.S.
A7	Parkhouse Drive	R13	R7	0.23	0.23	0.90	0.207	0.000	0.000	0.207	0.575	-	0.0	107.7	62.0	300	0.013	0.50	68.4	0.97	60.0	1.03	0.300	0.000	-	243.920	243.520
A1	Edgewood Lane	R7	CAP2	0.02	0.25	0.90	0.018	0.207	0.000	0.225	0.626	1.03	1.0	102.5	64.1	450	0.013	0.25	142.5	0.90	56.6	1.05	0.142	0.000	0.150	243.470	243.328
A2	Parkhouse Drive	R14	R6	0.20	0.20	0.90	0.180	0.000	0.000	0.180	0.500	-	0.0	107.7	53.9	300	0.013	0.50	68.4	0.97	62.7	1.08	0.314	0.000	-	243.365	243.052
	Trillium Way	R6	CAP1	0.00	0.20	0.90	0.000	0.180	0.000	0.180	0.500	1.08	1.1	102.5	51.3	375	0.013	0.33	130.7	0.91	56.6	1.03	0.187	0.000	0.075	242.977	242.790
A3	Parkhouse Drive	R2	R1	0.25	0.25	0.90	0.225	0.000	0.000	0.225	0.626	-	0.0	107.7	67.4	375	0.013	0.60	135.8	1.23	59.0	0.79	0.348	0.000	-	241.526	241.178
A4	Parkhouse Drive	R1	R3	0.17	0.42	0.90	0.153	0.225	0.000	0.378	1.051	0.79	0.8	104.0	109.3	375	0.013	0.55	130.0	1.18	86.4	1.22	0.475	0.000	0.075	241.103	240.528
A8	Parkhouse Drive	R8	R5	0.16	0.16	0.90	0.144	0.000	0.000	0.144	0.400	-	0.0	107.7	43.1	300	0.013	0.60	74.9	1.06	25.0	0.39	0.150	0.000	-	242.928	242.778
EXT-1	Sifton South Block	CAP3	R5	1.63	1.63	0.65	1.060	0.000	0.000	1.060	2.945	-	1.7	99.3	292.5	525	0.013	0.79	382.2	1.77	8.5	0.08	0.067	0.000	-	242.620	242.553
A6	Parkhouse Drive	R5	R4	0.15	1.94	0.90	0.135	1.050	0.144	1.339	3.721	0.08	1.8	99.3	369.6	600	0.013	0.60	475.6	1.68	72.5	0.72	0.435	0.000	0.075	242.478	242.043
EXT-2	Sifton South Block	CAP4	R4	1.06	1.06	0.50	0.530	0.000	0.000	0.530	1.473	-	1.9	98.4	145.0	450	0.013	0.30	156.2	0.98	8.5	0.14	0.026	0.000	-	242.049	242.023
A5	Parkhouse Drive	R4	R3	0.19	3.19	0.90	0.171	1.339	0.530	2.040	5.670	0.72	2.5	96.3	546.1	600	0.013	0.90	582.5	2.06	92.0	0.74	0.828	0.000	0.150	241.873	241.045
	Parkhouse Drive	R3	OGS	0.00	3.61	0.90	0.000	2.040	0.378	2.418	6.721	0.74	3.2	93.1	626.0	675	0.013	0.70	733.3	1.97	3.0	0.03	0.021	0.000	0.717	240.328	240.307
	Parkhouse Drive	OGS	R9	0.00	3.61	0.90	0.000	2.418	0.000	2.418	6.721	0.03	3.3	93.1	626.0	675	0.013	0.70	733.3	1.97	5.0	0.04	0.035	0.000	0.000	240.307	240.272
	Parkhouse Drive	R9	HEADWALL2	0.00	3.61	0.90	0.000	2.418	0.000	2.418	6.721	0.04	3.3	92.8	623.4	675	0.013	0.70	733.3	1.97	24.6	0.21	0.172	0.000	0.400	239.872	239.700
A10	Parkhouse Drive	R15	R16	0.48	0.48	0.61	0.293	0.000	0.000	0.293	0.814	-	0.0	107.7	87.7	525	0.013	0.21	197.1	0.91	90.0	1.65	0.189	-	-	243.678	243.499
A11	Parkhouse Drive	R16	R17	0.17	0.65	0.70	0.119	0.293	0.000	0.412	1.145	1.65	1.6	99.8	114.2	525	0.013	0.21	197.1	0.91	50.9	0.93	0.107	0.000	0.010	243.479	243.372
A12	Parkhouse Drive	R17	R19	0.37	1.02	0.70	0.259	0.412	0.000	0.671	1.865	0.93	2.6	95.9	178.8	525	0.013	0.21	197.1	0.91	94.9	1.74	0.199	0.000	0.010	243.362	243.163
	Parkhouse Drive	R19	1350 STM	0.00	1.02	0.90	0.000	0.671	0.000	0.671	1.865	1.74	4.3	89.2	165.3	525	0.013	0.21	197.1	0.91	13.4	0.25	0.028	0.000	0.010	243.153	243.125
EXT-3	Gillam Drain - Adelaide Road		R10	23.62	23.62	Max. capacity of the existing 825mm dia. @ 0.55% storm sewer, to be included in all down stream sewers -									1064.5	825											
EXT-4	Hoover-Green Drain - Parkhouse Drive		R10	8.19	8.19	Max. capacity of the existing 450mm dia. @ 0.20% storm sewer, to be included in all down stream sewers -									127.5	450											
	Parkhouse Drive	R10	R11	0.41	32.22	0.70	0.287	0.000	0.000	0.287	0.798	-	9.8	74.0	1251.0	900	0.013	0.50	1280.0	2.01	8.1	0.07	0.041	-	0.420	243.321	243.280
EXT-5	Fut. Development		R11	2.11	2.11	0.65	1.372	0.000	0.000	1.372	3.813	-	5.5	85.3	325.2												
A14	Parkhouse Drive	R11	R12 TEE	0.00	34.33	0.70	0.000	0.287	1.372	1.659	4.611	0.07	9.8	73.7	1532.0	1350	0.013	0.11	1770.1	1.24	97.7	1.32	0.107	0.000	0.450	242.830	242.723
	Parkhouse Drive	R12 TEE	HEADWALL1	0.00	35.35	0.90	0.000	0.671	1.659	2.329	6.475	1.32	21.2	71.0	1651.8	1350	0.013	0.11	1770.1	1.24	20.7	0.28	0.023	0.000	0.600	242.723	242.700

EXISTING SERVICES	DRAWING #, SOURCE	DATE	CONSTRUCTED SERVICES	COMPLETION

DETAILS	
DESIGN	AH/SB
DRAWN BY	CL
CHECKED	TP
APPROVED	AG
DATE	2023-01-31

00188_DS.dwg

No.	REVISIONS	DATE	CONSULTANT
1	PER REVIEW COMMENT	APRIL 8, 2021	LDS CONSULTANTS
2	PER 3RD SUB. REVIEW COMMENT	JUNE 17, 2021	LDS CONSULTANTS
3	PER REVIEW COMMENTS	AUG. 20, 2021	LDS CONSULTANTS
4	REVISED STORM SEWER DESIGN	OCT. 25, 2021	LDS CONSULTANTS
5.	FOR MUNICIPAL REVIEW	FEB. 6, 2023	LDS CONSULTANTS
6.	FOR TENDER	APRIL 24, 2023	LDS CONSULTANTS
7.	RAISED STORM SEWERS	MAY 5, 2024	LDS CONSULTANTS

CONSULTANT OR DIVISION: LDS

ENGINEER'S STAMP: LICENSED PROFESSIONAL ENGINEER — MAY 2024 — A. H. GUBBELS — PROVINCE OF ONTARIO

STRATHROY-CARADOC — URBAN OPPORTUNITY - RURAL HOSPITALITY

SCALE:

TITLE: MUNICIPALITY OF STRATHROY-CARADOC
VILLAGE OF MOUNT BRYDGES
PARKHOUSE DRIVE
RECONSTRUCTION

DESIGN SHEETS

PROJECT No. LD-00188
SHEET No. 3 of 23
PLAN FILE No.

21-014-00188 - PARKHOUSE DRIVE MT. BRYDGES\DETAIL DESIGN\CAD\CIVIL3D\SHEET FILES\00188_DS.DWG
2023-01-31 08:00:00 AM by MARK LEONE

Proposed McDonalds Resturant and Drive-Thrue
Southside Group (London) Limited
May 10th, 2024

Design: LJ

Avalible Capacity in Proposed Sewer Calculation

For Ext-5A (As per LDS Storm Drainage Area Plan),

$$Q = 2.78CiA$$

$$= 2.78\,(0.65)(85.3\ mm/hr)(0.44\ ha)$$

$$= 67.8\ L/s$$

∴ There is up to $0.068\ m^3/s$ of flow avalible in the Parkhouse Drive sewer.

ADS OGS Sizing Summary

Project Name: McDonald's

Consulting Engineer: LDS Consultants Inc.

Location: Mt. Brydges, ON

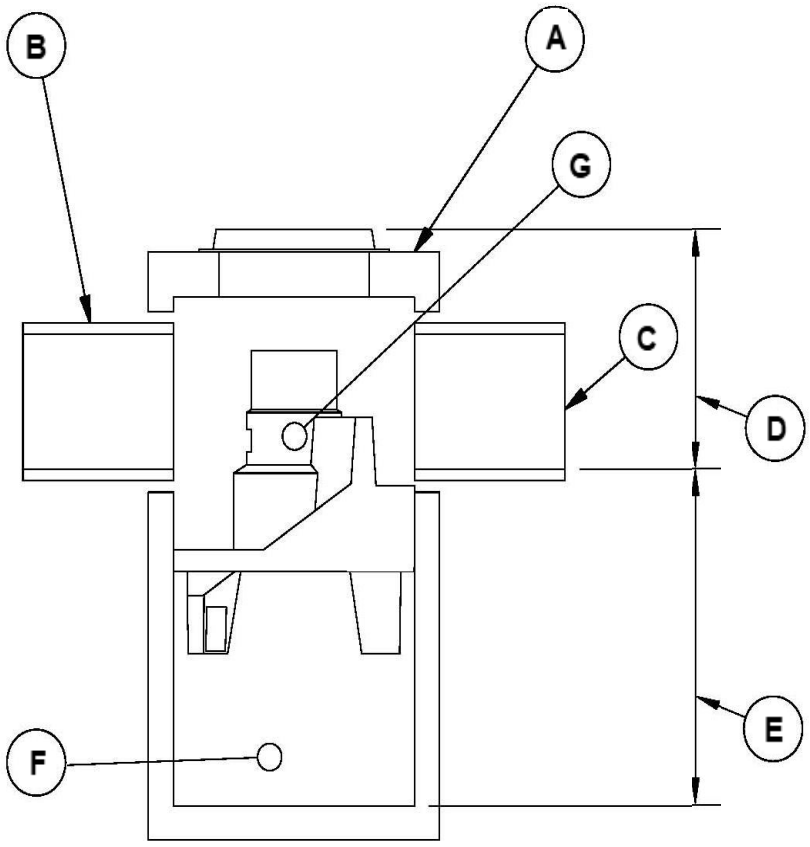
Sizing Completed By: C. Neath **Email:** cody.neath@ads-pipe.com

Treatment Requirements		
Treatment Goal:	Normal (MOE)	
Selected Parameters:	70% TSS	90% Volume
Selected Unit:	**FD-4HC**	

Site Details	
Site Area:	0.35 ha
% Impervious:	83%
Rational C:	0.84
Rainfall Station:	London Intl Airport, ON
Particle Size Distribution:	Fine
Peak Flowrate:	---

Summary of Results		
Model	**TSS Removal**	**Volume Treated**
FD-4HC	93.0%	>90%
FD-5HC	96.0%	>90%
FD-6HC	97.0%	>90%
FD-8HC	98.0%	>90%
FD-10HC	99.0%	>90%

FD-4HC Specification	
Unit Diameter (A):	1,200 mm
Inlet Pipe Diameter (B):	300 mm
Outlet Pipe Diameter (C):	300 mm
Height, T/G to Outlet Invert (D):	2000 mm
Height, Outlet Invert to Sump (E):	1515 mm
Sediment Storage Capacity (F):	0.78 m³
Oil Storage Capacity (G):	723 L
Recommended Sediment Depth for Maintenance:	440 mm
Max. Pipe Diameter:	600 mm
Peak Flow Capacity:	510 L/s



Site Elevations:	
Rim Elevation:	100.00
Inlet Pipe Elevation:	98.00
Outlet Pipe Elevation:	98.000

Notes:

Removal efficiencies are based on NJDEP Test Protocols and independently verified.

All units supplied by ADS have numerous local, provincial, and international certifications (copies of which can be provided upon request). The design engineer is responsible for ensuring compliance with applicable regulations.

Project Name: McDonald's
Consulting Engineer: LDS Consultants Inc.
Location: Mt. Brydges, ON

Net Annual Removal Efficiency Summary: FD-4HC

Rainfall Intensity[1]	Fraction of Rainfall[1]	FD-4HC Removal Efficiency[2]	Weighted Net-Annual Removal Efficiency
mm/hr	%	%	%
0.50	0.2%	100.0%	0.2%
1.00	13.7%	100.0%	13.7%
1.50	17.3%	100.0%	17.3%
2.00	13.5%	99.4%	13.4%
2.50	2.7%	97.3%	2.7%
3.00	2.3%	95.7%	2.2%
3.50	8.5%	94.3%	8.1%
4.00	4.7%	93.1%	4.4%
4.50	1.5%	92.1%	1.3%
5.00	5.2%	91.2%	4.7%
6.00	4.1%	89.7%	3.6%
7.00	4.4%	88.4%	3.9%
8.00	3.3%	87.3%	2.9%
9.00	2.4%	86.4%	2.1%
10.00	2.3%	85.5%	2.0%
20.00	9.2%	80.2%	7.4%
30.00	2.5%	77.2%	1.9%
40.00	1.1%	75.2%	0.8%
50.00	0.4%	73.6%	0.3%
100.00	0.6%	69.1%	0.4%
150.00	0.1%	0.0%	0.0%
200.00	0.0%	0.0%	0.0%
		Total Net Annual Removal Efficiency:	93.3%
		Total Runoff Volume Treated:	>90%

Notes:

(1) Rainfall Data: 1960:2002, HLY03, London AP, ONT, 6144475.

(2) Based on third party verified data and appoximating the removal of a PSD similar to the STC Fine distribution

(3) Rainfall adjusted to 5 min peak intensity based on hourly average.

LDS CONSULTANTS INC.

2323 Trafalgar Street
London, Ontario N5V 0E1

www.LDSconsultants.ca