David Schaeffer Engineering Ltd.
120 Iber Road, Suite 103
Stittsville, ON K2S 1E9
613-836-0856
dsel.ca

TECHNICAL MEMORANDUM

DATE: July 15, 2024

TO: **Gib Patterson**

FROM: Jeremy Chouinard, P.Eng.

SUBJECT: **4795 Bank Street Off-Site Sanitary Sewer Evaluation of Alternative Sanitary Solutions**

OUR FILE: 23-1352

ATTACHMENTS:
- Memo – S-4 Leitrim Expansion Lands Sanitary Sewer Installation on Bank Street, prepared by Arcadis, July 11, 2024
- Email from the City of Ottawa dated June 17, 2024

Per the City of Ottawa's request following its review of DSEL's June 11th Adequacy of Servicing Review memo, DSEL has reviewed alternate sanitary servicing options for the S5 lands.

DSEL's June 11th memo focused on serviceability of the S5 lands via a new gravity sewer along Bank Street connecting to an existing sanitary sewer upstream of the Leitrim Pump Station. This memo will present three (3) additional servicing options:

1- New pump station on S5 lands with forcemains discharging into the 375mm inlet pipe at the Leitrim Pump Station.
2- Splitting sanitary drainage from the S5 lands, allowing gravity drainage to the existing communities to the North and West of the property.
3- Drain all sanitary flows from the S5 lands via gravity North to the existing community.

Furthermore, in the attached email dated June 17th, 2024, the City of Ottawa questioned the land use and whether water services would be required from Bank St. to the S5 lands.

While the street layout for the expansion area S5 is unknown, DSEL has assumed the lands will be dedicated to residential use and has used a metric of 75pop/ha for capacity verifications. Water connections will be required to service the property. It is recommended that water service stubs be brought to the property line as part of the current Bank Street Reconstruction project

Sanitary Servicing Options

The following sanitary servicing alternatives have been reviewed by DSEL:

Option 1) Bank Street Gravity Sewer

The first proposed option for sanitary drainage from the S5 lands was discussed in DSEL's June 11th Adequacy of Servicing Review, where a 420m long 300mm gravity sewer was proposed along Bank Street from the northern limits of the S5 lands to Findlay Creek Drive. Capacity in the downstream pipes was evaluated and found to be consistent with previously approved designs, when considering a total flow of 17.13 l/s from the subject property.

Option 2) New Pump Station on S5 Lands

Alternatively, a pump station and off-site forcemains, as illustrated in **Figure 1**, could replace the gravity sewer. Similar to the previous option, the forcemains would direct flows to the 375mm gravity sewer at the intersection of Bank Street and Findlay Creek Drive. A capacity analysis would yield similar findings as the gravity sewer option.

***Figure 1** – Proposed Pump Station*

Option 3) Split Drainage

DSEL investigated an option where sanitary drainage is split and sent to existing neighboring communities. **Figure 2** shows an area of 4.78 hectares 1800 294 0985 draining to an existing

manhole on Sora Way on the west side of Bank Street and an area of 10.99 hectares draining to an existing manhole on Shuttleworth Drive through the storm servicing block to the North.

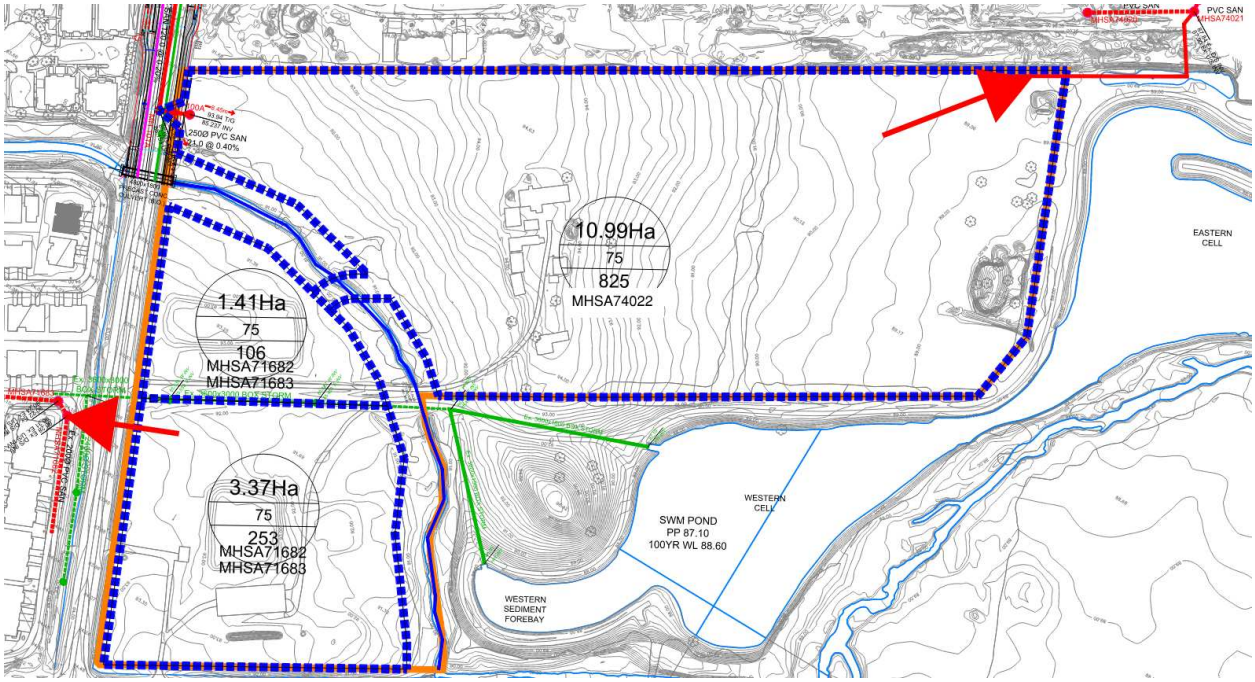


***Figure 2** – Proposed Split Drainage*

Using the design parameters seen in **Table 1**, design flows for the southern portion of the subject property were calculated to be 5.57 l/s and are proposed to drain to MHSA71683 on Sora Way. In addition to the sanitary flows from S5, the S4 lands also propose draining a portion of their lands to this existing sewer. A complete analysis of the residual capacities in exiting sewers and impacts on the sanitary HGL can be found in the attached memo prepared by Arcadis. DSEL completed a similar analysis for the northern 10.99ha area where design flows were calculated to be 12.40 l/s while residual capacities in the existing sewers range from 12.8-40 l/s.

***Table 1**: Wastewater Design Criteria*

Design Parameter	Value
Residential – Single Family	3.4 P/unit
Residential – Townhome	2.7 P/unit
Residential – Back-To-Back	1.8 P/unit
Average Daily Demand	280 L/d/per
Commercial and Institutional	28,000L/day/ha
Peaking Factor	Harmon's Peaking Factor. Max 4.0, Min 2.0 Harmon's Corrector Factor 0.8
Infiltration and Inflow Allowance	0.05 L/s/ha (Dry Weather) 0.28 L/s/ha (Wet Weather) 0.33 L/s/ha (Total)
Park Flows	0.33 L/s/ha
Parking Peaking Factor	9300 L/ha/d

Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} A R^{2/3} S^{1/2}$
Minimum Sewer Size	200 mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5 m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6 m/s
Maximum Full Flowing Velocity	3.0 m/s
Minimum Service Size	
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, October 2012, and recent residential subdivisions in City of Ottawa (including revisions per ISTB Sewer-2018-01)	

Option 4) All Sanitary Flows to Northern Community

The final option DSEL reviewed contemplated sending all sanitary flows from the 15.77ha parcel to the community to the north. The total design flows based on the parameters in **Table 1** were calculated to be 17.13l/s. In this option, the proposed design flows exceed the theoretical residual capacities in some lengths of sewer along Shuttleworth Drive. This option also introduces additional grade raise and earthworks constraints within the S5 lands.

Conclusion:

After reviewing several sanitary design options, DSEL has concluded that the first three options (Option 1-3) discussed above are feasible for servicing the S5 lands from a downstream sanitary capacity perspective.

Due to the complexity of off-site servicing and future operations/maintenance associated with Options 1 and 2, DSEL recommends further investigation of Option 3. Further analysis and discussions are required with the City of Ottawa to verify capacities of the existing downstream sewers.

Yours Truly,
David Schaeffer Engineering Ltd.

Per: Jeremy Chouinard, P.Eng.

Attachment 1 – Arcadis Bank Street Sanitary Report

Memo

SUBJECT
S-4 Leitrim Expansion Lands
Sanitary Sewer Installation on Bank Street

TO
Jeff Shillington
Senior Project Manager, Infrastructure Planning
City of Ottawa

DATE
July 11, 2024

OUR REF
Places Canada – Land Engineering

DEPARTMENT
Land Engineering

PROJECT NUMBER
145172

COPIES TO
Robin Van de Lande, City of Ottawa
John Bougadis, City of Ottawa
Evan Garfinkel, Regional Group

NAME
Ryan Magladry, C.E.T
ryan.magladry@arcadis.com

Arcadis Professional Services (Canada) Inc. has been retained by Regional Group to provide development consultation and design services for its property located at 4850 Bank Street, also known as area S-4 Leitrim Expansion Lands in the City's new official plan. This memo has been prepared to support the installation of a new sanitary sewer on Bank Street. The purpose of this memo is to provide information on the key design considerations and outline the necessity for installation to coincide with the City's work in the subject area.

1.1 Study Area

The new sanitary sewer would connect to the existing sewer in Labrador Crescent and extend approximately 165 m south along Bank Street, ending just past of the limit of construction of the city's contract. An aerial photo of the subject site location is provided below.

2.1 Project Description

The City of Ottawa S-4 Leitrim Expansion Lands, located to the south of the subject area, will require a sanitary sewer outlet to Bank Street when the land is serviced in future years. The proposed sewer outlet will flow north to the subject area and will connect to the existing infrastructure on Labrador Crescent to the west. The City of Ottawa has contracted to widen Bank Street from Leitrim Road to Blais/Miikana Road. Following discussions with the City of Ottawa and Regional Group, it is in both party's best interest to proceed with the installation of the sanitary sewer in the Bank Street contract limits, prior to a formal development approval. Proceeding with this installation will avoid future intersection disruptions and reinstatement costs, and delays associated with the Bank Street moratorium.

2.1.1 Scope of Work

The project shall include the installation of approximately 190 m of 200 mm diameter PVC pipe, 3 sanitary maintenance holes and a connection to the existing sanitary maintenance hole on Labrador Crescent. The scope of work will also include all excavation, support of existing utilities, backfilling, and compaction of the disturbed areas.

3.1 Existing Conditions

The proposed sanitary sewer will connect to the existing MH793A on Labrador Crescent. Arcadis has reviewed the downstream system from the subject area for theoretical residual capacity.

At the connection, the existing system has an available capacity of 15.60 L/s in a 200 mm diameter sewer, as shown on the as-built Sanitary Sewer Design Sheet prepared by IBI Group in 2017, located in **Appendix A.**

Downstream on Sora Way through Findlay Creek Village Stage 2 – Phase 4C to Cedar Creek Drive, residual capacities range from 14.35 to 7.83 L/s in a 200 mm diameter sewer. Continuing downstream on Sora Way, through Findlay Creek Village Stage 2 – Phase 4B to Kelly Farm Drive, residual capacities range from 21.05 to 5.99 L/s, in a 250 mm diameter sewer. Copies of the as-built sewer design sheets for Findlay Creek Village Stage 2 – Phase 4B and 4C have been included in **Appendix A.**

It should be noted that the existing conditions, as stated above, reflect the initial sewer design sheets prepared by IBI Group in Appendix A. The values in these design sheets were determined using the outdated City of Ottawa Sewer Design Criteria, where 350l/c/d was used for average residential flow and a Harmon Peaking Factor coefficient of 1.0 was used. Similarly, the extraneous flows (infiltration) used a rate of 0.28L/s. As part of the proposed analysis presented in section 3.9, the Sora Way sanitary sewer has been re-evaluated using current City of Ottawa Sewer Design Criteria from its connection on Labrador Crescent to Kelly Farm Drive.

At Kelly Farm Drive, flows continue north in a 375 mm diameter sewer to Findlay Creek Drive and head east to the Findlay Creek Sanitary Pumping Station.

3.2 Design Criteria

The sanitary flows for the subject lands were determined using on current City of Ottawa Sewer Design Criteria and the population densities established in the MSS, which include, but is not limited to the following:

3.2.1 Design Flow

- Population density = 60ppl/ha
- Average residential flow = 280 l/c/d
- Peak residential flow factor = (Harmon Formula) x 0.80
- Inflow and Infiltration Rate = 0.33 l/s/ha

- Minimum Full Flow Velocity = 0.60 m/s
- Maximum Full Flow Velocity = 3.0 m/s
- Minimum Pipe Size = 200 mm diameter
- Minimum Design Slope = 0.32%

3.5 Proposed Wastewater Disposal System

The S-4 Leitrim Expansion Lands are proposed to discharge into a future wastewater disposal system on Bank Street. The wastewater will flow north to the subject area and tie into the existing infrastructure on Labrador Crescent. The wastewater will then enter the existing Findlay Creek Village Stage 2 – Phase 4C sewer system and flow west on Sora Way to Kelly Farm Drive, continuing north on Kelly Farm Drive to Findlay Creek Drive. At Findlay Creek Drive, the flow will head east into the Findlay Creek Sanitary Pumping Station.

Proposed Sanitary sewers will consist of 200 mm dia. PVC pipe, constructed to current City of Ottawa design standards. A detailed sanitary sewer design sheet, plan and profile drawings **145172-100/101** and a Sanitary Drainage Area Plan **Figure 1** are provided in **Appendix B**. They demonstrate the sewers have been designed to meet City of Ottawa sewer design criteria and MECP guidelines.

3.6 Proposed Peak Flow Calculations

As previously noted, the concept development plan is not completed and therefore an approximated population density, based on the OSDG of 60ppl/Ha has been used. The total anticipated design population tributary to Labrador Crescent is indicated below.

AREA	POPULATION DENSITY	POPULATION
8.47 Ha	60 ppl/ ha	508

Using the population design calculated above, the peak design flow inclusive of extraneous flows (infiltration), has been demonstrated below.

POPULATION	280L/POP/DAY	PEAK FAFACTOR	PEAK FLOW (L/s)	AREA (ha)	EXT. FLOW (L/s)	TOTAL FLOW (L/s)
508	280	3.38	5.56	8.47	2.80	8.36
N/A				2.25	0.74	0.74
N/A				0.66	0.22	0.22
			Total:	**11.38**	**3.76**	**9.32**

The approximated flow, calculated from the future S-4 Expansion Lands inclusive of an infiltration allowance on Bank Street, is **9.32 L/s**. This was determined using the current Ottawa Sewer Design Criteria, as depicted in section 3.2 of this memo.

3.7 Additional Flows From S-5 Lands

Subsequent to initial discussions with the City, David Schaeffer Engineering Ltd. (DSEL) has contacted Arcadis to consider the south-western portion of the S-5 Leitrim Expansion Lands in the Sora Way sanitary sewer analysis.

DSEL has provided preliminary wastewater flows for approximately 4.78 ha of future development land south of the existing Findlay Creek. The estimated peak flows provided by DSEL are **5.57 L/s**, using a population density of 75 people/ha. Correspondence from DSEL has been provided in **Appendix C**.

3.8 Total Flows to Sora Way

As mentioned in sections 3.6 and 3.7, the estimated peak flows from the S-4 Leitrim Expansion Lands are **9.32 L/s,** and the estimated peak flows from the S-5 Leitrim Expansion Lands are **5.57 L/s**. Therefore, the total additional estimated flows to Sora Way are **14.89 L/s**.

3.9 Verification of Residual Capacity

As noted in section 3.1, using the current City of Ottawa Sewer Design Criteria, Arcadis has reviewed the downstream sewer system from the connection point on Labrador Crescent to Kelly Farm Drive. The calculations are provided on the Sewer Design sheet in **Appendix B** and summarized below.

U/S MH ID	D/S MH ID	Combined Peak Design Flow Q_p (L/s)	Pipe Capacity (L/s)	Residual Capacity (L/s)
735A	730A	34.19	46.84	12.65
740A	735A	33.87	31.63	*-2.24*
750A	740A	33.59	31.02	*-2.57*
760A	750A	31.85	31.02	*-0.83*
770A	760A	30.72	31.02	0.30
780A	770A	22.42	19.66	*-2.76*
790A	780A	20.60	20.24	*-0.36*
791D	790A	17.80	19.66	1.86
791A	791D	12.99	19.66	6.67
792A	791A	12.92	21.09	8.17
793A	792A	12.59	19.95	7.36

Based on the current City of Ottawa Sewer Design Criteria, the proposed design flows exceed the theoretical residual capacity at several locations along Sora Way. The net result is that some localized minor surcharging to the existing system may occur during theoretical peak conditions.

A static HGL analysis has been completed for Sora Way to determine the estimated surcharging effect on the existing sewer. The calculations are included in Appendix B and summarized in the table below.

MH ID	Sewer Obvert Elevation (m)	Static HGL (m)	Height of Surcharge (m)	Low USF (m)	Freeboard (m)
730A	88.330	88.330*		N/A	N/A
735A	88.934	88.847	-0.088	92.10	3.25
740A	89.066	89.066	*0*	92.45	3.38
750A	89.330	89.367	*0.037*	92.20	2.83
760A	89.539	89.600	*0.061*	N/A	N/A
770A	89.752	89.820	*0.068*	N/A	N/A
780A	89.812	90.198	*0.386*	92.28	2.08
790A	90.265	90.425	*0.160*	92.43	2.00
791D	90.413	90.546	*0.133*	92.58	2.03
791A	90.472	90.563	*0.091*	92.58	2.02
792A	90.820	90.736	-0.084	92.68	1.94
793A	91.091	91.007	-0.084	92.73	1.72

*For calculation purposes only, the downstream HGL at Kelly Farm Drive has been assumed to be equal to the pipe obvert.

We have also reviewed the existing house footing elevations; generally, the USF elevations range from 92.10 to 92.63 on Sora Way (from Kelly Farm to Labrador), and 92.58 to 92.73 on Labrador Crescent. The elevation of the existing sanitary sewer on Sora Way ranges from invert 88.210 to 90.275 (from Kelly Farm to Labrador), and from 90.472 to 91.091 on Labrador Crescent. The freeboard in this system ranges from 3.4m to 1.7m. Therefore, the minor localized surcharging resulting from the additional flows will not impact existing houses in the area.

3.10 Conclusions

This memo and the accompanying working drawings indicate that the proposed sanitary sewer meets the requirements of the stakeholder regulators, including the City of Ottawa, provincial MECP and SNC.

The design will be subject to governmental approval prior to construction, including but not limited to the following:

- Commence Work Notification: City of Ottawa
- Municipal Consent Circulation
- Addition to the City of Ottawa's CLI ECA

Ryan Magladry, C.E.T
Associate | Manager, Land Engineering

Demetrius Yannoulopoulos, P.Eng
Director | Office Lead

Angela Soward, EIT
Engineer in Training

Appendix A

FCV ST2 – PH4A – Sanitary Sewer Design Sheet

FCV ST2 - PH4B – Sanitary Sewer Design Sheet

FCV ST2 – PH4C – Sanitary Sewer Design Sheet

CUMMING COCKBURN LIMITED
1770 WOODWARD DRIVE
OTTAWA, ONTARIO
K2C 0P8

SANITARY SEWER DESIGN SHEET

Project: Findlay Creek Village Phase 4
Location: City of Ottawa
Owner: Findlay Creek Properties Ltd. And 1374537ontario Limited (Tartan)

Date: 26-Sep-05
Design: JIM Review: RK

LOCATION			INDIVIDUAL RESIDENTIAL						CUMULATIVE RESID'L FLOW			CUMULATIVE ICI FLOW			INFILTRATION ALLOWANCE			TOTAL	PROPOSED SEWER DESIGN					
Street	From	To	Residential Units			Area	Population	ICI Area	Population	Peaking	Peak Flow	Area	Pk. Fact.	Pk. Flow	Incr. Area	Cum. Area	Flow	FLOW	Capacity	Pipe Size	Length	Slope	Velocity(f)	Avail. Cap.
	MH	MH	Sing/Semi	Towns	Mixed Use	(Ha.)		(Ha.)		Factor	(l/s)			(l/s)	(Ha.)	(Ha.)	(l/s)	(l/s)	(l/s)	(mm)	(M)	(%)	M/sec	(%)
Findlay Creek Drive	290 A	280 A				0.28	0		0	4.00	0.00			0.00	1.58	1.58	0.44	0.44	21.64	200	106.2	0.40	0.67	97.96
Findlay Creek Drive	280 A	265A				0.26	0	0.31	0	4.00	0.00	0.31	1.50	0.47	0.57	2.15	0.60	1.07	21.64	200	103.9	0.40	0.67	95.07
Netley Circle	323A	322A	10			0.81	32		32	4.00	0.52			0.00	0.81	0.81	0.23	0.75	27.59	200	99.2	0.65	0.85	97.29
	322A	265A	15			1.21	48		80	4.00	1.30			0.00	1.21	2.02	0.57	1.87	39.24	250	140.0	0.40	0.77	95.25
Findlay Creek Drive	265 A	250A				0.26	0		80	4.00	1.30	0.31	1.50	0.47	0.26	4.43	1.24	3.01	39.24	250	102.1	0.40	0.77	92.34
	323A	327A	13			1.11	42		42	4.00	0.67			0.00	1.11	1.11	0.31	0.98	27.59	200	185.5	0.65	0.85	96.45
Netley Circle	327A	250A	17			1.35	54		96	4.00	1.56			0.00	1.35	2.46	0.69	2.25	39.24	250	146.0	0.40	0.77	94.27
Findlay Creek Drive	250 A	235 A				0.23	0		176	4.00	2.85			0.00	0.23	7.12	1.99	4.84	39.24	250	70.8	0.40	0.77	87.66
Cedar Creek Drive	341A	320A	3	4		0.25	19		19	4.00	0.31			0.00	0.25	0.25	0.07	0.38	34.22	200	50.0	1.00	1.06	98.89
Block 120	Bulkhead	320A			60	1.04	114		114	4.00	1.85			0.00	1.04	1.04	0.29	2.14	39.24	250	13.0	0.40	0.77	94.54
Cedar Creek Drive	320A	319A	11			0.52	35		168	4.00	2.73			0.00	0.52	1.81	0.51	3.24	39.24	250	89.5	0.40	0.77	91.75
Hillman Marsh Way	313A	310A	11	9		0.68	57		57	4.00	0.92			0.00	0.68	0.68	0.19	1.11	27.59	200	72.0	0.65	0.85	95.98
Hillman Marsh Way	313A	315A	5	8		0.58	35		35	4.00	0.57			0.00	0.58	0.58	0.16	0.73	27.59	200	83.4	0.65	0.85	97.35
Old Crow Way	*Ex MH*	315A	4	8		0.48	32		32	4.00	0.52			0.00	0.48	0.48	0.13	0.65	28.63	200	102.8	0.70	0.88	97.71
Hillman Marsh Way	315A	319A	12	8		0.77	58		125	4.00	2.02			0.00	0.77	1.83	0.51	2.53	39.24	250	159.3	0.40	0.77	93.55
Cedar Creek Drive	319 A	Ex Stub	4	8		0.51	32		325	4.00	5.27			0.00	0.51	4.15	1.16	6.43	39.24	250	96.0	0.40	0.77	83.61
Kelly Farm Drive (External)		700A				31.50	1890								31.50									
Kelly Farm Drive (External)		700A				56.00	3360								56.00	87.50								
	700A	333A	0	0		0.00	0		5250	3.23	68.59				0.00	87.50	24.50	93.09	115.68	375	182.3	0.40	1.02	19.53
High Level Sewer																								
~~Kelly Farm Drive~~	~~336B~~	~~333B~~	~~16~~	~~16~~		~~1.19~~	~~90~~		~~90~~	~~4.00~~	~~1.45~~			~~0.00~~	~~1.19~~	~~1.19~~	~~0.33~~	~~1.78~~	~~28.63~~	~~200~~	~~139.7~~	~~0.70~~	~~0.88~~	~~93.77~~
	335B	333B	16	17		1.18	92		92	4.00	1.49			0.00	1.18	1.18	0.33	1.82	28.63	200	139.7	0.70	0.88	93.64
Alasken Drive		Bulkhead				8.32	499		499						8.32									
	Bulkhead	333B		8		0.27	19		518	3.97	8.33				0.27	8.59	2.41	10.74	55.26	300	38.0	0.30	0.76	80.57
	333B	333A	0	0		0	0		700	3.89	11.04				0.00	10.96	3.07	14.11	55.26	300	7.3	0.30	0.76	74.47
Kelly Farm Drive	333A	331A	0	0		0	0		5950	3.17	76.51				0.00	98.46	27.57	104.08	115.68	375	135.7	0.40	1.02	10.03

Population Per Unit: 3.2 For Singles/Semi's
2.4 Townhouses
1.9 Mixed Use
Avg. Per Capita Flow Rate: 350 l/day
Infiltration Allowance: 0.28 l/sec/Ha
Residential Peaking Factor: Harmon Formula = 1+(14/(4+P^0.5)) where P = pop'n in thousands
Avg. Commercial/Institutional: 50000 l/Ha/day with Peaking Factor = 1.5
Avg. Pop'n Density Other Lands: 60 persons/Ha

Assumed pipe loss ceofficient = 0.013

Revisions:
No. 1 03-Nov-05

2024-07-024:00 PM

IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

LEGEND

Black text	5 year event curve design
Dark Red	*As-Built Length and Slope*
Grey Text	*Exisitng Sewer Length and Slope*

SANITARY SEWER DESIGN SHEET

PROJECT: FINDLAY CREEK VILLAGE STAGE 2 PHASE 4C
LOCATION: CITY OF OTTAWA
CLIENT: FINDLAY CREEK PARTNERSHIP

LOCATION				RESIDENTIAL									ICI AREAS							INFILTRATION ALLOWANCE			TOTAL FLOW	PROPOSED SEWER DESIGN						
				UNIT TYPES				AREA	POPULATION		PEAK FACTOR	PEAK FLOW	AREA (Ha)						PEAK FLOW	AREA (Ha)		FLOW		CAPACITY	LENGTH	DIA	SLOPE	VELOCITY (full)	AVAILABLE CAPACITY	
													INSTITUTIONAL		COMMERCIAL		INDUSTRIAL												
STREET	AREA ID	FROM MH	TO MH	SF	SD	TH	APT	(Ha)	IND	CUM		(L/s)	IND	CUM	IND	CUM	IND	CUM	(L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(m/s)	L/s	(%)
SAGEBRUSH CRESCENT	763Aa	MH763A	MH754A	5				0.34	16.0	16.0	4.00	0.26		0.00		0.00		0.00	0.00	0.34	0.34	0.10	0.35	28.01	*54.80*	200	*0.67*	0.864	27.65	98.73%
SAGEBRUSH CRESCENT	754A	MH754A	MH753A	2				0.23	6.4	22.4	4.00	0.36		0.00		0.00		0.00	0.00	0.23	0.57	0.16	0.52	28.42	*17.40*	200	*0.69*	0.876	27.90	98.16%
SAGEBRUSH CRESCENT	753A	MH753A	*BULK750AN*	16				0.84	51.2	73.6	4.00	1.19		0.00		0.00		0.00	0.00	0.84	1.41	0.39	1.59	26.94	*90.40*	200	*0.62*	0.831	25.35	94.11%
SAGEBRUSH CRESCENT		*BULK750AN*	*MH750A*						0.0	73.6	4.00	1.19		0.00		0.00		0.00	0.00	0.00	1.41	0.39	1.59	20.24	*18.00*	*200*	*0.35*	0.624	18.66	92.16%
SAGEBRUSH CRESCENT	763Ab	MH763A	MH762A	2				0.21	6.4	6.4	4.00	0.10		0.00		0.00		0.00	0.00	0.21	0.21	0.06	0.16	29.23	*15.90*	200	*0.73*	0.901	29.07	99.44%
SAGEBRUSH CRESCENT	762A	MH762A	*BULK760AN*	15				0.81	48.0	54.4	4.00	0.88		0.00		0.00		0.00	0.00	0.81	1.02	0.29	1.17	27.59	*89.80*	200	*0.65*	0.851	26.42	95.77%
SAGEBRUSH CRESCENT		*BULK760AN*	*MH760A*						0.0	54.4	4.00	0.88		0.00		0.00		0.00	0.00	0.00	1.02	0.29	1.17	27.59	*18.00*	*200*	*0.65*	0.851	26.42	95.77%
ERIC MALONEY	787A	MH787A	MH788A	3				0.20	9.6	9.6	4.00	0.16		0.00		0.00		0.00	0.00	0.20	0.20	0.06	0.21	27.16	*45.86*	200	*0.63*	0.837	26.95	99.22%
ERIC MALONEY	788A	MH788A	MH789A	6				0.32	19.2	28.8	4.00	0.47		0.00		0.00		0.00	0.00	0.32	0.52	0.15	0.61	28.22	*64.85*	200	*0.68*	0.870	27.60	97.83%
ERIC MALONEY	789A	MH789A	MH789B	3				0.18	9.6	38.4	4.00	0.62		0.00		0.00		0.00	0.00	0.18	0.70	0.20	0.82	27.80	*36.68*	200	*0.66*	0.857	26.98	97.06%
ERIC MALONEY		MH789B	*MH772A*						0.0	38.4	4.00	0.62		0.00		0.00		0.00	0.00	0.00	0.70	0.20	0.82	19.66	*18.10*	200	*0.33*	0.606	18.84	95.84%
ERIC MALONEY	786A	MH786A	MH785A			6		0.27	14.4	14.4	4.00	0.23		0.00		0.00		0.00	0.00	0.27	0.27	0.08	0.31	28.01	*47.68*	200	*0.67*	0.864	27.70	98.90%
ERIC MALONEY	785A	MH785A	MH784A			1		0.05	2.4	16.8	4.00	0.27		0.00		0.00		0.00	0.00	0.05	0.32	0.09	0.36	28.83	*10.78*	200	*0.71*	0.889	28.47	98.75%
ERIC MALONEY	784A	MH784A	MH783A			10		0.28	24.0	40.8	4.00	0.66		0.00		0.00		0.00	0.00	0.28	0.60	0.17	0.83	27.37	*50.95*	200	*0.64*	0.844	26.54	96.97%
ERIC MALONEY	783A	MH783A	MH782A			14		0.37	33.6	74.4	4.00	1.21		0.00		0.00		0.00	0.00	0.37	0.97	0.27	1.48	19.95	*51.03*	200	*0.34*	0.615	18.47	92.60%
[illegible]	[illegible]	[illegible]	[illegible]			4		0.18	9.6	84.0	4.00	1.36		0.00		0.00		0.00	0.00	0.18	1.15	0.32	1.68	21.91	*11.93*	200	*0.41*	0.676	20.23	92.32%
ERIC MALONEY	781A	MH781A	MH780A			8		0.30	19.2	103.2	4.00	1.67		0.00		0.00		0.00	0.00	0.30	1.45	0.41	2.08	19.95	*67.17*	200	*0.34*	0.615	17.87	89.58%
BLAIS ROAD	COM., 794A	BULK794AS	MH794A					0.49	0.0	0.0	4.00	0.00		0.00	3.41	3.41		0.00	2.96	3.90	3.90	1.09	4.05	19.66	*33.00*	200	*0.33*	0.606	15.60	79.38%
LABRADOR CRESCENT		MH794A	MH793A						0.0	0.0	4.00	0.00		0.00		3.41		0.00	2.96	0.00	3.90	1.09	4.05	19.66	*19.60*	200	*0.33*	0.606	15.60	79.38%
LABRADOR CRESCENT	793A	MH793A	MH792A			10		0.26	24.0	24.0	4.00	0.39		0.00		3.41		0.00	2.96	0.26	4.16	1.16	4.51	19.95	*73.40*	200	*0.34*	0.615	15.44	77.38%
LABRADOR CRESCENT	792A	MH792A	MH791A			10		0.23	24.0	48.0	4.00	0.78		0.00		3.41		0.00	2.96	0.23	4.39	1.23	4.97	21.09	*86.10*	200	*0.38*	0.650	16.13	76.45%
LABRADOR CRESCENT	791Ab	MH791A	MH791D			2		0.08	4.8	52.8	4.00	0.86		0.00		3.41		0.00	2.96	0.08	4.47	1.25	5.07	19.66	*9.50*	200	*0.33*	0.606	14.59	74.22%
SORA WAY	791Aa	MH791D	MH790A			5		0.17	12.0	64.8	4.00	1.05		0.00		3.41		0.00	2.96	0.17	4.64	1.30	5.31	19.66	*40.85*	200	*0.33*	0.606	14.35	72.99%
LABRADOR CRESCENT	795A	MH795A	MH796A			3		0.10	7.2	7.2	4.00	0.12		0.00		0.00		0.00	0.00	0.10	0.10	0.03	0.14	28.63	*12.99*	200	*0.70*	0.883	28.48	99.49%
LABRADOR CRESCENT	796A	MH796A	MH797A			21		0.41	50.4	57.6	4.00	0.93		0.00		0.00		0.00	0.00	0.41	0.51	0.14	1.08	27.37	*91.56*	200	*0.64*	0.844	26.30	96.07%
HAWKMERE WAY	769A	MH769A	MH768A			1		0.10	2.4	60.0	4.00	0.97		0.00		0.00		0.00	0.00	0.10	0.61	0.17	1.14	21.09	*11.33*	200	*0.38*	0.650	19.95	94.58%
HAWKMERE WAY	768A	MH768A	MH767A			8		0.24	19.2	19.2	4.00	0.31		0.00		0.00		0.00	0.00	0.24	0.24	0.07	0.38	27.59	*35.76*	200	*0.65*	0.851	27.21	98.63%
HAWKMERE WAY	767A	MH767A	MH766A			22		0.54	52.8	72.0	4.00	1.17		0.00		0.00		0.00	0.00	0.54	0.78	0.22	1.39	19.95	*78.10*	200	*0.34*	0.615	18.57	93.06%
HAWKMERE WAY	766A	MH766A	MH765A			4		0.20	9.6	81.6	4.00	1.32		0.00		0.00		0.00	0.00	0.20	0.98	0.27	1.60	22.44	*11.01*	200	*0.43*	0.692	20.84	92.88%
HAWKMERE WAY	765A	MH765A	MH797A			5		0.19	12.0	93.6	4.00	1.52		0.00		0.00		0.00	0.00	0.19	1.17	0.33	1.84	21.09	*40.52*	200	*0.38*	0.650	19.25	91.26%
[illegible]	[illegible]	[illegible]	[illegible]			9		0.22	21.6	172.8	4.00	2.80		0.00		0.00		0.00	0.00	0.22	1.90	0.53	3.33	20.81	*69.56*	200	*0.37*	0.642	17.48	83.99%
LABRADOR CRESCENT		MH798A	MH790A						0.0	172.8	4.00	2.80		0.00		0.00		0.00	0.00	0.00	1.90	0.53	3.33	21.37	*10.62*	200	*0.39*	0.659	18.04	84.41%
SORA WAY	790A	MH790A	MH780A			13		0.39	31.2	268.8	4.00	4.36		0.00		3.41		0.00	2.96	0.39	6.93	1.94	9.26	20.24	*57.35*	200	*0.35*	0.624	10.99	54.27%
SORA WAY	780A	MH780A	*BULK770E*			10		0.36	24.0	396.0	4.00	6.42		0.00		3.41		0.00	2.96	0.36	8.74	2.45	11.82	19.66	*62.24*	200	*0.33*	0.606	7.83	39.85%
SORA WAY		*BULK770E*	*MH770A*						0.0	396.0	4.00	6.42		0.00		3.41		0.00	2.96	0.00	8.74	2.45	11.82	19.66	*18.39*	*200*	*0.33*	0.606	7.83	39.85%

Error
should read 175.2

Error
should read 2.00

Design Parameters:

Residential			ICI Areas			
						Peak Factor
SF	3.2	p/p/u				
TH/SD	2.4	p/p/u	INST	50,000	L/Ha/day	1.5
APT	1.9	p/p/u	COM	50,000	L/Ha/day	1.5
Other	60	p/p/Ha	IND	35,000	L/Ha/day	MOE Chart
				17000	L/Ha/day	

Notes:

1. Mannings coefficient (n) =	0.013	
2. Demand (per capita):	350 L/day	300 L/day
3. Infiltration allowance:	0.28 L/s/Ha	0.4 L/s/Ha
4. Residential Peaking Factor:		
Harmon Formula = 1+(14/(4+P^0.5))		
where P = population in thousands		

Designed: W.Y.
Checked: J.I.M.
Dwg. Reference: 34249

No.	Revision	Date
1.	SUBMISSION #1 FOR CITY REVIEW	30/06/2016
2.	SUBMISSION #2 FOR CITY REVIEW	25/08/2016
3.	ISSUED FOR MOECC APPROVAL	20/09/2016
4.	SUBMISSION #3 FOR CITY REVIEW	14/10/2016
5.	AS-BUILT	6/7/2017

File Reference: 34249.5.7.1
Date: 30/06/2016
Sheet No: 1 of 1

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
PROVINCE OF ONTARIO

IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

SANITARY SEWER DESIGN SHEET

PROJECT: FINDLAY CREEK VILLAGE STAGE 2 PHASE 4B
LOCATION: CITY OF OTTAWA
CLIENT: FINDLAY CREEK PARTNERSHIP

LOCATION				RESIDENTIAL									ICI AREAS							INFILTRATION ALLOWANCE			TOTAL	PROPOSED SEWER DESIGN						
				UNIT TYPES				AREA	POPULATION		PEAK FACTOR	PEAK FLOW	AREA (Ha)						PEAK FLOW	AREA (Ha)		FLOW	FLOW	CAPACITY	LENGTH	DIA	SLOPE	VELOCITY (full)	AVAILABLE CAPACITY	
													INSTITUTIONAL		COMMERCIAL		INDUSTRIAL												
STREET	AREA ID	FROM MH	TO MH	SF	SD	TH	APT	(Ha)	IND	CUM		(L/s)	IND	CUM	IND	CUM	IND	CUM	(L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(m/s)	L/s	(%)
HELEN RAPP WAY	705Ab	*EX. 705A*	738A	5				0.34	16.0	16.0	4.00	0.26							0.00	0.34	0.34	0.10	0.35	27.16	*80.06*	200	*0.63*	0.837	26.80	98.69%
HELEN RAPP WAY	735Aa	735A	736A	2				0.20	6.4	6.4	4.00	0.10							0.00	0.20	0.20	0.06	0.16	26.06	*9.61*	200	*0.58*	0.804	25.90	99.39%
HELEN RAPP WAY	736A	736A	737A	12				0.65	38.4	44.8	4.00	0.73							0.00	0.65	0.85	0.24	0.96	28.42	*74.63*	200	*0.69*	0.876	27.46	96.61%
HELEN RAPP WAY	737A	737A	738A	6				0.36	19.2	64.0	4.00	1.04							0.00	0.36	1.21	0.34	1.38	19.95	*67.66*	200	*0.34*	0.615	18.58	93.10%
MABERLY WAY	738A	738A	731A	9				0.52	28.8	108.8	4.00	1.76							0.00	0.52	2.07	0.58	2.34	22.17	*73.95*	200	*0.42*	0.684	19.83	89.44%
HELEN RAPP WAY	735Ab	735A	734A	5				0.28	16.0	16.0	4.00	0.26							0.00	0.28	0.28	0.08	0.34	28.01	*65.02*	200	*0.67*	0.864	27.67	98.79%
HELEN RAPP WAY	734A	734A	733A	2				0.18	6.4	22.4	4.00	0.36							0.00	0.18	0.46	0.13	0.49	37.48	*9.95*	200	*1.20*	1.156	36.99	98.69%
HELEN RAPP WAY	733A	733A	732A	11				0.54	35.2	57.6	4.00	0.93							0.00	0.54	1.00	0.28	1.21	26.72	*72.44*	200	*0.61*	0.824	25.51	95.46%
HELEN RAPP WAY	732A	732A	731A	6				0.33	19.2	76.8	4.00	1.24							0.00	0.33	1.33	0.37	1.62	19.95	*70.36*	200	*0.34*	0.615	18.33	91.90%
MABERLY WAY	731A	731A	*EX. STUB*	9				0.51	28.8	214.4	4.00	3.47							0.00	0.51	3.91	1.09	4.57	39.46	*75.19*	200	*1.33*	1.217	34.89	88.42%
MABERLY WAY		*EX. STUB*	*EX.730A*						0.0	214.4	4.00	3.47							0.00	0.00	0.00	0.00	3.47	20.24	*5.00*	*200*	*0.35*	0.624	16.77	82.84%
KELLY FARM DRIVE	RES., COM., INST.		647A					61.75	3668.8	3668.8	3.37	50.04	2.46	2.46	7.12	7.12			8.32	75.67	75.67	21.19	79.54							
KELLY FARM DRIVE	647A	647A	742A			5		0.28	12.0	3680.8	3.37	50.18		2.46		7.12			8.32	0.28	75.95	21.27	79.76	101.84	*80.31*	375	*0.31*	0.893	22.08	21.68%
KESTREL STREET	FUT.	BULKHEAD	751A			22		0.65	52.8	52.8	4.00	0.86							0.00	0.65	0.65	0.18	1.04	31.55	*18.75*	200	*0.85*	0.973	30.51	96.71%
KESTREL STREET	751A	751A	745A			4		0.12	9.6	62.4	4.00	1.01							0.00	0.12	0.12	0.03	1.04	29.83	*25.77*	200	*0.76*	0.920	28.78	96.50%
KESTREL STREET	745A, PARK	745A	742A			11		0.37	26.4	88.8	4.00	1.44							0.00	0.37	1.02	0.29	1.72	28.22	*88.63*	200	*0.68*	0.870	26.49	93.89%
KELLY FARM DRIVE	742A	742A	741A			11		0.39	26.4	3796.0	3.35	51.57		2.46		7.12			8.32	0.39	77.36	21.66	81.55	96.79	*74.52*	375	*0.28*	0.849	15.24	15.75%
KELLY FARM DRIVE	741A	741A	*EX.730A*			5		0.28	12.0	3808.0	3.35	51.71		2.46		7.12			8.32	1.50	78.86	22.08	82.11	114.23	*73.37*	375	*0.39*	1.002	32.12	28.12%
REDPOLL WAY	FUT.	BULKHEAD	772A	12				0.70	38.4	38.4	4.00	0.62							0.00	1.92	1.92	0.54	1.16	19.66	*14.30*	200	*0.33*	0.606	18.50	94.10%
CEDAR CREEK DRIVE	772A	772A	771A			16		0.57	38.4	76.8	4.00	1.24							0.00	1.79	3.71	1.04	2.28	19.95	*71.89*	200	*0.34*	0.615	17.67	88.56%
CEDAR CREEK DRIVE	771A	771A	770A			18		0.56	43.2	120.0	4.00	1.94							0.00	1.78	5.49	1.54	3.48	20.81	*74.46*	200	*0.37*	0.642	17.33	83.27%
CEDAR CREEK DRIVE	FUT.	777A	770A			161		4.75	386.4	386.4	4.00	6.26							0.00	4.75	4.75	1.33	7.59	19.66	*25.14*	200	*0.33*	0.606	12.06	61.38%
SORA WAY	FUT., COM.	BULKHEAD	770A	24		65	48	5.29	324.0	324.0	4.00	5.25			3.41	3.41			2.96	8.70	8.70	2.44	10.65	19.95	*18.39*	200	*0.34*	0.615	9.31	46.64%
SORA WAY	770A	770A	760A	3				0.27	9.6	840.0	3.85	13.09				3.41			2.96	0.27	19.21	5.38	21.43	31.02	*82.14*	250	*0.25*	0.612	9.59	30.91%
SAGEBUSH CRESCENT	FUT.	BULKHEAD	760A	16				0.97	51.2	51.2	4.00	0.83							0.00	0.97	0.97	0.27	1.10	24.19	*18.00*	200	*0.50*	0.746	23.09	95.45%
SORA WAY	760A	760A	750A	6				0.37	19.2	910.4	3.83	14.11				3.41			2.96	0.37	20.55	5.75	22.82	31.02	*81.07*	250	*0.25*	0.612	8.20	26.42%
SAGEBUSH CRESCENT	FUT.	BULKHEAD	750A	22				1.46	70.4	70.4	4.00	1.14							0.00	1.46	1.46	0.41	1.55	22.70	*18.00*	200	*0.44*	0.700	21.15	93.17%
SORA WAY	750A	750A	740A	13				0.68	41.6	1022.4	3.79	15.71				3.41			2.96	0.68	22.69	6.35	25.03	31.02	*94.16*	250	*0.25*	0.612	5.99	19.32%
SORA WAY	740A	740A	735A	6				0.31	19.2	1041.6	3.79	15.99				3.41			2.96	0.31	23.00	6.44	25.39	31.63	*40.58*	250	*0.26*	0.624	6.25	19.75%
SORA WAY	735A	735A	*EX.730A*	6				0.46	19.2	1060.8	3.78	16.26				3.41			2.96	0.46	23.46	6.57	25.79	46.84	*105.34*	250	*0.57*	0.924	21.05	44.95%
SILVERBELL CRESCENT	714Aa	714A	715A	1				0.11	3.2	3.2	4.00	0.05							0.00	0.11	0.11	0.03	0.08	30.60	*10.68*	200	*0.80*	0.944	30.52	99.73%
SILVERBELL CRESCENT	715A	715A	716A	5	3	4		0.55	32.8	36.0	4.00	0.58							0.00	0.55	0.66	0.18	0.77	26.28	*70.03*	200	*0.59*	0.810	25.51	97.08%
SILVERBELL CRESCENT	716A	716A	*EX.717A*	3	4			0.29	19.2	55.2	4.00	0.89							0.00	0.29	0.95	0.27	1.16	21.91	*33.95*	200	*0.41*	0.676	20.75	94.70%
SILVERBELL CRESCENT	717A	*EX.717A*	*EX.720A*	2	1			0.19	8.8	64.0	4.00	1.04							0.00	0.19	1.14	0.32	1.36	20.24	*31.48*	*200*	*0.35*	0.624	18.89	93.30%
SILVERBELL CRESCENT	714Ab	714A	713A	5				0.36	16.0	16.0	4.00	0.26							0.00	0.36	0.36	0.10	0.36	27.37	*61.34*	200	*0.64*	0.844	27.01	98.68%
SILVERBELL CRESCENT	713A	713A	712A	1				0.08	3.2	19.2	4.00	0.31							0.00	0.08	0.44	0.12	0.43	31.73	*11.53*	200	*0.86*	0.978	31.30	98.63%
SILVERBELL CRESCENT	712A	712A	*EX.711A*			9		0.38	21.6	40.8	4.00	0.66							0.00	0.38	0.82	0.23	0.89	27.59	*79.63*	200	*0.65*	0.851	26.70	96.77%
SILVERBELL CRESCENT	711A	*EX.711A*	*EX.700A*			3		0.14	7.2	48.0	4.00	0.78							0.00	0.14	0.96	0.27	1.05	20.24	*31.60*	*200*	*0.35*	0.624	19.20	94.83%
KELLY FARM DRIVE		*EX.700A*	*EX.334A*						0.0	5304.0	3.22	69.21		2.46		10.53			11.28	0.00	111.04	31.09	111.58	121.33	*89.60*	*375*	*0.44*	1.064	9.75	8.04%

Design Parameters:

Residential			ICI Areas			
						Peak Factor
SF	3.2	p/p/u	INST	50,000	L/Ha/day	1.5
TH/SD	2.4	p/p/u	COM	50,000	L/Ha/day	1.5
APT	1.9	p/p/u	IND	35,000	L/Ha/day	MOE Chart
Other	60	p/p/Ha		17000	L/Ha/day	

Notes:

1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 350 L/day 300 L/day
3. Infiltration allowance: 0.28 L/s/Ha 0.4 L/s/Ha
4. Residential Peaking Factor:
   Harmon Formula = 1+(14/(4+P^0.5))
   where P = population in thousands

Designed: P.K.
Checked: J.I.M.
Dwg. Reference: 34249 - 501C & 501D

No.	Revision	Date
1.	SUBMISSION #1 FOR CITY REVIEW	21/11/2014
2.	SUBMISSION #2 FOR CITY REVIEW	28/04/2015
3.	RE-SUBMISSION #2 FOR CITY REVIEW	31/07/2015
4.	AS-BUILT (Silverbell, Maberly and Helen Rapp (MH705A to MH 734A))	7/3/2016
5	AS-BUILT	8/8/2016

File Reference: 34249.5.7.1 | Date: 21/11/2014 | Sheet No: 1 of 1

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
Aug 10/16
PROVINCE OF ONTARIO

Appendix B

Sanitary Sewer Design Sheet

Figure 1 – Sanitary Drainage Area Plan

Sanitary Hydraulic Grade Line Design Sheet

145172 – DWG100_Plan and Profile

145172 – DWG101_Plan and Profile

ARCADIS PROFESSIONAL SERVICES (CANADA) INC.
500-333 Preston Street
Ottawa, Ontario K1S 5N4 Canada
arcadis.com

SANITARY SEWER DESIGN SHEET

Bank Street Sanitary Sewer
Regional Group
CITY OF OTTAWA

LOCATION				RESIDENTIAL										ICI AREAS									INFILTRATION ALLOWANCE			FIXED FLOW (L/s)		TOTAL FLOW	PROPOSED SEWER DESIGN						
				AREA	UNIT TYPES				AREA	POPULATION		RES	PEAK	AREA (Ha)						ICI	PEAK		AREA (Ha)		FLOW				CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH	w/ Units (Ha)	SF	TH/SD	1 Bed APT	2 Bed APT	w/o Units (Ha)	IND	CUM	PEAK FACTOR	FLOW (L/s)	INSTITUTIONAL IND	INSTITUTIONAL CUM	COMMERCIAL IND	COMMERCIAL CUM	INDUSTRIAL IND	INDUSTRIAL CUM	PEAK FACTOR	FLOW (L/s)	IND	CUM	(L/s)	IND	CUM	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
S-4 Leitrim Expansion Lands	Future	S-4	Bank						8.47	508.2	508.2	3.38	5.56		0.0		0.0		0.0	1.00	0.00	8.47	8.47	2.80		0.0	8.36	20.24	0.00	200	0.35	0.624	11.89	58.72%
Bank Street	Future	Bank	MH300A						2.25	0.0	508.2	3.38	5.56		0.0		0.0		0.0	1.00	0.00	2.25	10.72	3.54		0.0	9.10	20.24	0.00	200	0.35	0.624	11.14	55.05%
Bank Street_San	Proposed	MH300A	MH200A							0.0	508.2	3.38	5.56		0.0		0.0		0.0	1.00	0.00	0.00	10.72	3.54		0.0	9.10	20.24	71.44	200	0.35	0.624	11.14	55.05%
Bank Street_San	Proposed	MH200A	MH100A						0.66	0.0	508.2	3.38	5.56		0.0		0.0		0.0	1.00	0.00	0.66	11.38	3.76		0.0	9.32	20.24	92.12	200	0.35	0.624	10.93	53.98%
Bank Street_San	Proposed	MH100A	MH793A							0.0	508.2	3.38	5.56		0.0		0.0		0.0	1.00	0.00	0.00	11.38	3.76		0.0	9.32	24.19	24.98	200	0.50	0.746	14.88	61.49%
Labrador Crescent	Existing	Blk794AS	MH794A						0.49	0.0	0.0	3.80	0.00		0.0	3.41	3.41		0.0	1.50	1.66	3.90	3.90	1.29		0.0	2.94	19.66	*33.00*	200	*0.33*	0.606	16.71	85.02%
Labrador Crescent	Existing	MH794A	MH793A						0.00	0.0	0.0	3.80	0.00		0.0		3.41		0.0	1.50	1.66	0.00	3.90	1.29		0.0	2.94	19.66	*19.60*	200	*0.33*	0.606	16.71	85.02%
Labrador Crescent	Existing	MH793A	MH792A	0.26						24.0	532.2	3.37	5.81		0.0		3.41		0.0	1.50	1.66	0.26	15.5	5.13		0.0	12.59	19.95	*73.40*	200	*0.34*	0.615	7.36	36.87%
Labrador Crescent	Existing	MH792A	MH791A	0.23						24.0	556.2	3.36	6.06		0.0		3.41		0.0	1.50	1.66	0.23	15.8	5.20		0.0	12.92	21.09	*86.10*	200	*0.38*	0.650	8.17	38.75%
Labrador Crescent	Existing	MH791A	MH791D	0.08						4.8	561.0	3.36	6.11		0.0		3.41		0.0	1.50	1.66	0.08	15.9	5.23		0.0	12.99	19.66	*9.50*	200	*0.33*	0.606	6.66	33.89%
Potential S-5 Lands	Potential	S-5	MH791D	4.78						359.0	359.0	3.44	4.00		0.0		0.00		0.0	1.00	0.00	4.78	4.8	1.58		0.0	5.57							
Sora Way	Existing	MH791D	MH790A	0.17						12.0	932.0	3.26	9.83		0.0		3.41		0.0	1.00	1.11	0.17	20.8	6.86		0.0	17.80	19.66	*40.85*	200	*0.33*	0.606	1.85	9.43%
Labrador Crescent West	Existing	Labrador	MH790A	2.00						175.2	175.2	3.53	2.01		0.0		0.00		0.0	1.00	0.00	2.00	2.0	0.66		0.0	2.67	21.37	*10.62*	200	*0.39*	0.659	18.70	87.52%
Sora Way	Existing	MH790A	MH780A	0.39						31.2	1138.4	3.21	11.84		0.0		3.41		0.0	1.00	1.11	0.39	23.2	7.65		0.0	20.60	20.24	*57.35*	200	*0.35*	0.624	**-0.36**	**-1.77%**
Eric Maloney Way	Existing	Eric Maloney	MH780A	1.45						103.2	103.2	3.59	1.20		0.0		0.00		0.0	1.00	0.00	1.45	1.5	0.48		0.0	1.68	19.95	*67.17*	200	*0.34*	0.615	18.27	91.58%
Sora Way	Existing	MH780A	MH770A	0.36						24.0	1265.6	3.19	13.06		0.0		3.41		0.0	1.00	1.11	0.36	25.0	8.25		0.0	22.42	19.66	*80.63*	200	*0.33*	0.606	**-2.76**	**-14.06%**
Cedar Creek Drive	Existing	Cedar Creek	MH770A	5.49						120.0	120.0	3.58	1.39		0.0		0.00		0.0	1.00	0.00	5.49	5.5	1.81		0.0	3.20	20.81	*74.46*	200	*0.37*	0.642	17.61	84.61%
Cedar Creek Drive	Existing	BULKHEAD	MH770A	4.75						386.4	386.4	3.42	4.29		0.0		0.00		0.0	1.00	0.00	4.75	4.8	1.57		0.0	5.85	19.66	*25.14*	200	*0.33*	0.606	13.80	70.22%
Sora Way	Existing	MH770A	MH760A	0.27						9.6	1781.6	3.10	17.90		0.0		3.41		0.0	1.00	1.11	0.27	35.5	11.72		0.0	30.72	31.02	*82.14*	250	*0.25*	0.612	0.30	0.97%
Sagebush Cresc. East	Existing	Sagebush	MH760A	1.02						54.4	54.4	3.65	0.64		0.0		0.00		0.0	1.00	0.00	1.02	1.0	0.34		0.0	0.98	27.59	*107.80*	200	*0.65*	0.851	26.61	96.45%
Sora Way	Existing	MH760A	MH750A	0.37						19.2	1855.2	3.09	18.57		0.0		3.41		0.0	1.00	1.11	0.37	36.9	12.18		0.0	31.85	31.02	*81.07*	250	*0.25*	0.612	**-0.83**	**-2.69%**
Sagebush Cresc. West	Existing	Sagebush	MH750A	1.41						73.6	73.6	3.62	0.86		0.0		0.00		0.0	1.00	0.00	1.41	1.4	0.47		0.0	1.33	20.24	*108.40*	200	*0.35*	0.624	18.91	93.43%
Sora Way	Existing	MH750A	MH740A	0.68						41.6	1970.4	3.07	19.62		0.0		3.41		0.0	1.00	1.11	0.68	39.0	12.87		0.0	33.59	31.02	*94.16*	250	*0.25*	0.612	**-2.57**	**-8.29%**
Sora Way	Existing	MH740A	MH735A	0.31						19.2	1989.6	3.07	19.79		0.0		3.41		0.0	1.00	1.11	0.31	39.3	12.97		0.0	33.87	31.63	*40.58*	250	*0.26*	0.624	**-2.24**	**-7.07%**
Sora Way	Existing	MH735A	MH730A	0.46						19.2	2008.8	3.07	19.97		0.0		3.41		0.0	1.00	1.11	0.46	39.8	13.12		0.0	34.19	46.84	*105.34*	250	*0.57*	0.924	12.64	26.99%
										2008.8	TRUE						3.41			3.4	TRUE		39.8	TRUE									

Design Parameters:

Residential			ICI Areas			
SF	3.2	p/p/u	INST	28,000	L/Ha/day	
TH/SD	2.4	p/p/u	COM	28,000	L/Ha/day	
1 Bed	1.4	p/p/u	IND	35,000	L/Ha/day	MOE Chart
2 Bed	2.1	p/p/u		17000	L/Ha/day	
Other	60	p/p/Ha				

Notes:

1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 280 L/day 200 L/day
3. Infiltration allowance: 0.33 L/s/Ha
4. Residential Peaking Factor:
   Harmon Formula = 1+(14/(4+(P/1000)^0.5))0.8
   where K = 0.8 Correction Factor
5. Commercial and Institutional Peak Factors based on total area, 1.5 if greater than 20%, otherwise 1.0

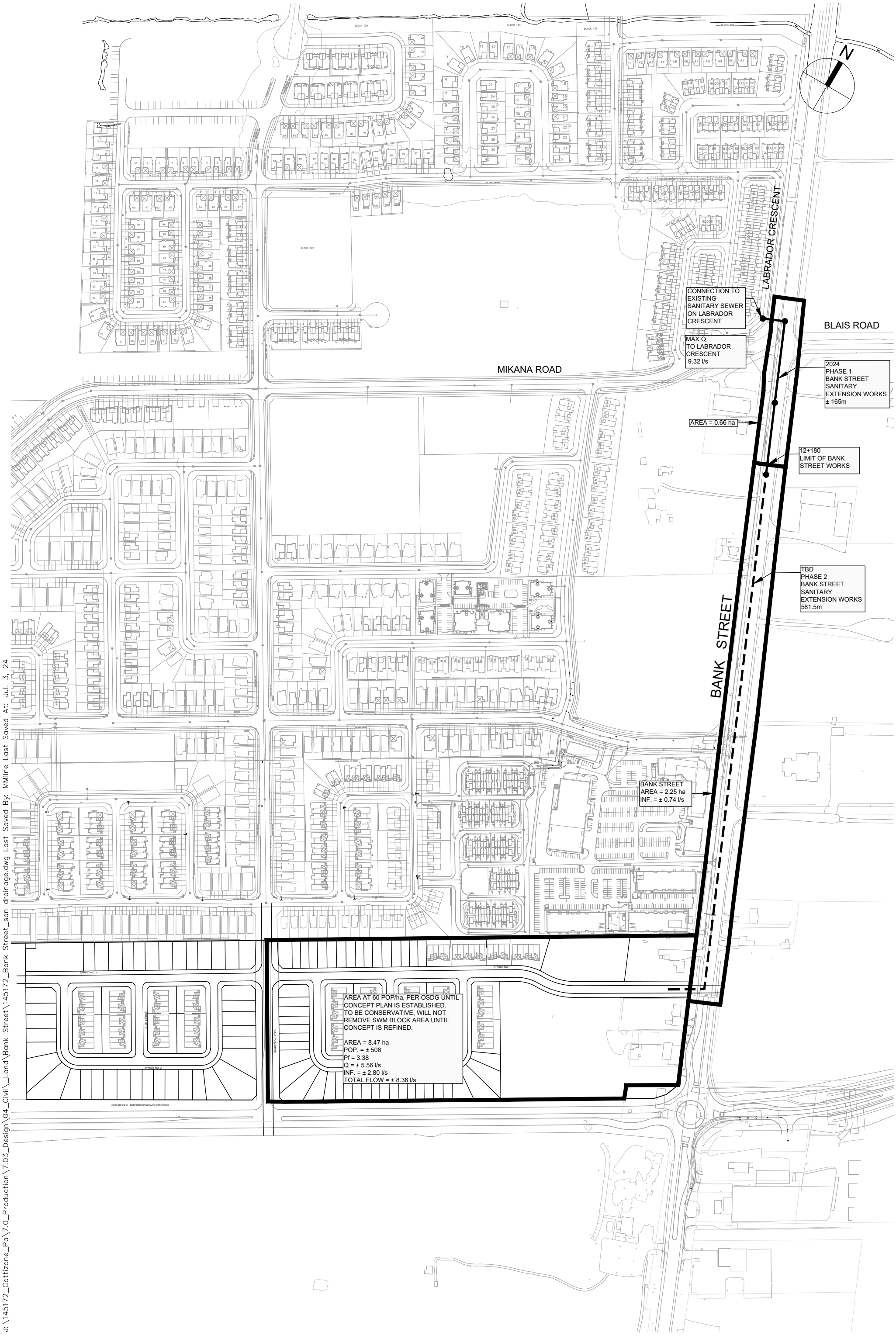
Designed: AS/RM

Checked: RM/DY

Dwg. Reference: 145172-100

No.	Revision	Date
1.	Bank Street Sanitary Sewer (S-4 Letrim Expansion Lands - Sanitary Sewer Installation on Bank Street Memo) - Submission No. 1	2024-07-09

File Reference:	Date:	Sheet No:
145172-6.04.03	2024-07-04	1 of 1



J: \145172_Cattizone_Pa\7.0_Production\7.03_Design\04_Civil_Land\Bank Street\145172_Bank Street_san drainage.dwg Last Saved By: MMilne Last Saved At: Jul. 3, 24

Project Title

CATTAZONE-BANK STREET
SANITARY SEWER

Drawing Title

SANITARY
DRAINAGE AREA PLAN

Sheet No.

FIGURE 1
JULY 2, 2024

ARCADIS

ARCADIS PROFESSIONAL SERVICES (CANADA) INC.
500-333 Preston Street
Ottawa, Ontario K1S 5N4 Canada
arcadis.com

SANITARY HYDRAULIC GRADE LINE DESIGN SHEET

Bank Street Sanitary Sewer | Regional Group
145172-6.0 | Rev #2 | 2024-07-09
Prepared By: AS | Checked By: RM

FRICTION LOSS	FROM MH	TO MH	PIPE ID
Sora Way	**730A**	**735A**	
INVERT ELEVATION (m)	88.080	88.684	
OBVERT ELEVATION (m)	88.330	88.934	
DIAMETER (mm)			250
LENGTH (m)			105.34
FLOW (l/s)			34.19
HGL (m) ***	**88.330**	**88.679**	**0.349**
MANHOLE COEF K= 0.02	LOSS (m)	0.000	
TOTAL HGL (m)		88.847	
MAX. SURCHARGE (mm)		-88	

MANNING FORMULA - FLOWING FULL

DIA (m)	Area (m2)	Perim. (m)	Slope (%)	Hyd.R. (m)	Vel. (m/s)	Q (l/s)
0.25	0.05	0.79	0.573	0.06	0.92	45.01

HYDRAULIC SLOPE =	0.49%
DESIGN FLOW TO FULL FLOW RATIO (Q/Qf) =	0.760
DESIGN FLOW DEPTH =	0.163

Head loss in manhole simplified method p. 71 (MWDM)
fig1.7.1, Kratio = 0.75 for 45 bends K_L=0.02
Velocity = Flow / Area = 0.70 m/s
$HL = K_L * V^2/ 2g$

FRICTION LOSS	FROM MH	TO MH	PIPE ID
Sora Way	**735A**	**740A**	
INVERT ELEVATION (m)	88.711	88.816	
OBVERT ELEVATION (m)	88.961	89.066	
DIAMETER (mm)			250
LENGTH (m)			40.58
FLOW (l/s)			33.87
HGL (m) ***	**88.847**	**88.978**	**0.132**
MANHOLE COEF K= 0.02	LOSS (m)	0.000	
TOTAL HGL (m)		89.066	
MAX. SURCHARGE (mm)		0	

MANNING FORMULA - FLOWING FULL

DIA (m)	Area (m2)	Perim. (m)	Slope (%)	Hyd.R. (m)	Vel. (m/s)	Q (l/s)
0.25	0.05	0.79	0.259	0.06	0.62	30.23

HYDRAULIC SLOPE =	0.54%
DESIGN FLOW TO FULL FLOW RATIO (Q/Qf) =	1.120
DESIGN FLOW DEPTH =	0.250

Head loss in manhole simplified method p. 71 (MWDM)
fig1.7.1, Kratio = 0.75 for 45 bends K_L=0.02
Velocity = Flow / Area = 0.69 m/s
$HL = K_L * V^2/ 2g$

FRICTION LOSS	FROM MH	TO MH	PIPE ID
Sora Way	**740A**	**750A**	
INVERT ELEVATION (m)	88.847	89.080	
OBVERT ELEVATION (m)	89.097	89.330	
DIAMETER (mm)			250
LENGTH (m)			94.16
FLOW (l/s)			33.59
HGL (m) ***	**89.066**	**89.367**	**0.301**
MANHOLE COEF K= 0.02	LOSS (m)	0.000	
TOTAL HGL (m)		89.367	
MAX. SURCHARGE (mm)		37	

MANNING FORMULA - FLOWING FULL

DIA (m)	Area (m2)	Perim. (m)	Slope (%)	Hyd.R. (m)	Vel. (m/s)	Q (l/s)
0.25	0.05	0.79	0.247	0.06	0.60	29.57

HYDRAULIC SLOPE =	0.32%
DESIGN FLOW TO FULL FLOW RATIO (Q/Qf) =	1.136
DESIGN FLOW DEPTH =	0.250

Head loss in manhole simplified method p. 71 (MWDM)
fig1.7.1, Kratio = 0.75 for 45 bends K_L=0.02
Velocity = Flow / Area = 0.68 m/s
$HL = K_L * V^2/ 2g$

ARCADIS PROFESSIONAL SERVICES (CANADA) INC.
500-333 Preston Street
Ottawa, Ontario K1S 5N4 Canada
arcadis.com

SANITARY HYDRAULIC GRADE LINE DESIGN SHEET

Bank Street Sanitary Sewer | Regional Group
145172-6.0 | Rev #2 | 2024-07-09
Prepared By: AS | Checked By: RM

FRICTION LOSS	FROM MH	TO MH	PIPE ID
Sora Way	750A	760A	
INVERT ELEVATION (m)	89.086	89.289	
OBVERT ELEVATION (m)	89.336	89.539	
DIAMETER (mm)			250
LENGTH (m)			81.07
FLOW (l/s)			31.85
HGL (m) ***	89.367	89.600	0.233
MANHOLE COEF K= 0.02	LOSS (m)	0.000	
TOTAL HGL (m)		89.600	
MAX. SURCHARGE (mm)		61	

MANNING FORMULA - FLOWING FULL

DIA (m)	Area (m2)	Perim. (m)	Slope (%)	Hyd.R. (m)	Vel. (m/s)	Q (l/s)
0.25	0.05	0.79	0.250	0.06	0.61	29.74

HYDRAULIC SLOPE =	0.29%
DESIGN FLOW TO FULL FLOW RATIO (Q/Qf) =	1.071
DESIGN FLOW DEPTH =	0.225

Head loss in manhole simplified method p. 71 (MWDM)
fig1.7.1, Kratio = 0.75 for 45 bends K_L=0.02
Velocity = Flow / Area = 0.65 m/s
$HL = K_L * V^2/2g$

FRICTION LOSS	FROM MH	TO MH	PIPE ID
Sora Way	760A	770A	
INVERT ELEVATION (m)	89.294	89.502	
OBVERT ELEVATION (m)	89.544	89.752	
DIAMETER (mm)			250
LENGTH (m)			82.14
FLOW (l/s)			30.72
HGL (m) ***	89.600	89.820	0.219
MANHOLE COEF K= 0.02	LOSS (m)	0.000	
TOTAL HGL (m)		89.820	
MAX. SURCHARGE (mm)		68	

MANNING FORMULA - FLOWING FULL

DIA (m)	Area (m2)	Perim. (m)	Slope (%)	Hyd.R. (m)	Vel. (m/s)	Q (l/s)
0.25	0.05	0.79	0.253	0.06	0.61	29.91

HYDRAULIC SLOPE =	0.27%
DESIGN FLOW TO FULL FLOW RATIO (Q/Qf) =	1.027
DESIGN FLOW DEPTH =	0.210

Head loss in manhole simplified method p. 71 (MWDM)
fig1.7.1, Kratio = 0.75 for 45 bends K_L=0.02
Velocity = Flow / Area = 0.63 m/s
$HL = K_L * V^2/2g$

FRICTION LOSS	FROM MH	TO MH	PIPE ID
Sora Way	770A	780A	
INVERT ELEVATION (m)	89.349	89.612	
OBVERT ELEVATION (m)	89.549	89.812	
DIAMETER (mm)			200
LENGTH (m)			80.63
FLOW (l/s)			22.42
HGL (m) ***	89.820	90.197	0.377
MANHOLE COEF K= 0.02	LOSS (m)	0.001	
TOTAL HGL (m)		90.198	
MAX. SURCHARGE (mm)		386	

MANNING FORMULA - FLOWING FULL

DIA (m)	Area (m2)	Perim. (m)	Slope (%)	Hyd.R. (m)	Vel. (m/s)	Q (l/s)
0.2	0.03	0.63	0.326	0.05	0.60	18.72

HYDRAULIC SLOPE =	0.47%
DESIGN FLOW TO FULL FLOW RATIO (Q/Qf) =	1.197
DESIGN FLOW DEPTH =	0.200

Head loss in manhole simplified method p. 71 (MWDM)
fig1.7.1, Kratio = 0.75 for 45 bends K_L=0.02
Velocity = Flow / Area = 0.71 m/s
$HL = K_L * V^2/2g$

ARCADIS PROFESSIONAL SERVICES (CANADA) INC.
500-333 Preston Street
Ottawa, Ontario K1S 5N4 Canada
arcadis.com

SANITARY HYDRAULIC GRADE LINE DESIGN SHEET

Bank Street Sanitary Sewer | Regional Group
145172-6.0 | Rev #2 | 2024-07-09
Prepared By: AS | Checked By: RM

FRICTION LOSS	FROM MH	TO MH	PIPE ID
Sora Way	780A	790A	
INVERT ELEVATION (m)	89.867	90.065	
OBVERT ELEVATION (m)	90.067	90.265	
DIAMETER (mm)			200
LENGTH (m)			57.35
FLOW (l/s)			20.60
HGL (m) ***	**90.198**	**90.424**	**0.226**
MANHOLE COEF K= 0.02	LOSS (m)	0.000	
TOTAL HGL (m)		90.425	
MAX. SURCHARGE (mm)		160	

MANNING FORMULA - FLOWING FULL						
DIA (m)	Area (m2)	Perim. (m)	Slope (%)	Hyd.R. (m)	Vel. (m/s)	Q (l/s)
0.2	0.03	0.63	0.345	0.05	0.61	19.26

HYDRAULIC SLOPE =	0.40%
DESIGN FLOW TO FULL FLOW RATIO (Q/Qf) =	1.069
DESIGN FLOW DEPTH =	0.180

Head loss in manhole simplified method p. 71 (MWDM)
fig1.7.1, Kratio = 0.75 for 45 bends K_L=0.02
Velocity = Flow / Area = 0.66 m/s
$HL = K_L * V^2/ 2g$

FRICTION LOSS	FROM MH	TO MH	PIPE ID
Sora Way	790A	791D	
INVERT ELEVATION (m)	90.080	90.213	
OBVERT ELEVATION (m)	90.280	90.413	
DIAMETER (mm)			200
LENGTH (m)			40.85
FLOW (l/s)			17.80
HGL (m) ***	**90.425**	**90.545**	**0.120**
MANHOLE COEF K= 0.02	LOSS (m)	0.000	
TOTAL HGL (m)		90.546	
MAX. SURCHARGE (mm)		133	

MANNING FORMULA - FLOWING FULL						
DIA (m)	Area (m2)	Perim. (m)	Slope (%)	Hyd.R. (m)	Vel. (m/s)	Q (l/s)
0.2	0.03	0.63	0.326	0.05	0.60	18.71

HYDRAULIC SLOPE =	0.30%
DESIGN FLOW TO FULL FLOW RATIO (Q/Qf) =	0.952
DESIGN FLOW DEPTH =	0.154

Head loss in manhole simplified method p. 71 (MWDM)
fig1.7.1, Kratio = 0.75 for 45 bends K_L=0.02
Velocity = Flow / Area = 0.57 m/s
$HL = K_L * V^2/ 2g$

FRICTION LOSS	FROM MH	TO MH	PIPE ID
Sora Way	791D	791A	
INVERT ELEVATION (m)	90.241	90.272	
OBVERT ELEVATION (m)	90.441	90.472	
DIAMETER (mm)			200
LENGTH (m)			9.50
FLOW (l/s)			12.99
HGL (m) ***	**90.546**	**90.560**	**0.015**
MANHOLE COEF K= 0.30	LOSS (m)	0.003	
TOTAL HGL (m)		90.563	
MAX. SURCHARGE (mm)		91	

MANNING FORMULA - FLOWING FULL						
DIA (m)	Area (m2)	Perim. (m)	Slope (%)	Hyd.R. (m)	Vel. (m/s)	Q (l/s)
0.2	0.03	0.63	0.326	0.05	0.60	18.73

HYDRAULIC SLOPE =	0.18%
DESIGN FLOW TO FULL FLOW RATIO (Q/Qf) =	0.694
DESIGN FLOW DEPTH =	0.122

Head loss in manhole simplified method p. 71 (MWDM)
fig1.7.1, Kratio = 0.75 for 45 bends K_L=0.30
Velocity = Flow / Area = 0.41 m/s
$HL = K_L * V^2/ 2g$

ARCADIS PROFESSIONAL SERVICES (CANADA) INC.
500-333 Preston Street
Ottawa, Ontario K1S 5N4 Canada
arcadis.com

SANITARY HYDRAULIC GRADE LINE DESIGN SHEET

Bank Street Sanitary Sewer | Regional Group
145172-6.0 | Rev #2 | 2024-07-09
Prepared By: AS | Checked By: RM

FRICTION LOSS	FROM MH	TO MH	PIPE ID
Labrador Crescent	**791A**	**792A**	
INVERT ELEVATION (m)	90.296	90.620	
OBVERT ELEVATION (m)	90.496	90.820	
DIAMETER (mm)			200
LENGTH (m)			86.10
FLOW (l/s)			12.92
HGL (m) ***	**90.563**	**90.697**	**0.134**
MANHOLE COEF K= 0.02	LOSS (m)	0.000	
TOTAL HGL (m)		**90.736**	
MAX. SURCHARGE (mm)		**-84**	

MANNING FORMULA - FLOWING FULL						
DIA (m)	Area (m2)	Perim. (m)	Slope (%)	Hyd.R. (m)	Vel. (m/s)	Q (l/s)
0.2	0.03	0.63	0.376	0.05	0.64	20.11

HYDRAULIC SLOPE =	0.20%
DESIGN FLOW TO FULL FLOW RATIO (Q/Qf) =	0.642
DESIGN FLOW DEPTH =	0.116

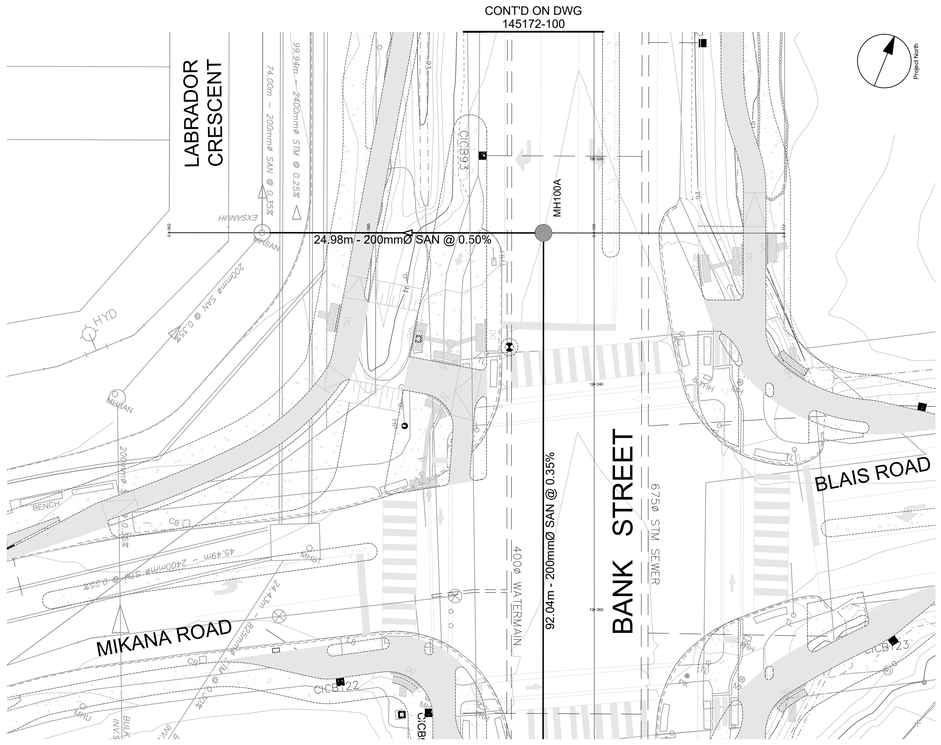
Head loss in manhole simplified method p. 71 (MWDM)
fig1.7.1, Kratio = 0.75 for 45 bends K_L=0.02
Velocity = Flow / Area = 0.41 m/s
HL = K_L * V^2/ 2g

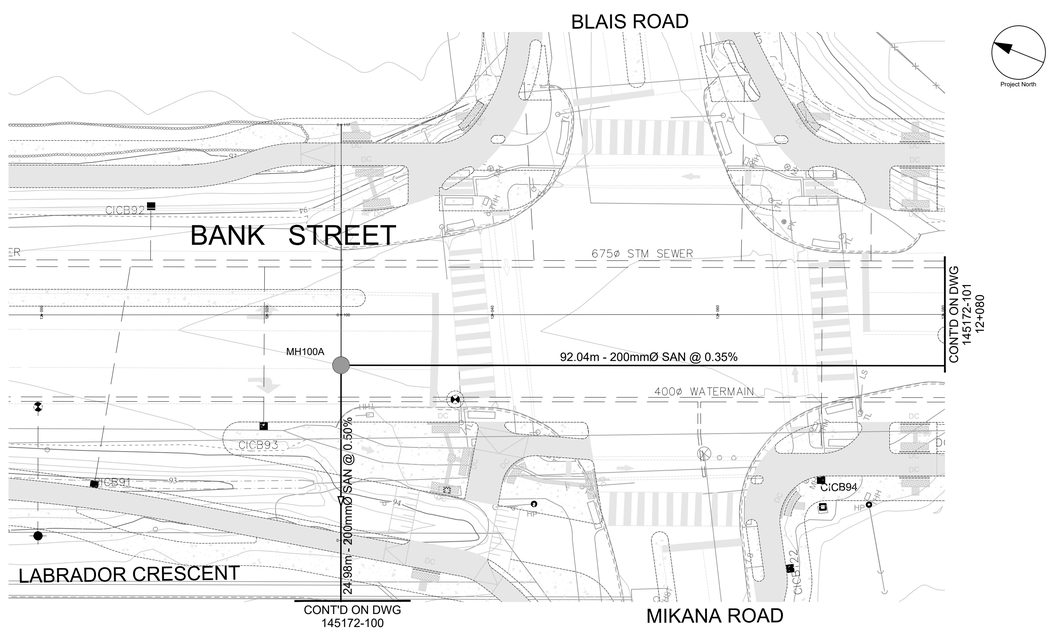
FRICTION LOSS	FROM MH	TO MH	PIPE ID
Labrador Crescent	**792A**	**793A**	
INVERT ELEVATION (m)	90.638	90.891	
OBVERT ELEVATION (m)	90.838	91.091	
DIAMETER (mm)			200
LENGTH (m)			73.40
FLOW (l/s)			12.59
HGL (m) ***	**90.736**	**90.844**	**0.108**
MANHOLE COEF K= 0.02	LOSS (m)	0.000	
TOTAL HGL (m)		**91.007**	
MAX. SURCHARGE (mm)		**-84**	

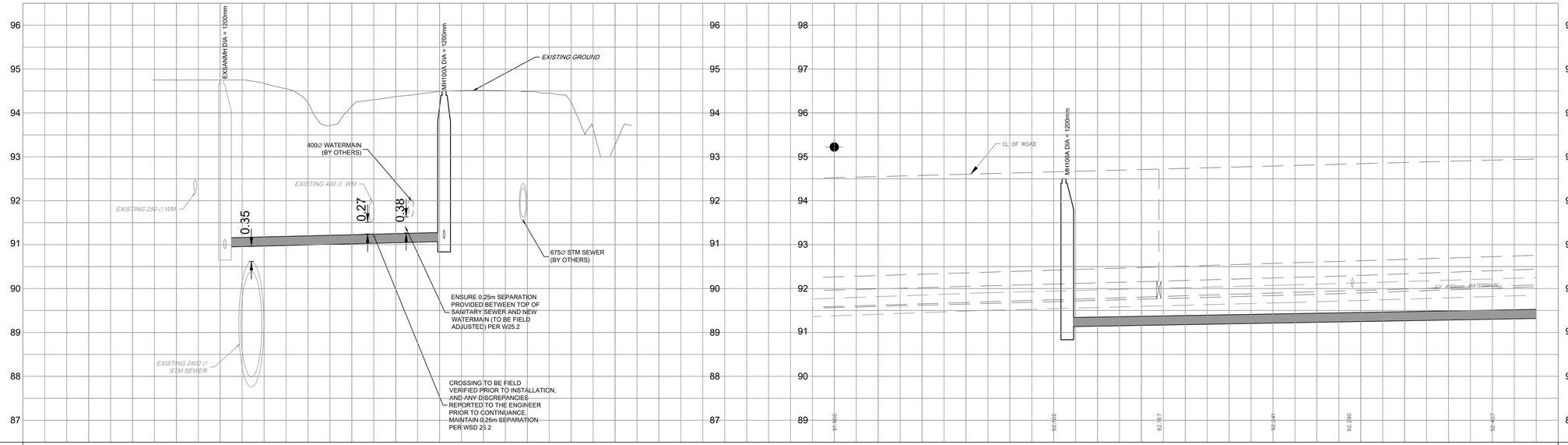
MANNING FORMULA - FLOWING FULL						
DIA (m)	Area (m2)	Perim. (m)	Slope (%)	Hyd.R. (m)	Vel. (m/s)	Q (l/s)
0.2	0.03	0.63	0.345	0.05	0.61	19.25

HYDRAULIC SLOPE =	0.37%
DESIGN FLOW TO FULL FLOW RATIO (Q/Qf) =	0.654
DESIGN FLOW DEPTH =	0.116

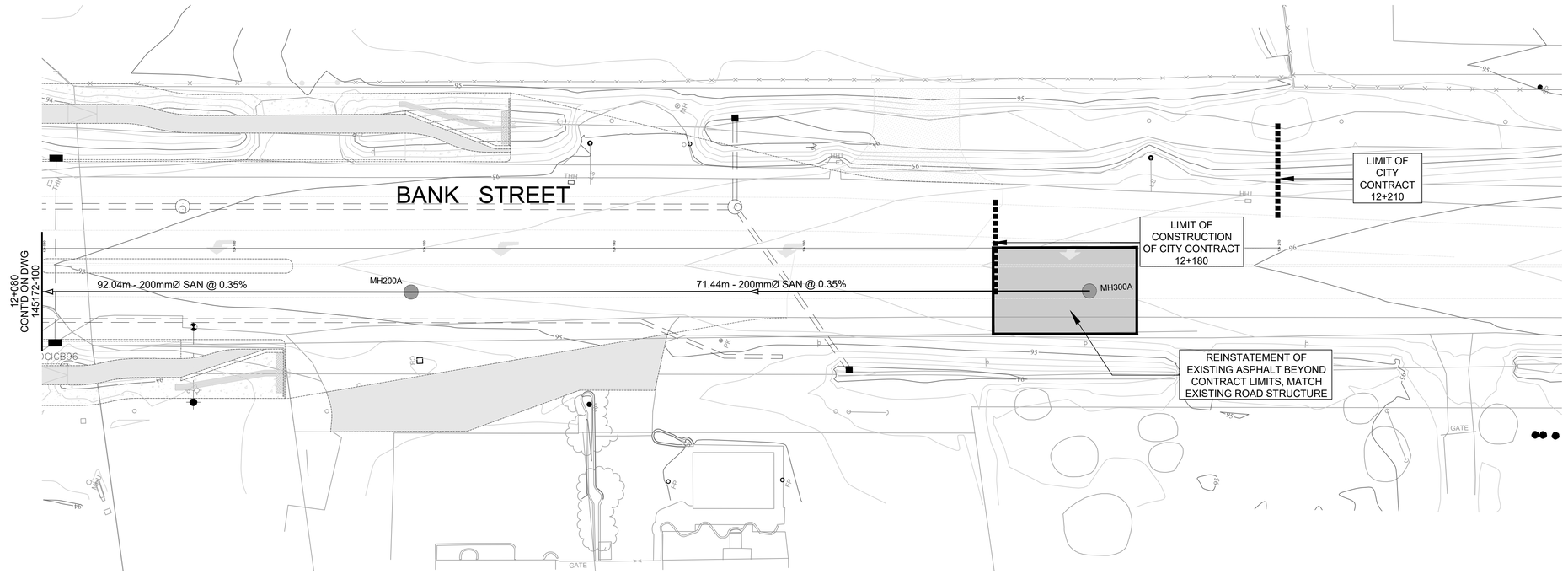
Head loss in manhole simplified method p. 71 (MWDM)
fig1.7.1, Kratio = 0.75 for 45 bends K_L=0.02
Velocity = Flow / Area = 0.40 m/s
HL = K_L * V^2/ 2g

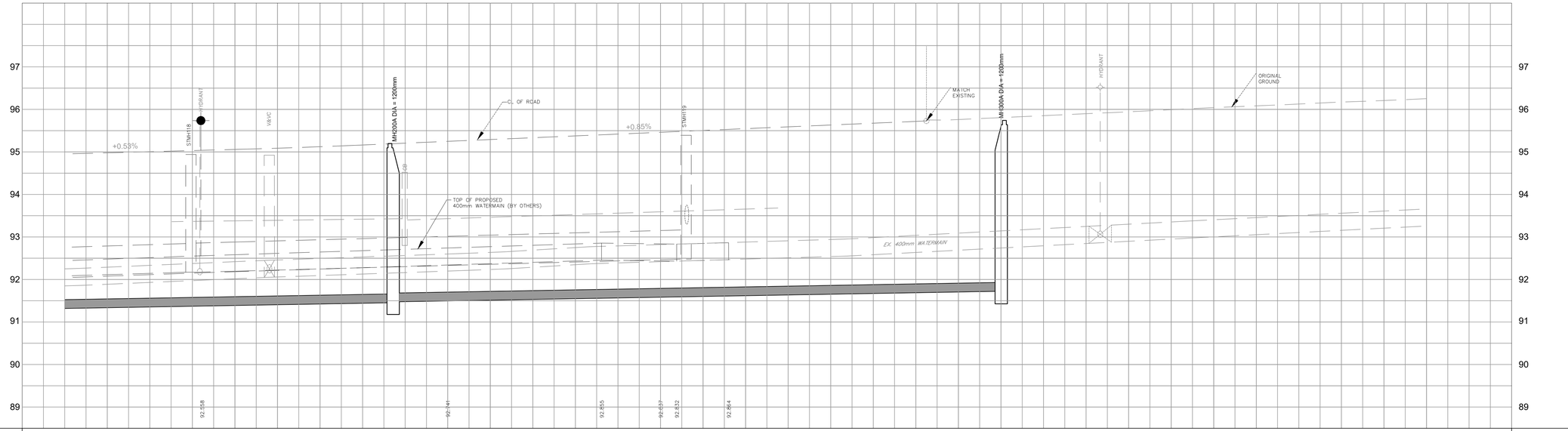

CONT'D ON DWG
145172-100
LABRADOR
CRESCENT
74.00m - 200mmø SAN @ 0.25%
99.94m - 240mmø STM @ 0.25%
EXSANMH
CICB93
MH100A
24.98m - 200mmØ SAN @ 0.50%
HYD
MHSAN
200mmø SAN @ 0.25%
BENCH
45.49m - 240mmø SAN @ 0.25%
24.47m - 825mmø STM @ 0.25%
MIKANA ROAD
CICB122
CICB
92.04m - 200mmØ SAN @ 0.35%
400ø WATERMAIN
675ø STM SEWER
BANK STREET
BLAIS ROAD
CICB123


BLAIS ROAD
BANK STREET
CICB92
675ø STM SEWER
CONT'D ON DWG
145172-101
12+080
MH100A
92.04m - 200mmØ SAN @ 0.35%
400ø WATERMAIN
CICB93
CICB91
CICB94
24.98m - 200mmØ SAN @ 0.50%
LABRADOR CRESCENT
CICB122
CONT'D ON DWG
145172-100
MIKANA ROAD


EXSANMH DIA = 1200mm
MH100A DIA = 1200mm
EXISTING GROUND
400Ø WATERMAIN
(BY OTHERS)
EXISTING 400 Ø WM
EXISTING 250 Ø WM
0.35
0.27
0.38
675Ø STM SEWER
(BY OTHERS)
ENSURE 0.25m SEPARATION
PROVIDED BETWEEN TOP OF
SANITARY SEWER AND NEW
WATERMAIN (TO BE FIELD
ADJUSTED) PER W25.2
EXISTING 2400 Ø
STM SEWER
CROSSING TO BE FIELD
VERIFIED PRIOR TO INSTALLATION,
AND ANY DISCREPANCIES
REPORTED TO THE ENGINEER
PRIOR TO CONTINUANCE.
MAINTAIN 0.25m SEPARATION
PER WSD 25.2
CL OF ROAD
MH100A DIA = 1200mm
EX 400mm WATERMAIN
0.47
96
95
94
93
92
91
90
89
88
87
98
97

| | | |


BANK STREET
12+080
CONTD ON DWG
145172-100
92.04m - 200mmØ SAN @ 0.35%
MH200A
71.44m - 200mmØ SAN @ 0.35%
MH300A
LIMIT OF CITY CONTRACT 12+210
LIMIT OF CONSTRUCTION OF CITY CONTRACT 12+180
REINSTATEMENT OF EXISTING ASPHALT BEYOND CONTRACT LIMITS, MATCH EXISTING ROAD STRUCTURE
GATE
Project North


+0.53%
+0.85%
STM118
HYDRANT
V&VC
MH200A DIA = 1200mm
CL OF ROAD
TOP OF PROPOSED 400mm WATERMAIN (BY OTHERS)
STM119
MATCH EXISTING
MH300A DIA = 1200mm
HYDRANT
ORIGINAL GROUND
EX. 400mm WATERMAIN
92.458
92.741
92.855
92.697
92.632
92.864

| | | |

Appendix C

Email Correspondence from DSEL

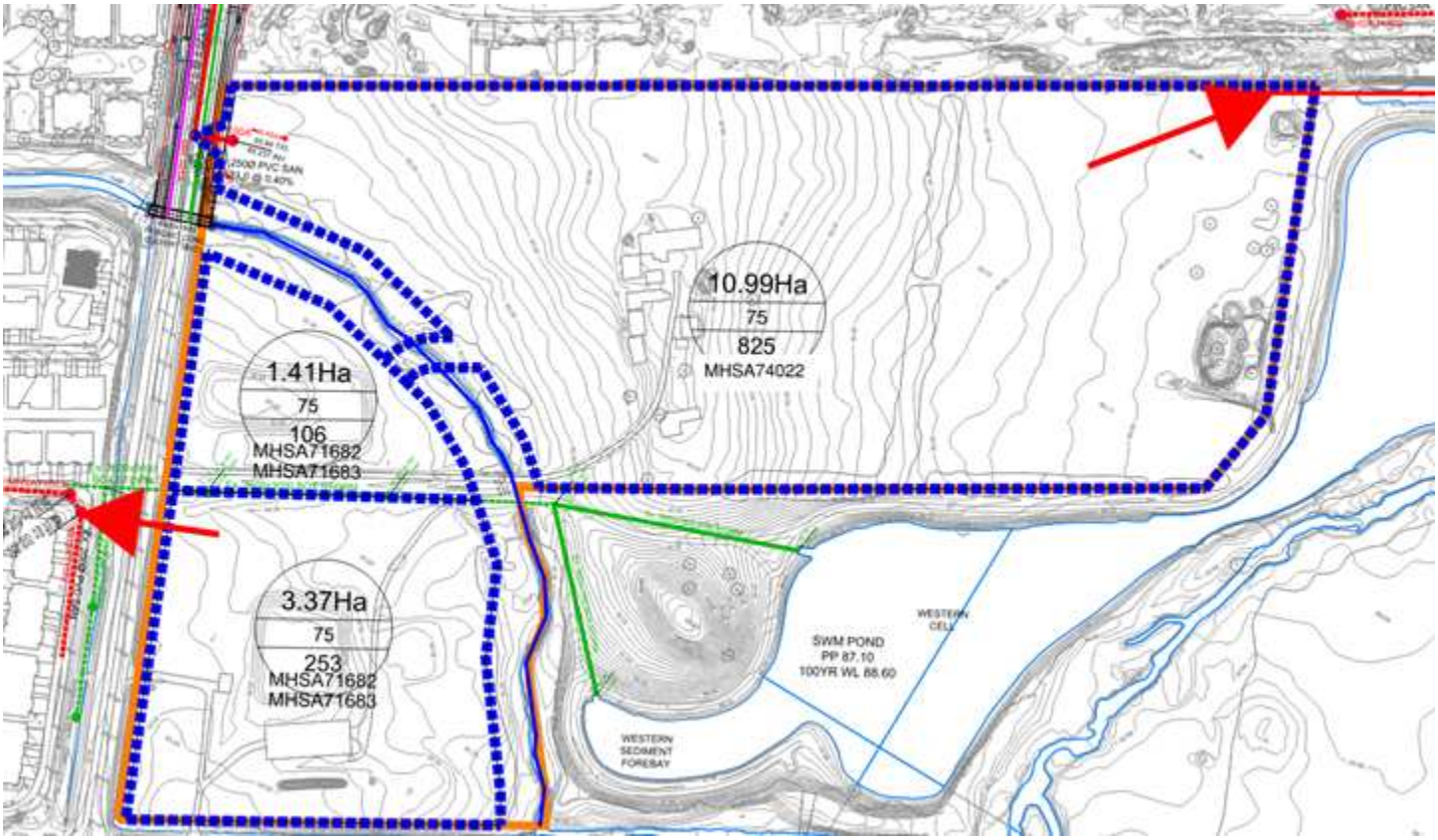
Soward, Angela

From: Jeremy Chouinard <JChouinard@dsel.ca>
Sent: Thursday, June 27, 2024 9:19 AM
To: Magladry, Ryan; Soward, Angela; Marc Pichette
Subject: RE: Bank Street Sanitary - Labrador and Sora Way As-builts

Arcadis Warning: Exercise caution with email messages from external sources such as this message. Always verify the sender and avoid clicking on links or scanning QR codes unless certain of their authenticity.

Hi Ryan,

As discussed, please see sketch below of what we're proposing for sanitary design. The flows from the south-west would be 5.57 l/s assuming 75pop/ha, 4.78 ha and current design guidelines. We'd be tying in to MHSA71682.



Let me know if you have any questions, thanks,

Jeremy Chouinard, P.Eng.,
Project Manager

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

Attachment 2 – City of Ottawa Email

Jeremy Chouinard

From: Marc Pichette
Sent: June 17, 2024 4:12 PM
To: Adam Fobert; Jeremy Chouinard
Subject: FW: 4795 Bank - Bank Street Reconstruction Drawings

FYI – lets discuss tomorrow morning.

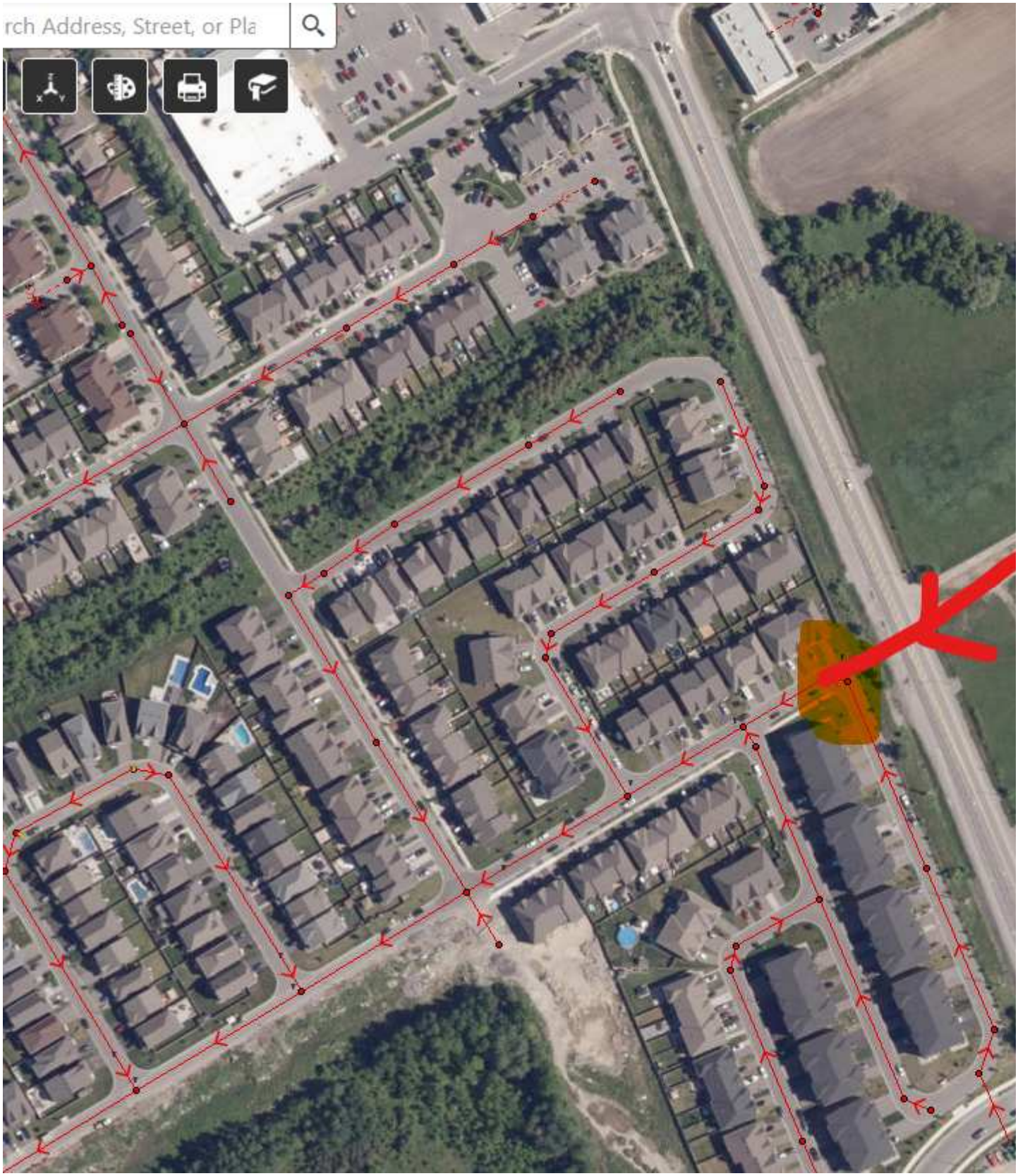
From: Shillington, Jeffrey <jeff.shillington@ottawa.ca>
Sent: June 17, 2024 3:54 PM
To: Marc Pichette <MPichette@dsel.ca>
Cc: Bougadis, John <John.Bougadis@ottawa.ca>; Xu, Lily <Lily.Xu@ottawa.ca>; Sharif, Golam <sharif.sharif@ottawa.ca>; van de Lande, Robin <Robin.vandeLande@ottawa.ca>; Rogers, Christopher <Christopher.Rogers@ottawa.ca>; Moodie, Derrick <Derrick.Moodie@ottawa.ca>
Subject: Re: 4795 Bank - Bank Street Reconstruction Drawings

EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hi Marc,

We have the following comments on your memo:

- Can DSEL provide more detailed information on the land use types and street layout for expansion area S5?
- Is it possible to direct sanitary flow from the S5 lands south of Findlay Creek to the existing 200 mm sewer on Sora Way to avoid a deep crossing of Findlay Creek?



- The City needs evidence that alternatives have been evaluated to ensure that impact to the project is minimized. This would be a normal requirement for a Master Servicing Study for new urban expansion areas. Is constructing a new sewer on Bank Street the only viable option to service the S5 lands?

- Please confirm if a connection to the Bank Street watermain is required for capacity and redundancy.
- Has the need for watermain connections from the Bank Street watermain to the new expansion areas been considered?

Please let us know if you would like to discuss or require clarification.

Jeff Shillington, P. Eng.

Senior Project Manager, Development Review, South Branch

Planning, Infrastructure and Economic Development

City of Ottawa

tel: 580-2424 x 16960

email: jeff.shillington@ottawa.ca

From: Marc Pichette <MPichette@dsel.ca>
Sent: Monday, June 17, 2024 2:14 PM
To: Shillington, Jeffrey <jeff.shillington@ottawa.ca>; Bougadis, John <John.Bougadis@ottawa.ca>
Subject: RE: 4795 Bank - Bank Street Reconstruction Drawings

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Thanks Jeff. I believe Ted has a follow-up meeting with the City setup for tomorrow (not sure who with), would be great to get any preliminary thoughts in advance of that if possible.

From: Shillington, Jeffrey <jeff.shillington@ottawa.ca>
Sent: June 14, 2024 10:02 AM
To: Marc Pichette <MPichette@dsel.ca>; Bougadis, John <John.Bougadis@ottawa.ca>
Subject: Re: 4795 Bank - Bank Street Reconstruction Drawings

EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

HI Marc,

Yes we've received it and will have some comments for you early next week.

Jeff

From: Marc Pichette <MPichette@dsel.ca>
Sent: Thursday, June 13, 2024 2:59 PM
To: Shillington, Jeffrey <jeff.shillington@ottawa.ca>; Bougadis, John <John.Bougadis@ottawa.ca>
Subject: RE: 4795 Bank - Bank Street Reconstruction Drawings

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Just following up to confirm receipt.

I'm out of the office tomorrow afternoon but can otherwise work around your schedules to find a time to review quickly.

From: Marc Pichette
Sent: June 11, 2024 10:00 PM
To: 'Shillington, Jeffrey' <jeff.shillington@ottawa.ca>; 'Bougadis, John' <John.Bougadis@ottawa.ca>
Cc: 'stephen.gallagher@ottawa.ca' <stephen.gallagher@ottawa.ca>; 'ted@dilligafproperties.com' <ted@dilligafproperties.com>; Jeremy Chouinard <JChouinard@dsel.ca>; Steve Pichette <SPichette@dsel.ca>
Subject: FW: 4795 Bank - Bank Street Reconstruction Drawings
Importance: High

Hi Jeff and John,

Please find attached memo which includes our functional design figure for the proposed sanitary sewer on Bank St. as well a review of the capacity of the downstream sewers. I think it would be helpful to have a quick meeting to present our analysis and ensure you have all information you need at this stage in order for us (or Robinson depending on the City's direction) to begin a detailed design ASAP.

Let me know your availability Wednesday/Thursday.

Thanks,

Marc

From: Sharif, Golam <sharif.sharif@ottawa.ca>
Sent: May 30, 2024 3:36 PM
To: Jeremy Chouinard <JChouinard@dsel.ca>
Cc: Xu, Lily <Lily.Xu@ottawa.ca>
Subject: RE: 4795 Bank (not 1352) - Bank Street Reconstruction Drawings

EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hi Jeremy,

I am following up on the email you sent to Stephen. We have discussed internally with different units of the City and these are the steps discussed:

1. Landowners should contact Robyn to coordinate the secondary planning for the S5 lands and organize a meeting to review the scope of work and servicing needs.

2. S4 and S5 landowners should prepare an adequacy of servicing report for their lands, including a design brief for the local sanitary sewer required on Bank Street. The report should also identify connections to the existing watermain on Bank Street and ensure that post-development stormwater runoff to Bank Street matches pre-development rates.

3. Circulate the design brief, including functional level plan and profile drawings of the sewer, to other City groups for approval.

4. Transfer the design brief and drawings to Stephen/Robinson to incorporate into the design of Bank Street.

5. Begin work on legal agreements and cost-sharing arrangements for the design and construction of sewers benefiting S4 and S5. This discussion can happen now.

5. A Third-Party Infrastructure Agreement will be required, and in the cases here, would require Council approval since it will likely be over the upset limit of $350,000 under the delegated authority.

There is no specific category of application intake for this type of work within our usual City system. However, we will setup up this work/ application under a category and go through all the necessary steps discussed above. Let me know if you have any question. I have also cc'd Lily Xu, Manager of DR South here.

Regards,

Sharif

Golam Sharif, P.Eng., M.Eng.

Senior Project Manager (A), Infrastructure Projects

Development Review South

Planning, Development and Building Services Department (PDBS) Department |

Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West. Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1

613.580.2424 ext./poste **20763**, fax/téléc:613-580-2576, sharif.sharif@ottawa.ca

---

From: Jeremy Chouinard <JChouinard@dsel.ca>
Sent: Monday, May 27, 2024 9:53 AM
To: Gallagher, Stephen <stephen.gallagher@ottawa.ca>
Subject: RE: 1352 - Bank Street Reconstruction Drawings

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Good morning,

Please find attached the sketches we reviewed last Thursday.

Regards,

Jeremy Chouinard, P.Eng.,

Project Manager

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

Cell: 613-668-2585
e-mail: jchouinard@DSEL.ca

This email, including any attachments, is for the sole use of the intended recipient(s) and may contain private, confidential, and privileged information. Any unauthorized review, use, disclosure, or distribution is prohibited. If you are not the intended recipient or if this information has been inappropriately forwarded to you, please contact the sender by reply email and destroy all copies of the original.

'

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

'

'

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

'
'

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

'