

December 20, 2024

City of Ottawa
 Planning, Infrastructure and Economic Development Department
 110 Laurier Avenue West, 4th Floor
 Ottawa, ON K1P 1J1

Attention: Vincent Duquette, E.I.T.

**Reference: Greystone Village – Phase 2 & 3 Master Servicing Study Update
 175 Main Street
 Update Submission No. 4
 Our File No. 114025
 City File No. D07-16-15-0001**

Vincent,

Subject to your recent comments on the Site Servicing Brief for the Forecourt Townhomes submission, there were several clerical errors discovered in the issued report tables. In order to provide a complete report free of errors, we have updated the report to address the transcription errors that were made when taking the model output and transcribing it into the report tables. There have no changes to the PCSWMM model since the December 5, 2024 submission.

Changes to the report (December 5, 2024 revision compared to December 20, 2024 revision):

1. Table 3.2: Inlet Control Device Sizes and Design Flows

Inputs for Catchment ID's A01B, A02, A3-A-1, A3-A-3, A08, A09A, B04, A04, A11B were revised and line for A14 was removed (see below):

ICD Parameters			5-year Event		100-year Event	
Catchment ID Model	Location	Orifice Diameter (mm)	Approach Flow from Catchment (L/s)	Inlet Capture Rate (L/s) ¹	Approach Flow from Catchment (L/s)	Inlet Capture Rate (L/s) ¹
<i>Catchbasins</i>						
A01A	CB53	102	23	24	43	27
A01B	CB51	94	16	1417	33	24
A02	CB49	83	16	59	31	89
A3-A-1	CB3	83	172	1416	29	16
A3-A-2	CBMH4	83	14	13	24	16
A3-A-3	CB5	83	14	14	2925	16
A08	CB45	127	1731	1627	2957	1645
A09A	CB28	200	41	37	10594	8474
B04	CB65	127	4042	45	8982	46
B24			30		55	

A04	Roof Drain	4929	11	2949	11
A09B	Roof Drain	38	10	64	10
A09C	Roof Drain	23	7	40	8
A10	Roof Drain	26	7	45	7
A11B	Roof Drain	1423	8	2540	8

2. Table 3.3: Overland Flow Results

Results for Structure ID 61/62 was revised (see below):

Structure ID	Max Static Depth ¹ (m)	3-hour Chicago 100-year				3-hour Chicago 100-year + 20%			
		Peak Flow (L/s)	Velocity (m/s)	Total Depth (static + dynamic) (m)	Velocity x Depth ² (m ² /s)	Peak Flow (L/s)	Velocity (m/s)	Total Depth (static + dynamic) (m)	Velocity x Depth (m ² /s)
<i>des Oblate Ave.</i>									
CB 61/62	CG	866	0.980-2 8	0.050-03	0.050-0 1	1164 4	1.060-3 1	0.060-04	0.060-01

3. Table 3.4: Overland Flow Depths at Low Points

Ponding depths in the 100-year event were revised for CB1, CB2 & CB6; Spill Flows were revised for CB1, CB2, CB6, & CBMH4; and maximum static ponding elevations were revised for CB3, CB6, CB8 and CBMH7:

Structure ID	Top of Grate Elevation (m)	Max Static Ponding Elevation (m)	Model Results		
			5-year	100-year	
			Ponding Depth (m)	Ponding Depth (m)	Spill Flow (L/s)
<i>Roadway Inlets</i>					
CB1	64.92	64.95	0.00	0.1705	36
CB2	64.84	64.87	0.00	0.1505	5
CB3	64.84	64.904	0.00	0.07	13
CB5	65.13	65.18	0.00	0.06	8
CB6	64.71	64.8875	0.00	0.0615	78
CB8	64.04	64.1007	0.00	0.06	13
CBMH4	65.15	65.20	0.00	0.05	89
CBMH7	64.45	64.501	0.00	0.06	13

Please note that there have been no changes to the SWM model since the December 5, 2024 dated submission, however, for convenience we have included below the list of changes to the stormwater management model since the previous Master Servicing Study update (October 23, 2024 dated submission to the December 5, 2024 dated submission):

1. Outlet structures for outlets 1 and 2 are changed according to as-built drawings. Using weirs caused model instability therefore a conduit is used.
2. As discussed in the meeting with staff on December 5, 2024, the peak runoff from model subcatchments (5-year) is compared to the peak runoff results obtained using the rational method. This comparison helps ensure that the parameters assigned to subcatchments, particularly those with irregular shapes, are within a reasonable range. Since it is not possible to match exact values from drawings (e.g. slope %), this verification process is useful for confirming that subcatchment parameters are assigned appropriately.
3. Roadside catchbasins nodes (CB34 & CB22) are revised and connected to the closer MH which is more aligned with reality.
4. The previous release rate for Area A14 was 176 L/s, resulting in a small, required storage capacity of only 6 m³. However, with the new 5-year release rate of 108 L/s for A14, the necessary storage capacity has increased to 41 m³. This adjustment aligns with the findings of the 2017 MSS report. Consequently, the outlet rate for A14 has been revised to 108 L/s.
5. For areas A06A and A06B, ICDs are designed and connected to the minor system.
6. A new model for the “Zero Parks Storage” scenario is added. In this scenario, storage volume is almost zero and a major system conduit is added to let A14 overflow to Deschâtelets Ave.
7. New information regarding as-built USF information was available and the as-built USF elevations in the report table and the appendices have been updated accordingly.

In addition to the above, 2 detailed tables of changes were issued on December 19, 2024 and have been appended to this letter:

8. Hydrological Parameters - Subcatchment Comparison (Hydrology Diff 114025 Greystone 3rd Sub.pdf); and
9. Maintenance Hole Information (MH Diff 114025 Greystone 3rd Sub.pdf).

We trust that the above clarifications and revisions satisfy the City’s comments and concerns and are sufficient to enable site plan approval for the current applications.

Please call with any questions.

Sincerely,

NOVATECH

Prepared By:



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Cc. Evan Garfinkel, Regional Group

Subcatchment	Difference - 2nd vs 3rd Model					Width (m)		Subarea Routing *	
	Area (ha)	Width (m)	Slope %	Imerv %	Zero Imperv %	2nd Model	3rd Model	2nd Model	3rd Model
A01A	0.00	-54.0	0.00	0	0	94	40	PERVIOUS	IMPERVIOUS
A01B	0.00	-46.0	0.00	0	0	88	42	PERVIOUS	IMPERVIOUS
A02	0.00	-43.0	0.00	0	0	90	47	PERVIOUS	IMPERVIOUS
A04	0.00	0.0	0.00	0	0	14	14	OUTLET	OUTLET
A05	0.00	-17.0	0.00	0	0	82	65	PERVIOUS	IMPERVIOUS
A06A	0.00	-75.0	-2.00	0	0	100	25	IMPERVIOUS	PERVIOUS
A06B	0.00	-80.0	1.00	0	0	100	20	IMPERVIOUS	PERVIOUS
A08	0.00	-10.0	0.00	0	0	110	100	PERVIOUS	IMPERVIOUS
A09A	0.00	0.0	0.00	0	0	150	150	PERVIOUS	IMPERVIOUS
A09B	0.00	0.0	0.00	0	0	33	33	OUTLET	OUTLET
A09C	0.00	0.0	0.00	0	0	32	32	OUTLET	OUTLET
A10	0.00	0.0	0.00	0	0	36	36	OUTLET	OUTLET
A11A	0.00	15.0	0.00	0	0	60	75	PERVIOUS	IMPERVIOUS
A11B	0.00	0.0	0.00	0	0	17	17	PERVIOUS	IMPERVIOUS
A11B-TR	0.00	0.0	0.00	0	0	15	15	OUTLET	OUTLET
A12	0.00	0.0	0.00	0	0	18	18	IMPERVIOUS	PERVIOUS
A13	0.00	-40.0	0.00	0	0	100	60	PERVIOUS	IMPERVIOUS
A14	0.00	11.7	-0.50	0	0	53	65	IMPERVIOUS	IMPERVIOUS
A15A	0.00	0.0	0.00	0	0	30	30	OUTLET	OUTLET
A15B	0.00	-61.0	0.00	0	0	106	45	PERVIOUS	IMPERVIOUS
A16A	0.00	0.0	0.00	0	0	30	30	PERVIOUS	IMPERVIOUS
A16B	0.00	0.0	0.00	0	0	30	30	PERVIOUS	IMPERVIOUS
A16C_1	0.00	0.0	0.00	0	0	32	32	OUTLET	OUTLET
A16C_2	0.00	0.0	0.00	0	0	28	28	OUTLET	OUTLET
A17	0.00	-5.7	0.00	0	0	41	35	IMPERVIOUS	IMPERVIOUS
A18	0.00	-10.0	0.00	0	0	80	70	PERVIOUS	PERVIOUS
A19A	0.00	0.0	0.00	0	0	24	24	PERVIOUS	PERVIOUS
A19B	0.00	0.0	0.00	0	0	29	29	PERVIOUS	PERVIOUS
A1C	0.00	0.0	0.00	0	0	21	21	IMPERVIOUS	IMPERVIOUS
A20	0.00	-10.0	0.00	0	0	80	70	PERVIOUS	PERVIOUS
A21B	0.00	-18.0	0.00	0	0	70	52	PERVIOUS	IMPERVIOUS
A22B	0.00	0.0	0.00	0	0	100	100	PERVIOUS	IMPERVIOUS
A23	0.00	0.0	0.00	0	0	58	58	PERVIOUS	IMPERVIOUS
A24	0.00	-23.0	0.00	0	0	78	55	PERVIOUS	IMPERVIOUS
A25	0.00	0.0	0.00	0	0	29	29	PERVIOUS	PERVIOUS
A26	0.00	0.0	0.00	0	0	15	15	IMPERVIOUS	PERVIOUS
A27A	0.00	0.0	0.00	0	0	80	80	PERVIOUS	IMPERVIOUS
A27B	0.00	0.0	0.00	0	0	18	18	PERVIOUS	PERVIOUS
A28	0.00	0.0	0.00	0	0	8	8	IMPERVIOUS	PERVIOUS
A29	0.00	1.9	0.00	0	0	38	40	IMPERVIOUS	PERVIOUS
A30	0.00	0.0	0.00	0	0	26	26	IMPERVIOUS	PERVIOUS

Subcatchment	Difference - 2nd vs 3rd Model					Width (m)		Subarea Routing *	
	Area (ha)	Width (m)	Slope %	Imerv %	Zero Imperv %	2nd Model	3rd Model	2nd Model	3rd Model
A31	0.00	-25.0	0.00	0	0	70	45	PERVIOUS	IMPERVIOUS
A32A	0.00	0.0	0.00	0	0	13	13	PERVIOUS	PERVIOUS
A32B	0.00	0.0	0.00	0	0	50	50	PERVIOUS	PERVIOUS
A33A	0.00	0.0	0.00	0	0	35	35	PERVIOUS	PERVIOUS
A33B	0.00	0.0	0.00	0	0	41	41	PERVIOUS	PERVIOUS
A34	0.00	0.0	0.00	0	0	29	29	PERVIOUS	PERVIOUS
A35	0.00	0.0	0.00	0	0	93	93	IMPERVIOUS	IMPERVIOUS
A36	0.00	-24.0	0.00	0	0	94	70	PERVIOUS	IMPERVIOUS
A3-A-1	0.00	0.9	0.00	0	0	17	18	PERVIOUS	PERVIOUS
A3-A-2	0.00	3.3	0.00	0	0	15	18	PERVIOUS	PERVIOUS
A3-A-3	-0.95	3.3	0.00	0	0	15	18	PERVIOUS	PERVIOUS
A3-A-4	0.00	0.9	0.00	0	0	6	7	PERVIOUS	PERVIOUS
A3-DR1	0.00	-3.0	0.00	0	0	13	10	PERVIOUS	PERVIOUS
A3-DR2	0.00	5.0	0.00	0	0	10	15	PERVIOUS	PERVIOUS
A3-DR3	0.00	11.8	0.00	0	0	4	16	PERVIOUS	PERVIOUS
A3-DR4	0.00	1.8	0.00	0	0	6	8	PERVIOUS	PERVIOUS
A7-A-5	0.00	0.3	0.00	0	0	7	7	PERVIOUS	PERVIOUS
A7-A-6	0.00	4.7	0.00	0	0	13	18	PERVIOUS	PERVIOUS
A7-A-7	0.00	0.9	0.00	0	0	17	18	PERVIOUS	PERVIOUS
A7-A-8	0.00	0.9	0.00	0	0	17	18	PERVIOUS	PERVIOUS
A7-DR5	0.00	2.4	0.00	0	0	6	8	PERVIOUS	PERVIOUS
A7-DR6	0.00	11.0	0.00	0	0	4	15	PERVIOUS	PERVIOUS
A7-DR7	0.00	11.0	0.00	0	0	4	15	PERVIOUS	PERVIOUS
A7-DR8	0.00	-2.7	0.00	0	0	11	8	PERVIOUS	PERVIOUS
B01A	0.00	0.0	0.00	0	0	28	28	PERVIOUS	IMPERVIOUS
B01B	0.00	-22.0	0.00	0	0	64	42	PERVIOUS	IMPERVIOUS
B02	0.00	0.0	0.00	0	0	18	18	PERVIOUS	PERVIOUS
B03	0.00	-95.0	0.00	0	0	130	35	PERVIOUS	IMPERVIOUS
B04	0.00	-50.0	0.00	0	0	100	50	PERVIOUS	IMPERVIOUS
B05	0.00	-67.0	0.00	0	0	107	40	PERVIOUS	IMPERVIOUS
B06	0.00	0.0	0.00	0	0	45	45	PERVIOUS	IMPERVIOUS
B07	0.00	0.0	0.00	0	0	47	47	PERVIOUS	IMPERVIOUS
B08	0.00	0.0	0.00	0	0	40	40	PERVIOUS	IMPERVIOUS
B09	0.00	0.0	0.00	0	0	70	70	PERVIOUS	IMPERVIOUS
B10	0.00	0.0	0.00	0	0	45	45	PERVIOUS	IMPERVIOUS
B11	0.00	0.0	0.00	0	0	20	20	PERVIOUS	IMPERVIOUS
B12	0.00	0.0	0.00	0	0	28	28	PERVIOUS	IMPERVIOUS
B13	0.00	0.0	0.00	0	0	15	15	PERVIOUS	PERVIOUS
B14	0.00	0.0	0.00	0	0	36	36	PERVIOUS	PERVIOUS
B15	0.00	0.0	0.00	0	0	60	60	PERVIOUS	PERVIOUS
B16	0.00	0.0	0.00	0	0	90	90	PERVIOUS	PERVIOUS

Subcatchment	Difference - 2nd vs 3rd Model					Width (m)		Subarea Routing *	
	Area (ha)	Width (m)	Slope %	Imerv %	Zero Imperv %	2nd Model	3rd Model	2nd Model	3rd Model
B17	0.00	0.0	0.00	0	0	45	45	PERVIOUS	IMPERVIOUS
B19	0.00	0.0	0.00	0	0	19	19	OUTLET	OUTLET
B20A	0.00	0.0	0.00	0	0	14	14	IMPERVIOUS	PERVIOUS
B22	0.00	0.0	0.00	0	0	15	15	IMPERVIOUS	IMPERVIOUS
B23	0.00	0.0	0.00	0	0	33	33	OUTLET	OUTLET
B24	0.00	0.0	0.00	0	0	23	23	IMPERVIOUS	IMPERVIOUS
B25	0.00	0.0	0.00	0	0	21	21	OUTLET	OUTLET
Condo2B_TR	0.00	0.0	0.00	0	0	12	12	OUTLET	OUTLET
MR-NB	0.00	0.0	0.00	0	0	6	6	OUTLET	OUTLET
MR-SB	0.00	0.0	0.00	0	0	8	8	OUTLET	OUTLET
NA01	0.00	0.0	0.00	0	0	7	7	PERVIOUS	PERVIOUS
NA02	0.00	0.0	0.00	0	0	24	24	PERVIOUS	PERVIOUS
NA03_1	0.00	0.0	0.00	0	0	6	6	PERVIOUS	PERVIOUS
NA03_2	0.00	0.0	0.00	0	0	6	6	PERVIOUS	PERVIOUS
NA03_3	0.00	0.0	0.00	0	0	3	3	PERVIOUS	PERVIOUS
NA04_1	0.00	0.0	0.00	0	0	5	5	OUTLET	OUTLET
NA04_2	0.00	0.0	0.00	0	0	6	6	OUTLET	OUTLET
NA05	0.00	0.0	0.00	0	0	8	8	PERVIOUS	PERVIOUS
NA06	0.00	0.0	0.00	0	0	15	15	OUTLET	OUTLET
TR1-NB	0.00	0.0	0.00	0	0	17	17	OUTLET	OUTLET
TR2-NB	0.00	0.0	0.00	0	0	5	5	OUTLET	OUTLET
TR-SB	0.00	0.0	0.00	0	0	10	10	OUTLET	OUTLET

* Subarea routing method is correct for 3rd submission;

Subarea Routing methods for roads, residential/park and storage are impervious, pervious and outlet, respectively.

Greystone 114025
Model Comparison



MH Model ID	MH Comparison 2nd vs. 3rd Model					
	2nd Model		3rd Model		Invert Diff	Rim Diff
	Invert (m)	Rim (m)	Invert (m)	Rim (m)	(m)	(m)
A04(STOR)	61.13	65.13	61.13	65.13	0	0
A09B(STOR)	100.00	100.15	100.00	100.15	0	0
A09C(STOR)	100.00	100.15	100.00	100.15	0	0
A10(STOR)	100.00	100.15	100.00	100.15	0	0
A11B(STOR)	60.98	64.03	60.98	64.03	0	0
A14(STOR)	62.70	64.20	62.70	64.20	0	0
A16C(STOR)	65.22	66.00	65.22	66.00	0	0
A22A(STOR)	100.00	100.15	100.00	100.15	0	0
B21(STOR)	100.00	100.15	100.00	100.15	0	0
B23(STOR)	56.51	60.20	56.51	60.20	0	0
B25(STOR)	100.00	100.15	100.00	100.15	0	0
CBMH2	60.98	63.98	60.98	63.98	0	0
GA-ParkSouthStorage	64.50	65.40	64.50	65.40	0	0
J2	65.37	65.52	65.37	65.52	0	0
J4	100.00	100.15	100.00	100.15	0	0
MH100	59.97	61.69	59.97	61.69	0	0
MH102	59.90	64.86	59.90	64.86	0	0
MH104	59.84	62.97	59.84	62.97	0	0
MH106	59.65	62.18	59.65	62.18	0	0
MH108	59.59	62.00	59.59	62.00	0	0
MH110	59.60	63.44	59.63	63.44	0.03	0
MH110B	59.40	63.19	59.42	63.19	0.02	0
MH112B	59.17	62.98	59.24	62.98	0.07	0
MH114	58.08	63.04	58.08	63.04	0	0
MH118	58.41	62.85	58.41	62.85	0	0
MH122	59.30	62.93	59.30	62.93	0	0
MH122B	58.58	62.84	58.58	62.84	0	0
MH124	60.55	63.37	60.55	63.37	0	0
MH126	61.32	63.47	61.32	63.47	0	0
MH128	60.02	63.83	60.02	63.83	0	0
MH130	60.98	63.98	60.98	63.98	0	0
MH132	61.34	64.31	61.34	64.31	0	0
MH136	60.90	63.15	60.90	63.15	0	0
MH140	60.80	63.05	60.80	63.05	0	0
MH144	59.44	63.05	59.44	63.05	0	0
MH148	61.22	63.47	61.22	63.47	0	0
MH152	59.92	63.58	59.92	63.58	0	0
MH164	61.43	64.66	61.43	64.66	0	0
MH166	61.65	64.87	61.65	64.87	0	0
MH168	61.74	65.04	61.74	65.04	0	0
MH170	61.13	65.22	61.13	65.22	0	0
MH172	62.06	65.22	62.06	65.22	0	0
MH174	62.17	65.23	62.17	65.23	0	0
MH176	62.90	65.24	62.90	65.24	0	0

MH Model ID	MH Comparison 2nd vs. 3rd Model					
	2nd Model		3rd Model		Invert Diff (m)	Rim Diff (m)
	Invert (m)	Rim (m)	Invert (m)	Rim (m)		
MH178	62.02	65.44	62.02	65.44	0	0
MH180	62.85	64.61	62.85	64.61	0	0
MH182	62.48	64.91	62.48	64.91	0	0
MH220	59.47	61.72	59.47	61.72	0	0
MH222	59.03	61.00	59.03	61.00	0	0
MH224	59.17	60.92	59.17	60.92	0	0
MH226	60.21	62.67	60.21	62.67	0	0
MH228	60.07	61.86	60.07	61.86	0	0
MH230	59.77	63.44	59.77	63.44	0	0
MH238	58.14	62.56	58.14	62.42	0	-0.14
MH242	56.00	61.68	56.00	61.68	0	0
MH246	59.84	64.28	59.84	64.28	0	0
MH248	61.61	64.77	61.61	64.77	0	0
MH250	62.63	65.74	62.63	65.74	0	0
MH300	62.40	64.86	62.40	64.86	0	0
MH302	61.52	64.32	61.52	64.32	0	0
MH304	60.91	63.44	60.91	63.44	0	0
MH306	59.44	62.10	59.44	62.10	0	0
MH308	58.67	61.62	58.67	61.62	0	0
MH310	56.51	60.06	56.51	60.06	0	0
MH312	61.64	64.19	61.64	64.19	0	0
MH314	60.61	63.06	60.61	63.06	0	0
MH316	57.13	60.20	57.13	60.20	0	0
MH318	57.52	59.59	57.52	59.59	0	0
MH320	56.95	59.97	56.95	59.97	0	0
MH322	56.91	60.03	56.91	60.03	0	0
MH324	60.65	62.79	60.65	62.79	0	0
MH326	59.17	61.81	59.17	61.81	0	0
MH328	58.04	60.43	58.04	60.43	0	0
MH330	57.05	59.30	57.05	59.30	0	0
MH332	56.53	59.20	56.53	59.20	0	0
MH334	56.33	59.03	56.33	59.03	0	0
MH336	56.35	58.81	56.35	59.31	0	0.5
MH338	56.34	58.75	56.34	59.25	0	0.5
MH340	56.01	58.33	56.01	58.33	0	0
MH400	62.79	65.24	62.79	65.24	0	0
MH402	62.32	64.88	62.86	64.88	0.54	0
MH404	65.53	65.53	63.26	65.53	-2.27	0
MH406	62.79	65.21	62.79	65.21	0	0
MH408	62.68	65.24	62.98	65.30	0.3	0.06
MH410	62.23	64.76	62.49	64.76	0.26	0
MH412	62.28	64.56	62.28	64.56	0	0
MH414	61.90	64.16	61.90	64.27	0	0.11