

2012-0040-32

December 21, 2020

Jeff Colyer
Development Manager
River Mill Developments
201-2000 Garth Street
Hamilton, ON L9B 0C1

Dear Mr. Colyer:

RE: River Mill Development - Phase 3B - Zone Change Servicing Feasibility Brief

We have been retained to confirm the servicing feasibility for the property identified as River Mill Developments Phase 3B (Block 3 – Draft Plan 30T-12104), in the City of Cambridge, in support of a zone change. The block is currently zoned as “RM3/CS5(S.4.1.303B)” and is proposed to be modified to a new site specific “RM3/CS5 (S.4.1.303B)-XX” zoning. This letter has been prepared in support of the proposed zone change.

The subject block is part of the overall Hunt Club Valley Subdivision with overall grading and servicing described in the report entitled “Functional Servicing and Stormwater Management Assessment Report”, dated July 13, 2015. A conceptual site plan has been prepared by T. Johns Consulting Group for the subject block and has been overlaid with conceptual servicing as shown in Figure 1.0. The following provides a review of the servicing and assessment of the capacity of the existing infrastructure based on the proposed zoning and increased density.

The topography of the site is currently at pre-grade elevation in accordance with the approved overall subdivision grading plans and in accordance with the City of Cambridge grading permit. The lands generally slope from west to east and outlet via the southeast corner of the site. The proposed site plan maintains the general topography.

The subject property is located within the water pressure zone CAM2W. An existing 200mm diameter watermain is located within Equestrian Way and has been designed to provide water service to the proposed surrounding developments along Equestrian Way as part of the approved municipal servicing for the subdivision. An existing water service stub exists at the northeast corner of the site, which is to be removed and replaced with a service located at the center driveway of the development. The site service connection to Equestrian Way is proposed to be located centrally along the frontage to align with the site access as well as to minimize pressure losses within the site as the existing connection is at a lower elevation. Based on the proposed zone change with an increased density, the theoretical domestic and potable demand and fire flow requirements of the property will not change. Therefore, capacity exists within the existing water system to accommodate the necessary fire and domestic needs to accommodate the proposed zone change.

An existing 200mm diameter sanitary sewer is located within Equestrian Way and has been designed, to provide sanitary service to the proposed surrounding developments along Equestrian Way as part of the approved municipal servicing for the subdivision. An existing 200mm diameter sanitary service stub exists at the northeast corner of the site. Based on the proposed zone change with an increased density, the theoretical flows calculated for the property have been reviewed. Based on this review capacity remains within the

sanitary sewer to accommodate the increased density. A revised overall subdivision sanitary sewer design spreadsheet has been attached displaying the adjusted flows based on an increased density.

The existing stormwater management scheme for the site has been designed to collect storm flows and direct them to the southeast corner of the site, where they will be conveyed to the SWM pond via an existing concrete channel. Based on the proposed zone change, the amount of impervious area allowed within the property will not change and the storm sewer system and the site plan have been developed to be within the allowable imperviousness. Therefore, capacity exists within the storm system to accommodate the proposed zone change.

As part of the overall subdivision development, utilities have been installed along Equestrian Way for the future development of the adjacent lands. As such, the subject site is serviced by all required utilities (i.e. Hydro (Energy+), Gas (Enbridge) and Telecommunications (Rogers and Bell)).

Based on our review of all available documentation, discussion with the City of Cambridge and in consideration of the development concepts provided by T. Johns Consulting Group, we find that the proposed site can be serviced appropriately to support the proposed zone change.

Sincerely,

WALTERFEDY



Dan Schipper, P.Eng.

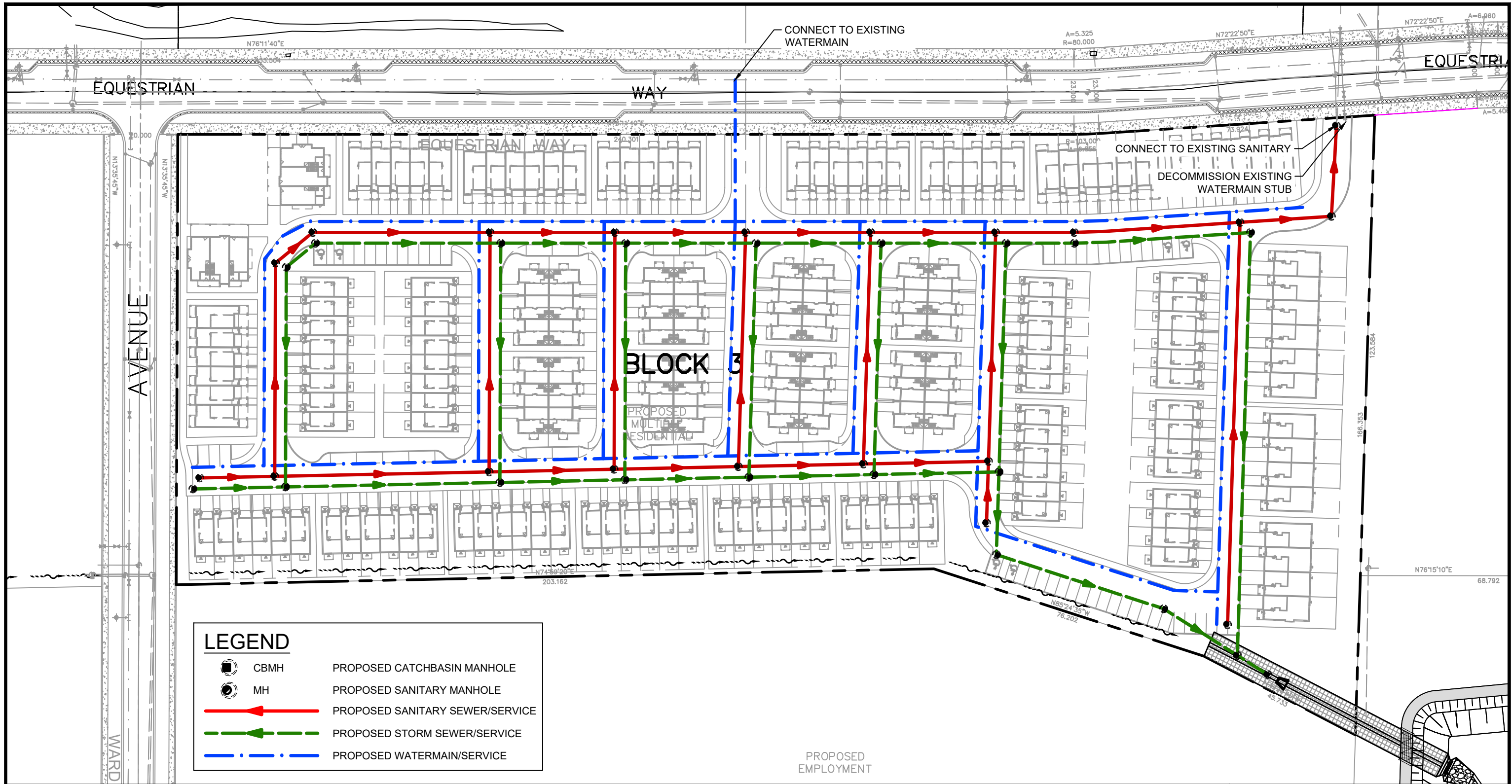
Practice Lead, Municipal Development, Civil
Associate

dschipper@walterfedy.com






519.576.2150, Ext. 276

DS:se

P:\2012\0040\32\06-DWGS\CIVIL\Plot Files\2012-0040-32_C-SVC-FIG; 17x11; DWG To PDF no layers.pc3; Kevin Brown; 2020-12-16 11:07:08 AM



LEGEND

-  CBMH PROPOSED CATCHBASIN MANHOLE
-  MH PROPOSED SANITARY MANHOLE
-  PROPOSED SANITARY SEWER/SERVICE
-  PROPOSED STORM SEWER/SERVICE
-  PROPOSED WATERMAIN/SERVICE

PROJECT:
**RIVER MILL COMMUNITY
 PHASE 3B**

TITLE:
CONCEPTUAL SERVICING LAYOUT

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WALTERFEDY

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SCALE: 1:1000	DATE: 2020.12.16
DRAWN BY: KDB	PROJECT NO.: 2012-0040-32
CHECKED BY: MN	FILE: 2012-0040-32_C-SVC-FIG
SHEET NO.:	

FIG 1.0

SANITARY SEWER DESIGN CALCULATIONS

PROJECT: Hunt Club
 PROJECT No: 2012-0040-32
 DATE: Dec. 16, 2020
 DESIGNED: DS
 CHECKED: RK



CITY OF CAMBRIDGE

DESIGN PARAMETERS

AVERAGE DAILY FLOW PER PERSON =	300 l/p/day	RESIDENTIAL:	0.000003 cums/Ha
MINIMUM VELOCITY = n =	0.600 m/s 0.013	COMMERCIAL:	0.00150 cums/Ha
MAX PEAK FAC. =	4.500	INDUSTRIAL:	0.00125 cums/Ha
MIN PEAK FAC. =	2.000	INSTITUTIONAL:	0.0003851 cums/Ha
		INFILTRATION:	0.00020 cums/Ha
		RESIDENTIAL HARMON PEAKING FACTOR	

LOCATION		RESIDENTIAL AREA AND POPULATION								COMMERCIAL		INDUSTRIAL		INSTITUTIONAL		C+I	INFILTRATION				PIPE					% FULL
STREET	FROM M.H.	TO M.H.	AREA (ha)	POP. DENSITY (p/ha)	POP.	CUMULATIVE		PEAK FACT.	PEAK FLOW (m3/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (m3/s)	TOTAL	ACCU.	INFILT.	TOTAL	DIST	DIA	SLOPE	CAP.	VEL.	
						AREA (ha)	AREA (ha)										AREA (ha)	AREA (ha)	AREA (ha)	AREA (ha)	AREA (ha)	AREA (ha)	AREA (ha)	AREA (ha)	AREA (ha)	
Compass Trail	PLUG	MH4A	1.94	312	606	1.94	606	3.930	0.008							0.000	1.94	1.94	0.003	0.011	13.6	200	0.60	0.025	0.81	44.36%
	MH4A	MH3A	0.00	0	0	1.94	606	3.930	0.008							0.000	0.00	1.94	0.003	0.011	90.0	200	1.00	0.033	1.04	34.36%
Pointer Street	MH1A	MH2A	0.82	143	118	0.82	118	4.223	0.002							0.000	0.82	0.82	0.003	0.005	83.9	200	1.00	0.033	1.04	14.42%
	MH2A	MH3A	0.65	143	93	1.47	211	4.139	0.003							0.000	0.65	1.47	0.003	0.006	90.0	200	1.40	0.039	1.24	15.55%
Pointer Street	MH3A	MH5A	0.36	143	52	3.77	869	3.838	0.012							0.000	0.36	3.77	0.003	0.015	82.1	200	0.60	0.025	0.81	57.40%
	MH5A	MH6A	0.37	143	53	4.14	922	3.822	0.012							0.000	0.37	4.14	0.003	0.015	84.8	200	0.60	0.025	0.81	59.98%
Steed Court	MH7A	MH8A	0.00	0	0	0.00	0	0.000	0.000							0.000	0.00	0.00	0.000	0.000	53.9	200	1.00	0.033	1.04	0.00%
	MH8A	MH6A	0.84	143	121	0.84	121	4.220	0.002							0.000	0.84	0.84	0.003	0.005	53.9	200	3.00	0.057	1.81	8.40%
Compass Trail	MH9A	MH10A	0.93	143	133	0.93	133	4.208	0.002							0.000	0.93	0.93	0.003	0.005	90.0	200	1.30	0.037	1.19	13.22%
	MH10A	MH11A	0.41	143	59	1.34	192	4.154	0.003							0.000	0.41	1.34	0.003	0.006	33.3	200	2.50	0.052	1.65	11.13%
	MH11A	MH12A	0.26	143	38	1.60	230	4.125	0.003							0.000	0.26	1.60	0.003	0.006	25.2	200	2.50	0.052	1.65	12.14%
	MH12A	MH13A	0.48	143	69	2.08	299	4.079	0.004							0.000	0.48	2.08	0.003	0.007	59.9	200	3.10	0.058	1.84	12.53%
Pickett Place	MH16A	MH17A	0.54	143	78	0.54	78	4.272	0.001							0.000	0.54	0.54	0.003	0.004	51.9	200	1.00	0.033	1.04	12.67%
	MH17A	MH18A	0.71	143	102	1.25	180	4.164	0.003							0.000	0.71	1.25	0.003	0.006	90.0	200	1.75	0.043	1.38	12.91%
	MH18A	MH19A	0.19	143	28	1.44	208	4.142	0.003							0.000	0.19	1.44	0.003	0.006	15.4	200	2.80	0.055	1.75	10.92%
	MH19A	MH20A	0.00	0	0	1.44	208	4.142	0.003							0.000	0.00	1.44	0.003	0.006	15.4	200	1.00	0.033	1.04	18.27%
	MH20A	MH13A	0.00	0	0	1.44	208	4.142	0.003							0.000	0.00	1.44	0.003	0.006	24.9	200	0.80	0.029	0.93	20.42%
Compass Trail	MH13A	MH14A	0.56	143	81	4.08	588	3.937	0.008							0.000	0.56	4.08	0.003	0.011	74.0	200	2.50	0.052	1.65	21.28%
	MH14A	MH15A	0.00	0	0	4.08	588	3.937	0.008							0.000	0.00	4.08	0.003	0.011	36.4	200	6.60	0.084	2.68	13.10%
Equestrian Way	MH6A	MH22A	0.28	143	41	5.26	1084	3.777	0.014							0.000	0.28	5.26	0.003	0.017	50.9	200	0.60	0.025	0.81	67.77%
	MH22A	MH22A	0.38	143	55	5.64	1139	3.763	0.015							0.000	0.38	5.64	0.003	0.018	51.6	200	0.60	0.025	0.81	70.33%
Mansfield Circle	MH46A	MH47A	1.33	143	191	1.33	191	4.155	0.003							0.000	1.33	1.33	0.003	0.006	90.0	200	2.25	0.049	1.57	11.70%
	MH47A	MH22A	0.00	0	0	1.33	191	4.155	0.003							0.000	0.00	1.33	0.003	0.006	17.8	200	2.30	0.050	1.58	11.57%
Equestrian Way	MH22A	MH23A	0.27	143	39	7.24	1369	3.708	0.018							0.000	0.27	7.24	0.003	0.021	44.0	200	0.60	0.025	0.81	81.18%
	MH23A	MH24A	0.43	143	62	7.67	1431	3.694	0.018							0.000	0.43	7.67	0.003	0.021	44.4	200	0.60	0.025	0.81	84.06%
	MH24A	MH25A	0.34	143	49	8.01	1480	3.684	0.019							0.000	0.34	8.01	0.003	0.022	31.8	200	4.00	0.066	2.09	33.43%
	MH25A	MH26A	0.28	143	41	8.29	1521	3.675	0.019							0.000	0.28	8.29	0.003	0.022	21.5	200	4.00	0.066	2.09	34.16%
	MH26A	MH27A	0.28	143	41	8.57	1562	3.667	0.020							0.000	0.28	8.57	0.003	0.023	22.8	200	1.00	0.033	1.04	69.78%

SANITARY SEWER DESIGN CALCULATIONS

PROJECT: Hunt Club
 PROJECT No: 2012-0040-32
 DATE: Dec. 16, 2020
 DESIGNED: DS
 CHECKED: RK



CITY OF CAMBRIDGE

DESIGN PARAMETERS

AVERAGE DAILY FLOW PER PERSON =	300 l/p/day	RESIDENTIAL:	0.000003 cums/Ha
MINIMUM VELOCITY = n =	0.600 m/s 0.013	COMMERCIAL:	0.00150 cums/Ha
MAX PEAK FAC.=	4.500	INDUSTRIAL:	0.00125 cums/Ha
MIN PEAK FAC.=	2.000	INSTITUTIONAL:	0.0003851 cums/Ha
		INFILTRATION:	0.00020 cums/Ha
		RESIDENTIAL HARMON PEAKING FACTOR	

LOCATION			RESIDENTIAL AREA AND POPULATION							COMMERCIAL		INDUSTRIAL		INSTITUTIONAL		C+I+	INFILTRATION				PIPE					% FULL
STREET	FROM	TO	AREA (ha)	POP. DENSITY (p/ha)	POP.	CUMULATIVE		PEAK FACT.	PEAK FLOW (m3/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (m3/s)	TOTAL	ACCU.	INFILT.	TOTAL	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (m3/s)	VEL. (FULL) (m/s)	
	M.H.	M.H.				AREA	POP.										AREA	POP.	AREA	AREA						
Burnham Crescent	MH106A	MH107A	0.89	36	33	0.89	33	4.348	0.0005							0.000	0.89	0.89	0.003	0.003	30.5	200	1.50	0.040	1.28	8.71%
	MH107A	MH108A	0.52	36	19	1.41	52	4.311	0.001							0.000	0.52	1.41	0.003	0.004	14.1	200	1.50	0.040	1.28	9.41%
	MH108A	MH109A	0.00	0	0	1.41	52	4.311	0.001							0.000	0.00	1.41	0.003	0.004	23.8	200	1.50	0.040	1.28	9.41%
	MH109A	MH105A	0.61	36	22	2.02	74	4.277	0.001							0.000	0.61	2.02	0.003	0.004	80.4	200	1.50	0.040	1.28	10.20%
Starr Crescent	PLUG	MH110A	0.58	36	21	0.58	21	4.378	0.0003							0.000	0.58	0.58	0.003	0.003	8.9	100	1.50	0.006	0.81	52.47%
	MH110A	MH111A	0.33	36	12	0.91	33	4.348	0.000							0.000	0.33	0.91	0.003	0.003	33.1	200	0.50	0.023	0.74	15.08%
	MH111A	MH112A	1.07	36	39	1.98	72	4.280	0.001							0.000	1.07	1.98	0.003	0.004	90.0	200	0.50	0.023	0.74	17.55%
Ratcliffe Drive	MH113A	MH112A	0.66	36	24	0.66	24	4.369	0.0004							0.000	0.66	0.66	0.003	0.003	85.0	200	4.10	0.066	2.11	5.07%
	MH112A	MH105A	0.26	36	10	2.90	106	4.237	0.002							0.000	0.26	2.90	0.003	0.005	34.2	200	0.50	0.023	0.74	19.66%
Block 65	MH105A	MH104A	0.00	0	0	4.92	180	4.164	0.003							0.000	0.00	4.92	0.003	0.006	64.3	200	0.50	0.023	0.74	24.16%
	MH104A	MH27A	0.00	0	0	4.92	180	4.164	0.003							0.000	0.00	4.92	0.003	0.006	62.4	200	0.50	0.023	0.74	24.16%
Equestrian Way	MH27A	MH15A	0.00	143	0	13.49	1742	3.632	0.022							0.000	0.00	13.49	0.003	0.025	43.1	250	0.44	0.039	0.80	63.29%
Equestrian Way	MH15A	MH28A	0.00	0	0	17.57	2330	3.533	0.029							0.000	0.00	17.57	0.003	0.032	69.0	250	0.44	0.039	0.80	80.07%
	MH28A	MH29A	0.00	0	0	17.57	2330	3.533	0.029							0.000	0.00	17.57	0.003	0.032	73.6	250	0.44	0.039	0.80	80.07%
	MH29A	MH30A	0.89	143	128	18.46	2458	3.514	0.030							0.000	0.89	18.46	0.003	0.033	90.0	250	0.50	0.042	0.86	78.47%
	MH30A	MH31A	0.37	143	53	18.83	2511	3.507	0.031							0.000	0.37	18.83	0.003	0.034	52.6	250	0.50	0.042	0.86	79.85%
	MH31A	MH32A	0.51	143	73	19.34	2584	3.497	0.031							0.000	0.51	19.34	0.003	0.034	53.5	250	0.50	0.042	0.86	81.74%
	MH32A	MH33A	0.00	0	0	19.34	2584	3.497	0.031							0.000	0.00	19.34	0.003	0.034	75.6	250	0.50	0.042	0.86	81.74%
	MH33A	MH34A	0.00	0	0	19.34	2584	3.497	0.031							0.000	0.00	19.34	0.003	0.034	28.1	250	0.50	0.042	0.86	81.74%
	MH34A	MH35A	0.00	0	0	19.34	2584	3.497	0.031							0.000	0.00	19.34	0.003	0.034	31.9	250	0.55	0.044	0.90	77.94%
	MH35A	MH36A	0.00	0	0	19.34	2584	3.497	0.031							0.000	0.00	19.34	0.003	0.034	31.6	250	0.55	0.044	0.90	77.94%
	MH36A	MH37A	0.00	0	0	19.34	2584	3.497	0.031							0.000	0.00	19.34	0.003	0.034	53.5	250	0.60	0.046	0.94	74.62%
Block 246	PLUG	MH37A	2.64	312	824	2.64	824	3.853	0.011							0.000	2.64	2.64	0.003	0.014	14.9	200	0.60	0.025	0.81	55.20%
	MH37A	MH38A	0.00	0	0	21.98	3408	3.395	0.040							0.000	0.00	21.98	0.004	0.045	37.9	250	2.00	0.084	1.71	53.06%
Equestrian Way	PLUG	MH45A	0.00	392	0	0.00	0			2.82	2.82					0.004	2.82	2.82	0.003	0.007	12.5	200	0.60	0.025	0.81	28.46%
	MH45A	MH44A	0.00	0	0	0.00	0				2.82					0.004	0.00	2.82	0.003	0.007	90.0	200	1.25	0.037	1.17	19.72%
	MH44A	MH43A	0.00	0	0	0.00	0				2.82					0.004	0.00	2.82	0.003	0.007	90.0	200	2.00	0.046	1.48	15.59%
	MH43A	MH42A	0.00	0	0	0.00	0				2.82					0.004	0.00	2.82	0.003	0.007	73.3	200	3.25	0.059	1.88	12.23%
	MH42A	MH41A	0.00	0	0	0.00	0				2.82					0.004	0.00	2.82	0.003	0.007	66.5	200	4.40	0.069	2.19	10.51%

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STREET	FROM M.H.	TO M.H.	AREA (ha)	POP. DENSITY (p/ha)	POP.	CUMULATIVE AREA (ha)	POP.	PEAK FACT.	PEAK FLOW (m3/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (m3/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (m3/s)	TOTAL FLOW (m3/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (m3/s)	VEL. (FULL) (m/s)	
Multiple Res.	PLUG	MH41A	0.00	392	0	0.00	0			2.54	5.36					0.008	2.54	5.36	0.003	0.011	12.5	200	0.60	0.025	0.81	43.46%
Multiple Res.	PLUG	MH41A	4.13	392	1619	4.13	1619	3.655	0.021	0.00	5.36					0.008	4.13	9.49	0.003	0.032	12.5	200	0.60	0.025	0.81	124.34%
	MH41A	MH40A	0.00	0	0	4.13	1619	3.655	0.021		5.36					0.008	0.00	9.49	0.003	0.032	39.3	200	4.40	0.069	2.19	45.91%
Adult Lifestyle	PLUG	MH40A	19.38	392	7597	19.38	7597	3.072	0.081							0.000	19.38	19.38	0.003	0.084	12.5	300	1.00	0.097	1.37	86.91%
Equestrian Way	MH40A	MH39A	0.00	0	0	23.51	9216	2.990	0.096		5.36					0.008	0.00	28.87	0.006	0.109	49.4	300	3.00	0.167	2.37	65.37%
	MH39A	MH38A	0.00	0	0	23.51	9216	2.990	0.096		5.36					0.008	0.00	28.87	0.006	0.109	41.8	300	2.90	0.165	2.33	66.49%
Ridge Road	MH38A	MH70A	0.42	143	61	45.91	12685	2.851	0.126		5.36					0.008	0.42	51.27	0.010	0.144	62.0	300	3.00	0.167	2.37	85.98%
	MH70A	MH71A	0.00	0	0	45.91	12685	2.851	0.126		5.36					0.008	0.00	51.27	0.010	0.144	42.6	300	3.50	0.181	2.56	79.59%
Ridge Road	PLUG	MH71A	1.51	312	472	1.51	472	3.987	0.007		5.36					0.008	1.51	6.87	0.003	0.018	11.0	200	0.60	0.025	0.81	69.17%
	MH71A	MH72A	0.33	143	48	47.75	12733	2.850	0.126		5.36					0.008	0.33	53.11	0.011	0.145	42.8	300	4.00	0.193	2.73	74.84%
	MH72A	MH73A	0.19	143	28	47.94	12761	2.849	0.126		5.36					0.008	0.19	53.30	0.011	0.145	17.6	300	4.00	0.193	2.73	74.98%
	MH73A	MH74A	0.18	143	26	48.12	12787	2.848	0.126		5.36					0.008	0.18	53.48	0.011	0.145	17.6	300	4.00	0.193	2.73	75.12%
	MH74A	MH62A	0.58	143	83	48.70	12870	2.845	0.127		5.36					0.008	0.58	54.06	0.011	0.146	87.2	300	4.00	0.193	2.74	75.49%
Ridge Road	MH30A	MH48A	0.45	143	65	0.45	65	4.290	0.001							0.000	0.45	0.45	0.003	0.004	90.0	200	2.80	0.055	1.75	7.23%
	MH48A	MH49A	0.50	143	72	0.95	137	4.204	0.002							0.000	0.50	0.95	0.003	0.005	54.7	200	2.80	0.055	1.75	9.11%
	MH49A	MH50A	0.10	143	15	1.05	152	4.189	0.002							0.000	0.10	1.05	0.003	0.005	18.0	200	2.80	0.055	1.75	9.49%
	MH50A	MH51A	0.38	143	55	1.43	207	4.143	0.003							0.000	0.38	1.43	0.003	0.006	37.2	200	2.80	0.055	1.75	10.89%
	MH51A	MH52A	0.42	143	61	1.85	268	4.099	0.004							0.000	0.42	1.85	0.003	0.007	45.0	200	2.80	0.055	1.75	12.42%
	MH52A	MH53A	0.45	143	65	2.30	333	4.059	0.005							0.000	0.45	2.30	0.003	0.008	45.2	200	2.80	0.055	1.75	14.02%
	MH53A	MH54A	0.38	143	55	2.68	388	4.028	0.005							0.000	0.38	2.68	0.003	0.008	46.9	200	2.50	0.052	1.65	16.25%
	MH54A	MH55A	0.42	143	61	3.10	449	3.998	0.006							0.000	0.42	3.10	0.003	0.009	68.2	200	2.60	0.053	1.68	17.46%
	MH55A	MH56A	0.00	0	0	3.10	449	3.998	0.006							0.000	0.00	3.10	0.003	0.009	12.3	200	0.60	0.025	0.81	36.34%
	MH56A	MH57A	0.00	0	0	3.10	449	3.998	0.006							0.000	0.00	3.10	0.003	0.009	11.5	200	0.60	0.025	0.81	36.34%
	MH57A	MH58A	0.64	143	92	3.74	541	3.956	0.007							0.000	0.64	3.74	0.003	0.010	66.0	200	0.60	0.025	0.81	41.06%
Dressage Trail	MH63A	MH64A	0.26	143	38	0.26	38	4.337	0.001							0.000	0.26	0.26	0.003	0.004	31.6	200	4.25	0.068	2.15	5.28%
	MH64A	MH65A	0.10	143	15	0.36	53	4.310	0.001							0.000	0.10	0.36	0.003	0.004	18.0	200	4.25	0.068	2.15	5.61%
	MH65A	MH66A	0.11	143	16	0.47	69	4.284	0.001							0.000	0.11	0.47	0.003	0.004	18.0	200	4.25	0.068	2.15	5.95%
	MH66A	MH67A	0.40	143	58	0.87	127	4.214	0.002							0.000	0.40	0.87	0.003	0.005	56.6	200	4.25	0.068	2.15	7.18%
	MH67A	MH68A	0.43	143	62	1.30	189	4.157	0.003							0.000	0.43	1.30	0.003	0.006	57.5	200	4.25	0.068	2.15	8.47%
	MH68A	MH69A	0.79	143	113	2.09	302	4.077	0.004							0.000	0.79	2.09	0.003	0.007	89.3	200	3.75	0.064	2.02	11.45%
	MH69A	MH58A	0.00	0	0	2.09	302	4.077	0.004							0.000	0.00	2.09	0.003	0.007	44.0	200	0.60	0.025	0.81	28.64%

SANITARY SEWER DESIGN CALCULATIONS

PROJECT: Hunt Club
 PROJECT No: 2012-0040-32
 DATE: Dec. 16, 2020
 DESIGNED: DS
 CHECKED: RK



CITY OF CAMBRIDGE

DESIGN PARAMETERS

AVERAGE DAILY FLOW PER PERSON =	300 l/p/day	RESIDENTIAL:	0.000003 cums/Ha
MINIMUM VELOCITY = n =	0.600 m/s	COMMERCIAL:	0.00150 cums/Ha
MAX PEAK FAC.=	4.500	INDUSTRIAL:	0.00125 cums/Ha
MIN PEAK FAC.=	2.000	INSTITUTIONAL:	0.0003851 cums/Ha
		INFILTRATION:	0.00020 cums/Ha
		RESIDENTIAL HARMON PEAKING FACTOR	

LOCATION		RESIDENTIAL AREA AND POPULATION								COMMERCIAL		INDUSTRIAL		INSTITUTIONAL		C+I+	INFILTRATION				PIPE					% FULL
STREET	FROM M.H.	TO M.H.	AREA (ha)	POP. DENSITY (p/ha)	POP.	CUMULATIVE AREA (ha)	POP.	PEAK FACT.	PEAK FLOW (m3/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (m3/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (m3/s)	TOTAL FLOW (m3/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (m3/s)	VEL. (FULL) (m/s)	
Ridge Road	MH58A	MH59A	0.70	143	101	6.53	944	3.816	0.013							0.000	0.70	6.53	0.003	0.016	80.5	200	0.60	0.025	0.81	61.04%
	MH59A	MH60A	0.00	0	0	6.53	944	3.816	0.013							0.000	0.00	6.53	0.003	0.016	73.5	200	0.60	0.025	0.81	61.04%
School	PLUG	MH60A	0.55	143	79	0.55	79	4.270	0.001					2.84	2.84	0.001	3.39	3.39	0.003	0.005	55.0	200	0.60	0.025	0.81	20.72%
Block 259	PLUG	MH60A	2.78	143 & 312	756	2.78	756	3.875	0.010							0.000	2.78	2.78	0.003	0.013	11.0	200	0.60	0.025	0.81	51.85%
	MH60A	MH61A	0.00	0	0	9.86	1779	3.625	0.022					2.84	2.84	0.001	0.00	12.70	0.003	0.026	93.0	250	0.50	0.042	0.86	62.98%
	MH61A	MH62A	0.36	143	52	10.22	1831	3.615	0.023					2.84	2.84	0.001	0.36	13.06	0.003	0.027	80.0	250	0.50	0.042	0.86	64.40%
Wannamaker Crescent	MH75A	MH76A	0.34	143	49	0.34	49	4.316	0.001							0.000	0.34	0.34	0.003	0.004	36.0	200	1.00	0.033	1.04	11.39%
	MH76A	MH77A	0.60	143	86	0.94	135	4.206	0.002							0.000	0.60	0.94	0.003	0.005	66.5	200	0.60	0.025	0.81	19.57%
	MH77A	MH78A	0.20	143	29	1.14	164	4.178	0.002							0.000	0.20	1.14	0.003	0.005	8.5	200	0.60	0.025	0.81	21.17%
	MH78A	MH79A	0.09	143	13	1.23	177	4.167	0.003							0.000	0.09	1.23	0.003	0.006	12.4	200	0.60	0.025	0.81	21.89%
	MH79A	MH80A	0.37	143	53	1.60	230	4.125	0.003							0.000	0.37	1.60	0.003	0.006	52.1	200	0.60	0.025	0.81	24.78%
	MH80A	MH81A	0.09	143	13	1.69	243	4.116	0.003							0.000	0.09	1.69	0.003	0.006	11.7	200	2.65	0.053	1.70	12.12%
Wannamaker Crescent	MH62A	MH82A	0.73	143	105	59.65	14806	2.784	0.143		5.36					2.84	0.73	67.85	0.014	0.166	89.8	450	0.50	0.202	1.27	82.25%
	MH82A	MH81A	0.32	143	46	59.97	14852	2.783	0.143		5.36					2.84	0.32	68.17	0.014	0.166	24.6	450	0.50	0.202	1.27	82.47%
SAN Easement	MH81A	MH95A	0.00	0	0	61.66	15095	2.775	0.145		5.36					2.84	0.00	69.86	0.014	0.169	90.0	450	0.50	0.202	1.27	83.62%
	MH95A	MH94A	0.00	0	0	61.66	15095	2.775	0.145		5.36					2.84	0.00	69.86	0.014	0.169	56.5	450	0.50	0.202	1.27	83.62%
Mixed Use	PLUG	MH83A	0.00	0	0	0.00	0				2.25	7.61				0.011	2.25	7.61	0.003	0.014	11.0	200	0.60	0.025	0.81	56.74%
Ward Avenue	MH83A	MH84A	0.00	0	0	0.00	0				7.61					0.011	0.00	7.61	0.003	0.014	57.7	200	3.50	0.061	1.95	23.49%
	MH84A	MH85A	0.00	0	0	0.00	0				7.61					0.011	0.00	7.61	0.003	0.014	79.0	200	2.60	0.053	1.68	27.26%
	MH85A	MH86A	0.00	0	0	0.00	0				7.61					0.011	0.00	7.61	0.003	0.014	84.8	200	1.20	0.036	1.14	40.12%
Prop. Employment	PLUG	MH87A	0.00	0	0	0.00	0									0.004	3.08	3.08	0.003	0.007	12.5	200	0.60	0.025	0.81	26.96%
Shaver Avenue	MH87A	MH86A	0.00	0	0	0.00	0									0.004	0.00	3.08	0.003	0.007	90.0	200	1.00	0.033	1.04	20.89%
Shaver Avenue	MH86A	MH88A	0.00	0	0	0.00	0				7.61					0.015	0.00	10.69	0.003	0.018	90.0	200	1.50	0.040	1.28	45.47%
	MH88A	MH89A	0.00	0	0	0.00	0				7.61					0.015	0.00	10.69	0.003	0.018	90.0	200	1.95	0.046	1.46	39.88%
Prop. Employment	PLUG	MH89A	0.00	0	0	0.00	0									0.011	5.39	8.47	0.003	0.014	12.5	200	0.60	0.025	0.81	53.48%

SANITARY SEWER DESIGN CALCULATIONS

PROJECT: Hunt Club
 PROJECT No: 2012-0040-32
 DATE: Dec. 16, 2020
 DESIGNED: DS
 CHECKED: RK



CITY OF CAMBRIDGE

DESIGN PARAMETERS

AVERAGE DAILY FLOW PER PERSON =	300 l/p/day	RESIDENTIAL:	0.000003 cums/Ha
MINIMUM VELOCITY =	0.600 m/s	COMMERCIAL:	0.00150 cums/Ha
n =	0.013	INDUSTRIAL:	0.00125 cums/Ha
MAX PEAK FAC.=	4.500	INSTITUTIONAL:	0.0003851 cums/Ha
MIN PEAK FAC.=	2.000	INFILTRATION:	0.00020 cums/Ha
		RESIDENTIAL HARMON PEAKING FACTOR	

LOCATION		RESIDENTIAL AREA AND POPULATION								COMMERCIAL		INDUSTRIAL		INSTITUTIONAL		C+I+	INFILTRATION				PIPE					% FULL
STREET	FROM	TO	AREA (ha)	POP. DENSITY (p/ha)	POP.	CUMULATIVE		PEAK FACT.	PEAK FLOW (m3/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (m3/s)	TOTAL	ACCU.	INFILT.	TOTAL	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (m3/s)	VEL. (FULL) (m/s)	
	M.H.	M.H.				AREA	POP.										AREA	AREA	AREA	AREA						
Shaver Avenue SAN Easement	MH89A	MH90A	0.00	0	0	0.00	0			7.61		8.47			0.022	0.00	16.08	0.003	0.025	47.5	200	2.50	0.052	1.65	48.21%	
	MH90A	MH91A	0.00	0	0	0.00	0			7.61		8.47			0.022	0.00	16.08	0.003	0.025	100.0	200	2.00	0.046	1.48	53.90%	
	MH91A	MH92A	0.00	0	0	0.00	0			7.61		8.47			0.022	0.00	16.08	0.003	0.025	90.0	200	5.10	0.074	2.36	33.76%	
	MH92A	MH93A	0.00	0	0	0.00	0			7.61		8.47			0.022	0.00	16.08	0.003	0.025	75.8	200	6.45	0.083	2.65	30.02%	
	MH93A	MH94A	0.00	0	0	0.00	0			7.61		8.47			0.022	0.00	16.08	0.003	0.025	20.2	250	0.60	0.046	0.94	54.28%	
SAN Easement	MH94A	MH96A	0.00	0	0	61.66	15095	2.775	0.145	12.97		8.47		2.84	0.031	0.00	85.94	0.017	0.194	13.7	450	0.50	0.202	1.27	96.13%	
	MH96A	MH97A	0.00	0	0	61.66	15095	2.775	0.145	12.97		8.47		2.84	0.031	0.00	85.94	0.017	0.194	38.7	450	0.50	0.202	1.27	96.13%	
	MH97A	MH98A	0.00	0	0	61.66	15095	2.775	0.145	12.97		8.47		2.84	0.031	0.00	85.94	0.017	0.194	76.4	450	0.50	0.202	1.27	96.13%	
	MH98A	MH99A	0.00	0	0	61.66	15095	2.775	0.145	12.97		8.47		2.84	0.031	0.00	85.94	0.017	0.194	120.0	525	0.50	0.304	1.40	63.73%	
	MH99A	MH100A	0.00	0	0	61.66	15095	2.775	0.145	12.97		8.47		2.84	0.031	0.00	85.94	0.017	0.194	72.4	525	0.50	0.304	1.40	63.73%	
	MH100A	MH101A	0.00	0	0	61.66	15095	2.775	0.145	12.97		8.47		2.84	0.031	0.00	85.94	0.017	0.194	82.5	525	0.50	0.304	1.40	63.73%	
	MH101A	MH102A	0.00	0	0	61.66	15095	2.775	0.145	12.97		8.47		2.84	0.031	0.00	85.94	0.017	0.194	120.0	525	0.50	0.304	1.40	63.73%	
	MH102A	MH103A	0.00	0	0	61.66	15095	2.775	0.145	12.97		8.47		2.84	0.031	0.00	85.94	0.017	0.194	120.0	525	0.50	0.304	1.40	63.73%	
	MH103A	PUMP STN	0.00	0	0	61.66	15095	2.775	0.145	12.97		8.47		2.84	0.031	0.00	85.94	0.017	0.194	5.7	750	1.00	1.113	2.52	17.41%	