MTE Consultants
520 Bingemans Centre Drive, Kitchener, Ontario N2B 3X9

December 6, 2024

MTE File No.: C54723-100

Chantalle Pellizzari
Planning Coordinator
Township of Centre Wellington
1 Macdonald Square
Elora, Ontario N0B 1S0

Dear Chantalle:

RE: Block 40, Youngblood Subdivision
Functional Servicing and Stormwater Management Brief
Elora, Ontario

BACKGROUND AND EXISTING CONDITIONS

MTE Consultants Inc. was retained by Granite Homes South River Inc. to prepare Site Grading and Servicing Plans along with this Functional Servicing and Stormwater Management (FS-SWM) Brief for the proposed residential development to be constructed on Block 40 (formerly Block 7) of the Youngblood Subdivision (herein referred to as "the Site") located in Elora, Township of Centre Wellington, in support of the Site Plan Approval Application.

Block 40 was created as a multi-residential block as part of the Youngblood Subdivision design. The Site is approximately 2.42ha and is bound to the north by Harrison Street and to the east, south and west by residential lots. For the exact location refer to the key plan located on the separately appended engineering drawings.

The proposed development for the Site is the construction of four 4-storey apartment buildings, with a combined unit count of 181 units, complete with surface parking, drive aisles, landscape, and amenity areas. The proposed development also includes one driveway entrance off Harrison Street centered along the Site frontage.

Block 40 was included in the stormwater management (SWM) design put forth for the Haylock and Youngblood Subdivision. The approved subdivision SWM design is detailed in MTE Consultants Inc. SWM Report titled "Haylock & Youngblood Residential Subdivision – Final Stormwater Management Report", last updated February 21, 2020. This brief reviews the block level stormwater management approach, identifies the stormwater management criteria for the block and demonstrates how the design for this block adheres to the Plan of Subdivision SWM Criteria as established in the approved subdivision SWM Report.

PROPOSED GRADING AND SERVICING

Grading and servicing strategies for the proposed development have been developed based on the topographic survey completed by MTE, as-recorded plan and profile information obtained from Meritech Engineering, and the Site Plan prepared by ABA Architects Inc. Refer to MTE Drawings C2.1, C2.2, C2.3 and C2.4 for the detailed grading and servicing designs for the Site.

Grading & Drainage

The proposed grading design respects the proposed subdivision design grades along all property lines. Regrading will involve raising the north half of the Site and lowering the south half of the Site to create “table lands” for the proposed surface parking. Risers are proposed up to Buildings “B” and “C” from Harrison Street while embankments and retaining walls are proposed along the south property line to facilitate the regrading. The grading strategy has been developed to direct runoff to the private storm sewer system which will collect runoff from the building rooftops, drive aisles, parking areas, amenity areas and landscape areas while ensuring the overland flow route will be towards the municipal right-of-way. Runoff from the frontage of the property, including portions of the dedicated amenity and landscape areas, will flow towards the Harrison Street right-of-way.

Water

There is an existing 200mm diameter municipal watermain along Harrison Street. The closest municipal fire hydrant is located on the west side of the proposed driveway entrance. The Site is currently serviced by a 200mm diameter water service stubbed at property line at the northwest corner of the Site which was installed as part of the Youngblood Subdivision design. The existing 200mm diameter water service stub will be extended internally to service the proposed development. The water service will run between Buildings A & B and through the parking lot where it will branch out to service each building.

Two private on-site hydrants will be required to service the proposed buildings since the existing municipal hydrants are not within the required 45m of the proposed fire department connections. The proposed private hydrants have been located within landscape islands in the parking lot adjacent to Buildings A & B and Buildings C & D, respectively, and are within 45m of each buildings fire department connection in accordance with the Ontario Building Code (OBC).

Sanitary

There is an existing 200mm diameter municipal sanitary sewer along Harrison Street draining towards the northwest. The Site is currently serviced by a 200mm sanitary service stubbed at property line complete with a manhole at the northwest corner of the Site which was installed as part of the Youngblood Subdivision design. The Site will be serviced by a 200mm diameter sanitary sewer running east to west through the Site, with services to each building, connecting to the existing property line manhole and ultimately to the existing 200mm sanitary service as shown on MTE Drawings C2.3 and C2.4.

A sanitary flow rate analysis was prepared to determine the flows anticipated to be generated by the proposed development based on 181 units, assuming 1.77 people per apartment unit per the Region of Waterloo Water and Wastewater Monitoring Report 2023, and a site area of 2.42ha. The anticipated peak sanitary flow rate from the Site was calculated to be 5.88L/s (including infiltration and peaking factor) using the Township of Centre Wellington Development Manual (June 2024) sanitary guidelines. The full flow capacity of the existing 200mm diameter sanitary service stub at 1.8% is 43.98L/s, which is greater than the anticipated peak flow. Therefore, the existing sanitary service stub has sufficient capacity to convey the peak sanitary flow rate from the Site. Refer to Appendix A for the sanitary sewer design sheet and the sanitary drainage plan for more information.

Storm

There is an existing 450mm diameter municipal storm sewer along Harrison Street draining towards the northwest which upsizes to a 675mm diameter municipal storm sewer across the Site frontage. The Site is currently serviced by a 600mm storm service stubbed at the property line at the northwest corner of the Site which was installed as part of the Youngblood Subdivision design. The full flow capacity of the existing 600mm diameter storm service stub at 0.57% is 463.57L/s, which is sufficient to convey the 5-year storm event flows from the Site (408.70L/s). A private storm sewer system will be installed on-site to collect runoff from the building rooftops, drive aisles, parking areas, amenity areas and landscape areas. The storm sewer system will run east to west through the Site, connecting to the existing 600mm storm service stub at the property line, discharging to the municipal storm sewer in the Harrison Street right-of-way. Since the Site is located within a Wellhead Protection Area, WHPA C, and an Issue Contributing Area (ICA) for Chloride as indicated by Wellington Source Water Protection, runoff generated from the building rooftops are proposed to be directed into the private storm sewer system in accordance with the Township's Risk Management Plan Requirements (Winter Maintenance). This will help minimize runoff across pedestrian walkways and other hard surfaces reducing the potential for ice formation and subsequently help reduce salt use on-site.

Refer to MTE Drawings C2.3 and C2.4 for more information on the layout, pipe sizes and inverts of the proposed storm sewer system. Refer to Appendix B for the Site's storm sewer design sheet and the storm drainage area plan for more information.

STORMWATER MANAGEMENT

As stated above, and detailed in the February 2020 MTE SWM Report, the Block was included in the stormwater management design for the subdivision. The subdivision SWM Facility provides water quantity control, while end-of-pipe oil and grit separator (OGS) units provide water quality control, for the contributing drainage areas which include the Site.

The subdivision SWM design utilized a 75% imperviousness for the Site, refer to Appendix C for illustration of the impervious parameters used for the Youngblood Subdivision. The proposed development encompasses an area of 2.418ha with an overall imperviousness of 67.6% based on the Site Plan by ABA Architects, refer to Figure 3.0 in Appendix B for illustration on how the Site's percent imperiousness was calculated. Since the proposed imperviousness is less than the allowable percent imperviousness utilized in the subdivision SWM design; therefore, no additional on-site water quantity or quality controls are required. The overland flow route for the Site was designed to be directed towards the Harrison Street right-of-way.

Despite the subdivision SWM design utilizing a 75% imperviousness for the Site, the subdivision storm drainage area plan (46090-114, ST1.1) only utilized a runoff coefficient of 0.60 (57% imperviousness). Due to this discrepancy, the subdivision storm sewer design sheets were updated to reflect the Site's proposed imperviousness (67.6%) and it was determined that there are no downstream capacity constraints from the Site to the SWM Facility. Therefore, no additional on-site water quantity controls are required. Refer to Appendix C for the Youngblood and Haylock subdivisions storm drainage area plans and excerpts of the subdivisions' updated storm sewer design sheets.

The subdivision SWM report indicates that as part of the block level stormwater management approach for the subdivision, the Site is required to provide 450mm amended topsoil within pervious areas to collect and promote infiltration of roof runoff. The amended topsoil has been incorporated into the landscape design. This will help maintain or enhance recharge rates across

the development area and is consistent with the overall water balance analysis carried out for the subdivision. Thus, no further water balance analysis is required for the Site.

EROSION AND SEDIMENTATION CONTROL

In order to minimize the effects of erosion during the grading of the Site, sediment control fencing will be installed, as shown on the separately appended engineering drawings, and around any stockpiles. Any sediment that is tracked onto the roadway during the course of construction will be cleaned by the contractor. To help minimize the amount of mud being tracked onto the roadway, a mud mat will be installed at the primary construction entrance.

CONCLUSIONS

Based on the information provided, and foregoing analyses, it is concluded that:

i) The grading design respects and matches into the subdivision design grades along all property lines.

ii) Existing water, sanitary and storm service stubs at property line are available to service the Site from Harrison Street.

iii) Two private on-site hydrants will be provided to ensure the proposed building fire department connections are within 45m of a hydrant in accordance with the OBC.

iv) The Site is less than 75% impervious, which was used in the subdivision SWMF design, based on the Site Plan: as such, no additional on-site water quantity or quality controls are required.

v) The Site is greater than 57% impervious, which was used in the subdivision storm sewer design, based on the Site Plan but the municipal storm sewers have sufficient capacity to accommodate the increased runoff: as such, no additional on-site water quantity controls are required.

i) Amended topsoil is required to be placed within pervious areas to collect and promote infiltration of roof runoff per the approved subdivision SWM report and adheres to the overall water balance analysis carried out for subdivision.

ii) Site servicing design is in accordance with the Risk Management Plan Requirements in terms of winter maintenance.

iii) Upon completion of construction, the Site will conform to the design criteria specified by the Township of Centre Wellington.

RECOMMENDATIONS

It is recommended that:

i) The Site grading be undertaken according to the proposed elevations, details and erosion control measures shown on the separately appended engineering drawings.

ii) The Site servicing be installed as detailed on the separately appended engineering drawings.

iii) The proposed civil works be inspected by MTE Consultants Inc., during construction, and certified to the Township of Centre Wellington upon completion.

We trust that this information is satisfactory. Please contact the undersigned if you have any questions.

Yours truly,

MTE Consultants Inc.

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Designer
519-743-6500 ext. 1362
jnguyen@mte85.com

Tyler Arndt, P.Eng.
Design Engineer
519-743-6500 ext. 1386
tarndt@mte85.com

JHN:dlb

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Appendix A

Sanitary Sewer Design Sheet & Figure

Youngblood - Block 40
Township of Centre Wellington

SANITARY SEWER DESIGN SHEET

ENGINEERING AND PUBLIC WORKS

Project Number: 54723-100
Date: December 6, 2024
Design By: JHN
Checked By: TMA
File: Q:\54723\100\SAN\BLock 40 - Sanitary Sewer Design Sheet.xls

Drainage Area Plan No: Figure 1.0

Design Parameters

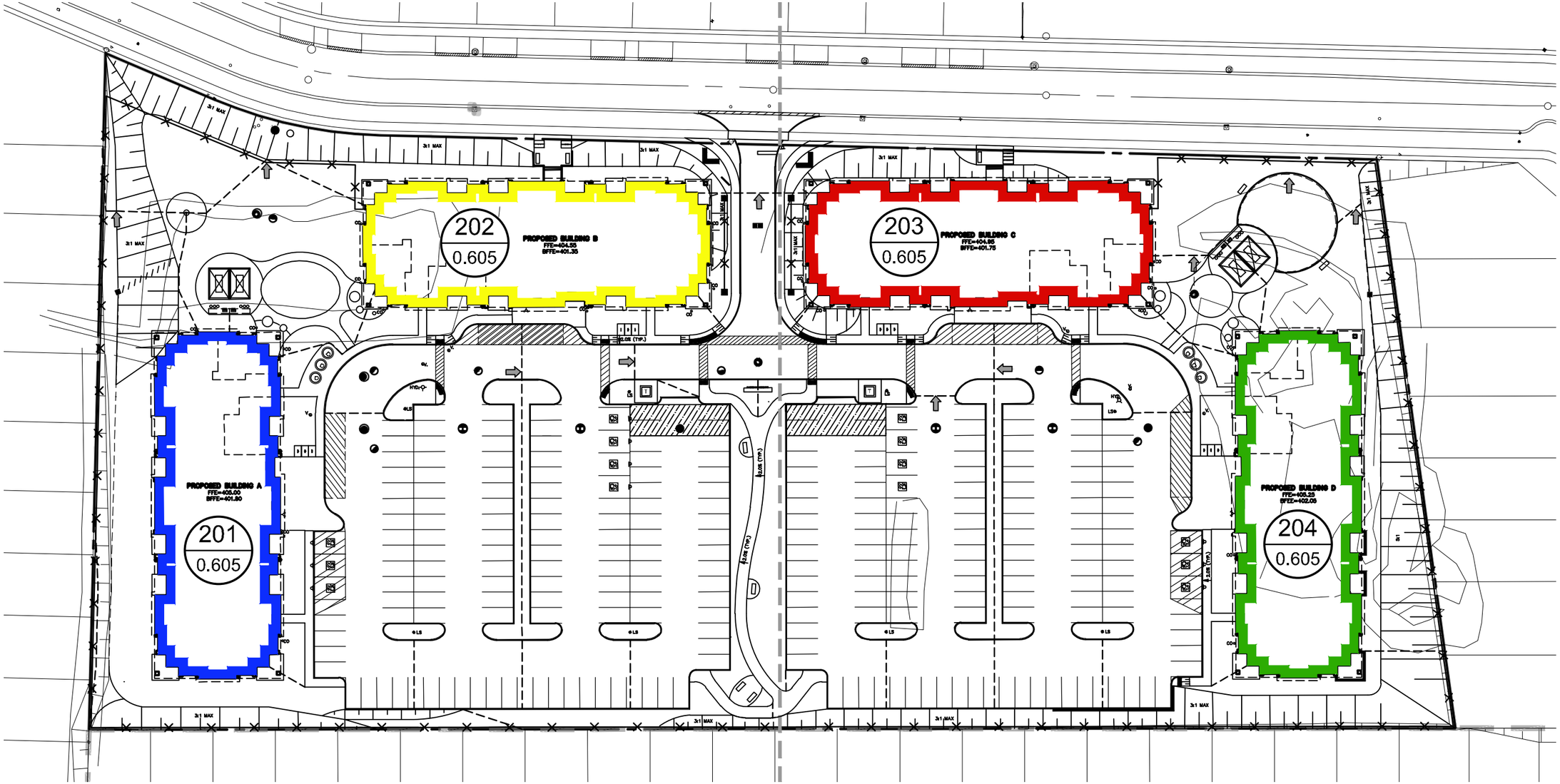
Average Daily Flow
Residential 0.00405 L/s/c [1]

Mannings "*n*" 0.013
Min. Velocity 0.6 m/sec
Max. Velocity 3.0 m/sec
Residential Harmon Peaking Factor (F) $F = 1 + 14/(4 + P^{0.5})$
Commercial Peaking Factor = 2.5
Residential Areas Infiltration 0.25 L/s/ha

LOCATION				RESIDENTIAL AREAS AND POPULATION						SCHOOL, INSTITUTIONAL			COMMERCIAL			INDUSTRIAL				INFILTRATION			DESIGN					
										HECTARES AND FLOW OF EACH ZONING																	
										0.00 *L/s/ha*			0.00 *L/s/ha*			0.00 *L/s/ha*											
NOTES	AREA NO.	MANHOLE LOCATION FROM MH	MANHOLE LOCATION TO MH	AREA	No. UNITS @ 1.77 PPU	No. UNITS @ PPU	POPUL.	CUMUL POPUL.	PEAK FACTOR "F"	PEAK RES. FLOW	AREA	CUMUL AREA	PEAK FLOW	AREA	CUMUL AREA	PEAK FLOW	AREA	CUMUL AREA	PEAK FLOW	TOTALS-C-I FLOW	AREA	CUMUL AREA	INFIL FLOW	TOTAL VOLUME FLOW	LENGTH	SLOPE	PIPE SIZE	CAPACITY	FULL FLOW VELOCITY
				ha	*(apartment)*		*1000s*	*1000s*		*L/sec*	*ha*	*ha*	*L/sec*	*ha*	*ha*	*L/sec*	*ha*	*ha*	*L/sec*	*L/sec*	*ha*	*ha*	*L/sec*	*L/sec*	*m*	%	*mm*	*L/sec.*	*m/s*
	204	Bldg D	7A	0.605	45.00		0.080	0.080	4.26933	1.3775											0.605	0.605	0.1513	1.5288	17.8	2.00	200	46.3604	1.476
		7A	6A					0.080	4.26933	1.3775												0.605	0.1513	1.5288	21.4	0.80	200	29.3209	0.934
	203	Bldg C	6A	0.605	45.00		0.080	0.080	4.26933	1.3775											0.605	0.605	0.1513	1.5288	23.5	2.00	200	46.3604	1.476
		6A	5A					0.159	4.182452	2.6990												1.210	0.3025	3.0015	56.0	0.80	200	29.3209	0.934
		5A	4A					0.159	4.182452	2.6990												1.210	0.3025	3.0015	42.8	0.80	200	29.3209	0.934
	202	Bldg B	AA	0.605	45.00		0.080	0.080	4.26933	1.3775											0.605	0.605	0.1513	1.5288	11.7	6.00	200	80.2986	2.557
		4A	2A					0.239	4.118856	3.9869												1.815	0.4538	4.4407	18.4	0.80	200	29.3209	0.934
	201	Bldg A	3A	0.605	46.00		0.081	0.081	4.266951	1.4074											0.605	0.605	0.1513	1.5586	18.4	7.00	200	86.7324	2.762
		3A	2A					0.081	4.266951	1.4074												0.605	0.1513	1.5586	13.7	0.80	200	29.3209	0.934
		2A	1A					0.320	4.066133	5.2770												2.420	0.6050	5.8820	32.2	0.80	200	29.3209	0.934
		1A	Ex. MH					0.320	4.066133	5.2770												2.420	0.6050	5.8820	15.3	0.80	200	29.3209	0.934
		Ex. MH	ROW MH					0.320	4.066133	5.2770												2.420	0.6050	5.8820	10.0 [2]	1.80 [2]	200	43.9814	1.401

Note 1: Residential Flow Rate taken from the Township of Centre Wellington Development Manual June 2024
Note 2: Existing pipe and slope calculated from inverts taken from topographical survey by MTE.

CAD: P:\54723\100\54723-100-F2.DWG



LEGEND

- CATCHMENT 201
- CATCHMENT 202
- CATCHMENT 203
- CATCHMENT 204

201 / 0.604 — SUB-CATCHMENT NUMBER; AREA (ha.)

0 7.5 15 22.5 30m

MTE
Engineers, Scientists, Surveyors

PROJECT
YOUNGBLOOD SUBDIVISION BLOCK 40 CIVIL WORKS

TITLE
POST-DEVELOPMENT SANITARY DRAINAGE AREA PLAN

Drawn: BDW	Scale: 1:750	Figure: **1.0**
Checked: JHN	Project No.: 54723-100	
Date: 2024-06-03	Rev No.: 0	

Plot Date: October 18, 2024 - 9:06 AM

Appendix B

Storm Sewer Design Sheet & Figures

Block 40 - Youngblood

Township of Centre Wellington

STORM SEWER DESIGN SHEET

ENGINEERING AND PUBLIC WORKS

Project Number: 54723-100
Date: November 15, 2024
Design By: JHN
Checked By: TMA
File: Q:\54723\100\54723-100 Storm Sewer Design Sheet Cambridge(SSMS)_Rev6.xlsx

Drainage Area Plan No: Figure 2.0

Design Parameters

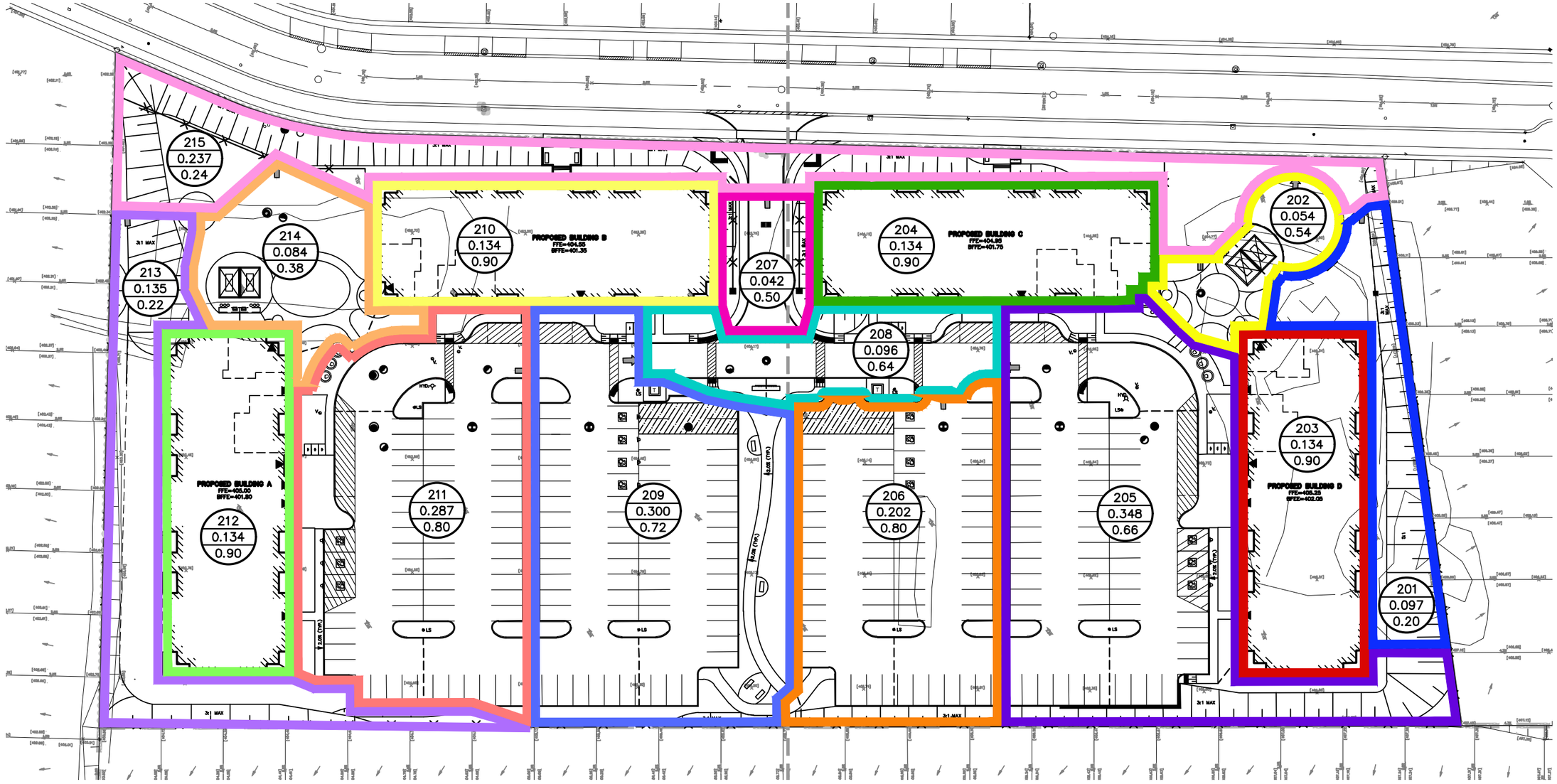
5 YEAR STORM

Q=kAIC, k=0.00278
Intensity (I) = $a/(tc+b)^c$
a = 1593.00
b = 11.000
c = 0.879

Manning's "n" 0.013
Min. Velocity 0.800 m/s
Max. Velocity 6.000 m/s

LOCATION				STORMWATER FLOW								DESIGN					
STREET	AREA NUMBER	MANHOLE LOCATION FROM MH	MANHOLE LOCATION TO MH	AREA (A)	RUNOFF COEFF. (C)	A x C	CUMUL. A x C	CONCENTRATION TIME TOTAL	CONCENTRATION TIME IN PIPE	RAIN INTENSITY (I)	FLOW (Q)	PIPE SIZE	LENGTH	SLOPE	CAPACITY	FULL FLOW VELOCITY	PIPE FULL
				ha		*ha*	*ha*	*min*	*min*	*mm/hr*	*L/sec*	*mm*	*m*	*%*	*L/sec*	*m/s*	*%*
	201	CB15	CBMH14	0.097	0.20	0.0194	0.0194	10.0000	0.8519	109.6440	5.9133	250	30.9	0.50	42.04989	0.8566	14.06
	202	CBMH14	CBMH12	0.054	0.54	0.0292	0.0486	10.8519	0.7480	105.8776	14.2931	300	34.3	0.50	68.37776	0.9673	20.90
	203	Rooftop D	MH13	0.134	0.90	0.1206	0.1206	10.0000	0.1647	109.6440	36.7601	250	17.5	2.40	92.12670	1.8768	39.90
		MH13	DCBMH12				0.1206	10.1647	0.1478	108.8936	36.5085	300	16.8	3.00	167.49063	2.3695	21.80
	204	Rooftop C	DCBMH12	0.134	0.90	0.1206	0.1206	10.0000	0.2038	109.6440	36.7601	250	23.5	3.00	103.00078	2.0983	35.69
	205	DCBMH12	DCBMH11	0.348	0.65	0.2262	0.5160	11.5999	0.1930	102.7912	147.4405	375	20.6	1.00	175.33014	1.5875	84.09
	206	DCBMH11	MH8	0.202	0.80	0.1616	0.6776	11.7929	0.3325	102.0257	192.1773	375	45.1	1.60	221.77704	2.0080	86.65
	207	DCB10	CBMH9	0.042	0.50	0.0210	0.0210	10.0000	0.5748	109.6440	6.4010	300	20.9	0.50	68.37776	0.9673	9.36
	208	CBMH9	MH8	0.096	0.64	0.0614	0.0824	10.5748	0.3043	107.0721	24.5391	300	16.2	0.50	68.37776	0.9673	35.89
		MH8	DCBMH7				0.7600	12.1255	0.1635	100.7349	212.8328	450	17.6	0.80	255.00668	1.6034	83.46
	209	DCBMH7	DCBMH6	0.300	0.72	0.2160	0.9760	12.2889	0.2011	100.1132	271.6350	525	20.7	0.60	333.12480	1.5389	81.54
	210	Rooftop B	DCBMH6	0.134	0.90	0.1206	0.1206	10.0000	0.1499	109.6440	36.7601	250	23.5	7.00	157.33629	3.2052	23.36
	211	DCBMH6	MH5	0.287	0.80	0.2296	1.3262	12.4901	0.1300	99.3593	366.3213	525	17.4	1.00	430.06227	1.9867	85.18
	212	Rooftop A	MH5	0.134	0.90	0.1206	0.1206	10.0000	0.1692	109.6440	36.7601	250	16.8	2.00	84.09979	1.7133	43.71
		MH5	MH4				1.4468	12.6201	0.0628	98.8783	397.6990	525	9.2	1.20	471.10961	2.1763	84.42
		MH4	CBMH2				1.4468	12.6829	0.2344	98.6477	396.7712	525	34.3	1.20	471.10961	2.1763	84.22
	213	CB3	CBMH2	0.135	0.22	0.0297	0.0297	10.0000	0.6983	109.6440	9.0529	300	28.1	0.50	68.37776	0.9673	13.24
	214	CBMH2	MH1	0.084	0.38	0.0319	1.5084	12.9173	0.0936	97.7975	410.1046	525	15.1	1.50	526.71656	2.4331	77.86
		MH1	Ex.MH				1.5084	13.0109	0.1342	97.4623	408.6993	600	14.9	0.57	463.56855	1.6395	88.16
Uncaptured Area	215			0.237													
Total Area				2.418													

CAD: P:\54723\100\54723-100-F1.DWG



LEGEND

- CATCHMENT 201
- CATCHMENT 202
- CATCHMENT 203
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- CATCHMENT 211
- CATCHMENT 212
- CATCHMENT 213
- CATCHMENT 214
- CATCHMENT 215

201
0.160
0.53

- SUB-CATCHMENT NUMBER
- AREA (Ha)
- RUNOFF COEFFICIENT

MTE
Engineers, Scientists, Surveyors

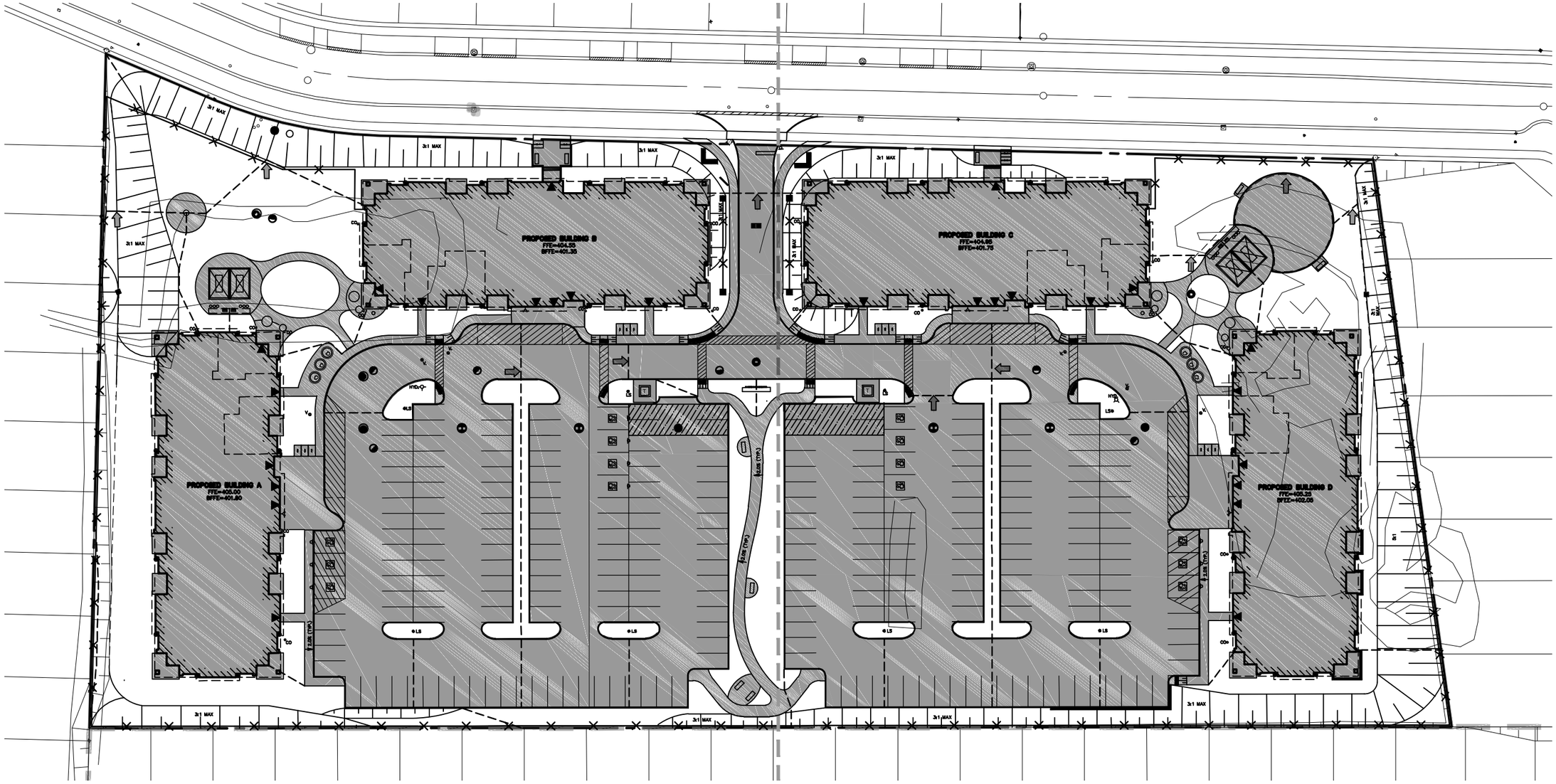
PROJECT
YOUNGBLOOD SUBDIVISION BLOCK 40 CIVIL WORKS

TITLE
POST-DEVELOPMENT STORM DRAINAGE AREA PLAN

Drawn: BDW	Scale: 1:750	Figure: **2.0**
Checked: JHN	Project No.: 54723-100	
Date: 2024-06-03	Rev No.: 0	

Plot Date: November 12, 2024 - 2:51 PM

CAD: P:\P\54723\100\54723-100-F2.DWG



LEGEND

CATCHMENT 201

IMPERVIOUS AREA

TOTAL SITE AREA=2.418ha.
TOTAL IMPERVIOUS AREA= 1.635ha.
TOTAL % IMPERVIOUS=67.6% (C=0.68)

0 7.5 15 22.5 30m

MTE
Engineers, Scientists, Surveyors

PROJECT
YOUNGBLOOD SUBDIVISION BLOCK 40 CIVIL WORKS

TITLE
POST-DEVELOPMENT IMPERVIOUS AREA

Drawn	Scale	Figure
MJR	1:750	**3.0**
Checked: JHN	Project No.: 54723-100	
Date: 2024-10-03	Rev No.: 0	

Plot Date: November 1, 2024 - 11:15 AM

Appendix C

Subdivision SWM Catchment Figures & Storm Sewer Design Sheets

HAYLOCK & YOUNGBLOOD
2019 MSB

SWM PARAMETERS AND IMPERVIOUSNESS

Ph	Plan	Block	Area	Zoning	% IMP	AC	
1	Youngblood	1	0.845	R	55	46.475	
1	Youngblood	2	0.32	R	55	17.6	
1	Youngblood	3	0.656	R	55	36.08	
1	Youngblood	4	0.488	R	55	26.84	
1	Youngblood	5	3.18	RC	30	95.4	
1	Youngblood	6	0.79	MR	75	59.25	
1	Youngblood	7	2.418	MR	75	181.35	(Block 40)
1	Youngblood	8	1.043	PARK	0	0	
1	Youngblood	9	0.111	PARK	0	0	
1	Youngblood	10	0.339	SWM	55	18.645	
1	Youngblood	11	0	OS			
2	Youngblood	1	1.924	R	45	86.58	
2	Youngblood	2	0.826	R	55	45.43	
2	Youngblood	3	0.015	Walkway	33	0.495	
2	Youngblood	4	0.034	Serv Corr	33	1.122	
2	Youngblood	5	0.143	Fut Dev	55	7.865	
2	Youngblood	6	0.209	Fut Dev	55	11.495	
2	Youngblood	Road	2.236	Road	70	156.52	
		(201)	12.40			695.747	56.12%
	Condo	(203)	3.18			95.4	30.0%
		(202)	18.50			1059.422	57.25%
	External	(100a)	3.10	ER5 Lands	0	0	0.0%
	Total Catchment (via Street One)		34.00	ha		1755.17	51.62%
	Condo	(205)	2.81	ha			30.0%

Youngblood Subdivision

Township of
Centre Wellington, Ontario

Project Number: 46090-114
Date: 8/9/2021 **Revised: November 15, 2024**
Design By: MXF **JHN**
Checked By: VAL
File: Q:\54723\100\STM\46090-114 Storm Sewer Design Sheet_Subdivision_JHN.xlsx

STORM SEWER DESIGN SHEET

ENGINEERING AND PUBLIC WORKS

Drainage Area Plan No: ST1.1

Design Parameters

5 YEAR STORM

Q=kAIR, k=0.00278
Intensity (I) = a/(tc+b)^c
a = 1593
b = 11
c = 0.8789

Manning's "n" 0.013
Min. Velocity 0.800 m/s
Max. Velocity 6.000 m/s

MTE

LOCATION				STORMWATER FLOW								DESIGN					
STREET	AREA NUMBER	MANHOLE LOCATION FROM MH	MANHOLE LOCATION TO MH	AREA (A)	RUNOFF COEFF. (C)	A x C	CUMUL. A x C	CONCENTRATION TIME TOTAL	CONCENTRATION TIME IN PIPE	RAIN INTENSITY (I)	FLOW (Q)	PIPE SIZE	LENGTH	SLOPE	CAPACITY	FULL FLOW VELOCITY	PIPE FULL
				ha		*ha*	*ha*	*min*	*min*	*mm/hr*	*L/s*	*mm*	*m*	*%*	*L/s*	*m/s*	*%*
Multi-Block 91 - Blk 40	19	Plug	MH22	2.418	0.68		1.5084 *	13.0109	0.1342	97.49332	408.69930	600	14.9	0.57	463.56855	1.6395	88.16
Street Two		MH22	SICBMH23	0.000	0.60	0.0000	3.2999	12.8852	0.2838	97.94408	898.51175	675	55.2	1.50	1029.50602	2.8769	87.28
	20	SICBMH23	SICBMH24	0.020	0.70	0.0140	3.3139	13.1690	0.1055	96.93268	893.00608	675	20.5	1.50	1029.50602	2.8769	86.74
	21	SICBMH24	MH25	0.360	0.45	0.1620	7.0145	50.3788	0.1491	42.72934	1068.21459	900	21.7	0.60	1402.26099	2.2042	76.18
		MH25	SICBMH26		0.45	0.0000	7.0145	50.5279	0.4638	42.63834	1066.44014	900	67.5	0.60	1402.26099	2.2042	76.05
		SICBMH26	*Ex.SICBMH48*		0.45	0.0000	7.0145	50.9917	0.2036	42.35783	1060.97010	900	29.6	0.60	1402.26099	2.2042	75.66

* Excluding uncaptured areas

PROPOSED SITE % IMPERVIOUSNESS

NO CONCERNS WITH DOWNSTREAM MUNICIPAL STM SEWERS DESPITE INCREASED % IMPERVIOUSNESS.

Youngblood Subdivision

Township of
Centre Wellington, Ontario

STORM SEWER DESIGN SHEET

ENGINEERING AND PUBLIC WORKS

Project Number:	46090-114		
Date:	8/9/2021	**Revised:**	**November 15, 2024**
Design By:	MXF		**JHN**
Checked By:	VAL		
File:	Q:\54723\100\STM\46090-114 Storm Sewer Design Sheet_Subdivision_JHN.xlsx		

Drainage Area Plan No: ST1.1

Design Parameters

5 YEAR STORM

Q=kAIR, k=0.00278
Intensity (I) = $a/(tc+b)^c$
a = 1593
b = 11
c = 0.8789

Manning's "n" 0.013
Min. Velocity 0.800 m/s
Max. Velocity 6.000 m/s

LOCATION				STORMWATER FLOW								DESIGN					
STREET	AREA NUMBER	MANHOLE LOCATION FROM MH	MANHOLE LOCATION TO MH	AREA (A)	RUNOFF COEFF. (C)	A x C	CUMUL. A x C	CONCENTRATION TIME TOTAL	CONCENTRATION TIME IN PIPE	RAIN INTENSITY (I)	FLOW (Q)	PIPE SIZE	LENGTH	SLOPE	CAPACITY	FULL FLOW VELOCITY	PIPE FULL
				ha		*ha*	*ha*	*min*	*min*	*mm/hr*	*L/s*	*mm*	*m*	*%*	*L/s*	*m/s*	*%*
Multi-Block 91 - Blk 40	19	Plug	MH22	2.418	0.68	1.6442	1.6442	13.0109	0.1342	97.49332	*408.69930	600	14.9	0.57	463.56855	1.6395	88.16
Street Two		MH22	SICBMH23	0.000	0.60	0.0000	3.4357	12.8852	0.2823	97.94408	935.49888	675	55.2	1.50	1029.50602	2.8769	90.87
	20	SICBMH23	SICBMH24	0.020	0.70	0.0140	3.4497	13.1675	0.1049	96.93798	929.66207	675	20.5	1.50	1029.50602	2.8769	90.30
	21	SICBMH24	MH25	0.360	0.45	0.1620	7.1503	50.3788	0.1486	42.72934	1084.35070	900	21.7	0.60	1402.26099	2.2042	77.33
		MH25	SICBMH26		0.45	0.0000	7.1503	50.5275	0.4625	42.63860	1082.54695	900	67.5	0.60	1402.26099	2.2042	77.20
		SICBMH26	*Ex.SICBMH48*		0.45	0.0000	7.1503	50.9900	0.2030	42.35887	1076.98644	900	29.6	0.60	1402.26099	2.2042	76.80

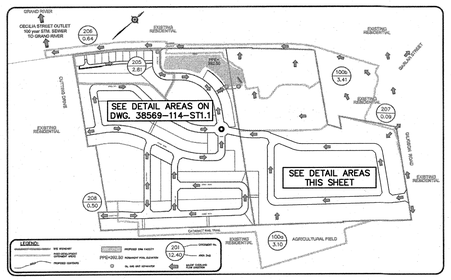
* Excluding uncaptured areas

MTE FILE PATH: P:\P\46090\114\46090-114-ST1

September 13, 2021 - 4:48:52 PM - Plotted By: Robert Chen

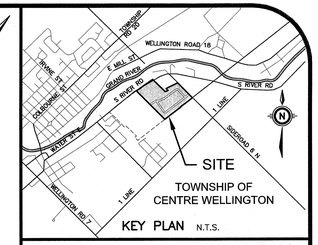
LEGEND

- SITE BOUNDARY
- EXISTING STORM SEWER (Ex. 375mmø STM. / Ex. MH)
- STORM SEWER (MH — 21.3m–300mmø STM @ 1.30%)
- DRAINAGE AREA
- OVERLAND FLOW DIRECTION
- PROPOSED STORM SEWER DESIGN PARAMETERS: 12 / 0.48 / 0.45 — AREA No. / AREA (ha) / RUNOFF COEFFICIENT
- EXTERNAL STORM SEWER DESIGN PARAMETERS: 100b / 3.41 / 0.26 — AREA No. / AREA (ha) / RUNOFF COEFFICIENT



STORM DRAINAGE INSERT
SCALE 1:7500

SOUTH RIVER ROAD
BLOCK 94
DRAINAGE AREA 204 FLOWS NORTH TO EXISTING DITCH ON SOUTH RIVER ROAD AND FLOWS WEST UNTIL IT IS CAPTURED BY EXISTING 100-YEAR STORM SEWER ON SOUTH RIVER ROAD (SEE DRAINAGE INSERT THIS SHEET).
EXISTING SWM BLOCK
BLOCK 95
BLOCK 96
BLOCK 93
HAYLOCK SUBDIVISION
YOUNGBLOOD SUBDIVISION
HARRISON STREET
HAYLOCK AVENUE
BLOCK 92
450mmø STM SERVICE & PLUG
STREET TWO
STREET ONE
GILKISON ROAD
BLOCK 97
BLOCK 98
BLOCK 99
BLOCK 100
BLOCK 101
MURRAY DRIVE
SITE
BLOCK 91
600mmø STM. SERVICE & PLUG
Allowable runoff coefficient for the site (57% IMP) based on the subdivision storm sewer design, refer to updated subdivision storm sewer design sheets which confirm the proposed site runoff coefficient of 0.68 (67.6% IMP) can be conveyed without any on-site controls.
DRAINAGE AREA 8 COMPRISES REAR YARDS OF THE HAYLOCK AND YOUNGBLOOD SUBDIVISIONS AND A PORTION OF PARK BLOCK 97. DRAINAGE IS CONVEYED BY EXISTING DITCHES ALONG THE TRESTLE BRIDGE TRAIL AND IS CAPTURED BY DDI9 WHERE IT COMBINES WITH EXTERNAL FLOWS FROM DRAINAGE AREA 100a (SEE DRAINAGE INSERT THIS SHEET).
REMOVE EX. CMP. REFER TO DWG L01.2 FOR DITCH RESTORATION DETAILS.
TRESTLE BRIDGE TRAIL
SPENCER DR



TOWNSHIP OF CENTRE WELLINGTON
KEY PLAN N.T.S.

GEODETIC BM ELEV. = 387.982m
POST OFFICE, BOLT IN FRONT WALL, IN LINTEL OF CENTER OF BASEMENT WINDOW (HISTORICAL No. 16U117E)

SITE BENCHMARK ELEV. = 389.815m
TOP NUT ON FIRE HYDRANT AT WEST CORNER OF HAYLOCK PROPERTY. LOCATED AT END OF CURB & GUTTER.

NOTE TO CONTRACTOR :

DO NOT SCALE DRAWINGS.

CONTRACTORS MUST CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

THE OWNER/ARCHITECT/CONTRACTOR IS ADVISED THAT M.T.E. CONSULTANTS INC. CANNOT CERTIFY ANY COMPONENT OF THE SITE WORKS NOT INSPECTED DURING CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO NOTIFY M.T.E. CONSULTANTS INC. PRIOR TO COMMENCEMENT OF CONSTRUCTION TO ARRANGE FOR INSPECTION.

No.	REVISION	BY	YYYY-MM-DD
8.			
7.			
6.			
5.			
4.			
3.	ISSUED FOR FINAL SUBMISSION	SKP	2021-09-13
2.	ISSUED FOR SECOND SUBMISSION	SKP	2021-03-15
1.	ISSUED FOR FIRST SUBMISSION	SKP	2020-03-18

TOWNSHIP of CENTRE WELLINGTON

MTE
Engineers, Scientists, Surveyors
519-743-6500

LICENSED PROFESSIONAL ENGINEER — Sept 14/21 — V. LAZIC 100025286 — PROVINCE OF ONTARIO

CLIENT
B. YOUNGBLOOD & 1238576 ONTARIO LIMITED
ELORA

PROJECT
YOUNGBLOOD SUBDIVISION
133 SOUTH RIVER ROAD ELORA

DRAWING
STORM DRAINAGE AREA PLAN

Project Manager	S.PETERSON	Project No.	46090-114
Design By	MXF	Checked By	VAL
Drawn By	SXP	Checked By	MXF
Surveyed By	MTE	Drawing No.	ST1.1
Date	Jan.20/20		
Scale	1:1000	Sheet	of

Haylock Subdivision

Township of
Centre Wellington, Ontario

STORM SEWER DESIGN SHEET

ENGINEERING AND PUBLIC WORKS

Project Number:	38569-114
Date:	February 20, 2020
Design By:	MXF **Revised: November 15, 2024**
Checked By:	VAL **JHN**
File:	Q:\54723\100\STM\38569-114 Storm Sewer Design Sheet_Subdivision JHN.xlsx

Drainage Area Plan No: ST1.1
Revised: August 9, 2021 (Updated Youngblood Flow)
Revised: June 10, 2022 (Updated Ph.2 slope on Davis/Murray)

Design Parameters

5 YEAR STORM

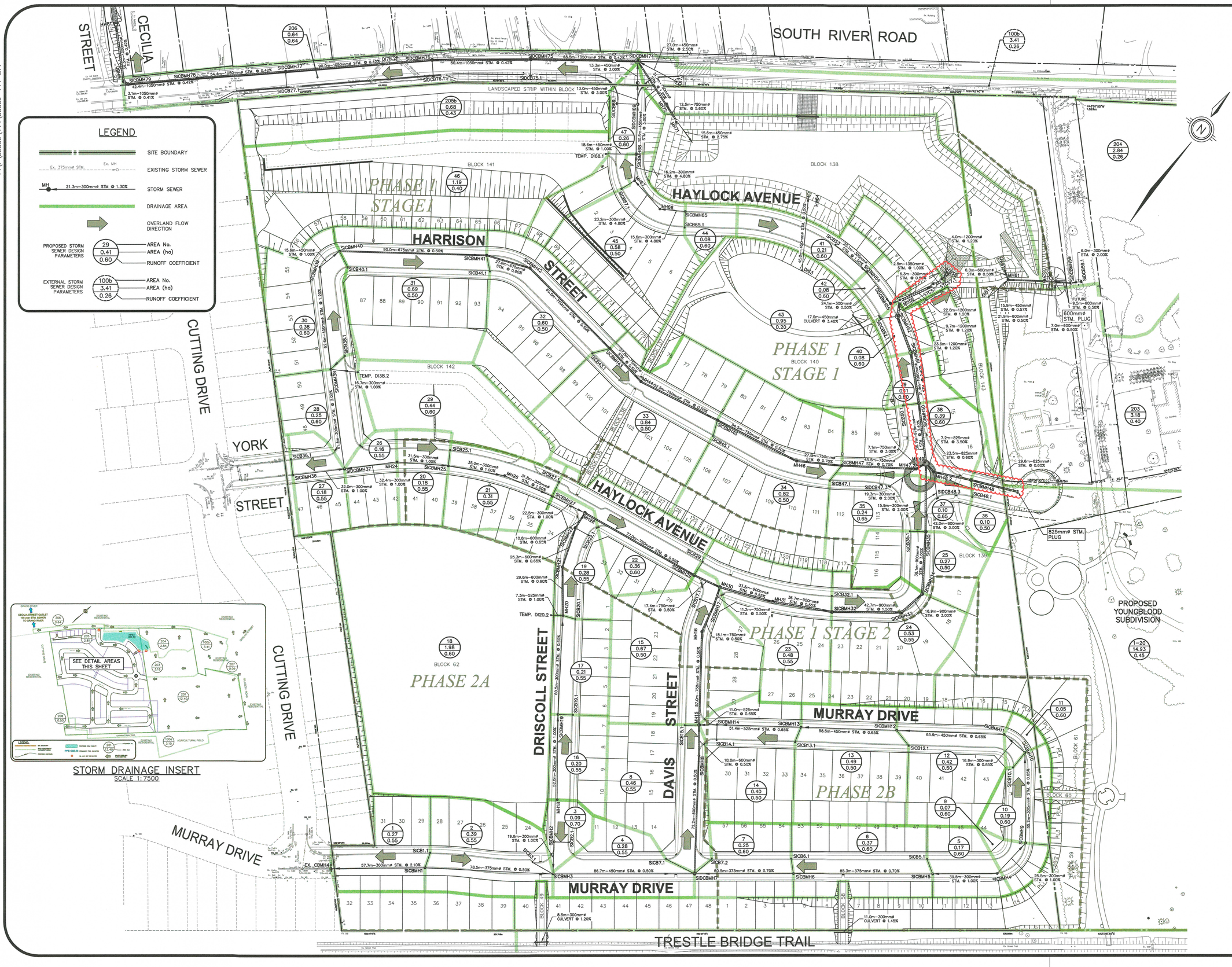
Q=kAIR, k=0.00278
Intensity (I) = a/(tc+b)^c
a = 1593
b = 11
c = 0.8789

Manning's "n" 0.013
Min. Velocity 0.800 m/s
Max. Velocity 6.000 m/s

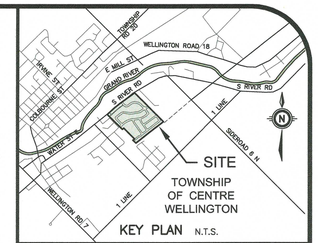
LOCATION				STORMWATER FLOW								DESIGN					
STREET	AREA NUMBER	MANHOLE LOCATION FROM MH	MANHOLE LOCATION TO MH	AREA (A)	RUNOFF COEFF. (C)	A x C	CUMUL. A x C	CONCENTRATION TIME TOTAL	CONCENTRATION TIME IN PIPE	RAIN INTENSITY (I)	FLOW (Q)	PIPE SIZE	LENGTH	SLOPE	CAPACITY	FULL FLOW VELOCITY	PIPE FULL
				ha		*ha*	*ha*	*min*	*min*	*mm/hr*	*L/s*	*mm*	*m*	*%*	*L/s*	*m/s*	*%*
Youngblood External							7.0145	50.9917	0.2036	42.35783	1076.97010		(See Youngblood Design Sheet)				
Harrison Street	36	Plug	SICBMH48	0.100	0.50	0.0500	7.0645	50.9917	0.2034	42.35784	1066.85799	900	29.6	0.60	1402.26099	2.2042	76.08
		SICBMH48	MH48.2	0.000	0.60	0.0000	7.0645	51.1951	0.1615	42.23608	1064.46671	900	23.5	0.60	1402.26099	2.2042	75.91
Traffic Circle	37	SIDCB48.3	MH48.2	0.100	0.65	0.0650	0.0650	10.0000	0.1925	109.67742	19.81871	300	15.9	2.00	136.75552	1.9347	14.49
		MH48.2	MH49	0.000	0.60	0.0000	7.1295	51.1951	0.0254	42.23608	1072.09877	900	7.2	3.50	3386.78205	5.3237	31.66
Haylock Avenue	38	MH49	SICBMH50	0.390	0.60	0.2340	14.9435	51.2205	0.1116	42.22091	1988.95969	975	36.7	3.40	4132.29802	5.5347	48.13
	39	SICBMH50	SICBMH51	0.110	0.60	0.0660	15.0095	51.3321	0.1087	42.15447	1993.93373	1050	31.4	2.40	4230.42130	4.8856	47.13
	40	SICBMH51	SICBMH52	0.080	0.60	0.0480	15.0575	51.4409	0.1060	42.08993	1996.85750	1200	23.6	1.20	4270.84504	3.7763	46.76
		SICBMH52	MH56	0.000	0.60	0.0000	15.0575	51.5468	0.0436	42.02726	1994.23400	1200	9.7	1.20	4270.84504	3.7763	46.69
Haylock Avenue	41	SICB53	SICBMH54	0.210	0.60	0.1260	0.1260	10.0000	0.3245	109.67742	38.41781	300	25.1	1.00	96.70076	1.3680	39.73
	42	SICBMH54	SICBMH55	0.080	0.60	0.0480	0.1740	10.3245	0.3769	108.20916	52.34293	300	24.1	0.50	68.37776	0.9673	76.55
		SICBMH55	MH56	0.000	0.60	0.0000	0.1740	10.7014	0.0988	106.55577	51.54316	300	6.3	0.50	68.37776	0.9673	75.38
SWM Block 138		MH56	STC57	0.000	0.60	0.0000	15.2315	51.5904	0.1022	42.00155	2013.47476	1200	22.8	1.20	4270.84504	3.7763	47.14
		STC57	STC57.1	0.000	0.60	0.0000	15.2315	51.6925	0.0120	41.94139	2010.92752	1350	2.5	1.00	5337.40204	3.7288	37.68
		STC57.1	HW58	0.000	0.60	0.0000	15.2315	51.7045	0.0045	41.93433	2010.62826	1200	1.0	1.20	4270.84504	3.7763	47.08

NO CONCERNS WITH DOWNSTREAM MUNICIPAL STM SEWERS DESPITE INCREASED % IMPERVIOUSNESS.

MTE FILE No: 38569-114-ST1.1
STORM DRAINAGE AREA PLAN
P:\P\38569\114\38569-114-ST1



STORM DRAINAGE INSERT
SCALE 1:7500



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POST OFFICE, BOLT IN FRONT WALL, IN LINTEL OF CENTER OF BASEMENT WINDOW
(HISTORICAL NUMBER 16U117E)

SITE BENCHMARK ELEV. = 389.815m
TOP NUT ON FIRE HYDRANT AT WEST CORNER OF HAYLOCK SITE. LOCATED AT END OF CURB AND GUTTER.

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No.	REVISION	BY	DATE
8.			
7.			
6.			
5.	ISSUED FOR FINAL SUBMISSION (TOWNSHIP)	SKP	OCT.23/20
4.	ISSUED FOR THIRD SUBMISSION (TOWNSHIP)	SKP	FEB.28/20
3.	ISSUED FOR SWM ECA APPROVAL	SKP	FEB.24/20
2.	ISSUED FOR SECOND SUBMISSION (TOWNSHIP)	SKP	NOV.11/19
1.	ISSUED FOR FIRST SUBMISSION	SKP	JUN.14/19

TOWNSHIP OF CENTRE WELLINGTON

MTE
Engineers, Scientists, Surveyors
519-743-6500

LICENSED PROFESSIONAL ENGINEER
V. LAZIC
100025286
PROVINCE OF ONTARIO
Oct 23/20

CLIENT
HAYLOCK FARM LTD.
7 EDINBURGH ROAD SOUTH, UNIT 1 GUELPH, ONTARIO

PROJECT
HAYLOCK SUBDIVISION
133 SOUTH RIVER ROAD ELORA, ONTARIO

DRAWING
STORM DRAINAGE AREA PLAN

Project Manager	S.PETERSON	Project No.	38569-114
Design By	MSB	Checked By	VAL
Drawn By	KAT/AXH	Checked By	MSB
Surveyed By	MTE	Drawing No.	ST1.1
Date	May.13/19		
Scale	1:1000	Sheet	of

October 22, 2020 – 9:35:15 AM – Plotted By: Srdjan Pejcic