FUNCTIONAL SERVICING REPORT
UPPER MILL POND SUBDIVISION

November 28, 2023

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1. Background

CAP Norwood Developments Inc. engaged Jewell Engineering Inc. (Jewell) to complete a servicing study to review the feasibility of a residential development north of Mill Street, south of the Canadian Pacific (CP) Railway and west of Asphodel 10th Line in Norwood, Ontario. The Development Site Plan is provided in Appendix A.

This servicing report has been prepared to support the Plan of Subdivision for Upper Mill Pond Subdivision as shown below in Figure 1.

Figure 1: Subject Property Location

Sanitary and water servicing have been considered in this report and stormwater management has been evaluated under separate cover.

1.1 Existing Use

The proposed development area is approximately 35.5 hectares (ha). The surrounding land uses are low density residential to the south, industrial and residential to the north and rural to the south and east.

1.2 Site Description

The subdivision fronts onto Mill Street and Asphodel 10th Line. The northwest property line is along the CP Railway. The development site is currently primarily being used for agricultural crops excluding an area in the interior of the parcel which contains a cell tower.

The topography is smooth and gently sloping to the southwest corner (towards Mill Pond East).

1.3 Proposed Development

The subdivision is to be low/medium density residential. There will be municipal roads throughout the subdivision with access from Mill Street and Asphodel 10th Line. Municipal water and sanitary infrastructure will service the subdivision. Municipal infrastructure has been designed to specifications set out by the Ministry of Environment, Conservation, and Parks (MECP/MOE) and municipal standards. The Development Site Plan (as developed by RFA Planning) is provided in Appendix A and shown below in Figure 2.

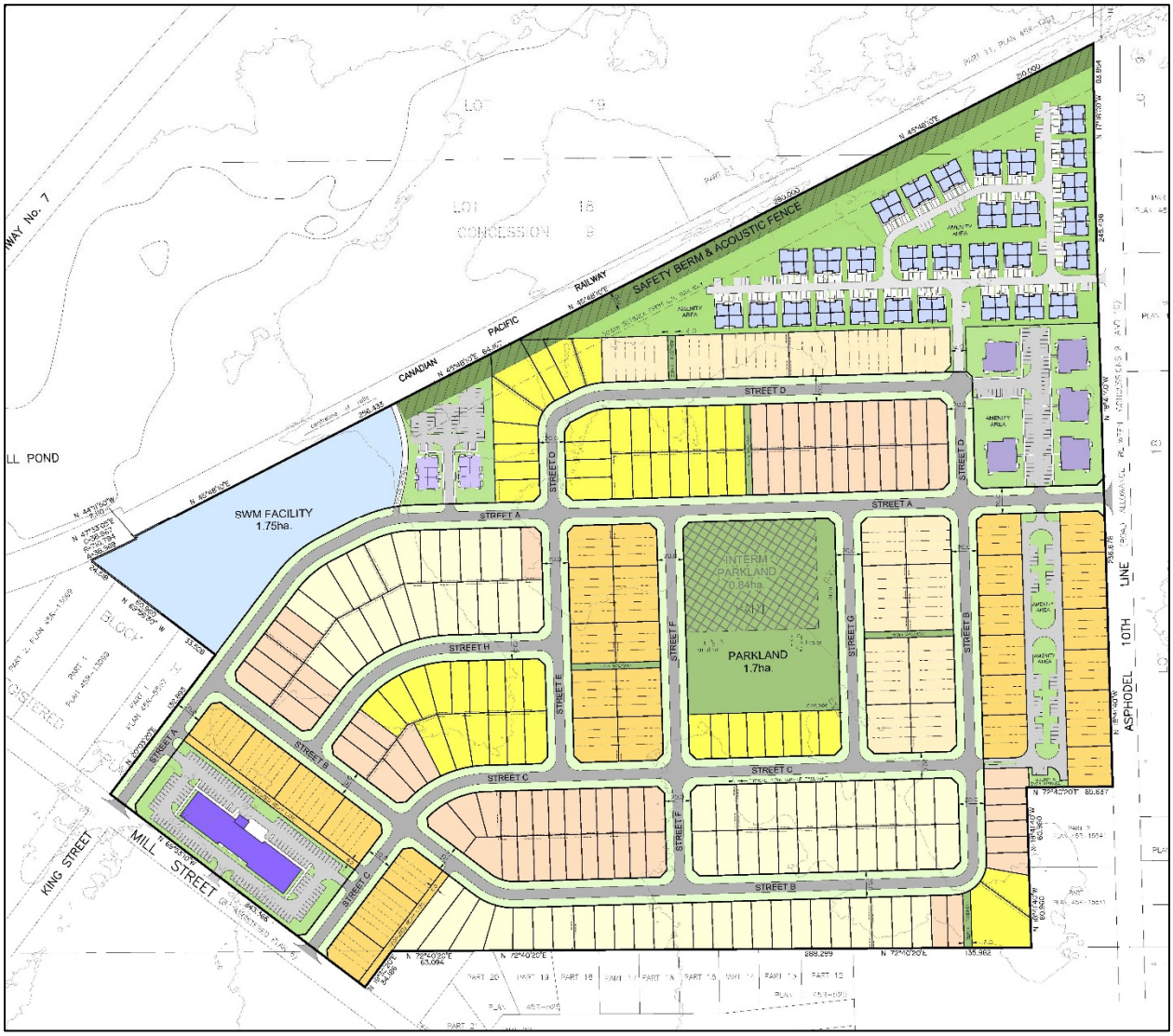

Figure 2: Development Site Plan

1.4 Servicing Options Statement

The Provincial Policy Statement (2020) Subsection 1.6.6.2 specifies that "municipal sewage services and municipal water services are the preferred form of servicing for settlement areas to support protection of the environment and minimize potential risks to human health and safety."

As the Upper Mill Pond development lies within the settlement area of Norwood, municipal services are the preferred form of servicing for this site. Both municipal sanitary sewer and municipal watermain services are present at the site frontage on Mill St. Connection to these services is further evaluated in subsequent sections of this report.

2. Water Distribution System

A 150 mm PVC watermain is present on Mill Street to service the proposed development. It is understood that the Township of Asphodel Norwood has recently completed an extensive review of their existing infrastructure in order to identify future development needs. The "Norwood Infrastructure Assessment" was completed in 2021 by Engage Engineering. As a result of the review, it is understood that a new water standpipe for treated water storage is currently under construction to accommodate future development. The new standpipe will provide increased treated water supply and increase pressures throughout the system. It is noted that the water system mapping included in the "Norwood Infrastructure Assessment" shows that the east side of the town is fed by a single watermain connection across the Ouse River at Flora St, however, discussions with Town staff indicate that a second connection across the river is already in place.

2.1 Design Criteria

The watermain design criteria used are based on MOE guidelines, which are summarized below:

- Minimum Watermain Diameter Size: 200 mm
- Average Residential Daily Domestic Demand:
  - Existing: 450 L/d*cap
  - Future*: 350 L/d*cap
- Population Factors:
  - Single Family: 3.0 person/unit
  - Townhomes: 2.4 person/unit
  - Apartment: 2.0 person/unit
- Peak Flow Factors:
  - Commercial: 0.33 L/s*ha
- Maximum Day Factor**: 2.0
- Peak Hour Factor**: 3.0
- Minimum Fire Flow**: 2.000 L/min

*As discussed with Township staff – design flows for future development for sanitary and water usage are reduced to 350L/d*cap to reflect the reduced water usage as a result of efficient appliances, water metering, new construction, etc.

**In accordance with the "Norwood Infrastructure Assessment" completed in 2021 by Engage Engineering.

2.2 Watermain Design

The proposed watermain network is shown on Figure 3. The proposed development will connect to the existing 150mm watermain on Mill St in two locations (at Street A and Street C) in Phase 1 of the development. A servicing block has also been provided to facilitate looping through adjacent development lands to the south in the future (if required by the Township). Within Upper Mill Pond Development, a 200mm watermain will be provided.

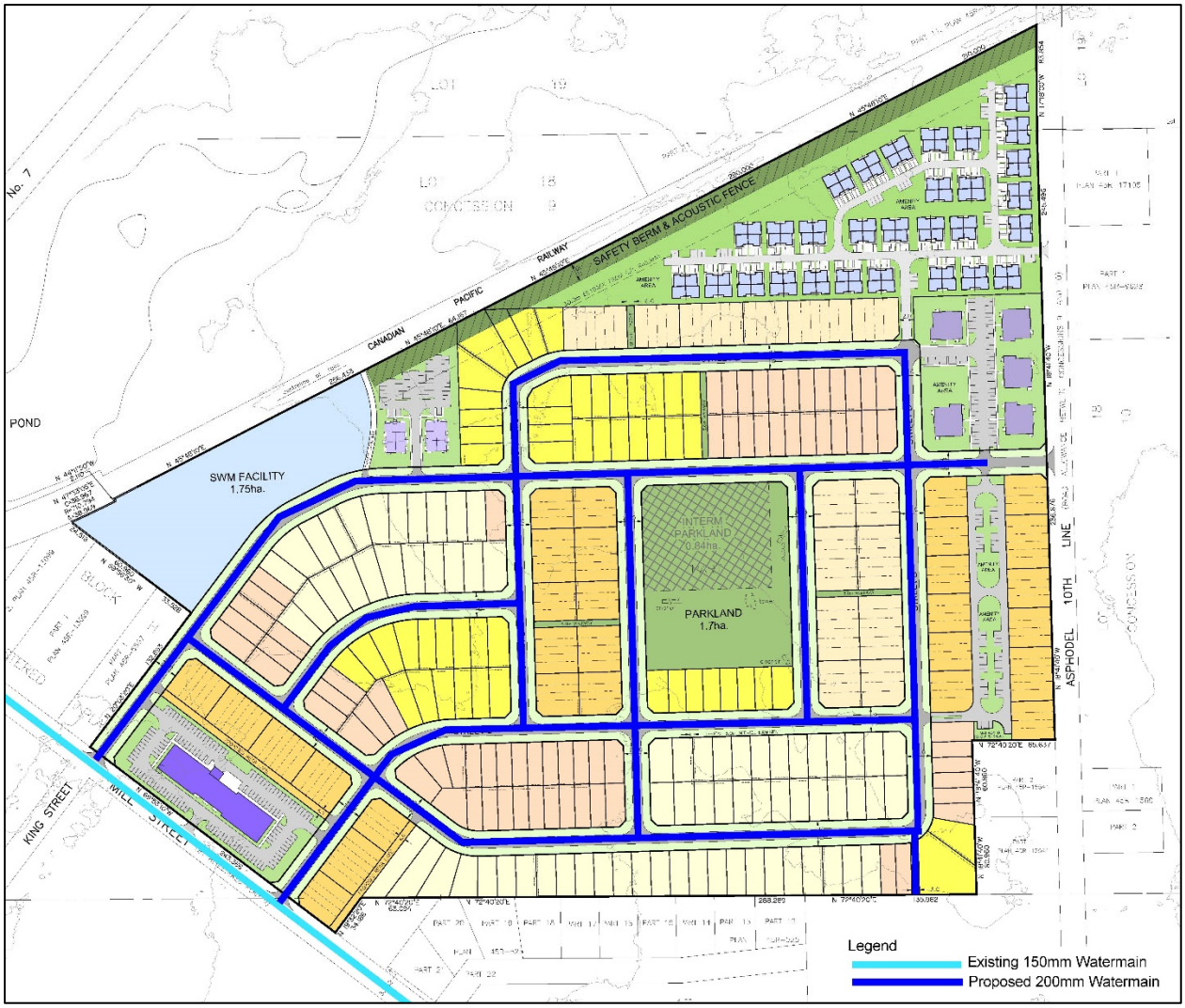

Figure 3: Proposed Watermain Network

Jewell determined the base water demands for each type of dwelling within the development using the population densities found in Table 1. The base average demand for each type of dwelling can be found in Table 2 to Table 4.

Table 1: Population Density

Population Density	
Single	3.0
Townhome	2.4
Apartment	2.0

Table 2: Single Average Demand

Type	Single	
# of Units	1	
Population/Unit	3.0	
Population	3.0	
Capita Usage	350	L/d*cap
Demand	1,050	L/d

Table 3: Townhome Average Demand

Type	Townhome	
# of Units	1	
Population/Unit	2.4	
Population	2.4	
Capita Usage	350	L/d*cap
Demand	840	L/d

Table 4: Apartment Average Demand

Type	Apartment	
# of Units	1	
Population/Unit	2.0	
Population	2.0	
Capita Usage	350	L/d*cap
Demand	700	L/d

A total summary of the average daily water demand can be found in Table 5.

Table 5: Summary of Average Water Demand

	Phase 1			**Full Development**		
	# Units	Population	Average Demand (L/d)	# Units	Population	Average Demand (L/d)
Single Detached	60	180	63,000	196	588	205,800
Townhome/4plex	59	141.6	49,560	344	825.6	288,960
Apartment	0	0	0	100	200	70,000
Total	**119**	**321.6**	**112,560**	**640**	**1613.6**	**564,760**

With the appropriate average demand established, peaking factors are determined from the "Norwood Infrastructure Assessment" report and applied to determine max day and peak hour demands.

Table 6: Drinking Water Treatment System Requirements

	Development Flow (M3/day)	
	Phase 1	Full Development
Average Day Flow	112.6	564.8
Peak Hour Flow	337.8	1,694.4
Maximum Day Flow	225.2	1,129.6
Fire Flow	2,880	2,880
Maximum Day + Fire Flow	3, 105	4,009

2.3 Drinking Water Distribution System

The "Norwood Infrastructure Assessment" completed in 2021 by Engage Engineering found that existing treated water storage is insufficient. As a result of the review, it is understood that a new water standpipe for treated water storage is currently under construction to accommodate future development. The new standpipe will provide increased treated water supply and increase pressures throughout the system. Although the Upper Mill Pond development lands were not specifically included in the "Norwood Infrastructure Assessment," 2021 by Engage Engineering, the adjacent lands were included and considered a maximum land elevation of 216.0. The Upper Mill Pond development has an estimated maximum land elevation of 212.4 (as shown on the attached preliminary grading plan, Appendix C). Accordingly, as the Upper Mill Pond development is at a lower elevation than the adjacent development, design of the new standpipe would not be impacted in terms of pressure requirements.

Hydrant test data documented in Figure 6 of the "Norwood Infrastructure Assessment", 2021 by Engage Engineering noted existing pressures of 40 – 60 psi and maximum flows of 2700-4600 L/min in the area of the proposed development.

Table 7: Existing Hydrant Flow Test Data

Hydrant Location	Static Pressure(psi)	Total 1 Port Flow at 20psi (USGPM - L/min)
King/Mill	50	1211 – 4,584
67 Mill St	48	712 – 2,695

The hydrant tests show that existing static pressures are within MOE requirements (40 – 100 psi) and existing fire flow available meets Township requirements (2,000 L/min) at the connection point to the proposed development. The new standpipe will further improve available pressures and flow to the proposed development.

2.4 Drinking Water Treatment System

The "Norwood Infrastructure Assessment" completed in 2021 by Engage Engineering found that existing treated water storage is insufficient. As a result of the review, it is understood that a new water standpipe for treated water storage is currently under construction to accommodate future development.

A council presentation on Nov. 8, 2023 by Watson & Associates Economists Ltd. also indicates the installation of additional wells.

The Nov. 8, 2023 Council Presentation by Watson & Associates Economists Ltd. indicates that the new standpipe will provide capacity to service an additional 3,678 people and the new wells would provide capacity to service an additional 3,750 people.

Table 8: Summary of Upper Mill Pond Subdivision Population Based on Population Factors from Watson 2023 Council Presentation

	Phase 1			Full Build Out		
	# Units	Ppl/unit	Population	# Units	Ppl/unit	Population
Single Detached	60	2.697	161.8	196	2.697	528.6
Townhome/4plex	59	2.044	120.6	344	2.044	703.1
Apartment	0	1.635	0	100	1.635	163.5
Total	**119**		**282.4**	**640**		**1395.2**

The proposed Upper Mill Pond Development will contain up to 119 dwelling units in Phase 1 and 640 dwelling units upon full build-out (note that the number of units in Phase 1 is approximate only may be reduced based on builder and/or market demand). Based on the population factors utilized in the Watson 2023 Council Presentation regarding the treatment system upgrades, Phase 1 would have a population of 283 people and there would be 1396 people upon full build-out of the development.

Based on the additional servicing capacity targeted of 3,750 people, it is expected that there will be sufficient capacity within the municipal system to accommodate the Upper Mill Pond development upon completion of the treatment system upgrades.

It is noted that the Upper Mill Pond development will be registered in phases (phasing plan is provided in Appendix B), therefore the ultimate capacity would not be expected to be required for ≈ 8 – 10 years (upon full build out).

2.5 Water Servicing Conclusions & Recommendations

The Upper Mill Pond Subdivision will be serviced via municipal water. There will be two connections to the existing 150 mm main on Mill Street. A servicing block has also been provided to facilitate looping through adjacent development lands to the south in the future (if required by the Township). 200 mm watermains will be provided throughout the proposed development.

It is understood that the Township of Asphodel Norwood has recently completed an extensive review of their existing infrastructure in order to identify future development needs. The "Norwood Infrastructure Assessment" was completed in 2021 by Engage Engineering. As a result of the review, it is understood that a new water standpipe for treated water storage is currently under construction to accommodate future development. The new standpipe will provide increased treated water supply and increase pressures throughout the system.

Hydrant test data shows that existing static pressures are within MOE requirements (40 – 100 psi) and existing fire flow available meets Township requirements (2,000 L/min) at the connection point to the proposed development. The new standpipe will further improve available pressures and flow to the proposed development.

A council presentation on Nov. 8, 2023 by Watson & Associates Economists Ltd. also indicates the installation of additional wells. The Nov. 8, 2023 Council Presentation by Watson & Associates Economists Ltd. indicates that the new standpipe will provide capacity to service an additional 3,678 people and the new wells would provide capacity to service an additional 3,750 people.

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Based on the additional servicing capacity targeted of 3,750 people, it is expected that there will be sufficient capacity within the municipal system to accommodate the Upper Mill Pond development upon completion of the treatment system upgrades.

It is noted that the Upper Mill Pond development will be registered in phases (phasing plan is provided in Appendix B), therefore the ultimate capacity would not be expected to be required for ≈ 8 – 10 years (upon full build out).

3. Sanitary Sewer System

The Township of Asphodel Norwood has recently completed an extensive review of their existing infrastructure in order to identify future development needs. The "Norwood Infrastructure Assessment" was completed in 2021 by Engage Engineering.

The topography of the Upper Mill Pond Subdivision site is conducive to a gravity system. There is a 200 mm sanitary main on Mill Street that continues down King Street, however, based on the results of the "Norwood Infrastructure Assessment", it is understood that these downstream sewers are currently at capacity.

Therefore, an alternative servicing route was investigated for the Upper Mill Pond Development ("Lutes lands") via Legion St. From discussions with Township staff, it is understood that upgrades were recently completed to a portion of this route (identified in yellow below). The northern portion of this route will need to be upgraded to support the proposed development (identified in red below) but limits the need for reconstruction of existing streets to a small section on Cedar St, Legion St, and a portion of Mill St that is already expected to be disturbed by the development to the east ("HBNG Property").

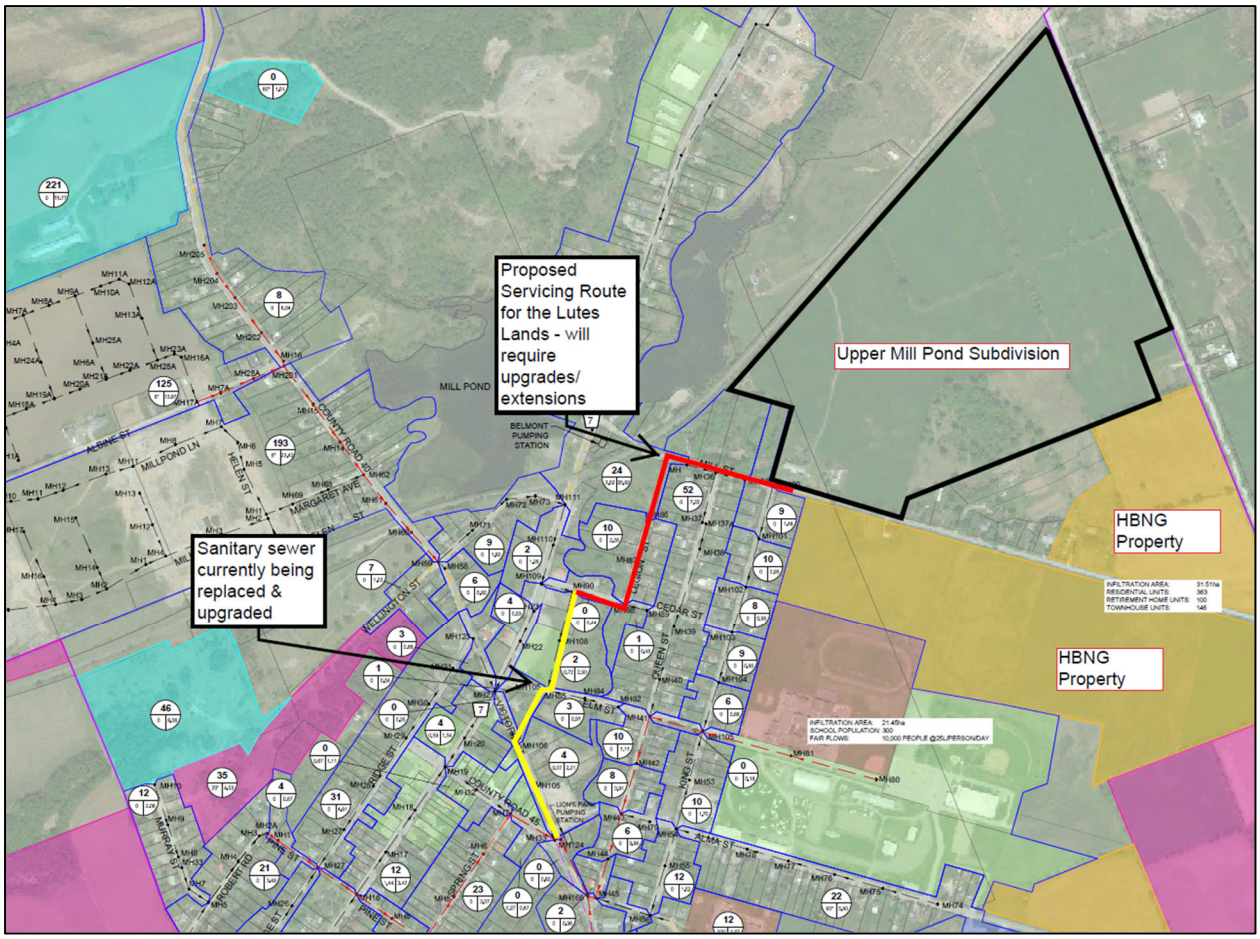


Figure 4: Proposed Sanitary Servicing Route

3.1 Design Criteria

The sanitary design criteria used are based on MECP guidelines, which are summarized below.

- Minimum Sanitary Sewer Diameter Size: 200 mm
- Minimum Full Flow Velocities: 0.6 m/s
- Maximum Full Flow Velocities: 3.0 m/s
- Extraneous Flow Allowance: 0.28 L/s*ha
- Peaking Factor: Harmon's formula
- Average Daily Residential Domestic Design Flow*:
    - Existing: 450 L/d*cap
    - Future: 350 L/d*cap
- Population Factors:
    - Single Family: 3.0 persons/unit
    - Townhomes: 2.4 persons/unit
    - Apartment: 2.0 persons/unit
- Peak Flows:
    - Commercial: 0.33 L/s*ha

*As discussed with Township staff – design flows for future development for sanitary and water usage are reduced to 350L/d*cap to reflect the reduced water usage as a result of efficient appliances, water metering, new construction, etc.

3.2 Sanitary Sewer Network Design

The Servicing route identified in Figure 4 discharges to the Lion's Park Pumping Station. The operation of this pump station was reviewed in the "Norwood Infrastructure Assessment," 2021 by Engage Engineering and found to be nearing capacity under existing conditions (96 additional single-family units can be accommodated). As a result of the review, it is understood that pump station/forcemain upgrades are currently underway by the Township to accommodate future development.

Review of the sanitary sewer network capacity was based on the analysis completed in the "Norwood Infrastructure Assessment," 2021 by Engage Engineering. The upgrades made to the servicing route (portion identified in yellow on Figure 4), and the future development lands included in the report, were considered in the analysis. Table 9 provides the detailed calculations and sanitary sewer design for the Upper Mill Pond Development and downstream system. The associated catchment area plan and proposed sewer system/upgrades is shown in Figure 5.

A portion of the adjacent development lands ("HBNG Property") have also been considered to drain via the Legion St servicing route (as capacity exists in the system and the Township has expressed a desire to limit the amount of disturbance to existing residents as much as possible). Therefore, accommodating a portion of the "HBNG Property" via the Legion St route can eliminate the need for upgrades on Elm & Queen St (which is the servicing route identified for these lands in the "Norwood Infrastructure Assessment").

As shown in Table 9 and Figure 5, the gravity main along Cedar Street and Legion Street will need to be upgraded to a 375 mm sewer to service the Upper Mill Pond and HBNG Developments. These upgrades are to be completed by the Municipality.

A 375 mm gravity main is required along Mill Street to King Street/Street A to service the Upper Mill Pond and HBNG Developments. At the Mill St/King St intersection, the sanitary sewer will need to be approximately 4.0m deep in order facilitate gravity service of the Upper Mill Pond Development. Increased depth may be required to service the HBNG Development - subject to their review and confirmation.

On Mill St from King Street to the east, a 300 mm gravity main is required to service the HBNG Development.

The Upper Mill Pond development will be serviced with gravity mains ranging in size from 200 mm to 300 mm with a minimum slope of 0.4%, connecting at the King St/Mill St intersection.

Table 9: Sanitary Design Sheet

SANITARY SEWER DESIGN SHEET

Flow	Type	Value	Unit
Single Family	Residence	3.0	person/unit
Townhomes	Residence	2.4	person/unit
Apartment	Residence	2.0	person/unit
Retirement Home	Residence	1.0	person/unit
Commercial	Peak Flow	0.33	L/s*ha

Peak Flow		Value	Unit
Flow Rate	(Existing)	450	L/d*cap
Flow Rate	(Future)	350	L/d*cap
Infiltration Rate		0.28	L/s*ha
Max Capacity		80%	

Legend
- Assumed
- Upgraded for Norwood Park Phase 3
- Future Development
- Upgraded for Future Development
- Capacity greater than 80%
- Lutes & Crowley Lands via Legion Street

Location			Peak Flow Calculation																				Sewer Data								
Street Name	Upstream Manhole	Downstream Manhole	Single Family		Townhomes		Apartment		Retirement Home		Residential Population					Residential Area		Commercial Area		Design Flow (L/s)				Diameter	Slope	Length	Material	Mannings	Velocity	Capacity	Capacity	Act. Vel.
			# of Units	Population	# of Units	Population	# of Units	Population	# of Units	Population	Tot. Ind.	Cum. Ex.	Cum. Fut.	Tot. Cum.	Harmon	(ha)	Cum. (ha)	(ha)	Cum. (ha)	Residential	Commercial	Infiltration	Peak	(mm)	(%)	(m)		(n)	(m/s)	(L/s)	(%)	(m/s)
North PS Inlet																															
CR 40 - Future		MH205	221	663.0	0	0.0	0	0.0	80	80.0	743.0	0.0	743.0	743.0	3.88	17.28	17.28	0.00	0.00	11.68	0.00	4.84	16.51	250	0.7%	100.0	PVC	0.013	1.01	49.8	33.2%	0.91
CR 40	MH205	MH201	8	24.0	0	0.0	0	0.0	0	0.0	24.0	24.0	743.0	767.0	3.87	6.54	23.82	0.00	0.00	12.13	0.00	6.67	18.80	200	1.0%	259.7	RCP	0.013	1.04	32.8	57.3%	1.08
Albine - Future		MH17A	273	819.0	8	19.2	0	0.0	0	0.0	838.2	0.0	838.2	838.2	3.85	19.48	19.48	0.00	0.00	13.07	0.00	5.45	18.52	250	0.5%	100.0	PVC	0.013	0.86	42.1	44.0%	0.83
Albine	MH17A	MH201	125	375.0	0	0.0	0	0.0	0	0.0	375.0	375.0	838.2	1,213.2	3.74	13.97	33.45	0.00	0.00	20.03	0.00	9.37	29.39	300	0.4%	167.0	PVC	0.013	0.87	61.2	48.1%	0.86
CR 40	MH201	MH59	193	579.0	0	0.0	0	0.0	0	0.0	579.0	978.0	1,581.2	2,559.2	3.50	23.43	80.70	0.00	0.00	40.25	0.00	22.60	62.84	375	0.7%	430.0	RCP	0.013	1.33	146.7	42.8%	1.27
Wellington - Future		MH59	35	105.0	20	48.0	0	0.0	0	0.0	153.0	0.0	153.0	153.0	4.19	4.53	4.53	0.00	0.00	2.60	0.00	1.27	3.86	200	0.5%	100.0	PVC	0.013	0.74	23.2	16.7%	0.55
Wellington		MH59	7	21.0	0	0.0	0	0.0	0	0.0	21.0	21.0	0.0	21.0	4.38	1.03	1.03	0.00	0.00	0.48	0.00	0.29	0.77	200	0.7%	105.0	RCP	0.013	0.87	27.4	2.8%	0.38
CR 40 S		MH59	6	18.0	0	0.0	0	0.0	0	0.0	18.0	18.0	0.0	18.0	4.39	0.92	0.92	0.00	0.00	0.41	0.00	0.26	0.67	200	0.7%	99.0	RCP	0.013	0.87	27.4	2.4%	0.36
Wellington	MH59	MH111	9	27.0	0	0.0	0	0.0	0	0.0	27.0	1,044.0	1,734.2	2,778.2	3.47	1.90	89.08	3.02	3.02	43.26	1.00	24.94	69.20	375	0.6%	272.0	PVC	0.013	1.23	135.8	50.9%	1.23
HWY 7		MH111	24	72.0	0	0.0	0	0.0	0	0.0	72.0	72.0	0.0	72.0	4.28	20.82	20.82	0.00	0.00	1.61	0.00	5.83	7.43	200	0.4%	604.0	RCP	0.013	0.66	20.7	35.8%	0.60
HWY 7	MH111	MH109	2	6.0	0	0.0	0	0.0	0	0.0	6.0	1,122.0	1,734.2	2,856.2	3.46	1.28	111.18	0.00	3.02	44.53	1.00	31.13	76.65	375	0.5%	147.0	PVC	0.013	1.12	124.0	61.8%	1.18
Cedar St	MH109	MH5A	0	0.0	0	0.0	0	0.0	0	0.0	0.0	1,122.0	1,734.2	2,856.2	3.46	0.44	111.62	0.00	3.02	44.53	1.00	31.25	76.78	375	0.5%	57.0	PVC	0.013	1.12	124.0	61.9%	1.18
Mill St - Future (HBNG C)		PS South	202	606.0	30	72.0	0	0.0	0	0.0	678.0	0.0	678.0	678.0	3.90	14.31	14.31	2.10	2.10	10.72	0.69	4.01	15.42	200	0.4%	200.0	PVC	0.013	0.66	20.7	74.3%	0.72
Mill St - Future (HBNG B)	MH4B	MH3B	92	276.0	0	0.0	0	0.0	0	0.0	276.0	0.0	276.0	276.0	4.09	8.20	8.20	0.00	0.00	4.58	0.00	2.30	6.87	200	0.4%	200.0	PVC	0.013	0.66	20.7	33.1%	0.59
Mill St - Future (HBNG A)	MH3B	MH1B	354	1,062.0	41	98.4	0	0.0	0	0.0	1,160.4	0.0	1,436.4	1,436.4	3.69	31.50	39.70	0.00	0.00	21.49	0.00	11.12	32.60	300	0.4%	350.0	PVC	0.013	0.87	61.2	53.3%	0.88
HBNG Total			***648***	***1,944.0***	***71***	***170.4***	***0***	***0.0***	***0***	***0.0***						***54.01***		***2.10***														
Mill St - Future (UMPS)	MH5B	MH1B	196	588.0	344	825.6	100	200.0	0	0.0	1,613.6	0.0	1,613.6	1,613.6	3.66	35.50	35.50	0.00	0.00	23.90	0.00	9.94	33.84	300	0.4%	120.0	PVC	0.013	0.87	61.2	55.3%	0.89
Mill St	MH1B	MH86	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0.0	3,050.0	3,050.0	3.44	0.00	75.20	0.00	0.00	42.45	0.00	21.06	63.51	375	0.4%	420.0	PVC	0.013	1.00	110.9	57.3%	1.04
Legion St	MH86	MH88	10	30.0	0	0.0	0	0.0	0	0.0	30.0	30.0	3,050.0	3,080.0	3.43	2.28	77.48	0.00	0.00	42.95	0.00	21.69	64.65	375	0.4%	152.0	RCP	0.013	1.00	110.9	58.3%	1.04
Cedar St	MH89	MH88	1	3.0	0	0.0	0	0.0	0	0.0	3.0	3.0	0.0	3.0	4.45	0.48	0.48	0.00	0.00	0.07	0.00	0.13	0.20	200	0.4%	40.0	RCP	0.013	0.66	20.7	1.0%	0.21
Cedar St	MH88	MH5A	0	0.0	0	0.0	0	0.0	0	0.0	0.0	33.0	3,050.0	3,083.0	3.43	0.00	77.96	0.00	0.00	42.99	0.00	21.83	64.82	375	0.4%	97.0	RCP	0.013	1.00	110.9	58.4%	1.04
Easement	MH5A	MH7A	2	6.0	0	0.0	0	0.0	0	0.0	6.0	1,161.0	4,784.2	5,945.2	3.17	2.50	192.08	0.72	3.74	80.71	1.23	53.78	135.72	450	0.4%	184.7	PVC	0.013	1.13	180.3	75.3%	1.24
Elm St	MH82	MH7A	3	9.0	0	0.0	0	0.0	0	0.0	9.0	9.0	0.0	9.0	4.42	0.91	0.91	0.00	0.00	0.21	0.00	0.25	0.46	200	0.7%	128.0	RCP	0.013	0.87	27.4	1.7%	0.32
Easement	MH7A	MH8A	0	0.0	0	0.0	0	0.0	0	0.0	0.0	1,170.0	4,784.2	5,954.2	3.17	0.00	192.99	0.00	3.74	80.86	1.23	54.04	136.13	450	0.3%	15.5	PVC	0.013	0.98	156.2	87.2%	1.11
Easement	MH8A	MH9A	1	3.0	0	0.0	0	0.0	0	0.0	3.0	1,173.0	4,784.2	5,957.2	3.17	0.54	193.53	0.00	3.74	80.90	1.23	54.19	136.33	450	0.4%	93.8	PVC	0.013	1.13	180.3	75.6%	1.24
HWY 7	MH23	MH21	4	12.0	0	0.0	0	0.0	0	0.0	12.0	12.0	0.0	12.0	4.41	0.93	0.93	0.00	0.00	0.28	0.00	0.26	0.54	200	0.6%	160.0	RCP	0.013	0.81	25.4	2.1%	0.32
CR 40	MH123	MH21	3	9.0	0	0.0	0	0.0	0	0.0	9.0	9.0	0.0	9.0	4.42	0.68	0.68	0.00	0.00	0.21	0.00	0.19	0.40	200	9.2%	102.0	RCP	0.013	3.17	99.5	0.4%	0.73
HWY 7	MH19	MH21	4	12.0	0	0.0	0	0.0	0	0.0	12.0	12.0	0.0	12.0	4.41	1.54	1.54	0.59	0.59	0.28	0.19	0.43	0.90	200	1.6%	161.0	RCP	0.013	1.32	41.5	2.2%	0.53
Victoria St	MH21	MH9A	4	12.0	0	0.0	0	0.0	0	0.0	12.0	45.0	0.0	45.0	4.32	0.25	3.40	0.07	0.66	1.01	0.22	0.95	2.18	200	1.6%	103.0	RCP	0.013	1.32	41.5	5.3%	0.70
Victoria St	MH9A	MH11A	0	0.0	0	0.0	0	0.0	0	0.0	0.0	1,218.0	4,784.2	6,002.2	3.17	2.21	199.14	0.00	4.40	81.57	1.45	55.76	138.78	450	0.5%	158.7	PVC	0.013	1.27	201.6	68.8%	1.37
Victoria St	MH11A	MH12A	0	0.0	0	0.0	0	0.0	0	0.0	0.0	1,218.0	4,784.2	6,002.2	3.17	0.00	199.14	0.00	4.40	81.57	1.45	55.76	138.78	450	0.5%	24.0	PVC	0.013	1.27	201.6	68.8%	1.37
Victoria St	MH12A	PS	0	0.0	0	0.0	0	0.0	0	0.0	0.0	1,218.0	4,784.2	6,002.2	3.17	0.00	199.14	0.00	4.40	81.57	1.45	55.76	138.78	525	0.5%	6.0	PVC	0.013	1.40	304.1	45.6%	1.37

that

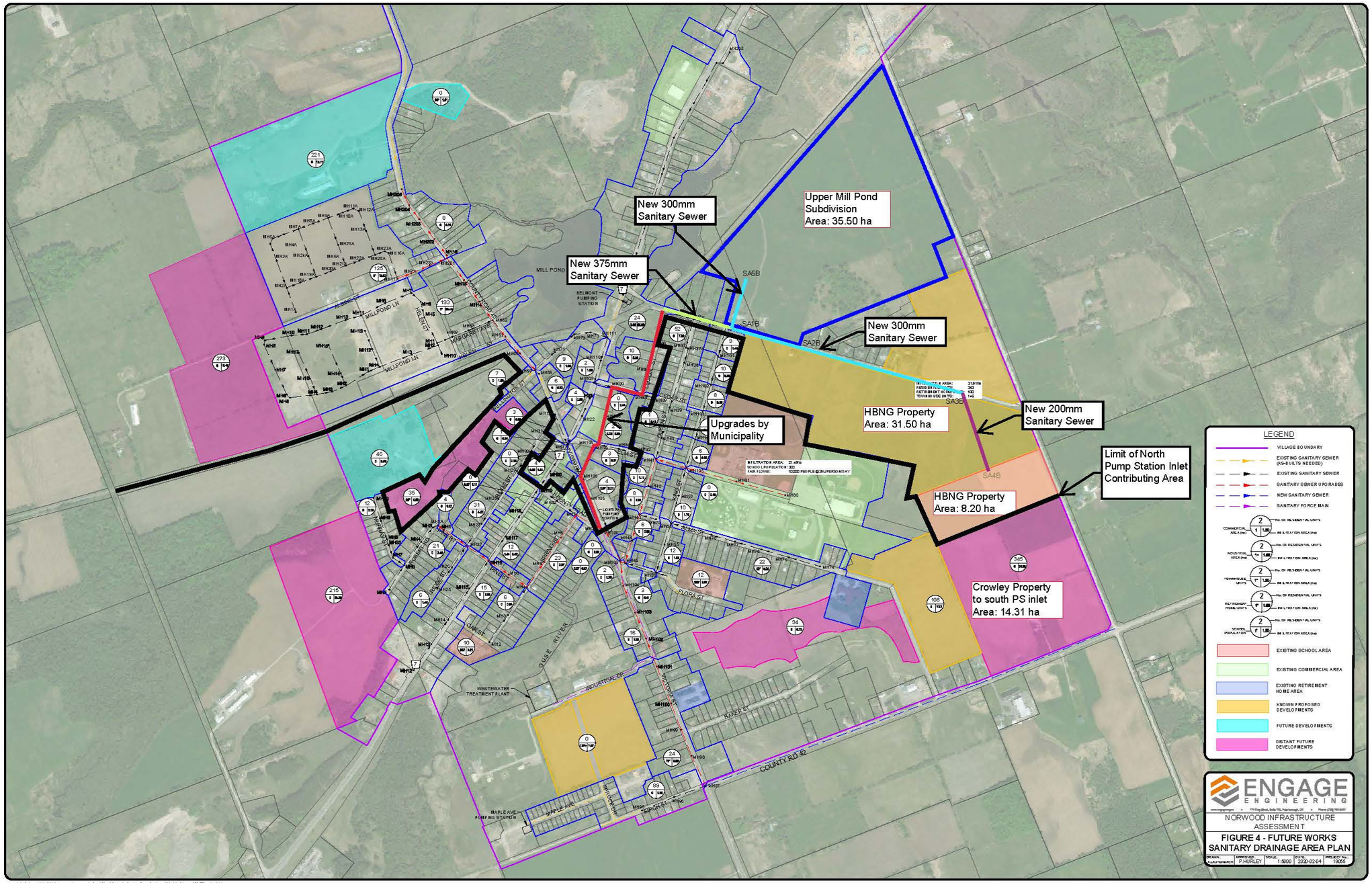


Figure 5: Sanitary Catchment Plan

3.3 Wastewater Treatment System

The "Norwood Infrastructure Assessment" completed in 2021 by Engage Engineering found that the WWTP is currently operating at 39% and therefore has capacity to support some future development. This determination was based on utilization of the full plant rated capacity of 1,500m^3/day.

However, a council presentation on Nov. 8, 2023 by Watson & Associates Economists Ltd. found that "due to increased loading, the Norwood WWTP does not have sufficient capacity to operate at its rated capacity of 1,500m^3/day..." The Nov. 8, 2023 Council Presentation by Watson & Associates Economists Ltd. noted that "The Township intends to modify the existing wastewater treatment plant to reach the original rated capacity of 1,500m^3/day with increased loading. The anticipated work includes modifications to the SBR system, aeration blowers, and biosolids tank, all within the existing property." This would provide capacity to service an additional 2,450 people.

Table 10: Summary of Upper Mill Pond Subdivision Population Based on Population Factors from Watson 2023 Council Presentation

	Phase 1			Full Build Out		
	# Units	**Ppl/unit**	**Population**	**# Units**	**Ppl/unit**	**Population**
Single Detached	60	2.697	161.8	196	2.697	528.6
Townhome/4plex	59	2.044	120.6	344	2.044	703.1
Apartment	0	1.635	0	100	1.635	163.5
Total	**119**		**282.4**	**640**		**1395.2**

The proposed Upper Mill Pond Development will contain up to 119 dwelling units in Phase 1 and 640 dwelling units upon full build-out (note that the number of units in Phase 1 is approximate only may be reduced based on builder and/or market demand). Based on the population factors utilized in the Watson 2023 Council Presentation regarding the treatment system upgrades, Phase 1 would have a population of 283 people and there would be 1,396 people upon full build-out of the development.

Based on the additional servicing capacity targeted for the WWTP of 2,450 people, it is expected that there will be sufficient capacity within the treatment plant to accommodate the Upper Mill Pond development upon completion of the upgrades.

It is noted that the Upper Mill Pond development will be registered in phases (phasing plan is provided in Appendix B), therefore the ultimate capacity would not be expected to be required for ≈ 8 – 10 years (upon full build out).

3.4 Sanitary Servicing Conclusions and Recommendations

The Upper Mill Pond Subdivision will be serviced via municipal sanitary sewer:

- The gravity main along Cedar Street and Legion Street will need to be upgraded to a 375 mm sewer to service the Upper Mill Pond & HBNG developments. These upgrades are to be completed by the Municipality;
- A 375 mm gravity main is required along Mill Street to King Street/Street A to service the Upper Mill Pond & HBNG developments. At the Mill St/King St intersection, the sanitary sewer will need to be approximately 4.0m deep in order facilitate gravity service of the Upper Mill Pond Development. Increased depth may be required to service the HBNG Development - subject to their review and confirmation.
- On Mill St., from King Street to the east, a 300 mm gravity main is required to service the HBNG development;
- The Upper Mill Pond development will be serviced with gravity mains ranging in size from 200 mm to 300 mm with a minimum slope of 0.4%, connecting at the King St/Mill St intersection.

The operation of the Lion's Park pump station was reviewed in the "Norwood Infrastructure Assessment," 2021 by Engage Engineering and found to be nearing capacity under existing conditions (96 additional single-family units can be accommodated). As a result of the review, it is understood that pump station/forcemain upgrades are currently underway by the Township to accommodate future development.

The Nov. 8, 2023 Council Presentation by Watson & Associates Economists Ltd. noted that "The Township intends to modify the existing wastewater treatment plant to reach the original rated capacity of 1,500 m^3/day with increased loading. The anticipated work includes modifications to the SBR system, aeration blowers, and biosolids tank, all within the existing property." This would provide capacity to service an additional 2,450 people.

The proposed Upper Mill Pond Development will contain up to 119 dwelling units in Phase 1 and 640 dwelling units upon full build-out (note that the number of units in Phase 1 is approximate only may be reduced based on builder and/or market demand). Based on the population factors utilized in the Watson 2023 Council Presentation, Phase 1 of the proposed Upper Mill Pond Development would have a population of 283 people and there would be 1,396 people upon full build-out of the development. Based on the additional servicing capacity targeted for the WWTP of 2,450 people, it is expected that there will be sufficient capacity within the treatment plant to accommodate the Upper Mill Pond development upon completion of the upgrades.

It is noted that the Upper Mill Pond development will be registered in phases (phasing plan is provided in Appendix B), therefore the ultimate capacity would not be expected to be required for ≈ 8 – 10 years (upon full build out).

4. Conclusions

Jewell studied the proposed Upper Mill Pond development and has made the following conclusions:

1) Water Servicing
    a. The Upper Mill Pond Subdivision will be serviced via municipal water via connection to Mill Street.
    b. Hydrant test data shows that existing static pressures are within MOE requirements (40 – 100 psi) and existing fire flow available meets Township requirements (2,000 L/min) at the connection point to the proposed development. The new standpipe will further improve available pressures and flow to the proposed development.
    c. Based on the additional servicing capacity targeted of 3,678 people for the new municipal standpipe and 3,750 people for the new municipal wells, it is expected that there will be sufficient capacity within the municipal system to accommodate the Upper Mill Pond development upon completion of the treatment system upgrades. Upper Mill Pond Development Phase 1 will have a population of up to 283 people and there would be 1,396 people upon full build-out of the development.

2) Sanitary Servicing
    a. The Upper Mill Pond Subdivision will be serviced via municipal sanitary sewer:
        i. The gravity main along Cedar Street and Legion Street will need to be upgraded to a 375 mm sewer to service to service the Upper Mill Pond and HBNG Developments. These upgrades are to be completed by the Municipality;
        ii. A 375 mm gravity main is required along Mill Street to King Street/Street A to service the Upper Mill Pond & HBNG developments. At the Mill St/King St intersection, the sanitary sewer will need to be approximately 4.0m deep in order facilitate gravity service of the Upper Mill Pond Development. Increased depth may be required to service the HBNG Development - subject to their review and confirmation.
        iii. On Mill St., from King Street to the east, a 300 mm gravity main is required to service the HBNG development;
        iv. The Upper Mill Pond development will be serviced with gravity mains ranging in size from 200 mm to 300 mm with a minimum slope of 0.4%, connecting at the King St/Mill St intersection.
    b. It is understood that pump station/forcemain upgrades are currently underway at the Lion's Park Pump Station by the Township to accommodate future development.
    c. Based on the additional servicing capacity targeted for the WWTP of 2,450 people, it is expected that there will be sufficient capacity within the treatment plant to accommodate the Upper Mill Pond development upon completion of the upgrades. Phase 1 of the proposed Upper Mill Pond Development would have a population of up to 283 people and there would be 1,396 people upon full build-out of the development.

In conclusion, the development is serviceable in accordance with the above conclusions.

Submitted by:

Julie Humphries, C.E.T.
Jewell Engineering Inc.

Amanda Redden, P.Eng.
Jewell Engineering Inc.

5. References

The information used to prepare this report is based on the following documents and information provided as noted below:

- Ontario Ministry of Environment
    - Design Guidelines for Sewage Works, 2007
    - Design Guidelines for Drinking-Water Systems, 2007
- Ontario Building Code
- Engage Engineering
    - Norwood Infrastructure Assessment, 2021
- Watson & Associates Economists Ltd.
    - Township of Asphodel-Norwood, Water and Wastewater Connection Charges Council Presentation, Nov. 8, 2023
    - Township of Asphodel-Norwood, Development Charges Background Study, Oct. 13, 2023

APPENDIX A:
DEVELOPMENT SITE PLAN

DEVELOPMENT CONCEPT FOR DRAFT PLAN OF SUBDIVISION

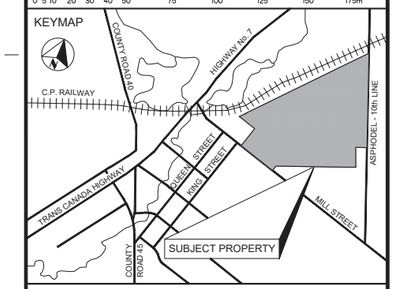
UPPER MILL POND

PART OF BLOCK H, REGISTERED PLAN 6
FORMERLY VILLAGE OF NORWOOD
AND PART OF LOTS 17, 18 AND 19
CONCESSION 9
GEOGRAPHIC TOWNSHIP OF ASPHODEL
TOWNSHIP OF ASPHODEL-NORWOOD
COUNTY OF PETERBOROUGH

SCALE = 1:1500

0 5 10 20 30 40 50 75 100 125 150 175m

KEYMAP



LAND USE SUMMARY

LAND USE	AREA(ha)	AREA%	UNITS	UNITS
12.2m - SINGLE DETACHED LOTS	3.27	9.2	71	
13.7m - SINGLE DETACHED LOTS	3.04	8.6	52	
15.0m - SINGLE DETACHED LOTS	4.41	12.4	73	
6.1m - 2 STOREY TOWNHOUSES (INCLUDING LANES)	4.26	12.0	134	
7.4m - BUNGALOW TOWNHOUSES	2.07	5.8	70	
LOW DENSITY TOTAL - 17.05ha				400
2 - 12 UNIT, 3 STOREY, STACKED TOWNHOUSE BUILDINGS	0.55	1.5	24	
5 - 12 UNIT, 3 STOREY, BUILDINGS	1.21	3.4	60	
3 STOREY APARTMENT BUILDING WITH COMMERCIAL AT GRADE (SOUTH WEST SIDE) 1842sq.m GFA	1.08	3.0	40	
MEDIUM DENSITY CONDOMINIUM BLOCK 29 - 4 PLEX BUNGALOW UNITS	4.03	11.4	116	
MEDIUM DENSITY TOTAL - 6.87ha				240
PARKLAND, WALKWAYS & SERVICE EASEMENTS	1.84	5.2		
STORM WATER POND	1.75	4.9		
SAFETY BERM & ACOUSTIC FENCE	0.92	2.6		
20.0m MUNICIPAL ROAD ALLOWANCE = 3607.0m (STREETS A, B, C, D, E, F, G & H)	7.07	20.0		
TOTAL	35.50ha	100.0%		640

LOW DENSITY RESIDENTIAL
400 UNITS/17.05ha. = 24 UNITS/ha (NET)

MEDIUM DENSITY RESIDENTIAL
240 UNITS/6.87ha. = 35 UNITS/ha (NET)

OVERALL NET DENSITY
640 UNITS/23.92ha. = 27 UNITS/ha (NET)

SURVEYOR'S CERTIFICATE

I CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ARE CORRECTLY SHOWN.

STEVE GIFFORD
ONTARIO LAND SURVEYOR.

DATE

GIFFORD, HARRIS SURVEYING LTD.
ONTARIO LAND SURVEYORS
255 GLEN MILLER ROAD, UNIT 1, TRENTON ONTARIO
613-392-2177

No.	REVISION	DATE	APPR'D

DRAWN BY: L.B. | CHECKED BY: R.F.A. | DATE: NOV. 10, 2023 | SCALE: 1:1500

METRIC NOTE:
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO IMPERIAL BY DIVIDING BY 0.3048.

CONTOURS NOTE:
CONTOURS PROVIDED BY CANADIAN LiDAR DATA AND DRAWING AT X.Xm INTERVALS.

NOVEMBER 10, 2023

JOB No. 852

RFA PLANNING CONSULTANT INC
211 Dundas Street East, Suite 202,
Belleville, Ontario, K8N 1E2

APPENDIX B:
PHASING PLAN

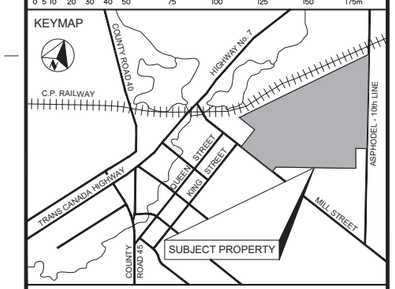
PRELIMINARY PHASING PLAN
UPPER MILL POND

PART OF BLOCK H, REGISTERED PLAN 6
FORMERLY VILLAGE OF NORWOOD
AND PART OF LOTS 17, 18 AND 19
CONCESSION 9

GEOGRAPHIC TOWNSHIP OF ASPHODEL
TOWNSHIP OF ASPHODEL-NORWOOD
COUNTY OF PETERBOROUGH

SCALE = 1:1500

0 5 10 20 30 40 50 75 100 125 150 175m



LAND USE SUMMARY

BUILDING PHASES	1	2	3	4	5	6	7	8	TOTAL
12.2m SINGLE DETACHED LOT	23		16	20	12				71
13.7m SINGLE DETACHED LOT	15		12	5	20				52
15.0m SINGLE DETACHED LOT	22		38	13					73
6.1m - 2 STOREY TOWNHOUSES	59		23			52			134
7.4m - BUNGALOW TOWNHOUSES				40	30				70
3 STOREY STACKED TOWNHOUSES		24							24
12 UNIT, 3 STOREY APARTMENT BUILDINGS								60	60
3 STOREY MIXED USE COMMERCIAL/RESIDENTIAL		40							40
4 PLEX BUNGALOW UNITS							116		116
PHASE SUB TOTAL	119	64	89	78	62	52	116	60	
								SITE TOTAL	640

NOTES:

1. PHASES 2, 6, 7 & 8 ARE SUBJECT TO SITE PLAN APPROVAL AND OR CONDOMINIUM REGISTRATION.
2. NO BUILDINGS WILL EXCEED 3 STOREYS IN HEIGHT.
3. PHASING IS PRELIMINARY AND BASED ON MARKET CONDITIONS.

No.	REVISION	DATE	APPR'D

DRAWN BY: L.B. | CHECKED BY: R.F.A. | DATE: NOVEMBER 6, 2023 | SCALE: 1:1500

METRIC NOTE:
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO IMPERIAL BY DIVIDING BY 0.3048.

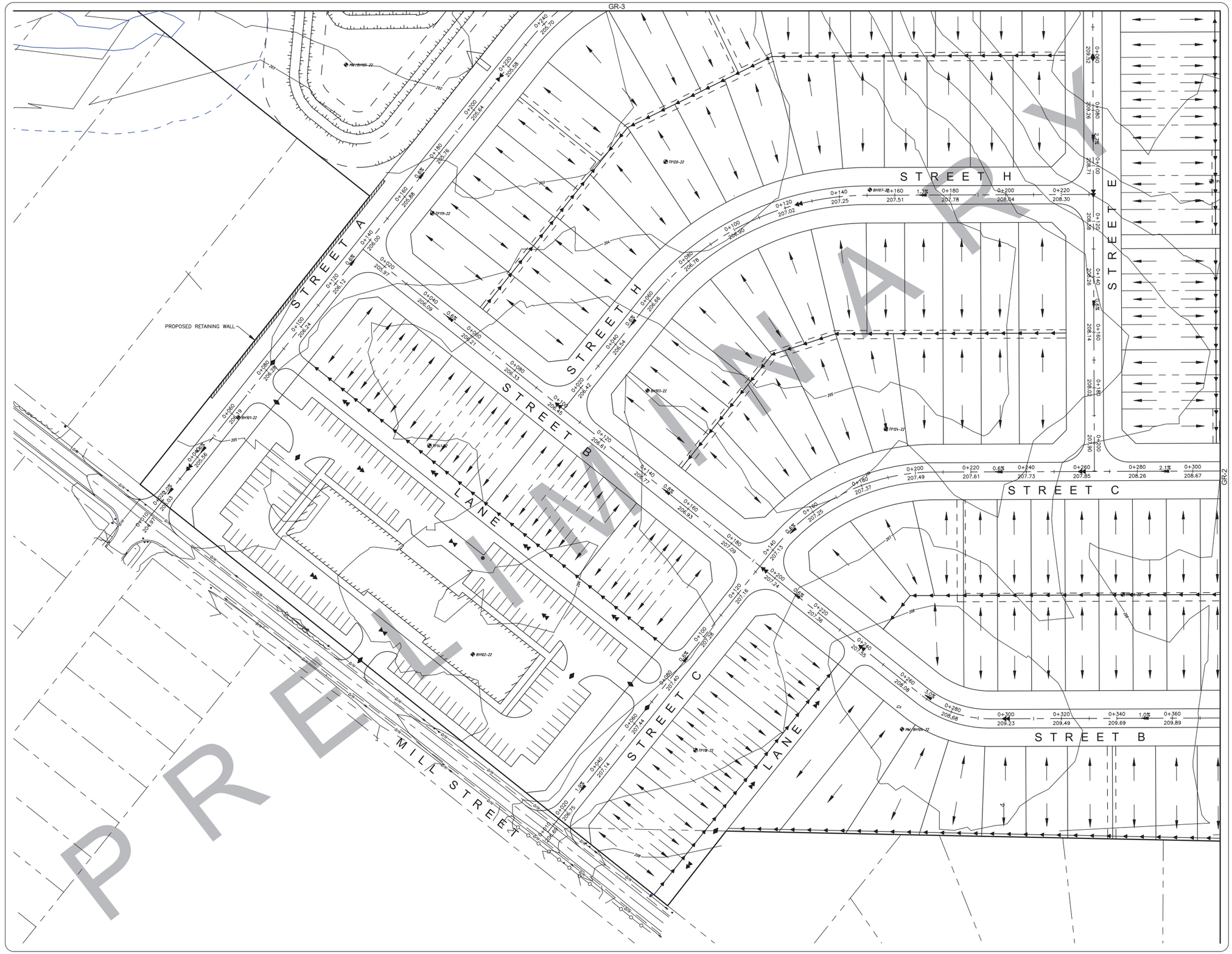
CONTOURS NOTE:
CONTOURS PROVIDED BY CANADIAN LiDAR DATA AND DRAWING AT X.Xm INTERVALS.

NOVEMBER 6, 2023

JOB No. 852

RFA PLANNING CONSULTANT INC
211 Dundas Street East, Suite 202,
Belleville, Ontario, K8N 1E2

APPENDIX C:
PRELIMINARY GRADING PLAN



11/09/2023

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GENERAL NOTES:

- ALL INFORMATION TO BE VERIFIED ON SITE PRIOR TO COMMENCING ANY WORK. ANY DISCREPANCIES ARE TO BE REPORTED TO THE CONSULTANT IMMEDIATELY.
- ALL UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL CONFIRM THE LOCATION ON SITE AND ASSUME ALL LIABILITY FOR DAMAGE TO ALL UTILITIES.
- EXCLUDING THE BENCHMARK AND DESCRIPTION PROVIDED FOR THIS PROJECT, NO OTHER ELEVATIONS ARE TO BE USED AS A REFERENCE ELEVATION FOR ANY PURPOSE.

METRIC NOTE:

- ALL DIMENSIONS SHOWN ARE IN METRES OR MILLIMETRES, UNLESS OTHERWISE NOTED.

GEOMETRIC NOTE:

- ALL SURVEY DATA SHOWN ON THIS DRAWING WAS RECORDED USING REAL-TIME KINETIC (RTK) GPS OBSERVATIONS IN REFERENCE TO UTM 18 NORTH COORDINATE SYSTEM.
- ALL ELEVATIONS ARE IN REFERENCE TO LOCAL DATUM NAD83 - GEODETIC MODEL HT2_0, UNLESS DESCRIBED OTHERWISE.

* * DRAWINGS ARE NOT TO BE SCALED * *

REVISIONS

NO.	DATE	DESCRIPTION	BY

KEY PLAN
SCALE - N.T.S.

LEGEND

SYMBOL	DESCRIPTION
◆	ROAD GRADING - HIGH POINT
⧓	ROAD GRADING - LOW POINT
⏩	ROAD GRADING - GRADE CHANGE
→	LOT DRAINAGE
⇨	OVERLAND FLOW ROUTE
—▶—▶—▶—	REAR YARD SWALE

JEWELL
ENGINEERING

MILL STREET SUBDIVISION
PARK GATE DEVELOPMENT

NORWOOD, ONTARIO
TOWNSHIP OF ASPHODEL-NORWOOD

PRELIMINARY
GRADING PLAN
1 of 4

DRAWN BY: JH	PROJECT NO: 210-5049
DESIGNED BY:	DATE: November 2023
CHECKED BY: AMR	SCALE: HORIZONTAL - 1:600 VERTICAL - N/A
APPROVED BY:	CONTRACT NO:
	DRAWING NO: GR-1

11/09/2023

GR-4

GR-1

STREET F

STREET G

STREET B

STREET C

STREET F

STREET B

PRELIMINARY

GENERAL NOTES:

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** DRAWINGS ARE NOT TO BE SCALED **

REVISIONS

NO.	DATE	DESCRIPTION	BY

KEY PLAN
SCALE - N.T.S.

LEGEND

SYMBOL	DESCRIPTION
	ROAD GRADING - HIGH POINT
	ROAD GRADING - LOW POINT
	ROAD GRADING - GRADE CHANGE
	LOT DRAINAGE
	OVERLAND FLOW ROUTE
	REAR YARD SWALE

JEWELL ENGINEERING

MILL STREET SUBDIVISION
PARK GATE DEVELOPMENT

NORWOOD, ONTARIO
TOWNSHIP OF ASPHODEL-NORWOOD

PRELIMINARY
GRADING PLAN
2 of 4

DRAWN BY: JH	PROJECT NO: 210-5049		
DESIGNED BY:	DATE: November 2023		
CHECKED BY: AMR	SCALE: HORIZONTAL - 1:600 VERTICAL - N/A		
APPROVED BY:	CONTRACT NO:	DRAWING NO: GR-2	

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11/09/2023

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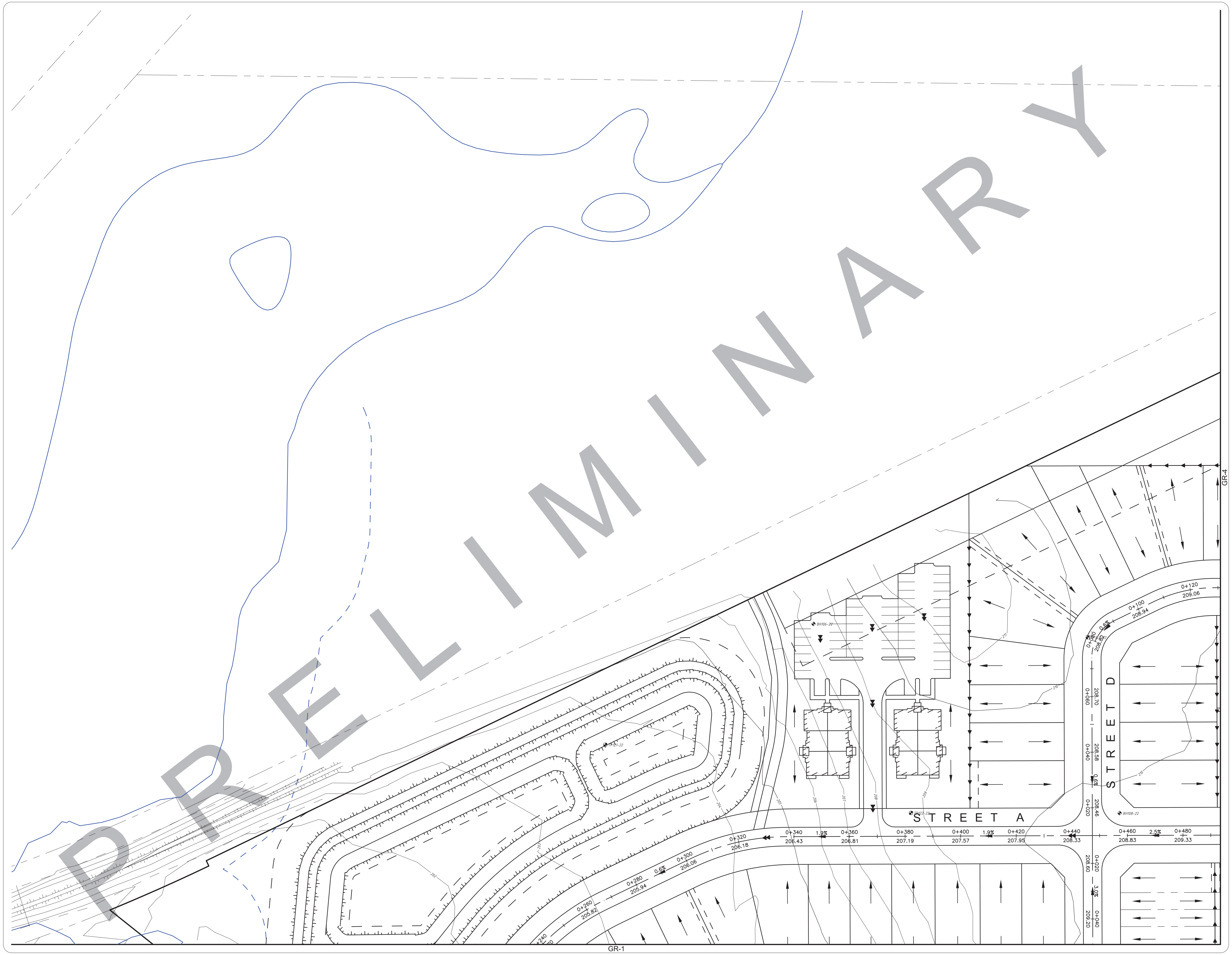

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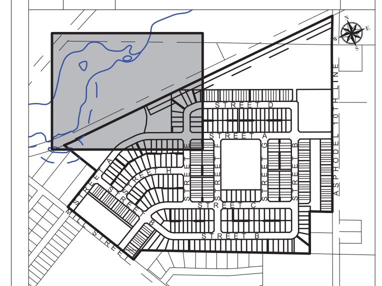
* * DRAWINGS ARE NOT TO BE SCALED * *

REVISIONS

NO.	DATE	DESCRIPTION	BY



KEY PLAN
SCALE - N.T.S.

LEGEND

SYMBOL	DESCRIPTION
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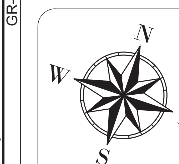
⧓	ROAD GRADING - LOW POINT
▶▶	ROAD GRADING - GRADE CHANGE
→	LOT DRAINAGE
⇨	OVERLAND FLOW ROUTE
→→	REAR YARD SWALE



JEWELL
ENGINEERING

MILL STREET SUBDIVISION
PARK GATE DEVELOPMENT

NORWOOD, ONTARIO
TOWNSHIP OF ASPHODEL-NORWOOD

PRELIMINARY
GRADING PLAN
3 of 4

DRAWN BY: JH	PROJECT NO: 210-5049	
DESIGNED BY:	DATE: November 2023	
CHECKED BY: AMR	SCALE: HORIZONTAL - 1:600 VERTICAL - N/A	
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11/09/2023

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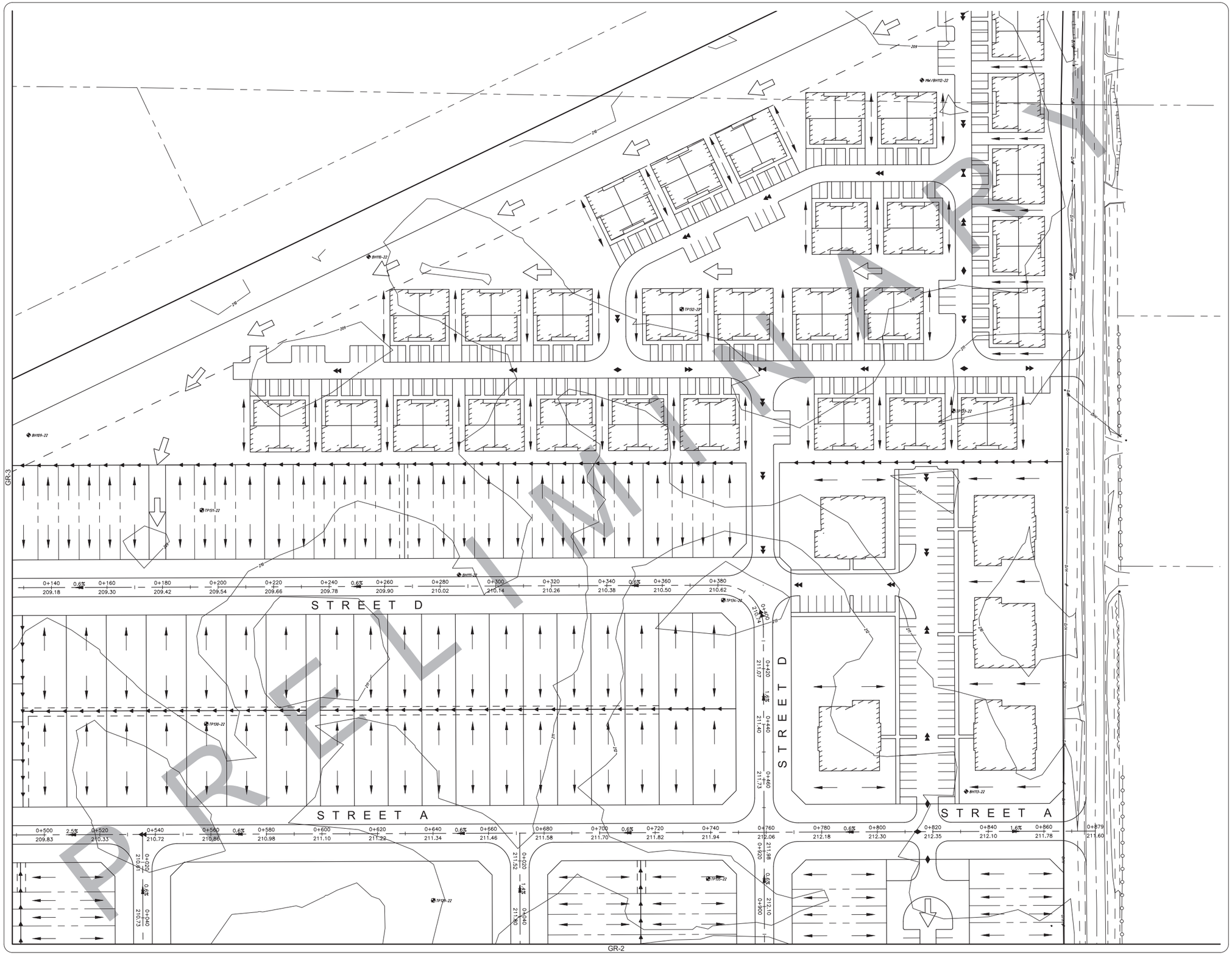

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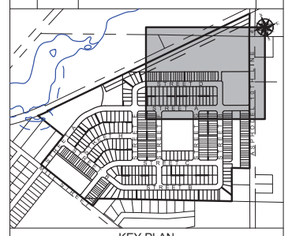
GEOMETRIC NOTE:

- ALL SURVEY DATA SHOWN ON THIS DRAWING WAS RECORDED USING REAL-TIME KINETIC (RTK) GPS OBSERVATIONS IN REFERENCE TO UTM 18 NORTH COORDINATE SYSTEM.
- ALL ELEVATIONS ARE IN REFERENCE TO LOCAL DATUM NAD83 - GEODETIC MODEL HT2_0, UNLESS DESCRIBED OTHERWISE.

** DRAWINGS ARE NOT TO BE SCALED **

REVISIONS

NO.	DATE	DESCRIPTION	BY



KEY PLAN
SCALE - N.T.S.

LEGEND

SYMBOL	DESCRIPTION
	ROAD GRADING - HIGH POINT
	ROAD GRADING - LOW POINT
	ROAD GRADING - GRADE CHANGE
	LOT DRAINAGE
	OVERLAND FLOW ROUTE
	REAR YARD SWALE

N W E S

JEWELL ENGINEERING

MILL STREET SUBDIVISION
PARK GATE DEVELOPMENT

NORWOOD, ONTARIO
TOWNSHIP OF ASPHODEL-NORWOOD

PRELIMINARY
GRADING PLAN
4 of 4

DRAWN BY: JH	PROJECT NO: 210-5049
DESIGNED BY:	DATE: November 2023
CHECKED BY: AMR	SCALE: HORIZONTAL - 1:600 VERTICAL - N/A
APPROVED BY:	CONTRACT NO:
	DRAWING NO: GR-4