

To: Lucy Cui, SvN
From: Peter Middaugh, P.Eng.
CC: Kevin Phillips, AECOM
Date: December 6, 2023
Project #: 60591532

Memorandum

Subject: Bowmanville Secondary Plan – Goodyear Lands – Functional Servicing Report

1. Introduction

The Bowmanville East Urban Centre Secondary Plan Update is being completed by SvN. The vision for the Bowmanville East Urban Centre is to:

- Revive new civic, medical and mixed-use precincts;
- Facilitate new built form and densities to provide a variety of housing, businesses, and essential services;
- Provide a vibrant, cohesively walkable public realm; and
- Be an entertainment, institutional, service, tourism and family destination – welcoming people of all generations, incomes and abilities to live, work and play.

The SvN team has developed Emerging Character Areas to facilitate the implementation of the vision by identifying an approach, objectives and design objectives for each emerging area.

The purpose of this Functional Servicing Report is to provide guidance on the provision water, wastewater and stormwater infrastructure required to service the Goodyear Lands Emerging Character Area. Refer to Figure 1 for the location of the Emerging Character Areas within the Bowmanville East Urban Centre Secondary Plan and the location of the Goodyear Lands within the Secondary Plan.

Figure 1: Emerging Character Areas (Goodyear Lands)



The approach, objectives and design parameters being considered for the Goodyear Lands as an Emerging Character Area are shown in **Figure 2** on page 3.

SvN developed a Concept Plan for the Goodyear Lands to demonstrate how the objectives of the Goodyear Lands Emerging Character Area could be achieved. The Concept Plan is shown in **Figure 3** on page 4.

SvN also developed Demonstration Model Yields for the Concept Plan that provides details on planned land use, floor areas, building heights, residential areas, commercial areas, units and population. The Demonstration Model Yields are shown in **Figure 4** on page 5.

This Functional Servicing Report provides guidance on the servicing of the Concept Plan shown on **Figure 3** and the Demonstration Model Yields specified in **Figure 4**.

Figure 2: Goodyear Lands – Emerging Character Area – Approach, Objectives and Design Parameters

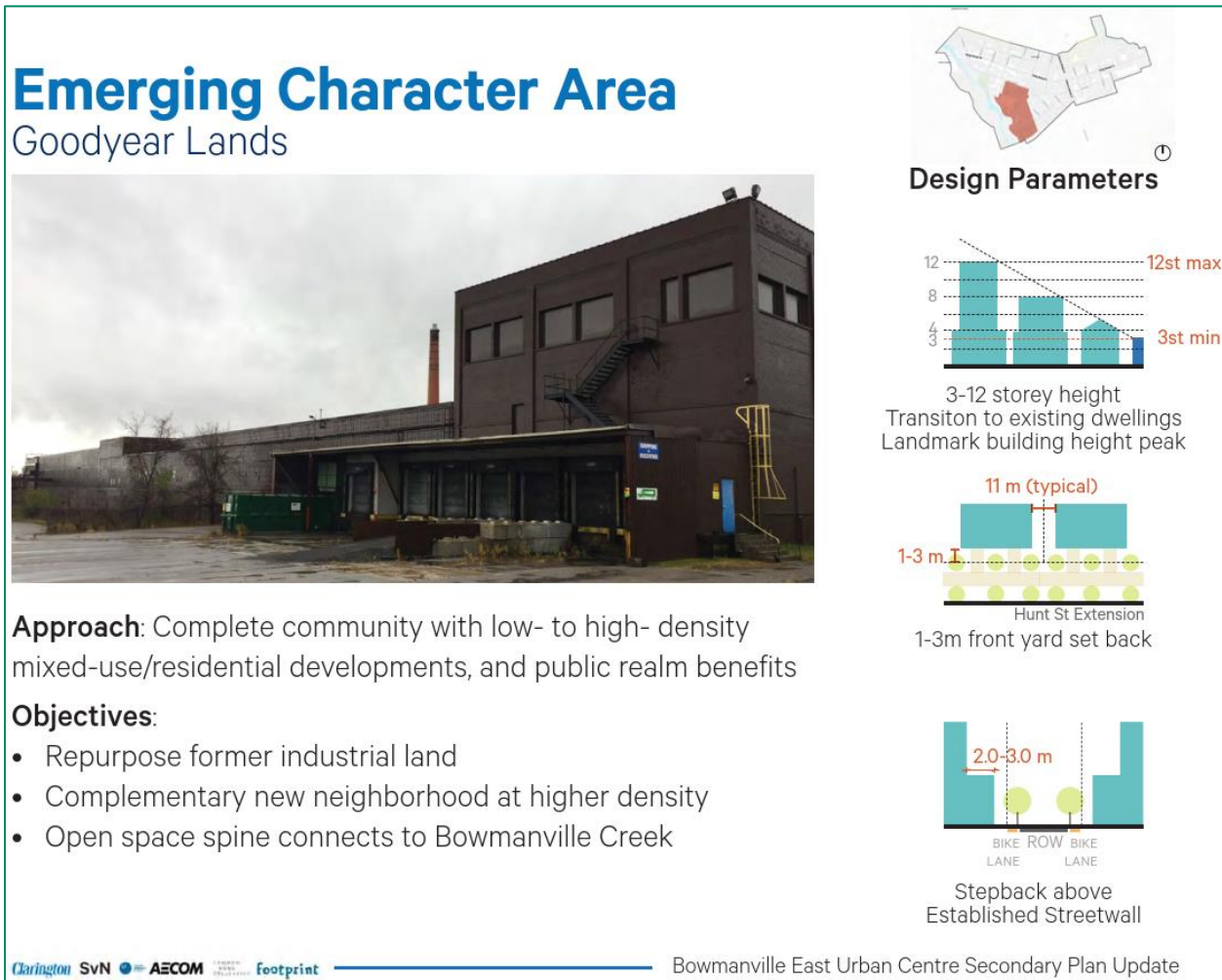


Figure 3: Concept Plan for the Goodyear Lands

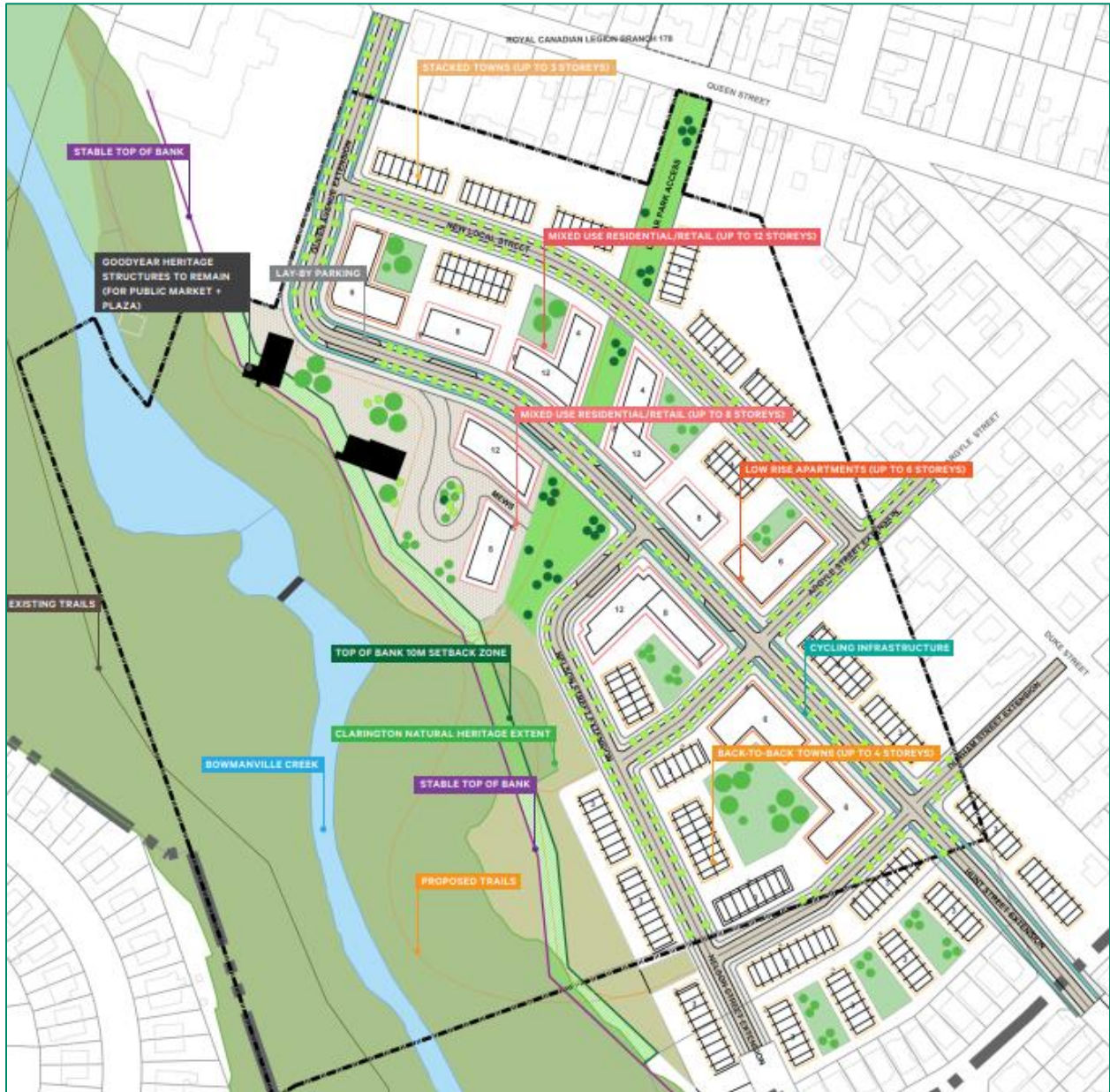


Figure 4: Demonstration Yields for the Goodyear Lands Concept Plan

Bowmanville East Secondary Plan												AECOM PN 60591532		
Demonstration Model Yields For the Goodyear Lands Concept Plan														
Demonstration Model Version 1														
15-Mar-22														
Block ID	Building ID	Land Use	Ground Floor Plate Area (m ²)	Gross Floor Area (m ²)	Building Height (storeys)	Commercial GFA (m ²) = 50% of Ground Floor	Net Residential GFA (m ²)	Gross Unit Size (m ²)	Units	Population per Unit	Residential Population	1 job per 45m ²	Employment (Jobs)	
30a	95	Residential - Townhouse	571	1557	3	0	1557	216	7	1.75	12			
30a	96	Residential - Townhouse	571	1557	3	0	1557	216	7	1.75	12			
30a	97	Residential - Townhouse	498	1343	3	0	1343	216	6	1.75	11			
30b	98	Residential - Townhouse	572	1560	3	0	1560	216	7	1.75	12			
30b	99	Residential - Townhouse	502	1362	3	0	1362	216	6	1.75	11			
30b	100	Residential - Townhouse	570	1552	3	0	1552	216	7	1.75	12			
30c	101	Residential - Apartments	1211	6770	6	0	6770	100	68	1.75	119			
30c	102	Residential - Back To Back Stacked Townhouse	735	2718	4	0	2718	108	25	1.75	44			
30c	103	Mixed Use	799	4671	7	400	4272	100	43	1.75	75	45	9	
30c	104	Mixed Use	1295	9462	12	648	8814	100	88	1.75	154	45	14	
30d	105	Mixed Use	1395	9241	12	697	8544	100	85	1.75	149	45	15	
30d	106	Residential - Back To Back Stacked Townhouse	554	2081	4	0	2081	108	19	1.75	33			
30d	107	Residential - Apartments	644	4041	8	0	4041	100	40	1.75	70			
30d	108	Residential - Apartments	1137	6357	6	0	6357	100	64	1.75	112			
30e	109	Residential - Back To Back Stacked Townhouse	737	2774	4	0	2774	108	26	1.75	46			
30e	110	Residential - Townhouse	570	1552	3	0	1552	216	7	1.75	12			
30f	111	Residential - Townhouse	570	1552	3	0	1552	216	7	1.75	12			
30f	112	Residential - Townhouse	570	1552	3	0	1552	216	7	1.75	12			
30g	113	Mixed Use	984	9114	12	492	8622	100	86	1.75	151	45	11	
30g	113.1	Retail/Commercial	396	396	1	396	0	100	0	1.75	0	45	9	
30g	113.2	Retail/Commercial	479	479	1	479	0	100	0	1.75	0	45	11	
30g	114	Mixed Use	888	5175	7	444	4731	100	47	1.75	82	45	10	
30h	115	Mixed Use	1752	13817	12	876	12941	100	129	1.75	226	45	19	
30h	116	Residential - Back To Back Stacked Townhouse	554	2081	4	0	2081	108	19	1.75	33			
30i	117	Residential - Apartments	1072	5993	6	0	5993	100	60	1.75	105			
30i	118	Residential - Apartments	1101	6154	6	0	6154	100	62	1.75	109			
30i	119	Residential - Townhouse	437	1191	3	0	1191	216	6	1.75	11			
30i	120	Residential - Back To Back Stacked Townhouse	737	2786	4	0	2786	108	26	1.75	46			
30i	121	Residential - Townhouse	574	1565	3	0	1565	216	7	1.75	12			
30j	122	Residential - Townhouse	626	1708	3	0	1708	216	8	1.75	14			
30j	123	Residential - Townhouse	501	1349	3	0	1349	216	6	1.75	11			
30j	124	Residential - Townhouse	501	1349	3	0	1349	216	6	1.75	11			
30j	125	Residential - Townhouse	717	1971	3	0	1971	216	9	1.75	16			
30j	126	Residential - Townhouse	501	1349	3	0	1349	216	6	1.75	11			
30j	127	Residential - Townhouse	501	1349	3	0	1349	216	6	1.75	11			
30k	128	Residential - Townhouse	1213	3289	6	0	3289	216	15	1.75	26			
30l	129	Residential - Townhouse	682	1849	3	0	1849	216	9	1.75	16			
Totals			27716	124668		4431	120236		1026	1.75	1799	360	98	

AECOM prepared an Existing Condition Reports for the Goodyear Lands on September 16, 2020. A copy of the report is attached in Appendix of this Functional Servicing Report.

In the preparation of this Functional Servicing Report AECOM consulted with Region of Durham to update our understanding of the Region’s planned capital improvement projects for this area of Bowmanville and request a copy of the Regions sanitary sewer design sheets for the sanitary sewers that could potentially service the Goodyear Lands. The information received from the Region of Durham during this consultation assisted AECOM in our reporting of the water / wastewater servicing needs for the development of the Goodyear Lands. The following sections of the report provide a summary of our findings.

2. Summary of Findings

2.1 Water Servicing

- No general concerns with providing a sufficient supply of water to the Goodyear Lands given the site has a 400 millimetres feedermain located on it.
- Region of Durham minimum pipe sizes are 150 millimetres for servicing the residential areas and 300 millimetres for the commercial areas. Fire protection demands for the higher density residential areas may trigger the need for watermains larger than 150 millimetres.
- Provide sufficient looping and connection with the existing water distribution system.
- The location of planned building foot prints on the Concept Plan may be in close proximity to the existing 400 millimetres feedermain located on the Goodyear Lands. Consultation with the Region of Durham to assess the need for relocations and other protective measures during the development approval process for the lands.
- Refer to the Watermain Servicing Plan in Appendix B for more information on the potential need to relocate / protect the existing 400 millimetres feedermain and provide a water supply the Goodyear Lands.

2.2 Wastewater Servicing

- The Region do not have any sanitary sewer capacity sheets for the existing sanitary sewers in this area of Bowmanville that they have confidence in the for assessing spare capacities.
- The Region has completed sanitary pipe capacity assessments of their linear assets that service the Goodyear Lands and adjacent lands. The capacity assessment concluded their sanitary sewer sewage collection system is constrained and has identified one potential solution as part of the 2023 Development Charge Background Study. The potential solution is to increase capacity in this area and provide funding for the Region's share of this future potential solution. (Item 308 - Sanitary Sewer on Easement and Hunt Street from Highway 401 to Durham Street (Region Share)).

- Some of the Goodyear site may be able to connect to the existing Queen Street sanitary sewer by gravity.
- The Region is not planning for a pumping station to service this area.
- It is unlikely that that a sanitary sewer can be constructed under the Bowmanville Creek and connect to the existing trunk sanitary sewer on the west side of the creek by gravity.
- Prior to the Region's publication of the 2023 Development Charge Background Study AECOM checked the sanitary flows from the Goodyear Lands and the existing residential lots serviced by the Hunt Street sanitary sewer and the need for external improvements to the Hunt Street sanitary sewer will be a function of the following:
 - The pipe sized needed to service the Goodyear Lands. The pipe size will either be a 200 millimetres or a 250 millimetres based on the pipe slope that can achieved during detailed design for the development of the Goodyear Lands. If a 250 millimetres pipe is required it will trigger the need for external pipe replacements. If a 200 millimetres pipe is required then spare capacity within the existing Hunt Street sanitary sewer between Albert Street and Highway 401 will determine the need for external improvements; and
 - The Region has identified, in their 2023 Background Development Charges Study, the replacement of the existing sanitary sewer on Hunt Street, from Durham Street to Highway 401 as a potential solution to the capacity constraints in the existing sanitary sewer along Hunt Street that will service the Goodyear Lands. The applicant for the Goodyear Lands will need to consult with the Region during the development approval process to obtain updates on the status of implementation of the potential servicing solution identified as Item 308 - Sanitary Sewer on Easement and Hunt Street from Highway 401 to Durham Street (Region Share) in the 2023 Background Development Charges Study.
- It is recommended that during the development approval process for the Goodyear Lands that an assessment of the capacity of the Hunt Street sanitary sewer be completed to determine if there is spare capacity in the

existing Hunt Street sanitary sewer to facilitate a phased development of the Goodyear Lands.

- Refer to Appendix C for a copy of the Sanitary Sewer Check sheet to estimate the existing capacity in the Hunt Street sanitary and thresholds regarding pipe slopes that would trigger the need improvements to the existing Hunt Street sanitary. We caution that this is a high level check and the existing flows may be underestimated and no allowance has been made for other future development that may contribute to the Hunt Street sanitary sewer. This estimate was prepared prior to the Region's publication of the 2023 Development Charge Background Study which has identified the need for a capacity solution and a potential solution.
- Refer to the Sanitary Servicing Plan in Appendix C for more information on the provision of sanitary sewage collection system on the Goodyear Lands.

2.3 Stormwater Servicing

- The concept plan shown in **Figure 3** makes no provision for a footprint for a stormwater management facility.
- Refer to the Stormwater Servicing Plan in Appendix D for the location and approximate area of a stormwater management facility needed to service the Goodyear Lands and the existing 18.6 hectares of the existing urban area that is serviced by the Municipal storm sewer system located on and outletting to the Goodyear Lands.
- Modifications to the existing Municipal storm sewer would be required to implement the concept plan in Figure 3. The modifications may trigger the need for a stormwater management facility to treat the existing runoff from the 18.6 hectares +/- area serviced by the existing Municipal storm sewer.
- With regard to the design of the future minor / major storm sewer drainage system for the Goodyear Lands, the existing stormwater management facility located south of Nelson Street and west of Hunt Street in Block 111 of the Hunt Street Subdivision (18T-93008) detailed on the Storm Sewer Drainage Scheme Drawing No D-3, approved by the Municipality of Clarington on June 22, 2005 was designed to receive 1.39 hectares of the Goodyear Lands based on a runoff coefficient of 0.50. All the future catchbasins in this 1.39 hectares drainage area will need to be fitted with

inlet control devices to restrict flows to 20 Litres per second. The approximate boundaries of this 1.39 hectares drainage area within the Goodyear Lands as shown on the Concept Plan in **Figure 3** would be the Durham Street Extension to the north, Hunt Street Extension the east and the Nelson Street Extension to the west and the rear lot line of existing lots fronting on Albert Street.

- It is recommended that the Municipality of Clarington and the Developer of the Goodyear Lands prepare a Master Drainage Report to determine the preferred solution for the management of runoff from the 12.0 hectares +/- Goodyear Lands and the 18.6 hectares +/- area currently serviced by the existing storm sewer system.
- Refer to Appendix E for a table that identifies considerations that could be given in the development of the Goodyear Lands to achieve the Watershed Health Targets of Bowmanville / Soper Creek Watershed Plan, Final April 2013.

Appendix A

**Existing Condition Reports
for the Goodyear Lands on
September 16, 2020**



To:
SvN

CC:
Kevin Phillips, AECOM

Project name:
Bowmanville Secondary Plan

Project ref:
60591532

From:
Peter Middaugh

Date:
September 16, 2020

Memorandum

Existing Conditions – Former Goodyear Lands

Sanitary Sewage Servicing

We have no records of how the former Goodyear lands are currently serviced.

Based on a review of the Regional Sanitary Sewage Collection System plans we assume the site is currently serviced by the existing 300mm sanitary sewer located on Queen Street. The Queen Street sanitary outlets to the Region's trunk sanitary sewer system located on Ontario Street. Given the topography of the Goodyear lands fall away from Queen Street, it is possible the buildings on the former Goodyear site were serviced by sewage pumps with forcemains that discharged the effluent to the Queen Street sanitary sewer. Refer to Figure 1 on page 2 for the existing sanitary sewage collection system located adjacent to the former Goodyear lands.

The former Goodyear lands are located in close proximity to the Region's trunk sanitary sewage collection system located on Ontario Street and along the west side of the Bowmanville Creek.

Servicing options for the development of the former Goodyear lands are as follows:

1. Provide sanitary sewage pumping station and connect to the existing sanitary sewer on Ontario Street;
2. Connect to the existing trunk sanitary sewer along the west side of the Bowmanville Creek by means of a trenchless water crossing of the creek at the south end of the former Goodyear lands. The Region is planning to complete twinning improvements to downstream sections of this trunk sanitary sewer and as such this may be an opportunity to provide a gravity outlet for the entire site.

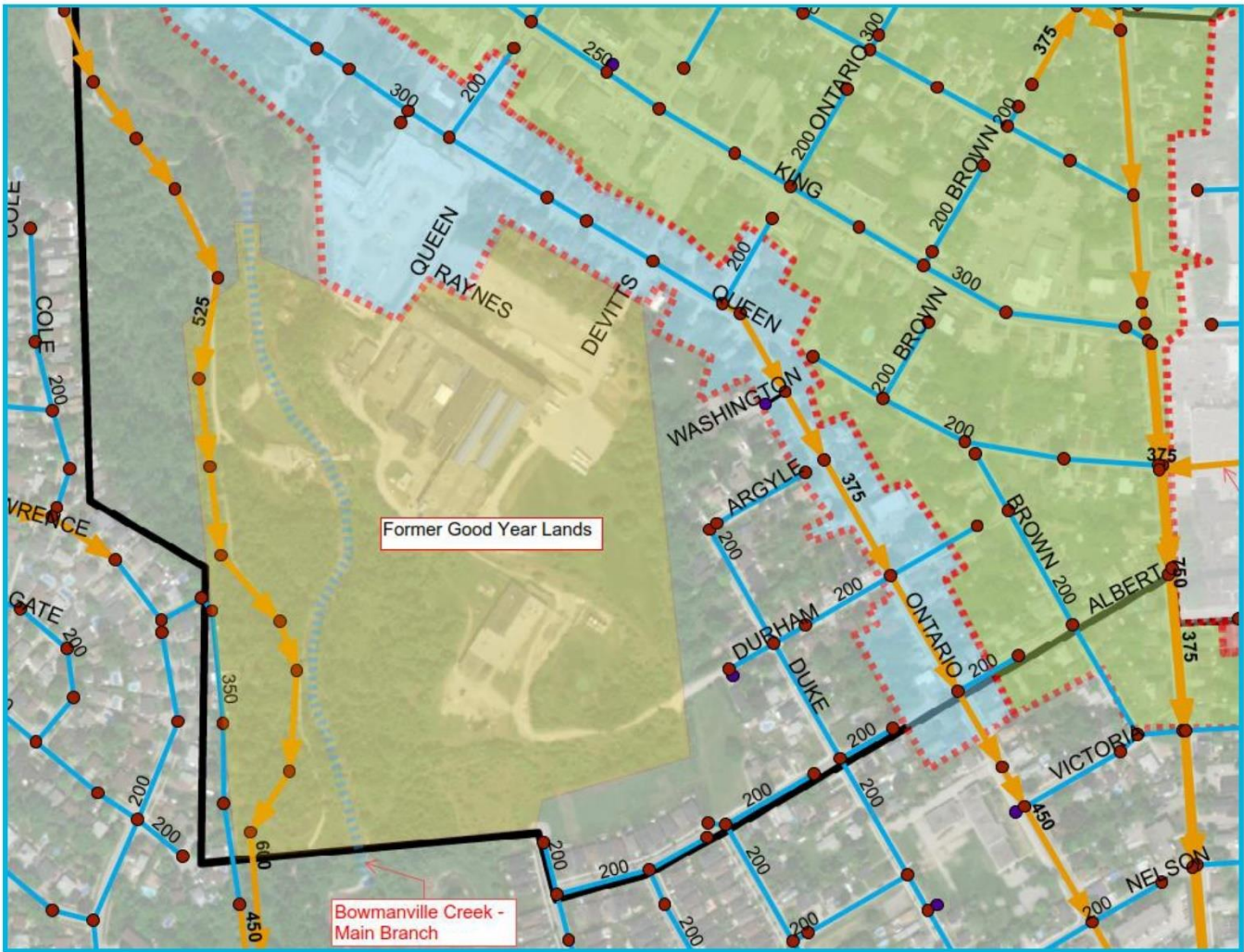


Figure 1 - Existing Sanitary Sewage Collection System

Watermain Servicing

The former Goodyear lands has an existing 400mm feedermain located along the north and east boundary of the site. Linear infrastructure upgrade needs to facilitate the delivery of an adequate water supply to future development on the site will be minimal. Consultation with the Region will be completed to understand any constraints related to storage / treatment needs and the timing of any such improvements to the Region's water supply system.

Refer to Figure 2 on page 4 for the existing water distribution system in proximity to the former Goodyear lands.

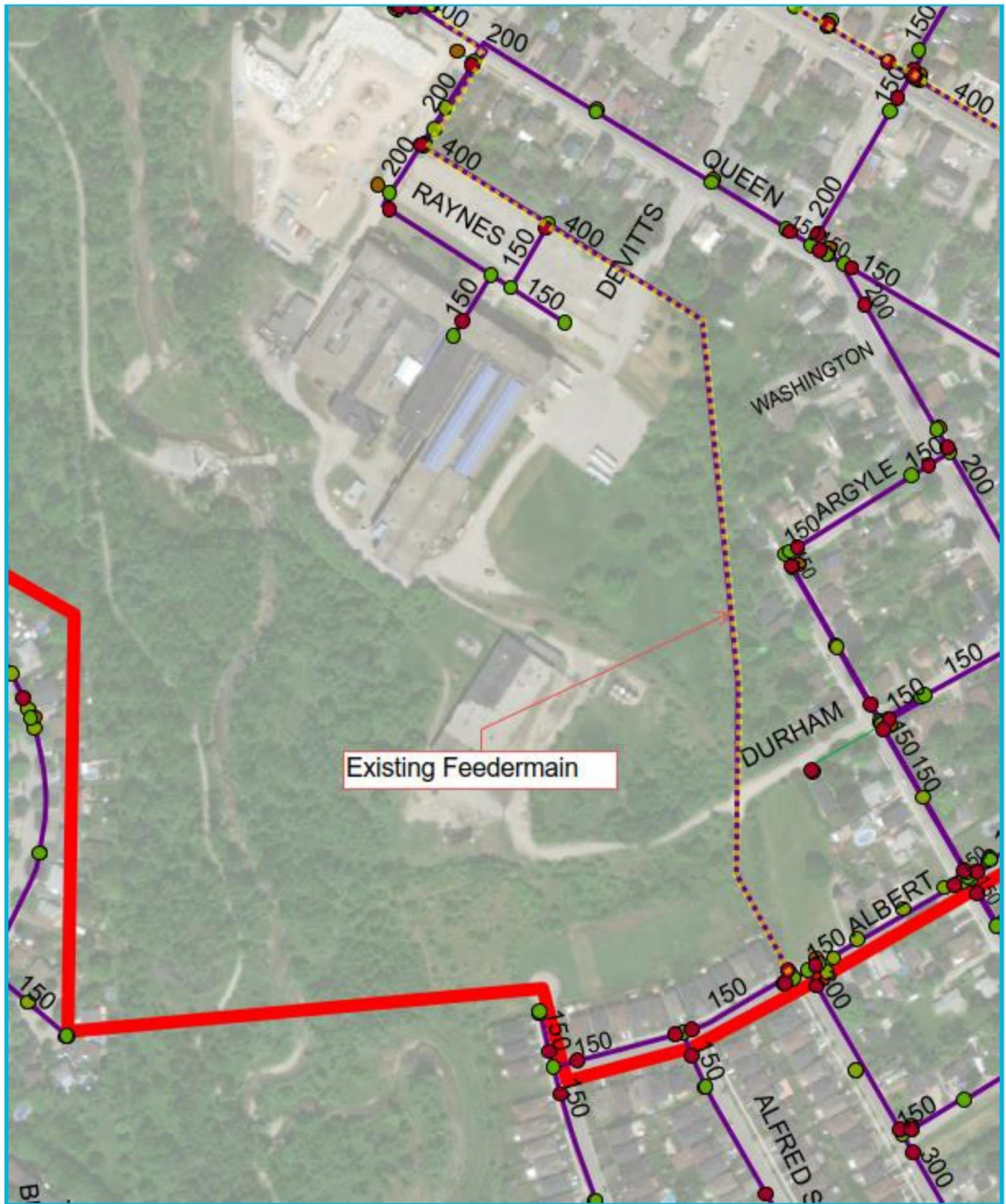


Figure 2 - Existing Water Distribution System

Storm Drainage Servicing

We have no records of the existing private storm sewers that may service the existing lands. Regardless the existing system, if one exists, would likely be deemed insufficient to service the re-development of the lands.

Approximately 14.3 Ha of the former Goodyear lands are located on the east side of the Bowmanville Creek valley. The re-development of the former Goodyear lands will provide an opportunity to provide a new storm sewer system and any necessary quantity / quality control measures as prescribed by the Central Lake Ontario Conservation Authority (CLOCA).

There is an existing municipal storm sewer system that outlets through the former Goodyear lands. The existing storm sewer system services a contributing area of approximately 18.59 ha. The redevelopment of the former Goodyear lands will provide an opportunity for the Municipality to implement an end-of-pipe water quality control facility on the former Goodyear lands.

Refer to Figure 3 for the existing storm drainage systems in proximity to the former Goodyear lands.

Constraints and Opportunities

AECOM has highlighted in the table below several constraints and opportunities for stormwater management improvements for the Goodyear site and ultimately Outlet #1. As indicated in the Bowmanville/Soper Creek Watershed Plan (completed in April 2013 by CLOCA) and the latest CLOCA Technical Guidelines for Stormwater Management Submissions, the Goodyear site is required to meet stormwater management targets for water quality, water quantity, groundwater recharge, and erosion protection. Within these constraints are opportunities to improve the effectiveness of the municipal storm sewer system. AECOM recommends that pre-consultation between Goodyear, the Municipality, and CLOCA to determine a conceptually approved plan to address surface runoff from a proposed Goodyear site development.

<u>Constraints</u>	<u>Opportunities</u>
<ul style="list-style-type: none"> • <u>Water Quantity Control:</u> Manage stormwater runoff to maintain pre-development peak flow rates to receiving streams runoff for the 1:2-year through 1:100-year storm events and the Regional Event (Hurricane Hazel). Proposed development to also maintain existing watershed boundaries and drainage patterns 	<ul style="list-style-type: none"> • Utilize a treatment train approach (lot level, conveyance system, and end of pipe in conjunction with each other) to mitigate all impacts to water quality and groundwater recharge, including thermal impacts • Goodyear land to discharge separately to Bowmanville Creek, which would provide additional capacity to the existing municipal storm sewer system.

- **Water Quality:** Achieve Enhanced-Level (80% total suspended solids removal) and reduce thermal impacts.
- **Water Balance:** Match pre- and post-development groundwater recharge volumes.
- **Stream Erosion:** Runoff from a 25 mm rainfall event must be retained onsite through infiltration, evapotranspiration, reuse, bioretention etc. to the maximum extent practical with a minimum of 5 mm. Any remaining runoff volume from the 25mm event must be detained onsite for 24 to 48hours.
- Water quality improvements to Outlet #1, near the discharge location to Bowmanville Creek, to improve overall water quality within the Outlet #1 catchment area.
- Capture roof water as potential source for infiltration opportunities
- If repairs/upgrades to the existing outlet are required or new outlet is proposed, assess proposed outlet to ensure erosion rates are not aggravated and that natural heritage features are not impacted. Restoration and compensation should be considered for vegetation removal.

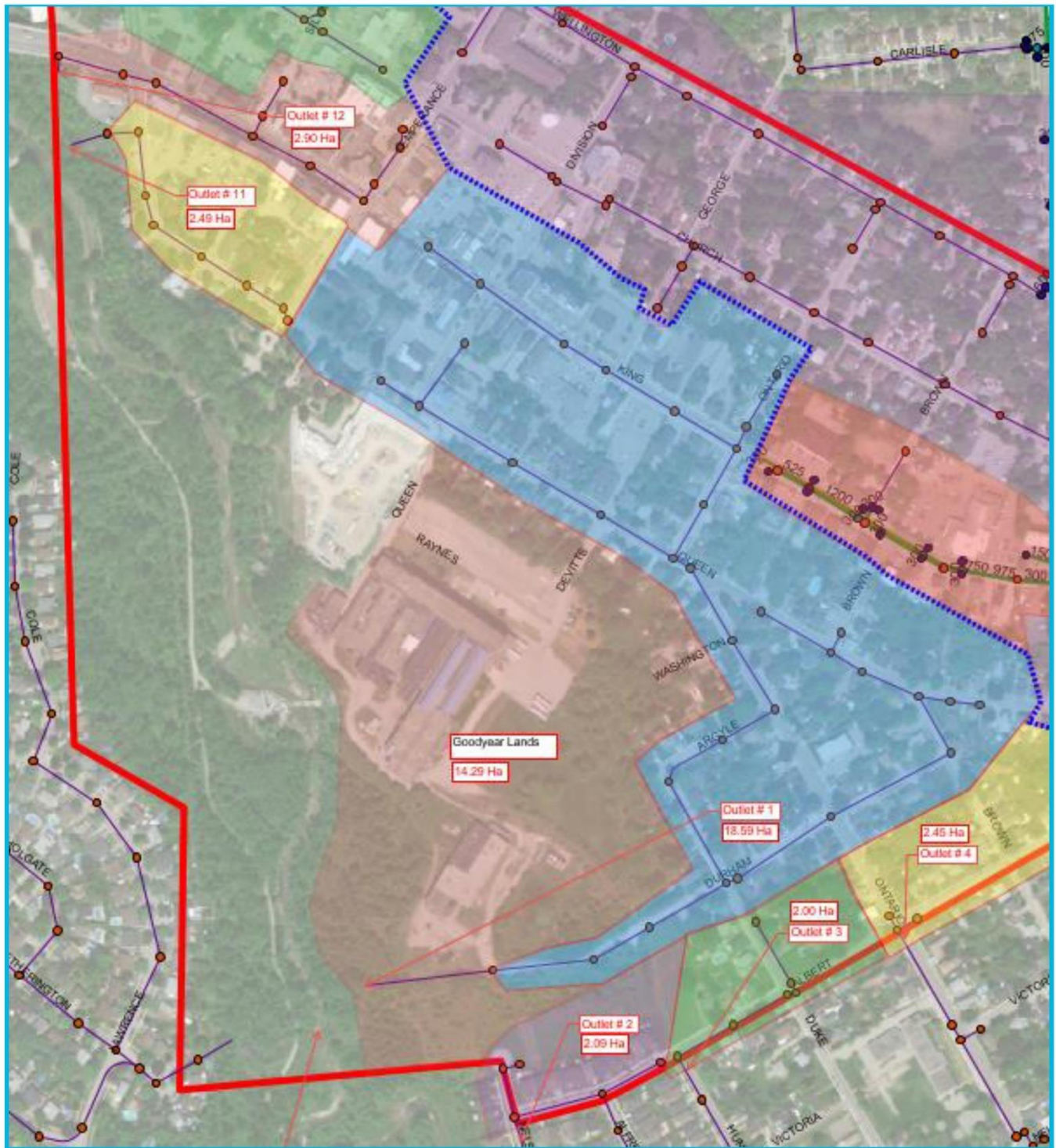


Figure 3 - Existing Storm Drainage Systems

Appendix B

**Watermain Servicing Plan for the
Goodyear Lands Concept Plan**



Existing 400mm Feedermain
Ex Feedermain from Queen St to the Linear Park Access could possibly be retained subject to consultation with the Region of Durham. Length = 225m +/-.

Existing 400mm Feedermain
Ex Feedermain from the Linear Park Access to approximately Albert St may need to be relocated to shown. Length of the 400mm FM that may need to be removed and / or abandoned is 400m +/-.

Existing 150mm watermains and service connections to be removed. Length = 200m +/-

Region of Durham planning to replace existing 150mm w/m with new 150mm along Brown St from Victoria St to Queen St.

Sizes and looping of watermains shall be determined at the preliminary stage of a development application through consultation with the Region of Durham.

The minimum pipe size requirements are as follows :

- Residential areas = 150 mm diameter
- Commercial areas = 300 mm diameter

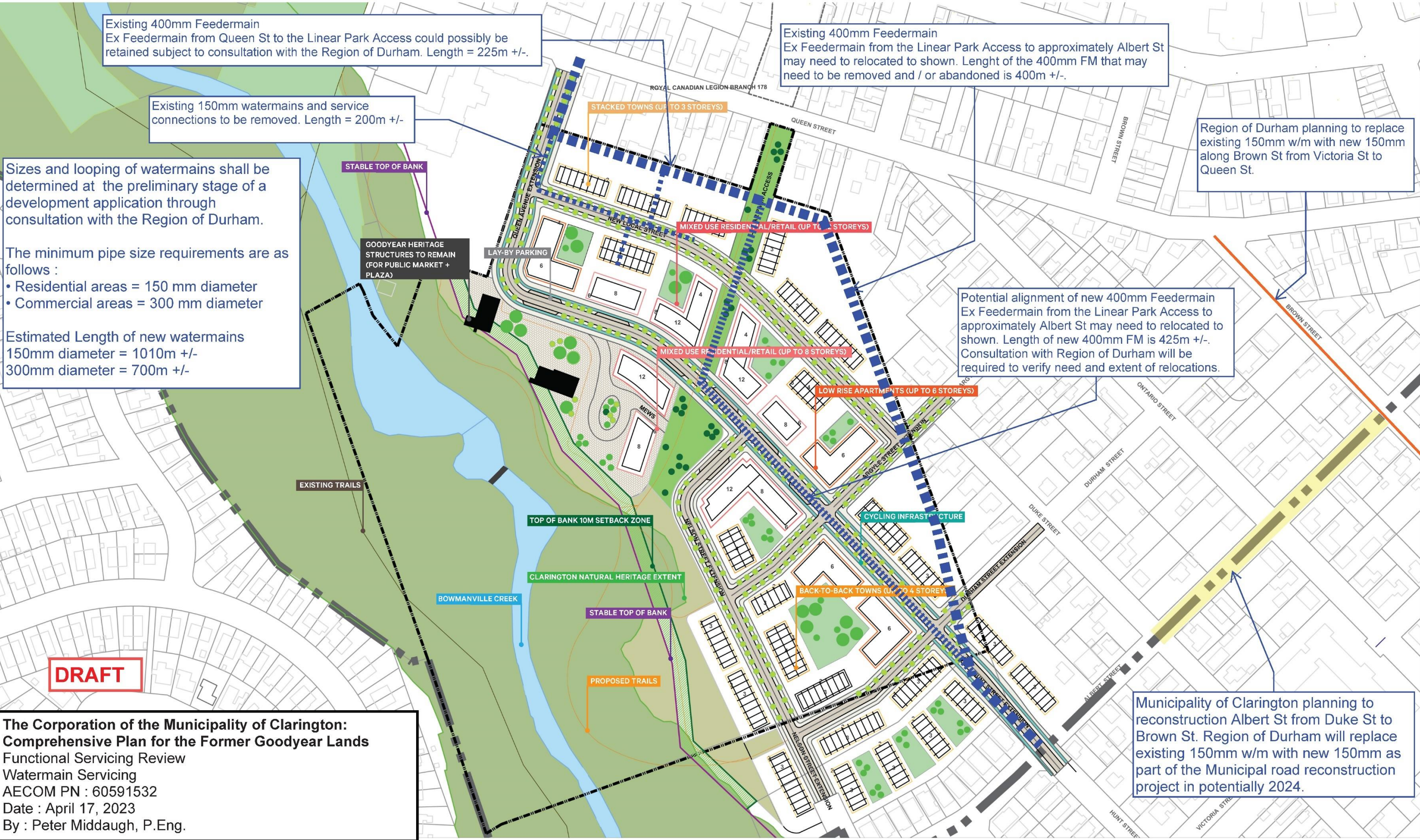
Estimated Length of new watermains
150mm diameter = 1010m +/-
300mm diameter = 700m +/-

Potential alignment of new 400mm Feedermain
Ex Feedermain from the Linear Park Access to approximately Albert St may need to be relocated to shown. Length of new 400mm FM is 425m +/-.
Consultation with Region of Durham will be required to verify need and extent of relocations.

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**The Corporation of the Municipality of Clarington:
Comprehensive Plan for the Former Goodyear Lands**
Functional Servicing Review
Watermain Servicing
AECOM PN : 60591532
Date : April 17, 2023
By : Peter Middaugh, P.Eng.

Municipality of Clarington planning to reconstruction Albert St from Duke St to Brown St. Region of Durham will replace existing 150mm w/m with new 150mm as part of the Municipal road reconstruction project in potentially 2024.



Appendix C

**Sanitary Servicing Plan for the
Goodyear Lands Concept Plan**





REGIONAL MUNICIPALITY OF DURHAM - WORKS DEPARTMENT

SANITARY SEWER CHECK SHEET FOR EXISTING CONDITIONS
(METRIC)



MUNICIPALITY: Municipality of Clarington
PROJECT: Bowmanville East Secondary Plan - FSR Goodyear Lands

DESIGNED BY:
CHECKED BY: P. Middaugh
MANNING'S "n": 0.013
DATE: 04/14/2023
PROJECT: 60591532

- NOTES:**
- 1) MINIMUM VELOCITY = 0.6 m/s
 - 2) MAXIMUM VELOCITY = 3.65 m/s
 - 3) INFILTRATION 0.26 l/s = 22.5 m3/ha/D
 - 4) COMMERCIAL = 180cub.m/gfa/day = 2.08 l/s
 - 5) EXISTING CONDITION INCLUDES COMMITTED DEVELOPMENT
 - 6) USE ACTUAL METRIC I.D PIPE SIZE IN mm
 - 7) COMMERCIAL FLOOR SPACE INDEX=50% UNLESS OTHERWISE KNOWN
 - 8) 364 l/person/day = 0.004213 l/person/s

$$Q_{(d)} = \frac{P \cdot q \cdot M}{86.4} + I \cdot A$$

$Q_{(d)}$ = Peak Domestic Flow(L/s)
 P = Population (in 1000 capitas)
 q = Average daily flow per capita day (L/day/capita)
 M = Harmon Peaking Factor (min 2)
 A = Area (ha)

$$M = \left(1 + \frac{14}{4 + P^{1/2}} \right) > 2.0$$

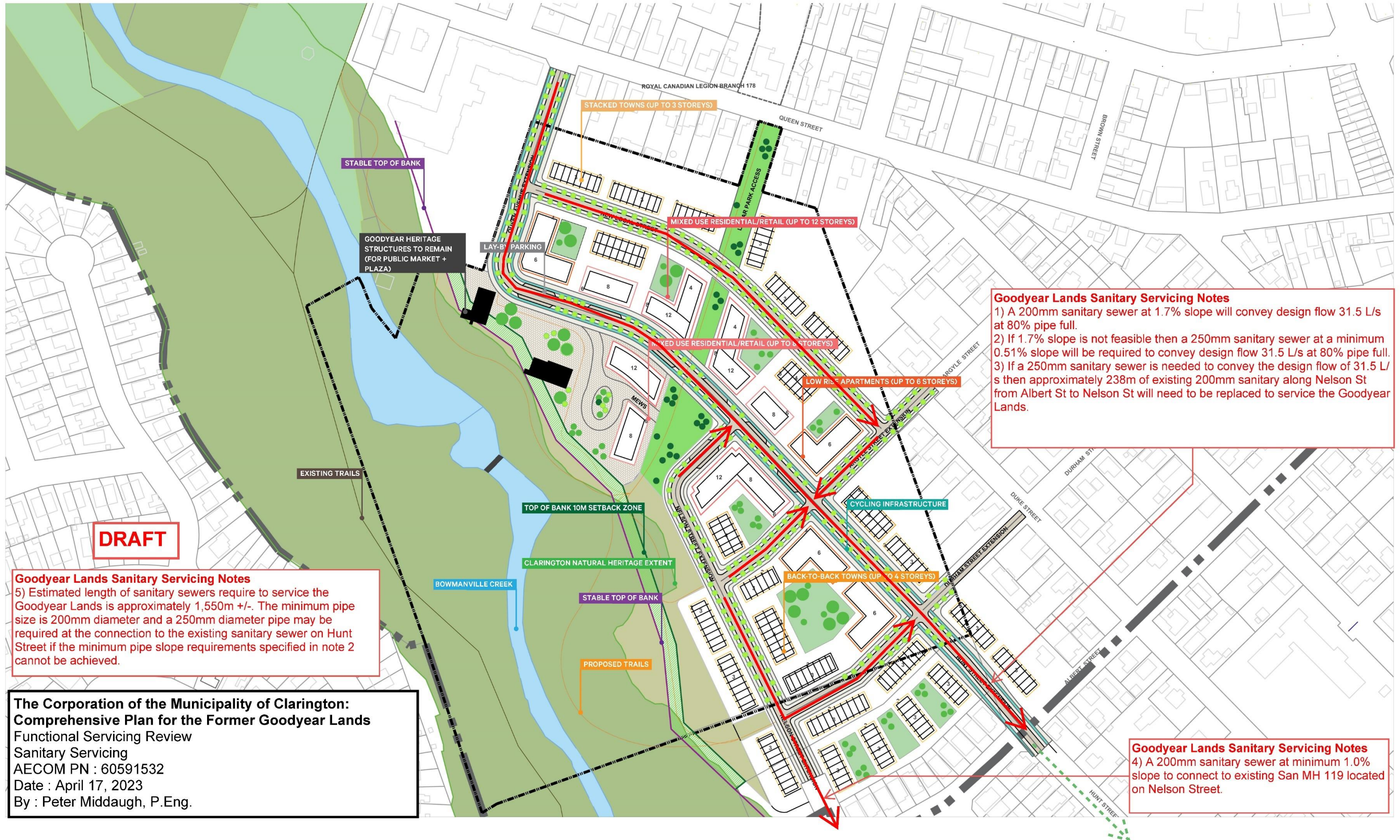
$$Q_{(p)} = \frac{1}{n} \cdot A \cdot R^2 \cdot S^{1/2}$$

$Q_{(p)}$ = Flow Capacity of Sewer(m^3/s)
 A = Cross Sectional Area (m^2)
 R = Hydraulic Radius (m)
 S = Sewer Slope (m/m)
 n = Mannings Roughness Coef.

I = Infiltration (0.28 L/s / ha)

SUBDIVISION AREA MAINTENANCE HOLE	RESIDENTIAL				COMMERCIAL			INDUST.	INSTIT.	FLOW IN LITRES PER SECOND						EXISTING SEWER				PRESENT CONDITION		
	GROSS AREA (HA)	POP DENSIT Y (PERSONS/11A)	POP.	PEAK FLOW FACTOR	LOT AREA (Ha)	FLOOR SPACE INDEX	FLOOR AREA (Ha)	LOT AREA (Ha)	LOT AREA (Ha)	RESIDENTIAL FLOW		COMM. 2.08 l/s/ha	INDUS. 2.08 l/s/ha	INSTIT. 2.08 l/s	TOTAL FLOW Q (d) l/s	PIPE SIZE (mm)	SLOPE %	Q(p) l/s	V m/s	SURCHARGED %		
										INFIL 0.26 l/s	SEWAGE 0.00421 l/s											
HUNT STREET OUTLET FOR THE GOODYEAR LANDS																						
Goodyear Lands	Ex MH 117	Hunt St / Albert St	12.00	150.00	1800	3.62	0.88	0.50	0.44	0.00	0.00	3.12	27.46	0.92	0.00	0.00	31.50	200.00	1.50%	40.17	1.28	78%
			12.00	0.00	1800	3.62	0.88	0.50	0.44	0.00	0.00	3.12	27.46	0.92	0.00	0.00	31.50	250.00	0.50%	42.05	0.86	75%
HUNT STREET - ALBERT ST TO NELSON STREET (Existing Sanitary Flows based on Lot Count and 3.5 persons per SFD)(41 Lots x 3.5 persons / SFD = 144 persons +/-)																						
Ex MH 117	at Albert St	Ex MH 165	at Nelson St	2.62	55.00	144	3.80	0.00	0.50	0.00		0.68	2.31	0.00	0.00	0.00	2.99	200.00	1.00%	32.80	1.04	9%
HUNT STREET - ALBERT ST TO NELSON STREET (Existing Sanitary Flows based on Lot Count and 3.5 persons per SFD plus Goodyear Sanitary Flows)																						
Ex MH 117	at Albert St	Ex MH 165	at Nelson St	14.62		1944	3.60	0.88	0.50	0.44		3.80	29.45	0.92	0.00	0.00	34.17	250.00	0.51%	42.47	0.87	80%
HUNT STREET - NELSON ST (MH 165) TO 71, SOUTH TO MH 164 (CHECK CAPACITY OF EXISTING 250MM SANITARY SEWER) (98 SFD at 3.5 Persons / Unit = 343 Persons, Area = 6.3 Ha)																						
Ex MH 165	at Nelson St	Ex MH 164	(71m d/s of MH 165)	20.92		2287	3.54	0.88	0.50	0.44		5.44	34.11	0.92	0.00	0.00	40.47	250.00	1.20%	65.14	1.33	62%
HUNT STREET - PINE ST (MH 086) TO BASELINE RD (MH 031) (57 SFD at 3.5 Persons / Unit = 200 Persons, Area = 6.5 Ha)																						
Ex San MH 086	Pine St	San MH 031		27.42		2487	3.51	0.88	0.50	0.44		7.13	36.78	0.92	0.00	0.00	44.83	250.00	1.40%	70.36	1.43	64%

Above assessment assumes the existing 200mm sanitary sewer on Duke St at the intersection of Victoria Street flows south along Duke St and there is **NO** splitting of flows at San MH 181 to the Hunt St sanitary sewer system vi San MH 169



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Goodyear Lands Sanitary Servicing Notes
 5) Estimated length of sanitary sewers require to service the Goodyear Lands is approximately 1,550m +/- . The minimum pipe size is 200mm diameter and a 250mm diameter pipe may be required at the connection to the existing sanitary sewer on Hunt Street if the minimum pipe slope requirements specified in note 2 cannot be achieved.

Goodyear Lands Sanitary Servicing Notes
 1) A 200mm sanitary sewer at 1.7% slope will convey design flow 31.5 L/s at 80% pipe full.
 2) If 1.7% slope is not feasible then a 250mm sanitary sewer at a minimum 0.51% slope will be required to convey design flow 31.5 L/s at 80% pipe full.
 3) If a 250mm sanitary sewer is needed to convey the design flow of 31.5 L/s then approximately 238m of existing 200mm sanitary along Nelson St from Albert St to Nelson St will need to be replaced to service the Goodyear Lands.

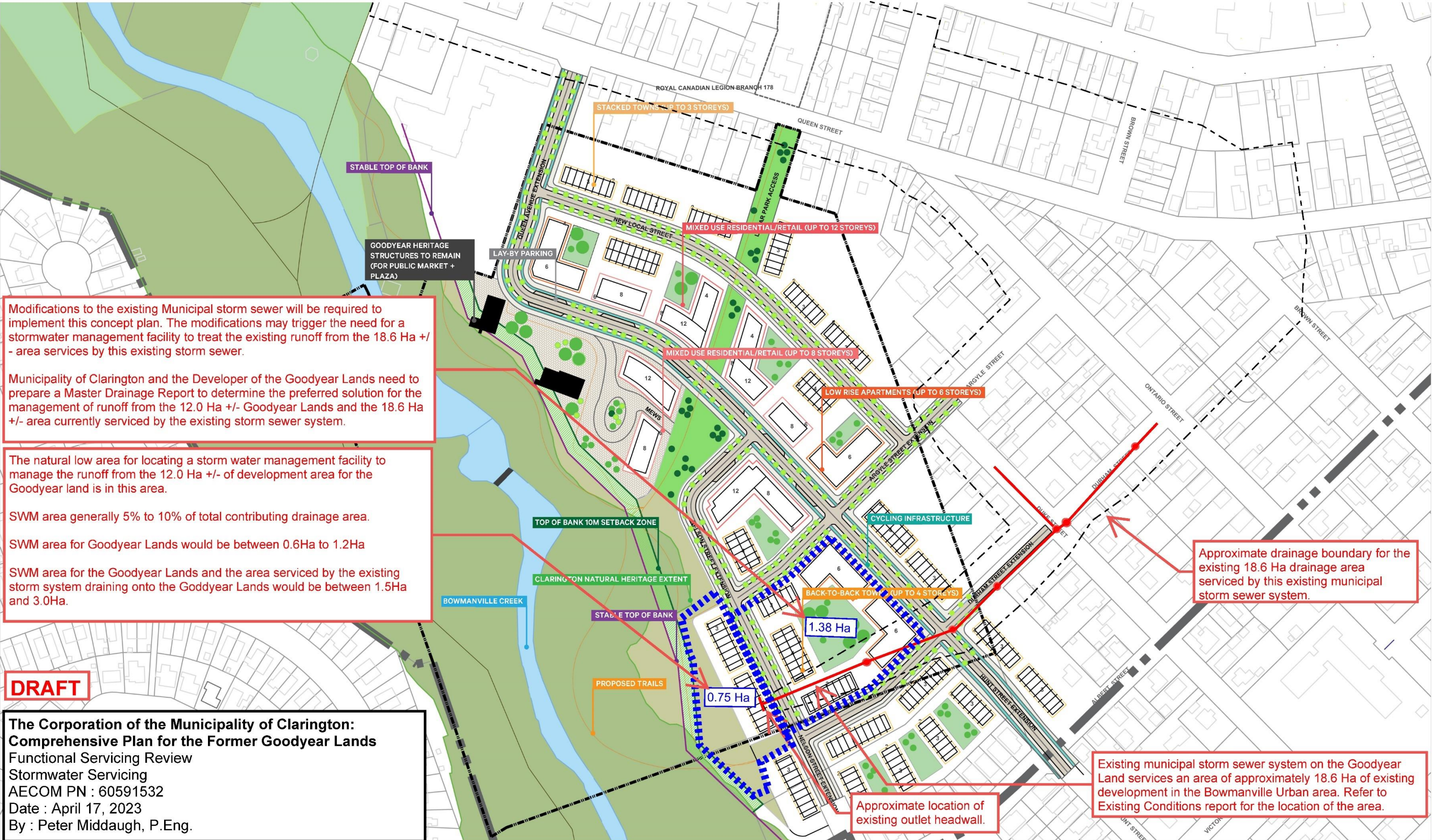
Goodyear Lands Sanitary Servicing Notes
 4) A 200mm sanitary sewer at minimum 1.0% slope to connect to existing San MH 119 located on Nelson Street.

The Corporation of the Municipality of Clarington:
Comprehensive Plan for the Former Goodyear Lands
 Functional Servicing Review
 Sanitary Servicing
 AECOM PN : 60591532
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 By : Peter Middaugh, P.Eng.

Appendix D

Stormwater Servicing Plan for the Goodyear Lands Concept Plan





Modifications to the existing Municipal storm sewer will be required to implement this concept plan. The modifications may trigger the need for a stormwater management facility to treat the existing runoff from the 18.6 Ha +/- area services by this existing storm sewer.

Municipality of Clarington and the Developer of the Goodyear Lands need to prepare a Master Drainage Report to determine the preferred solution for the management of runoff from the 12.0 Ha +/- Goodyear Lands and the 18.6 Ha +/- area currently serviced by the existing storm sewer system.

The natural low area for locating a storm water management facility to manage the runoff from the 12.0 Ha +/- of development area for the Goodyear land is in this area.

SWM area generally 5% to 10% of total contributing drainage area.

SWM area for Goodyear Lands would be between 0.6Ha to 1.2Ha

SWM area for the Goodyear Lands and the area serviced by the existing storm system draining onto the Goddyear Lands would be between 1.5Ha and 3.0Ha.

Approximate drainage boundary for the existing 18.6 Ha drainage area serviced by this existing municipal storm sewer system.

Approximate location of existing outlet headwall.

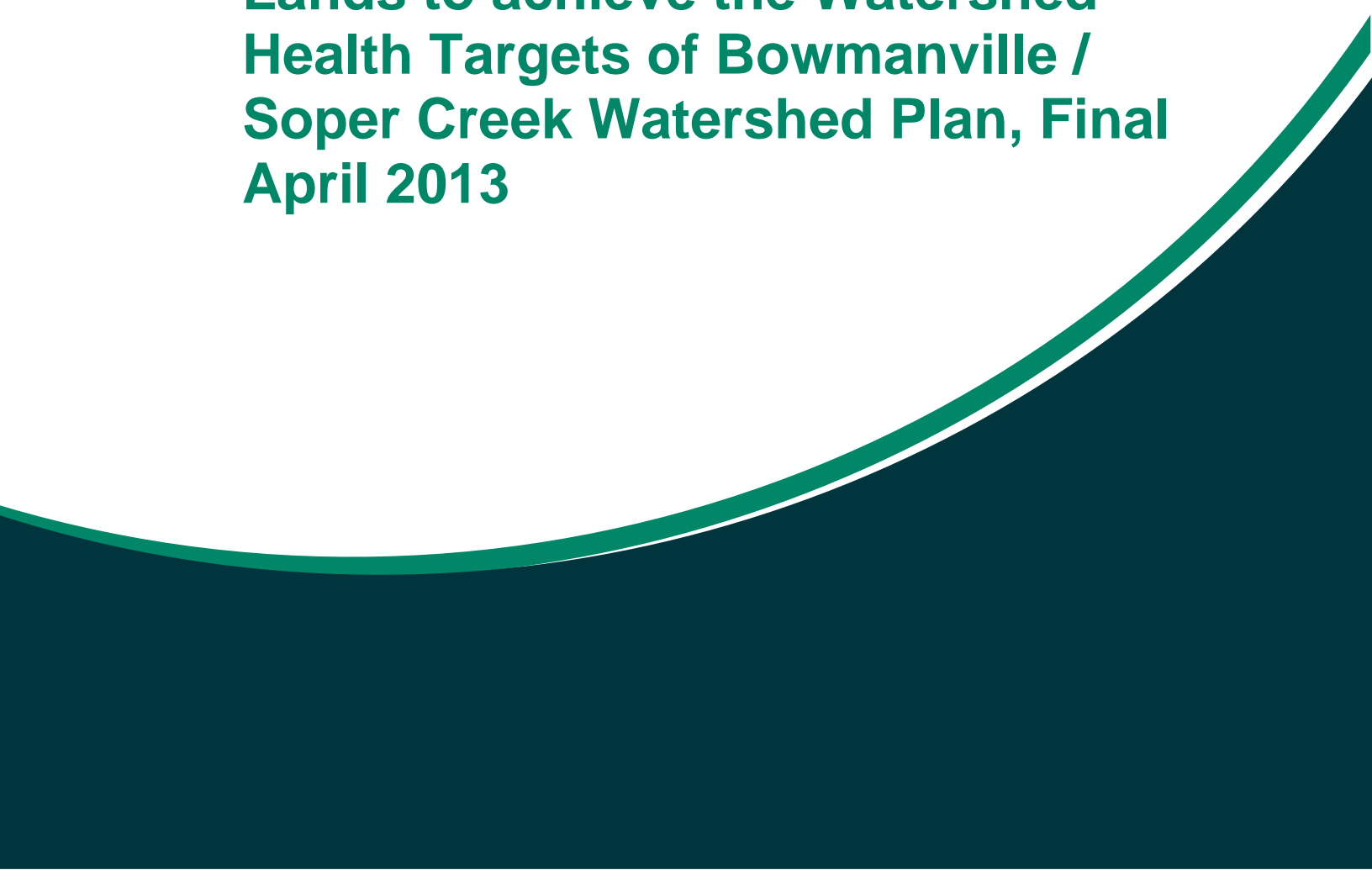
Existing municipal storm sewer system on the Goodyear Land services an area of approximately 18.6 Ha of existing development in the Bowmanville Urban area. Refer to Existing Conditions report for the location of the area.

DRAFT

The Corporation of the Municipality of Clarington:
Comprehensive Plan for the Former Goodyear Lands
 Functional Servicing Review
 Stormwater Servicing
 AECOM PN : 60591532
 Date : April 17, 2023
 By : Peter Middaugh, P.Eng.

Appendix E

**Considerations that could be given
in the development of the Goodyear
Lands to achieve the Watershed
Health Targets of Bowmanville /
Soper Creek Watershed Plan, Final
April 2013**





Consideration to Watershed Health Targets in Table 10 of the Bowmanville / Soper Creek Watershed Plan, Final April 2013)				
Component	Indicators	Existing Conditions	Targets	Consideration on Goodyear Lands
Limit impervious land cover in watershed	Percent imperviousness	Bowmanville Main = 15.1%	<p>Decrease in % imperviousness in urban areas</p> <p>Increase the use of Low Impact Development (LID) / green technologies for future development and retrofits to existing development where applicable</p>	<p>Consider smaller building footprints and greater number of floors to achieve planned densities.</p> <p>Utilize LID measures within a treatment train approach (lot level, conveyance system, and end of pipe in conjunction with each other) to mitigate all impacts to water quality and groundwater recharge, including thermal impacts</p> <p>Capture roof water as potential source for infiltration opportunities.</p> <p>Municipality to implement LID's in the 18.6 Ha area, external to the Goodyear Lands, that currently outlet onto the Goodyear Lands by means of capital works projects and development approvals.</p>
Protect human life and property	Flood Damage Centres	Flood damage centre located d/s of the Goodyear Lands	<p>Limit flood damages and prevent further flood damage Centres.</p> <p>All new infrastructure to have no impediment to natural overland / surface water flows.</p>	<p>Municipality and Developer of the Goodyear Lands to prepare a swm report to assess of the risks to the d/s Flood Damage Centre are mitigated by maintaining pre-development peak flow rates, considering the proximity of the Goodyear Lands to Lake Ontario.</p> <p>Major storm overland flow routes will be identified and design to manage the major event.</p>



Consideration to Watershed Health Targets in Table 10 of the Bowmanville / Soper Creek Watershed Plan, Final April 2013)				
Component	Indicators	Existing Conditions	Targets	Consideration on Goodyear Lands
Maintain pre-development peak flow rates from stormwater runoff	Peak flow rates	See table 2 of Chapter 15, Existing Conditions Report, Page 7.	Peak flow rates on receiving streams must not exceed corresponding pre-development rates for the 1:2-year through 1:100-year design storm events and the Regional Event (Hurricane Hazel) <i>Note: exceptions include areas in proximity to Lake Ontario or where Master Plans exist and state otherwise.</i>	Municipality and Developer of the Goodyear Lands to prepare a swm report to assess of the risks to the d/s Flood Damage Centre are mitigated by maintaining pre-development peak flow rates, considering the proximity of the Goodyear Lands to Lake Ontario.
Effective and efficient performance of Stormwater Management Facilities	Existing and new facilities	10 Stormwater Management (SWM) ponds. 2 Oil Grit Separators (OGSS)	<ul style="list-style-type: none"> • Achieve enhanced Level 1 requirements • Reduce thermal impacts • Achieve intended designed flow control • Reduce the number of structures impacted by flooding • Reduce the number of flooding complaints • New stormwater management facilities to mitigate all impacts to water quality including stream temperature • Improve existing stormwater management facilities to reduce adverse ecological impacts of development 	SWM report for the development of the lands to consider and assess how the targets can be achieved to the satisfaction of CLOCA and the Municipality.