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PROPOSED REDEVELOPMENT
1755 & 1805 Pickering Parkway,
City of Pickering, Ontario

FUNCTIONAL SERVICING AND STORM WATER MANAGEMENT REPORT

BLOCK 1 - PHASE 1

Prepared For:

Pickering Ridge Lands Inc.
&
Bayfield Realty Advisors

ORIGINAL:	March 18, 2022
REVISED:	April 20, 2022 (for Submission)
REVISED:	April 10, 2024 (for Submission)
REVISED:	January 29, 2025 (for Submission)(R2)

*** Please refer to the Master Servicing Study prepared by Odan Detech Group dated January 29th 2025 for details on the ultimate development.**

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1. INTRODUCTION

Site Description

The subject development comprises Phase 1 of a multi phased development, phase 1 has an area of 0.936 ha with a proposed future Right of Way of 0.258 ha. and is bound by existing commercial lands to the north, Highway 401 to the south, existing commercial lands to the east and Brock Road to the west.

Please refer to the Master Servicing Study prepared by Odan Detech Group dated January 20th 2025 for details on the ultimate build out future development Blocks 2 to 7 including future Right of Way allowance

Currently, the site is developed with multi-tenant, “big box” and smaller commercial retail establishments with associated asphalt parking lots. The topography of the site is relatively flat sloping northeast. The subject site known as First Pickering Place (FPP) is currently designated as “Mixed Use Areas – Specialty Retailing Node” in the Pickering Official Plan; the lands with this designation are intended to have the widest variety of uses and highest levels of activities. An aerial view of the site can be found in Appendix A showing surrounding uses. Refer to Exhibit 1 below for the site location. Exhibit 2 shows the plan of the redeveloped site and location of phase 1 within the site.

Background

This report will evaluate the serviceability of the proposed Phase 1 redevelopment with respect to sanitary, water, and storm servicing. This report will also evaluate the stormwater management (SWM) strategy to meet the SWM requirements set out by regulatory agencies.

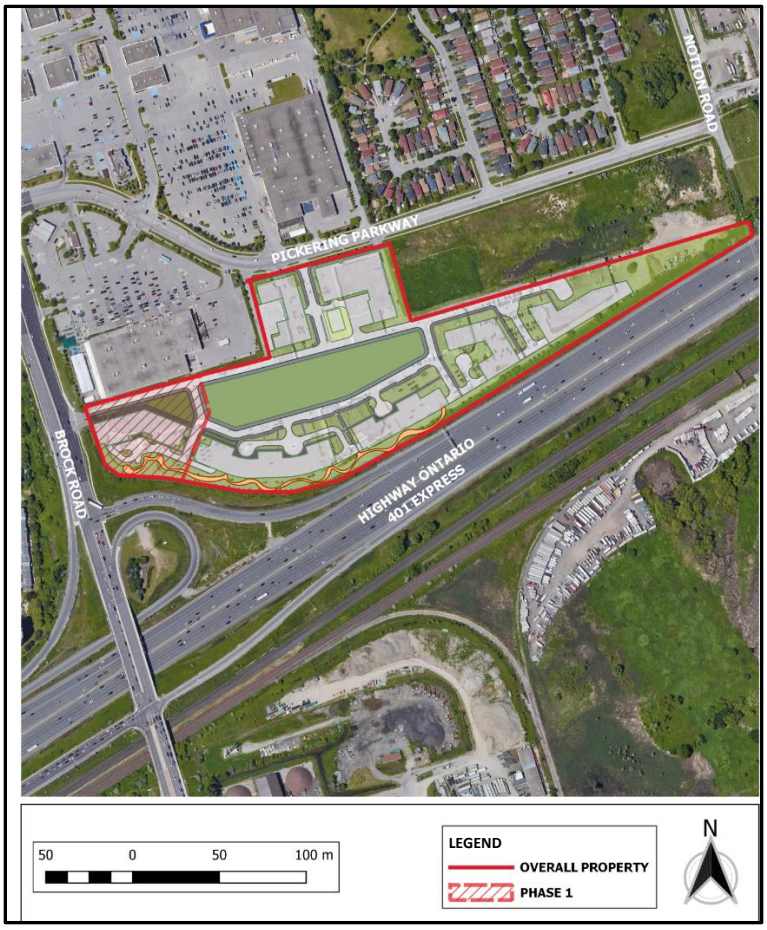


Exhibit 1 Location of the project site

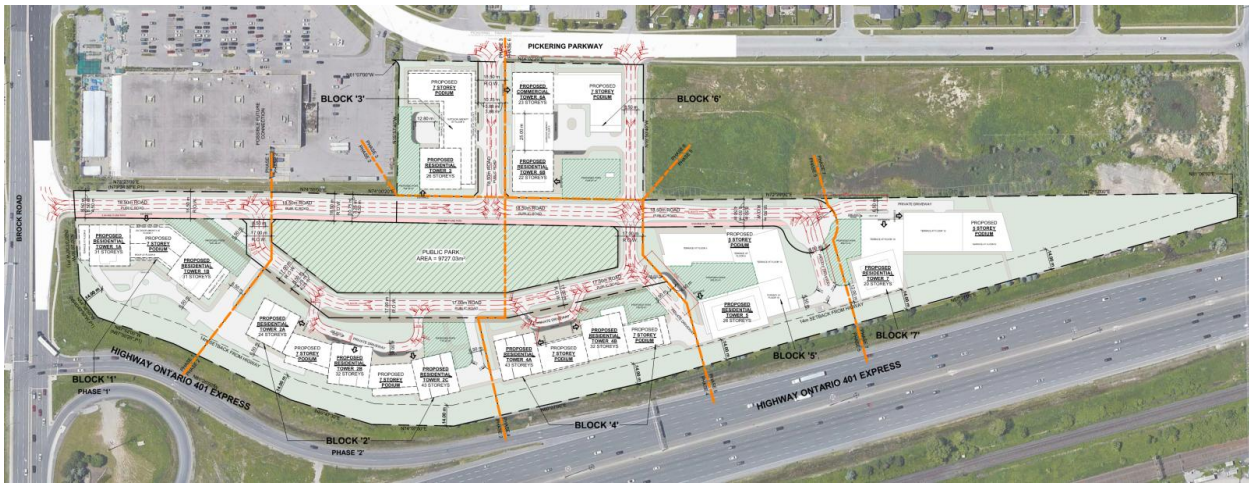


Exhibit 2 Full build out layout and location of Phase 1

2. SCOPE OF WORK

The Odan/Detech Group Inc. was retained by the owners, **Pickering Ridge Lands Inc. & Bayfield Realty Advisors** to propose a servicing scheme(s) for the Redevelopment of 1755 & 1805 Pickering Parkway (Pickering Design Centre). The scope of work related to this report involves Phase 1 Zoning and in brief involves the following:

a) Gather information on the existing services for the Site and surrounding the Site.

b) Work with or assemble a team of Consultants and Vendors to perform specialized tasks required for the global servicing assessment.

c) Meetings/conversations with consulting team and landowners in order to coordinate developments.

d) Produce Servicing Schemes that will allow for the development of the intensified site at full build out and focus on the development of Phase 1. The servicing analysis entails a review for sanitary wastewater, water distribution, storm water management and grading.

Currently, the proposed development area is divided into 7 blocks (Block ‘1’ to Block ’7’), of which Phase 1 corresponds to Block ‘1’. The proposed redevelopment in Phase 1 will consist of a mixed-use development with two towers of 31 storeys. The proposed building will have retail at grade, 678 apartment dwelling units, 4 level of underground parking and surface parking, and 1,365 m2 of indoor amenity space. Refer to site plan prepared by Turner Fleischer Architects Inc. in Appendix A for additional information.

3. SANITARY SERVICING

Existing Sanitary Sewer Infrastructure

As constructed and design drawings obtained from the Region of Durham and the City of Pickering show that an existing 250 mm diameter sanitary sewer in Pickering Parkway are located as the main sanitary outlet of the subject site.

There are two existing sanitary sewer connections to the site, a 250mm sanitary outlet toward Pickering Parkway at the north of the site and a 150 mm sanitary outlet toward Notion Road at the east of the site.

Refer to Exhibit 3 for the location of the Site and the layout of the existing sanitary sewers in the area.

Most of the sanitary flow from the existing commercial site is conveyed through an existing 250 mm diameter sanitary sewer west to east along Pickering Parkway. Then connected to a 250 mm diameter sanitary sewer at the intersection with Marshcourt Dr, which conveys the sanitary flow to the north. The 250 mm diameter sanitary sewer on Marshcourt Dr then increases to a 375 mm diameter sewer at the Region's easement and the sanitary sewer conveys the collected sanitary flow to a 375 mm diameter sanitary sewer on Notion Road. The 375 mm diameter sanitary sewer on Notion Road is connected to a 750 mm sanitary sewer on Orchard Road that conveys the collected flow to the east. The 750mm pipe is the outlet for the subject site. There is a site located to the south of the Region Easement located on the east side of Notion Road that is currently service via this existing sanitary sewer. The Site is service with a 300mm dia. Sanitary sewer south of the 375mm dia. Sanitary sewer on Notion Rd. and subsequently with a 200mm lateral.

The sanitary analysis will be conducted considering the flow from all sites that presently flow to Orchard Road and the future flow from the redevelopment of 1899 Brock Road and surrounding tributary areas which have been provided by the Region. Refer to Region sanitary maps and correspondence in Appendix B for additional information.

In completing the analysis, the following information will be used or relied upon:

- Drawings from City of Pickering.
- Drawings from The Regional Municipality of Durham.
- Sanitary system Maps from The Regional Municipality of Durham
- Design guidelines for sanitary sewers systems from The Regional Municipality of Durham
- Master Servicing & Stormwater Management Report -1899 Brock Road, SCHAEFFERS Consulting Engineers, May 2021
- Functional Servicing & Stormwater Management Report Residential Townhouse Development - 1856 Notion Road, GHD, Jan 2018

EXISTING SYSTEM REVIEW

Based on findings in the MSS report by Odan Detech, the redeveloped site cannot be routed through the existing sewer system along Pickering Pkwy, Marshcourt Drive, easement between homes to Notion Road to Orchard Drive Due to limitations of the existing sanitary sewer capacity, it would mean replacing a relatively deep sewer between two existing homes. The recommended and preferred routing would be along Pickering Pkwy to Notion Road to Orchard Drive.

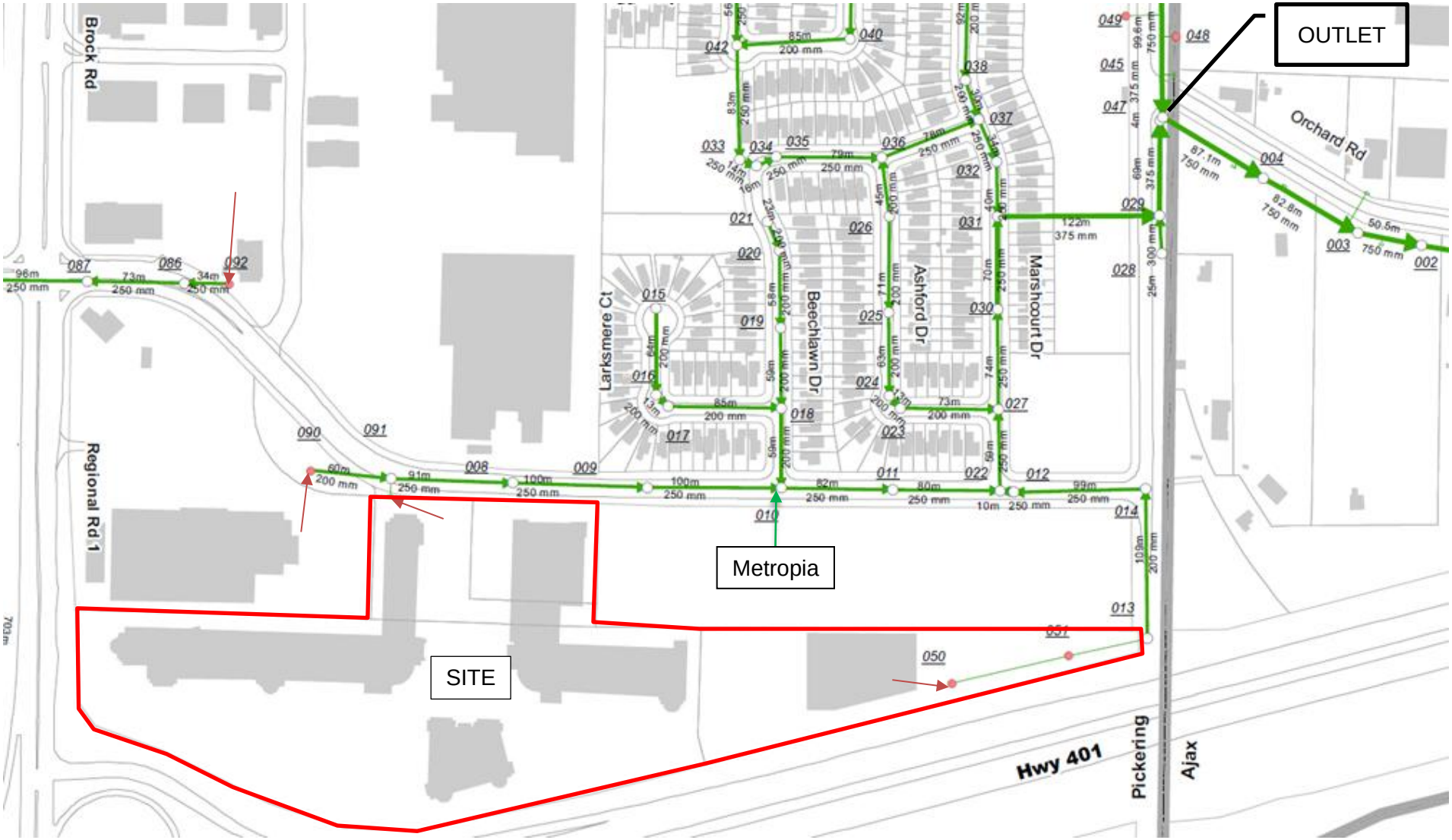


Exhibit 3 Durham Region layout of existing sanitary sewers

REGION OF DURHAM PREFERRED SYSTEM

Discussion with the Region of Durham (Aaron Christie) regarding the redevelopment of the subject site and that of the proposed future development lands can be summed up as follows:

1) The Region solution for the intensification is to provide a sewage pump station (SP) on the south side of HWY 401. From this SP a large trunk sewer will be extended North under HWY 401 to Notion Road, then continue North on Notion Road. This pump station is outlined within the current Region's Capital Budget and 9-year forecast; however, this will be subject to further study as part of a Class Environmental Assessment. The applicant shall note that the timing for this future project cannot be determined at this time as indicated by the Region.

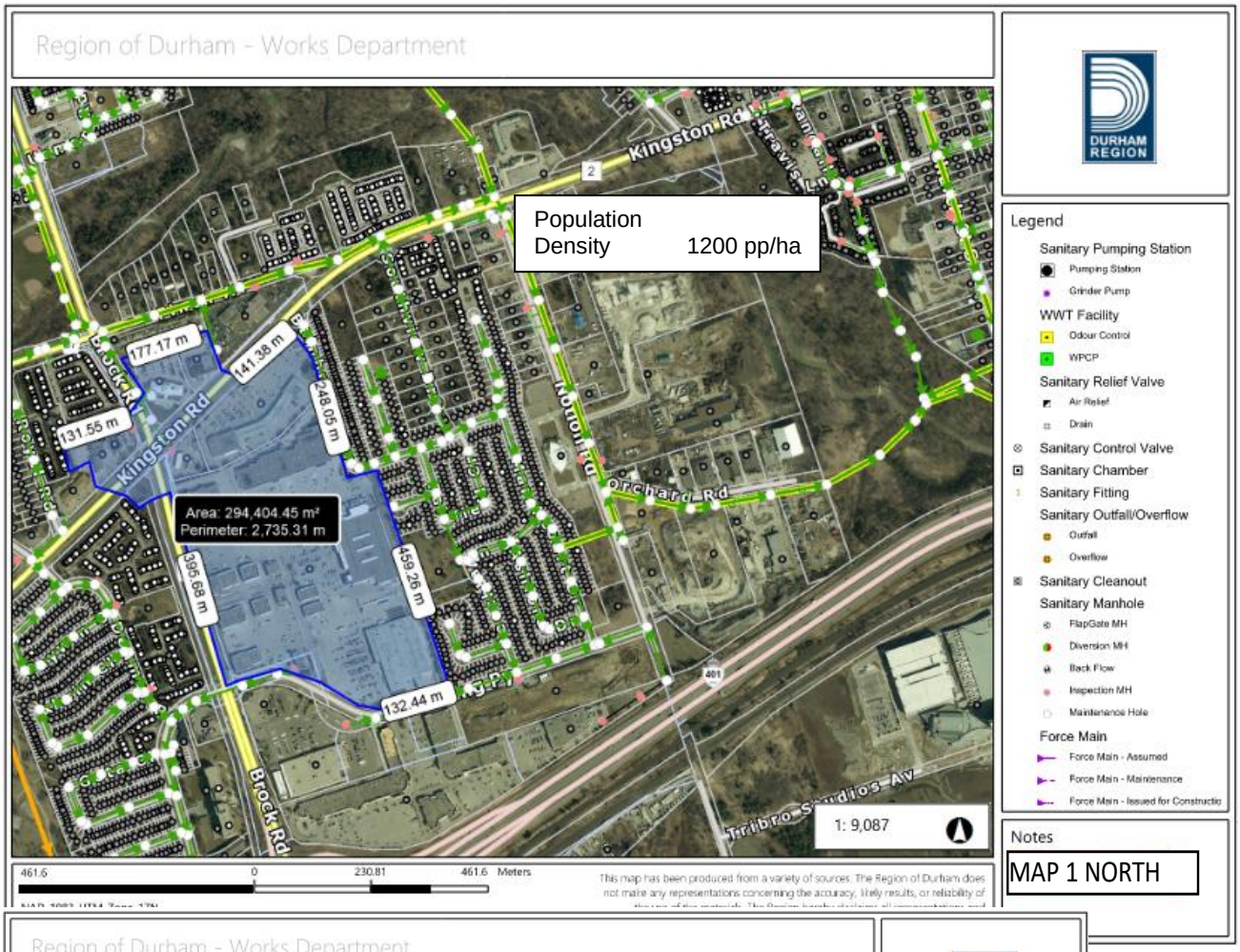
2) For the early Phases of this development, a new sanitary sewer is proposed along Pickering Parkway to Notion Road. This section of sewer will be sized for full build-out of Brock Precinct service area.

3) The applicat is proposing to construct a sanitary sewer along Notion Road to Orchard Road to utilise the remaining capacity inf the Orchard Road Trunk Sanitary Sewer on an interim bases for the early phases of this proposed development.

4) Any cost sharing for works constructed by the developer will be determined as per the Region's cost shar policy. Generally, the application will be responsible for the minimum size required to service their development along the full length of the constructed sanitary sewer.

5) Sanitary mapping has been provided by the Region which indicates proposed future development lands and the associated tributary areas which will ultimately discharge to the SP on the south side of HWY 401 via Pickering Parkway and the Notion Road trunk sewer. Population densities for these proposed development lands were provided by the Region. Refer to Exhibits 4, 5 & 6 below for the Region's sanitary mapping and related population densities.

Region of Durham Sanitary Maps & Correspondence indicating population densities



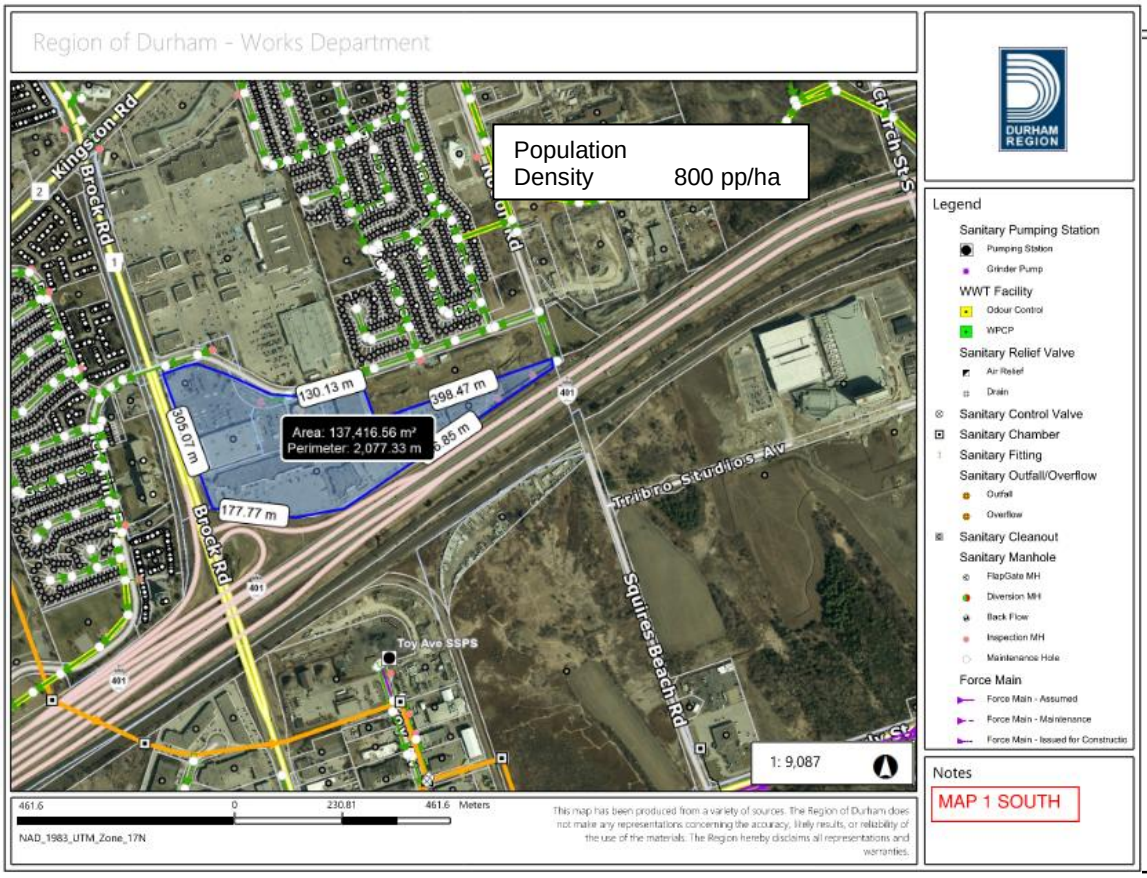


Exhibit 5 – Region Map 1 South [Subject site and 1731/1735 Pickering Pkw

Exhibit 6 – Region Map 2 South [Metropia Lands]

6) The Region has allowed for the Phase 1 of 1899 Brock Road to be discharged west ward to Brock Road and will therefore not be included in our Phase 1 downstream sanitary analysis.

7) The Phase 1 for the subject site will be allowed to discharge to Orchard Drive North on Notion Road, for the interim condition.

8) In the full build out condition the temporary sewers on Notion Road will be replaced by the Region with a trunk sewer. Thus, all the sewage from the existing and redeveloped sites will flow south in the Notion Road trunk, under HWY 401 to the new Region SP.

9) The Region prefers that the Sewer to Notion Road along Pickering Parkway be installed to accommodate the fully built out sites and the existing sites along the way.

10) The Region will allow a smaller sewer diameter pipe on Notion Road than on Pickering Parkway for the interim condition since the trunk sewer will replace this to flow South under the HWY 401.

11) Sanitary Capacity is assigned upon execution of a development agreement with the Region of Durham.

The Region has also given us the approximate reserve capacity of the Orchard Drive sewer from where we show it on Exhibit 3 eastward. See the following e-mail from Aaron Christie.

Hello Mark,

At this time base your study on the assumption that there could be up to a capacity of 150 l/s available within the 750mm sanitary sewer at Orchard Road. This is based on preliminary input received from the Region of Durham and is subject to change as your application and development of the surrounding lands moves forward.

Based on my interpretation of the mapping, the 600mm watermain on Brock Road has a 300mm dia. tee to the west and then there is a 300mm x 300mm dia. tee and 90 degree bend providing the 300mm dia. watermain to the east across Brock Road to Pickering Parkway.

Thanks,

Aaron Christie, P.Eng. | Manager, Engineering Planning & Studies
Works Department
The Regional Municipality of Durham
Aaron.Christie@durham.ca | 905-668-7711 extension 3608 | durham.ca
My pronouns are he/his

Design Criteria

Sanitary flows for the subject site are calculated based on the Regional Municipality of Durham design specifications for sanitary sewers. The summary is as follows:

Residential

- Average flow: 364 L/person/day
- Infiltration: 22.5 m^3 gross ha/day (0.26 l/s/ha/day) – when foundation drains are not connected to the sanitary sewer.
- Peaking Factor:

$$K = 1 + \frac{14}{4 + P^{1/2}}$$

Where K=Harmon Peaking Factor, P = Population in thousands.
K-Maximum= 3.8m, K-Minimum= 1.5

- When the number and type of housing units within a proposed development are known, the calculation of population for the proposed development shall be based on the following:

Type of Housing	Persons/ha
Single Family Dwelling,	60
Semi-detached & Duplex	100
Townhouses	125
Apartment(s)	
- Low density (62 u/ha)	150
- Medium to low density (86 u/ha)	210
- Medium density (124 u/ha)	300
- High Density (274 u/ha)	600
u/ha = units per hectare	

Type of Housing	Persons/Unit
Single Family Dwelling, Semi-Detached and Links	3.5
Townhouses/Stacked Townhouses	3.0
Apartment(s)	
- 1 Bedroom or smaller (Bachelor)	1.5
- 1 Bedroom and Den	2.5
- 2 Bedroom	2.5
- 3 Bedroom	3.5
- 4 Bedroom or larger	4.5

Commercial

Design Flow: 180 m^3/gross floor area ha/day (2.08 l/s/day) including infiltration and peaking effect.

EXISTING SANITARY SEWER CAPACITY CALCULATION

The capacity of the existing sanitary sewer system from the subject site to Orchard Rd was evaluated in the MSS report by Odan Detech. The existing sanitary sewer was found to have insufficient capacity to accept Phase 1 of the subject development. Refer to the MSS report by Odan Detech for further details and information pertaining to the existing sanitary capacity, including sanitary design spread sheet and existing sanitary tributary plan.

PROPOSED SANITARY SEWER DESIGN CONSIDERATION

Based on our discussion with the Region of Durham (Aaron Christie), that they (the Region) want the redeveloped flow from 1899 Brock Road and the updated tributary areas, provided by the Region, to flow from their Site east on Pickering Parkway to Notion Road.

Metropia is planning to develop a new townhouse development at 1856 Notion Road known as the Metropia Site. The details are contained within the "Functional Servicing and Stormwater Management Report", by GHD, Jan 2018. The sanitary flow (6.78 L/s) from the development will be routed to the existing manhole (MH-H9-0010) on Pickering Parkway.

Since four existing retail buildings will remain operational within the site for phase one construction. The construction of new sewers will need to be phased to ensure drainage is maintained to the existing buildings.

Table 1 is a summary of the flows generated by the Site during Phase 1.

Table 1 – Proposed population and sanitary peak flow estimate (Phase 1)

Unit Type /Land Use	Number of Units /Gross floor Area	Persons/ Unit	Population	Peaking Factor	Infiltration (L/sec)	Sanitary Flow (L/sec)
North Sanitary Outlet to Pickering Parkway						
Commercial (Ex.)	0.79 ha	-	-	1	-	1.65
Commercial (Prop.)	0.17 ha	-	-	1		0.35
Apartments (Prop.)	678 Units 126- 1 Bedroom 337- 2 Bedroom 207-3 Bedroom 8 -4 Bedroom	 1.5 2.5 3.5 4.5	1793	3.62	0.31	27.28
Total	-	-	-	-		29.28
East Sanitary Outlet to Notion Road						
Commercial (Ex.)	0.425 ha	-	0.425 ha	1		0.88
Total	-	-	-	-		0.88

The total flow to the 750mm sanitary sewer outlet at Orchard Road for Phase 1 of the subject site including existing commercial is 66.37 L/sec. Refer to sanitary design sheets in Appendix B for detailed calculations of the Phase 1 development and the future ultimate build out development.

Existing sanitary flow into the Orchard Road outlet is 42.42 L/s (refer to MSS report by Odan Detech). Thus, the increase in flow, 23.95 L/s, is less than the available excess flow capacity of 150 L/s (provided by Durham Region), therefore the outlet sewer has adequate capacity for Phase 1 of the subject development.

SUMMARY AND RECOMMENDATION

Based on the above review, analysis and findings of the MSS report by Odan Detech we offer the following summary and recommendations:

1) Phase 1 of First Pickering Place cannot be accommodated by the existing sanitary sewer system and present routing path. This would mean replacing a deep sanitary sewer between two existing houses and is not recommended. Refer to MSS report for detailed analysis of the existing conditions.

2) The 750 mm sanitary sewer on Orchard Road has sufficient capacity to accommodate Phase 1 of First Pickering Place and the existing uses.

3) We recommend that the owners of First Pickering Place build the sanitary sewer on Pickering Parkway from 1899 Brock Road site to Notion Road to accommodate the full build out of all future development sites and the existing flows. This recommendation allows the Pickering Parkway sanitary sewer to be installed and completed at one time rather than removing the road surface on separate occasions during future phasing. This section of sanitary sewer will be subject to development charges as discussed with the Region of Durham.

4) The sanitary pipe on Notion Road (from Pickering Parkway to Orchard Rd) will be sized to convey existing flows and flows from Phase 1 (First Pickering Place) to the existing Orchard Road sanitary sewer. The Region will allow this interim condition at limited capacity until such time that the Ultimate Trunk Sewer is constructed in the future to convey flows to the South SP. The interim pipe will be downsized from that on Pickering Parkway, the Region will allow this, since it is a temporary measure until the Region replaces it with a trunk sewer on Notion Road.

Refer to sanitary design spreadsheets in Appendix B for detailed calculations of Phase 1 development and the Ultimate build out development.

Table 2 – Offsite sewer improvements

Sewer location	Upstream MH	Downstream MH	Sewer size, length and slope	Comments
Pickering Parkway	1899 Brock Road	EX MH H8-0091	525mm – 116m @ 1.0%	Future New pipe
Pickering Parkway	EX MH H8-0091	Prop MH9A	675mm – 49.4m @ 0.45%	Replacement pipe
Pickering Parkway	Prop MH9A	EX MH H9-0018	675mm – 41.8m @ 0.45%	Replacement pipe
Pickering Parkway	EX MH H9-0018	EX MH H9-0019	675mm – 100m @ 0.45%	Replacement pipe
Pickering Parkway	EX MH H9-0019	EX MH H9-0010	675mm – 100m @ 0.45%	Replacement pipe
Pickering Parkway	EX MH H9-0010	EX MH H9-0011	675mm – 83m @ 0.45%	Replacement pipe
Pickering Parkway	EX MH H9-0011	EX MH H9-0022	675mm – 80m @ 0.45%	Replacement pipe
Pickering Parkway	EX MH H9-0022	EX MH H9-0014	675mm – 110m @ 0.45%	Replacement pipe
Pickering Parkway	EX MH H9-0014	Prop MH 13A	450mm – 15m @ 0.22%	Interim Pipe Phase 1
Notion Road	Prop MH 13A	Prop MH 14A	450mm – 100m @ 0.22%	Interim Pipe Phase 1
Notion Road	Prop MH 14A	SAN MH H9-0029	450mm – 102m @ 0.22%	Interim Pipe Phase 1
Notion Road	Prop MH H9-0029	Prop MH H9-0045	450mm – 72m @ 0.22%	Replacement pipe
Notion Road	Prop MH H9-0045	Prop MH 17	450mm – 4m @ 0.23%	Replacement pipe

Note: Notion Road pipes are temporary and will be replaced by the Ultimate Regional Trunk sewer that will be directed South on Notion Road to the downstream SP.

4. WATER SUPPLY AND DISTRIBUTION

EXISTING SYSTEM:

First Pickering Place (FPP) existing water service is fed from a 300 mm Ø City main on Pickering Parkway. The Plaza has a 300mm Ø service main off of Pickering Parkway with a series of hydrants and lateral services inside the Plaza to feed the multiple buildings. Refer to Exhibit 7 for the Regions existing water system.

REDEVELOPED SITE:

Fire Protection

Fire flows for Phase 1 will be supplied by a 300mm PVC fire service proposed to connect to the 300mm watermain on Pickering Parkway and looped to Brock St. 600mm water main via a 300mm local water main connection. These two locations will provide a looped system complete with an isolation valve on the Pickering Parkway and Brock Street mainlines. The proposed looped system will surround be located on the west side rear laneway of the the existing single storey brick retail building, refer to Figure 3 in Appendix E for details on layout of the proposed Phase 1 looped watermain system. This will ensure that a separate water main is provided to Phase 1 without interconnecting to the existing Plaza water main.

As per Ontario Building Code 3.2.9.7 (4), Residential Towers being over 84m tall require an additional source of water supply from a public water system. To meet this requirement a second 300mm PVC fire service will be connected to the looped 300mm watermain with isolation valves installed on the 300mm watermain between the two fire services. Isolation valves will also be installed at Pickering Parkway and Brock Street to create redundancy in the system.

Refer to Figure 3 in Appendix E for details and locations of proposed watermain services.

Domestic Water Service

The domestic water supply is proposed to connect to the existing 300mm watermain on Pickering Parkway via a looped water main to Brock Street with a proposed 300mm PVC watermain. Refer to Figure 3 in Appendix E for location of proposed water services.

Proposed Site

The pressures and volumes must be sufficient for Peak hour conditions and under fire conditions as established by the Ontario Building Code. The MOE minimal residual pressure under fire conditions is 140 kPa (20.3 psi). According to the Durham Region, Design Criteria for Water mains the allowable pressures are as per Table 3.

Table 3 – Allowable pressures

SCENARIO	DURHAM REGION CRITERIA Allowable Pressure (kPa)		MOE Allowable Pressure (kPa)	
	min	max	max	max
Min. Hour	275	700	275	700
Average Day	275	700	275	700
Max Day	275	700	275	700
Max Hour	275	700	275	700
Maximum Day + Fire	140	700	140	700

In order to evaluate the potential water demand for fire protection, the development was assessed using the Fire Underwriters Survey (FUS) guide. As shown in Appendix C, the following assumptions were made to perform the calculations.

1. Proposed buildings shall be of Fire Resistive type construction, therefore a construction type coefficient of 0.6 will be applied.

Proposed buildings shall be equipped with an automatic sprinkler system which meets NFPA 13 sprinkler standard including a fully supervised system, system to be designed by Mechanical Engineer.

The water demand requirement for the site based on the new population is calculated as follows:

Residential (Domestic)

a)	Average Day domestic demand -	using 364 L/cap/day (1793 persons)	7.55 L/s
b)	Max day demand -	1.9 x daily demand	14.35 L/s
c)	Peak hour demand -	2.85 x daily demand	21.52 L/s

Commercial (Domestic)

a)	Average Day domestic demand -	using 5000 L/m^2/day (1687.6m^2)	0.10 L/s
b)	Max day demand -	1.9 x daily demand	0.19 L/s
c)	Peak hour demand -	2.85 x daily demand	0.53 L/s

d) Fire flow 167 L/s

Flow testing was conducted and results analysed using a hydraulic model KYPIPE for the full development site in the MSS report by Odan Detech. Available flow results from the report are shown below.

Table 4 – Total Water Demand for Phase 1 – First Pickering Place

	L/s	USGM
Peak Day Demand	14.35	227.45
Fire Flow Demand	166.67	2,642
Total Water Demand	181.02	2869
Available Flow at Block 1 (from MSS)	374	5,928

The total water demand for the Phase 1 development is 181 L/s which is less than the available flow of 374 L/s. Therefore, the existing flow within the system is adequate to meet the domestic and fire demands for the proposed Phase 1 site.

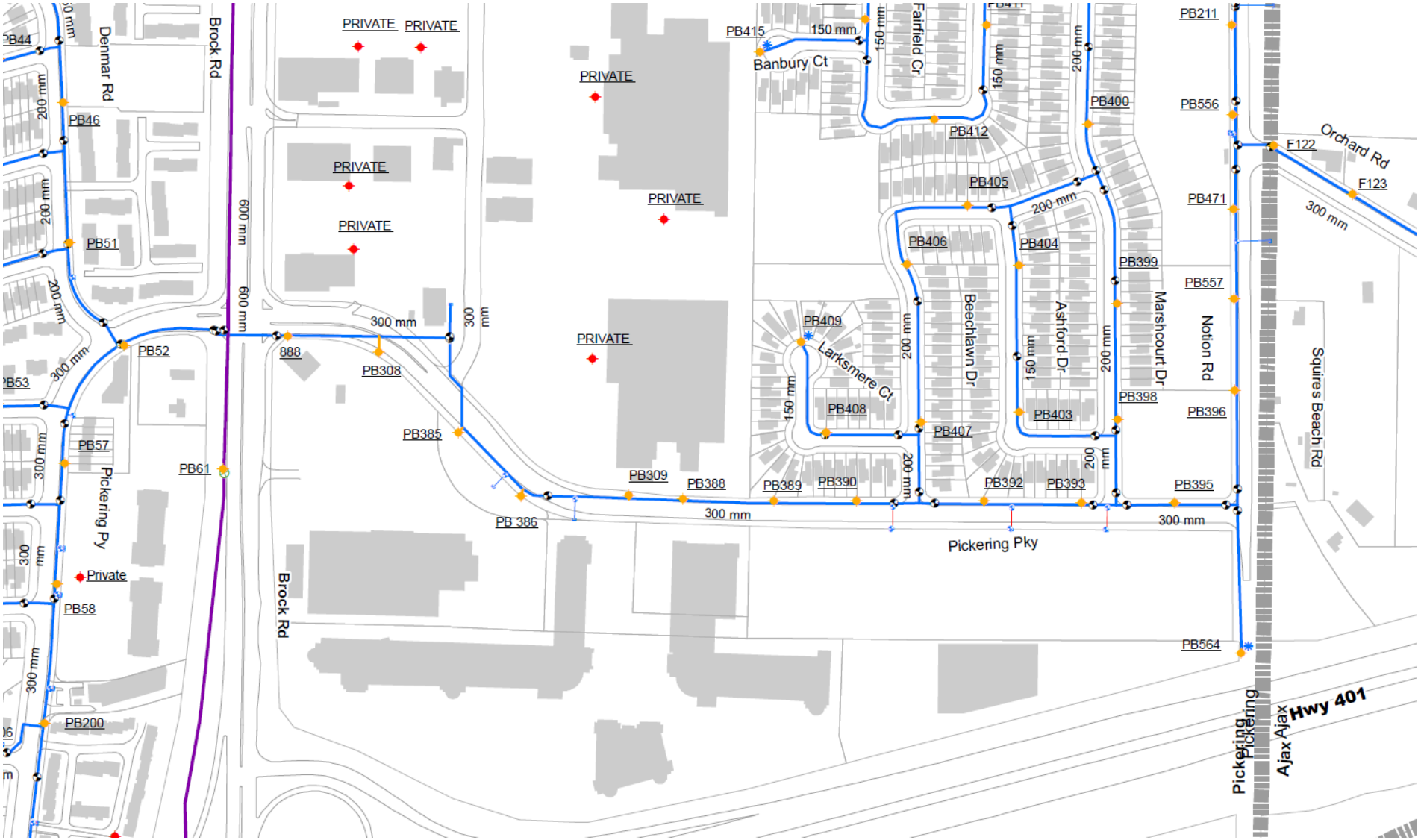


Exhibit 7 Durham Region layout of existing water system

DISCUSSION OF RESULTS:

- The pipe sizes shown are required for the fire flows and to ensure velocities are below 5.0 m/sec for fire flows.

- First Pickering Place will require new mains and hydrants. Some will be relocated to suit the development.

- The pipe sizes chosen are adequate.

- Where pressures are greater than 80 psi (550 kPa) buildings will require pressure reducing valves prior to meter connection. Hydrant tests prior to permit stage will confirm this.

- Looping the watermain connection to Pickering Parkway is required to provide redundancy in the system for the development since buildings are taller than 84 m. The OBC requires a second connection to a public system when buildings are greater than 84 m. This routing will be through a proposed servicing Easement in favour of the Region and City during Phase 1 of the development.

- Phase 1 requires an interim condition watermain which will be looped within the noted Region and City Servicing Easement through the existing retail plaza to provide a redundancy to the system. This interim water main will be decommissioned within the future parkland and rerouted within the Right-of-Way in subsequent Phases. For layout and details of the proposed Phase 1 watermain looped system refer to Figure 3 in Appendix E.

5. STORMWATER MANAGEMENT & FOUNDATION WATERPROOFING

Design Criteria

Stormwater management for the proposed development will follow the stormwater management criteria set out by the City of Pickering, Toronto and Region Conservation Authority and the Ontario Ministry of the Environment, Conservation and Parks.

A summary of the stormwater management criteria applicable to the site are as follows:

Quantity Control:

The City of Pickering requires quantity control of Blocks 1 to 7 to a post development allowable flow based on a 5 year Design Storm to a runoff coefficient of C=0.50 during this event. All storms up to and including the 100 Year Design storm must be controlled to this criterion.

Block 1 will follow this requirement to control flows to a C=0.50 for the 5 Year Design Storm up to and including the 100 year design storm.

Quality Control:

Quality control measures are to be designed to provide Enhanced Protection - long term average removal of 80% of Total Suspended Solids (TSS) on an annual loading basis from all runoff leaving the proposed development site based on the post-development level of imperviousness.

This can be achieved via filtration many methods and Low Impact Development Techniques (LID). To ensure that 80% TSS removal is achieved the use of a Jellyfish Filtration Oil Grit Separator (JFOGS) or similar approved equivalent would accomplish this.

Water Balance:

Retention of the runoff from up to a 5mm storm event on site for reuse, evaporation or infiltration.

- Rain Harvesting
- Green Roofs
- Downspout Disconnection
- Soakaway Pits, Infiltration Trenches (Galleries) and Chambers
- Bioretention Facilities
- Vegetated Filter Strips
- Permeable Pavers
- Enhanced Grass Swales
- Dry Swales
- Perforated Pipe Systems

These techniques help to promote water quality and quantity and water reuse as it relates to stormwater management techniques. At the Stie Plan development stage these techniques will be reviewed in detailed to determine the ideal strategy for each development Block.

Existing Storm Servicing and Drainage Patterns

As constructed and design plans and profiles drawings obtained from the Region of Durham and the City of Pickering show that the following storm sewers are located within and around the site.

Refer to Exhibit 8 for the existing storm sewer system and outlet for the Phase 1 subject site.

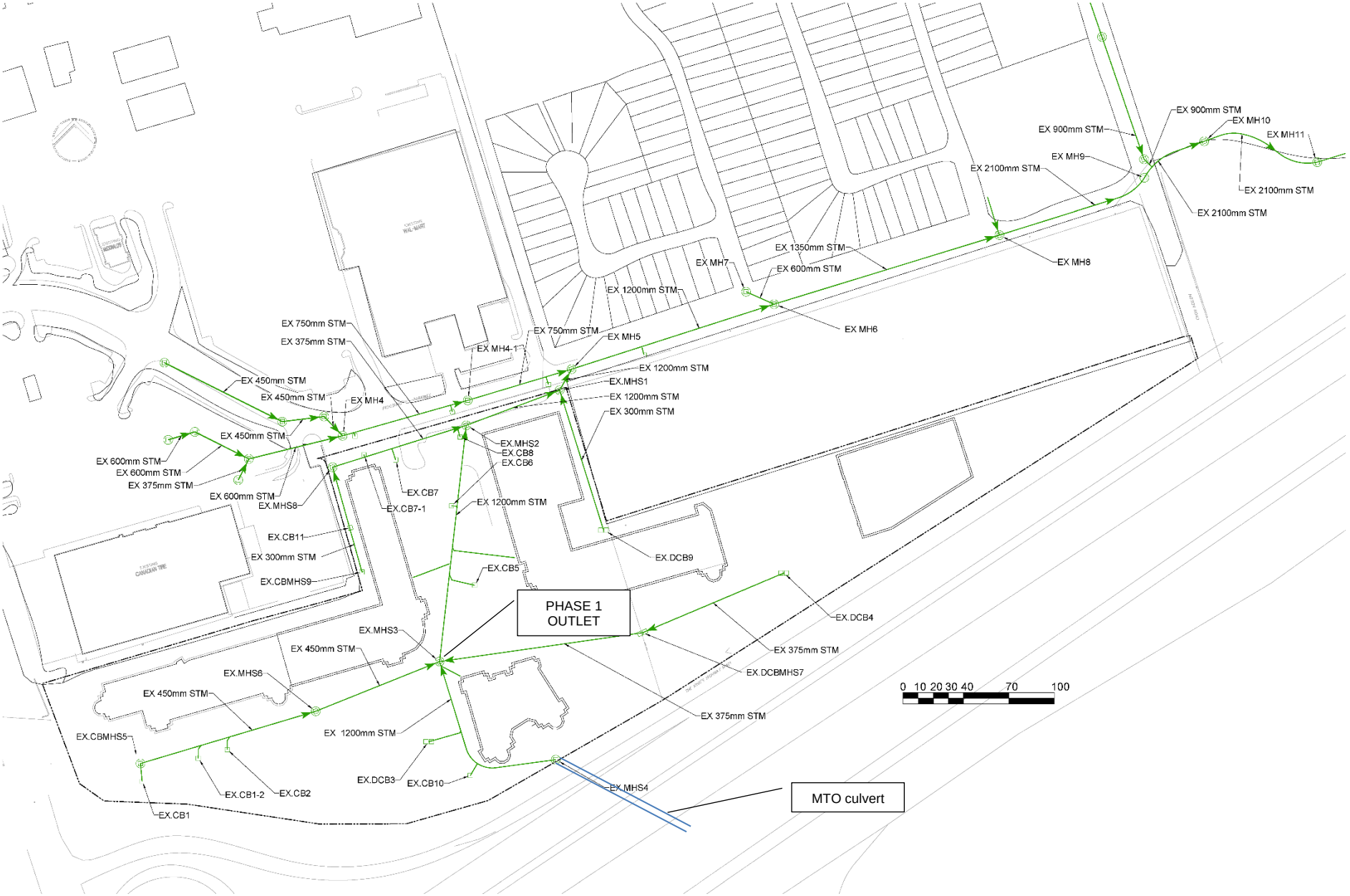


Exhibit 8 - City layout of existing Storm sewers and Site sewers

The drainage from the subject site can be summarized as follow:

1. MTO box culvert discharges flow from Hwy # 401 to a short ditch on the south side of the subject site. The flow is captured by an inlet structure attached to an existing 1200 ø storm sewer system which is routed north to Pickering Parkway where it discharges to a 1200 ø existing storm on Pickering Parkway. The pipe continues east on Pickering parkway, changes pipe sizes as shown on Exhibit 8, crosses Notion Road, continues east and discharges via a head wall to a drainage channel which empties into Duffin's Creek.

2. The subject site drains via a series of catch basins and sewers which connect to the 1200 ø storm from the 401 to Pickering Parkway as described in 1 above.

3. The overland flow from the site is conveyed more or less from the south through the lands onto the Pickering Parkway and ultimately conveyed via Pipes and existing channel, east of the Notion Road, to the Duffin's Creek.

4. Currently, there is no stormwater quantity, quality control measures implemented within the existing site.

A pre-development tributary plan has been prepared based on a drainage pattern analysis of the site's digital terrain model created from existing topographic survey and information obtained from the Region and the City. The pre-development storm tributary plan is included in Appendix E.

Pre-development/Allowable Flow Rates

The post-development flows from the site will be limited to the 5-year design storm event at an allowable rate based on a runoff coefficient of C=0.50 up to the 100-year design storm event. Please note that the actual runoff coefficient for the existing site condition is much higher than C=0.5. The flows were calculated using both rational method. The City of Pickering's Intensity Duration Frequency (IDF) curve values were used for rational method calculation.

The allowable flows for Phase 1 site are presented in Table 5.

Table 5 – Summary Table of Allowable Flows

Block #	Area	$Q_{5yr\ Pre}$
Block 1	0.88	0.130

The existing Mall and City ROW are not included in the above as they will remain uncontrolled during Phase 1 which is the current existing Site Condition as this area is mainly asphalt and rooftop.

The post-development flows from the site will be limited to the pre-development flows for the 5-year design storm event. The pre-development flows were calculated based on pre-development tributary areas with runoff coefficient of 0.5. Please note that the actual runoff coefficient for the existing site condition is much higher than 0.5. The allowable flows were calculated using the rational method. The City of Pickering's Intensity Duration Frequency (IDF) curve values were used for rational method calculation. Refer to Appendix for Rational Calculations.

POST-DEVELOPMENT

The SWM for the redeveloped First Pickering Place will establish/analyse the following:

1. Flows to the existing 1200 ø storm sewer based on the criteria established above.
2. Establish SWM criteria for Phase 1 in order to limit the flows.
3. Evaluate the flows entering the down-stream sewer system at the outlet.
4. Evaluate the water quality requirements.
5. Evaluate the water balance for the Site.
6. Make recommendations as to the implementation of the SWM.

Based on the description of the existing system City requires a flow reduction to a C =0.5 from the existing site C= 0.85. The post developed site will reduce the existing flows to the outlet at the existing 1200 ø sewer. Phase 1 allows outlet to the existing 1200 ø sewer. Refer to Appendix E for the site servicing drawings.

The City of Pickering uses the the 4 hour Chicago storm is the critical storm for all storage facilities.

Stormwater Management Criteria that must be included in the FSSR are as follows:

- Control of post-development peak flow rates from the 100 year design storm to 5 Year Design Storm Event at a runoff coefficient equal to C=0.50 for development Blocks.
- A maximum runoff coefficient of 0.5 should be used to represent pre-development conditions for Block 1.
- Follow Stormwater Management Design Guidelines, prepared by City of Pickering. Runoff Conveyance will be as follows, the minor system is to be designed to accommodate the 5-year storm, while the major overland system is to be designed for the 100-year storm event. Where there is no suitable overland flow route, the minor system must convey the 100-year storm after on site attenuation.

The following Table establishes the allowable flows from Block 1 based on a runoff coefficient of C=0.50 for the 5 year design storm event and provides for the required storage volumes of each block. In order to establish required storage volumes a conservative approach was taken at this stage using a runoff coefficient of C=0.90 for post development. This will be refined during the Site Plan approval and detailed design stage.

In general a C=0.85 is used for apartment type developments. It is therefore likely that the runoff coefficient will be reduced further from C=0.90 through implementation of various Low Impact Design Techniques and Water Reuse at the time of Detailed Design during Site Plan approval.

Table 6 – Summary Table of SWMM Quantity Pre Development Allowable Flows and Storage

Block #	Area	$Q_{5yr\ Pre}$	Volume $Q_{100\ Post}$
Block 1	0.88	0.130	200

Refer to Appendix D for detailed calculations related to storage volumes and orifice sizes based on the Rationale Method related to the above Table values.

The Tank Size and related storage techniques including locations will be finalized for Phase 1 development at the detailed design stage during Site Plan approval based on the finalized build form.

SUMMMARY OF SWM Quantity Control Features:

Refer to table 7 for the SWM used for quantity control on the redeveloped Site.

Table 7 – Summary Table of SWMM Quantity Features for Redeveloped Site

BLOCK OR DESCRIPTION AND FLOW AREA TO TANK (ha)	**SWMM FEATURE DESCRIPTION & FOOTPRINT (m2)**	**VOLUME REQUIRED 100-year flow (m3) max of 4 hr Chicago or AES**	**ORIFICE CONTROL C=0.80**	**ORIFICE max head (m)**	**Maximum 100-year flow (L/sec)**
BLOCK 1 (0.88 ha)	1-Storage Tank (206)	* TANK 1 – 314	175 mm	1.52	105

All Maximum Volumes created by 4-hour Chicago storm.

Max volumes calculated using the modified rational method and City of Pickering IDF parameters.

*Note – Tank Sizes have been provided with a safety factor of 1.5x and will be adjusted during the Site Plan approval stage based on detailed design. The safety factor has been applied to account for maximizing tank volumes should the system require pumping in order to minimize the footprint of the tank within the proposed building and underground parking.

Refer to Appendix for Rational Method calculations.

Table 8 summarizes the allowable flows for Block 1 – Phase 1.

Table 8 – Target Release rates from development Block 1 Phase 1 to Pickering Parkway sewer

Block #	**Area (ha)**	**Allowable Release Rate** (m^3/s) 5 year Storm	**Post-development Flows** (m^3/s) 100 Year Storm
Block 1	0.88	0.130	0.105
Total Site (Excluding Park & Private Roads)	0.88	0.130	0.105

Rational method uses C = 0.5 for 5 year event, Tc = 10 min (conservative).

As per City criteria for; 100-year storm - Ca = 1.25

For Detailed Rational Calculations related to Block 1 refer to Appendix D.

6. WATER BALANCE

The primary objective of the Water Balance Targets/Criteria is to capture and manage annual rainfall on the development site itself to preserve the pre-development hydrology (or "water balance", which typically consists of three components: runoff, infiltration, and evapotranspiration) through a combination of infiltration, evapotranspiration, landscaping, rainwater reuse and/or other low impact development practices.

Site Criteria

In most cases, the minimum on-site runoff retention requires the proponent to retain all runoff from a small design rainfall event – typically 5mm through infiltration, evapotranspiration and rainwater reuse.

The City of Pickering Stormwater Management Design Guidelines' target for water balance is to provide runoff reduction from the site through infiltration, evapotranspiration and reuse of a minimum of 5mm of rainfall depth across all impervious surfaces.

CITY OF PICKERING GUIDELINE WATER BALANCE SUMMARY

Project: 1755&1805 Pickering Parkway (First Pickering Place)
Project No.: 20266

Site Area	8760	m^2
Rainfall depth required to capture	5	mm
Captured Volume Target (5mm across entire site) (Total Area x Rainfall Depth)	43.8	m^3

SURFACE TYPE	SURFACE CAPTURE (mm)	AREA (m^2)	% OF SITE AREA	VOLUME CAPTURE (m^3)
Green Roof	7	682	7.8	4.8
Landscaped Areas	5	921	10.5	4.6
Roof Area (Drains to Cistern for Reuse)	12.5	2309	26.4	28.9
Asphalt Driveway, Pavers and Concrete (Ground)	1	4848	55.3	4.8
TOTAL		8760	100	38.2

CAPTURED VOLUME BY INTIAL ABSTRACTION (m^3)	**14.2**
VOLUME OF CISTERN (m^3)	**28.9**
CAPTURED VOLUME (m^3)	**43.1**

The site area and 5mm rainfall depth will be used to calculate the water balance target. The water balance target is as follows.

Water Balance Target:

Site Area* x 5mm *= (8,760m^2 x 0.005m)*
= 43.8m^3
**Site area does not include 14m MTO Setback Lands.*

It is proposed to achieve the above target through infiltration/absorption and rainwater harvesting for reuse. Other techniques will be considered at the Site Plan approval stage based on the finalized detailed site plan.

Further detail on water reuse will be presented in the Stormwater Management Report at the Site Plan Approval stage. Preliminary calculations are shown below.

Water Balance Summary:

Water Balance Target:	***43.8m^3***
Capture:	
Initial Abstraction (Absorption/ Infiltration/ Evapotranspiration)	
Green Roofs (assumed)	*4.8m^3*
Planters & Landscaping	*4.6m^3*
Total Captured Volume by Initial Abstraction	*14.2m^3*
Capture in Cistern from Roof Top for Reuse	*28.9m^3*
Total Volume Capture	***43.1m^3***
Reuse Potential from Cistern	
Greywater toilet and urinal reuse (Retail)	**TBD**
Irrigation requirement for landscaping	**TBD**
Greywater wash-down area reuse (Underground Parking)	**TBD**
Total Reuse Potential from Cistern	***>28.9m^3***

The total capture of 43.1m^3 meets the target volume of 43.1m^3; therefore, the water balanced target can be achieved on site. In addition, the total on-site water re-use potential of shall exceed the minimum cistern capture requirement of 28.9 m^3.

7. WATER QUALITY

The water quality target for the subject development as required by City of Pickering is Enhanced Level of Protection - long term average removal of 80% Total Suspended Solids (TSS) on an annual loading basis from all runoff leaving the proposed development site based on the post-development level of imperviousness.

The site was divided according to surface conditions and the effective TSS removal for each surface condition was considered based on the treatment it would receive. The general basis of the effective TSS removal rates are as follows:

1. Rooftop areas are subject only to airborne particles and insignificant amounts of sediment transported by foot traffic. As such, an effective removal efficiency of 80% is utilized on a conventional roof to reflect the inherent runoff quality from a conventional roof.

2. Balconies and sodded areas are subject to insignificant amounts of sediment transport by foot traffic. An effective removal rate of 80% is used.

3. Driving and ground-level pedestrian surfaces which are open-to-above will be subject to Winter maintenance, therefore they are assumed to have an effective removal efficiency of 0% and filtration is thus required.

Block 1 is comprised of open-to-above driving and pedestrian areas which will be subject to future winter maintenance. Oil and Grit Separation (OGS) devices will be specified accordingly to provide 80% TSS Removal for the site. Flows from asphalt driveway, paver and concrete areas will be directed to an Oil/Grit Separator sized accordingly for the development prior to entering the SWM Tank.

Through the above inherent TSS removal rates and the OGS unit, the 80% TSS removal rate can be achieved.

At the Site Plan approval stage a Jellyfish Filtration Oil/Grit Separator will be sized to meet the required 80% TSS removal.

Further review to determine if alternative Train Treatment will be reviewed at that time.

8. SITE SERVICING PHASE 1

In order to maintain the operation of the existing Mall during Phase 1 it is recommended that the during Phase 1 an Interim Municipal and Regional Servicing Easement is provided from the Private development in Phase 1 through the existing Mall Lands. This easement would be in favour of the Region and Municipality during an interim condition until the future Phases are developed and future Right-of-Way is constructed.

Providing a Municipal and Regional Servicing Easement during Phase 1 allows for the proposed Phase 1 to proceed while allowing for connection of the existing Mall to the new Municipal and Regional Easement during this Phase.

The proposed conceptual Phase 1 Servicing Schematic is provided in Appendix E - Figure PH1-Phase 1 Site Servicing and Easement Plan.

In general, the following is proposed for allowing Phase 1 Servicing to proceed:

- Construct sanitary storm and water servicing within Phase 1 through Municipal and Regional Servicing Easement.
- Maintain Existing Mall servicing within Mall lands and reconnect to Interim Municipal and Regional Servicing Easement.
- Relocate existing Storm sewer within Mall to align with future ROW and maintain existing storm sewer located on north property line during Phase 1 and until such time that Phase 6 proceeds.
- Subsequent Phasing will be reviewed at such time that the Phases proceed and will generally follow similar Phasing as identified during Phase 1 in which existing Mall services will be reconnect and adjusted to connect to the Municipal and Regional Servicing Easement. Refer to Figure PH1 Phase 1 Siet Servicing and Easement Plan for general layout and notes related to Future Phasing.

In general, the addition of a Municipal and Regional Servicing Easement during Phase 1 will allow for Private Mall services and Phase 1 Private Development to connect to a Municipal and Regional Servicing Easement.

As the site develops to future Phases connection to the Municipal and Regional Servicing Easement can continue in future Phases and be adjusted as required to maintain existing Mall function.

Detailed Phasing Plans will be provided at the Detailed Design stage for each Phase of the development as they are submitted.

9. FOUNDATION WATERPROOFING STRATEGY

Dewatering discharge during construction and long term will be as follows:

At the Pre-consultation for 1755 & 1805 Pickering Parkway the City of Pickering made the following statement:

Please note that the City will not accept discharge of foundation drainage to the storm system due to the potential for adverse impacts.

Please note that Region of Durham will not accept discharge of foundation drainage to the sanitary sewers. This statement is part of their sewer bylaw.

Based on the above we recommend the Architect, Structural Engineer, Geotechnical Engineer and Mechanical Engineer devise a waterproofing system with the shoring and foundation design.

Based on the above we have not incorporated any allowance for foundation drainage in the SWM for the site.

DISCUSSION OF RESULTS:

- The outlet for Phase 1 can be the existing 1200mm dia. storm sewer since the Phase 1 quantity controls will reduce the flow entering this pipe
- Phase 1 requires 236m^3 of storage for quantity control to meet the City of Pickering SWM design guidelines, storage volume will be provided by means of a storm water management tank located in the underground parking levels
- Orifice control for the storm water management tank will be a 250mm dia. orifice plate
- Flows from the site will be reduced at Phase 1 of the development, further flow reduction will occur at each subsequent phase of the ultimate build out (See MSS report by Odan Detech for further details)

10. GRADING CONSIDERATIONS

The existing topography of the site generally slopes from west to northeast towards the low point of the site located on the east side of the Site. Under the new development and existing adjacent developments there are several grading constraints for this development to match. The constraints are the existing commercial buildings, intersection at Brock Road and MTO lands to the south.

For proposed grading of the redeveloped site refer to the Preliminary Grading Plan included in Appendix E.

11. EROSION AND SEDIMENT CONTROL

Erosion and sediment controls for the site will be implemented according to the Golden Horseshoe Area Conservation Authorities' Erosion and Sediment Control Guidelines for Urban Construction. A detailed erosion control plan will be prepared upon final design and at Site Plan Approval Stage.

12. SOILS REPORT AND HYDROGEOLOGY:

A preliminary Geotechnical investigation has been completed for the site. The purpose of the study is to characterize hydrogeological conditions and determine permitting requirements for the proposed development at the First Pickering Place. The study was completed by Terraprobe dated May 27, 2021 for Pickering Ridge Lands Inc. & Bayfield Realty Advisors.

Native clayey silt glacial till, underlying dense to very dense matrix of sandy silt to silty sand till is the typical soil underlying the site. The soils have some infiltration capacity. The water table underneath varies from 4 to 6 m below grade. Based on the grading it may be possible to provide infiltration galleries. The water table should be monitored further in order to get a wide range of potential water table levels. Monitoring will provide better confidence in the potential maximum ground water levels.

13. RECOMMENDATIONS:

1) We recommend that the owners of First Pickering Place build the sanitary sewer on Pickering Parkway from 1899 Brock Road site to Notion Road to accommodate the full build out of all future development sites and the existing flows. This section of sanitary sewer will be subject to development charges as discussed with the Region of Durham.

2) The sanitary pipe on Notion Road (from Pickering Parkway to Orchard Rd) will be sized to convey existing flows and flows from Phase 1 (First Pickering Place) to the existing Orchard Road sanitary sewer. The Region will allow this interim condition at limited capacity until such time that the Ultimate Trunk Sewer is constructed in the future to convey flows to the South SP. The interim pipe will be downsized from that on Pickering Parkway, the Region will allow this, since it is a temporary measure until the Region replaces it with a trunk sewer on Notion Road.

3) We recommend looping the watermain to Notion Road or Brock Road to provide redundancy to the development since many buildings are taller than 84 m. The OBC requires a second connection to a public system when buildings are greater than 84 m.

14. CONCLUSIONS

The findings of our investigation and analysis can be concluded as follows:

The proposed site is serviceable with the added density with respect to sanitary, water and storm by connecting to the existing infrastructure in and around the site as outlined in this report.

Table 9 summarizes the SWM components of the proposed development.

Table 9 – Summary Information for Proposed Re-Development	
Allowable release rate from site (L/s)	130 L/s
Actual release rate from site (L/s) (100-year storm)	105L/s
Total Stormwater Storage Volume Required/Available in U/G Parking SWM Tank	314 m^3
Cistern Tank For Stormwater Reuse	28.9 m^3
Orifice tube size used	175 mm
Water Quality	80% TSS Achieved via Jellyfish Filtration OGS

15. REFERENCES

1. City of Pickering (September 18, 2020**). Summary of Comments**, Pre-consultation for 1755 & 1805 Pickering Parkway. City of Pickering, Ontario.
2. City of Pickering (July 2019). **Stormwater Management Design Guidelines**. City of Pickering, Ontario.
3. TRCA (August 2012). **Stormwater Management Criteria**, Version 1.0. Toronto and Region Conservation Authority, Ontario.
4. GGHA CAs (December, 2006). **Erosion and Sediment Control Guideline for Urban Construction**, Greater Golden Horseshoe Area Conservation Authorities, Ontario.
5. Ontario Ministry of the Environment (March, 2003). **Stormwater Management Planning and Design** Manual. Ministry of the Environment, Ontario. ISBN 0-7794-2969-9.
6. Ontario Ministry of the Environment (2008). **Design Guidelines for Drinking-Water Systems**. Ministry of Environment, Ontario. ISBN 978-1-4249-8517-3.
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10. **MNR Technical Guide – River and Streams Systems: Flooding Hazard Limits**, 2002.
11. **FEMA Chapter 4 - Flood Risk Assessment**.
12. **ROAD AND BRIDGE DECK DRAINAGE SYSTEMS** by MTO, November 1982.
13. **XPSWMM users Guide** by INNOVYZE 2021.
14. **EPA SWMM 5**, Build 5.1.012, Manual.
15. **LOW IMPACT DEVELOPMENT STORMWATER MANAGEMENT MANUAL**, 2008, by Credit Valley Conservation Authority and Toronto Town Conservation Authority.
16. **Master Servicing and Stormwater Management Report**, for 1899 Brock Road, City of Pickering, May 2021 by SCHAEFFERS.
17. **Functional Servicing & Stormwater Management Report Residential Townhouse Development – 1856 Notion Road Durham Region – City of Pickering**, January 19, 2018, by GHD.
18. City of Pickering and Pickering Developments Inc. – **New Highway 401 Road Crossing (from Notion Road to Squires Beach Road) Schedule "C' Municipal Class Environmental Assessment**, October 2019, by AECOM.
19. **Master Servicing and Stormwater Management Report**, 1755 & 1805 Pickering Parkway, City of Pickering, January 2022, by ODAN/DETECH Group.

Respectfully Submitted:
The Odan Detech Group Inc.

January 29th, 2025

Mark Harris

Digitally signed by Mark Harris
DN: C=CA, E=mark@odandetech.com, O=The Odan/Detech Group Inc., CN=Mark Harris
Date: 2025.01.29 09:35:27-05'00'

Paul Hecimovic, P.Eng.

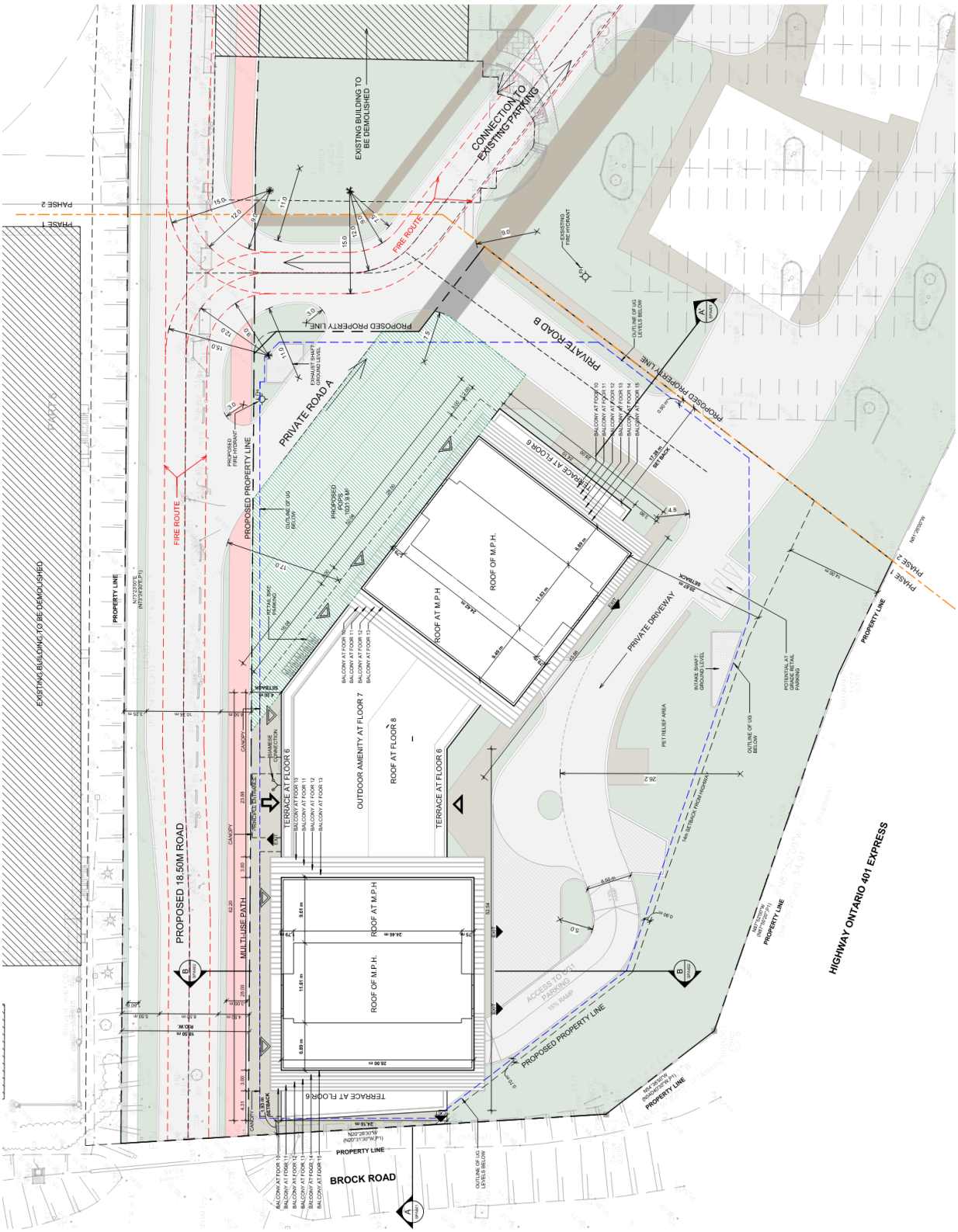
Mark Harris, Dipl. Tech.

APPENDIX A

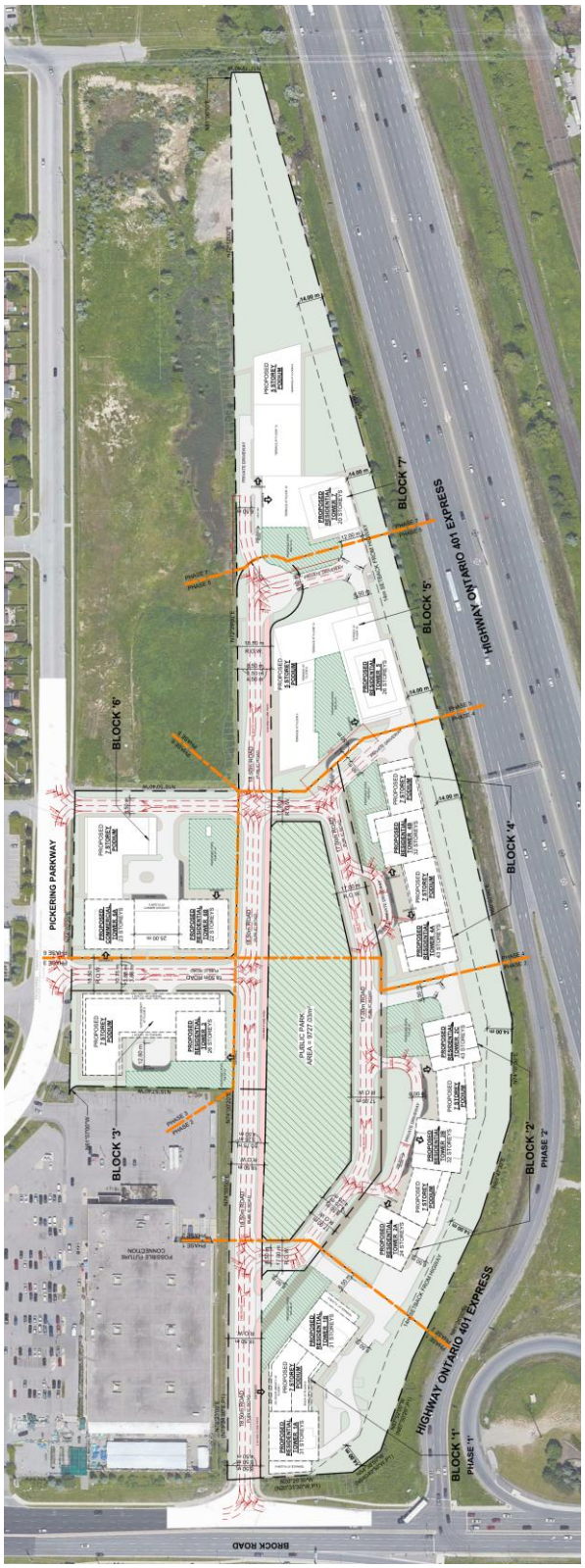
Aerial Photo of Existing Site
Phase 1 Site Plan of the Proposed Development (reduced)
Ultimate Site Plan of the Proposed Development (reduced)

Aerial Photo of Existing Site

Phase 1 Site Plan of the Proposed Development (reduced)



Ultimate Site Plan of the Proposed Development (reduced)



APPENDIX B

Redeveloped site Phase 1 sanitary sewer design sheet

Redeveloped sites (subject site, 1899 Brock Road and surrounding tributaries) sanitary sewer design sheet

SCENARIO 2: PHASE 1 CONDITIONS
Redeveloped subject site Phase 1 sanitary sewer design sheet **PROPOSED PIPE SIZES**

DESIGNED BY: S. Ahonen
CHECKED BY: M. Al-Awad

FIGURE S-4

DATE: 2025-01-17

STREET	TRIB ID	UPSTREAM MH	DOWNSTREAM MH	RESIDENTIAL							COMMERCIAL				INDUST.		FLOW (L/s)						EXISTING SEWER					PRESENT CONDITION	NOTES
				LOT AREA		POP. DENSITY (Persons/ha)	POP. DENSITY (Persons/ Unit)	# OF UNITS	POP.	PEAK FLOW FACTOR, K_H	LOT AREA (Ha)	FLOOR SPACE INDEX	GROSS FLOOR AREA		GROSS FLOOR AREA		RESIDENTIAL FLOW		COMM. 2.08 l/s	INDUS. 2.08 l/s see note 4	INSTIT. 1.30 l/s	TOTAL FLOW l/s	Length	Size	Slope	Full Flow Capacity	Full Flow Velocity	% Full	
				UNIT (ha)	ACCUM. (ha)								GFA (ha)	ACCUM. (ha)	UNIT (ha)	ACCUM. (ha)	INFIL. 0.26 (L/s)	SEWAGE 0.0042 (L/s)					L (m)	D (mm)	S (%)	Qcap (L/s)	V (m/s)	Q(d)/Qcap	
Canadian Tire Site	4	EX.MH090	SAN MH H9-0091										0.79	0.79					1.65			1.65	59.8	200	0.30	17.96	0.57	9.2	
Pickering Parkway		SAN MH 34-82	Prop MH9A	0.52	0.52									0.79			0.14	0.00	1.65			1.78	49.0	675	0.45	563.88	1.58	0.3	pipe sized for full build-out
Subject Site	P1	Prop MHBK1	Prop MH2A	1.18	1.18			678	1793	3.62			0.17	0.17			0.31	27.28	0.35			27.94	11.3	300	2.00	136.76	1.93	20.4	pipe sized for full build-out
Subject Site		Prop MH2A	Prop MH3A		1.18				1793	3.62				0.17			0.31	27.28	0.35			27.94	60.8	300	0.70	80.91	1.14	34.5	pipe sized for full build-out
Subject Site	P2	Prop MH3A	Prop MH4A		1.18				1793	3.62			0.28	0.45			0.31	27.28	0.93			28.52	90.0	300	0.70	80.91	1.14	35.2	pipe sized for full build-out
Subject Site		Prop MH4A	Prop MH9A-1		1.18				1793	3.62				0.45			0.31	27.28	0.93			28.52	41.1	300	0.70	80.91	1.14	35.2	Interim pipe Phase 1
Subject Site	P3,2	Prop MH9A-1	Prop MH6A		1.18				1793	3.62			1.50	1.95			0.31	27.28	4.05			31.64	35.1	300	0.70	80.91	1.14	39.1	Interim pipe Phase 1
Subject Site		Prop MH6A	Prop MH1A-1		1.18				1793	3.62				1.95			0.31	27.28	4.05			31.64	22.8	300	0.70	80.91	1.14	39.1	pipe sized for full build-out
Subject Site		Prop MH1A-1	Prop MH7A		1.18				1793	3.62				1.95			0.31	27.28	4.05			31.64	45.4	450	0.70	238.54	1.50	13.3	pipe sized for full build-out
Subject Site		Prop MH7A	Prop MH8A		1.18				1793	3.62				1.95			0.31	27.28	4.05			31.64	29.9	450	0.70	238.54	1.50	13.3	pipe sized for full build-out
Subject Site		Prop MH8A	Prop MH9A		1.18				1793	3.62				1.95			0.31	27.28	4.05			31.64	14.3	450	0.70	238.54	1.50	13.3	pipe sized for full build-out
Pickering Parkway	13	Prop MH9A	SAN MH H9-0018	0.25	1.95				1793	3.62				2.74			0.51	27.28	5.70			33.48	42.0	675	0.45	563.88	1.58	5.9	pipe sized for full build-out
Pickering Parkway	14	SAN MH H9-0018	SAN MH H9-0019	0.24	2.19				1793	3.62				2.74			0.57	27.28	5.70			33.55	100.0	675	0.45	563.88	1.58	5.9	pipe sized for full build-out
Pickering Parkway	15	SAN MH H9-0019	SAN MH H9-0010	0.28	2.47				1793	3.62				2.74			0.64	27.28	5.70			33.62	99.8	675	0.45	563.88	1.58	6.0	pipe sized for full build-out
BEECHLAWN DR	7	EX MH018	EX MH H9-0010	2.89	2.89		3.5	63	221	3.80							0.75	3.52				4.27	59.0	200	0.95	31.97	1.02	13.4	
METROPIA	6	EX MH3A	EX MH H9-0010	2.09	2.09		3	130	390	3.80							0.54	6.22				6.77	38.2	200	1.00	32.80	1.04	20.6	
Pickering Parkway	16	EX MH H9-0010	EX MH H9-0011	0.22	7.67				2404	3.52				2.74			1.99	35.56	5.70			43.25	82.5	675	0.45	563.88	1.58	7.7	pipe sized for full build-out
Pickering Parkway	17	EX MH H9-0011	EX MH-H9-0022	0.24	7.91				2404	3.52				2.74			2.06	35.56	5.70			43.31	80.0	675	0.45	563.88	1.58	7.7	pipe sized for full build-out
Pickering Parkway	18	EX MH-H9-0022	EX MH H9-0014	0.22	8.13				**2404**	3.52				2.74			2.11	35.56	5.70			43.37	110.1	675	0.45	563.88	1.58	7.7	pipe sized for full build-out
Subject Site	5	SAN MH 35-34	SAN MH 35-33										0.42	0.42			0.00		0.88			0.88	145.7	150	1.00	15.23	0.86	5.8	
Notion Road	20	SAN MH 35-33	SAN MH H9-0014	0.50	0.50									0.42			0.13		0.88			1.01	109.4	200	1.82	44.25	1.41	2.3	
~~MARSHCOURT DR~~		~~EX MH 35-8~~	~~EX MH 35-25~~		~~0.00~~					~~0.00~~							~~0.00~~	~~0.00~~	~~0.00~~			~~0.00~~	~~58.9~~	~~250~~	~~0.41~~	~~38.08~~	~~0.78~~	~~0.0~~	pipe to remain as cleanout access
ASHFORD DR	8	EX.MH023	SAN MH 35-25	1.93	1.93		3.5	44	154	3.80							0.50	2.46				2.96	73.0	200	0.10	10.37	0.33	28.5	
MARSHCOURT DR	9	SAN MH 35-25	SAN MH 35-26	0.29	2.22		3.5	8	28	3.80							0.58	0.45	0.00			1.02	72.8	250	0.54	43.70	0.89	2.3	
MARSHCOURT DR	10	SAN MH 35-26	SAN MH 35-27	0.60	2.82		3.5	14	49	3.80							0.73	0.78	0.00			1.51	70.3	250	0.55	44.10	0.90	3.4	
MARSHCOURT DR	11, 12	EX MH 032	SAN MH 35-27	17.39	17.39		3.5	262	917	3.80			0.67	0.67			4.52	14.64	1.39			20.55	40.5	250	0.27	30.90	0.63	66.5	
EASEMENT		SAN MH 35-27	SAN MH H9-0029	0.00	20.21				966	3.80				0.67			5.25	15.42	1.39			22.06	124.0	375	0.16	70.13	0.63	31.5	
NOTION ROAD		SAN MH H9-0014	Prop MH 13A	0.01	0.51				2404	3.52				3.16			0.13	35.56	6.58			42.27	14.5	450	0.40	180.32	1.13	23.4	**Interim pipe Phase 1**
NOTION ROAD		Prop MH 13A	Prop MH 14A	0.25	0.76				2404	3.52				3.16			0.20	35.56	6.58			42.34	100.0	450	0.22	133.73	0.84	31.7	**Interim pipe Phase 1**
NOTION ROAD	21,23	Prop MH 14A	SAN MH H9-	0.29	1.05				2404	3.52				3.16	0.66		0.27	35.56	6.58	1.3728		43.79	101.8	450	0.22	133.73	0.84	32.7	**Interim pipe Phase 1**
NOTION ROAD	22	SAN MH H9-0029	SAN MH H9-0045	0.30	21.56				3370	3.40				3.83	0.66		5.60	48.10	7.98	1.3728		63.06	71.8	450	0.22	133.73	0.84	47.2	Interim pipe Phase 1
NOTION ROAD		SAN MH H9-0045	SAN MH 17		21.56				3370	3.40				3.83	0.66		5.60	48.10	7.98	1.3728		63.06	3.5	450	0.23	136.73	0.86	46.1	Interim pipe Phase 1
ORCHARD ROAD		SAN MH 17	SAN MH 18		21.56																	**63.06**		750	Available capacity at Orchard Rd 750mm dia. pipe is 150 L/s. Total flow calculated here does not include the existing sanitary flows conveyed south on Notion Rd to Orchard Rd.				see note below about capacity

Design Criteria as per The Regional Municipality of Durham '*Design Specifications for Sanitary Sewers*'
Average daily per capita flow = 364 L/cap/day (Residential)
Average daily per capita flow = 180,000 L/GFA hectares/day (commercial&industrial)
I = Unit of peak extraneous flow when foundation drains are NOT connected to the storm sewer = 0.26 L/s/Ha
Q(p) = peak population flow (L/s) Q(I) = peak extraneous flow (L/s)
Q(d) = peak design flow (L/s)
PEAKING FACTOR (Harmon; Residential) M =1 + 14/(4+(P/1000^0.5))
PEAK POPULATION FLOW, Q (p) = q*P*M / 86400 L / Sec.
PEAK EXTRANEOUS FLOW, Q(i) = I*A L / Sec.
PEAK DESIGN FLOW, Q(d) = Q(p) + Q(i) L / Sec.
PIPE ROUGHGNESS, n = 0.013 For Manning's Equation

NOTES:
1) MINIMUM VELOCITY = 0.60 m/s
2) MAXIMUM VELOCITY = 3.65 m/s
3) INFILTRATION 0.26 l/s = 22.5 m3/Ha/DAY
INFILTRATION 0.52 l/s = 45.0 m3/Ha/DAY (Foundation DraIn Connections)
4) COMMERCIAL 2.08 l/s (local sewers) 1.04 l/s (trunk sewers)
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

Population Density by Land Use

Housing Type	Density
Single & Semi Detached	3.5 P/u
Townhouse	3.0 P/u
1 Bedroom	1.5 P/u
2 Bedroon and 1 Bedroom+Den	2.5 P/u
3 Bedroom	3.5 P/u
4 Bedroom	4.5 P/u

Housing Type	Density
Single Family	60 persons/ha
Semi Detached & Duplex	100 persons/ha

* ASSUMED 150 L/s AVAILABLE EXCESS FLOW CAPACITY AT ORCHARD ROAD as per correspondence with Durham Region

ODAN·DETECH CONSULTING ENGINEERS

SCENARIO 3: CONCEPTUAL FULL BUILDOUT CONDITIONS
Full development of subject site and future tributary sanitary design sheet

DESIGNED BY: S. Ahone 0.013
CHECKED BY: M. Al-Awa 09/09/2021

DATE: 2025-01-17

FIGURE S-5

STREET	TRIB ID	UPSTREAM MH	DOWNSTREAM MH	RESIDENTIAL						COMMERCIAL				INDUST.		FLOW (L/s)				EXISTING SEWER					PRESENT CONDITION	NOTES
				LOT AREA		POP. DENSITY (Persons/ha)	POP. DENSITY (Persons/ Unit)	# OF UNITS	POP.	PEAK FLOW FACTOR, K_H	LOT AREA (Ha)	FLOOR SPACE INDEX	GROSS FLOOR AREA		GROSS FLOOR AREA		RESIDENTIAL FLOW		COMM. 2.08 l/s	TOTAL FLOW l/s	Length	Size	Slope	Full Flow Capacity	Full Flow Velocity	% Full	
				UNIT (ha)	ACCUM. (ha)								GFA (ha)	ACCUM. (ha)	UNIT (ha)	ACCUM. (ha)	INFIL. 0.26 (L/s)	SEWAGE 0.0042 (L/s)			L (m)	D (mm)	S (%)	Qcap (L/s)	V (m/s)	Q(d)/Qcap	
1899 Brock Road	P9	Prop MH16A	SAN MH H9-0091	29.50	29.50	800			23600	2.58							7.67	255.78	0.00	263.45	116.0	525	1.00	430.06	1.99	61.3	FUTURE PROPOSED
Canadian Tire Lands	P10	EX.MH090	SAN MH H9-0091	4.10	4.10	1200			4920	3.25							1.07	67.19	0.00	68.25	59.8	450	0.30	156.16	0.98	43.7	EX PIPE OUTSIDE SCOPE OF WORK
Pickering Parkway	13	SAN MH H9-0091	Prop MH9A	0.25	33.85				28520	2.50				0.00			8.80	299.32	0.00	308.12	49.0	675	0.45	563.88	1.58	54.6	PROPOSED
Subject Site	P1	Prop MHBK1	Prop MH2A	1.18	1.18			678	1793	3.62			0.17	0.17			0.31	27.28	0.35	27.94	11.3	300	2.00	136.76	1.93	20.4	PROPOSED
Subject Site		Prop MH2A	Prop MH3A		1.18				1793	3.62				0.17			0.31	27.28	0.35	27.94	60.8	300	0.70	80.91	1.14	34.5	PROPOSED
Subject Site	P2	Prop MH3A	Prop MH4A	1.28	2.46		2.5	1090	4518	3.29			0.10	0.27			0.64	62.34	0.56	63.54	90.0	300	0.70	80.91	1.14	78.5	PROPOSED
Subject Site		Prop MH4A	Prop MH5A		2.46				4518	3.29				0.27			0.64	62.34	0.56	63.54	32.8	300	0.70	80.91	1.14	78.5	PROPOSED
Subject Site	P3,P4	Prop MH5A	Prop MH6A	3.01	5.47		2.5	1022	7073	3.10			0.07	0.34			1.42	92.16	0.71	94.28	35.1	300	0.70	80.91	1.14	116.5	PROPOSED
Subject Site	P5,P6	Prop MH6A	Prop MH1A-1	2.63	8.10		2.5	1403	10581	2.93			0.07	0.41			2.11	130.22	0.85	133.17	22.8	450	0.70	238.54	1.50	55.8	PROPOSED
Subject Site	P7,P8	Prop MH1A-1	Prop MH7A	1.45	9.55		2.5	1208	13601	2.82			2.26	2.67			2.48	161.14	5.55	169.18	45.4	450	0.70	238.54	1.50	70.9	PROPOSED
Subject Site		Prop MH7A	Prop MH8A		9.55				13601	2.82				2.67			2.48	161.14	5.55	169.18	29.9	450	0.70	238.54	1.50	70.9	PROPOSED
Subject Site		Prop MH8A	Prop MH9A		9.55				13601	2.82				2.67			2.48	161.14	5.55	169.18	14.3	450	0.70	238.54	1.50	70.9	PROPOSED
Pickering Parkway	13	Prop MH9A	EX MH H9-0018	0.25	43.65				42121	2.33				2.67			11.35	413.01	5.55	429.91	42.1	675	0.45	563.88	1.58	76.2	PROPOSED
Pickering Parkway	14	EX MH H9-0018	EX MH H9-0019	0.24	43.89				42121	2.33				2.67			11.41	413.01	5.55	429.97	100.0	675	0.45	563.88	1.58	76.3	PROPOSED
Pickering Parkway	15	EX MH H9-0019	EX MH H9-0010	0.28	44.17				42121	2.33				2.67			11.48	413.01	5.55	430.04	99.8	675	0.45	563.88	1.58	76.3	PROPOSED
BEECHLAWN DR	7	EX MH018	EX MH H9-0010	2.89	2.89		3.5	63	221	3.80							0.75	3.52		4.27	59.0	200	0.95	31.97	1.02	13.4	EX
METROPIA	20	SAN MH3A	SAN MH H9-	2.09	2.09		3	130	390	3.80							0.54	6.22		6.77	38.2	200	1.00	32.80	1.04	20.6	EX
~~MARSHCOURT DR~~		~~EX MH H9-0022~~	~~EX MH 35-25~~							~~0.00~~							~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~58.9~~	~~250~~	~~0.41~~	~~38.08~~	~~0.78~~	~~0.0~~	pipe to remain as cleanout access
ASHFORD DR	8	EX.MH023	SAN MH 35-25	1.93	1.93		3.5	44	154	3.80							0.50	2.46		2.96	73.0	200	0.10	10.37	0.33	28.5	EX
MARSHCOURT DR	9	SAN MH 35-25	SAN MH 35-26	0.29	2.22		3.5	8	28	3.80							0.58	0.45	0.00	1.02	72.8	250	0.54	43.70	0.89	2.3	EX
MARSHCOURT DR	10	SAN MH 35-26	SAN MH 35-27	0.60	2.82		3.5	14	49	3.80							0.73	0.78	0.00	1.51	70.3	250	0.55	44.10	0.90	3.4	EX
MARSHCOURT DR	11	EX MH 032	SAN MH 35-27	17.39	17.39		3.5	262	917	3.80							4.52	14.64	0.00	19.16	40.5	250	0.27	30.90	0.63	62.0	EX
EASEMENT		SAN MH 35-27	SAN MH H9-0029		20.21				966	3.80							5.25	15.42	0.00	20.67	124.0	375	0.16	70.13	0.63	29.5	outlet to Region Trunk on Notion Rd*
Pickering Parkway	16	SAN MH H9-0010	SAN MH H9-0011	0.22	2.31				42731	2.33				0.00			0.60	417.93	0.00	418.53	82.5	675	0.45	563.88	1.58	74.2	PROPOSED
Pickering Parkway	17	SAN MH H9-0011	SAN MH H9-0022	0.24	2.55				42731	2.33				0.00			0.66	417.93	0.00	418.59	80.1	675	0.45	563.88	1.58	74.2	PROPOSED
Pickering Parkway	18	SAN MH H9-0022	SAN MH H9-0014	0.22	2.77				42731	2.33				0.00			0.72	417.93	0.00	418.65	110.1	675	0.45	563.88	1.58	74.2	PROPOSED
Notion Road		SAN MH H9-0014	MH 13A																	418.65	14.5	675	0.20	375.92	1.05	111.4	outlet to Region Trunk on Notion Rd

Design Criteria as per The Regional Municipality of Durham '*Design Specifications for Sanitary Sewers*'
Average daily per capita flow = 364 L/cap/day (Residential)
Average daily per capita flow = 180,000 L/GFA hectares/day (commercial&industrial)
I = Unit of peak extraneous flow when foundation drains are NOT connected to the storm sewer = 0.26 L/s/Ha
Q(p) = peak population flow (L/s) Q(I) = peak extraneous flow (L/s)
Q(d) = peak design flow (L/s)
PEAKING FACTOR (Harmon; Residential) M =1 + 14/(4+(P/1000^0.5))
PEAK POPULATION FLOW, Q (p) = q*P*M / 86400 L / Sec.
PEAK EXTRANEOUS FLOW, Q(i) = I*A L / Sec.
PEAK DESIGN FLOW, Q(d) = Q(p) + Q(i) L / Sec.
PIPE ROUGHGNESS, n = 0.013 For Manning's Equation

NOTES:
1) MINIMUM VELOCITY = 0.60 m/s
2) MAXIMUM VELOCITY = 3.65 m/s
3) INFILTRATION 0.26 l/s = 22.5 m3/Ha/DAY
   INFILTRATION 0.52 l/s = 45.0 m3/Ha/DAY (Foundation Drain Connections)
4) COMMERCIAL 2.08 l/s (local sewers) 1.04 l/s (trunk sewers)
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

Population Density by Land Use

Housing Type	Density
Single & Semi Detached	3.5 P/u
Townhouse	3.0 P/u
1 Bedroom	1.5 P/u
2 Bedroon and 1 Bedroom+Den	2.5 P/u
3 Bedroom	3.5 P/u
4 Bedroom	4.5 P/u

Housing Type	Density
Single Family	60 persons/ha
Semi Detached & Duplex	100 persons/ha

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*ASSUMED FLOW FROM EASEMENT SEWER AND PICKERING PARKWAY WILL OUTLET TO REGION TRUNK ON NOTION RD

APPENDIX C

FUS Fire Demand Calculations
Location of hydrant flow tests
Hydrant flow tests

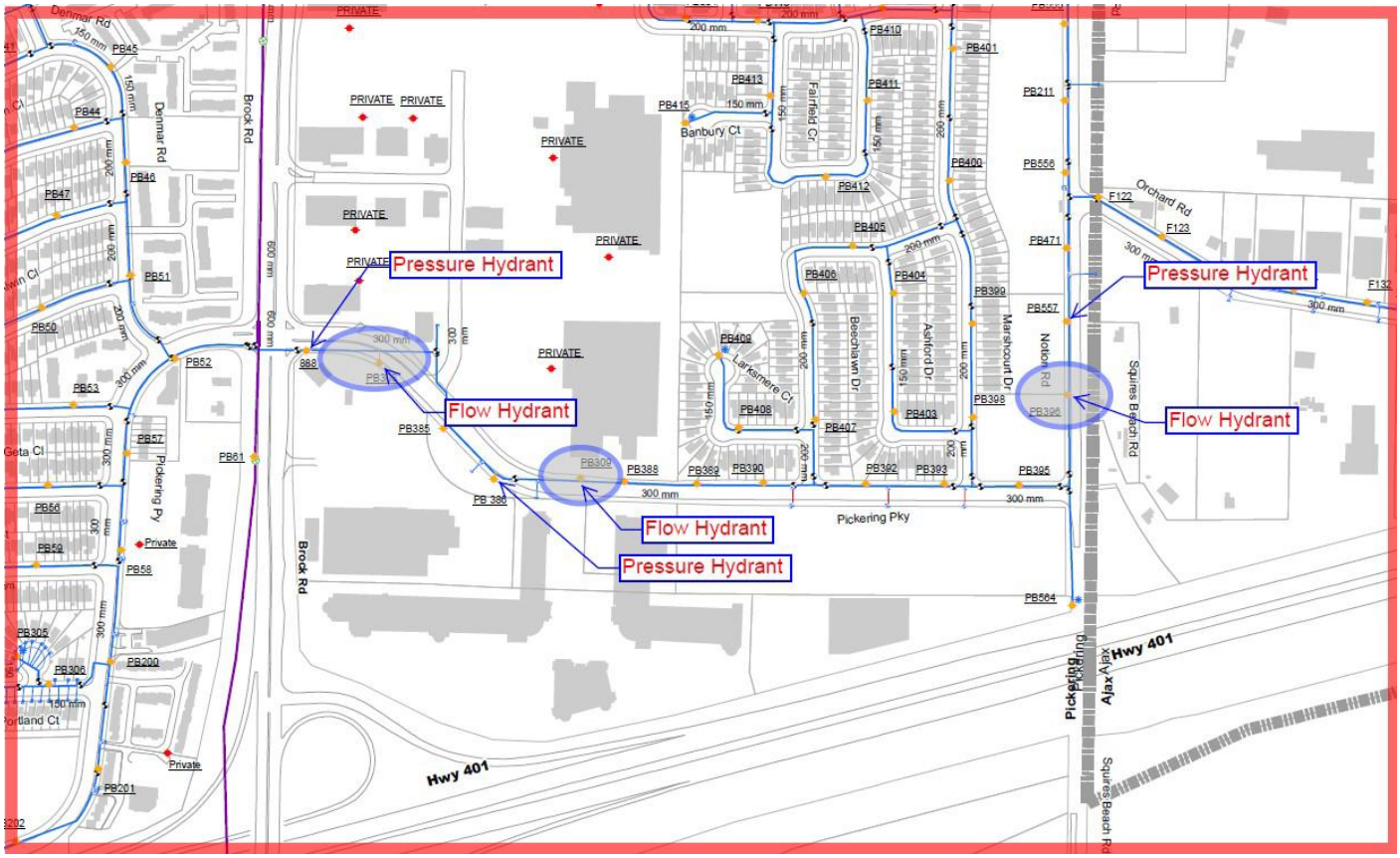
FUS Fire Demand Calculations

WATER SUPPLY FOR PUBLIC FIRE PROTECTION , FIRE UNDERWRITERS SURVEY
GUIDE FOR DETERMINATION OF REQUIRED FIRE FLOWS

$F = 220 \times C \times \sqrt{A}$
Where:
F = required fire flow in liters per minute
C= Coefficient related to the type of construction
A = the total floor area in square meters (excluding basements) in the building considered

LOCATION:	20266 - Phase 1 (Block 1)				**PROJECT:**	31 Storey Residential - Mixed Use			
OBC OCCUPANCY:	Mixed Use				**PROJECT No:**	21241			
BUILDING FOOT PRINT (m2):	18461							Contents	Charge
# OF STOREYS	31							Non-Combustible	-25%
								Limited Combustible	-15%
								Combustible	0%
CONSTRUCTION CLASS:	Fire Resistive							Free Burning	15%
								Rapid Buring	25%
AUTOMATED SPRINKLER PROTECTION		Credit	Total						
NFPA 13 sprinkler standard	yes	30%	50%					Coefficient related to type of construction	
Standard Water Supply	yes	10%						1.5	Wood Frame
Fully Supervised System	yes	10%						1	Ordinary
		50%						0.8	Non combustible
								0.6	Fire Resistive
CONTENTS FACTOR:	Limited Combustible				CHARGE:	-15%			
								Separation	Charge
EXPOSURE 1 (south)	Distance to Exposure Building (m)				>45	0		0-3 m	25%
	Length - Height							3.1 -10 m	20%
EXPOSURE 2 (east)	Distance to Exposure Building (m)				21.0	10		10.1 - 20 m	15%
	Length - Height							20.1 - 30 m	10%
EXPOSURE 3 (west)	Distance to Exposure Building (m)				>45	0		30.1 - 45	5%
	Length - Height							> 45 m	0%
EXPOSURE 4 (north)	Distance to Exposure Building (m)				27.9	10		Firewall	10%
	Length - Height								
					Total:	20	no more than 75%		
ARE BUILDINGS CONTIGUOUS:	NO								
FIRE RESISTANT BUILDING	Are vertical openings and exterior vertical communications protected with a minimum one (1) hr rating?							NO	
CALCULATIONS	*C =*	0.6		Fire Resistive					
	A =	15569	m2	Total				STOREY AREAS m2	
	F =	16470	L/min					1715	1
Round to Nearest 1000 L/min	F =	16000	L/min	must be > 2000 L/min				1454	2
								1454	3
CORRECTION FACTORS:								1454	4
OCCUPANCY		-2400	L/min					1454	5
FIRE FLOW ADJUSTED FOR OCCUPANCY		13600	L/min					1289	6
REDUCTION FOR SPRINKLER		-6800	L/min					728	7
EXPOSURE CHARGE		2720	L/min					778	8-15 (8)
								762	16-31 (16)
REQUIRED FIRE FLOW	**F =**	9520	L/min						
Round to Nearest 1000 L/min	**F =**	10000	L/min	2642	usgm				
	F =	166.67	L/sec						

Location of hydrant flow tests



FLOWMETRIX
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PROCESS
WESTCAN

Fire Flow Testing Report

Residual Hydrant #	**PB557**
NFPA Colour Code	**BLUE**

DATE	September 8, 2021
TIME	10:30 AM
ADDRESS	1972 Notion Rd
	Pickering, ON
SIZE-inches/mm	12 300
MATERIAL	PVC
CONTACT INFO	The Odan/Detech Group Inc.
	Mark Harris
	C: (905) 632-3811 ext.122
	E: mark@odandetech.com

RESIDUAL HYDRANT INFO.

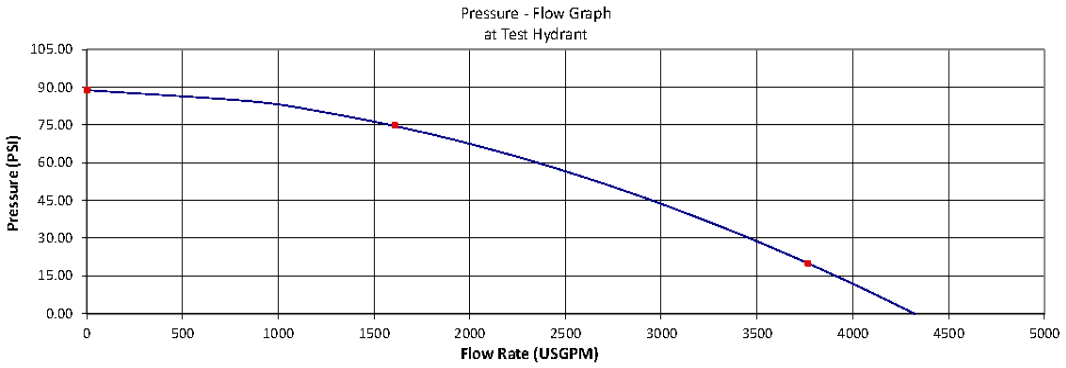
HYDRANT #	PB557	
N.F.P.A. COLOUR CODE	BLUE	
STATIC PRESSURE	88.9	psi
RESIDUAL PRESSURE	74.6	psi
PRESSURE DROP	14.3	psi
% PRESSURE DROP	16.0	% psi

Flow on Water Main At Test Hydrant - 20 psi 3766 USGPM

FLOW HYDRANT(S) INFO.

HYDRANT ASSET ID	HYD. # PORTS	OUTLET DIAMETER (INCHES)	NOZZLE COEFFICIENT	DIFFUSER TYPE	DIFFUSER COEFFICIENT	PITOT READING (psi)	PITOT FLOW (USGPM)	FLOW METER (USGPM)
PB396	2	2.5	Round	LPD250	0.90	**28.4**	804	0
		2.5	Round	LPD250	0.90	**28.4**	804	0
				Total Flow (USGPM)			1609	0
				Total Flow (USGPM)			1609	

FIRE FLOW CHART



COMMENTS

OPERATOR	FMX	Jordan Whitlock
OPERATOR	FMX	Denis Kriventsev
OPERATOR		Region of Durham

ODG_FireFlowTestingReport_Pickering

"If we don't measure it, how do you manage it?"

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Fire Flow Testing Report

Residual Hydrant # **PB386**
NFPA Colour Code **BLUE**

DATE	September 8, 2021
TIME	10:45 AM
ADDRESS	1735 Pickering Pkwy
	Pickering, ON
SIZE-Inches/mm	12 300
MATERIAL	PVC

CONTACT INFO
The Odan/Detech Group Inc.
Mark Harris
C: (905) 632-3811 ext.122
E: mark@odandetech.com

RESIDUAL HYDRANT INFO.

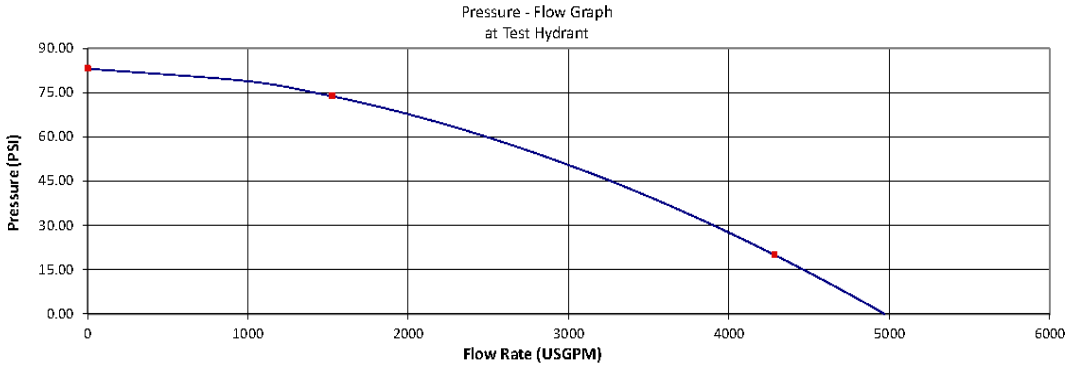
HYDRANT #	PB386	
N.F.P.A. COLOUR CODE	BLUE	
STATIC PRESSURE	83.2	psi
RESIDUAL PRESSURE	73.8	psi
PRESSURE DROP	9.3	psi
% PRESSURE DROP	11.2	% psi

Flow on Water Main At Test Hydrant - 20 psi 4283 USGPM

FLOW HYDRANT(S) INFO.

HYDRANT ASSET ID	HYD. # PORTS	OUTLET DIAMETER (INCHES)	NOZZLE COEFFICIENT	DIFFUSER TYPE	DIFFUSER COEFFICIENT	PITOT READING (psi)	PITOT FLOW (USGPM)	FLOW METER (USGPM)
PB309	2	2.5	Round	LPD250	0.90	**25.5**	762	0
		2.5	Round	LPD250	0.90	**25.5**	762	0
					Total Flow (USGPM)		1525	0
					Total Flow (USGPM)		1525	

FIRE FLOW CHART



COMMENTS

OPERATOR	FMX	Jordan Whitlock
OPERATOR	FMX	Denis Kriventsev
OPERATOR		Region of Durham

ODG_FireFlowTestingReport_Pickering

"If we don't measure it, how do you manage it?"

FLOWMETRIX
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Fire Flow Testing Report

Residual Hydrant #	**PB888**
NFPA Colour Code	**BLUE**

DATE	September 8, 2021
TIME	11:00 AM
ADDRESS	1785 Pickering Pkwy
	Pickering, ON
SIZE-inches/mm	12 300
MATERIAL	PVC
CONTACT INFO	The Odan/Detech Group Inc.
	Mark Harris
	C: (905) 632-3811 ext.122
	E: mark@odandetech.com

RESIDUAL HYDRANT INFO.

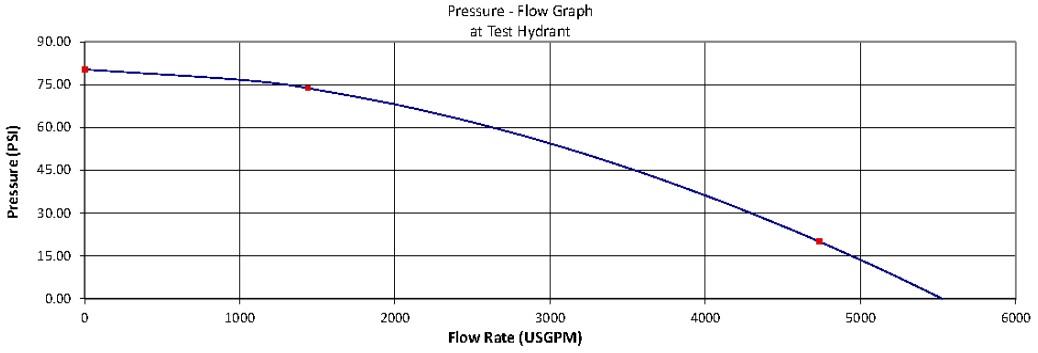
HYDRANT #	PB888	
N.F.P.A. COLOUR CODE	BLUE	
STATIC PRESSURE	80.3	psi
RESIDUAL PRESSURE	73.7	psi
PRESSURE DROP	6.7	psi
% PRESSURE DROP	8.3	% psi

Flow on Water Main At Test Hydrant - 20 psi 4735 USGPM

FLOW HYDRANT(S) INFO.

HYDRANT ASSET ID	HYD. # PORTS	OUTLET DIAMETER (INCHES)	NOZZLE COEFFICIENT	DIFFUSER TYPE	DIFFUSER COEFFICIENT	PITOT READING (psi)	PITOT FLOW (USGPM)	FLOW METER (USGPM)
PB308	2	2.5	Round	LPD250	0.90	**22.7**	720	0
		2.5	Round	LPD250	0.90	**22.7**	720	0
					Total Flow (USGPM)		1439	0
					Total Flow (USGPM)		1439	

FIRE FLOW CHART



COMMENTS

OPERATOR	FMX	Jordan Whitlock
OPERATOR	FMX	Denis Kriventsev
OPERATOR		Region of Durham

ODG_FireFlowTestingReport_Pickering

"If we don't measure it, how do you manage it?"

APPENDIX D

Rational Method Calculations
Water Balance Calculations
Jellyfish ETV Certification

Modified Rational Method

Project:	1755 & 1805 Pickering PKWY	Date:	1/15/2025
Project No.:	20266		
Municipality:	Pickering		
Catchment No.	Block 1		

Area (ha):	0.880		100-year Rainfall	
Runoff Coefficient:	0.500		Intensity (I) :	A/(T+B)^C
100-Yr Runoff Coefficient:	0.900		A:	2096.43
*Target Flow (m3/s):	0.105	Note: Adjusted to Orifice	B:	6.485
(5-yr Allowable)	0.130		C:	0.863

Initial Time:	10 min
Increment:	5 min

Time	I	Peak Flow	Runoff Vol.	Discharge Vol.	Storage
min	mm/hr	m3/s	m3	m3	m3
10	186.7	0.411	246.6	63	183.6
15	148.5	0.327	294.3	94.5	199.8
20	**124.0**	**0.273**	**327.6**	**126**	**201.6**
25	106.8	0.235	352.8	157.5	195.3
30	94.1	0.207	372.8	189	183.8
35	84.2	0.185	389.3	220.5	168.8
40	76.3	0.168	403.2	252	151.2
45	69.9	0.154	415.4	283.5	131.9
50	64.5	0.142	426.0	315	111.0
55	59.9	0.132	435.6	346.5	89.1
60	56.0	0.123	444.2	378	66.2
65	52.6	0.116	452.0	409.5	42.5
70	49.7	0.109	459.2	441	18.2
75	47.0	0.104	465.8	472.5	-6.7
80	44.7	0.098	472.0	504	-32.0

* Target Flow is calculated based on 5-year storm event-Rational Method

I5= 1082.901/(T+6.007)^0.837
Tc= 10 min
I5=106.4 mm/hr.

ORIFICE DISCHARGE CALCULATOR - SWM TANK - BLK 1

This program calculates the discharge from a circular orifice when given elevations and orifice diameters by the user.

Discharge based on orifice equ.: Q = CA x sqrt(2gh)

Tank Area

137.5 m2

Stall Area	Stalls	Total Area
13.75	10	137.5

Q-allowable

130 l/sec

Orifice Diameter = 0.1750 m
Orifice Area = 0.0241 m2
Discharge Coeff. = 0.8000

	Head (m)	Discharge(m3/s)	Discharge (L/s)	Vol (m3)	
	0	0.0000	0	0	
	0.20	0.0381	38	28	
	0.40	0.0539	54	55	
	0.80	0.0762	76	110	
	1.00	0.0852	85	138	
100-year	1.52	0.1051	105	209	
Top of Tank (free board)	1.80	0.1144	114	248	
				@1.5x	@x1.5 Area
				314	206

Water Balance Calculations

CITY OF PICKERING GUIDELINE WATER BALANCE SUMMARY

Project: 1755&1805 Pickering Parkway (First Pickering Place)
Project No.: 20266

Site Area	8760	m^2
Rainfall depth required to capture	5	mm
Captured Volume Target (5mm across entire site) (Total Area x Rainfall Depth)	43.8	m^3

SURFACE TYPE	SURFACE CAPTURE (mm)	AREA (m^2)	% OF SITE AREA	VOLUME CAPTURE (m^3)
Green Roof	7	682	7.8	4.8
Landscaped Areas	5	921	10.5	4.6
Roof Area (Drains to Cistern for Reuse)	12.5	2309	26.4	28.9
Asphalt Driveway, Pavers and Concrete (Ground)	1	4848	55.3	4.8
TOTAL		8760	100	38.2

CAPTURED VOLUME BY INTIAL ABSTRACTION (m^3)	**14.2**
VOLUME OF CISTERN (m^3)	**28.9**
CAPTURED VOLUME (m^3)	**43.1**

APPENDIX E

Figure PH1 – Phase 1 – Site Servicing and Easement Plan

Figure 1 – Preliminary Site Servicing Plan
Figure 2 – Preliminary Grading Plan

Figure 3 – Post Development Watermain Service
Figure 4 – Post Development Storm Service
Figure 5a – Post Development Sanitary Service
Figure 5b – Post Development Sanitary Service

Figure 6 – Post Sanitary Tributary Area Plan
Figure 7 – Pre-Development Storm Tributary Area Plan
Figure 8 – Post Development Storm Tributary Area Plan
Figure 9 – Notion Road – Profile
Figure 10 – Pickering Parkway – Profile 1/2
Figure 11 – Pickering Parkway – Profile 2/2

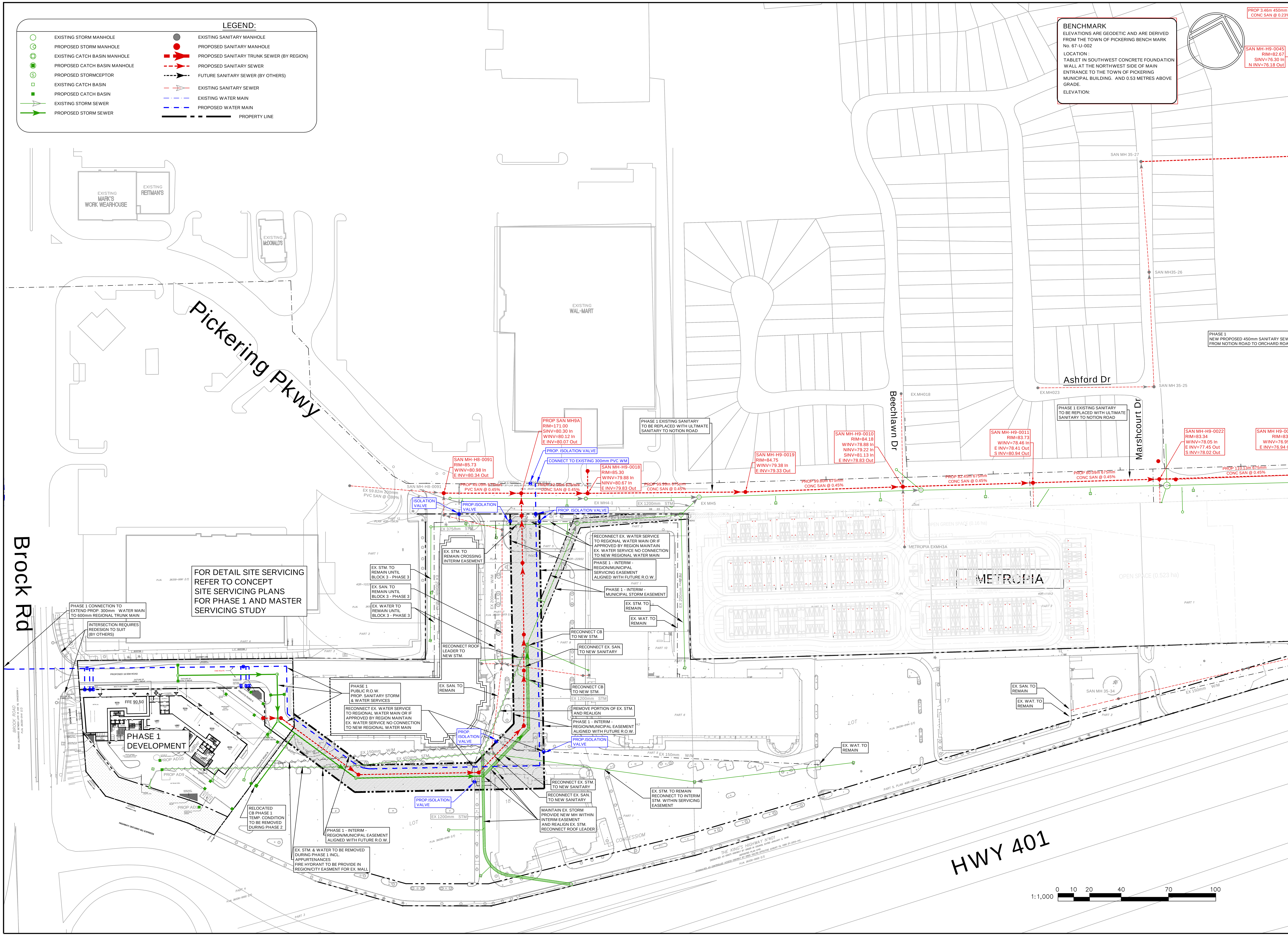


FIGURE PH1

PHASE 1 SITE SEVICING & EASEMENT PLAN

PICKERING BRIDGE LANDS INC.
PROPOSED MIX-USE DEVELOPMENT
1755 + 1805 PICKERING PARKWAY
PICKERING, ON

DATE:	PROJ. NO.:	SCALE:
JAN 2025	20266	1:1000

ODAN·DETECH CONSULTING ENGINEERS

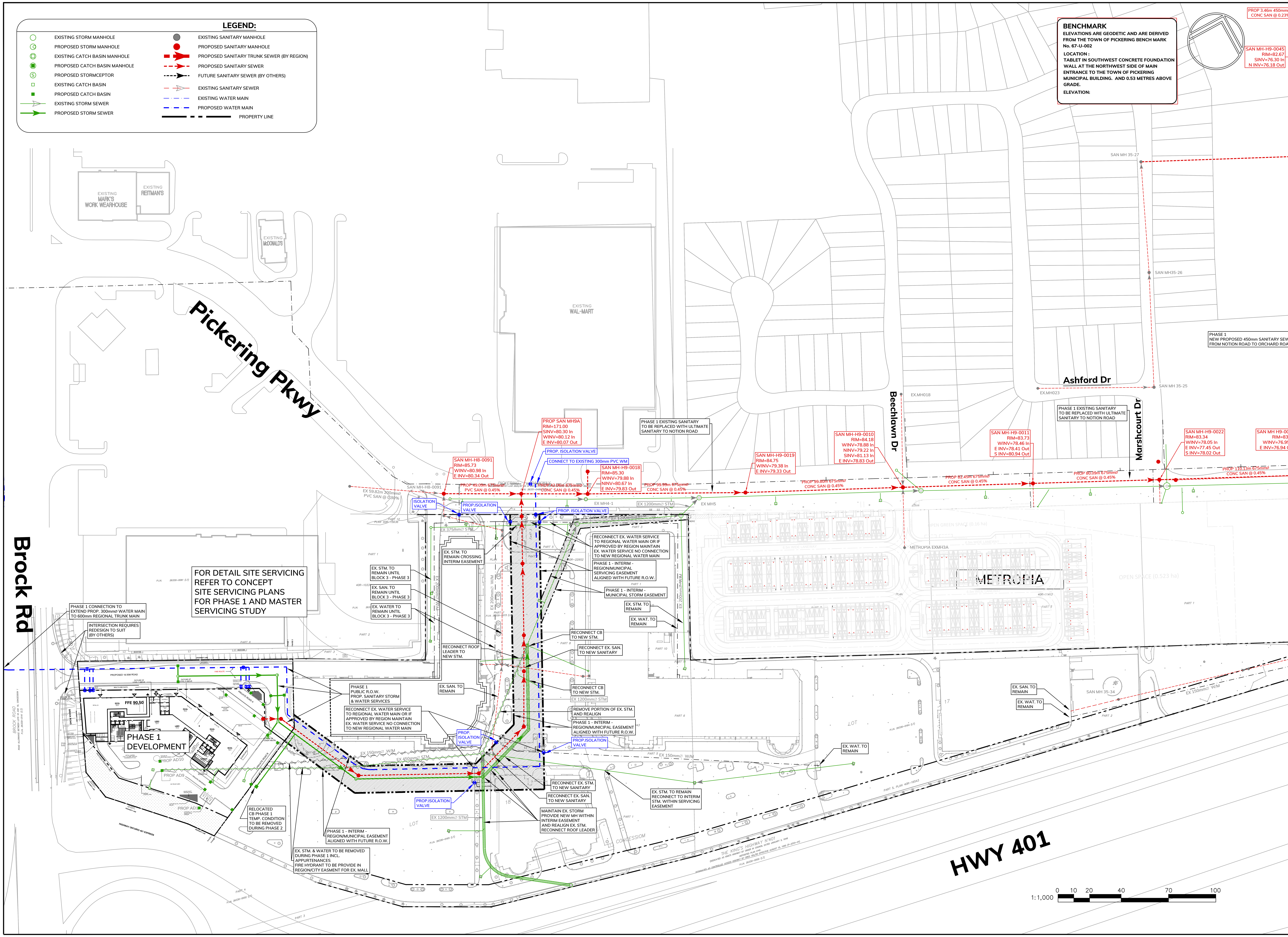


FIGURE PH1

PHASE 1 SITE SEVICING & EASEMENT PLAN

PICKERING BRIDGE LANDS INC.
PROPOSED MIX-USE DEVELOPMENT
1755 + 1805 PICKERING PARKWAY
PICKERING, ON

DATE:	PROJ. NO.:	SCALE:
JAN 2025	20266	1:1000

ODAN·DETECH CONSULTING ENGINEERS

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5230 SOUTH SERVICE ROAD, BURLINGTON, ONTARIO, L7L 5K2

LEGEND:

- EXISTING STORM MANHOLE
- PROPOSED STORM MANHOLE
- EXISTING CATCH BASIN MANHOLE
- PROPOSED CATCH BASIN MANHOLE
- PROPOSED STORMCEPTOR
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- PROPOSED DRIVEWAY (S = SINGLE, D = DOUBLE)
- EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED SANITARY SEWER
- EXISTING SANITARY SEWER
- EXISTING HYDRANT
- PROPOSED HYDRANT
- EXISTING WATER VALVE & BOX
- PROPOSED WATER VALVE & BOX
- EXISTING VALVE CHAMBER
- BOREHOLE LOCATION
- PROPOSED VALVE CHAMBER
- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- PROPOSED REDUCER
- PROPOSED CAP FOR SANITARY, STORM AND/OR WATER AS NOTED
- PROPOSED SLOPE (3:1 OR HIGHER)
- LIMIT OF CONSTRUCTION
- PROPERTY LINE

1899 BROCK ROAD

Pickering Pkwy

Brock Rd

Orchard Rd

Notion Rd

Beechlawn Dr

Ashford Dr

Marshcourt Dr

Easement

METROPIA

HWY 401

EXISTING MARK'S WORK WAREHOUSE

EXISTING REITMAN'S

EXISTING McDONALD'S

EXISTING WAL-MART

EXISTING CANADIAN TIRE

LANDSCAPE

PROP 3.46m 450mmø CONC SAN @ 0.23%

SAN MH-H9-0045

SAN MH 17

EX 103.39m 825mmø CONC STM @ 0.20%

PROP 7.59m 450mmø CONC SAN @ 0.23%

EX MH (EXT) - (11)

SAN MH-H9-0029

EX SAN CONTROL MH

EX 109.34m 825mmø Reinforced Concrete STM @ 0.20%

PROP 101.76m 450mmø PVC SAN @ 0.23%

SAN MH 35-27

SAN MH35-26

SAN MH 35-25

PROP SAN MH14A

EX MH (EXT) - (10)

EX 85.50m 900mmø Reinforced Concrete STM @ 0.20%

PROP 15.60m 750mmø PVC SAN @ 0.23%

EX MH (EXT) - (17)

SAN MH H9-0014

PROP SAN MH13A

PROP 14.47m 450mmø PVC SAN @ 0.22%

PROP SAN MH10A

PROP 110.13m 675mmø CONC SAN @ 0.45%

SAN MH-H9-0022

PROP 80.09m 675mmø CONC SAN @ 0.45%

SAN MH-H9-0011

PROP 82.45m 675mmø CONC SAN @ 0.45%

SAN MH-H9-0010

EX 20.25m 600mmø CONC STM @ 0.30%

EX 155.84m 1350mmø CONC STM @ 0.33%

EX 83.45m 2100mmø CONC STM @ 0.20%

EX MH6

EX MH8

EX 140.65m 1200mmø CONC STM @ 0.50%

EX MH5

EX 16.05m 1200mmø CONC STM @ 1.26%

EX MHS1

PROP 99.99m 675mmø CONC SAN @ 0.45%

SAN MH-H9-0019

EX 71.76m 750mmø CONC STM @ 0.75%

EX 66.01m 1200mmø CONC STM @ 0.50%

SAN MH-H9-0018

PROP 99.80m 675mmø CONC SAN @ 0.45%

CONNECT TO EXISTING 300mm PVC WM

PROP 42.06m 675mmø CONC SAN @ 0.45%

EX 91.15m 250mm PVC SAN

SAN MH-H8-0091

PROP SAN MH9A

PROP 49.09m 675mmø PVC SAN @ 0.45%

PROP ISOLATION VALVE

PROP SAN MH8A

EX MHS2

6m CITY STORM EASEMENT (INTERIM)

EX 92.64m 375mmø CONC STM @ 1.01%

PROP 14.30m 450mmø CONC SAN @ 0.70%

PROP 29.89m 450mmø CONC SAN @ 0.70%

PROP SAN MH7A

EX 157.21m 1200mmø CONC STM @ 0.46%

6m CITY STORM EASEMENT (INTERIM)

TO BE REMOVED DURING PHASE 3

REGION/CITY SERVICING EASEMENT FUTURE ROW

PROP 300mmø PVC W/M

PROP SAN MH1A-1

PROP STM MH6-3

PROP 22.80m 300mmø PVC SAN @ 0.70%

PROP FIRST FIRE 300mm PVC WM

PROP SECOND FIRE 300mm PVC WM

PROP DOMESTIC 300mm PVC WM

PROP SECOND FIRE 300mm PVC WM

PROP FIRST FIRE 300mm PVC WM

PROP DOMESTIC 300mm PVC WM

PROP 62.81m 300mmø PVC STM @ 0.99%

EX FIRE HYDRANT

EX SIAMESE CONNECTION

PROP 300mmø PVC W/M

PROP STM MH1

PROP STM MH2

PROP 29.40m 375mmø PVC STM @ 1.43%

PROP SAN MH2A

PROP FH1 EL EL 89.33

PROP FH&V

PROP SIAMESE CONNECTION

PROP 11.35m 300mmø PVC SAN @ 2.00%

PROP SAN MH BK1

PARTIAL DEMOLITION OF EXISTING BUILDING A DURING PHASE 1

BUILDING A EXISTING 1 STOREY BRICK BUILDING

CONNECTION TO PROP

CONNECTION TO PROP

EX SIAMESE CONNECTION

PROP 35.09m 300mmø PVC SAN @ 0.70%

PROP 53.45m 1200mmø CONC STM @ 0.30%

PROP SAN MH9A - 1

PROP STM MH6-2

PROP 41.63m 1200mmø CONC STM @ 0.50%

BUILDING B EXISTING 1 STOREY BRICK & STUCCO BUILDING

PROP STM MH3

PROP 8.95m 450mmø CONC STM @ 2.23%

PROP 41.10m 300mmø PVC SAN @ 0.70%

EX.MHS3

PROP 60.76m 300mmø PVC SAN @ 0.70%

PROP 300mmø PVC W/M

PROP STM MH4

PROP STM OGS B1

PROP SAN MH4A

PROP 61.43m 525mmø CONC STM @ 0.85%

PROP STM MH5

PROP 60.45m 600mmø CONC STM @ 0.80%

PROP STM MH5-1

EX 135.61m 375mmø CONC STM @ 0.41%

PROP SAN MH3A

PROP 76.23m 300mmø PVC SAN @ 0.70%

REGION/CITY SERVICING EASEMENT FUTURE ROW

EX SIAMESE CONNECTION

BUILDING C EXISTING 1 STOREY BRICK AND STUCCO BUILDING

EXISTING SERVICES AND HYDRANTS SHALL BE RECONNECTED TO SUIT AS REQUIRED

BENCHMARK

ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM THE TOWN OF PICKERING BENCH MARK No. 67-U-002

TABLET IN SOUTHWEST CONCRETE FOUNDATION WALL AT THE NORTHWEST SIDE OF MAIN ENTRANCE TO THE TOWN OF PICKERING MUNICIPAL BUILDING. AND 0.53 METRES ABOVE GRADE.

PUBLISHED ELEVATION =87.581 metres.

FIGURE 1
PRELIMINARY SITE SERVICING LAYOUT (Phase 1)

PICKERING BRIDGE LANDS INC.
PROPOSED MIX-USE DEVELOPMENT
1755 + 1805 PICKERING PARKWAY
PICKERING, ON

DATE:	PROJ. NO.:	SCALE:
SEPT 2021	20266	1:500

ODAN-DETECH CONSULTING ENGINEERS
The Odan/Detech Group Inc. P: (905) 632-3811 F: (905) 632-3363
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BENCHMARK
ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM THE TOWN OF PICKERING BENCH MARK No. 67-U-002
LOCATION :
TABLET IN SOUTHWEST CONCRETE FOUNDATION WALL AT THE NORTHWEST SIDE OF MAIN ENTRANCE TO THE TOWN OF PICKERING MUNICIPAL BUILDING. AND 0.53 METRES ABOVE GRADE.
PUBLISHED ELEVATION =87.581 metres.
PROPOSED 18.50M ROAD
FIRE ROUTE
MULTI-USE PATH
PROPOSED PROPERTY LINE
PRIVATE ROAD A
PRIVATE ROAD B
PRIVATE DRIVEWAY
PROPOSED POPS 1031.9 M²
DROP OFF
LANDSCAPE
PET RELIEF AREA
GRADING LEGEND:
EXISTING STORM MANHOLE
PROPOSED STORM MANHOLE
EXISTING CATCH BASIN MANHOLE
PROPOSED CATCH BASIN MANHOLE
PROPOSED STORMCEPTOR
EXISTING CATCH BASIN
PROPOSED CATCH BASIN
PROPOSED AREA DRAIN
EXISTING SANITARY MANHOLE
PROPOSED SANITARY MANHOLE
EXISTING HYDRANT
PROPOSED HYDRANT
EXISTING WATER VALVE & BOX
PROPOSED WATER VALVE & BOX
EXISTING VALVE CHAMBER
BOREHOLE LOCATION
PROPOSED VALVE CHAMBER
FUTURE ELEVATION
EXISTING SPOT ELEVATION
PROPOSED ELEVATION
PROPOSED TOP OF CURB ELEVATION
PROPOSED GUTTER LINE ELEVATION
PROPOSED HIGH POINT
PROPOSED LOW POINT
PROPOSED SWALE INVERT ELEVATION
PROPOSED FLOW ARROW AND SLOPE
PROPOSED EMERGENCY OVERLAND FLOW
EXISTING CONTOUR
PROPOSED SLOPE (3:1 OR HIGHER)
DENOTES PROPOSED PROPERTY LINE
DENOTES PROPOSED LIMIT OF CONSTRUCTION
DENOTES PROPOSED HEAVY DUTY ASPHALT AREA
FIGURE 2
FUNCTIONAL GRADING PLAN (PHASE 1)
PICKERING BRIDGE LANDS INC.
PROPOSED MIX-USE DEVELOPMENT
1755 + 1805 PICKERING PARKWAY
PICKERING, ON
DATE: SEPT 2021
PROJ. NO.: 20266
SCALE: 1:250
ODAN·DETECH CONSULTING ENGINEERS

LEGEND:

- EXISTING STORM MANHOLE
- PROPOSED STORM MANHOLE
- EXISTING CATCH BASIN MANHOLE
- PROPOSED CATCH BASIN MANHOLE
- PROPOSED STORMCEPTOR
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED SANITARY SEWER
- EXISTING SANITARY SEWER
- EXISTING HYDRANT
- PROPOSED HYDRANT
- EXISTING WATER VALVE & BOX
- PROPOSED WATER VALVE & BOX
- EXISTING VALVE CHAMBER
- PROPOSED SIAMESE CONNECTION
- PROPOSED VALVE CHAMBER
- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- PROPOSED REDUCER
- PROPOSED CAP FOR SANITARY, STORM AND/OR WATER AS NOTED
- DENOTES PIPE TO BE REMOVED
- PROPOSED SLOPE (3:1 OR HIGHER)
- LIMIT OF CONSTRUCTION
- PROPERTY LINE

BENCHMARK

ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM THE TOWN OF PICKERING BENCH MARK No. 67-U-002

TABLET IN SOUTHWEST CONCRETE FOUNDATION WALL AT THE NORTHWEST SIDE OF MAIN ENTRANCE TO THE TOWN OF PICKERING MUNICIPAL BUILDING. AND 0.53 METRES ABOVE GRADE.

PUBLISHED ELEVATION =87.581 metres.

PROP ISOLATION VALVE

6m CITY STORM EASEMENT (INTERIM)

6m CITY STORM EASEMENT (INTERIM)

REGION/CITY SERVICING EASEMENT FUTURE ROW

PROP FIRST FIRE 300mm PVC WM

PROP SECOND FIRE 300mm PVC WM

PROP DOMESTIC 300mm PVC WM

PROP SECOND FIRE 300mm PVC WM

PROP FIRST FIRE 300mm PVC WM

PROP DOMESTIC 300mm PVC WM

TO BE REMOVED DURING PHASE 3

EX FIRE HYDRANT

EX SIAMESE CONNECTION

PARTIAL DEMOLITION OF EXISTING BUILDING A DURING PHASE 1

BUILDING A
EXISTING 1
STOREY BRICK BUILDING

PROP FH&V

PROP SIAMESE CONNECTION

REGION/CITY SERVICING EASEMENT FUTURE ROW

EX SIAMESE CONNECTION

BUILDING C
EXISTING 1 STOREY
BRICK AND STUCCO
BUILDING

BUILDING B
EXISTING 1 STOREY
BRICK & STUCCO
BUILDING

EXISTING SERVICES AND HYDRANTS SHALL BE RECONNECTED TO SUIT AS REQUIRED

PHASE 1
PHASE 2

Brock Rd

PICKERING PARKWAY

PUBLIC ROAD

EXISTING CANADIAN TIRE

LANDSCAPE

FIGURE 3
FUNCTIONAL SITE SERVICING PLAN WATERMAIN

PICKERING BRIDGE LANDS INC.
PROPOSED MIX-USE DEVELOPMENT
1755 + 1805 PICKERING PARKWAY
PICKERING, ON

DATE:	PROJ. NO.:	SCALE:
SEPT 2021	20266	1:500

ODAN·DETECH CONSULTING ENGINEERS
The Odan/Detech Group Inc. P: (905) 632-3811 F: (905) 632-3383
9230 SOUTH SERVICE ROAD, BURLINGTON, ONTARIO, L7L 0K2

LEGEND:
EXISTING STORM MANHOLE
PROPOSED STORM MANHOLE
EXISTING CATCH BASIN MANHOLE
PROPOSED CATCH BASIN MANHOLE
PROPOSED STORMCEPTOR
EXISTING CATCH BASIN
PROPOSED CATCH BASIN
EXISTING STORM SEWER
PROPOSED STORM SEWER
EXISTING SANITARY MANHOLE
PROPOSED SANITARY MANHOLE
PROPOSED SANITARY SEWER
EXISTING SANITARY SEWER
EXISTING HYDRANT
PROPOSED HYDRANT
EXISTING WATER VALVE & BOX
PROPOSED WATER VALVE & BOX
EXISTING VALVE CHAMBER
PROPOSED SIAMESE CONNECTION
PROPOSED VALVE CHAMBER
EXISTING WATER MAIN
PROPOSED WATER MAIN
PROPOSED REDUCER
PROPOSED CAP FOR SANITARY, STORM AND/OR WATER AS NOTED
DENOTES PIPE TO BE REMOVED
PROPOSED SLOPE (3:1 OR HIGHER)
LIMIT OF CONSTRUCTION
PROPERTY LINE
BENCHMARK
ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM THE TOWN OF PICKERING BENCH MARK No. 67-U-002
TABLET IN SOUTHWEST CONCRETE FOUNDATION WALL AT THE NORTHWEST SIDE OF MAIN ENTRANCE TO THE TOWN OF PICKERING MUNICIPAL BUILDING. AND 0.53 METRES ABOVE GRADE.
PUBLISHED ELEVATION =87.581 metres.
PICKERING PARKWAY
EXISTING CANADIAN TIRE
Brock Rd
18.50 m R.O.W
PUBLIC ROAD
PROPOSED 18.50M ROAD
6m CITY STORM EASEMENT (INTERIM)
6m CITY STORM EASEMENT (INTERIM)
REGION/CITY SERVICING EASEMENT FUTURE ROW
CONNECTION TO PROP
CONNECTION TO PROP
PARTIAL DEMOLITION OF EXISTING BUILDING A DURING PHASE 1
BUILDING A EXISTING 1 STOREY BRICK BUILDING
BUILDING B EXISTING 1 STOREY BRICK & STUCCO BUILDING
BUILDING C EXISTING 1 STOREY BRICK AND STUCCO BUILDING
REGION/CITY SERVICING EASEMENT FUTURE ROW
LANDSCAPE
LANDSCAPE
PRIVATE ROAD A
PRIVATE ROAD B
PHASE 1
PHASE 2
PROP STM MH1
PROP STM MH2
PROP STM MH3
PROP STM MH4
PROP STM MH5
PROP STM OGS B1
PROP STM MH6-1
PROP STM MH6-2
PROP STM MH6-3
EX.MHS3
PROP 62.81m 300mmØ PVC STM @ 0.99%
PROP 29.40m 375mmØ PVC STM @ 1.43%
PROP 8.95m 450mmØ CONC STM @ 2.23%
PROP 61.43m 525mmØ CONC STM @ 0.85%
PROP 53.45m 1200mmØ CONC STM @ 0.30%
PROP 41.63m 1200mmØ CONC STM @ 0.50%
EX 750mmØ STM
EX 450mmØ STM
EX 250mmØ STM
EX 300mmØ STM
EX 1200mmØ STM
EX 375mmØ STM
CONCESSION
LOT 18
EXISTING SERVICES AND HYDRANTS SHALL BE RECONNECTED TO SUIT AS REQUIRED
FIGURE 4
FUNCTIONAL SITE SERVICING PLAN STORM
PICKERING BRIDGE LANDS INC.
PROPOSED MIX-USE DEVELOPMENT
1755 + 1805 PICKERING PARKWAY
PICKERING, ON
DATE: SEPT 2021
PROJ. NO.: 20266
SCALE: 1:500
ODAN·DETECH CONSULTING ENGINEERS

1899 BROCK ROAD

LEGEND:

- EXISTING STORM MANHOLE
- PROPOSED STORM MANHOLE
- EXISTING CATCH BASIN MANHOLE
- PROPOSED CATCH BASIN MANHOLE
- PROPOSED STORMCEPTOR
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED SANITARY SEWER
- EXISTING SANITARY SEWER
- EXISTING HYDRANT
- PROPOSED HYDRANT
- EXISTING WATER VALVE & BOX
- PROPOSED WATER VALVE & BOX
- EXISTING VALVE CHAMBER
- PROPOSED SIAMESE CONNECTION
- PROPOSED VALVE CHAMBER
- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- PROPOSED REDUCER
- PROPOSED CAP FOR SANITARY, STORM AND/OR WATER AS NOTED
- DENOTES PIPE TO BE REMOVED
- PROPOSED SLOPE (3:1 OR HIGHER)
- LIMIT OF CONSTRUCTION
- PROPERTY LINE

BENCHMARK

ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM THE TOWN OF PICKERING BENCH MARK No. 67-U-002

TABLET IN SOUTHWEST CONCRETE FOUNDATION WALL AT THE NORTHWEST SIDE OF MAIN ENTRANCE TO THE TOWN OF PICKERING MUNICIPAL BUILDING. AND 0.53 METRES ABOVE GRADE.

PUBLISHED ELEVATION =87.581 metres.

Pickering Pkwy

Brock Rd

Beechlawn Dr

EXISTING McDONALD'S

EXISTING CANADIAN TIRE

TO NOTION ROAD
PIPES TO BE SIZED AND CONSTRUCTED FOR FULL BUILD OUT OF SUBJECT SITE, 1899 BROCK ROAD AND FUTURE DEVELOPMENTS (PER REGION)

EX 59.82m 200mm PVC SAN
EX 250mm PVC SAN
EX 92.64m 375mm□ CONC STM @ 1.01%
EX 250mm PVC SAN
EX 91.15m 250mm PVC SAN
EX 91.15m 250mm PVC SAN
EX 150mm PVC SAN
EX 150mm PVC SAN
EX 150mm PVC SAN
EX 200mm PVC SAN
EX 200mm PVC SAN

SAN MH-H8-0091
PROP SAN MH9A
SAN MH-H9-0018
SAN MH-H9-0019
SAN MH-H9-0010
PROP SAN MH8A
PROP SAN MH7A
PROP SAN MH1A-1
PROP SAN MH9A
PROP SAN MH9A - 1
PROP SAN MH2A
PROP SAN MH BK1
PROP SAN MH3A
PROP SAN MH4A

PROP 42.06m 675mmØ CONC SAN @ 0.45%
PROP 49.09m 675mmØ PVC SAN @ 0.45%
PROP 99.99m 675mmØ CONC SAN @ 0.45%
PROP 99.80m 675mmØ CONC SAN @ 0.45%
PROP 14.30m 450mmØ CONC SAN @ 0.70%
PROP 29.89m 450mmØ CONC SAN @ 0.70%
PROP 22.80m 300mmØ PVC SAN @ 0.70%
PROP 35.09m 300mmØ PVC SAN @ 0.70%
PROP 41.10m 300mmØ PVC SAN @ 0.70%
PROP 11.35m 300mmØ PVC SAN @ 2.00%
PROP 60.76m 300mmØ PVC SAN @ 0.70%
PROP 76.23m 300mmØ PVC SAN @ 0.70%

6m CITY STORM EASEMENT (INTERIM)
6m CITY STORM EASEMENT (INTERIM)
REGION/CITY SERVICING EASEMENT FUTURE ROW
REGION/CITY SERVICING EASEMENT FUTURE ROW

PARTIAL DEMOLITION OF EXISTING BUILDING A DURING PHASE 1

BUILDING A
EXISTING 1 STOREY BRICK BUILDING

BUILDING B
EXISTING 1 STOREY BRICK & STUCCO BUILDING

BUILDING C
EXISTING 1 STOREY BRICK AND STUCCO BUILDING

EXISTING SERVICES AND HYDRANTS SHALL BE RECONNECTED TO SUIT AS REQUIRED

MATCHLINE

FIGURE 5a
FUNCTIONAL SITE SERVICING PLAN SANITARY (1 of 2)

PICKERING BRIDGE LANDS INC.
PROPOSED MIX-USE DEVELOPMENT
1755 + 1805 PICKERING PARKWAY
PICKERING, ON

DATE:	PROJ. NO.:	SCALE:
SEPT 2021	20266	1:750

ODAN-DETECH CONSULTING ENGINEERS
The Odan/Detech Group Inc. P: (905) 632-3811 F: (905) 632-3363
5150 SOUTH SERVICE ROAD, BURLINGTON, ONTARIO, L7L 6K2

Orchard Rd

Notion Rd

Marshcourt Dr

Ashford Dr

Easement

MATCHLINE

METROPIA

EX 3.46m 375mm PVC SAN

PROP 3.46m 450mmØ CONC SAN @ 0.23%

SAN MH-H9-0045

SAN MH 17

EX 750mm CONC SAN

EX 750mm CONC SAN

EX 750mm CONC SAN

CONTINUES

EX 71.69m 375mm PVC SAN

PROP 71.69m 450mmØ CONC SAN @ 0.22%

EX 375mm PVC SAN

SAN MH 35-27

SAN MH-H9-0029

EX 200mm PVC SAN

EX SAN. CONTROL MH

EX 200mm PVC SAN

EX 250mm PVC SAN

SAN MH35-26

PROP 117.74m 450mmØ PVC SAN @ 0.22%

PROP SAN MH14A

EX 200mm PVC SAN

SAN MH 35-25

EX 250mm PVC SAN

PROP SAN MH10A

SAN MH H9-0014

SAN MH-H9-0011

PROP 82.45m 675mmØ CONC SAN @ 0.45%

PROP 80.09m 675mmØ CONC SAN @ 0.45%

SAN MH-H9-0022

PROP 110.13m 675mmØ CONC SAN @ 0.45%

PROP SAN MH13A

PROP 14.47m 450mmØ PVC SAN @ 0.22%

EX 10.40m 250mm PVC SAN

EX 1500mm CONC SAN

TO OUTLET AT ORCHARD ROAD PIPES TO BE SIZED FOR PHASE 1 THROW AWAY ONCE REGION CONSTRUCTS TRUNK SEWER

EX SAN MHSAN MH 35-33

EX SAN MHSAN MH 35-34

EXISTING SERVICES AND HYDRANTS SHALL BE RECONNECTED TO SUIT AS REQUIRED

BENCHMARK

ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM THE TOWN OF PICKERING BENCH MARK No. 67-U-002

TABLET IN SOUTHWEST CONCRETE FOUNDATION WALL AT THE NORTHWEST SIDE OF MAIN ENTRANCE TO THE TOWN OF PICKERING MUNICIPAL BUILDING. AND 0.53 METRES ABOVE GRADE.

PUBLISHED ELEVATION =87.581 metres.

LEGEND:

- EXISTING STORM MANHOLE
- PROPOSED STORM MANHOLE
- EXISTING CATCH BASIN MANHOLE
- PROPOSED CATCH BASIN MANHOLE
- PROPOSED STORMCEPTOR
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED SANITARY SEWER
- EXISTING SANITARY SEWER
- EXISTING HYDRANT
- PROPOSED HYDRANT
- EXISTING WATER VALVE & BOX
- PROPOSED WATER VALVE & BOX
- EXISTING VALVE CHAMBER
- PROPOSED SIAMESE CONNECTION
- PROPOSED VALVE CHAMBER
- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- PROPOSED REDUCER
- PROPOSED CAP FOR SANITARY, STORM AND/OR WATER AS NOTED
- DENOTES PIPE TO BE REMOVED
- PROPOSED SLOPE (3:1 OR HIGHER)
- LIMIT OF CONSTRUCTION
- PROPERTY LINE

FIGURE 5b
FUNCTIONAL SITE SERVICING PLAN SANITARY (2 of 2)

PICKERING BRIDGE LANDS INC.
PROPOSED MIX-USE DEVELOPMENT
1755 + 1805 PICKERING PARKWAY
PICKERING, ON

DATE:	PROJ. NO.:	SCALE:
SEPT 2021	20266	1:750

ODAN·DETECH CONSULTING ENGINEERS
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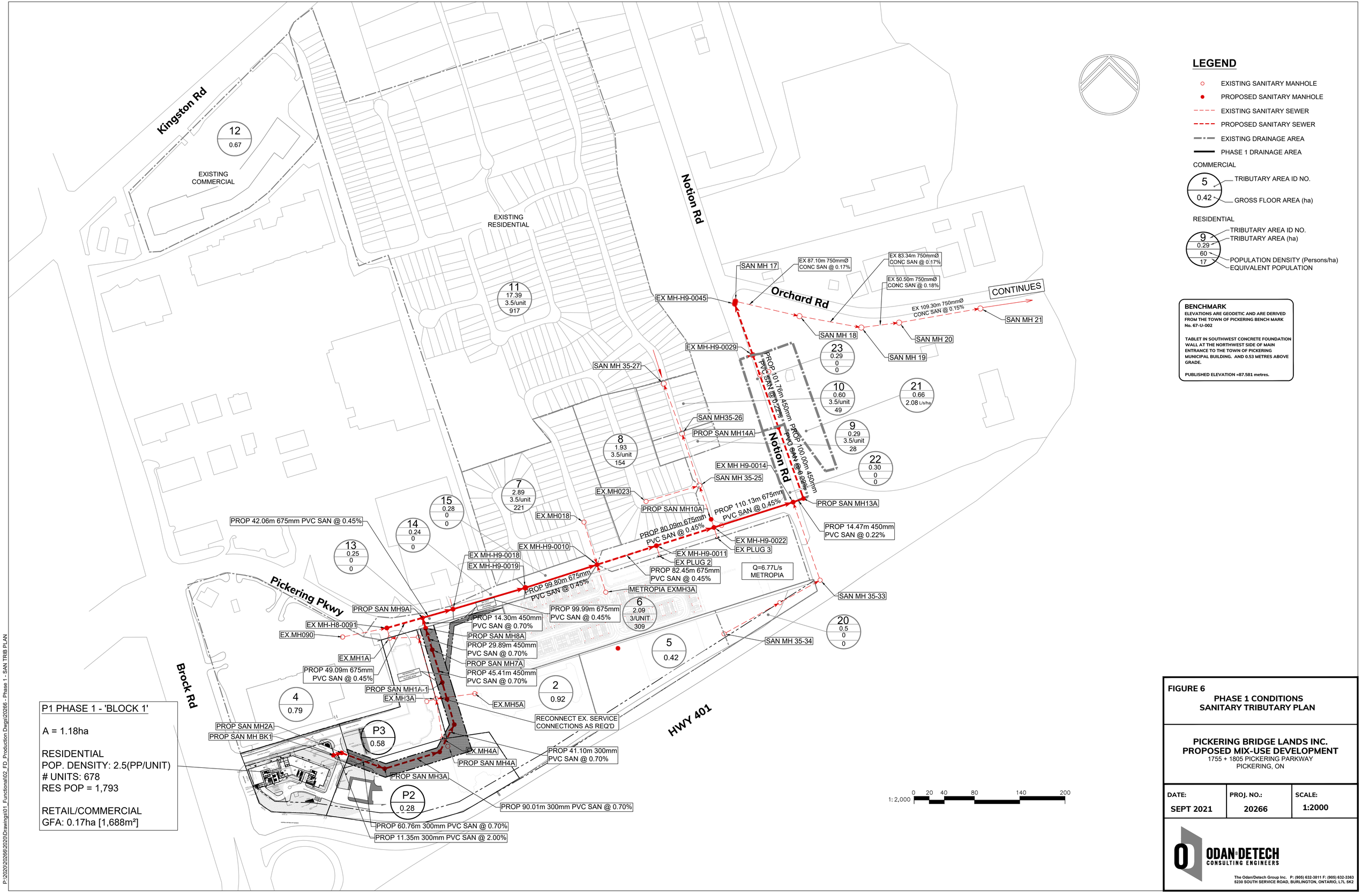
3226 SOUTH SERVICE ROAD, BURLINGTON, ONTARIO, L7N, 3K2



LEGEND

- EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING DRAINAGE AREA
- PHASE 1 DRAINAGE AREA

COMMERCIAL

5 — TRIBUTARY AREA ID NO.
0.42 — GROSS FLOOR AREA (ha)

RESIDENTIAL

9 — TRIBUTARY AREA ID NO.
0.29 — TRIBUTARY AREA (ha)
60 — POPULATION DENSITY (Persons/ha)
17 — EQUIVALENT POPULATION

BENCHMARK

ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM THE TOWN OF PICKERING BENCH MARK No. 67-U-002

TABLET IN SOUTHWEST CONCRETE FOUNDATION WALL AT THE NORTHWEST SIDE OF MAIN ENTRANCE TO THE TOWN OF PICKERING MUNICIPAL BUILDING. AND 0.53 METRES ABOVE GRADE.

PUBLISHED ELEVATION =87.581 metres.

P1 PHASE 1 - 'BLOCK 1'

A = 1.18ha

RESIDENTIAL
POP. DENSITY: 2.5(PP/UNIT)
UNITS: 678
RES POP = 1,793

RETAIL/COMMERCIAL
GFA: 0.17ha [1,688m²]

1: 2,000 — 0 20 40 80 140 200

FIGURE 6
PHASE 1 CONDITIONS
SANITARY TRIBUTARY PLAN

PICKERING BRIDGE LANDS INC.
PROPOSED MIX-USE DEVELOPMENT
1755 + 1805 PICKERING PARKWAY
PICKERING, ON

DATE:	PROJ. NO.:	SCALE:
SEPT 2021	20266	1:2000

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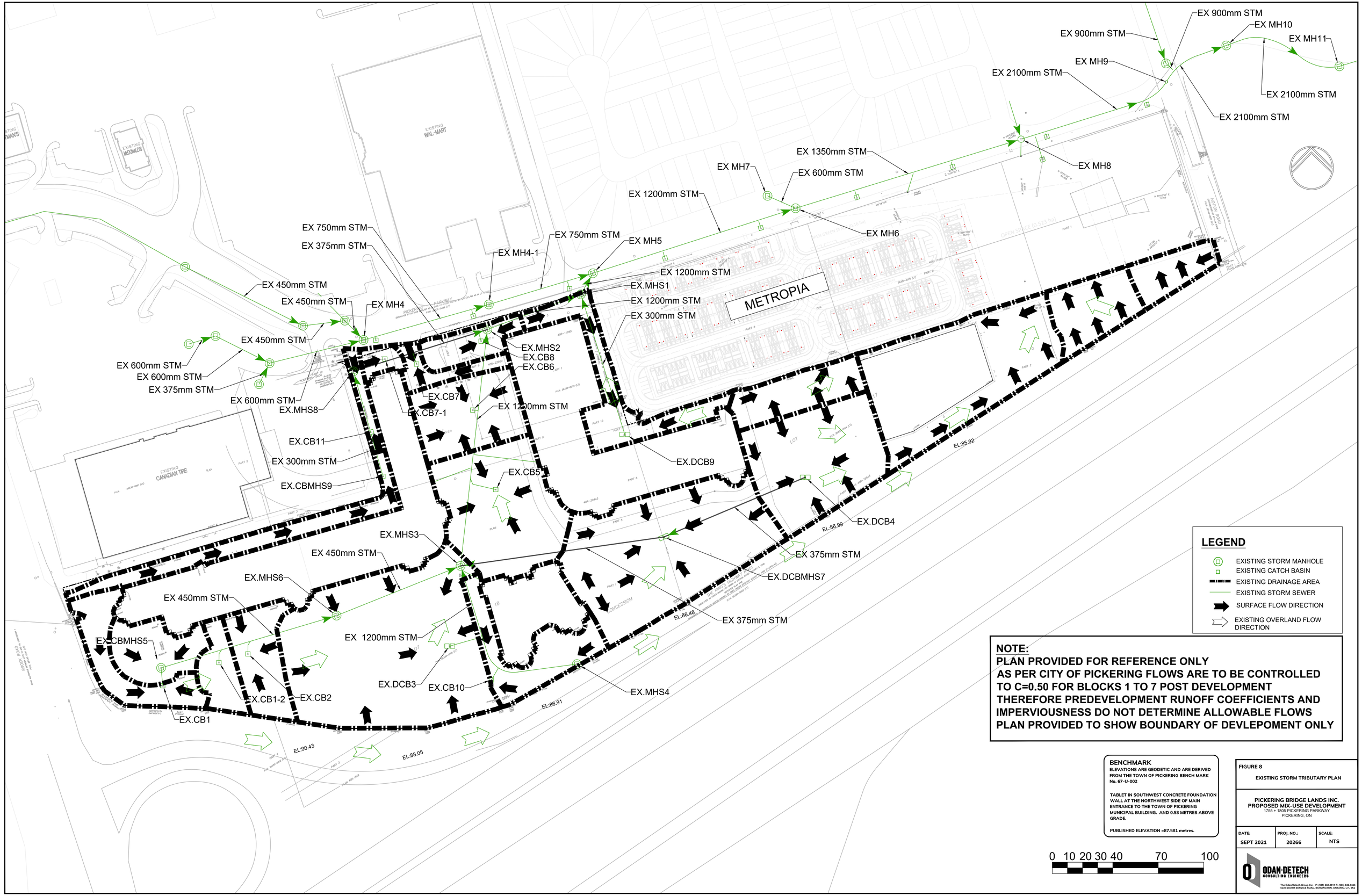
METROPIA
BUILDING A
EXISTING 1
STOREY BRICK BUILDING
BUILDING B
EXISTING 1 STOREY
BRICK & STUCCO
BUILDING
BUILDING C
EXISTING 1 STOREY
BRICK AND STUCCO
BUILDING
EL:90.43
EL:88.05
EL:86.91
EL:86.48
EL:86.99
EL:85.92
1
0.93 0.50
A1
41.9 10
AS PER CITY OF PICKERING
TRIBUTARY PLAN (JUNE 1991)
LEGEND
PROPOSED STORM MANHOLE
EXISTING STORM MANHOLE
PROPOSED CATCH BASIN
EXISTING CATCH BASIN
PROPOSED DRAINAGE AREA
PROPOSED STORM SEWER
EXISTING STORM SEWER
SURFACE FLOW DIRECTION
EXISTING OVERLAND FLOW DIRECTION
EL: 100.00 EXISTING ELEVATION
ID NUMBER
RUNOFF COEFFICIENT
DRAINAGE AREA (ha)
BENCHMARK
ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM THE TOWN OF PICKERING BENCH MARK No. 67-U-002
TABLET IN SOUTHWEST CONCRETE FOUNDATION WALL AT THE NORTHWEST SIDE OF MAIN ENTRANCE TO THE TOWN OF PICKERING MUNICIPAL BUILDING. AND 0.53 METRES ABOVE GRADE.
PUBLISHED ELEVATION =87.581 metres.
FIGURE 7
PROPOSED STORM TRIBUTARY PLAN
PHASE 1
PICKERING BRIDGE LANDS INC.
PROPOSED MIX-USE DEVELOPMENT
1755 + 1805 PICKERING PARKWAY
PICKERING, ON
DATE: SEPT 2021
PROJ. NO.: 20266
SCALE: NTS
0 10 20 50 100
ODAN·DETECH
CONSULTING ENGINEERS



LEGEND

- EXISTING STORM MANHOLE
- EXISTING CATCH BASIN
- EXISTING DRAINAGE AREA
- EXISTING STORM SEWER
- SURFACE FLOW DIRECTION
- EXISTING OVERLAND FLOW DIRECTION

NOTE:

PLAN PROVIDED FOR REFERENCE ONLY
AS PER CITY OF PICKERING FLOWS ARE TO BE CONTROLLED TO C=0.50 FOR BLOCKS 1 TO 7 POST DEVELOPMENT
THEREFORE PREDEVELOPMENT RUNOFF COEFFICIENTS AND IMPERVIOUSNESS DO NOT DETERMINE ALLOWABLE FLOWS
PLAN PROVIDED TO SHOW BOUNDARY OF DEVLEPOMENT ONLY

BENCHMARK

ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM THE TOWN OF PICKERING BENCH MARK No. 67-U-002

TABLET IN SOUTHWEST CONCRETE FOUNDATION WALL AT THE NORTHWEST SIDE OF MAIN ENTRANCE TO THE TOWN OF PICKERING MUNICIPAL BUILDING. AND 0.53 METRES ABOVE GRADE.

PUBLISHED ELEVATION =87.581 metres.

0 10 20 30 40 70 100

FIGURE 8

EXISTING STORM TRIBUTARY PLAN

PICKERING BRIDGE LANDS INC.
PROPOSED MIX-USE DEVELOPMENT
1755 + 1805 PICKERING PARKWAY
PICKERING, ON

DATE:	PROJ. NO.:	SCALE:
SEPT 2021	20266	NTS

ODAN·DETECH CONSULTING ENGINEERS
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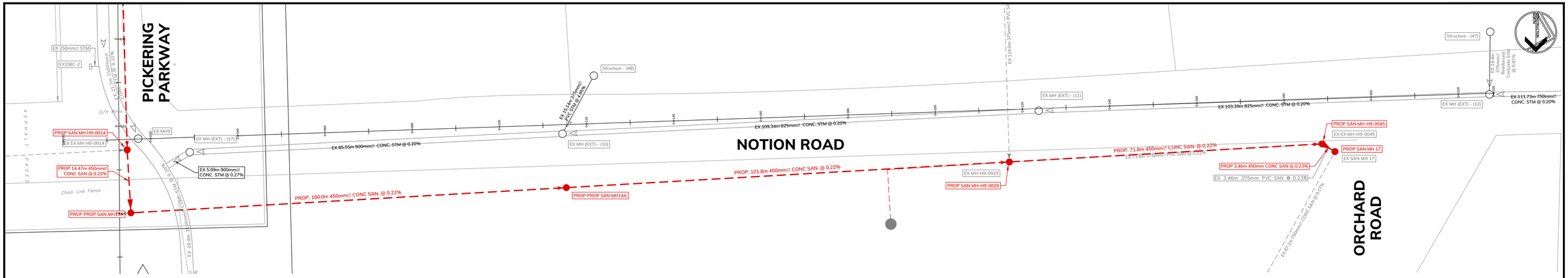
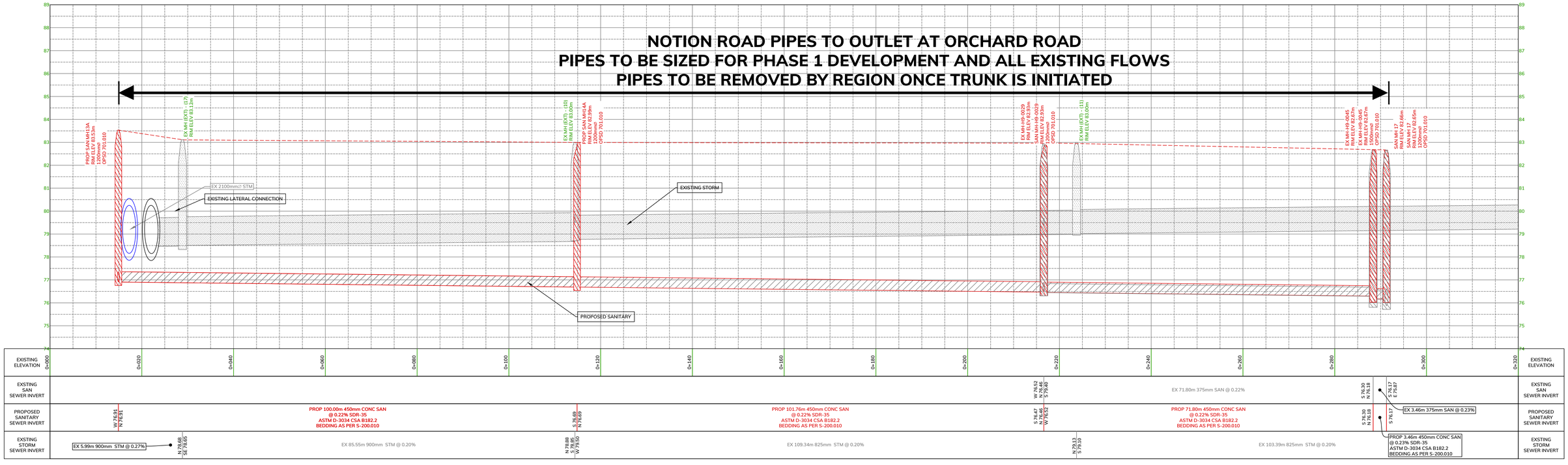


PICKERING PARKWAY **ORCHARD ROAD**

NOTION ROAD PIPES TO OUTLET AT ORCHARD ROAD
PIPES TO BE SIZED FOR PHASE 1 DEVELOPMENT AND ALL EXISTING FLOWS
PIPES TO BE REMOVED BY REGION ONCE TRUNK IS INITIATED



SCALES
HOR 1:400
VER 1:80

FIGURE 9
NOTION ROAD PROFILE
(0+000 to 0+320)

PICKERING BRIDGE LANDS INC.
PROPOSED MIX-USE DEVELOPMENT
1755 + 1805 PICKERING PARKWAY
PICKERING, ON

DATE:	PROJ. NO.:	SCALE:
APR 2024	20266	AS NOTED

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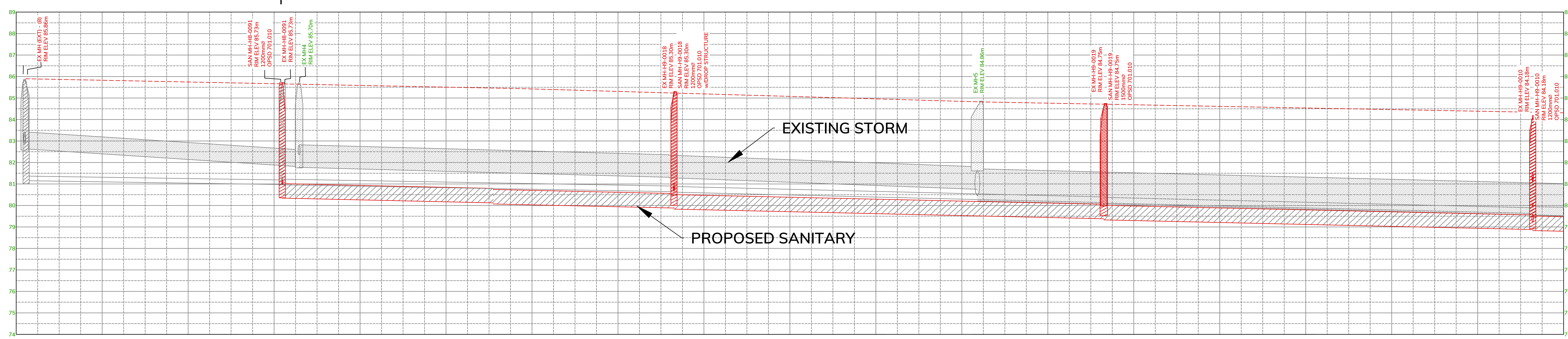
PIPES TO NOTION ROAD TO BE SIZED AND CONSTRUCTED FOR FULL BUILD OUT OF SUBJECT SITE, 1899 BROCK ROAD AND FUTURE DEVELOPMENTS (PER REGION)

SEE FIGURE 11



EXISTING ELEVATION	0+000	0+020	0+040 85.85	0+060 85.76	0+080 85.65	0+100 85.54	0+120	0+140	0+160	0+180	0+200	0+220	0+240	0+260	0+280	0+300	0+320	0+340	0+360	EXISTING ELEVATION

Row	Entries (left to right)	Row
PROPOSED SANITARY	E 80.34 / W 80.98; PROP 49.09m 675mm CONC SAN @ 0.45% PVC-SDR 35 ASTM D-3034 CSA B182.2 BEDDING AS PER S-200.010; PROP 42.06m 675mm CONC SAN @ 0.45% PVC-SDR 35 ASTM D-3034 CSA B182.2 BEDDING AS PER S-200.010; PROP 99.99m 675mm CONC SAN @ 0.45% PVC-SDR 35 ASTM D-3034 CSA B182.2 BEDDING AS PER S-200.010; W 79.38 / E 79.33; PROP 99.80m 675mm CONC SAN @ 0.45% PVC-SDR 35 ASTM D-3034 CSA B182.2 BEDDING AS PER S-200.010; W 78.88 / E 78.83 / N 79.22 / S 81.13; PROP 82.45m 675mm CONC SAN @ 0.45% PVC-SDR 35 ASTM D-3034 CSA B182.2 BEDDING AS PER S-200.010	PROPOSED SANITARY SEWER INVERT
EXISTING SANITARY	EX 59.82m 200mm SAN @ 0.30%; E 80.96 / S 81.07 / W 80.98; EX 91.15m 250mm SAN @ 0.35% (TO BE REMOVED); W 79.88 / E 79.83 / N 80.67; EX 99.99m 250mm SAN @ 0.49% (TO BE REMOVED); W 80.14 / E 80.12; EX 99.80m 250mm SAN @ 0.48% (TO BE REMOVED); W 79.64 / E 79.62 / N 79.92 / S 81.13	EXSTING SAN SEWER INVERT
EXISTING STORM	E 82.73 / SW 82.93 / NW 82.83; W 81.90 / NW 82.34; EX 86.05m 750mm STM @ 0.54%; EX 71.76m 750mm STM @ 0.75%; W 80.90 / E 80.36 / SW 80.44; EX 140.65m 1200mm STM @ 0.50%; EX 82.45m 250mm SAN @ 0.36% (TO BE REMOVED)	EXSTING STORM SEWER INVERT

FIGURE 10
PICKERING PARKWAY PROFILE (0+000 to 0+360)

PICKERING BRIDGE LANDS INC.
PROPOSED MIX-USE DEVELOPMENT
1755 + 1805 PICKERING PARKWAY
PICKERING, ON

DATE:	PROJ. NO.:	SCALE:
APR 2024	20266	NTS

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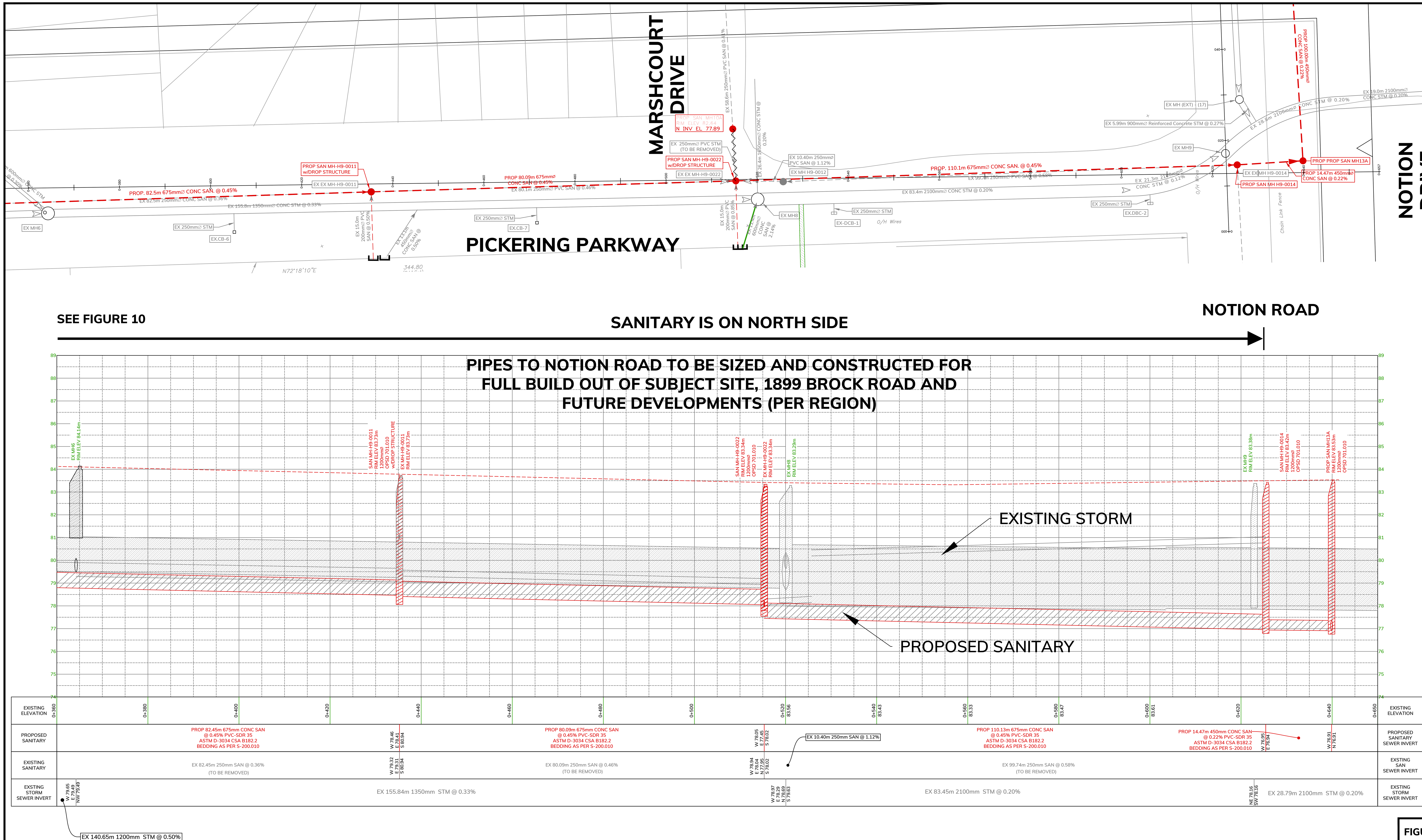

FIGURE 11
PICKERING PARKWAY PROFILE
(0+360 to 0+650)

PICKERING BRIDGE LANDS INC.
PROPOSED MIX-USE DEVELOPMENT
1755 + 1805 PICKERING PARKWAY
PICKERING, ON

DATE:	PROJ. NO.:	SCALE:
APR 2024	20266	NTS

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