TRIBUTE (BROOKDALE) LIMITED

FUNCTIONAL SERVICING REPORT

1101A, 1105, and 1163 Kingston Road

October 27, 2023

1101A, 1105 AND 1163 KINGSTON ROAD

FUNCTIONAL SERVICING REPORT

TRIBUTE (BROOKDALE) LIMITED

FUNCTIONAL SERVICING REPORT

PROJECT NO.: 221-12931
DATE: OCTOBER 2023

WSP CANADA INC.
100 COMMERCE VALLEY DRIVE WEST
THORNHILL, ON, CANADA L3T 0A1

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1 INTRODUCTION

WSP has been retained by Tribute (Brookdale) Limited to prepare a Functional Servicing Report in support of the proposed redevelopment of the site located at 1101A, 1105 and 1163 Kingston Road in the City of Pickering, Ontario. The proposed plan, which will be constructed in four phases, involves the re-development of the existing commercial site into a six building multi-use development. This report provides the conceptual framework for water distribution, sanitary sewage and storm drainage for the site prior to the commencement of detailed design. A Stormwater Management Report outlining the proposed conceptual Stormwater Management controls on this site has been prepared by WSP under a separate cover.

In preparing this report, WSP staff secured and reviewed the Site Plan prepared by Turner Fleischer Architects Inc. dated October 23, 2023, topographic surveys prepared by J.D. Barnes Ltd. dated February 2, 2023 (see **Appendix E**), and record drawings provided by the Region of Durham (see **Appendix E**). This report is intended to provide the functional design framework for the proposed development. All required approvals from the City of Pickering, Region of Durham, and all other governing bodies shall be obtained as part of the registration of the development.

1.1 SITE DESCRIPTION

The subject site is approximately 7.75 ha (19.15 acres), and it is located at 1101A, 1105 and 1163 Kingston Road in the City of Pickering, Ontario. The site is bounded by Kingston Road to the north-west, a segment of Walnut Lane and a segment of Public Road to the north-east, Highway 401 to the south and existing commercial lands to the west. Under the existing conditions, the site contains five commercial buildings. The location and existing site conditions are illustrated in **Figure 1-A – "Location Map",** and **Figure 1-B – "Pre-development Plan"** respectively.

Based on the site plan provided by Turner Fleischer, the proposed development will be mixed use, and it will include six buildings that will be constructed across four phases. The intention of the phasing is to keep the existing commercial developments located outside of the phase limits operational in the interim condition. The existing public driveway that runs along the north-east boundary of the site will also be replaced by a complete 20.0 m R.O.W. as part of the Walnut Lane extension project.

The first phase, which will be located at the north end of the development will introduce two new buildings (Buildings 'A1' and 'A2') that will fall under the same condo corporation. With the introduction of these buildings, three of the existing commercial developments located within the site will be removed. The second phase, which will be located at the south-east corner of the site, will introduce one new Building (Building 'B') and one existing commercial development will be removed. The third phase, which will be located in the middle of the site, will introduce two new buildings (Buildings 'C1' and 'C2') that will fall under the same condo corporation. No existing commercial developments will be removed in Phase 3. The fourth phase will introduce one new Building (Building 'D') and one existing commercial development will be removed.

The development statistics that summarize each of the proposed phases are outlined in Table 1. The ultimate conditions are illustrated in **Figure 1-C – "Post Development Plan"**.

Table 1 – Development Statistics Summary

Phase	Area (ha)	Building	Land Use	Units	Residential Population	Commercial GFA (sq.m.)	Number of Floors
1	1.76	Building 'A1'	Mixed-Use Residential	609	1,214	4,946	19+MPH
		Building 'A2'	Mixed-Use Residential	602	1,199	716	23+MPH
2	1.61	Building 'B'	Residential	1,303	2,593	N/A	35+MPH
3	1.91	Building 'C1'	Mixed-Use Residential	1,103[1]	2,195	2203	27+MPH
		Building 'C2'	Residential			N/A	27+MPH
4	2.47	Building 'D'	Residential	1,621	3,226	N/A	35+MPH
TOTAL	**7.75**			**5,238**	**10,427**	**4,865**	

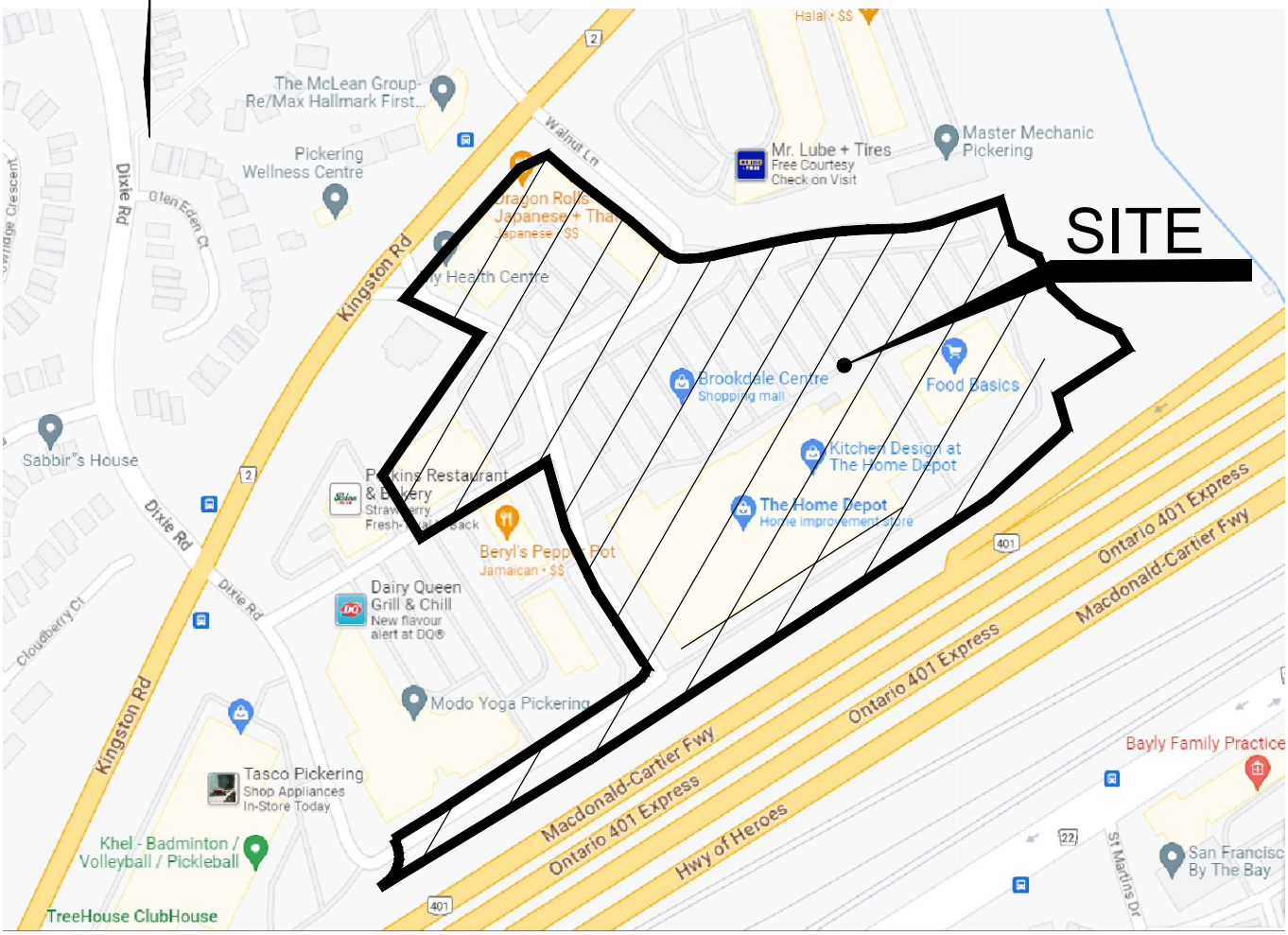
(1) *At the time of writing this report the delineation of the total unit count across the proposed buildings had not yet been determined.*

(2) *Occupancy rates, per capita flows and peaking factor are as per the Region of Durham Design Specifications*

(3) *Unit Counts and Floor Areas from drawings prepared by Turner Fleisher, dated October 23, 2023*

1.2 PUBLIC RIGHT - OF - WAY

A municipal road that runs through the site and connects to Walnut Lane is proposed as part of the site plan. The road will run in a north-south direction on the west side of the Phase 2 lands, and it will run in the east - west direction on the south side of the Phase 3 lands. The public road will terminate at the west property boundary, with the option to extend this road to Dixie Road in the future. The proposed municipal right - of - way will be 20.0 m in size, and it will contain an 8.5 m pavement width and boulevard areas on each side. The proposed road layout is outlined in **Figure 1-C – "Post Development Plan".**



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1101A, 1105, and 1163 KINGSTON ROAD

SITE LOCATION PLAN

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KINGSTON ROAD

WALNUT LANE

PUBLIC ROAD

DIXIE ROAD

HIGHWAY 401

TRCA FLOODLINE

10.0m OFFSET FROM TRCA FLOODLINE

10.0m

LEGEND

PROPERTY LINE

CLIENT

TRIBUTE (BROOKDALE) LIMITED

TITLE

1101A, 1105, and 1163 KINGSTON ROAD

PRE-DEVELOPMENT PLAN

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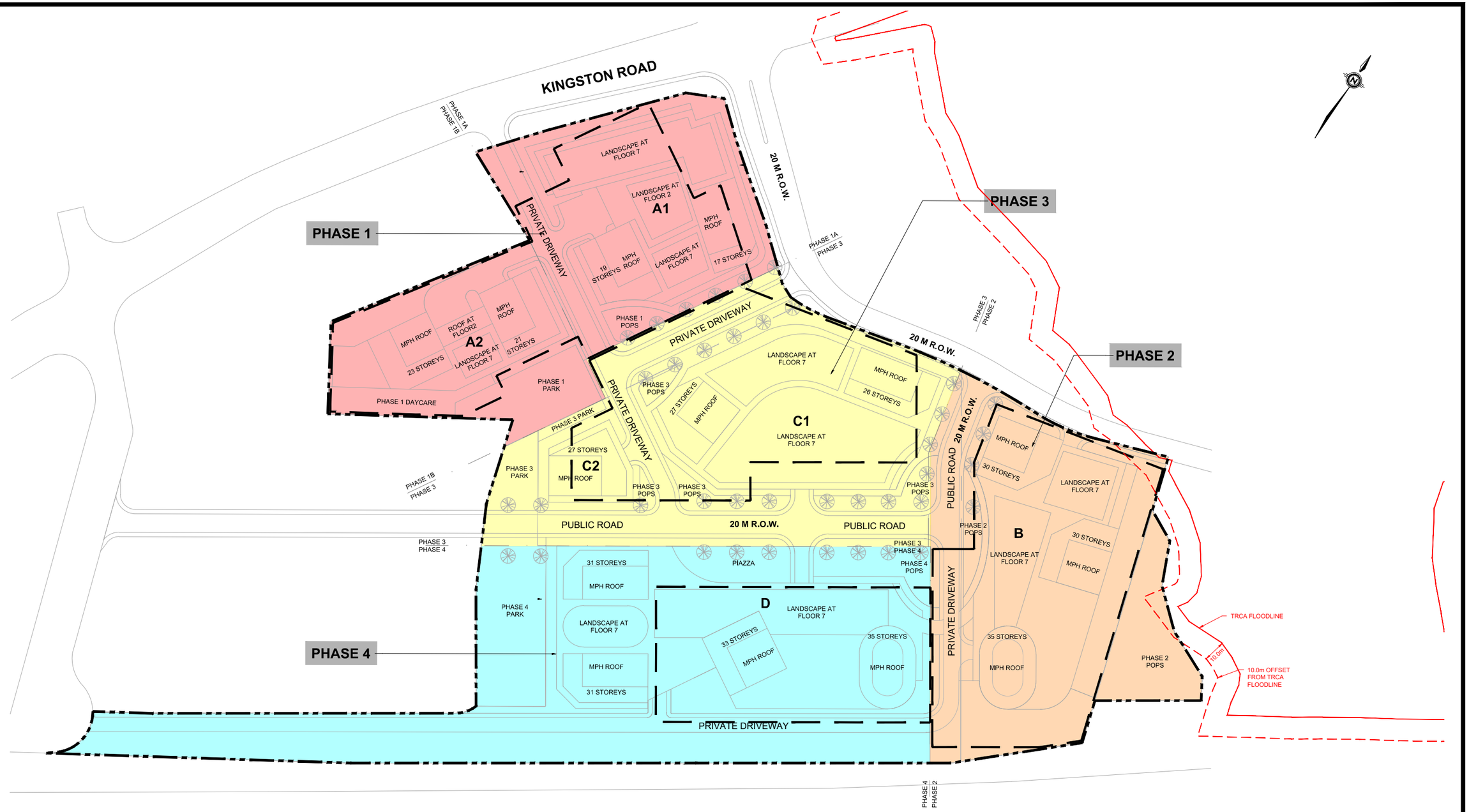

LEGEND

- PROPERTY LINE
- LIMITS OF UNDERGROUND STRUCTURE
- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4

CLIENT
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TITLE
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POST-DEVELOPMENT PLAN

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2 WATER SUPPLY AND APPURTENANCES

2.1 EXISTING CONDITIONS

Based on the record drawings from the Region of Durham, and the topographic surveys prepared by J.D. Barnes Ltd the existing infrastructure in the vicinity of the site is as follows:

- a 300 mm diameter watermain on Kingston Road north of the site;
- a 250 mm diameter watermain on Walnut Lane;
- a 100 mm diameter watermain on Walnut Lane;
- a series of 100 – 250 mm diameter watermains located within the existing commercial site that service the existing commercial developments; and
- an external chamber and backflow preventor room located east of Walnut Lane that services all buildings within the existing development.

The location of the existing water services is illustrated in **Figure 2A - "Existing Watermains".**

2.2 MUNICIPAL WATERMAIN IMPROVEMENTS

A new 300 mm diameter watermain will be constructed north of the site as part of the future Walnut Lane extension. The proposed watermain will connect to the existing watermains on Liverpool Road and Kingston Road. The future watermain will be active at the time of the proposed redevelopment of this site, so the intention is to use it as the connection point for the proposed development. At this time, it is WSP's understanding that the 300 mm diameter watermain will have the capacity to service the proposed development.

2.3 PROPOSED WATER SERVICES

An illustration of the proposed water servicing strategy for each phase is outlined in **Figures 2B - 2E**. The following subsections describe the proposed water servicing in detail.

2.3.1 PHASE 1

In Phase 1, a set of domestic and fire water service connections will be made directly to the future watermain on Walnut Lane to service Buildings 'A1' and 'A2'. The connections will be made in accordance with Region of Durham Standards. If the height of these towers exceeds 84 m, a secondary fire connection will be provided as per Ontario's building code requirements. Sizing of the

water service connections will be coordinated with the Region of Durham and the mechanical engineering consultant at the detailed design stage.

To limit the disturbance to the existing commercial development during the construction of Phase 1, all watermains intersecting the Phase 1 limits will be capped at the phase limit. Since none of the existing buildings relying on these watermains will be preserved during Phase 1, no temporary water servicing strategy will be required. Refer to **Figure 2B - "Phase 1 Water Servicing"** for an illustration of the proposed water servicing strategy for Phase 1.

2.3.2 PHASE 2

In Phase 2, a 300 mm diameter watermain will be installed within the proposed 20.0 m R.O.W west of Building 'B'. The proposed 300 mm diameter watermain will connect to the future watermain in Walnut Lane, and it will be used to service the domestic and fire connections for Building 'B'. The water connections for Building 'B' will be made in accordance with Region of Durham Standards, and if the height of these towers exceeds 84 m, a secondary fire connection will be provided as per Ontario's building code requirements. Sizing of the water service connections will be coordinated with the Region of Durham and the mechanical engineering consultant at the detailed design stage.

According to the topographic surveys prepared by J.D. Barnes Ltd, the existing commercial development in the south of the site has water connections that fall within the west limits of Phase 2. These connections will have to be removed to accommodate the underground structure of Building 'B', so temporary domestic and water service connections will have to be installed to re-route these existing services outside of the proposed underground structure. The temporary connections will connect to the proposed 300 mm watermain installed within the proposed R.O.W introduced in Phase 2 to prevent additional disruption to the existing development. Since the existing building relies on an external chamber and backflow preventor room located within the Phase 3 lands, a temporary chamber and backflow preventor room are proposed to be installed to service the existing building in the interim condition.

Refer to **Figure 2C - "Phase 2 Water Servicing"** for an illustration of the proposed water servicing strategy for Phase 2.

2.3.3 PHASE 3

In Phase 3, the proposed 300 mm diameter watermain from Phase 2 will be extended west across the proposed R.O.W extension. The watermain will be capped at the property line on the west side of the site. Extending the watermain enables future connection if the R.O.W is ultimately extended to Dixie Road.

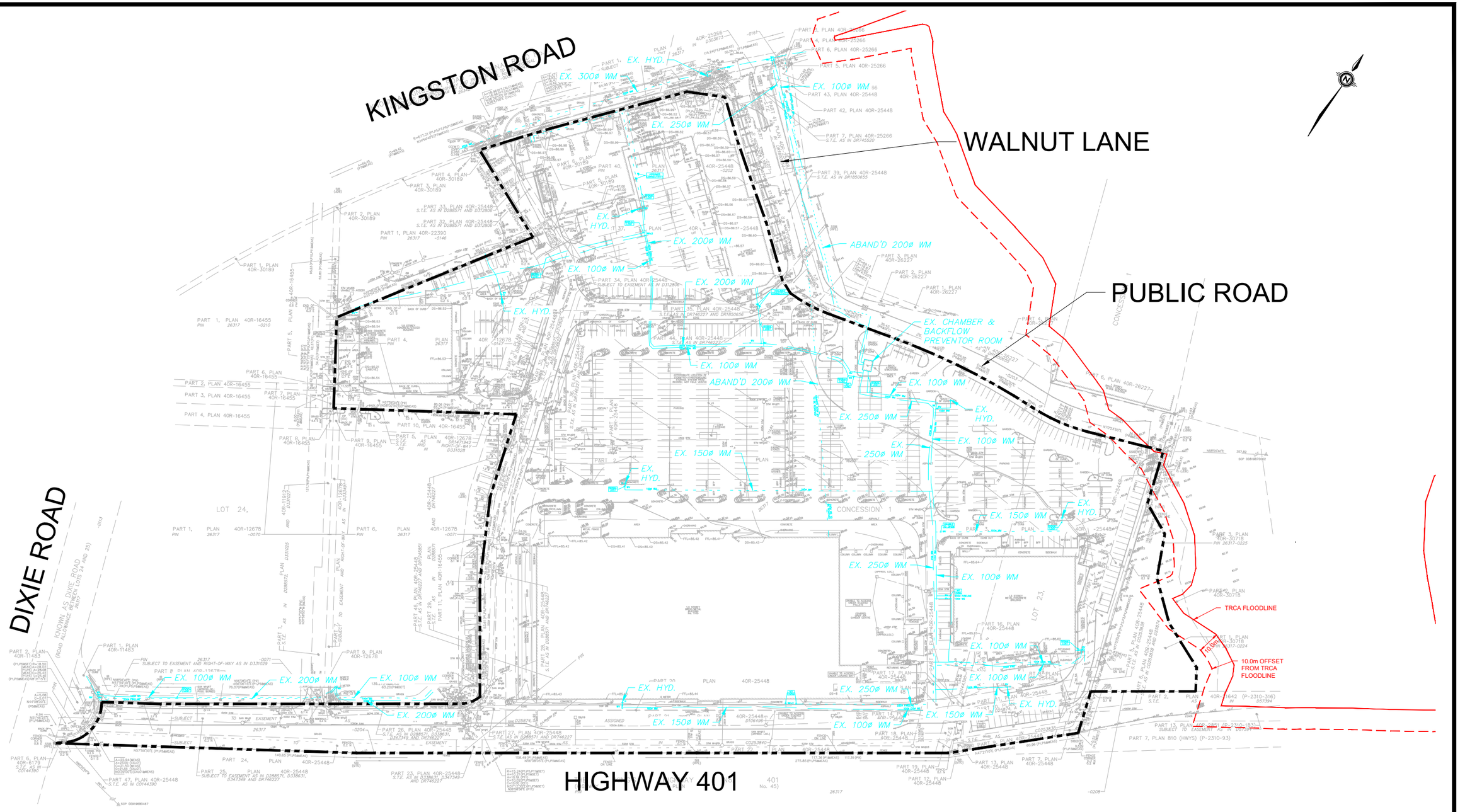
To service Buildings 'C1' and 'C2', a set of domestic and fire water service connections will be made to the proposed 300 mm diameter watermain within the 20.0 m R.O.W. The connections will be made in accordance with Region of Durham Standards, and if the height of the buildings exceeds 84 m, a secondary fire connection will be provided as per Ontario's building code requirements. Sizing of the

water service connections will be coordinated with the Region of Durham and the mechanical engineering consultant at the detailed design stage.

Refer to **Figure 2D - "Phase 3 Water Servicing"** for an illustration of the proposed water servicing strategy for Phase 3.

2.3.4 PHASE 4

In Phase 4, Building 'D' will have domestic and fire water service connections to the proposed 300 mm diameter watermain within the 20.0 m R.O.W north of the building. The water connections for Building 'D' will be made in accordance with Region of Durham Standards, and if the height of these towers exceeds 84 m, a secondary fire connection will be provided as per Ontario's building code requirements. Sizing of the water service connections will be coordinated with the Region of Durham and the mechanical engineering consultant at the detailed design stage. Refer to **Figure 2E - "Phase 4 Water Servicing"** for an illustration of the proposed water servicing strategy for Phase 4.



LEGEND

PROPERTY LINE

EXISTING WATER SERVICE

CLIENT

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EXISTING WATERMAINS

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KINGSTON ROAD

DIXIE ROAD

HIGHWAY 401

WALNUT LANE

PRIVATE DRIVEWAY

BLDG A1

BLDG A2

PARK

EXISTING BUILDING

EXISTING BUILDING

EX. HYD.

EX. 300ø WM

FUTURE 300Ø WM WITHIN WALNUT LANE

PROPOSED BUILDING 'A1' & BUILDING 'A2' DOMESTIC AND FIRE WATERMAIN CONNECTIONS

CAP EX. WM

EX. 200ø WM

EX. CHAMBER & BACKFLOW PREVENTOR ROOM

EX. 100ø WM

ABAND'D 200ø WM

EX. 250ø WM

EX. 150ø WM

EX. HYD.

EX. 100ø WM

EX. 250ø WM

EX. 150ø WM

EX. HYD.

EX. 100ø WM

EX. 250ø WM

EX. 100ø WM

EX. 100ø WM

EX. HYD.

EX. 150ø WM

EX. HYD.

EX. 100ø WM

EX. 200ø WM

EX. 100ø WM

EX. 200ø WM

EX. HYD.

EX. 250ø WM

EX. 150ø WM

EX. 100ø WM

EX. 150ø WM

TRCA FLOODLINE

10.0m

10.0m OFFSET FROM TRCA FLOODLINE

LEGEND

- PROPERTY LINE
- EXISTING WATER SERVICE
- PROPOSED WATER SERVICE
- PHASE 1

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PHASE 1 - WATER SERVICING

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KINGSTON ROAD

EX. HYD.

EX. 300ø WM

FUTURE 300Ø WM WITHIN WALNUT LANE

WALNUT LANE

PRIVATE DRIVEWAY

BLDG A1

PROPOSED BUILDING 'A1' & BUILDING 'A2' DOMESTIC AND FIRE WATERMAIN CONNECTIONS

EX. CHAMBER & BACKFLOW PREVENTOR ROOM

BLDG A2

PARK

EX. 200ø WM

EX. 100ø WM

ABAND'D 200ø WM

EX. 100ø WM

EX. 250ø WM

EX. 250ø WM

EX. 150ø WM

PROPOSED 300Ø WM IN PUBLIC ROAD

PUBLIC ROAD

PROPOSED BUILDING 'B' DOMESTIC AND FIRE WATERMAIN CONNECTIONS

EX. HYD.

DIXIE ROAD

PROPOSED TEMPORARY CHAMBER AND BACKFLOW PREVENTOR FOR EX BUILDING DOMESTIC & FIRE WM CONNECTIONS. CONNECT CHAMBER TO PHASE 3 20m ROW WM.

EXISTING BUILDING

INSTALL TEMPORARY DOMESTIC AND FIRE WATER SERVICES FOR EXISTING BUILDING AND CONNECT TO EXISTING SERVICES AS SHOWN

BLDG B

PRIVATE DRIVEWAY

TRCA FLOODLINE

10.0m

10.0m OFFSET FROM TRCA FLOODLINE

EX. 100ø WM

EX. 200ø WM

EX. 100ø WM

EX. 200ø WM

EX. HYD.

EX. 250ø WM

EX. 150ø WM

EX. 100ø WM

HIGHWAY 401

LEGEND

- PROPERTY LINE
- EXISTING WATER SERVICE
- PROPOSED WATER SERVICE
- PROPOSED WATER SERVICE INSTALLED IN PRIOR PHASE

- PHASE 1
- PHASE 2

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TITLE

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PHASE 2 - WATER SERVICING

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KINGSTON ROAD

EX. HYD.

EX. 300Ø WM

FUTURE 300Ø WM WITHIN WALNUT LANE

WALNUT LANE

PRIVATE DRIVEWAY

BLDG A1

PROPOSED BUILDING 'A1' & BUILDING 'A2' DOMESTIC AND FIRE WATERMAIN CONNECTIONS

BLDG A2

PARK

PRIVATE DRIVEWAY

PRIVATE DRIVEWAY

BLDG C1

PROPOSED 300Ø WM IN PUBLIC ROAD

PUBLIC ROAD

PARK

BLDG C2

PROPOSED BUILDING 'C1' & 'C2' DOMESTIC AND FIRE WATERMAIN CONNECTIONS

PROPOSED BUILDING 'B' DOMESTIC AND FIRE WATERMAIN CONNECTIONS

BLDG B

DIXIE ROAD

CAP WATERMAIN AT PROPERTY LINE

PUBLIC ROAD

PROPOSED 300Ø WM IN PUBLIC ROAD

PROPOSED TEMPORARY CHAMBER AND BACKFLOW PREVENTOR FOR EX BUILDING DOMESTIC & FIRE WM CONNECTIONS. CONNECT CHAMBER TO PHASE 3 20m ROW WM.

EXISTING BUILDING

INSTALL TEMPORARY DOMESTIC AND FIRE WATER SERVICES FOR EXISTING BUILDING AND CONNECT TO EXISTING SERVICES AS SHOWN

PRIVATE DRIVEWAY

TRCA FLOODLINE

10.0m

10.0m OFFSET FROM TRCA FLOODLINE

EX. 100Ø WM

EX. 200Ø WM

EX. 100Ø WM

EX. 200Ø WM

EX. HYD.

EX. 250Ø WM

EX. 150Ø WM

EX. 100Ø WM

HIGHWAY 401

LEGEND

- PROPERTY LINE
- EXISTING WATER SERVICE
- PROPOSED WATER SERVICE
- PROPOSED WATER SERVICE INSTALLED IN PRIOR PHASE

- PHASE 1
- PHASE 2
- PHASE 3

CLIENT

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TITLE

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PHASE 3 - WATER SERVICING

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KINGSTON ROAD

EX. HYD.

EX. 300Ø WM

FUTURE 300Ø WM WITHIN WALNUT LANE

PROPOSED BUILDING 'A1' & BUILDING 'A2' DOMESTIC AND FIRE WATERMAIN CONNECTIONS

BLDG A1

BLDG A2

PRIVATE DRIVEWAY

WALNUT LANE

PROPOSED WM IN PUBLIC ROAD

PARK

PRIVATE DRIVEWAY

BLDG C1

PROPOSED 300Ø WM IN PUBLIC ROAD

PUBLIC ROAD

PARK

BLDG C2

PROPOSED BUILDING 'C1' & 'C2' DOMESTIC AND FIRE WATERMAIN CONNECTIONS

PROPOSED BUILDING 'B' DOMESTIC AND FIRE WATERMAIN CONNECTIONS

DIXIE ROAD

CAP WATERMAIN AT PROPERTY LINE

PUBLIC ROAD

BLDG B

PROPOSED 300Ø WM IN PUBLIC ROAD

PARK

BLDG D

PRIVATE DRIVEWAY

PROPOSED BUILDING 'D' DOMESTIC AND FIRE WATERMAIN CONNECTIONS

TRCA FLOODLINE

10.0m

10.0m OFFSET FROM TRCA FLOODLINE

EX. 100Ø WM

EX. 200Ø WM

EX. 100Ø WM

EX. 200Ø WM

PRIVATE DRIVEWAY

HIGHWAY 401

LEGEND

- PROPERTY LINE
- EXISTING WATER SERVICE
- PROPOSED WATER SERVICE
- PROPOSED WATER SERVICE INSTALLED IN PRIOR PHASE

- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4

CLIENT

TRIBUTE (BROOKDALE) LIMITED

TITLE

1101A, 1105, and 1163 KINGSTON ROAD

PHASE 4 - WATER SERVICING

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3 SANITARY SEWAGE SYSTEM

3.1 EXISTING CONDITIONS

Based on the record drawings from the Region of Durham, and the topographic surveys prepared by J.D. Barnes Ltd the existing infrastructure in the vicinity of the site is as follows:

- 1050 mm diameter trunk sanitary sewer on the south side of the site;
- 200 mm diameter sanitary sewers located in an easement on the west side of the site;
- 200 mm diameter sanitary sewer on Walnut Lane; and
- 200 mm diameter sanitary sewer north of the site on Kingston Road.

In the existing condition, all sanitary waste generated within the site is ultimately discharged to the 1050 mm diameter trunk sewer. The methods of connection to the trunk are summarized below:

- The two buildings on the south side of the site have direct connections to the trunk;
- The building on the west side of the site is conveyed to the trunk via the 200 mm diameter sanitary sewer located in the easement on the west side of the site; and
- The two buildings on the north side of the site have connections to the Kingston Road sanitary sewer before connecting to the 1050 mm diameter trunk sewer.

Figure 3A - "Existing Sanitary Sewers" illustrates the existing on - site sanitary servicing strategy.

3.2 DESIGN PARAMETERS

To calculate the peak sanitary flows, the following Region of Durham design criteria has been utilized:

- 180,000 L / ha / day average day flow generation rate for commercial use;
- 364 L / cap / day average day flow generation rate for residential use;
- Population equivalent based on unit type for residential use:
  - 1.5 people per one Bedroom residential apartment unit;
  - 2.5 people per two Bedroom residential apartment unit;
  - 3.5 people per three Bedroom residential apartment unit; and
  - 4.5 people per four Bedroom residential apartment unit.
- Peaking Factor for residential use: Harmon Formula $KH = 1 + \frac{14}{4+P^{0.5}}$; and
- Infiltration: 0.26 L / ha / s.

3.3 POST - DEVELOPMENT SEWAGE FLOW

The anticipated post - development sanitary flows to the downstream sanitary sewer system have been calculated based on the Region of Durham Design Criteria and site statistics provided by Turner Fleischer Architects Inc. dated October 23, 2023. Detailed flow generation design sheets are included in **Appendix A**. The flow summary for each phase is included in **Table 2**.

Table 2 – Sanitary Flow Generation Summary

Phase	Buildings	Average Daily Flow	Peak Flow
1	Building 'A1' & Building 'A2'	11.80 L/s	37.43 L/s
2	Building 'B'	11.34 L/s	38.60 L/s
3	Building 'C1' & Building 'C2'	10.20 L/s	33.82 L/s
4	Building 'D'	14.23 L/s	47.06 L/s

3.4 PROPOSED SANITARY SERVICING

As part of the Walnut Lane extension project, there will be a sanitary sewer installed within the Walnut Lane R.O.W that will be sized to convey flows from the proposed development. The future Walnut Lane sewer will discharge to the 1050 mm diameter trunk sanitary sewer south of the site.

As the subject site is developed, connections from the proposed development to the future sanitary sewer in Walnut Lane will be made via sanitary sewers installed within the site. The following subsections outline the proposed sanitary servicing strategy in detail. Sanitary design sheets and drainage plans corresponding to the proposed sanitary servicing strategy are given in **Appendix A**.

3.4.1 PHASE 1

In Phase 1, one sanitary sewer connection that services Buildings 'A1' and 'A2'will be made to the future sanitary sewer on Walnut Lane. Preliminary sizing of the sanitary connection suggests that the connection should be 250 mm diameter. However, the final size will be coordinated with the Mechanical Engineer at the detailed design stage.

According to the topographic surveys prepared by J.D. Barnes Ltd, the existing commercial development in the northwest corner of the site has a sanitary connection to the 200 mm diameter municipal sanitary sewer that runs within an easement on the west boundary of the site. It is proposed that the existing connection to this municipal sanitary sewer be removed during Phase 1 construction. Since the municipal sanitary sewer collects sanitary drainage from the existing commercial development to the west of the site, this municipal sewer must be protected and maintained during all phases of the proposed redevelopment. The survey also shows a sanitary connection directly to Kingston Road for the existing commercial development at the northeast corner of the site. It is proposed that during Phase 1 construction this existing sanitary connection is abandoned.

Refer to **Figure 3B - "Phase 1 Sanitary Servicing"** for an illustration of the proposed sanitary servicing strategy for Phase 1.

3.4.2 PHASE 2

In Phase 2, a public sanitary sewer that connects to the future sanitary sewer on Walnut Lane will be constructed within the proposed public R.O.W west of Building 'B'. This leg of public sanitary sewer will be sized to convey all sanitary flows from Phase 2, Phase 3, and Phase 4. Preliminary sizing suggests that this sewer in the R.O.W should be 375 mm diameter. However, the size will be confirmed during detailed design.

Building 'B' will have one sanitary service connection to the sanitary sewer within the proposed public R.O.W. Preliminary sizing of the sanitary connection suggests that the size should be 200 mm diameter. However, the final size will be coordinated with the Mechanical Engineer at the detailed design stage.

According to the topographic surveys prepared by J.D. Barnes Ltd, the existing commercial development has a sanitary connection to the existing trunk sanitary sewer that runs along the south side of the site. It is proposed that this existing sanitary service connection to the trunk is removed during Phase 2 construction. However, the trunk sanitary sewer must be protected and maintained during all phases of construction.

Refer to **Figure 3C - "Phase 2 Sanitary Servicing"** for an illustration of the proposed sanitary servicing strategy for Phase 2.

3.4.3 PHASE 3

In Phase 3, an extension to the public sanitary sewer proposed in Phase 2 will be made along the proposed public R.O.W south of Buildings 'C1' and 'C2'. This leg of public sanitary sewer will be sized to convey the sanitary flows from Phases 3 and 4. Preliminary sizing suggests that this sewer should be 375 mm diameter. However, the size will be confirmed during detailed design.

The proposed sanitary sewer in the public R.O.W south of Buildings 'C1' and 'C2' will not be extended along the full length of the R.O.W to the property line on the west side of the development. WSP believes that even with minimal pipe sloping, there is too much length and not enough cover to have a sanitary sewer drain by gravity from the lands to the west and connect to the future sanitary sewer in

Walnut Lane. Thus, any future redevelopment within the lands to the west shall direct sanitary flows west to Dixie Road before draining south to the 1050 mm diameter trunk sewer.

One sanitary service connection that services Buildings 'C1' and 'C2' will be made to the sanitary sewer within the proposed R.O.W before the flows are conveyed towards Walnut Lane. Preliminary sizing of the sanitary connection suggests that the connection should be 200 mm diameter. However, the final size will be coordinated with the mechanical engineer at the detailed design stage.

Although no existing buildings will be removed during Phase 3, the topographic surveys prepared by J.D. Barnes Ltd shows that there is an existing 200 mm diameter sanitary connection to the municipal sanitary sewer on the west side of the site that falls within the proposed Phase 3 Lands. It is proposed that this connection be removed as part of the Phase 3 redevelopment, while the existing municipal sewer is to remain.

Refer to **Figure 3D - "Phase 3 Sanitary Servicing"** for an illustration of the proposed sanitary servicing strategy for Phase 3.

3.4.4 PHASE 4

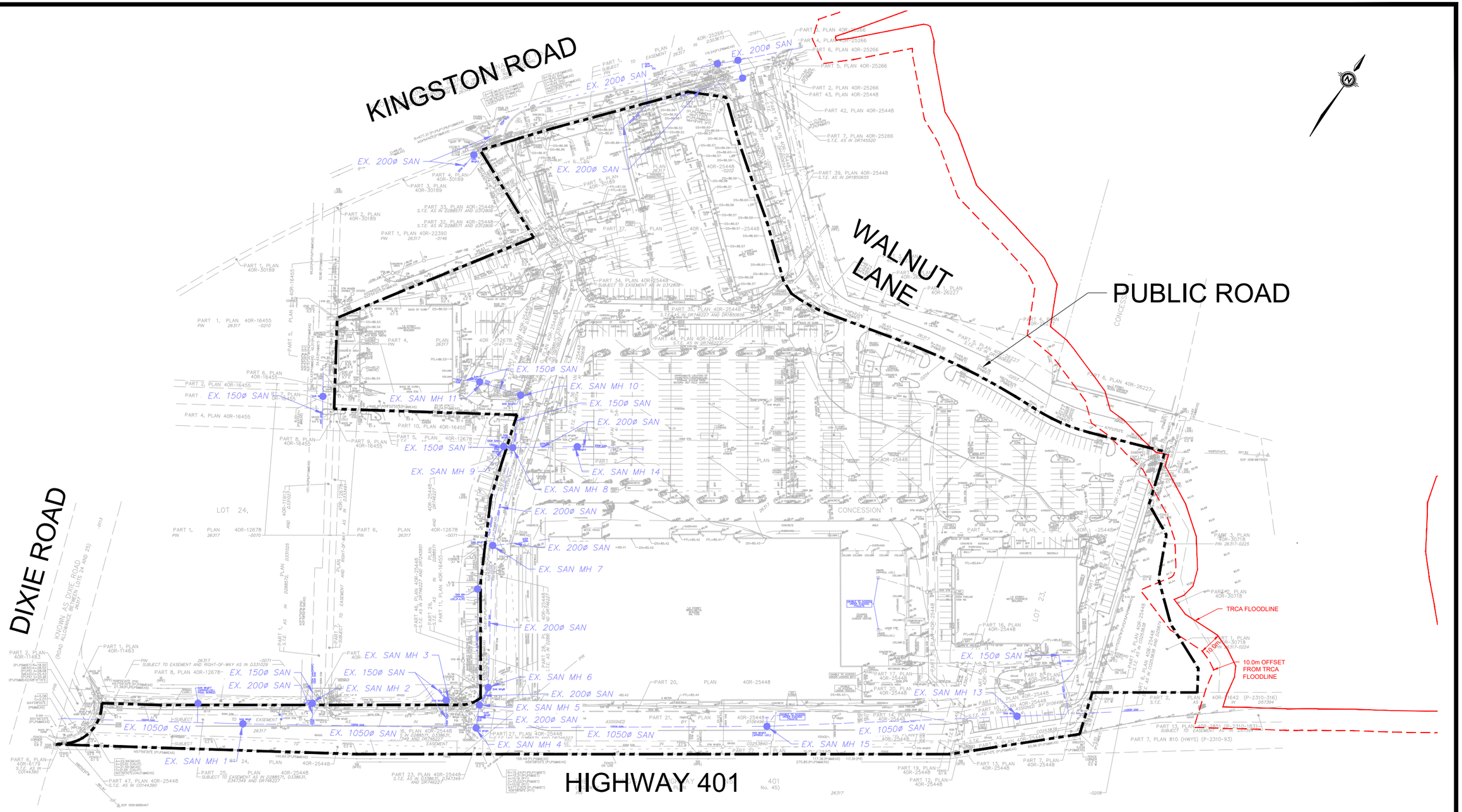
In Phase 4, Building 'D' is proposed to have one sanitary service connection to the sanitary sewer within the proposed R.O.W north of the building. Preliminary sizing of the sanitary connection suggests that the connection should be 250 mm diameter. However, the final size will be coordinated with the mechanical engineer at the detailed design stage.

According to the topographic surveys prepared by J.D. Barnes Ltd, the existing commercial development on the south side of the site has a sanitary connection to the 200 mm diameter municipal sanitary sewer that runs along the west boundary of the site. It is proposed that this existing service connection is removed during the Phase 4 redevelopment, while the exiting municipal sanitary sewers are to remain.

Refer to **Figure 3E - "Phase 3 Sanitary Servicing"** for an illustration of the proposed sanitary servicing strategy for Phase 4.

3.5 SANITARY CAPACITY ANALYSIS

WSP contacted the Region of Durham regarding the 1050 mm diameter trunk sanitary sewer capacity for a nearby site in October of 2021. At that time, it was indicated that capacity was to be allocated on a first come first serve basis at the time of signing a development agreement. There are currently other ongoing developments within the service area and as such the Region of Durham is in the process of confirming capacity limitations through the use of ongoing flow monitoring. This will form the basis of determining any potential upgrades that will be required as development continues to proceed within the existing sanitary drainage boundary of Pickering City Centre area and beyond.



LEGEND

PROPERTY LINE

EXISTING SANITARY SERVICE

CLIENT

TRIBUTE (BROOKDALE) LIMITED

TITLE

1101A, 1105, and 1163 KINGSTON ROAD

EXISTING SANITARY SEWERS

wsp

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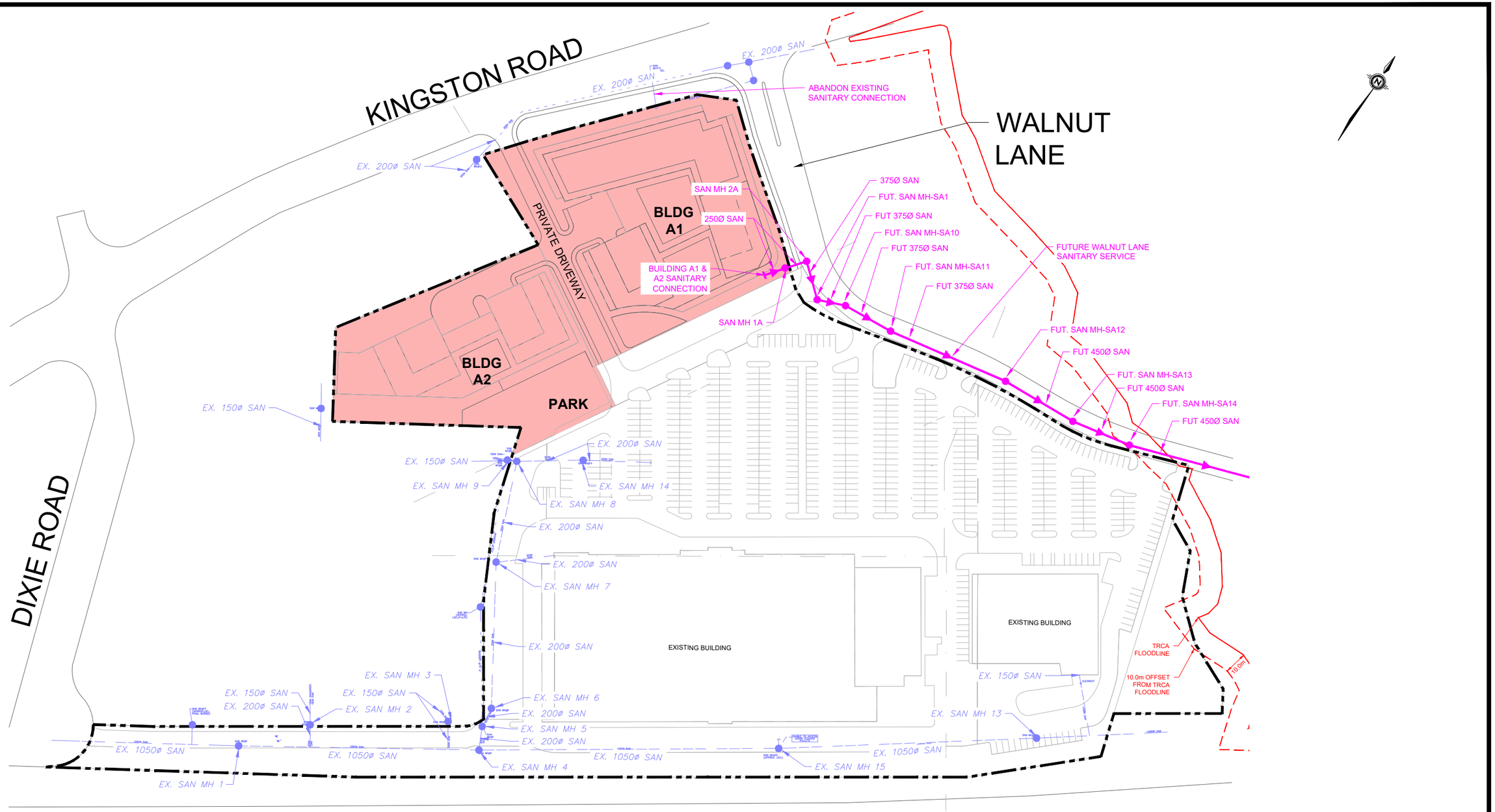
Date OCT 2023	Proj. No. 221-12931
Scale 1:1750	Figure No. 3A



LEGEND

- PROPERTY LINE
- EXISTING SANITARY SERVICE
- PROPOSED WATER SERVICE
- PHASE 1

CLIENT

TRIBUTE (BROOKDALE) LIMITED

TITLE

1101A, 1105, and 1163 KINGSTON ROAD

PHASE 1 - SANITARY SERVICING

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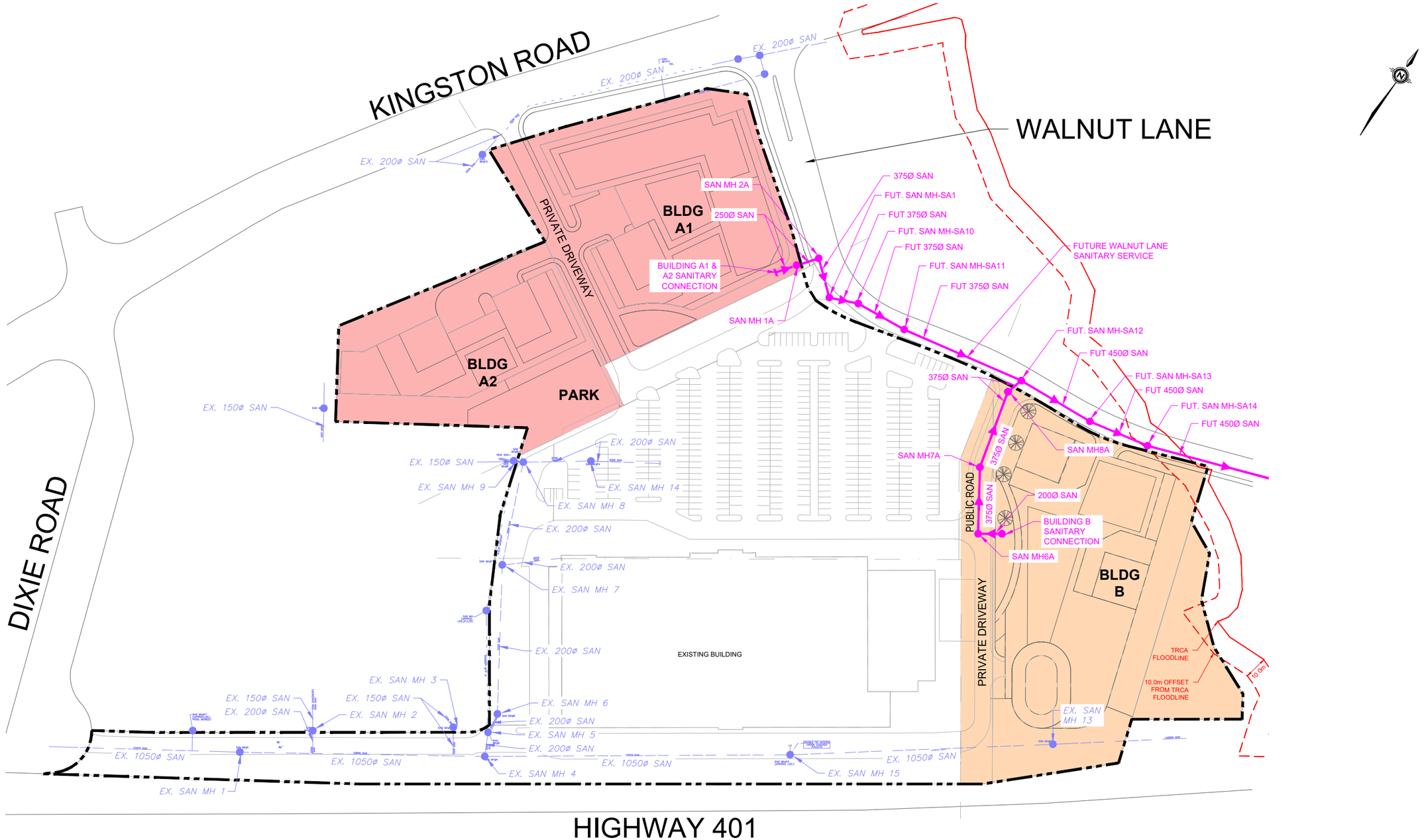

LEGEND

- PROPERTY LINE
- EXISTING SANITARY SERVICE
- PROPOSED SANITARY SERVICE
- PROPOSED SANITARY SERVICE INSTALLED IN PRIOR PHASE
- PHASE 1
- PHASE 2

CLIENT
TRIBUTE (BROOKDALE) LIMITED

TITLE
1101A, 1105, and 1163 KINGSTON ROAD
PHASE 2 - SANITARY SERVICING

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KINGSTON ROAD

WALNUT LANE

DIXIE ROAD

HIGHWAY 401

PUBLIC ROAD

PRIVATE DRIVEWAY

PRIVATE DRIVEWAY

PUBLIC ROAD

EXISTING BUILDING

BLDG A1

BLDG A2

BLDG C1

BLDG C2

BLDG B

PARK

PARK

EX. 200ø SAN

EX. 200ø SAN

EX. 200ø SAN

EX. 150ø SAN

EX. SAN MH 9

EX. SAN MH 8

EX. 150ø SAN

EX. 200ø SAN

EX. 200ø SAN

EX. SAN MH 7

EX. 200ø SAN

EX. SAN MH 3

EX. 150ø SAN

EX. 200ø SAN

EX. 150ø SAN

EX. SAN MH 2

EX. SAN MH 6

EX. 200ø SAN

EX. SAN MH 5

EX. 200ø SAN

EX. SAN MH 4

EX. 1050ø SAN

EX. 1050ø SAN

EX. 1050ø SAN

EX. SAN MH 1

EX. 1050ø SAN

EX. SAN MH 15

EX. SAN MH 13

SAN MH 2A

250Ø SAN

BUILDING A1 & A2 SANITARY CONNECTION

SAN MH 1A

375Ø SAN

FUT. SAN MH-SA1

FUT 375Ø SAN

FUT. SAN MH-SA10

FUT 375Ø SAN

FUT. SAN MH-SA11

FUT 375Ø SAN

FUTURE WALNUT LANE SANITARY SERVICE

FUT. SAN MH-SA12

FUT 450Ø SAN

FUT. SAN MH-SA13

FUT 450Ø SAN

FUT. SAN MH-SA14

FUT 450Ø SAN

375Ø SAN

SAN MH7A

SAN MH8A

375Ø SAN

BUILDING C1 & C2 SANITARY CONNECTION

200Ø SAN

SAN MH 4A

200Ø SAN

SAN MH5A

375Ø SAN

200Ø SAN

BUILDING B SANITARY CONNECTION

SAN MH6A

TRCA FLOODLINE

10.0m OFFSET FROM TRCA FLOODLINE

10.0m

PHASE 3 DEVELOPMENT LIMITS

LEGEND

- PROPERTY LINE
- EXISTING SANITARY SERVICE
- PROPOSED SANITARY SERVICE
- PROPOSED SANITARY SERVICE INSTALLED IN PRIOR PHASE

- PHASE1
- PHASE 2
- PHASE 3

CLIENT

TRIBUTE (BROOKDALE) LIMITED

TITLE

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PHASE 3 - SANITARY SERVICING

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KINGSTON ROAD

WALNUT LANE

DIXIE ROAD

PUBLIC ROAD

PRIVATE DRIVEWAY

HIGHWAY 401

BLDG A1

BLDG A2

BLDG C1

BLDG C2

BLDG B

BLDG D

PARK

EX. 200ø SAN

EX. 150ø SAN

EX. SAN MH 1

EX. SAN MH 2

EX. SAN MH 3

EX. SAN MH 4

EX. SAN MH 5

EX. SAN MH 6

EX. SAN MH 7

EX. SAN MH 8

EX. SAN MH 9

EX. SAN MH 13

EX. SAN MH 15

EX. 1050ø SAN

SAN MH 1A

SAN MH 2A

SAN MH 3A

SAN MH 4A

SAN MH5A

SAN MH6A

SAN MH7A

SAN MH8A

250ø SAN

200ø SAN

375ø SAN

FUT. SAN MH-SA1

FUT 375ø SAN

FUT. SAN MH-SA10

FUT. SAN MH-SA11

FUT. SAN MH-SA12

FUT 450ø SAN

FUT. SAN MH-SA13

FUT. SAN MH-SA14

BUILDING A1 & A2 SANITARY CONNECTION

BUILDING C1 & C2 SANITARY CONNECTION

BUILDING B SANITARY CONNECTION

BUILDING D SANITARY CONNECTION

FUTURE WALNUT LANE SANITARY SERVICE

TRCA FLOODLINE

10.0m OFFSET FROM TRCA FLOODLINE

10.0m

LEGEND

- PROPERTY LINE
- EXISTING SANITARY SERVICE
- PROPOSED SANITARY SERVICE
- PROPOSED SANITARY SERVICE INSTALLED IN PRIOR PHASE

- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4

CLIENT

TRIBUTE (BROOKDALE) LIMITED

TITLE

1101A, 1105, and 1163 KINGSTON ROAD

PHASE 4 - SANITARY SERVICING

wsp

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Scale 1:1750	Figure No. 3E

4 STORM DRAINAGE SYSTEM

A Stormwater Management Report for this development also prepared by WSP has been prepared under a separate cover. It identifies the stormwater controls under which this site will operate to comply all relevant Wet Weather Flow Management Guidelines (WWFMG).

4.1 EXISTING CONDITIONS

Based on the record drawings from the Region of Durham, and the topographic surveys prepared by J.D. Barnes Ltd the existing infrastructure in the vicinity of the site is as follows:

- 200 mm – 900 mm diameter storm sewers across the site;
- Two quantity control chambers (one within the proposed Phase 1 lands, and one within the proposed Phase 2 lands);
- On - site surface storage;
- On - site roof storage;
- One headwall at the south side of the site. This headwall contains two (2) inlets; and
- 1.83 m x 1.83 m box culvert located at the south end of the site.

In the existing condition, all of the on - site storm sewers ultimately discharge to the 1.83 m x 1.83 m box culvert located at the south end of the site. It is WSP's understanding that the box culvert runs beneath Highway 401 and discharges to a 900 mm culvert under the Go Transit and CNR tracks. It is understood that all flows from the site are ultimately discharged to Frenchman's Bay. Based on the topographic surveys prepared by J.D. Barnes Ltd, it is believed that the existing on - site storm sewers are very shallow due to the outlet elevation and size of the site. The methods of connection are as follows:

- The section of the site that falls within the future Phase 1, and Phase 3 lands drain via the storm network that runs along the west side of the site (herein referred to Existing Storm Network A). Sewers in the main network range from 450 mm diameter to 675 mm diameter in size, and this network has a direct connection to the headwall before discharging to the box culvert. The network also has an existing 150 mm diameter orifice at EX. STM MH 10 that provides quantity control and allows the network to backflow into an on - site quantity control chamber located in the future Phase 3 Lands;
- The section of the site that falls within the future Phase 2, and Phase 4 lands drains through a network that runs along the east and south sides of the site (herein referred to Existing Storm Network B). Sewers in the main network range from 450 mm diameter to 525 mm diameter in size. Based on the topographic surveys prepared by J.D. Barnes Ltd, it is believed that this network discharges directly to the box culvert and avoids the headwall. The network also has an existing 150 mm diameter orifice at EX. STM MH 18 that provides quantity control and allows the network

to backflow into an on - site underground storage chamber located in the future Phase 2 Lands; and

- The segment of driveway within the Phase 4 lands that is located west of the headwall drains via a storm network that runs beneath the driveway (herein referred to Existing Storm Network C). The sewers of the main network that fall within the proposed development range from 525 mm diameter to 900 mm diameter and the system has a direct connection to the headwall. Based on the topographic surveys prepared by J.D. Barnes Ltd, it is believed that this storm network west of the headwall collects drainage from Dixie Road and the existing commercial developments to the west.

The existing on - site storm features are illustrated in figure **Figure 4A - "Existing Storm Sewers".**

4.2 PROPOSED MINOR STORM DRAINAGE SYSTEM

As part of the Walnut Lane extension project, there will be a storm network installed within the Walnut Lane R.O.W that will be sized to capture and convey the proposed storm flows within Walnut Lane. The future Walnut Lane sewer will discharge flows to a proposed headwall east of the site. The proposed development will not use the future Walnut Lane storm sewer network to convey its storm flows. Instead, the proposed development will use on - site sewer networks to convey flows to the box culvert located south of the site. The proposed on-site minor storm drainage system will capture all flows up to the 100-year event and release them to the box culvert at the allowable release rate.

The following sections outline the proposed phased storm servicing strategy in detail. Additional details regarding the allowable release rate and overall storm servicing strategy for the site is outlined in the Stormwater Management Report prepared by WSP under a separate cover.

4.2.1 PHASE 1

Storm flows from Phase 1 (excluding the park) will be collected by an internal storm drainage system and directed to a storage tank within Building 'A2'. Details regarding the internal drainage system will be determined at the detailed design stage, but the system is to be fit with an OGS to provide the required quality control for the road segments within Phase 1. The storage tank will discharge the flows to a maximum allowable release rate of 161.0 L/s, and it will be designed to hold a volume of 600 m^3. Preliminary sizing of the storm service connection from the building suggests that the size should be 375 mm diameter. However, the final size will be confirmed at the detailed design stage. Flows from Phase 1 will be directed into Existing Storm Network A.

Storm flows from the Phase 1 park will be captured and controlled by a superpipe fit with a flow control device that will release flows to a maximum allowable release rate of 10.3 L/s. The park flows will be discharged into Existing Storm Network A. Preliminary sizing suggests that this superpipe should be 450 mm in size. However, this will be confirmed at the detailed design stage.

During Phase 1, it is proposed that the existing 10 m - 150 mm diameter orifice that is located on the south side of EX. STM MH 10 be relocated to the east side of the manhole. Relocating the orifice will

provide the same level of quantity control for the existing parking lot east of the manhole that will remain in Phase 1. Since quantity control measures are being proposed in the Phase 1 lands, this orifice will not have to provide quantity control for the future Phase 1 flows.

Preliminary sizing suggests that there will be no upgrades required to Existing Storm Network A to convey the proposed flows from the development in each of the interim conditions described in the subsequent sections. However, in the preliminary analysis it was assumed that there are no flows entering Existing Storm Network A from the commercial lands to the west. It should be noted that the survey shows an existing 300 mm diameter storm sewer connecting to EX. STM MH 9 from the lands to the west. The belief is that this segment of pipe was decommissioned when the lands to the west were redeveloped. If Existing Storm Network A is taking external flows from the west development, then it is likely that storm sewer upgrades will be required. The Phase 1 storm sewer drainage plans and design sheets are included in **Appendix B**.

An infiltration pit located within the Phase 1 Lands is proposed to maintain the pre-development water balance following Phase 1 construction. Preliminary sizing suggests that the pit should have a footprint of 250 m^2, and a stone depth of 0.85 m. However, the final sizing will be confirmed at the detailed design stage.

Additional details relating to the proposed Phase 1 storm servicing strategy and modelling are included in the Stormwater Management Report prepared by WSP under a separate cover. The proposed storm servicing layout is shown on **Figure 4B - "Phase 1 – Storm Servicing".**

4.2.2 PHASE 2

Storm flows from Phase 2 (excluding the R.O.W) will be collected by an internal storm drainage system and directed to a storage tank within Building 'B'. Specifications regarding the internal drainage system will be determined at the detailed design stage, but the system is to be fit with an OGS to provide the required quality control for the private road segments within Phase 2. The storage tank will discharge the flows to a maximum allowable release rate of 120.7 L / s and will have a storage volume of 500 m^3. A storm connection will be made from Building 'B' to Existing Storm Network B. Preliminary sizing of the storm connections suggests that the connection should be 375 mm diameter. However, the final size will be confirmed at the detailed design stage.

To avoid backflow into proposed Building 'B', the 10m-250 mm diameter orifice on the northeast side of STM MH 18 will be removed. Remodelling the system without the orifice and backflow suggests that the existing 525 mm diameter sewers will need to be upgraded to sizes ranging from 675 to 750 mm diameter. In the analysis it was assumed that the existing pipe slopes measured from the topographic surveys prepared by J.D. Barnes Ltd would be maintained. The Phase 2 storm sewer drainage plans and design sheets that were developed in the analysis are included in **Appendix B.**

Storm flows from the Phase 2 R.O.W will be conveyed west across the site by a superpipe into Existing Storm Network A. The superpipe will be fit with a flow control device to discharge at a maximum allowable release rate of 15.3 L / s. Preliminary sizing suggests that this superpipe should be 1050 mm diameter to handle the future flows. However, the sizing will be confirmed at the detailed design stage.

An infiltration pit located within the Phase 2 lands is proposed to maintain the pre-development water balance following Phase 2 construction. Preliminary sizing suggests that the pit should have a footprint of 324 m^2, and a stone depth of 0.49 m. However, the final sizing will be confirmed at the detailed design stage.

Additional details relating to the proposed Phase 2 storm strategy and modelling are included in the Stormwater Management Report prepared by WSP under a separate cover. The proposed storm servicing layout is shown on **Figure 4C - "Phase 2 – Storm Servicing"**.

4.2.3 PHASE 3

Storm flows from Phase 3 (excluding the R.O.W) will be collected by an internal storm drainage system and directed to a storage tank within Building 'C2'. Specifications regarding the internal drainage system will be determined at the detailed design stage, but the system is to be fit with an OGS to provide the required quality control for the private road segments within Phase 3. The storage tank will discharge the flows to a maximum allowable release rate of 138.80 L / s and will have a volume of 700.0 m^3. A storm connection will be made from Building 'C2' to the proposed 1050 mm diameter superpipe within the proposed R.O.W before discharging to Existing Storm Network A. Preliminary sizing of the storm service connection suggests that it should be 375 mm diameter. However, the final size will be confirmed at the detailed design stage.

Storm flows from the Phase 3 park will be captured and controlled by a superpipe fit with a flow control device that will release flows to a maximum allowable release rate of 6.6 L / s. Preliminary sizing suggests that this superpipe should be 450 mm in diameter. However, this will be confirmed at the detailed design stage. Flows from the park will also be conveyed into the superpipe within the proposed R.O.W before entering Existing Storm Network A.

Storm flows from the Phase 3 R.O.W will be conveyed into the proposed superpipe located within the R.O.W. With the contribution of the controlled flows of Phase 3, the maximum allowable release rate of the superpipe will increase to 200.4 L / s. The Phase 3 storm sewer drainage plans and design sheets that were developed in the analysis are included in **Appendix B**.

An infiltration pit located within the Phase 3 Lands is proposed to maintain the pre-development water balance following Phase 3 construction. Preliminary sizing suggests that the pit should have a footprint of 380 m^2, and a stone depth of 0.61 m. However, the final sizing will be confirmed at the detailed design stage.

Additional details relating to the proposed Phase 3 storm servicing strategy and modelling are included in the Stormwater Management Report prepared by WSP under a separate cover. The proposed storm servicing layout is shown on **Figure 4C - "Phase 3 – Storm Servicing".**

4.2.4 PHASE 4

Storm flows within Phase 4 that are from north of the proposed driveway, and east of the proposed park will be collected by an internal storm drainage system and directed to a storage tank within Building 'D'. Specifications regarding the internal drainage system will be determined at the detailed

design stage, but the system is to be fit with an OGS to provide the required quality control for the any road segments within the phase that are north of the proposed building. The storage tank will discharge the flows to a maximum allowable release rate of 131.7 L / s and will have a storage volume of 600 m^3. A storm service connection will be made from Building 'D' to Existing Storm Network B. Preliminary sizing of the storm connections suggest that it should be 375 mm diameter. However, the final size will be confirmed at the detailed design stage.

Storm flows within Phase 4 that are tributary to the private road east of the headwall, are proposed to flow into Existing Storm Network B using the existing catch basins within the driveway. The intention with this strategy is to match the existing condition, and re-use as many of the existing catch basins and as possible. Quality control for this area will be provided by the existing OGS located at EX. STM MH 17.

Storm flows within the Phase 4 park will be captured and controlled by a superpipe fit with a flow control device that will release flows to a maximum allowable release rate of 22.6 L / s. Preliminary sizing suggests that this superpipe should be 600 mm in diameter. However, this will be confirmed at the detailed design stage. The park will then have a storm connection that also conveys flow directly to Existing Storm Network B.

For the section of Phase 4 private road that is located west of the headwall, the intention is to match the existing condition and have this area drain to the headwall via Existing Storm Network C.

An infiltration pit located within the Phase 4 Lands is proposed to maintain the pre-development water balance following Phase 4 construction. Preliminary sizing suggests that the pit should have a footprint of 484 m^2, and a stone depth of 0.44 m. However, the final sizing will be confirmed at the detailed design stage.

The Phase 4 design sheets and sewer analysis are included in **Appendix B**. Since the intention is to match the existing condition west of the headwall and preserve all of Existing Storm Network C, this segment of the network was excluded from the analysis.

4.3 MAJOR STORM DRAINAGE SYSTEM

The major storm system is a conveyance system for flows in excess of the minor system flows. Stormwater run-off from events up to and including the 100 - year storm event will be contained on - site and released at a controlled rate within the allowable post-development limits to the minor storm system. For major storm events exceeding the 100 - year storm, overland flow routes will be designed to direct excess flows to the existing culvert at the south end of the site via the on - site roadways.

For the development of the site, the grading design will be prepared such that the surface (i.e., roads, walkways and landscaped areas) grades will direct surface drainage away from the building to approved outlets. The proposed grading of the subject site will ensure that existing grade elevations at the time of construction will be met along the property limits. The plumbing system for each building will be coordinated with the mechanical consultant to ensure that they are designed to convey a 100-year run-off from the development. For major storm events exceeding the 100 - year storm and the capacity of the proposed storage tanks, an overflow will be designed to direct excess flows to grade

and ultimately to the existing box culvert at the south end of the site via the on - site roadways. Refer to **Appendix C** for the preliminary site grading plan.

KINGSTON ROAD

WALNUT LANE

PUBLIC ROAD

DIXIE ROAD

HIGHWAY 401

EX. 375ø STM
EX. 300ø STM
EX. 150ø STM
EX.STM MH 16
EX. 450ø STM
EX.STM MH 15
EX.STM MH 28
EX. 150ø STM
EX. 450ø STM
EX. 450ø STM
EX.STM MH 14
EX. 450ø STM
EX.STM MH 13
EX.STM MH 11
EX. 450ø STM
EX. STM TANK
EX. 450ø STM
EX.STM MH 29
EX.STM MH 31
EX. 450ø STM
EX. 300ø STM
EX. STM TANK
EX.STM MH 25
EX.STM MH 12
EX.STM MH 10
EX. 450ø STM
EX.STM MH 30
EX. 450ø STM
EX. 450ø STM
EX. 150ø ORIFICE
EX. 600ø STM
EX. 450ø STM
EX.STM MH 24
EX. 300ø STM (ASSUMED TO BE ABANDONED)
EX.STM MH 9
EX. 600ø STM
EX. 250ø STM
EX.STM MH 8
EX. 600ø STM
EX.STM MH 7
EX. 150ø STM
EX. 250ø STM
EX. 450ø STM
EX. 825ø STM
EX. STM TANK
EX. 600ø STM
EX. 600ø STM
EX. 250ø STM
EX. 300ø STM
EX. 825ø STM
EX.STM MH 22
EX. 600ø STM
EX.STM MH 6
EX. 250ø STM
EX.STM MH 1
EX.STM MH 2
EX.STM MH 4
EX. 675ø STM
EX. 250ø STM
EX. 250ø STM
EX. 250ø STM
EX. 525ø STM
EX. 200ø STM
EX. 450ø STM
EX. 400ø STM
EX. 200ø STM
EX. 525ø STM
EX. 900ø STM
EX.STM MH 18
EX.STM MH 19
EX.STM MH 20
EX. 300ø STM
EX. 900ø STM
EX.STM MH 3
EX. 525ø STM
EX. 525ø STM
EX. 525ø STM
EX. HEADWALL
EX.STM MH 17
EX. 525ø STM
EX.STM MH 21
EX.STM MH 23

TRCA FLOODLINE
10.0m OFFSET FROM TRCA FLOODLINE

LEGEND

- PROPERTY LINE
- EXISTING STORM SERVICE
- EXISTING STORM SEWER NETWORK A
- EXISTING STORM SEWER NETWORK B
- EXISTING STORM SEWER NETWORK C

CLIENT
TRIBUTE (BROOKDALE) LIMITED

TITLE
1101A, 1105, and 1163 KINGSTON ROAD
EXISTING STORM SEWERS

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Scale 1:1750	Figure No. 4A

KINGSTON ROAD

DIXIE ROAD

WALNUT LANE

PRIVATE DRIVEWAY

BLDG A1

BLDG A2

PARK

EXISTING BUILDING

EXISTING BUILDING

EX. 375Ø STM

PH1 INFILTRATION PIT

PH1 STM TANK

375Ø STM

450Ø SUPERPIPE W/ FLOW CONTROL DEVICE

450Ø STM

EX.STM MH 10

REPLACE EX. 150Ø ORIFICE WITH 600Ø SEWER

EX. 600Ø STM

EX. 300Ø STM (ASSUMED TO BE ABANDONED)

RELOCATE EX. 150Ø ORIFICE ON SOUTH SIDE OF MANHOLE TO EAST SIDE OF MANHOLE

EX.STM MH 9

EX. 600Ø STM

EX.STM MH 8

EX. 600Ø STM

EX.STM MH 7

EX. 600Ø STM

EX. 825Ø STM

EX. 825Ø STM

EX. 300Ø STM

EX. 200Ø STM

EX. 450Ø STM

EX. 400Ø STM

EX. 200Ø STM

EX.STM MH 1

EX.STM MH 2

EX. 525Ø STM

EX. 300Ø STM

EX.STM MH 3

EX. STM TANK

EX. 600Ø STM

EX.STM MH 22

EX. 600Ø STM

EX.STM MH 4

EX. 900Ø STM

EX. 900Ø STM

EX. HEADWALL

EX.STM MH 6

EX. 675Ø STM

EX.STM MH 18

EX. 250Ø STM

EX. 250Ø STM

EX. 250Ø STM

EX. 525Ø STM

EX.STM MH 17

EX. 525Ø STM

EX. STM TANK

EX.STM MH 31

EX. 450Ø STM

EX. 450Ø STM

EX. 300Ø STM

EX.STM MH 30

EX. 450Ø STM

EX.STM MH 24

EX. 450Ø STM

EX. 250Ø STM

EX. 250Ø STM

EX. 450Ø STM

EX. 300Ø STM

EX. 250Ø STM

EX. 525Ø STM

EX.STM MH 19

EX. 525Ø STM

EX.STM MH 20

EX.STM MH 23

EX.STM MH 25

EX. STM TANK

EX. 450Ø STM

EX. 150Ø STM

EX. 250Ø STM

EX.STM MH 21

FUT STM MH 5A

FUT 375Ø STM

FUT STM MH 5B

FUT 375Ø STM

FUTURE WALNUT LANE STORM NETWORK

FUT STM MH 7

FUT 375Ø STM

FUT STM MH 10

FUT 1200Ø STM

FUT STM MH 14

FUT 450Ø STM

FUT OGS

FUT STM MH 16

FUT 450Ø STM

FUT HEADWALL

TRCA FLOODLINE

10.0m OFFSET FROM TRCA FLOODLINE

10.0M

HIGHWAY 401

LEGEND

- PROPERTY LINE
- EXISTING STORM SERVICE
- EXISTING STORM SEWER NETWORK A
- EXISTING STORM SEWER NETWORK B
- EXISTING STORM SEWER NETWORK C
- PROPOSED STORM SERVICE
- PROPOSED STORM SERVICE INSTALLED IN PRIOR PHASE
- PHASE 1

CLIENT

TRIBUTE (BROOKDALE) LIMITED

TITLE

1101A, 1105, and 1163 KINGSTON ROAD

PHASE 1 - STORM SERVICING

wsp

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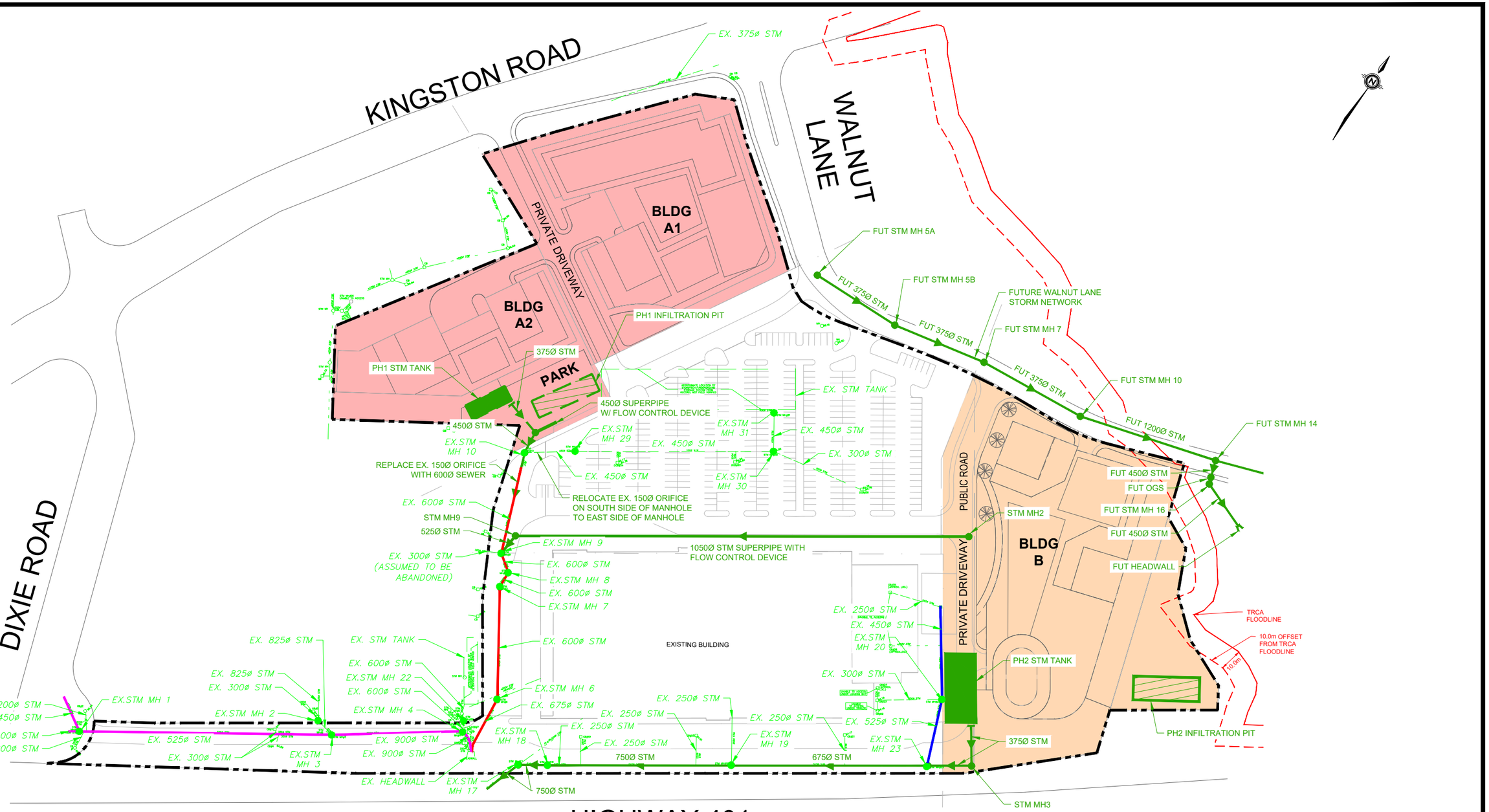
Date OCT 2023	Proj. No. 221-12931
Scale 1:1750	Figure No. 4B



LEGEND

- PROPERTY LINE
- EXISTING STORM SERVICE
- EXISTING STORM SEWER NETWORK A
- EXISTING STORM SEWER NETWORK B
- EXISTING STORM SEWER NETWORK C
- PROPOSED STORM SERVICE
- PROPOSED STORM SERVICE INSTALLED IN PRIOR PHASE
- PHASE 1
- PHASE 2

CLIENT
TRIBUTE (BROOKDALE) LIMITED

TITLE
1101A, 1105, and 1163 KINGSTON ROAD
PHASE 2 - STORM SERVICING

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Scale 1:1750	Figure No. 4C

KINGSTON ROAD

EX. 375Ø STM

WALNUT LANE

PRIVATE DRIVEWAY

BLDG A1

BLDG A2

PH1 INFILTRATION PIT

PH1 STM TANK

375Ø STM

PARK

450Ø SUPERPIPE W/ FLOW CONTROL DEVICE

450Ø STM

EX.STM MH 10

REPLACE EX. 150Ø ORIFICE WITH 600Ø SEWER

200Ø STM

EX. 600Ø STM

STM MH9

525Ø STM

EX.STM MH 9

EX. 300Ø STM (ASSUMED TO BE ABANDONED)

BLDG C2

STM MH7

PH3 STM TANK

PH3 INFILTRATION PIT

BLDG C1

PUBLIC ROAD

STM MH5

375Ø STM

STM MH6

1050Ø STM SUPERPIPE WITH FLOW CONTROL DEVICE

STM MH8

EX. 600Ø STM

EX.STM MH 8

EX. 600Ø STM

EX.STM MH 7

EX. 600Ø STM

EXISTING BUILDING

EX. 825Ø STM

EX. STM TANK

EX. 600Ø STM

EX. 825Ø STM

EX. 300Ø STM

EX.STM MH 22

EX. 600Ø STM

EX.STM MH 4

EX.STM MH 6

EX. 675Ø STM

EX. 250Ø STM

EX. 250Ø STM

EX. 250Ø STM

EX. 250Ø STM

EX. 250Ø STM

EX. 250Ø STM

EX. 525Ø STM

EX. 200Ø STM

EX. 450Ø STM

EX. 400Ø STM

EX. 200Ø STM

EX.STM MH 1

EX.STM MH 2

EX. 525Ø STM

EX. 300Ø STM

EX.STM MH 3

EX. 900Ø STM

EX. 900Ø STM

EX.STM MH 18

EX.STM MH 19

EX.STM MH 23

750Ø STM

675Ø STM

EX. HEADWALL

EX.STM MH 17

750Ø STM

STM MH3

PUBLIC ROAD

PRIVATE DRIVEWAY

STM MH2

BLDG B

FUT STM MH 5A

FUT 375Ø STM

FUT STM MH 5B

FUTURE WALNUT LANE STORM NETWORK

FUT 375Ø STM

FUT STM MH 7

FUT 375Ø STM

FUT STM MH 10

FUT 1200Ø STM

FUT STM MH 14

FUT 450Ø STM

FUT OGS

FUT STM MH 16

FUT 450Ø STM

FUT HEADWALL

EX. 250Ø STM

EX. 450Ø STM

EX.STM MH 20

EX. 300Ø STM

PH2 STM TANK

375Ø STM

TRCA FLOODLINE

10.0m OFFSET FROM TRCA FLOODLINE

10.0m

PH2 INFILTRATION PIT

DIXIE ROAD

HIGHWAY 401

LEGEND

- PROPERTY LINE
- EXISTING STORM SERVICE
- EXISTING STORM SEWER NETWORK A
- EXISTING STORM SEWER NETWORK B
- EXISTING STORM SEWER NETWORK C
- PROPOSED STORM SERVICE
- PROPOSED STORM SERVICE INSTALLED IN PRIOR PHASE
- PHASE 1
- PHASE 2
- PHASE 3

CLIENT

TRIBUTE (BROOKDALE) LIMITED

TITLE

1101A, 1105, and 1163 KINGSTON ROAD

PHASE 3 - STORM SERVICING

wsp

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Scale 1:1750	Figure No. 4D

KINGSTON ROAD

EX. 375Ø STM

WALNUT LANE

PRIVATE DRIVEWAY

BLDG A1

BLDG A2

PH1 INFILTRATION PIT

PH1 STM TANK

375Ø STM

PARK

450Ø SUPERPIPE W/ FLOW CONTROL DEVICE

450Ø STM

EX.STM MH 10

REPLACE EX. 150Ø ORIFICE WITH 600Ø SEWER

200Ø STM

EX. 600Ø STM

STM MH9

525Ø STM

EX.STM MH 9

EX. 300Ø STM (ASSUMED TO BE ABANDONED)

DIXIE ROAD

BLDG C2

PARK

STM MH7

PH3 STM TANK

PH3 INFILTRATION PIT

STM MH5

375Ø STM

PUBLIC ROAD

STM MH6

1050Ø STM SUPERPIPE WITH FLOW CONTROL DEVICE

STM MH8

EX. 600Ø STM

EX.STM MH 8

EX. 600Ø STM

EX.STM MH 7

PH4 INFILTRATION PIT

BLDG C1

BLDG D

PUBLIC ROAD

PRIVATE DRIVEWAY

STM MH2

BLDG B

PH2 STM TANK

375Ø STM

PH2 INFILTRATION PIT

FUT STM MH 5A

FUT 375Ø STM

FUT STM MH 5B

FUTURE WALNUT LANE STORM NETWORK

FUT STM MH 7

FUT 375Ø STM

FUT STM MH 10

FUT 1200Ø STM

FUT STM MH 14

FUT 450Ø STM

FUT OGS

FUT STM MH 16

FUT 450Ø STM

FUT HEADWALL

TRCA FLOODLINE

10.0m OFFSET FROM TRCA FLOODLINE

10.0m

EX. 825Ø STM

EX. STM TANK

EX.STM MH 6

EX. 600Ø STM

EX. 825Ø STM

EX. 300Ø STM

EX.STM MH 22

EX. 600Ø STM

EX.STM MH 4

600Ø SUPERPIPE W/ FLOW CONTROL DEVICE

PARK

EX. 200Ø STM

EX. 450Ø STM

EX.STM MH 1

EX. 400Ø STM

EX. 200Ø STM

EX.STM MH 2

EX. 525Ø STM

EX. 300Ø STM

EX.STM MH 3

EX. 900Ø STM

EX. 900Ø STM

EX. HEADWALL

EX. 675Ø STM

750Ø STM

STM MH10

200Ø STM

EX. 250Ø STM

EX. 250Ø STM

750Ø STM

EX.STM MH 18

750Ø STM

EX.STM MH 17

EX. 250Ø STM

375Ø STM

675Ø STM

EX.STM MH 19

EX.STM MH 23

STM MH3

HIGHWAY 401

LEGEND

- PROPERTY LINE
- EXISTING STORM SERVICE
- EXISTING STORM SEWER NETWORK A
- EXISTING STORM SEWER NETWORK B
- EXISTING STORM SEWER NETWORK C
- PROPOSED STORM SERVICE
- PROPOSED STORM SERVICE INSTALLED IN PRIOR PHASE
- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4

CLIENT: TRIBUTE (BROOKDALE) LIMITED

TITLE:

1101A, 1105, and 1163 KINGSTON ROAD

PHASE 4 - STORM SERVICING

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Date: OCT 2023	Proj. No.: 221-12931
Scale: 1:1750	Figure No.: 4E

Figure 4-A – Existing Storm Sewers

5 SITE GRADING

5.1 EXISTING CONDITIONS

In the existing condition the site falls from north to south. Runoff is conveyed away from the existing buildings to a series of on – site drains. In the emergency situation where runoff cannot be captured, it is conveyed to the existing box culvert located at the south end of the site via the on - site driveways.

5.2 PROPOSED CONDITIONS

The proposed grading design for the new development will direct storm drainage to the on - site collection points. Since the site grading will be phased, the objective is to capture as much runoff within each phase as possible and prevent overland flow to the existing property. However, since the existing site falls from north to south, the emergency overland flow route for the major storm events must go through the existing site towards the box culvert located at the south end of the site. This flow will be via the on - site driveways and R.O.W's and it will ensure that drainage is diverted away from all of the buildings.

The proposed grading plans for each phase are included in **Appendix C**. In summary the plans consider the following:

- Proposed grades along all boundaries (phase and site) are to match to existing so that there is no impact to the adjacent properties;
- Minimize disruption to all existing municipal rights-of-way containing existing utilities and services;
- Promote drainage into the minor sewer systems;
- Grade the lands to direct overland flow away from the proposed structures;
- Create high points within the development area to direct flows towards drainage inlets with a maximum proposed ponding depth of 0.30 m; and
- Ensure that minimum and maximum grades conform to AODA and City of Pickering standards.

6 EROSION AND SEDIMENT CONTROL

Temporary Erosion and Sediment Control must be provided onsite during construction to prevent sediment runoff to the neighbouring developments and municipal roads. Fencing and hoarding will be erected surrounding the perimeter of each phase, and mud mats will be required at site access points. In addition, catchbasins that are to remain in close proximity to the construction zones will be protected with geotextile fabric. All Erosion and Sediment Control Best Management Practices shall be designed, constructed and maintained for the duration of construction. The proposed Erosion and Sediment Control Plans for each phase are outlined in **Appendix D**.

7 CONCLUSIONS

7.1 WATER

The proposed development will rely on the future 300mm diameter watermain in Walnut Lane for water servicing. At this time. it is WSP's understanding that this watermain will have the capacity to service the proposed development. Buildings within the proposed development will either have service connections directly to the watermain in Walnut Lane, or to the proposed extension of the watermain along the future 20.0m R.O.W that is proposed within the site. Each building's water service connection will at minimum consist of one domestic connection and one fire connection. If the height of any building exceeds 84 m, a secondary fire connection will be provided as per Ontario's building code requirements. The service connection sizing will be coordinated with the Region of Durham and the mechanical engineering consultant at the detailed design stage. The connections will be made in accordance with Region of Durham standards.

7.2 SANITARY

Sanitary flows from the proposed development will be conveyed to the future sanitary sewer that will be installed in Walnut Lane. The Walnut Lane sanitary sewer has been sized to convey flows from the proposed development to the existing 1050 mm diameter trunk sanitary sewer that runs along the south side of the site. For a nearby development, WSP was informed by the Region of Durham that the capacity for the trunk sewer was to be allocated on a first come first serve basis at the time of signing a development agreement. It is WSP's understanding that there are currently other ongoing developments within the service area and as such the Region of Durham is in the process of confirming capacity limitations through use of ongoing flow monitoring. This will form the basis of determining any potential upgrades that will be required as development continues to proceed within the existing sanitary drainage boundary of Pickering City Centre area and beyond. Thus, it is assumed that at the time of the proposed redevelopment of the subject lands, there will be capacity in the trunk sewer to accept the proposed sanitary flows.

7.3 STORM

All storm flows from the site up to the 100-year event will ultimately be released at the allowable release rate to the 1.83 m x 1.83 m box culvert located at the south end of the site. On site quantity control chambers and superpipes will be used to provide the necessary quantity controls throughout the site.

Storm flows from Phases 1 and 3, and the proposed 20.0m R.O.W will be conveyed into Existing Storm Network A on the west side of the site. Preliminary sizing suggests that Existing Storm Network A has enough capacity to convey the flows to the box culvert in each of the proposed conditions.

Storm flows from Phase 2 (excluding the R.O.W) and flows within Phase 4 that are east of the headwall will be conveyed into Existing Storm Network B that runs along the south side of the site. Preliminary sizing suggests that minor pipe upgrades to Existing Storm Network B will be required to accommodate the proposed flows.

Storm flows within Phase 4 that are tributary to west of the headwall will flow to the box culvert via Existing Storm Network C (southwest side of the site) matching the existing condition.

Water balance will be addressed on a phase-by-phase basis using infiltration pits that will be installed within the limits of each phase.

APPENDIX

A SANITARY FLOW CALCULATIONS AND DESIGN SHEETS

SANITARY FLOW GENERATION

PHASE 1

Project: **1101A, 1105, and 1163 KINGSTON ROAD**
Job No.: **221-12931**

Building	Unit Count/ GFA (ha)	Site Area (ha)	Occupancy Rate	Equivalent Population	Per Capita Flow	Average Daily Flow (L/s)	Peaking Factor	Peak Flow (L/s)
Building A1								
Residential	609			1214	364 L/cap/day	5.11	3.74	19.15
1B	*359*		*1.5 ppu*	*539*				
2B	*201*		*2.5 ppu*	*503*				
3B	*49*		*3.5 ppu*	*172*				
Retail	0.49				180000 L/ha/day	1.03	1.00	1.03
Infiltration		1.02				0.27		0.27
Subtotal				1214		6.41		20.45
Building A2								
Residential	602			1199	364 L/cap/day	5.05	3.75	18.93
1B	*355*		*1.5 ppu*	*533*				
2B	*199*		*2.5 ppu*	*498*				
3B	*48*		*3.5 ppu*	*168*				
Daycare	0.07				180000 L/ha/day	0.15	1.00	0.15
Infiltration		0.74				0.19		0.19
Subtotal				1199		5.39		19.27
Phase 1 Residential Subtotal				**2413**	**364 L/cap/day**	**10.17**	**3.52**	**35.79**
Phase 1 Retail/Daycare Subtotal	**0.57**				**180000 L/ha/day**	**1.18**	**1.00**	**1.18**
Phase 1 Infiltration		**1.76**				**0.46**		**0.46**
PHASE 1 TOTAL						**11.80**		**37.43**

Notes:
1. Occupancy rates, per capita flows and peaking factor are as per the Region of Durham Design Specifications For Sanitary Sewers
2. Unit Counts and Floor Areas from drawings prepared by Turner Fleisher, dated October 23, 2023
3. Infiltration considered for entire Phase area to account for any future changes in plan

SANITARY FLOW GENERATION

PHASE 2

Project: **1101A, 1105, and 1163 KINGSTON ROAD**
Job No.: **221-12931**

Building	Unit Count/ GFA (ha)	Site Area (ha)	Occupancy Rate	Equivalent Population	Per Capita Flow	Average Daily Flow (L/s)	Peaking Factor	Peak Flow (L/s)
Building B								
Residential	1303			2593	364 L/cap/day	10.92	3.50	38.18
1B	*769*		*1.5 ppu*	*1154*				
2B	*430*		*2.5 ppu*	*1075*				
3B	*104*		*3.5 ppu*	*364*				
Retail	0.00				180000 L/ha/day	0.00	1.00	0.00
Infiltration		1.61				0.42		0.42
Subtotal				2593		11.34		38.60
Phase 2 Residential Subtotal				**2593**	**364 L/cap/day**	**10.92**	**3.50**	**38.18**
Phase 2 Retail Subtotal	**0.00**				**180000 L/ha/day**	**0.00**	**1.00**	**0.00**
Phase 2 Infiltration		**1.61**				**0.42**		**0.42**
PHASE 2 TOTAL						**11.34**		**38.60**

Notes:
1. Occupancy rates, per capita flows and peaking factor are as per the Region of Durham Design Specifications For Sanitary Sewers
2. Unit Counts and Floor Areas from drawings prepared by Turner Fleisher, dated October 23, 2023
3. Infiltration considered for entire Phase area to account for any future changes in plan

SANITARY FLOW GENERATION

PHASE 3

Project: **1101A, 1105, and 1163 KINGSTON ROAD**
Job No.: **221-12931**

Building	Unit Count/ GFA (ha)	Site Area (ha)	Occupancy Rate	Equivalent Population	Per Capita Flow	Average Daily Flow (L/s)	Peaking Factor	Peak Flow (L/s)
Building C1 & C2								
Residential	1103			2195	364 L/cap/day	9.25	3.55	32.87
1B	*651*		*1.5 ppu*	*977*				
2B	*364*		*2.5 ppu*	*910*				
3B	*88*		*3.5 ppu*	*308*				
Retail	0.22				180000 L/ha/day	0.46	1.00	0.46
Infiltration		1.91				0.50		0.50
Subtotal				2195		10.20		33.82
Phase 3 Residential Subtotal				**2195**	**364 L/cap/day**	**9.25**	**3.55**	**32.87**
Phase 3 Retail Subtotal	**0.22**				**180000 L/ha/day**	**0.46**	**1.00**	**0.46**
Phase 3 Infiltration		**1.91**				**0.50**		**0.50**
PHASE 3 TOTAL						**10.20**		**33.82**

Notes:
1. Occupancy rates, per capita flows and peaking factor are as per the Region of Durham Design Specifications For Sanitary Sewers
2. Unit Counts and Floor Areas from drawings prepared by Turner Fleisher, dated October 23, 2023
3. Infiltration considered for entire Phase area to account for any future changes in plan
4. Individual unit breakdowns for Buildings C1 and C2 were not available at the time of writing this report

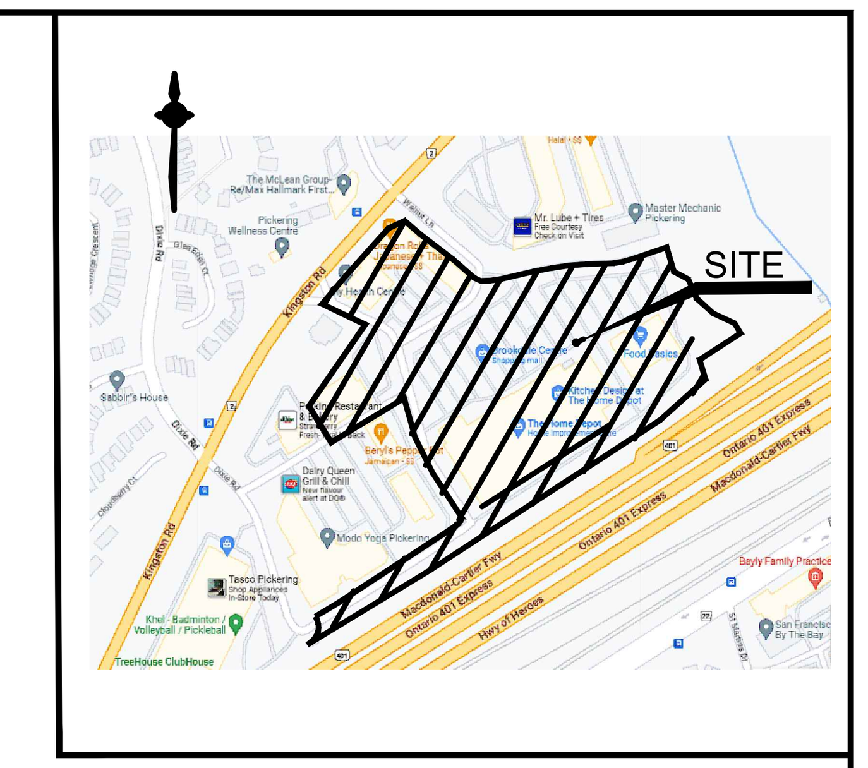
SANITARY FLOW GENERATION

PHASE 4

Project: **1101A, 1105, and 1163 KINGSTON ROAD**
Job No.: **221-12931**

Building	Unit Count/ GFA (ha)	Site Area (ha)	Occupancy Rate	Equivalent Population	Per Capita Flow	Average Daily Flow (L/s)	Peaking Factor	Peak Flow (L/s)
Building D								
Residential	1621			3226	364 L/cap/day	13.59	3.42	46.42
1B	*957*		*1.5 ppu*	*1436*				
2B	*535*		*2.5 ppu*	*1338*				
3B	*129*		*3.5 ppu*	*452*				
Retail	0.00				180000 L/ha/day	0.00	1.00	0.00
Infiltration		2.47				0.64		0.64
Subtotal				3226		14.23		47.06
Phase 4 Residential Subtotal				**3226**	**364 L/cap/day**	**13.59**	**3.42**	**46.42**
Phase 4 Retail Subtotal	**0.00**				**180000 L/ha/day**	**0.00**	**1.00**	**0.00**
Phase 4 Infiltration		**2.47**				**0.64**		**0.64**
PHASE 4 TOTAL						**14.23**		**47.06**

Notes:
1. Occupancy rates, per capita flows and peaking factor are as per the Region of Durham Design Specifications For Sanitary Sewers
2. Unit Counts and Floor Areas from drawings prepared by Turner Fleisher, dated October 23, 2023
3. Infiltration considered for entire Phase area to account for any future changes in plan



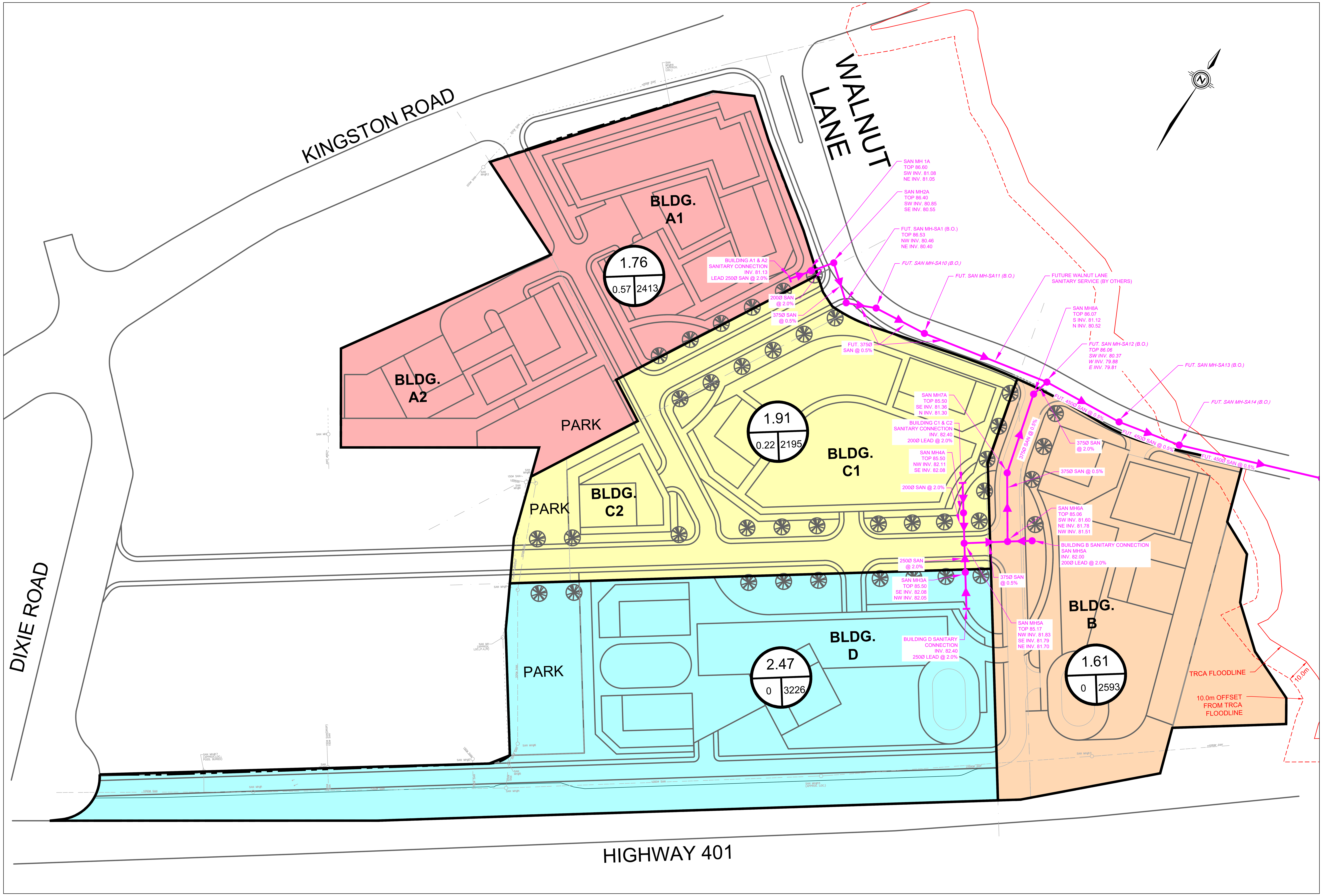
KEY PLAN N.T.S.

LEGEND

- PROPERTY LINE
- PROPOSED SANITARY
- EX. SANITARY TO REMAIN
- SANITARY DRAINAGE BOUNDARY

0.45 / 6 / 416 — AREA (ha); RESIDENTIAL POPULATION (ppl); COMMERCIAL FLOOR AREA (ha)

- PHASE1
- PHASE 2
- PHASE 3
- PHASE 4



KINGSTON ROAD
WALNUT LANE
DIXIE ROAD
HIGHWAY 401
BLDG. A1
BLDG. A2
BLDG. C1
BLDG. C2
BLDG. D
BLDG. B
PARK
PARK
PARK
1.76
0.57
2413
1.91
0.22
2195
2.47
0
3226
1.61
0
2593
SAN MH 1A TOP 86.60 SW INV. 81.08 NE INV. 81.05
SAN MH2A TOP 86.40 SW INV. 80.85 NE INV. 80.55
FUT. SAN MH-SA1 (B.O.) TOP 86.53 NW INV. 80.46 NE INV. 80.40
FUT. SAN MH-SA10 (B.O.)
FUT. SAN MH-SA11 (B.O.)
FUTURE WALNUT LANE SANITARY SERVICE (BY OTHERS)
SAN MH8A TOP 86.07 S INV. 81.12 N INV. 80.52
FUT. SAN MH-SA12 (B.O.) TOP 86.06 SW INV. 80.37 W INV. 79.88 E INV. 79.81
FUT. SAN MH-SA13 (B.O.)
FUT. SAN MH-SA14 (B.O.)
BUILDING A1 & A2 SANITARY CONNECTION INV. 81.13 LEAD 250Ø SAN @ 2.0%
200Ø SAN @ 2.0%
375Ø SAN @ 0.5%
FUT. 375Ø SAN @ 0.5%
SAN MH7A TOP 85.50 SE INV. 81.36 N INV. 81.30
BUILDING C1 & C2 SANITARY CONNECTION INV. 82.40 200Ø LEAD @ 2.0%
SAN MH4A TOP 85.50 NW INV. 82.11 SE INV. 82.08
200Ø SAN @ 2.0%
375Ø SAN @ 2.0%
375Ø SAN @ 0.5%
FUT. 450Ø SAN @ 0.5%
SAN MH6A TOP 85.06 SW INV. 81.60 NE INV. 81.78 NW INV. 81.51
BUILDING B SANITARY CONNECTION SAN MH5A INV. 82.00 200Ø LEAD @ 2.0%
250Ø SAN @ 2.0%
SAN MH3A TOP 85.50 SE INV. 82.08 NW INV. 82.05
375Ø SAN @ 0.5%
SAN MH5A TOP 85.17 NW INV. 81.83 SE INV. 81.79 NE INV. 81.70
BUILDING D SANITARY CONNECTION INV. 82.40 250Ø LEAD @ 2.0%
TRCA FLOODLINE
10.0m OFFSET FROM TRCA FLOODLINE
10.0m

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	ISSUED FOR ZBA & OPA	KK	23-10-27	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT: TRIBUTE (BROOKDALE) LIMITED

MUNICIPALITY: CITY OF PICKERING

PROJECT TITLE: 1101A, 1105, and 1163 KINGSTON ROAD

SHEET TITLE: SANITARY DRAINAGE PLAN

CONSULTANT: wsp

STAMP

APPROVAL

DESIGNED	DRAWN	CHECKED
Z.B.	CAD 20	K.K.

SCALE: 1:750

DATE: OCTOBER 2023

JOB NUMBER: 221-12931

SHEET NUMBER: SAN-1

WSP CANADA INC.

THE REGIONAL MUNICIPALITY OF DURHAM

SANITARY SEWER DESIGN SHEET

PROJECT : 1101A, 1105, and 1163 KINGSTON ROAD **Phase 1**
JOB No. : 221-12931-00
FROM :

DESIGNED BY: ZB
CHECKED BY : KK
DATE : 2023-10-25

MH. No.	Residential				Commercial			Industrial	Institutional	Flow in L/s						Proposed Sewer				
	Gross area (ha)	Population density	Population	Peak flow factor	Lot area (ha)	Floor space Index	Floor area (ha)	Lot area	Lot (ha)	Res. flow Infil* L/S 0.26	Res. flow Sewage L/S 0.0042	Comm. L/S 2.08	Indus. L/S 1.04	Inst. L/S 1.30	Total flow L/s	Actual Pipe size mm	Slope %	Capacity in L/s	Velocity in m/s	Load %
BLDG A1 & A2	1.76		2413				0.57													
SAN MH1A	1.76		2413	3.52			0.57			0.46	35.79	1.18	0.00	0.00	37.43	250	*2.00*	84.10	1.71	45%
SAN MH1A	0.00		0				0.00													
SAN MH2A	1.76		2413	3.52			0.57			0.46	35.79	1.18	0.00	0.00	37.43	200	*2.00*	46.38	1.48	81%
SAN MH2A	0.00		0				0.00													
FUT. SAN MH-SA1	1.76		2413	3.52			0.57			0.46	35.79	1.18	0.00	0.00	37.43	375	*0.50*	123.98	1.12	30%

Notes:

1. Occupancy rates, per capita flows and peaking factor are as per the Region of Durham Design Specifications For Sanitary Sewers
2. Unit Counts and Floor Areas from drawings prepared by Turner Fleisher, dated October 23, 2023
3. Infiltration considered for entire Site Area to account for any future changes in plan

WSP CANADA INC.

THE REGIONAL MUNICIPALITY OF DURHAM

SANITARY SEWER DESIGN SHEET

PROJECT : 1101A, 1105, and 1163 KINGSTON ROAD **Phase 2-4**
JOB No. : 221-12931-00
FROM :

DESIGNED BY: ZB
CHECKED BY : KK
DATE : 2023-10-25

MH. No.	Residential				Commercial			Industrial	Institutional	Flow in L/s						Proposed Sewer				
	Gross area (ha)	Population density	Population	Peak flow factor	Lot area (ha)	Floor space Index	Floor area (ha)	Lot area	Lot (ha)	Res. flow Infil* L/S 0.26	Res. flow Sewage L/S 0.0042	Comm. L/S 2.08	Indus. L/S 1.04	Inst. L/S 1.30	Total flow L/s	Actual Pipe size mm	Slope %	Capacity in L/s	Velocity in m/s	Load %
BLDG D	2.47		3226				0.00													
SAN MH 3A	2.47		3226	3.42			0.00			0.64	46.42	0.00	0.00	0.00	47.06	250	*2.00*	84.10	1.71	56%
SAN MH 3A	0.00		0				0.00													
SAN MH 5A	2.47		3226	3.42			0.00			0.64	46.42	0.00	0.00	0.00	47.06	250	*2.00*	84.10	1.71	56%
BLDG C1 & C2	1.91		2195				0.22													
SAN MH 4A	1.91		2195	3.55			0.22			0.50	32.87	0.46	0.00	0.00	33.82	200	*2.00*	46.38	1.48	73%
SAN MH 4A	0.00		0				0.00													
SAN MH 5A	1.91		2195	3.55			0.22			0.50	32.87	0.46	0.00	0.00	33.82	200	*2.00*	46.38	1.48	73%
SAN MH 5A	0.00		0				0.00													
SAN MH 6A	4.38		5421	3.21			0.22			1.14	73.36	0.46	0.00	0.00	74.96	375	*0.50*	123.98	1.12	60%
BLDG B	1.61		2593				0.00													
SAN MH 6A	1.61		2593	3.50			0.00			0.42	38.18	0.00	0.00	0.00	38.60	200	*2.00*	46.38	1.48	83%
SAN MH 6A	0.00		0				0.00													
SAN MH 7A	5.99		8014	3.05			0.22			1.56	102.96	0.46	0.00	0.00	104.97	375	*0.50*	123.98	1.12	85%
SAN MH 7A	0.00		0				0.00													
SAN MH 8A	5.99		8014.00	3.05			0.22			1.56	102.96	0.46	0.00	0.00	104.97	375	*0.50*	123.98	1.12	85%
SAN MH 8A	0.00		0				0.00													
FUT. SAN MH-SA12	5.99		8014.00	3.05			0.22			1.56	102.96	0.46	0.00	0.00	104.97	375	*0.50*	123.98	1.12	85%

Notes:

1. Occupancy rates, per capita flows and peaking factor are as per the Region of Durham Design Specifications For Sanitary Sewers
2. Unit Counts and Floor Areas from drawings prepared by Turner Fleisher, dated October 23, 2023
3. Infiltration considered for entire Site Area to account for any future changes in plan

APPENDIX

B STORM FLOW CALCULATIONS AND DESIGN SHEETS

EXISTING CATCHMENTS DELINEATED USING TOPO BY J.D BARNES LIMITED DATED FEBRUARY 2, 2023 AND STORMWATER MANAGEMENT REPORT BY a.m candaras associates inc. DATED JANUARY 2015
KINGSTON ROAD
WALNUT LANE
DIXIE ROAD
HIGHWAY 401
BLDG. A1
BLDG. A2
PH 1
161.0
PARK 1
10.3
PARK
EX. 1
88.25
PHASE 1 INFILTRATION PIT REQUIRED FOOTPRINT = 250 m² DEPTH OF STONE = 0.85 m
STM MH 1 TOP 85.30 NW INV. 83.14 NE INV. 83.14 S INV. 83.05
PHASE 1 STM TANK PROVIDED VOLUME = 600.0 m³ MAX ALLOWABLE RELEASE RATE = 161.0 L/s OUTLET INV. 83.44 LEAD 375Ø STM @ 2.0%
PHASE 1 PARK SUPERPIPE RECOMMENDED 450Ø TO BE FIT WITH FLOW CONTROL DEVICE MAX ALLOWABLE RELEASE RATE = 10.3 L/s
450Ø STM @ 0.50%
EX. STM MH 10 TOP 85.06 N INV. 82.73 EX. NE INV. 83.12 EX. S INV. 83.00
RELOCATE EXISTING 10m-150Ø ORIFICE ON SOUTH SIDE OF MANHOLE TO NE SIDE OF MANHOLE. CONTROLLED RELEASE RATE = 14.22 L/s
REPLACE 150Ø ORIFICE WITH 600Ø PIPE
*RELEASE RATE CALCULATED USING MAXIMUM CAPACITY OF 10m-150Ø ORIFICE. REFER TO COMMENTS IN PHASE 1 STORM SEWER DESIGN SHEET FOR DETAILS.
*APPROXIMATE EXISTING CONTROLLED CATCHMENT AREA FOLLOWING PHASE 1 & WALNUT LANE CONSTRUCTION. CATCHMENT DELINEATED AS PER TOPO AND STORMWATER MANAGEMENT REPORT FOR EXISTING DEVELOPMENT BY a.m candaras associates inc. DATED JANUARY 2015
EX. 600Ø STM @ 0.60% (PIPE SLOPE AS PER am. candaras associates inc. "Site Servicing & Storm Water Management Plan" dated May 21, 2010
EX. 300Ø STM (ASSUMED TO BE ABANDONED)
EX. STM MH 8 OGS STC 6000
EX. 600Ø STM @ 0.60% (PIPE SLOPE AS PER am. candaras associates inc. "Site Servicing & Storm Water Management Plan" dated May 21, 2010
EX. STM MH 7
EX. 600Ø STM @ 0.39%
EX. STM MH 6
EX. 675Ø STM @ 0.39% (SLOPE ASSUMED)
EXISTING BUILDING
EXISTING BUILDING
TRCA FLOODLINE
10.0m
10.0m OFFSET FROM TRCA FLOODLINE
SITE
KEY PLAN
N.T.S.
LEGEND
PROPERTY LINE
PROPOSED STORM
EXISTING STORM SEWER TO REMAIN
STORM DRAINAGE BOUNDARY
EXISTING STORM DRAINAGE BOUNDARY
ROW 1
0.16
0.90
PROPOSED CATCHMENT ID
RUNOFF COEFFICIENT
DRAINAGE AREA (ha)
1.69
0.084
PROPOSED CATCHMENT ID
CONTROLLED RELEASE RATE (L/s)
EX. 2
0.28
0.95
EXISTING CATCHMENT ID
RUNOFF COEFFICIENT
DRAINAGE AREA (ha)
EX. 1
0.014
EXISTING CATCHMENT ID
CONTROLLED RELEASE RATE (L/s)
PHASE1
PHASE 2
PHASE 3
PHASE 4

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	ISSUED FOR ZBA & OPA	KK	23-10-27	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
TRIBUTE (BROOKDALE) LIMITED

MUNICIPALITY
CITY OF PICKERING

PROJECT TITLE
1101A, 1105, and 1163 KINGSTON ROAD

SHEET TITLE
STORM DRAINAGE PLAN PHASE 1

CONSULTANT
wsp

STAMP

APPROVAL

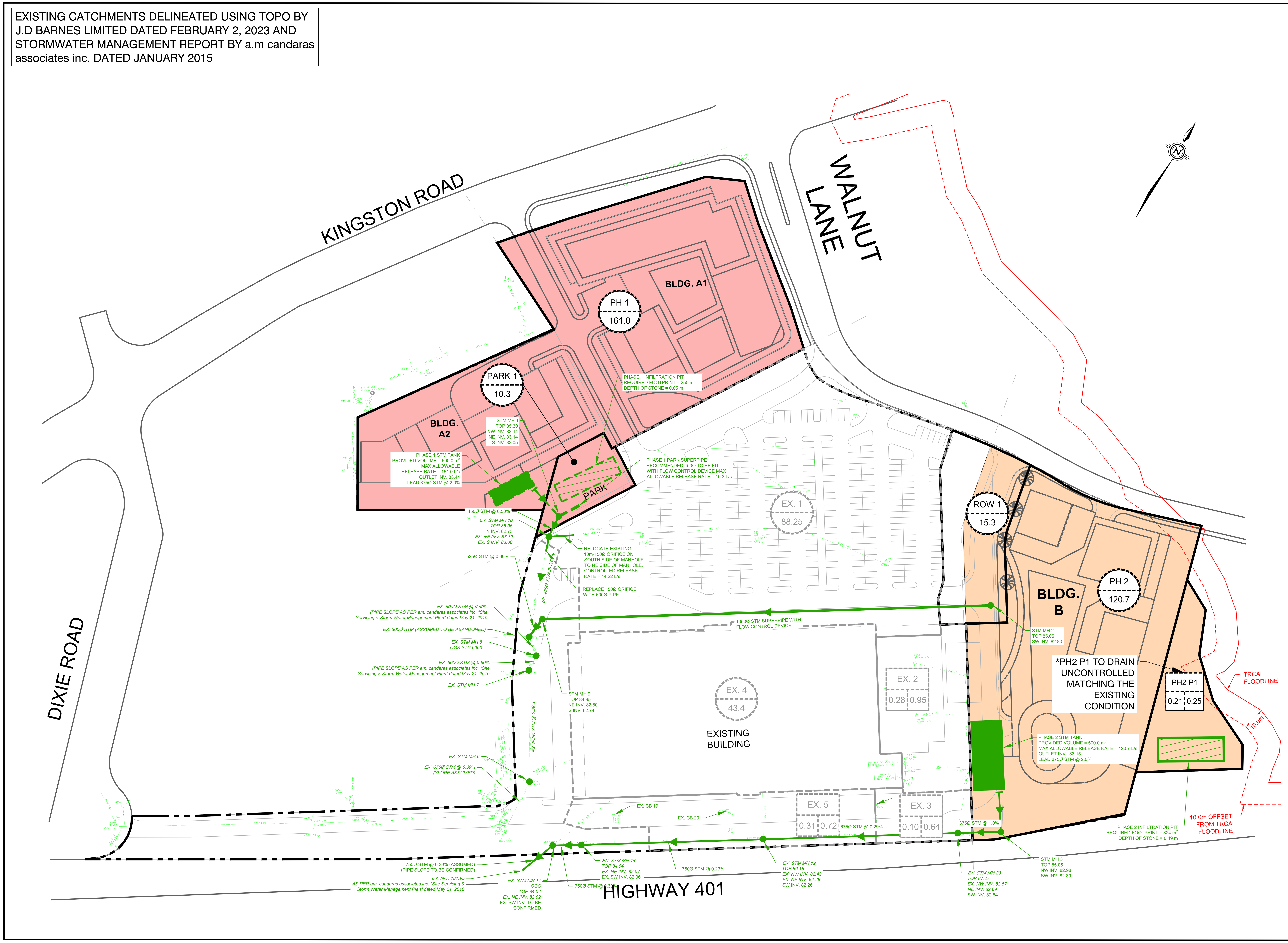
DESIGNED	DRAWN	CHECKED
Z.B.	CAD 20	K.K.

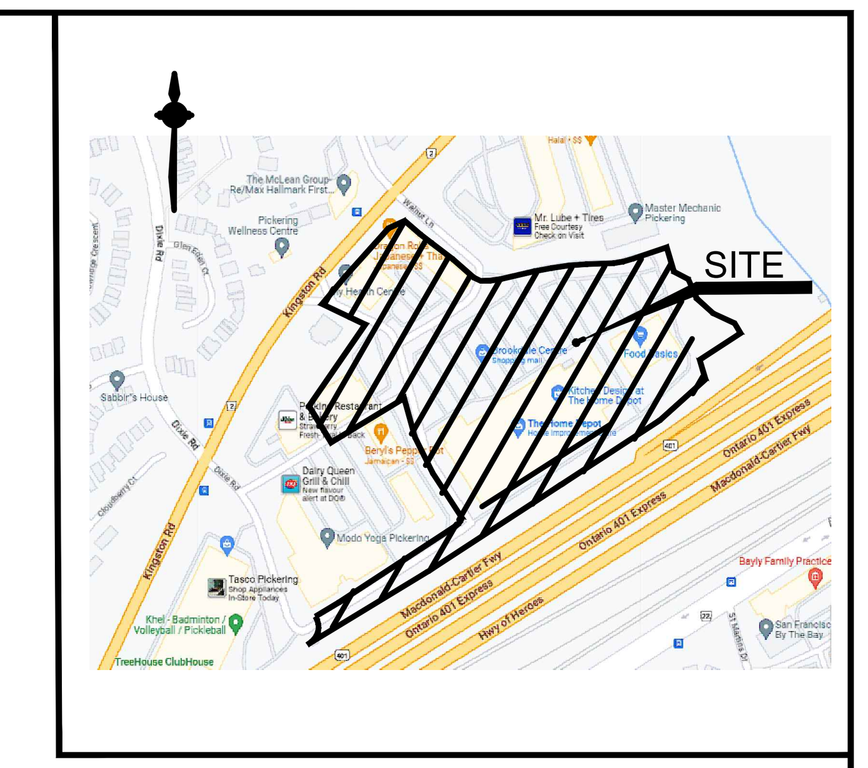
SCALE 1:750

DATE OCTOBER 2023

JOB NUMBER 221-12931

SHEET NUMBER STM-1


EXISTING CATCHMENTS DELINEATED USING TOPO BY J.D BARNES LIMITED DATED FEBRUARY 2, 2023 AND STORMWATER MANAGEMENT REPORT BY a.m candaras associates inc. DATED JANUARY 2015
KINGSTON ROAD
WALNUT LANE
DIXIE ROAD
HIGHWAY 401
BLDG. A1
BLDG. A2
BLDG. B
PH 1
161.0
PARK 1
10.3
PARK
PH 2
120.7
ROW 1
15.3
PH2 P1
0.21 0.25
EX. 1
88.25
EX. 2
0.28 0.95
EX. 3
0.10 0.64
EX. 4
43.4
EX. 5
0.31 0.72
EXISTING BUILDING
*PH2 P1 TO DRAIN UNCONTROLLED MATCHING THE EXISTING CONDITION
PHASE 1 STM TANK PROVIDED VOLUME = 600.0 m³ MAX ALLOWABLE RELEASE RATE = 161.0 L/s OUTLET INV. 83.44 LEAD 375Ø STM @ 2.0%
PHASE 1 INFILTRATION PIT REQUIRED FOOTPRINT = 250 m² DEPTH OF STONE = 0.85 m
PHASE 1 PARK SUPERPIPE RECOMMENDED 450Ø TO BE FIT WITH FLOW CONTROL DEVICE MAX ALLOWABLE RELEASE RATE = 10.3 L/s
STM MH 1 TOP 85.30 NW INV. 83.14 NE INV. 83.14 S INV. 83.05
450Ø STM @ 0.50%
EX. STM MH 10 TOP 85.06 N INV. 82.73 EX. NE INV. 83.12 EX. S INV. 83.00
525Ø STM @ 0.30%
RELOCATE EXISTING 10m-150Ø ORIFICE ON SOUTH SIDE OF MANHOLE TO NE SIDE OF MANHOLE. CONTROLLED RELEASE RATE = 14.22 L/s
REPLACE 150Ø ORIFICE WITH 600Ø PIPE
EX. 600Ø STM @ 0.60% (PIPE SLOPE AS PER am. candaras associates inc. "Site Servicing & Storm Water Management Plan" dated May 21, 2010
EX. 300Ø STM (ASSUMED TO BE ABANDONED)
EX. STM MH 8 OGS STC 6000
EX. 600Ø STM @ 0.60% (PIPE SLOPE AS PER am. candaras associates inc. "Site Servicing & Storm Water Management Plan" dated May 21, 2010
EX. STM MH 7
STM MH 9 TOP 84.95 NE INV. 82.80 S INV. 82.74
EX. 450Ø STM @ 0.50%
EX. 600Ø STM @ 0.39%
1050Ø STM SUPERPIPE WITH FLOW CONTROL DEVICE
STM MH 2 TOP 85.05 SW INV. 82.80
EX. STM MH 6
EX. 675Ø STM @ 0.39% (SLOPE ASSUMED)
PHASE 2 STM TANK PROVIDED VOLUME = 500.0 m³ MAX ALLOWABLE RELEASE RATE = 120.7 L/s OUTLET INV. 83.15 LEAD 375Ø STM @ 2.0%
EX. CB 19
EX. CB 20
675Ø STM @ 0.29%
375Ø STM @ 1.0%
750Ø STM @ 0.39% (ASSUMED) (PIPE SLOPE TO BE CONFIRMED)
EX. INV. 181.95
AS PER am. candaras associates inc. "Site Servicing & Storm Water Management Plan" dated May 21, 2010
EX. STM MH 17 OGS TOP 84.02 EX. NE INV. 82.02 EX. SW INV. TO BE CONFIRMED
750Ø STM @ 0.30%
EX. STM MH 18 TOP 84.04 EX. NE INV. 82.07 EX. SW INV. 82.06
750Ø STM @ 0.23%
EX. STM MH 19 TOP 86.18 EX. NW INV. 82.43 EX. NE INV. 82.28 SW INV. 82.26
EX. STM MH 23 TOP 87.27 EX. NW INV. 82.57 NE INV. 82.69 SW INV. 82.54
STM MH 3 TOP 85.05 NW INV. 82.98 SW INV. 82.89
PHASE 2 INFILTRATION PIT REQUIRED FOOTPRINT = 324 m² DEPTH OF STONE = 0.49 m
10.0m OFFSET FROM TRCA FLOODLINE
TRCA FLOODLINE
10.0m



KEY PLAN N.T.S.

LEGEND

- PROPERTY LINE
- PROPOSED STORM
- EXISTING STORM SEWER TO REMAIN
- STORM DRAINAGE BOUNDARY
- EXISTING STORM DRAINAGE BOUNDARY
- ROW 1 / 0.16 / 0.90 — PROPOSED CATCHMENT ID, RUNOFF COEFFICIENT, DRAINAGE AREA (ha)
- 1.69 / 0.084 — PROPOSED CATCHMENT ID, CONTROLLED RELEASE RATE (L/s)
- EX. 2 / 0.28 / 0.95 — EXISTING CATCHMENT ID, RUNOFF COEFFICIENT, DRAINAGE AREA (ha)
- EX. 1 / 0.014 — EXISTING CATCHMENT ID, CONTROLLED RELEASE RATE (L/s)
- PHASE1
- PHASE 2
- PHASE 3
- PHASE 4

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	ISSUED FOR ZBA & OPA	KK	23-10-27	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
TRIBUTE (BROOKDALE) LIMITED

MUNICIPALITY
CITY OF PICKERING

PROJECT TITLE
1101A, 1105, and 1163 KINGSTON ROAD

SHEET TITLE
STORM DRAINAGE PLAN PHASE 2

CONSULTANT
wsp

STAMP

APPROVAL

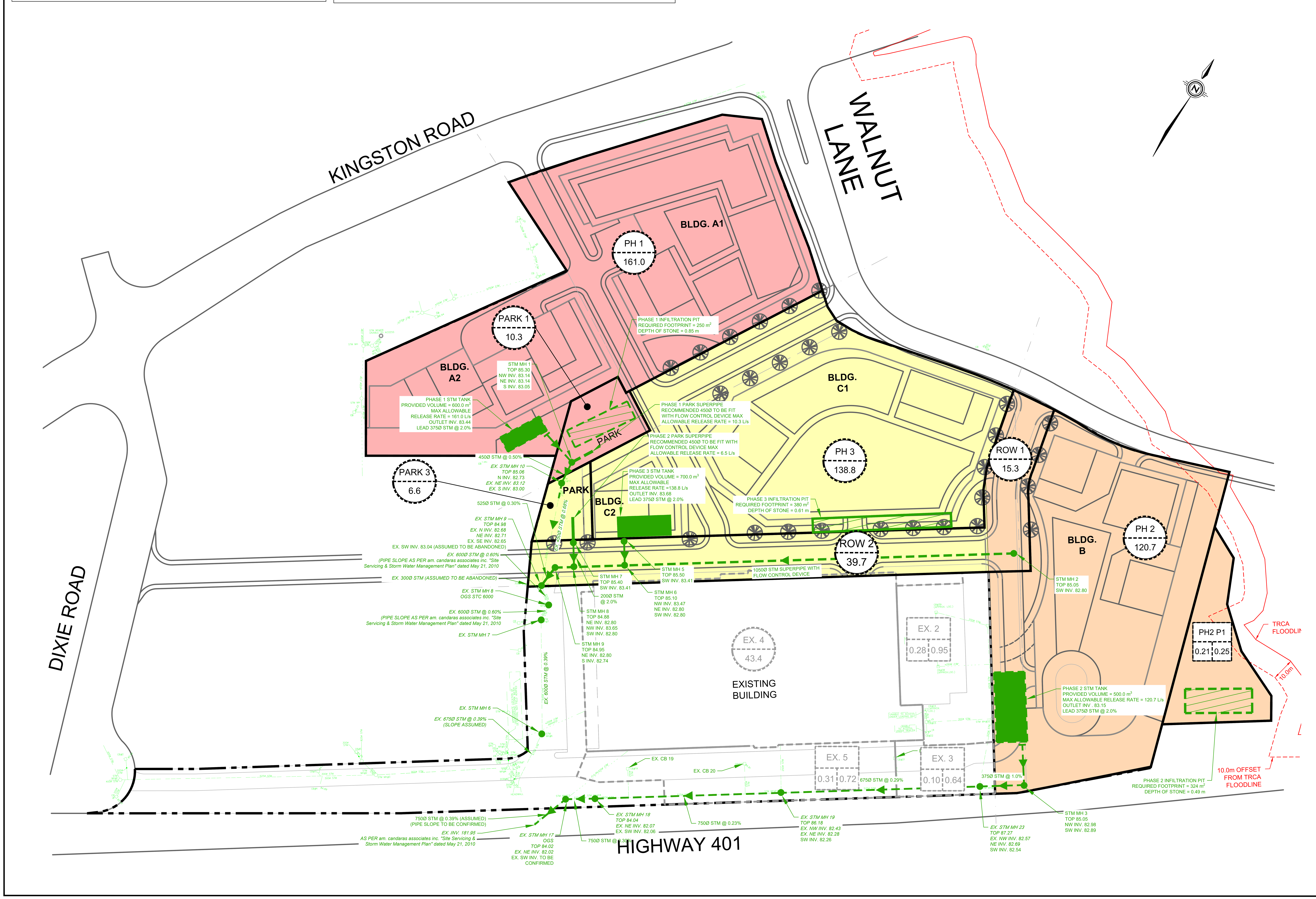
DESIGNED	DRAWN	CHECKED
Z.B.	CAD 20	K.K.

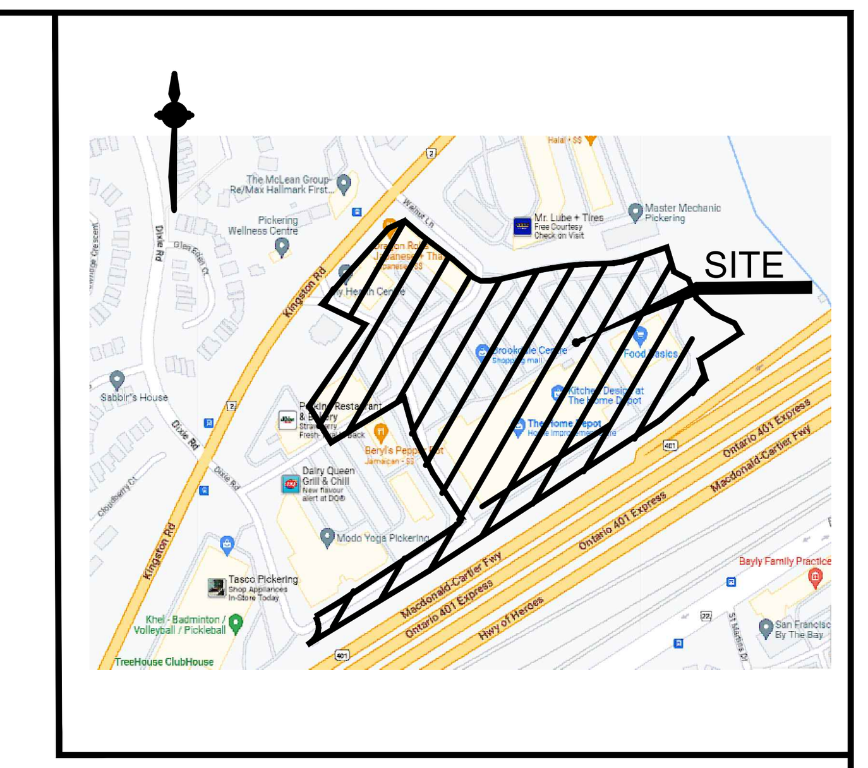
SCALE	DATE
1:750	OCTOBER 2023

JOB NUMBER	SHEET NUMBER
221-12931	STM-2

EXISTING CATCHMENTS DELINEATED USING TOPO BY J.D BARNES LIMITED DATED FEBRUARY 2, 2023 AND STORMWATER MANAGEMENT REPORT BY a.m candaras associates inc. DATED JANUARY 2015

WHERE APPLICABLE, EXISTING ROOFTOP RELEASE RATES ARE AS INDICATED IN "SITE SERVICING & STORMWATER MANAGEMENT PLAN" BY a.m candaras associates inc. DATED MAY 21,2010





KEY PLAN N.T.S.

LEGEND

- PROPERTY LINE
- PROPOSED STORM
- EXISTING STORM SEWER TO REMAIN
- STORM DRAINAGE BOUNDARY
- EXISTING STORM DRAINAGE BOUNDARY
- ROW 1 / 0.16 / 0.90 — PROPOSED CATCHMENT ID, RUNOFF COEFFICIENT, DRAINAGE AREA (ha)
- 1.69 / 0.084 — PROPOSED CATCHMENT ID, CONTROLLED RELEASE RATE (L/s)
- EX. 2 / 0.28 / 0.95 — EXISTING CATCHMENT ID, RUNOFF COEFFICIENT, DRAINAGE AREA (ha)
- EX. 1 / 0.014 — EXISTING CATCHMENT ID, CONTROLLED RELEASE RATE (L/s)
- PHASE1
- PHASE 2
- PHASE 3
- PHASE 4

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	ISSUED FOR ZBA & OPA	KK	23-10-27	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT: TRIBUTE (BROOKDALE) LIMITED

MUNICIPALITY: CITY OF PICKERING

PROJECT TITLE: 1101A, 1105, and 1163 KINGSTON ROAD

SHEET TITLE: STORM DRAINAGE PLAN PHASE 3

CONSULTANT: wsp

STAMP

APPROVAL

DESIGNED	DRAWN	CHECKED
Z.B.	CAD 20	K.K.

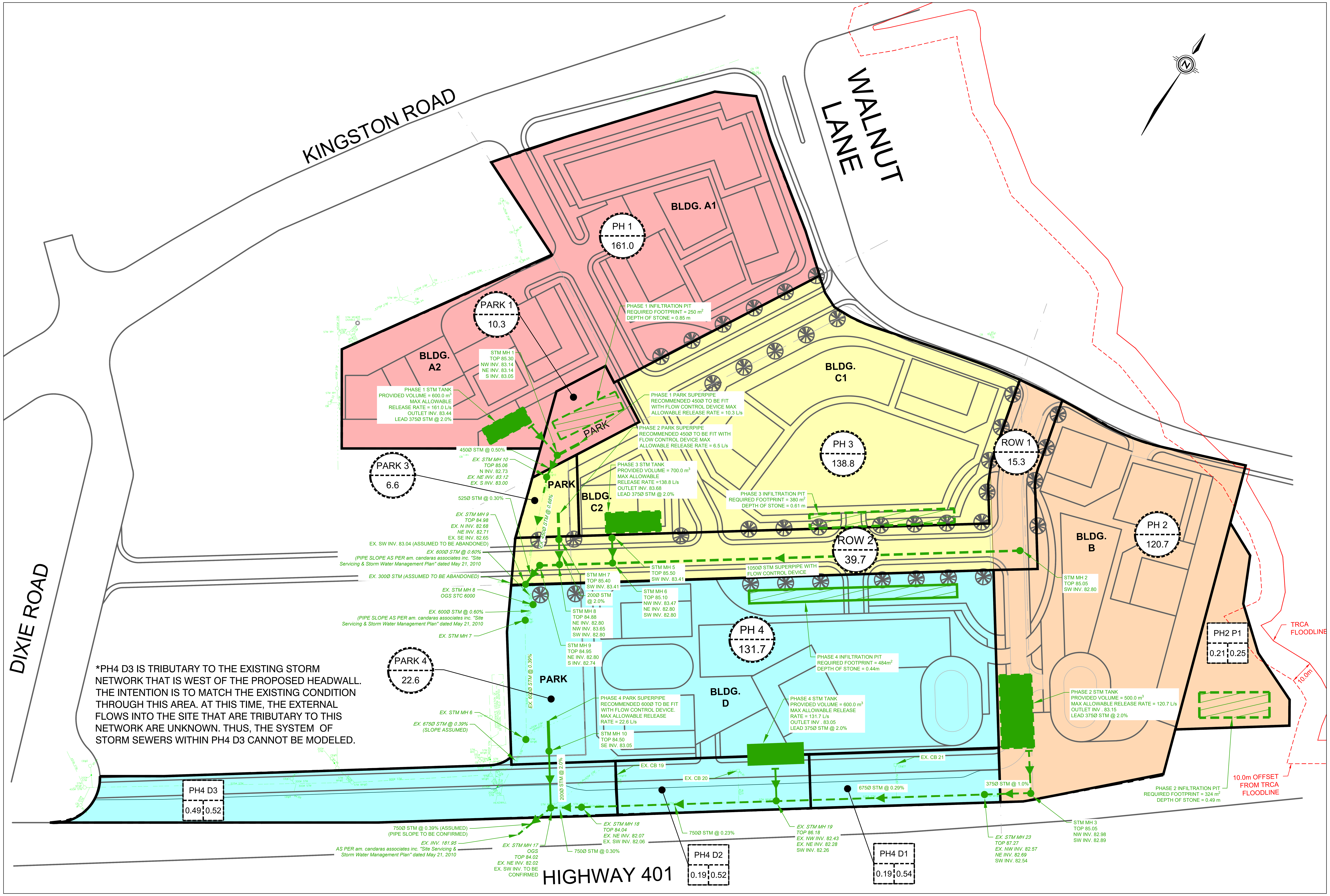
SCALE: 1:750

DATE: OCTOBER 2023

JOB NUMBER: 221-12931

SHEET NUMBER: STM-3

EXISTING CATCHMENTS DELINEATED USING TOPO BY J.D BARNES LIMITED DATED FEBRUARY 2, 2023 AND STORMWATER MANAGEMENT REPORT BY a.m candaras associates inc. DATED JANUARY 2015



KINGSTON ROAD
WALNUT LANE
DIXIE ROAD
HIGHWAY 401
BLDG. A1
BLDG. A2
BLDG. C1
BLDG. C2
BLDG. B
BLDG. D
PARK
PH 1
161.0
PARK 1
10.3
PH 3
138.8
ROW 1
15.3
PARK 3
6.6
ROW 2
39.7
PH 2
120.7
PH 4
131.7
PARK 4
22.6
PH2 P1
0.21 0.25
PH4 D3
0.49 0.52
PH4 D2
0.19 0.52
PH4 D1
0.19 0.54
PHASE 1 INFILTRATION PIT
REQUIRED FOOTPRINT = 250 m²
DEPTH OF STONE = 0.85 m
PHASE 1 STM TANK
PROVIDED VOLUME = 600.0 m³
MAX ALLOWABLE RELEASE RATE = 161.0 L/s
OUTLET INV. 83.44
LEAD 375Ø STM @ 2.0%
PHASE 1 PARK SUPERPIPE
RECOMMENDED 450Ø TO BE FIT WITH FLOW CONTROL DEVICE MAX ALLOWABLE RELEASE RATE = 10.3 L/s
PHASE 2 PARK SUPERPIPE
RECOMMENDED 450Ø TO BE FIT WITH FLOW CONTROL DEVICE MAX ALLOWABLE RELEASE RATE = 6.5 L/s
PHASE 3 STM TANK
PROVIDED VOLUME = 700.0 m³
MAX ALLOWABLE RELEASE RATE =138.8 L/s
OUTLET INV. 83.68
LEAD 375Ø STM @ 2.0%
PHASE 3 INFILTRATION PIT
REQUIRED FOOTPRINT = 380 m²
DEPTH OF STONE = 0.61 m
1050Ø STM SUPERPIPE WITH FLOW CONTROL DEVICE
PHASE 4 INFILTRATION PIT
REQUIRED FOOTPRINT = 484m²
DEPTH OF STONE = 0.44m
PHASE 4 STM TANK
PROVIDED VOLUME = 600.0 m³
MAX ALLOWABLE RELEASE RATE = 131.7 L/s
OUTLET INV. 83.05
LEAD 375Ø STM @ 2.0%
PHASE 4 PARK SUPERPIPE
RECOMMENDED 600Ø TO BE FIT WITH FLOW CONTROL DEVICE. MAX ALLOWABLE RELEASE RATE = 22.6 L/s
PHASE 2 STM TANK
PROVIDED VOLUME = 500.0 m³
MAX ALLOWABLE RELEASE RATE = 120.7 L/s
OUTLET INV. 83.15
LEAD 375Ø STM @ 2.0%
PHASE 2 INFILTRATION PIT
REQUIRED FOOTPRINT = 324 m²
DEPTH OF STONE = 0.49 m
10.0m OFFSET FROM TRCA FLOODLINE
TRCA FLOODLINE
10.0m
STM MH 1
TOP 85.30
NW INV. 83.14
NE INV. 83.14
S INV. 83.05
STM MH 2
TOP 85.05
SW INV. 82.80
STM MH 3
TOP 85.05
NW INV. 82.98
SW INV. 82.89
STM MH 5
TOP 85.50
SW INV. 83.41
STM MH 6
TOP 85.10
NW INV. 83.47
NE INV. 82.80
SW INV. 82.80
STM MH 7
TOP 85.40
SW INV. 83.41
STM MH 8
TOP 84.88
NE INV. 82.80
NW INV. 83.65
SW INV. 82.80
STM MH 9
TOP 84.95
NE INV. 82.80
S INV. 82.74
STM MH 10
TOP 84.50
SE INV. 83.05
450Ø STM @ 0.50%
525Ø STM @ 0.30%
200Ø STM @ 2.0%
375Ø STM @ 1.0%
675Ø STM @ 0.29%
750Ø STM @ 0.23%
750Ø STM @ 0.30%
EX. STM MH 10
TOP 85.06
N INV. 82.73
EX. NE INV. 83.12
EX. S INV. 83.00
EX. STM MH 9
TOP 84.98
EX. N INV. 82.68
NE INV. 82.71
EX. SE INV. 82.65
EX. SW INV. 83.04 (ASSUMED TO BE ABANDONED)
EX. 600Ø STM @ 0.60%
(PIPE SLOPE AS PER am. candaras associates inc. "Site Servicing & Storm Water Management Plan" dated May 21, 2010
EX. 300Ø STM (ASSUMED TO BE ABANDONED)
EX. STM MH 8
OGS STC 6000
EX. 600Ø STM @ 0.60%
EX. STM MH 7
EX. STM MH 6
EX. 675Ø STM @ 0.39%
(SLOPE ASSUMED)
EX. 600Ø STM @ 0.39%
750Ø STM @ 0.39% (ASSUMED)
(PIPE SLOPE TO BE CONFIRMED)
EX. INV. 181.95
AS PER am. candaras associates inc. "Site Servicing & Storm Water Management Plan" dated May 21, 2010
EX. STM MH 17
OGS
TOP 84.02
EX. NE INV. 82.02
EX. SW INV. TO BE CONFIRMED
EX. STM MH 18
TOP 84.04
EX. NE INV. 82.07
EX. SW INV. 82.06
EX. STM MH 19
TOP 86.18
EX. NW INV. 82.43
EX. NE INV. 82.28
SW INV. 82.26
EX. STM MH 23
TOP 87.27
EX. NW INV. 82.57
NE INV. 82.69
SW INV. 82.54
EX. CB 19
EX. CB 20
EX. CB 21
SITE

*PH4 D3 IS TRIBUTARY TO THE EXISTING STORM NETWORK THAT IS WEST OF THE PROPOSED HEADWALL. THE INTENTION IS TO MATCH THE EXISTING CONDITION THROUGH THIS AREA. AT THIS TIME, THE EXTERNAL FLOWS INTO THE SITE THAT ARE TRIBUTARY TO THIS NETWORK ARE UNKNOWN. THUS, THE SYSTEM OF STORM SEWERS WITHIN PH4 D3 CANNOT BE MODELED.

KEY PLAN N.T.S.

LEGEND

- PROPERTY LINE
- PROPOSED STORM
- EXISTING STORM SEWER TO REMAIN
- STORM DRAINAGE BOUNDARY
- EXISTING STORM DRAINAGE BOUNDARY
- ROW 1 / 0.16 / 0.90 — PROPOSED CATCHMENT ID, RUNOFF COEFFICIENT, DRAINAGE AREA (ha)
- 1.69 / 0.084 — PROPOSED CATCHMENT ID, CONTROLLED RELEASE RATE (L/s)
- EX. 2 / 0.28 / 0.95 — EXISTING CATCHMENT ID, RUNOFF COEFFICIENT, DRAINAGE AREA (ha)
- EX. 1 / 0.014 — EXISTING CATCHMENT ID, CONTROLLED RELEASE RATE (L/s)
- PHASE1
- PHASE 2
- PHASE 3
- PHASE 4

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	ISSUED FOR ZBA & OPA	KK	23-10-27	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
TRIBUTE (BROOKDALE) LIMITED

MUNICIPALITY
CITY OF PICKERING

PROJECT TITLE
1101A, 1105, and 1163 KINGSTON ROAD

SHEET TITLE
STORM DRAINAGE PLAN PHASE 4

CONSULTANT
WSP

STAMP

APPROVAL

DESIGNED	DRAWN	CHECKED
Z.B.	CAD 20	K.K.

SCALE	DATE
1:750	OCTOBER 2023

JOB NUMBER	SHEET NUMBER
221-12931	STM-4

WSP CANADA INC.

STORM SEWER DESIGN SHEET
1101A, 1105, and 1163 KINGSTON ROAD - PHASE 1

City of Pickering

PREPARED BY:	Z.B.
CHECKED BY:	K.K.
DATE:	25-Oct-23
LAST PRINTED:	25-Oct-23
FILE No	221-12931

STREET	FROM M.H.	TO M.H.	CATCHMENT ID.	ha AREA Mixed/Use	R RUNOFF COEFFICIENT	2.78 A.R.	ACCUM 2.78 A.R.	T_c (MIN)	i RAINFALL INTENSITY (mm / hr)	Q_{100} PEAK UNCONTROLLED FLOW (L / S)	Q_{CON} CONTROLLED FLOW (L / S)	Q_{TOTAL} $Q_{100} + Q_{CON}$ (L / S)	PIPE DIA. (mm)	SLOPE (%)	LENGTH (m)	CAPACITY (L / s)	VELOCITY (m / s)	TIME IN SECTION (min.)	TOTAL TIME (min.)	LOAD %	COMMENTS
EAST SITE																					
Phase 1	PHASE 1 SWM TANK	STM MH 1	PH 1	1.66	0.95	4.38	4.38	10.00	186.69	-	161.00	**161.00**	375	2.00	16.7	247.95	2.25	0.12	10.12	65%	- PH1 ALLOWABLE REALEASE RATE
Phase 1	PHASE 1 PARK SUPERPIPE	STM MH 1	PARK 1	0.10	0.25	0.07	0.07	10.00	186.69	-	10.30	**10.30**	450	-	-	-	-	-	-	-	- SUPERPIPE WITH FLOW CONTROL - ALLOWABLE RELEASE RATE
Phase 1	STM MH 1	EX STM MH 10	-	-	-	-	4.45	10.12	185.49	-	171.30	**171.30**	450	0.50	10.3	201.60	1.27	0.14	10.26	85%	- PH1 + PH1 PARK ALLOWABLE RELEASE RATE REFER TO CATCHMENTS 201 & 202 IN SWM FIGURE 3
Existing Development	EX STM MH 29	EX STM MH 10	EX. 1	1.69	1.00	4.70	4.70	10.00	186.69	-	88.25	**88.25**	150	0.87	10.0	14.22	0.80	0.21	10.21	-	Q=CA (2gh)^0.5 WHERE: C = 0.8 (orifice tube), A = 0.0177m^2 (150 mm DIA. ORIFICE) , g = 9.81 m/s^2, h= 85.10 (HIGH WATER LEVEL PER a.m candaras associates inc STORMWATER MANAGEMENT REPORT DATED JANUARY, 2015) - 83.12 (PROPOSED NE INV. AFTER ORIFICE RELOCATION) = 1.98m Q=0.8*0.0177m^2*(2*9.81m/s^2*1.98m) Q=0.08825m^3/s Q= 88.25 L/s
Existing Development	EX STM MH 10	EX STM MH 9	-	-	-	-	9.15	10.26	184.19	-	259.55	**259.55**	600	0.68	46.8	506.33	1.79	0.44	10.70	51%	- PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Existing Development	EX STM MH 9	EX STM MH 8 (OGS)	-	-	-	-	9.15	10.70	180.15	-	259.55	**259.55**	600	0.60	9.4	475.61	1.68	0.09	10.79	55%	- PIPE SLOPE AS PER a.m candaras associates inc. "SITE SERVICING & STORM WATER MANAGEMENT PLAN" DATED May 21, 2010. DESIGN INFO USED BECAUSE SURVEY CONTAINS CONFLICTING INFORMATION THROUGH THIS SEGMENT. SLOPE TO BE VERIFIED DURING DETAILED DESIGN.
Existing Development	EX STM MH 8 (OGS)	EX STM MH 7	-	-	-	-	9.15	10.79	179.32	-	259.55	**259.55**	600	0.60	7.4	475.61	1.68	0.07	10.86	55%	- PIPE SLOPE AS PER a.m candaras associates inc. "SITE SERVICING & STORM WATER MANAGEMENT PLAN" DATED May 21, 2010. DESIGN INFO USED BECAUSE SURVEY CONTAINS CONFLICTING INFORMATION THROUGH THIS SEGMENT. SLOPE TO BE VERIFIED DURING DETAILED DESIGN.
Existing Development	EX STM MH7	EX STM MH 6	-	-	-	-	9.15	10.86	178.66	-	259.55	**259.55**	600	0.39	51.1	383.45	1.36	0.63	11.49	68%	- PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023 - UPSIZE EX. 600mm DIA. SEWER TO 675mm DIA. TO ACCOMMODATE FUTURE PHASES
Existing Development	EX STM MH 6	Headwall	-	-	-	-	9.15	11.49	173.26	-	259.55	**259.55**	675	0.39	35.6	524.95	1.47	0.40	11.89	49%	- PIPE SLOPE UNKNOWN, ASSUMED SAME SLOPE AS UPSTREAM PIPE. SLOPE TO BE VERIFIED DURING DETAILED DESIGN.

*i_{100}=2096.425/(T_c+6.485)^0.863

NOTE: UNCONTROLLED RUNOFF COEFFICIENTS ARE SCALED BY FACTOR OF 1.25 (TO MAX VALUE OF 1) AS PER PICKERING STANDARDS

RUNOFF COEFFICIENTS

0.25	SOFT LANDSCAPING/PARK	0.95	IMPERVIOUS AT GRADE	0.90	
0.50	GREEN ROOF	0.95	IMPERVIOUS ROOF	0.90	

No. OF SHEETS
1

WSP CANADA INC.

STORM SEWER DESIGN SHEET
1101A, 1105, and 1163 KINGSTON ROAD - PHASE 2

City of Pickering

PREPARED BY: Z.B.
CHECKED BY: K.K.
DATE: 25-Oct-23
LAST PRINTED: 25-Oct-23
FILE No 221-12931

STREET	FROM M.H.	TO M.H.	CATCHMENT ID.	ha AREA Mixed/Use	R RUNOFF COEFFICIENT	2.78 A.R.	ACCUM 2.78 A.R.	T_c (MIN)	i RAINFALL INTENSITY (mm / hr)	Q_{100} PEAK UNCONTROLLED FLOW (L / S)	Q_{CON} CONTROLLED FLOW (L / S)	Q_{TOTAL} Q_{100} * Q_{CON} (L / S)	PIPE DIA. (mm)	SLOPE (%)	LENGTH (m)	CAPACITY (L / s)	VELOCITY (m / s)	TIME IN SECTION (min.)	TOTAL TIME (min.)	LOAD %	COMMENTS
EAST SITE																					
Phase 1	PHASE 1 SWM TANK	STM MH 1	PH 1	1.66	0.95	4.38	4.38	10.00	186.69	-	161.00	**161.00**	375	2.00	16.7	247.95	2.25	0.12	10.12	65%	- PH1 ALLOWABLE REALEASE RATE
Phase 1	PHASE 1 PARK SUPERPIPE	STM MH 1	PARK 1	0.10	0.25	0.07	0.07	10.00	186.69	-	10.30	**10.30**	450	-	-	-	-	-	-	-	- SUPERPIPE WITH FLOW CONTROL - ALLOWABLE RELEASE RATE
Phase 1	STM MH 1	EX STM MH 10	-	-	-	-	4.45	10.12	185.49	-	171.30	171.30	450	0.50	10.3	201.60	1.27	0.14	10.26	85%	- PH1 + PH1 PARK ALLOWABLE RELEASE RATE REFER TO CATCHMENTS 201 & 202 IN SWM FIGURE 3
Existing Development	EX. MH29	EX STM MH 10	EX. 1	1.69	0.95	4.46	4.46	10.00	186.69	-	88.25	**88.25**	150	0.87	10.0	14.22	0.80	0.21	10.21	-	Q=CA (2gh)^0.5 (Orifice Equation) WHERE: C = 0.8 (orifice tube), A = 0.0177m^2 (150 mm DIA. ORIFICE) , g = 9.81 m/s^2, h= 85.10 (HIGH WATER LEVEL PER a.m candaras associates inc STORMWATER MANAGEMENT REPORT DATED JANUARY, 2015) - 83.12 (PROPOSED NE INV. AFTER ORIFICE RELOCATION) = 1.98m Q=0.8*0.0177m^2*(2*9.81m/s^2*1.98m) Q=0.08825m^3/s Q= 88.25 L/s
Existing Development	EX STM MH 10	EX STM MH 9	-	-	-	-	8.92	10.26	184.19	-	259.55	**259.55**	600	0.68	46.8	506.33	1.79	0.44	10.70	51%	- PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Existing Development	STM MH 2	STM MH 9	ROW 1	0.27	0.95	0.71	0.71	10.00	186.69	-	15.30	**15.30**	1050	0.00	205.7	0.00	0.00	-	-	-	- PROPOSED FLAT 1050mm DIA. SUPERPIPE ACROSS SITE WITHIN PHASE 3 R.O.W. REFER TO SWM REPORT FOR MODELLING DETAILS - PHASE 2 ROW ALLOWABLE RELEASE RATE
Existing Development	STM MH9	EX STM MH 9		-	-	-	0.71	10.00	186.69	-	15.30	**15.30**	525	0.30	10.1	235.55	1.09	0.15	10.15	6%	
Existing Development	EX STM MH 9	EX STM MH 8 (OGS)	-	-	-	-	9.62	10.70	180.15	-	274.85	**274.85**	600	0.60	9.4	475.61	1.68	0.09	10.79	58%	- PIPE SLOPE AS PER a.m candaras associates inc. "SITE SERVICING & STORM WATER MANAGEMENT PLAN" DATED May 21, 2010. DESIGN INFO USED BECAUSE SURVEY CONTAINS CONFLICTING INFORMATION THROUGH THIS SEGMENT. SLOPE TO BE VERIFIED DURING DETAILED DESIGN.
Existing Development	EX STM MH 8 (OGS)	EX STM MH 7	-	-	-	-	9.62	10.79	179.32	-	274.85	**274.85**	600	0.60	7.4	475.61	1.68	0.07	10.86	58%	- PIPE SLOPE AS PER a.m candaras associates inc. "SITE SERVICING & STORM WATER MANAGEMENT PLAN" DATED May 21, 2010. DESIGN INFO USED BECAUSE SURVEY CONTAINS CONFLICTING INFORMATION THROUGH THIS SEGMENT. SLOPE TO BE VERIFIED DURING DETAILED DESIGN.
Existing Development	EX STM MH7	EX STM MH 6	-	-	-	-	9.62	10.86	178.66	-	274.85	**274.85**	600	0.39	51.1	383.45	1.36	0.63	11.49	72%	- PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Existing Development	EX STM MH 6	Headwall	-	-	-	-	9.62	11.49	173.26	-	274.85	**274.85**	675	0.39	35.6	524.95	1.47	0.40	11.89	52%	- PIPE SLOPE UNKNOWN, ASSUMED SAME SLOPE AS UPSTREAM PIPE. SLOPE TO BE VERIFIED DURING DETAILED DESIGN.
SOUTH SITE																					
Phase 2	PHASE 2 SWM TANK	STM MH 3	PH 2	1.24	0.87	3.00	3.00	10.00	186.69	-	120.70	**120.70**	375	2.00	18.2	247.95	2.25	0.14	10.14	49%	- PH2 ALLOWABLE REALEASE RATE
Phase 2	STM MH 3	EX STM MH 23	-	-	-	-	3.00	10.14	185.38	-	120.70	**120.70**	375	1.00	19.8	175.33	1.59	0.21	10.34	69%	
Existing Development	EX STM MH 20	EX STM MH 23	EX. 2	0.28	1.00	0.78	0.78	10.00	186.69	145.32	0.00	**145.32**	525	0.35	31.2	254.43	1.18	0.44	10.44	57%	- REFER TO EX. 2 IN PHASE 2 STORM DRAINAGE PLAN - PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Existing Development	EX BUILDING	EX STM MH 23	EX. 4	1.01	1.00	2.81	2.81	10.00	186.69	-	43.40	**43.40**	250	2.00	21.0	84.10	1.71	0.20	10.20	52%	- REFER TO EX. 4 IN PHASE 2 STORM DRAINAGE PLAN. - CONTROLLED RELEASE RATE AS PER a.m candaras associates inc. "SITE SERVICING & STORM WATER MANAGEMENT PLAN" DATED May 21, 2010.
Existing Development	EX STM MH 23	EX STM MH 19	EX. 3	0.10	0.80	0.22	1.00	10.44	182.47	182.62	164.10	**346.72**	675	0.29	88.8	452.67	1.26	1.17	11.61	77%	- REFER TO EX. 3 IN PHASE 2 STORM DRAINAGE PLAN. - UPGRADE EX. 525mm DIA. SEWER TO 675mm DIA. - PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Existing Development	EX STM MH 19	EX STM MH 18	EX. 5	0.31	0.90	0.78	1.78	11.61	172.25	305.99	164.10	**470.09**	750	0.23	83.3	533.91	1.21	1.15	12.76	88%	- REFER TO EX. 5 IN PHASE 2 STORM DRAINAGE PLAN. - UPGRADE EX. 525mm DIA. SEWER TO 750mm DIA. - PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Existing Development	EX STM MH 18	EX STM MH 17	-	-	-	-	1.78	12.76	163.34	290.16	164.10	**454.26**	750	0.30	13.3	609.77	1.38	0.16	12.92	74%	- UPGRADE EX. 525mm DIA. SEWER TO 750mm DIA. - PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Existing Development	EX STM MH 17	BOX CULVERT	-	-	-	-	1.78	12.92	162.17	288.09	164.10	**454.26**	750	0.39	-	695.24	1.57	-	-	65%	- UPGRADE EX. 525mm DIA. SEWER TO 750mm DIA. - PIPE SLOPE ASSUMED BASED ON MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023, AND PROPOSED INVERT ELEVATION IN a.m candaras associates inc. "SITE SERVICING & STORM WATER MANAGEMENT PLAN" DATED May 21, 2010

*i_{100}=2096.425/(T_c+6.485)^0.863

NOTE: UNCONTROLLED RUNOFF COEFFICIENTS ARE SCALED BY FACTOR OF 1.25 (TO MAX VALUE OF 1) AS PER PICKERING STANDARDS

RUNOFF COEFFICIENTS

0.25	SOFT LANDSCAPING/PARK	0.95	IMPERVIOUS AT GRADE	0.90	
0.50	GREEN ROOF	0.95	IMPERVIOUS ROOF	0.90	

No. OF SHEETS
1

WSP CANADA INC.

STORM SEWER DESIGN SHEET
1101A, 1105, and 1163 KINGSTON ROAD - PHASE 3

City of Pickering

PREPARED BY: Z.B.
CHECKED BY: K.K.
DATE: 25-Oct-23
LAST PRINTED: 25-Oct-23
FILE No 221-12931

STREET	FROM M.H.	TO M.H.	CATCHMENT ID.	ha AREA Mixed/Use	R RUNOFF COEFFICIENT	2.78 A.R.	ACCUM 2.78 A.R.	T_c (MIN)	i RAINFALL INTENSITY (mm / hr)	Q_{100} PEAK UNCONTROLLED FLOW (L / S)	Q_{CON} CONTROLLED FLOW (L / S)	Q_{TOTAL} Q_{100} + Q_{CON} (L / S)	PIPE DIA. (mm)	SLOPE (%)	LENGTH (m)	CAPACITY (L / s)	VELOCITY (m / s)	TIME IN SECTION (min.)	TOTAL TIME (min.)	LOAD %	COMMENTS
EAST SITE																					
Phase 1	PHASE 1 SWM TANK	STM MH 1	PH 1	1.66	0.95	4.38	4.38	10.00	186.69	-	161.00	**161.00**	375	2.00	16.7	247.95	2.25	0.12	10.12	65%	- PH1 ALLOWABLE REALEASE RATE
Phase 1	PHASE 1 PARK SUPERPIPE	STM MH 1	PARK 1	0.10	0.25	0.07	0.07	10.00	186.69	-	10.30	**10.30**	450	-	-	-	-	-	-	-	- SUPERPIPE WITH FLOW CONTROL - ALLOWABLE RELEASE RATE
Phase 1	STM MH 1	EX STM MH 10	-	-	-	-	4.45	10.12	185.49	-	171.30	**171.30**	450	0.50	10.3	201.60	1.27	0.14	10.26	85%	- PH1 + PH1 PARK ALLOWABLE RELEASE RATE
Phase 3	EX STM MH 10	EX STM MH 9	-	-	-	-	4.45	10.26	184.19	-	171.30	**171.30**	600	0.68	46.8	506.33	1.79	0.44	10.70	34%	- PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Phase 3	STM MH 2	STM MH 6	ROW 1 + ROW 2	0.57	0.95	1.51	1.51	10.00	186.69	-	55.00	**55.00**	1050	0.00	174.4	0.00	0.00	-	-	-	- PROPOSED FLAT 1050mm DIA. SUPERPIPE ACROSS SITE WITHIN PHASE 3 R.O.W. REFER TO SWM REPORT FOR MODELLING DETAILS - PHASE 2 & 3 ROW ALLOWABLE RELEASE RATE
Phase 3	STM MH 5	STM MH 6	PH 3	1.43	0.95	3.78	3.78	10.00	186.69	-	138.80	**138.80**	375	2.00	46.8	247.95	2.25	0.35	10.35	56%	- PH3 ALLOWABLE REALEASE RATE
Phase 3	STM MH 6	STM MH 8	-	-	-	-	0.00	10.35	183.36	-	193.80	**193.80**	1050	0.00	22.7	0.00	0.00	-	-	-	- PROPOSED FLAT 1050mm DIA. SUPERPIPE ACROSS SITE WITHIN PHASE 3 R.O.W. REFER TO SWM REPORT FOR MODELLING DETAILS
Phase 3	PHASE 3 PARK SUPERPIPE	STM MH 7	PARK 3	0.07	0.25	0.05	0.05	10.00	186.69	-	6.60	**6.60**	450	-	-	-	-	-	-	-	- SUPERPIPE WITH FLOW CONTROL - ALLOWABLE RELEASE RATE
Phase 3	STM MH 7	STM MH 8	-	-	-	-	0.05	10.00	186.69	-	6.60	**6.60**	200	2.00	10.6	46.38	1.48	0.12	10.12	14%	
Phase 3	STM MH 8	STM MH 9	-	-	-	-	0.05	10.00	186.69	-	200.40	**200.40**	1050	0.00	9.5	0.00	0.00	-	-	-	- PROPOSED FLAT 1050mm DIA. SUPERPIPE ACROSS SITE WITHIN PHASE 3 R.O.W. REFER TO SWM REPORT FOR MODELLING DETAILS
Existing Development	STM MH 9	EX STM MH 9	-	-	-	-	1.51	10.00	186.69	-	200.40	**200.40**	525	0.30	10.1	235.55	1.09	0.15	10.15	85%	
Existing Development	EX STM MH 9	EX STM MH 8 (OGS)	-	-	-	-	5.96	10.70	180.15	-	371.70	**371.70**	600	0.60	9.4	475.61	1.68	0.09	10.79	78%	- PIPE SLOPE AS PER a.m candaras associates inc. "SITE SERVICING & STORM WATER MANAGEMENT PLAN" DATED May 21, 2010. DESIGN INFO USED BECAUSE SURVEY CONTAINS CONFLICTING INFORMATION THROUGH THIS SEGMENT. SLOPE TO BE VERIFIED DURING DETAILED DESIGN.
Existing Development	EX STM MH 8 (OGS)	EX STM MH 7	-	-	-	-	5.96	10.79	179.32	-	371.70	**371.70**	600	0.60	7.4	475.61	1.68	0.07	10.86	78%	- PIPE SLOPE AS PER a.m candaras associates inc. "SITE SERVICING & STORM WATER MANAGEMENT PLAN" DATED May 21, 2010. DESIGN INFO USED BECAUSE SURVEY CONTAINS CONFLICTING INFORMATION THROUGH THIS SEGMENT. SLOPE TO BE VERIFIED DURING DETAILED DESIGN.
Existing Development	EX STM MH7	EX STM MH 6	-	-	-	-	5.96	10.86	178.66	-	371.70	**371.70**	600	0.39	51.1	383.45	1.36	0.63	11.49	97%	- PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Existing Development	EX STM MH 6	Headwall	-	-	-	-	5.96	11.49	173.26	-	371.70	**371.70**	675	0.39	35.6	524.95	1.47	0.40	11.89	71%	- PIPE SLOPE UNKNOWN, ASSUMED SAME SLOPE AS UPSTREAM PIPE. SLOPE TO BE VERIFIED DURING DETAILED DESIGN.
SOUTH SITE																					
PHASE 2	PHASE 2 SWM TANK	STM MH 3	PH 2	1.24	0.87	3.00	3.00	10.00	186.69	-	120.70	**120.70**	375	2.00	18.2	247.95	2.25	0.14	10.14	49%	- PH2 ALLOWABLE REALEASE RATE
PHASE 2	STM MH 3	EX STM MH 23	-	-	-	-	3.00	10.14	185.38	-	120.70	**120.70**	375	1.00	19.8	175.33	1.59	0.21	10.34	69%	
Existing Development	EX STM MH 20	EX STM MH 23	EX. 2	0.28	1.00	0.78	0.78	10.00	186.69	145.32	0.00	**145.32**	525	0.35	31.2	254.43	1.18	0.44	10.44	57%	- REFER TO EX. 2 IN PHASE 2 STORM DRAINAGE PLAN - PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Existing Development	EX BUILDING	EX STM MH 23	EX. 4	1.01	1.00	2.81	2.81	10.00	186.69	-	43.40	**43.40**	250	2.00	21.0	84.10	1.71	0.20	10.20	52%	- REFER TO EX. 4 IN PHASE 2 STORM DRAINAGE PLAN. - CONTROLLED RELEASE RATE AS PER a.m candaras associates inc. "SITE SERVICING & STORM WATER MANAGEMENT PLAN" DATED May 21, 2010.
Existing Development	EX STM MH 23	EX STM MH 19	EX. 3	0.10	0.80	0.22	1.00	10.44	182.47	182.62	164.10	**346.72**	675	0.29	88.8	452.67	1.26	1.17	11.61	77%	- REFER TO EX. 3 IN PHASE 2 STORM DRAINAGE PLAN. - UPGRADE EX. 525mm DIA. SEWER TO 675mm DIA. - PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Existing Development	EX STM MH 19	EX STM MH 18	EX. 5	0.31	0.90	0.78	1.78	11.61	172.25	305.99	164.10	**470.09**	750	0.23	83.3	533.91	1.21	1.15	12.76	88%	- REFER TO EX. 5 IN PHASE 2 STORM DRAINAGE PLAN. - UPGRADE EX. 525mm DIA. SEWER TO 750mm DIA. - PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Existing Development	EX STM MH 18	EX STM MH 17	-	-	-	-	1.78	12.76	163.34	290.16	164.10	**454.26**	750	0.30	13.3	609.77	1.38	0.16	12.92	74%	- UPGRADE EX. 525mm DIA. SEWER TO 750mm DIA. - PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Existing Development	EX STM MH 17	BOX CULVERT	-	-	-	-	1.78	12.92	162.17	360.11	164.10	**454.26**	750	0.39	-	695.24	1.57	-	-	65%	- UPGRADE EX. 525mm DIA. SEWER TO 750mm DIA. - PIPE SLOPE ASSUMED BASED ON MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023, AND PROPOSED INVERT ELEVATION IN a.m candaras associates inc. "SITE SERVICING & STORM WATER MANAGEMENT PLAN" DATED May 21, 2010

*I_{100}=2096.425/(T_c+6.485)^0.863

NOTE: UNCONTROLLED RUNOFF COEFFICIENTS ARE SCALED BY FACTOR OF 1.25 (TO MAX VALUE OF 1) AS PER PICKERING STANDARDS

RUNOFF COEFFICIENTS

0.25	SOFT LANDSCAPING/PARK	0.95	IMPERVIOUS AT GRADE	0.90	
0.50	GREEN ROOF	0.95	IMPERVIOUS ROOF	0.90	

No. OF SHEETS
1

WSP CANADA INC.

STORM SEWER DESIGN SHEET
1101A, 1105, and 1163 KINGSTON ROAD - PHASE 4

City of Pickering

PREPARED BY: Z.B.
CHECKED BY: K.K.
DATE: 25-Oct-23
LAST PRINTED: 25-Oct-23
FILE No 221-12931

STREET	FROM M.H.	TO M.H.	CATCHMENT ID.	ha AREA Mixed/Use	R RUNOFF COEFFICIENT	2.78 A.R.	ACCUM 2.78 A.R.	T_c (MIN)	i RAINFALL INTENSITY (mm / hr)	Q_{100} PEAK UNCONTROLLED FLOW (L / S)	Q_{CON} CONTROLLED FLOW (L / S)	Q_{TOTAL} Q_{100} + Q_{CON} (L / S)	PIPE DIA. (mm)	SLOPE (%)	LENGTH (m)	CAPACITY (L / s)	VELOCITY (m / s)	TIME IN SECTION (min.)	TOTAL TIME (min.)	LOAD %	COMMENTS
EAST SITE																					
Phase 1	PHASE 1 SWM TANK	STM MH 1	PH 1	1.66	0.95	4.38	4.38	10.00	186.69	-	161.00	**161.00**	375	2.00	16.7	247.95	2.25	0.12	10.12	65%	- PH1 ALLOWABLE REALEASE RATE
Phase 1	PHASE 1 PARK SUPERPIPE	STM MH 1	PARK 1	0.10	0.25	0.07	0.07	10.00	186.69	-	10.30	**10.30**	450	-	-	-	-	-	-	-	- SUPERPIPE WITH FLOW CONTROL - ALLOWABLE RELEASE RATE
Phase 1	STM MH 1	EX STM MH 10	-	-	-	-	4.45	10.12	185.49	-	171.30	**171.30**	450	0.50	10.3	201.60	1.27	0.14	10.26	85%	- PH1 + PH1 PARK ALLOWABLE RELEASE RATE
Existing Development	EX STM MH 10	EX STM MH 9	-	-	-	-	4.45	10.26	184.19	-	171.30	**171.30**	600	0.68	46.8	506.33	1.79	0.44	10.70	34%	- PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Phase 3	STM MH 2	STM MH 6	ROW 1 + ROW 2	0.16	0.95	0.42	0.42	10.00	186.69	-	55.00	**55.00**	1050	0.00	174.4	0.00	0.00	-	-	-	- PROPOSED FLAT 1050mm DIA. SUPERPIPE ACROSS SITE WITHIN PHASE 3 R.O.W. REFER TO SWM REPORT FOR MODELLING DETAILS - PHASE 2 & 3 ROW ALLOWABLE RELEASE RATE
Phase 3	STM MH 5	STM MH 6	PH 3	1.43	0.95	3.78	3.78	10.00	186.69	-	138.80	**138.80**	375	2.00	46.8	247.95	2.25	0.35	10.35	56%	- PH3 ALLOWABLE REALEASE RATE
Phase 3	STM MH 6	STM MH 8	-	-	-	-	0.00	10.35	183.36	-	193.80	**193.80**	1050	0.00	22.7	0.00	0.00	-	-	-	- PROPOSED FLAT 1050mm DIA. SUPERPIPE ACROSS SITE WITHIN PHASE 3 R.O.W. REFER TO SWM REPORT FOR MODELLING DETAILS
Phase 3	PHASE 3 PARK SUPERPIPE	STM MH 7	PARK 3	0.07	0.25	0.05	0.05	10.00	186.69	-	6.60	**6.60**	450	-	-	-	-	-	-	-	- SUPERPIPE WITH FLOW CONTROL - ALLOWABLE RELEASE RATE
Phase 3	STM MH 7	STM MH 8	-	-	-	-	0.05	10.00	186.69	-	6.60	**6.60**	200	2.00	10.6	46.38	1.48	0.12	10.12	14%	
Phase 3	STM MH 8	STM MH 9	-	-	-	-	0.05	10.00	186.69	-	200.40	**200.40**	1050	0.00	9.5	0.00	0.00	-	-	-	- PROPOSED FLAT 1050mm DIA. SUPERPIPE ACROSS SITE WITHIN PHASE 3 R.O.W. REFER TO SWM REPORT FOR MODELLING DETAILS
Phase 4	STM MH9	EX STM MH 9	-	-	-	-	0.42	10.00	186.69	-	200.40	**200.40**	525	0.30	10.1	235.55	1.09	0.15	10.15	85%	
Phase 4	EX STM MH 9	EX STM MH 8 (OGS)	-	-	-	-	4.88	10.70	180.15	-	371.70	**371.70**	600	0.60	9.4	475.61	1.68	0.09	10.79	78%	- PIPE SLOPE AS PER a.m candaras associates inc. "SITE SERVICING & STORM WATER MANAGEMENT PLAN" DATED May 21, 2010. DESIGN INFO USED BECAUSE SURVEY CONTAINS CONFLICTING INFORMATION THROUGH THIS SEGMENT. SLOPE TO BE VERIFIED DURING DETAILED DESIGN.
Phase 4	EX STM MH 8 (OGS)	EX STM MH 7	-	-	-	-	4.88	10.79	179.32	-	371.70	**371.70**	600	0.60	7.4	475.61	1.68	0.07	10.86	78%	- PIPE SLOPE AS PER a.m candaras associates inc. "SITE SERVICING & STORM WATER MANAGEMENT PLAN" DATED May 21, 2010. DESIGN INFO USED BECAUSE SURVEY CONTAINS CONFLICTING INFORMATION THROUGH THIS SEGMENT. SLOPE TO BE VERIFIED DURING DETAILED DESIGN.
Phase 4	EX STM MH7	EX STM MH 6	-	-	-	-	4.88	10.86	178.66	-	371.70	**371.70**	600	0.39	51.1	383.45	1.36	0.63	11.49	97%	- PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Phase 4	EX STM MH 6	Headwall	-	-	-	-	4.88	11.49	173.26	-	371.70	**371.70**	675	0.39	35.6	524.95	1.47	0.40	11.89	71%	- PIPE SLOPE UNKNOWN, ASSUMED SAME SLOPE AS UPSTREAM PIPE. SLOPE TO BE VERIFIED DURING DETAILED DESIGN.
SOUTH SITE																					
Phase 2	PHASE 2 SWM TANK	STM MH 3	PH 2	1.24	0.87	3.00	3.00	10.00	186.69	-	120.70	**120.70**	375	2.00	18.2	247.95	2.25	0.14	10.14	49%	- PH2 ALLOWABLE REALEASE RATE
Phase 2	STM MH 3	EX STM MH 23	-	-	-	-	3.00	10.14	185.38	-	120.70	**120.70**	375	1.00	19.8	175.33	1.59	0.21	10.34	69%	
Phase 4	EX STM MH 23	EX STM MH 19	PH4 D1	0.19	0.68	0.36	0.36	10.34	183.41	65.39	120.70	**186.09**	675	0.29	88.8	452.67	1.26	1.17	11.51	41%	- REFER TO PH4 D1 IN PHASE 4 STORM DRAINAGE PLAN - UPGRADE EX. 525mm DIA. SEWER TO 675mm DIA. - PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Phase 4	PHASE 4 SWM TANK	EX STM MH 19	PH 4	1.36	1.00	-	-	10.00	186.69	-	131.70	**131.70**	375	2.00	13.9	247.95	2.25	0.10	10.10	53%	- PH4 ALLOWABLE REALEASE RATE
Phase 4	EX STM MH 19	EX STM MH 18	PH4 D2	0.19	0.65	0.34	0.70	11.51	173.08	121.13	252.40	**373.53**	750	0.23	83.3	533.91	1.21	1.15	12.66	70%	- REFER TO PH4 D2 IN PHASE 4 STORM DRAINAGE PLAN. - UPGRADE EX. 525mm DIA. SEWER TO 750mm DIA. - PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Phase 4	EX STM MH 18	EX STM MH 17	-	-	-	-	0.70	12.66	164.08	114.83	252.40	**367.23**	750	0.30	13.3	609.77	1.38	0.16	12.82	60%	- UPGRADE EX. 525mm DIA. SEWER TO 750mm DIA. - PIPE SLOPE MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023
Phase 4	PHASE 4 PARK SUPERPIPE	EX STM MH 17	PARK 4	0.23	0.25	-	0.00	10.00	186.69	-	22.60	**22.60**	600	-	-	-	-	-	-	-	- SUPERPIPE WITH FLOW CONTROL - ALLOWABLE RELEASE RATE
Phase 4	STM MH 10	EX STM MH 17	-	-	-	-	0.00	10.00	186.69	-	22.60	**22.60**	200	2.00	24.3	46.38	1.48	0.27	10.27	49%	
Phase 4	EX STM MH 17	BOX CULVERT	-	-	-	-	0.70	12.82	162.90	114.01	275.00	**367.23**	750	0.39	-	695.24	1.57	-	-	53%	- UPGRADE EX. 525mm DIA. SEWER TO 750mm DIA. - PIPE SLOPE ASSUMED BASED ON MEASURED FROM INVERT INFORMATION PROVIDED IN SITE SURVEY PREPARED BY J.D BARNES DATED FEB 2, 2023, AND PROPOSED INVERT ELEVATION IN a.m candaras associates inc. "SITE SERVICING & STORM WATER MANAGEMENT PLAN" DATED May 21, 2010

*I_{100}=2096.425/(T_c+6.485)^0.863

NOTE: UNCONTROLLED RUNOFF COEFFICIENTS ARE SCALED BY FACTOR OF 1.25 (TO MAX VALUE OF 1) AS PER PICKERING STANDARDS

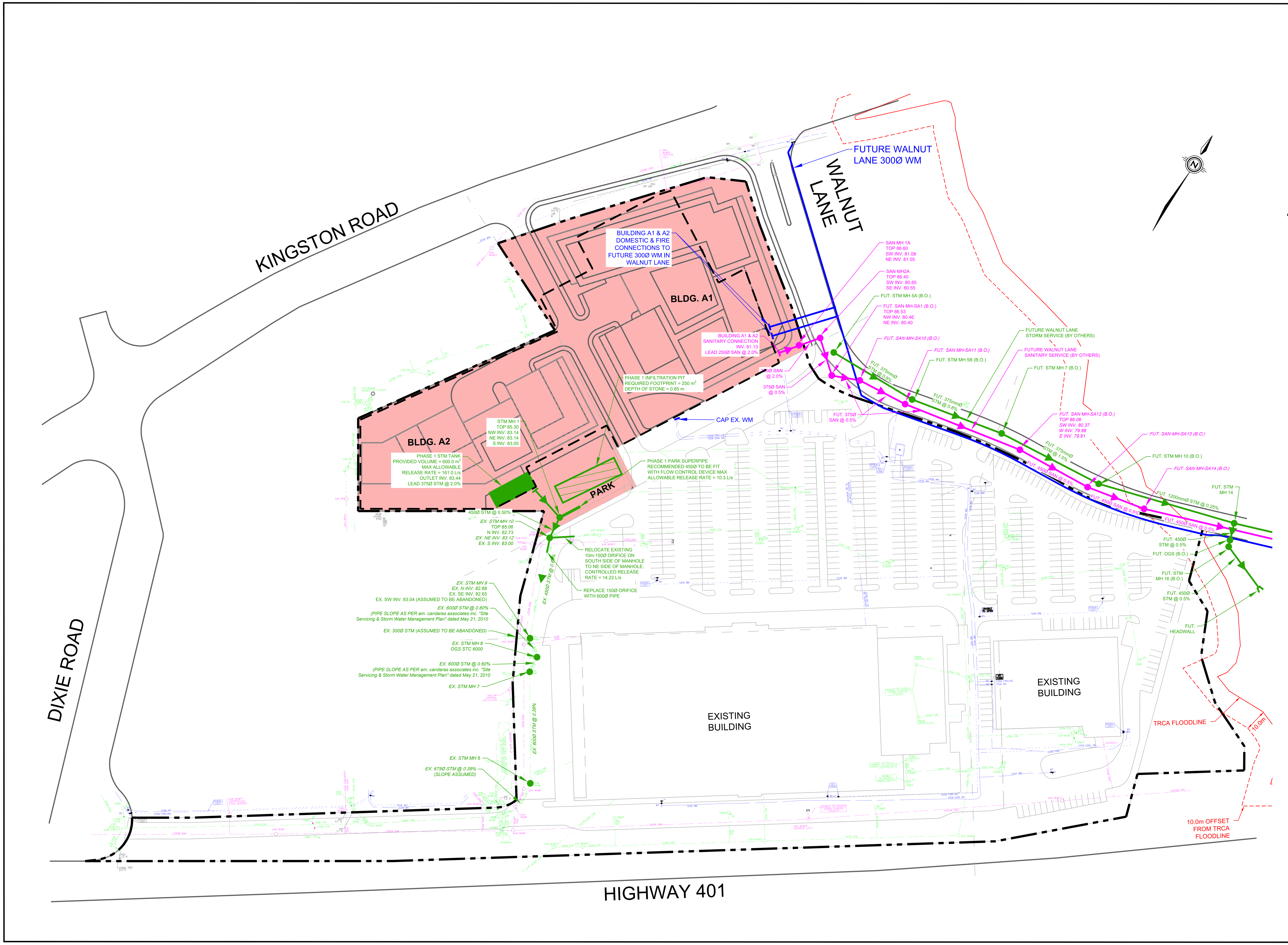
RUNOFF COEFFICIENTS

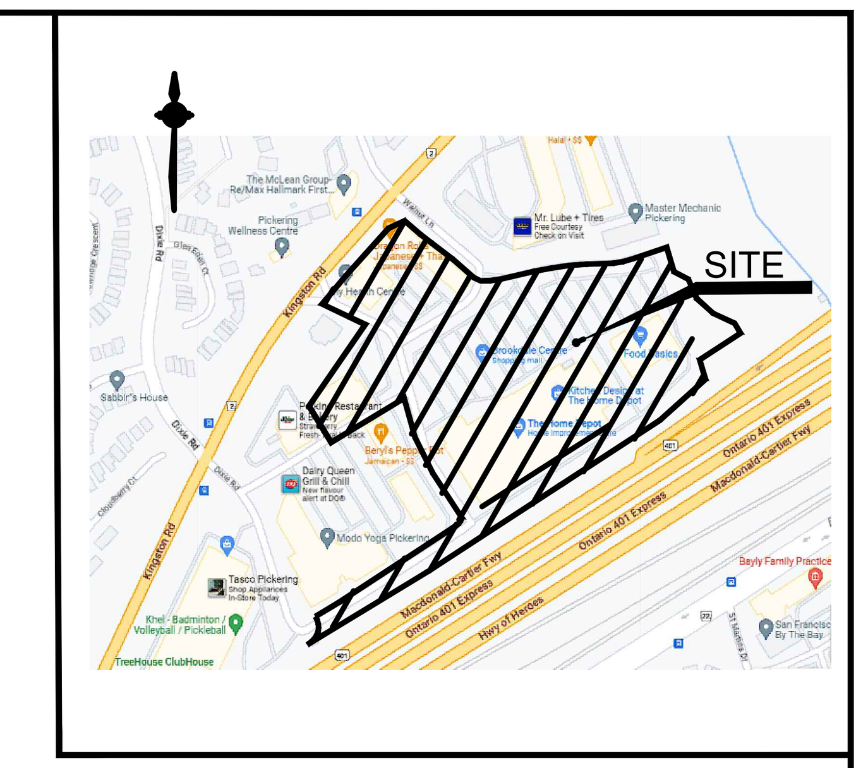
0.25	SOFT LANDSCAPING/PARK	0.95	IMPERVIOUS AT GRADE	0.90	
0.50	GREEN ROOF	0.95	IMPERVIOUS ROOF	0.90	

No. OF SHEETS
1

APPENDIX

C SITE SERVICING AND GRADING PLANS


KINGSTON ROAD
DIXIE ROAD
WALNUT LANE
HIGHWAY 401
FUTURE WALNUT LANE 300Ø WM
BUILDING A1 & A2 DOMESTIC & FIRE CONNECTIONS TO FUTURE 300Ø WM IN WALNUT LANE
BLDG. A1
BLDG. A2
PARK
BUILDING A1 & A2 SANITARY CONNECTION INV. 81.13 LEAD 250Ø SAN @ 2.0%
PHASE 1 INFILTRATION PIT REQUIRED FOOTPRINT = 250 m² DEPTH OF STONE = 0.85 m
CAP EX. WM
STM MH 1 TOP 85.30 NW INV. 83.14 NE INV. 83.14 S INV. 83.05
PHASE 1 STM TANK PROVIDED VOLUME = 600.0 m³ MAX ALLOWABLE RELEASE RATE = 161.0 L/s OUTLET INV. 83.44 LEAD 375Ø STM @ 2.0%
PHASE 1 PARK SUPERPIPE RECOMMENDED 450Ø TO BE FIT WITH FLOW CONTROL DEVICE MAX ALLOWABLE RELEASE RATE = 10.3 L/s
450Ø STM @ 0.50%
EX. STM MH 10 TOP 85.06 N INV. 82.73 EX. NE INV. 83.12 EX. S INV. 83.00
RELOCATE EXISTING 10m-150Ø ORIFICE ON SOUTH SIDE OF MANHOLE TO NE SIDE OF MANHOLE. CONTROLLED RELEASE RATE = 14.22 L/s
REPLACE 150Ø ORIFICE WITH 600Ø PIPE
EX. STM MH 9 EX. N INV. 82.68 EX. SE INV. 82.65 EX. SW INV. 83.04 (ASSUMED TO BE ABANDONED)
EX. 600Ø STM @ 0.60% (PIPE SLOPE AS PER am. candaras associates inc. "Site Servicing & Storm Water Management Plan" dated May 21, 2010
EX. 300Ø STM (ASSUMED TO BE ABANDONED)
EX. STM MH 8 OGS STC 6000
EX. 600Ø STM @ 0.60% (PIPE SLOPE AS PER am. candaras associates inc. "Site Servicing & Storm Water Management Plan" dated May 21, 2010
EX. STM MH 7
EX. STM MH 6
EX. 675Ø STM @ 0.39% (SLOPE ASSUMED)
EX. 450Ø STM @ 0.5%
EX. 600Ø STM @ 0.39%
SAN MH 1A TOP 86.60 SW INV. 81.08 NE INV. 81.05
SAN MH2A TOP 86.40 SW INV. 80.85 SE INV. 80.55
FUT. STM MH 5A (B.O.)
FUT. SAN MH-SA1 (B.O.) TOP 86.53 NW INV. 80.46 NE INV. 80.40
FUT. SAN MH-SA10 (B.O.)
FUT. SAN MH-SA11 (B.O.)
FUT. STM MH 5B (B.O.)
FUTURE WALNUT LANE STORM SERVICE (BY OTHERS)
FUTURE WALNUT LANE SANITARY SERVICE (BY OTHERS)
FUT. STM MH 7 (B.O.)
FUT. SAN MH-SA12 (B.O.) TOP 86.06 SW INV. 80.37 W INV. 79.88 E INV. 79.81
FUT. SAN MH-SA13 (B.O.)
FUT. STM MH 10 (B.O.)
FUT. SAN MH-SA14 (B.O.)
FUT. STM MH 14
250Ø SAN @ 2.0%
375Ø SAN @ 0.5%
FUT. 375Ø SAN @ 0.5%
FUT. 375mmØ STM @ 0.8%
FUT. 375mmØ STM @ 1.0%
FUT. 450Ø SAN @ 0.5%
FUT. 1200mmØ STM @ 0.25%
FUT. 450Ø STM @ 0.5%
FUT. OGS (B.O.)
FUT. STM MH 16 (B.O.)
FUT. HEADWALL
EXISTING BUILDING
EXISTING BUILDING
TRCA FLOODLINE
10.0m
10.0m OFFSET FROM TRCA FLOODLINE



KEY PLAN N.T.S.

LEGEND

- PROPERTY LINE
- PROPOSED UNDERGROUND LIMITS
- PROPOSED WATERMAIN
- PROPOSED STORM
- PROPOSED SANITARY
- PROPOSED TEMPORARY WATERMAIN
- PROPOSED WATERMAIN INSTALLED IN PREVIOUS PHASES
- PROPOSED STORM INSTALLED IN PREVIOUS PHASES
- PROPOSED SANITARY INSTALLED IN PREVIOUS PHASES
- EXISTING STORM SEWER TO REMAIN
- EXISTING SANITARY SEWER TO REMAIN
- EXISTING WATERMAIN TO REMAIN
- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	ISSUED FOR ZBA & OPA	KK	23-10-27	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
TRIBUTE (BROOKDALE) LIMITED

MUNICIPALITY
CITY OF PICKERING

PROJECT TITLE
1101A, 1105, and 1163 KINGSTON ROAD

SHEET TITLE
SITE SERVICING PLAN PHASE 1

CONSULTANT
WSP

STAMP

APPROVAL

DESIGNED	DRAWN	CHECKED
Z.B.	CAD 20	K.K.

SCALE	DATE
1:750	OCTOBER 2023

JOB NUMBER	SHEET NUMBER
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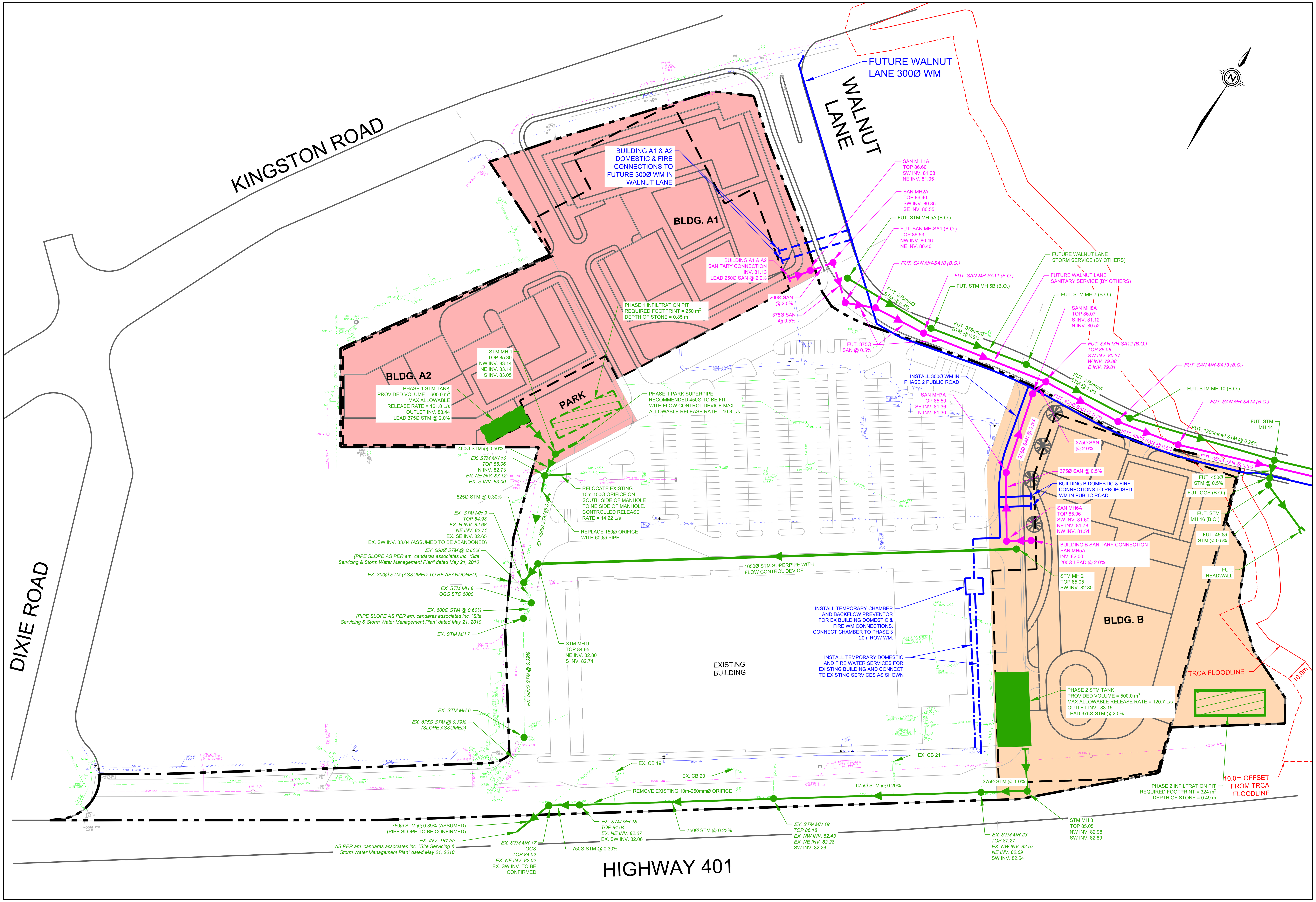

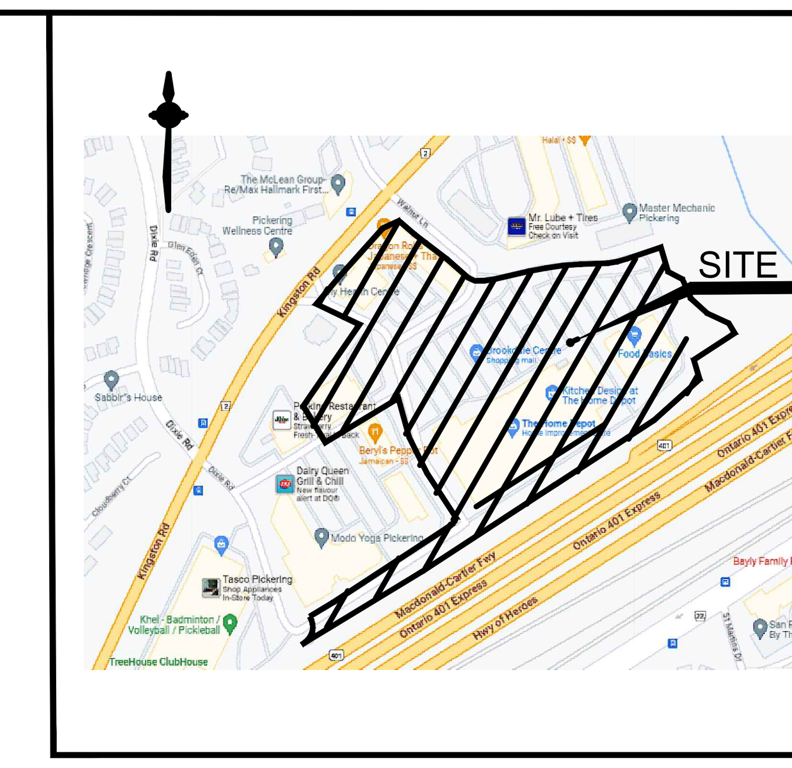

KEY PLAN N.T.S.

LEGEND

- PROPERTY LINE
- PROPOSED UNDERGROUND LIMITS
- PROPOSED WATERMAIN
- PROPOSED STORM
- PROPOSED SANITARY
- PROPOSED TEMPORARY WATERMAIN
- PROPOSED WATERMAIN INSTALLED IN PREVIOUS PHASES
- PROPOSED STORM INSTALLED IN PREVIOUS PHASES
- PROPOSED SANITARY INSTALLED IN PREVIOUS PHASES
- EXISTING STORM SEWER TO REMAIN
- EXISTING SANITARY SEWER TO REMAIN
- EXISTING WATERMAIN TO REMAIN
- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	ISSUED FOR ZBA & OPA	KK	23-10-27	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
TRIBUTE (BROOKDALE) LIMITED

MUNICIPALITY
CITY OF PICKERING

PROJECT TITLE
1101A, 1105, and 1163 KINGSTON ROAD

SHEET TITLE
SITE SERVICING PLAN PHASE 2

CONSULTANT
wsp

STAMP

APPROVAL

DESIGNED	DRAWN	CHECKED
Z.B.	CAD 20	K.K.

SCALE	DATE
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JOB NUMBER	SHEET NUMBER
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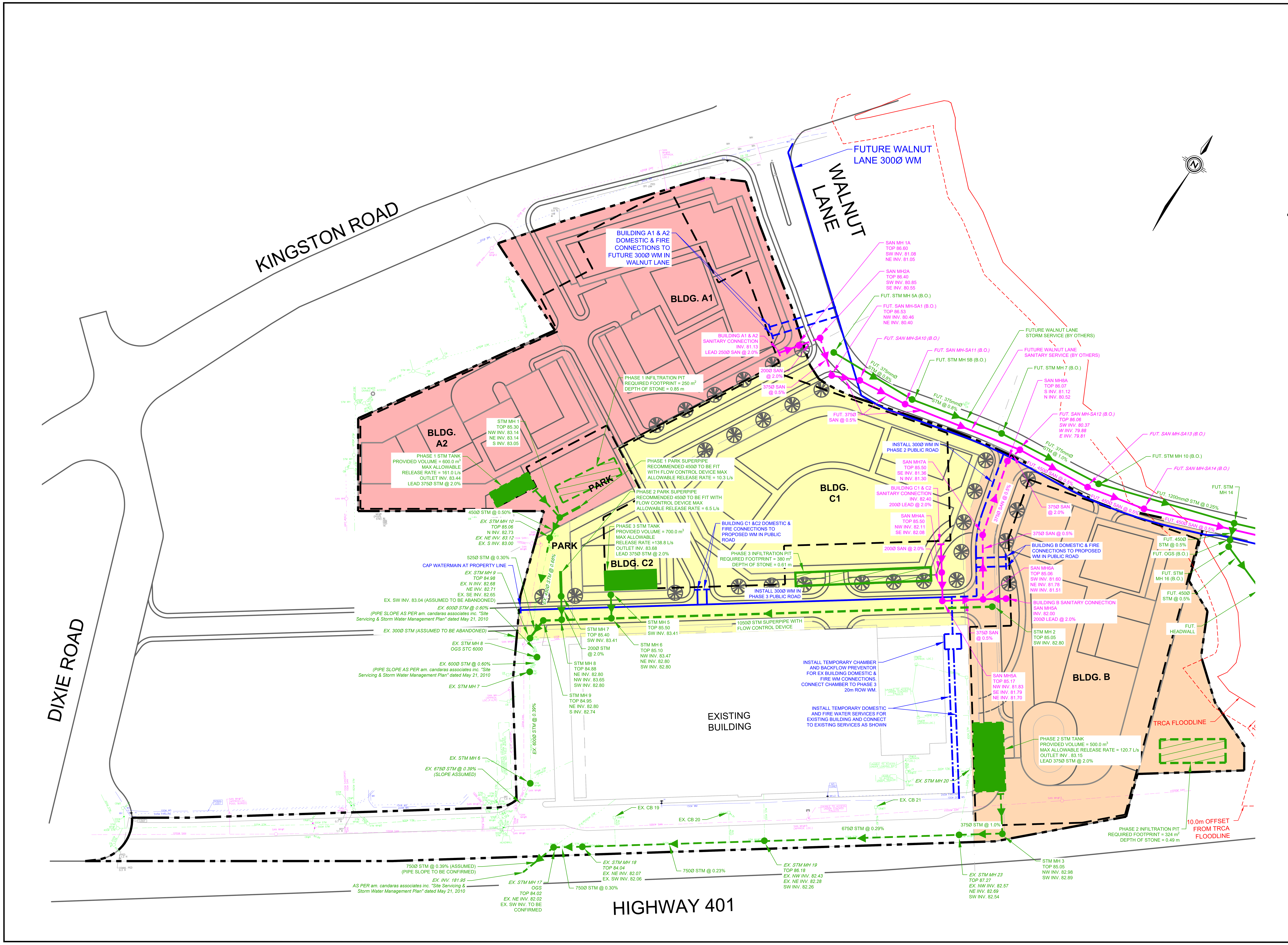

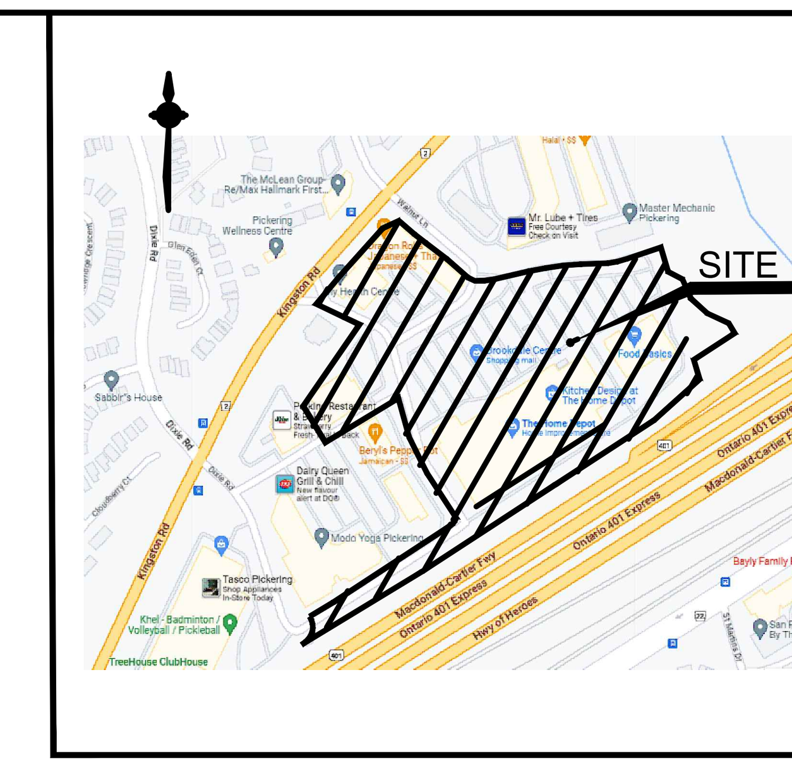

KEY PLAN N.T.S.

LEGEND

- PROPERTY LINE
- PROPOSED UNDERGROUND LIMITS
- PROPOSED WATERMAIN
- PROPOSED STORM
- PROPOSED SANITARY
- PROPOSED TEMPORARY WATERMAIN
- PROPOSED WATERMAIN INSTALLED IN PREVIOUS PHASES
- PROPOSED STORM INSTALLED IN PREVIOUS PHASES
- PROPOSED SANITARY INSTALLED IN PREVIOUS PHASES
- EXISTING STORM SEWER TO REMAIN
- EXISTING SANITARY SEWER TO REMAIN
- EXISTING WATERMAIN TO REMAIN
- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	ISSUED FOR ZBA & OPA	KK	23-10-27	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT: TRIBUTE (BROOKDALE) LIMITED

MUNICIPALITY: CITY OF PICKERING

PROJECT TITLE: 1101A, 1105, and 1163 KINGSTON ROAD

SHEET TITLE: SITE SERVICING PLAN PHASE 3

CONSULTANT: wsp

STAMP

APPROVAL

DESIGNED	DRAWN	CHECKED
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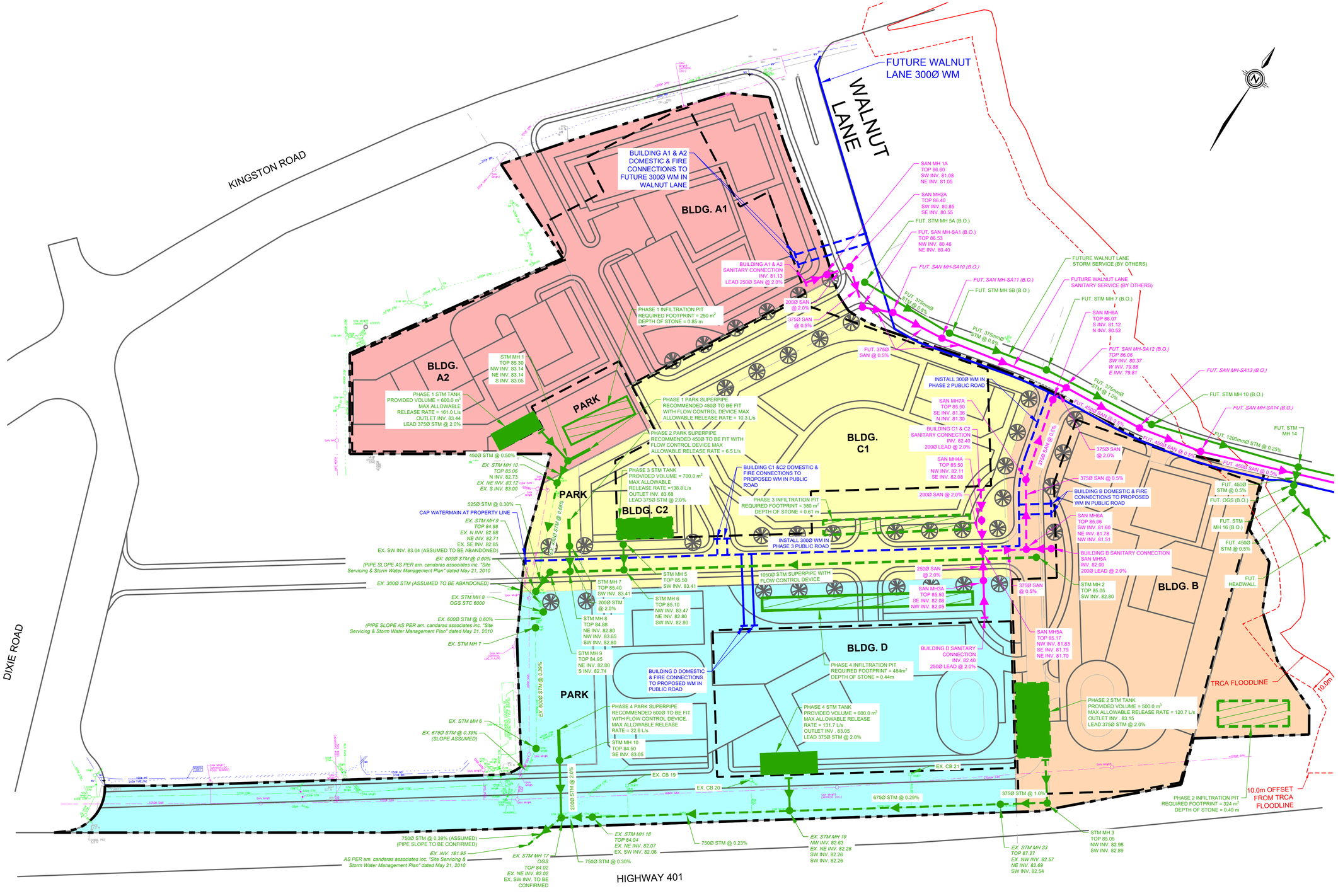
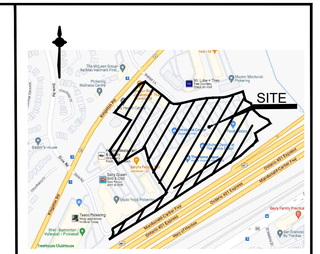
SCALE	DATE
1:750	OCTOBER 2023

JOB NUMBER	SHEET NUMBER
221-12931	SS3





KEY PLAN N.T.S.

LEGEND

- PROPERTY LINE
- PROPOSED UNDERGROUND LIMITS
- PROPOSED WATERMAIN
- PROPOSED STORM
- PROPOSED SANITARY
- PROPOSED TEMPORARY WATERMAIN
- PROPOSED WATERMAIN INSTALLED IN PREVIOUS PHASES
- PROPOSED STORM INSTALLED IN PREVIOUS PHASES
- PROPOSED SANITARY INSTALLED IN PREVIOUS PHASES
- EXISTING STORM SEWER TO REMAIN
- EXISTING SANITARY SEWER TO REMAIN
- EXISTING WATERMAIN TO REMAIN
- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	ISSUED FOR ZBA & OPA	KK	23-10-27	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
TRIBUTE (BROOKDALE) LIMITED

MUNICIPALITY
CITY OF PICKERING

PROJECT TITLE
1101A, 1105, and 1163 KINGSTON ROAD

SHEET TITLE
SITE SERVICING PLAN PHASE 4

CONSULTANT
wsp

STAMP

APPROVAL

DESIGNED	DRAWN	CHECKED
Z.B.	CAD 20	K.K.

SCALE 1:750

DATE OCTOBER 2023

JOB NUMBER 221-12931

SHEET NUMBER SS4

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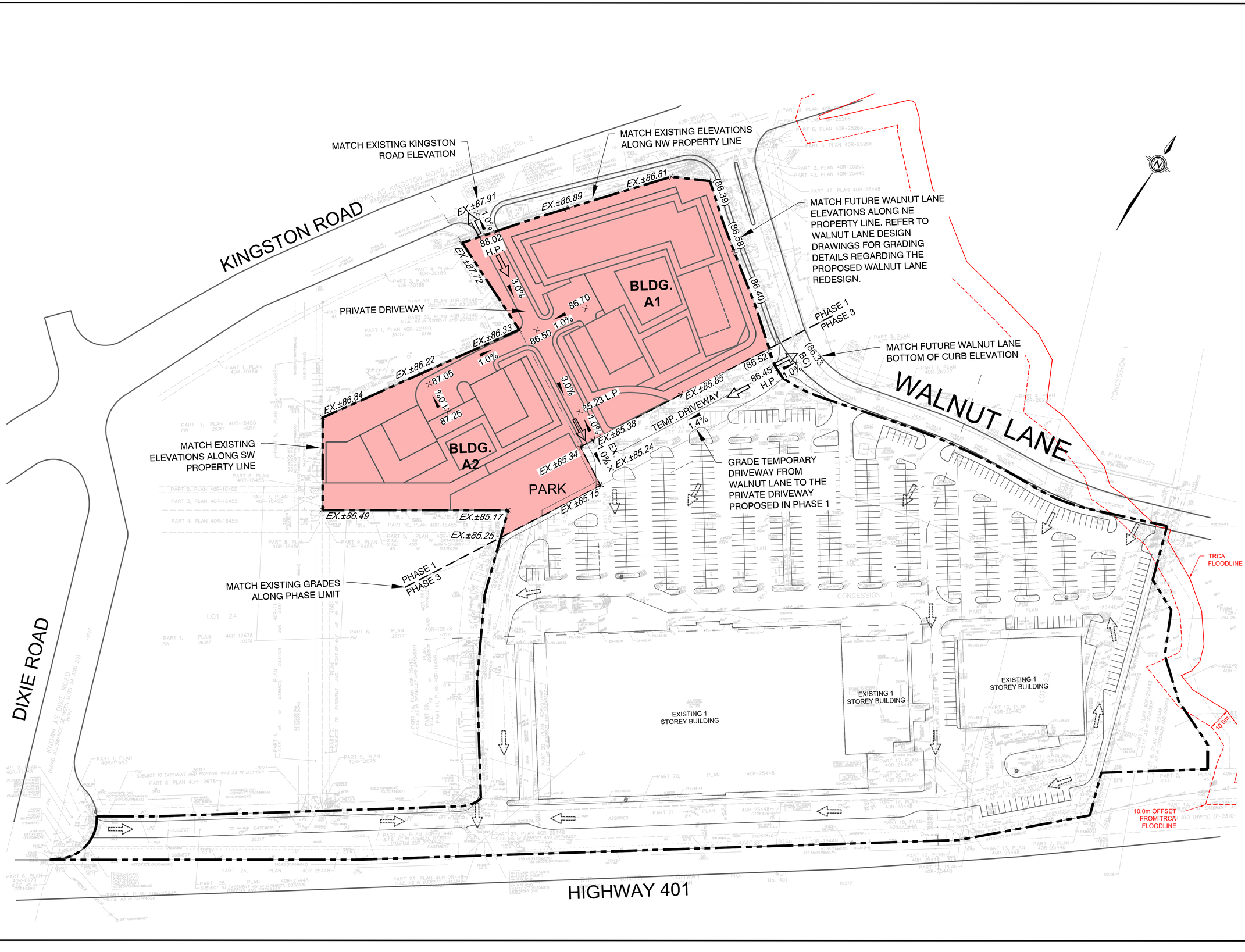

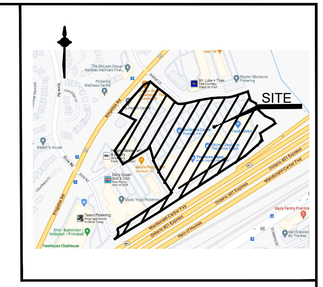

KEY PLAN N.T.S.

LEGEND

- PROPERTY LINE
- PHASE LIMITS
- × EX.±86.48 EXISTING ELEVATION TO MATCH
- × (86.52) FUTURE WALNUT LANE ELEVATION TO MATCH
- × 86.52 PROPOSED ELEVATION
- 2.0% PROPOSED GRADE
- OVERLAND FLOW
- EXISTING OVERLAND FLOW
- PHASE 1

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	ISSUED FOR ZBA & OPA	KK	23-10-27	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
TRIBUTE (BROOKDALE) LIMITED

MUNICIPALITY
CITY OF PICKERING

PROJECT TITLE
1101A, 1105, and 1163 KINGSTON ROAD

SHEET TITLE
GRADING PLAN PHASE 1

CONSULTANT
wsp

STAMP

APPROVAL

DESIGNED	DRAWN	CHECKED
Z.B.	CAD 20	K.K.

SCALE	DATE
1:750	OCTOBER 2023

JOB NUMBER	SHEET NUMBER
221-12931	GR1

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KINGSTON ROAD

WALNUT LANE

DIXIE ROAD

HIGHWAY 401

BLDG. A1

BLDG. A2

BLDG. B

PARK

PRIVATE DRIVEWAY

PUBLIC ROAD

EXISTING 1 STOREY BUILDING

EXISTING 1 STOREY BUILDING

PHASE 1 / PHASE 3

PHASE 3 / PHASE 4

PHASE 3 / PHASE 2

PHASE 2 / PHASE 4

MATCH FUTURE WALNUT LANE BOTTOM OF CURB ELEVATION

MATCH FUTURE WALNUT LANE PROPERTY LINE GRADES ALONG N PROPERTY LINE. REFER TO WALNUT LANE DESIGN DRAWINGS FOR GRADING DETAILS REGARDING THE PROPOSED WALNUT LANE REDESIGN.

MATCH EXISTING ELEVATIONS ALONG BOTTOM OF ISLAND

MATCH EXISTING ELEVATIONS AT DRIVEWAY INTERSECTION WITH PHASE LIMIT

MATCH EXISTING ELEVATIONS ALONG PHASE LIMIT

MATCH EXISTING ELEVATIONS ALONG NE AND SE PROPERTY LINES

TRANSITION FROM PUBLIC ROAD TO PRIVATE DRIVEWAY

TRCA FLOODLINE

10.0m OFFSET FROM TRCA FLOODLINE

EX.±87.91 1.0% 88.02 H.P. 3.0% EX.±87.72

EX.±86.89 EX.±86.81 (86.39) (86.58) (86.40)

EX.±86.33 1.0% 86.70 86.50 1.0%

EX.±86.22 1.0% 87.05 1.0% 87.25

EX.±86.84

3.0% 85.23 L.P. 1.0%

EX.±85.85 (86.52) 86.45 H.P. (86.33 BC) 1.0%

EX.±85.38 EX.±85.24 1.4%

EX.±85.34 EX.±85.15

EX.±86.49 EX.±85.17 EX.±85.25

EX.±86.07 (85.99 BC) (86.24TC) 86.07 H.P. (85.72TC) (85.13BC) (84.72TC)

EX.±85.89 EX.±85.07 85.73 1.7% 85.53 1.7%

EX.±85.15 1.0% 85.05 L.P. 3.0% 85.45 H.P.

EX.±85.16 PRIVATE DRIVEWAY 0.7%

84.94 L.P. 2.0%

EX.±85.19

EX.±85.14 EX.±85.13 EX.±84.74 EX.±85.32 10.0m

EX.±85.31

EX.±86.01 EX.±86.79 EX.±88.41 EX.±88.22

SITE

KEY PLAN N.T.S.

LEGEND

- PROPERTY LINE
- PHASE LIMITS
- ×EX.±86.48 EXISTING ELEVATION TO MATCH
- ×(86.52) FUTURE WALNUT LANE ELEVATION TO MATCH
- × 86.52 PROPOSED ELEVATION
- 2.0% PROPOSED GRADE
- OVERLAND FLOW
- EXISTING OVERLAND FLOW
- PHASE 1
- PHASE 2

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	ISSUED FOR ZBA & OPA	KK	23-10-27	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT: TRIBUTE (BROOKDALE) LIMITED

MUNICIPALITY: CITY OF PICKERING

PROJECT TITLE: 1101A, 1105, and 1163 KINGSTON ROAD

SHEET TITLE: GRADING PLAN PHASE 2

CONSULTANT: wsp

STAMP

APPROVAL

DESIGNED	DRAWN	CHECKED
Z.B.	CAD 20	K.K.

SCALE: 1:750

DATE: OCTOBER 2023

JOB NUMBER: 221-12931

SHEET NUMBER: GR2

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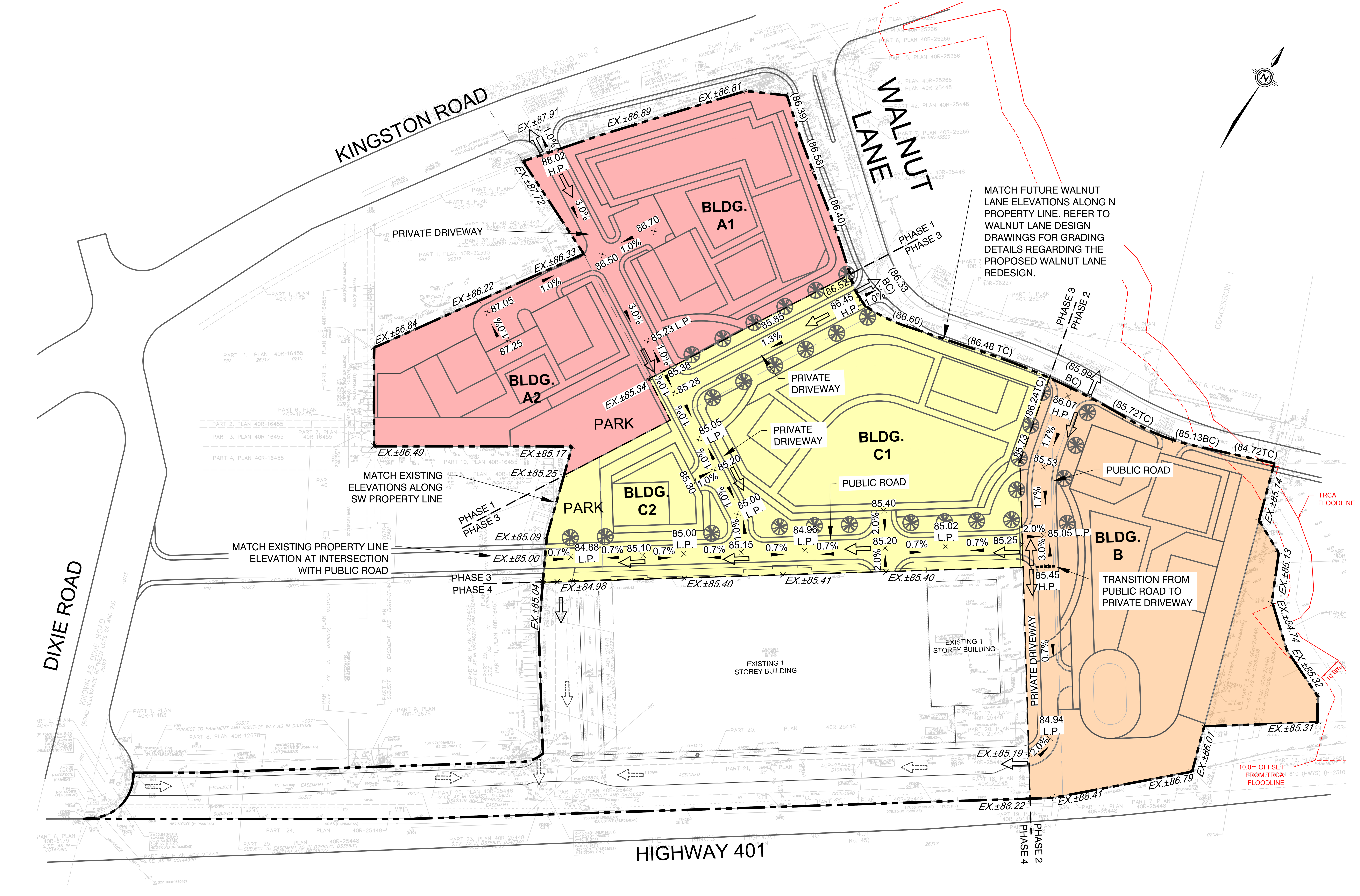

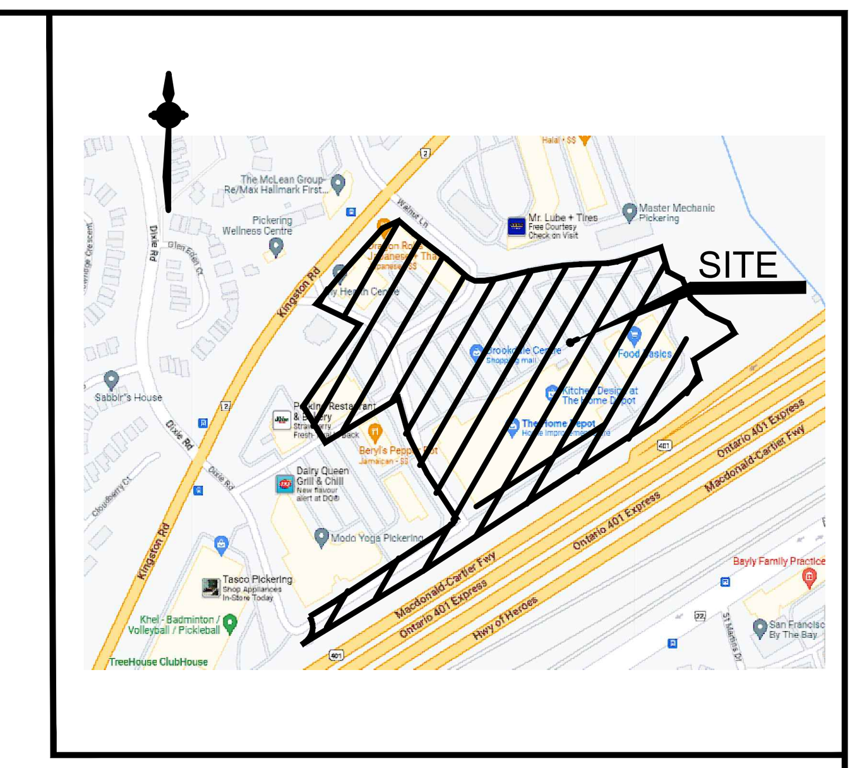

KEY PLAN N.T.S.

LEGEND

- PROPERTY LINE
- PHASE LIMITS
- × EX.±86.48 — EXISTING ELEVATION TO MATCH
- × (86.52) — FUTURE WALNUT LANE ELEVATION TO MATCH
- × 86.52 — PROPOSED ELEVATION
- 2.0% — PROPOSED GRADE
- OVERLAND FLOW
- EXISTING OVERLAND FLOW
- PHASE 1
- PHASE 2
- PHASE 3

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	ISSUED FOR ZBA & OPA	KK	23-10-27	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT: TRIBUTE (BROOKDALE) LIMITED

MUNICIPALITY: CITY OF PICKERING

PROJECT TITLE: 1101A, 1105, and 1163 KINGSTON ROAD

SHEET TITLE: GRADING PLAN PHASE 3

CONSULTANT: wsp

STAMP

APPROVAL

DESIGNED	DRAWN	CHECKED
Z.B.	CAD 20	K.K.

SCALE	DATE
1:750	OCTOBER 2023

JOB NUMBER	SHEET NUMBER
221-12931	GR3

KINGSTON ROAD

DIXIE ROAD

HIGHWAY 401

WALNUT LANE

PRIVATE DRIVEWAY

BLDG. A1

BLDG. A2

BLDG. B

BLDG. C1

BLDG. C2

BLDG. D

PARK

PUBLIC ROAD

PRIVATE DRIVEWAY

TRANSITION FROM PUBLIC ROAD TO PRIVATE DRIVEWAY

MATCH ELEVATIONS ALONG NW PROPERTY LINE

MATCH ELEVATIONS ALONG SW PROPERTY LINE

MAINTAIN EXISTING ENTRANCES

MATCH EXISTING ELEVATIONS ALONG SE PROPERTY LINE

EXISTING HEADWALL

MATCH EXISTING ELEVATIONS ALONG SE PROPERTY LINE

PHASE 1
PHASE 3

PHASE 3
PHASE 2

PHASE 3
PHASE 4

PHASE 2
PHASE 4

TRCA FLOODLINE

10.0m OFFSET FROM TRCA FLOODLINE

KEY PLAN N.T.S.

SITE

LEGEND

- PROPERTY LINE
- PHASE LIMITS
- × EX.±86.48 EXISTING ELEVATION TO MATCH
- × (86.52) FUTURE WALNUT LANE ELEVATION TO MATCH
- × 86.52 PROPOSED ELEVATION
- 2.0% PROPOSED GRADE
- OVERLAND FLOW
- EXISTING OVERLAND FLOW
- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	ISSUED FOR ZBA & OPA	KK	23-10-27	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT: TRIBUTE (BROOKDALE) LIMITED

MUNICIPALITY: CITY OF PICKERING

PROJECT TITLE: 1101A, 1105, and 1163 KINGSTON ROAD

SHEET TITLE: GRADING PLAN PHASE 4

CONSULTANT: wsp

STAMP

APPROVAL

DESIGNED	DRAWN	CHECKED
Z.B.	CAD 20	K.K.

SCALE: 1:750

DATE: OCTOBER 2023

JOB NUMBER: 221-12931

SHEET NUMBER: GR4

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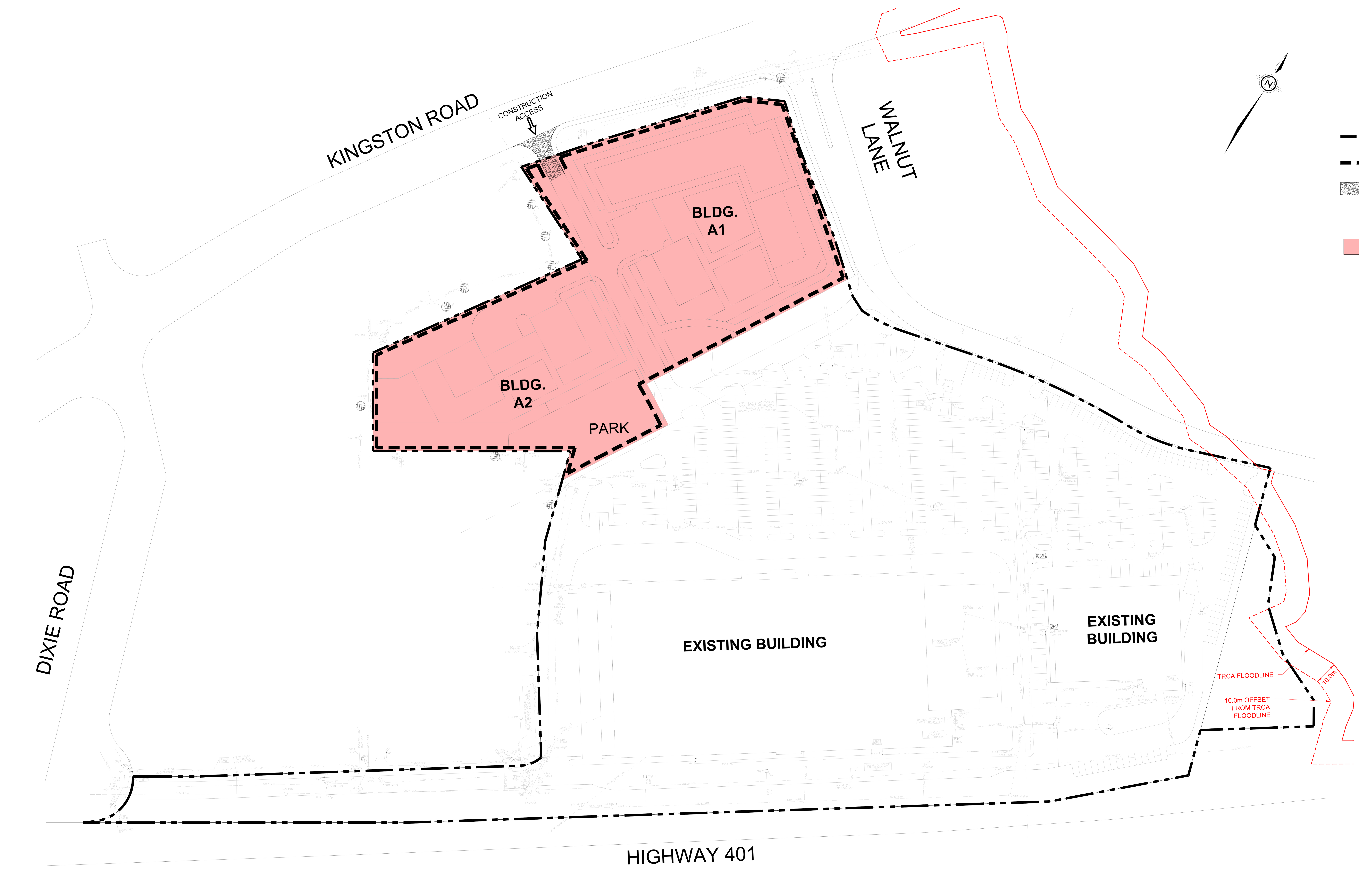
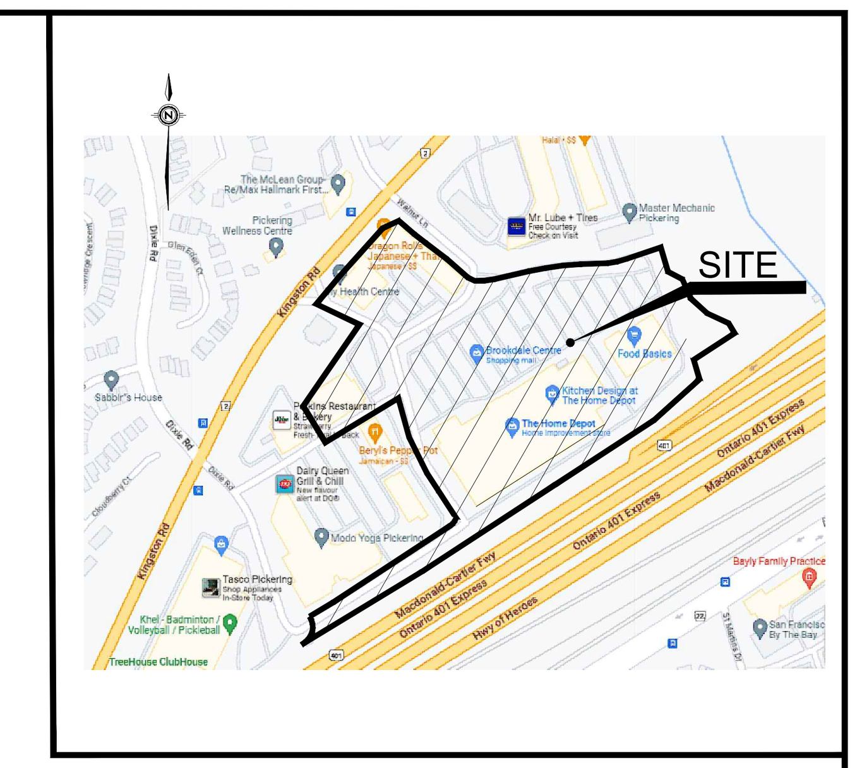
PLOTDATE: Oct 26, 2023 - 1:47pm, CADD20.ctb

APPENDIX

D EROSION AND SEDIMENT CONTROL PLANS





KEY PLAN N.T.S.

LEGEND

- PROPERTY LINE
- PHASE 4 SILT FENCE
- MUD MAT
- SEDIMENT CONTROL DEVICE
- PHASE 1

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	ISSUED FOR ZBA & OPA	KK	23-10-27	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
TRIBUTE (BROOKDALE) LIMITED

MUNICIPALITY
CITY OF PICKERING

PROJECT TITLE
1101A, 1105, and 1163 KINGSTON ROAD

SHEET TITLE
EROSION AND SEDIMENT CONTROL PLAN PHASE 1

CONSULTANT
wsp

STAMP

APPROVAL

DESIGNED	DRAWN	CHECKED
Z.B.	CAD 20	K.K.

SCALE 1:750
DATE OCTOBER 2023
JOB NUMBER 221-12931
SHEET NUMBER ESC1

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KINGSTON ROAD

WALNUT LANE

DIXIE ROAD

HIGHWAY 401

BLDG. A1

BLDG. A2

PARK

EXISTING BUILDING

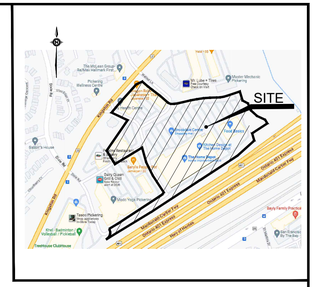
BLDG. B

CONSTRUCTION ACCESS

TRCA FLOODLINE

10.0m

10.0m OFFSET FROM TRCA FLOODLINE



KEY PLAN N.T.S.

LEGEND

- PROPERTY LINE
- PHASE 4 SILT FENCE
- MUD MAT
- SEDIMENT CONTROL DEVICE
- PHASE 1
- PHASE 2

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	ISSUED FOR ZBA & OPA	KK	23-10-27	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
TRIBUTE (BROOKDALE) LIMITED

MUNICIPALITY
CITY OF PICKERING

PROJECT TITLE
1101A, 1105, and 1163 KINGSTON ROAD

SHEET TITLE
EROSION AND SEDIMENT CONTROL PLAN PHASE 2

CONSULTANT
wsp

STAMP

APPROVAL

DESIGNED	DRAWN	CHECKED
Z.B.	CAD 20	K.K.

SCALE	DATE
1:750	OCTOBER 2023

JOB NUMBER	SHEET NUMBER
221-12931	ESC2

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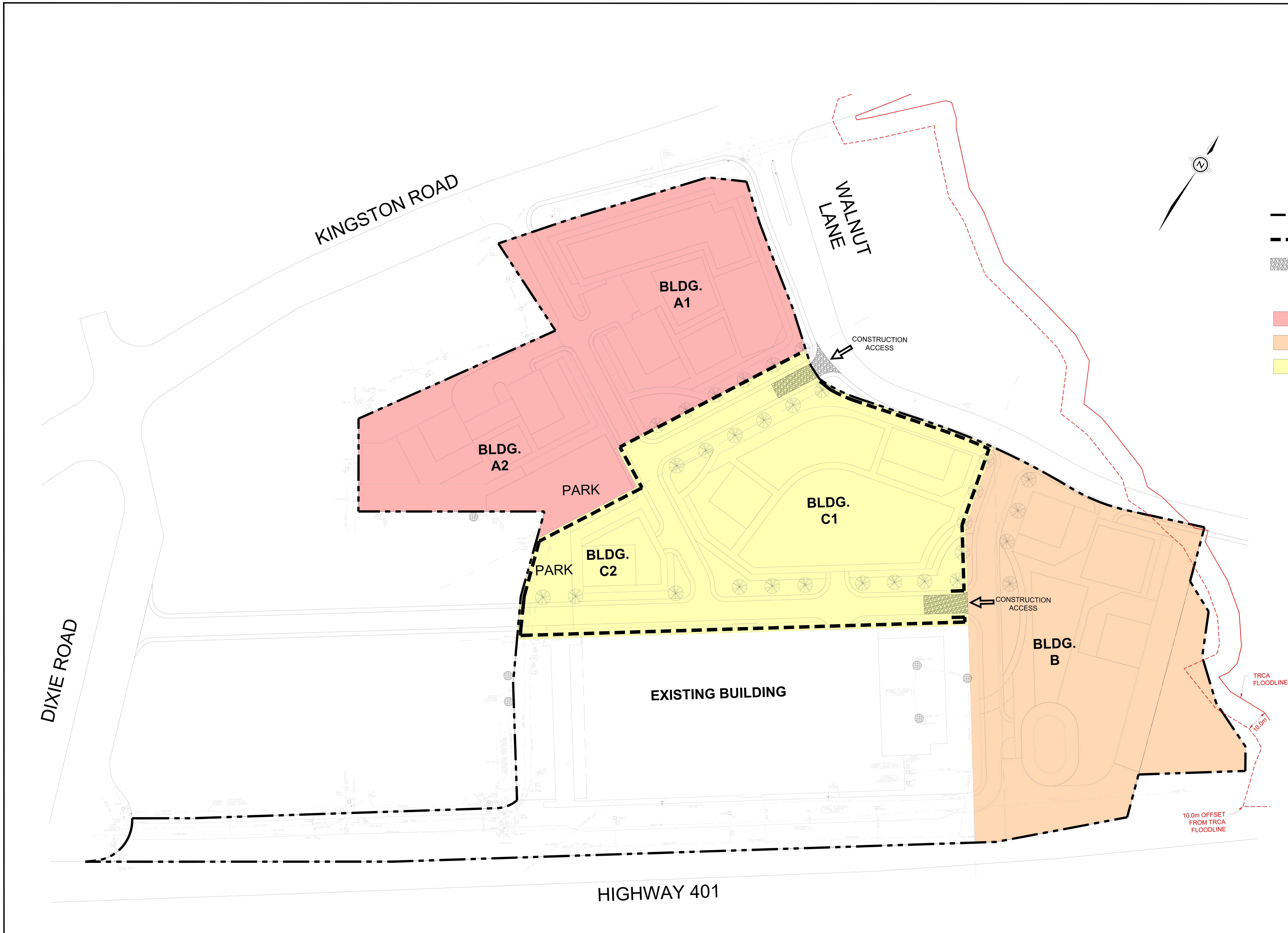
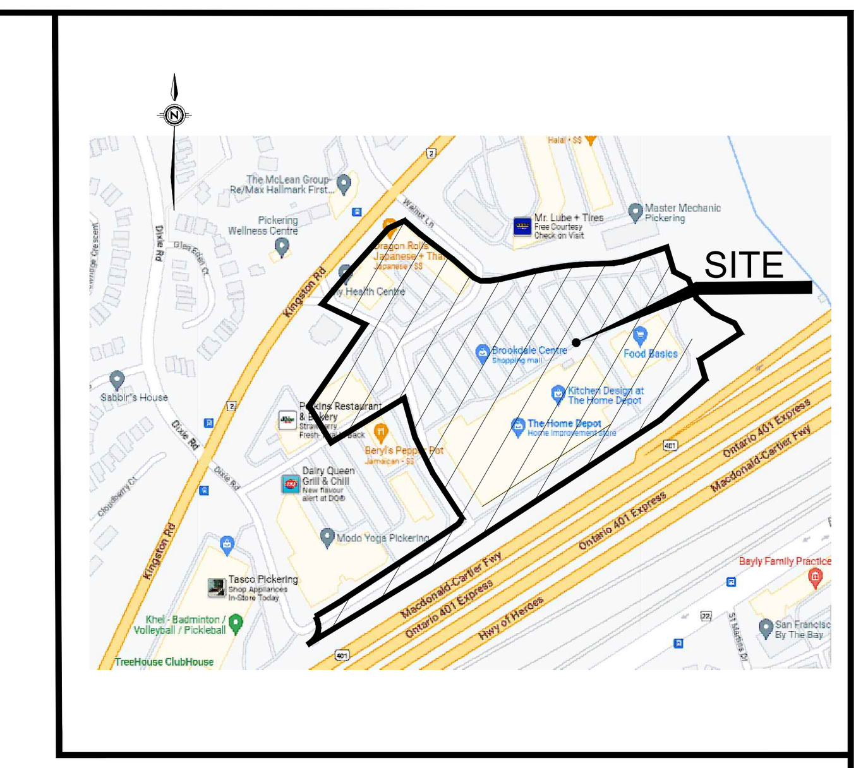




KEY PLAN N.T.S.

LEGEND

- PROPERTY LINE
- PHASE 4 SILT FENCE
- MUD MAT
- SEDIMENT CONTROL DEVICE
- PHASE 1
- PHASE 2
- PHASE 3

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	ISSUED FOR ZBA & OPA	KK	23-10-27	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
TRIBUTE (BROOKDALE) LIMITED

MUNICIPALITY
CITY OF PICKERING

PROJECT TITLE
1101A, 1105, and 1163 KINGSTON ROAD

SHEET TITLE
ERROSION AND SEDIMENT CONTROL PLAN PHASE 3

CONSULTANT
wsp

STAMP

APPROVAL

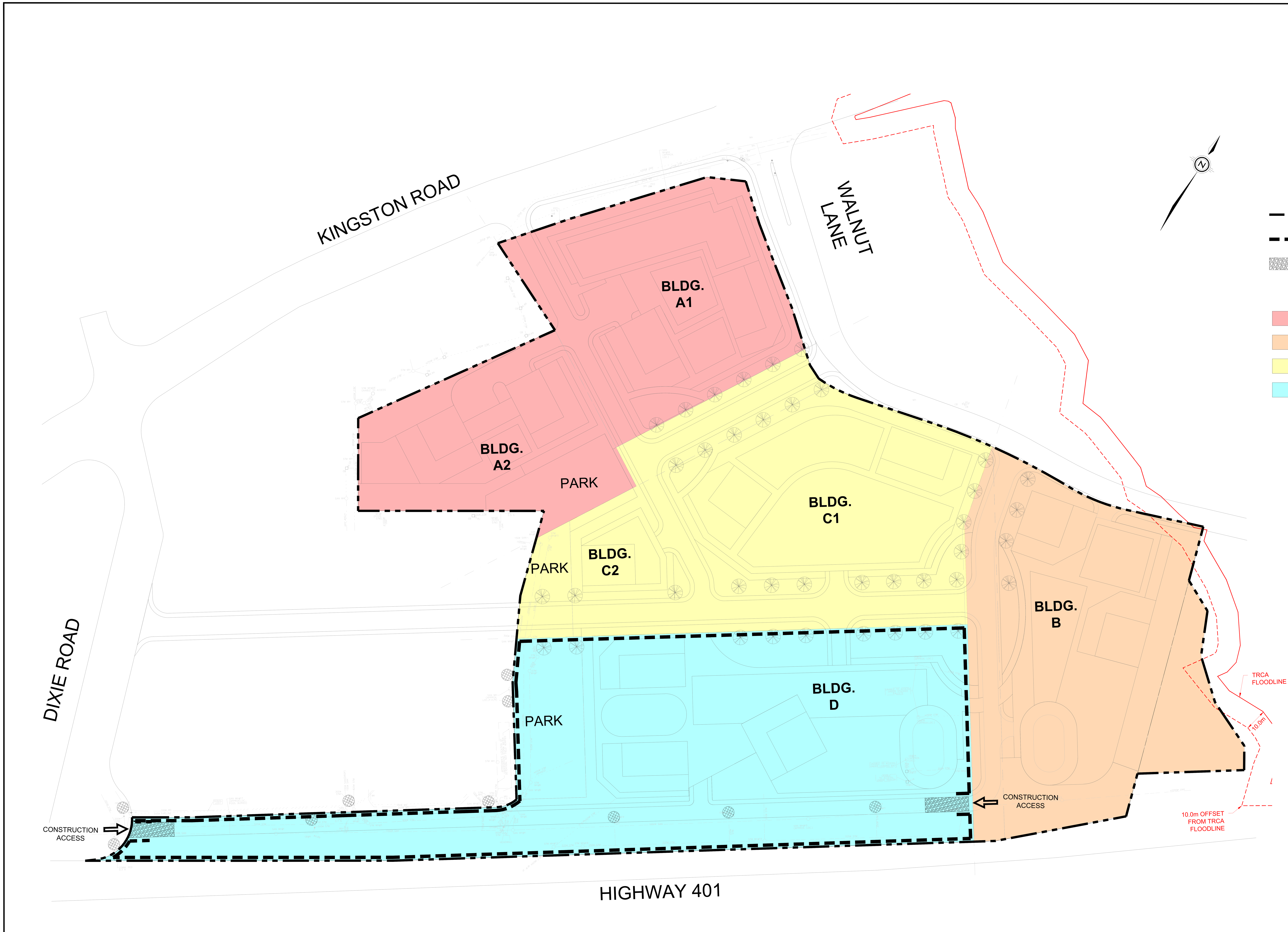
DESIGNED	DRAWN	CHECKED
Z.B.	CAD 20	K.K.

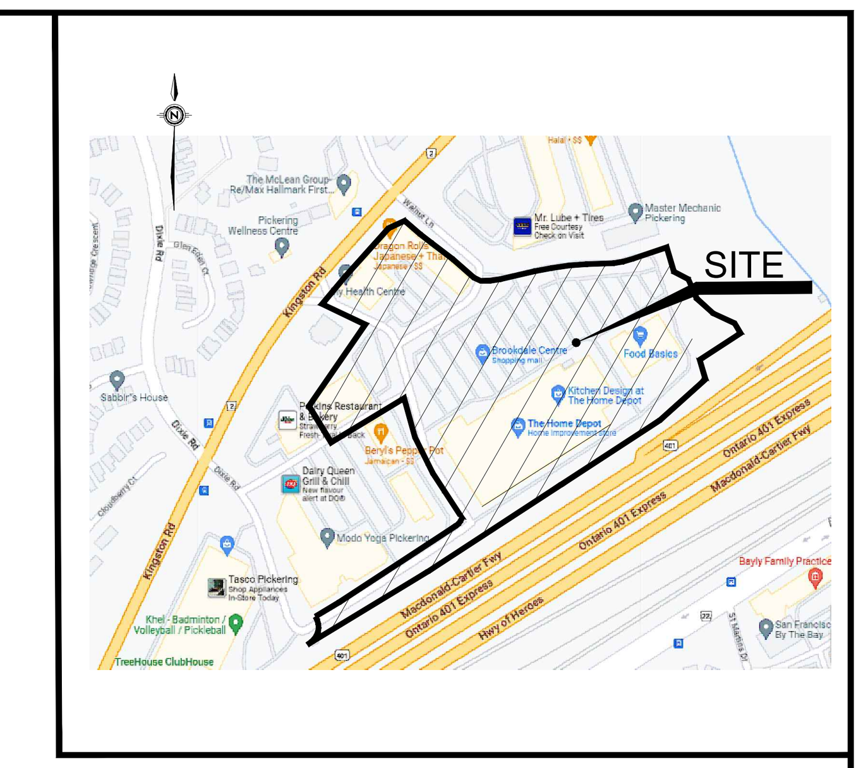
SCALE 1:750

DATE OCTOBER 2023

JOB NUMBER 221-12931

SHEET NUMBER ESC3





KEY PLAN N.T.S.

LEGEND

PROPERTY LINE

PHASE 4 SILT FENCE

MUD MAT

SEDIMENT CONTROL DEVICE

PHASE 1

PHASE 2

PHASE 3

PHASE 4

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	ISSUED FOR ZBA & OPA	KK	23-10-27	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
TRIBUTE (BROOKDALE) LIMITED

MUNICIPALITY
CITY OF PICKERING

PROJECT TITLE
1101A, 1105, and 1163 KINGSTON ROAD

SHEET TITLE
EROSION AND SEDIMENT CONTROL PLAN PHASE 4

CONSULTANT
wsp

STAMP

APPROVAL

DESIGNED	DRAWN	CHECKED
Z.B.	CAD 20	K.K.

SCALE	DATE
1:750	OCTOBER 2023

JOB NUMBER	SHEET NUMBER
221-12931	ESC4

APPENDIX

E SUPPORTING DOCUMENTS

SEWER INVERT DATA TABLE

MH/CB	DIRECTION	DIAMETER	INVERT	TOP OF LID/ GRATE ELEV.	INVERT ELEVATION	NOTES
CB#1	N	200	1.31	85.54	84.23	
CB#2	SE	200	1.23	85.54	84.31	
CB#3	SE	300	1.23	84.91	83.68	
CB#4	N	300	1.37	84.89	83.52	
CB#5	NE	300	1.09	84.95	83.86	
DCB#6	NE	300	1.26	84.32	83.06	
DCB#7	SE	300	1.17	84.28	83.11	
CB#8	W	300	1.40	85.29	83.89	
CB#9	W	250	1.30	84.91	83.61	
CB#10	W	300	1.43	85.38	83.95	
CB#11	S	450	1.52	85.24	83.72	
CB#12	SE	300	1.30	85.41	84.11	
CB#13	NW S	450 450	1.59 1.86	85.62	84.03 83.76	
CB#14	NW	250	1.07	85.26	84.19	
CB#15	NE	250	0.96	85.44	84.48	
CB#16	SE	300	0.78	85.71	84.93	
DCB#17	SE SW	300 250	1.29 1.27	85.65	84.36 84.38	
CB#18	NW	250	1.24	85.58	84.34	
CB#19	SSE	250	1.44	84.69	83.25	
CB#20	SE	250	1.49	84.81	83.32	
CB#21	SE	250	1.58	84.77	83.19	
CB#22	*NW	*250	N/A	84.19	N/A	PARKED TRUCK
CB#23	NW NE SE	250 300 250	1.30 1.31 1.30	84.19	82.89 82.88 82.89	
CB#24	SE	250	N/A	N/A	N/A	1.10 TO DEBRIS
DCB#25	SW	300	1.35	84.88	83.53	
CB#26	NW NE SE W	450 150 450 250	2.14 1.71 2.15 1.88	85.03	82.89 83.32 82.88 83.15	
CB#27	N/A	N/A	N/A	84.77	N/A	NO PIPE
CB#28	SW	250	1.20	84.44	83.24	
DCB#29	SE	250	1.24	84.83	83.59	
CB#30	SE SW	250 450	1.27 1.32	84.74	83.47 83.42	
CB#31	NW	250	1.14	84.95	83.81	
CB#32	W	300	1.57	85.53	83.96	
CB#33	NE	300	1.00	85.24	84.24	
DCB#34	NW	250	1.0	84.77	83.77	
DCB#35	NW	250	0.70	84.84	84.14	
DCB#36	W	300	0.72	84.78	84.06	
CB#37	NE	250	1.81	85.87	84.06	
CB#38	*E	*250	*1.50	*85.25	*83.75	
CB#39	*NE	*250	*1.50	*85.25	*83.75	
STM MH#1	NW NE SW	450 525 400	1.87 1.97 1.90	85.77	83.90 83.80 83.87	
STM MH#2	NW E W	825 825 300	2.27 2.44 1.90	85.04	82.77 82.60 83.14	
STM MH#3	NE SW W	825 *900 *525	2.38 *2.37 *2.33	84.82	82.44 82.45 82.49	
STM MH#4	NW E SW	600 900 900	±1.98 2.34 2.14	84.41	±82.43 82.07 82.27	
STM MH#5	NW SE	600 100	2.26 2.29	84.76	82.50 82.47	SE - REDUCED PIPE
STM MH#6	NW S	600 675	2.23 2.26	84.59	82.36 82.33	

*INFORMATION OBTAINED FROM RECORDS FROM CLIENT, REGION OF DURHAM AND CITY OF PICKERING; NOT FIELD VERIFIED BY ONSITE LOCATES INC.

MH/CB	DIRECTION	DIAMETER	INVERT	TOP OF LID/ GRATE ELEV.	INVERT ELEVATION	NOTES
STM MH#7	N SE	600 600	2.30 2.33	84.89	82.59 82.56	
STM MH#8	NW S	*600 *600	±2.50 ±2.50	84.99	±82.49 ±82.49	OIL GRIT SEPARATOR
STM MH#9	N SE SW	600 600 300	2.30 2.33 1.94	84.98	82.68 82.65 83.04	
STM MH#10	NW N NE S	300 450 450 *150	1.92 N/A 1.94 *2.06	85.06	83.14 N/A 83.12 *83.00	1.95TO DEBRIS REDUCED PIPE
STM MH#11	E W	300 300	1.90 1.84	85.06	83.16 83.22	
STM MH#12	N E SW	450 300 450	2.34 ±2.07 ±2.02	85.86	83.52 ±83.79 ±83.84	
STM MH#13	N NE S SW	450 450 450 150	2.65 2.70 2.62 1.80	86.13	83.48 83.43 83.51 84.33	
STM MH#14	SE SW	100 450	2.19 2.17	85.51	83.32 83.34	
STM MH#15	N NE S	450 *450 450	1.83 1.74 1.85	85.56	83.73 83.82 83.71	NE-RECESSED
STM MH#16	NW N SE	300 150 450	1.40 1.31 2.15	86.32	84.92 85.01 84.17	
STM MH#17	*N NE *S	*525 *525 *525	N/A 2.00 N/A	84.02	N/A 82.02 N/A	OIL GRIT SEPARATOR
STM MH#18	NE SW	250 525	1.97 1.98	84.04	82.07 82.06	NE-W/ ORIFICE PIPE
STM MH#19	NW NE SW	250 525 525	3.75 3.90 3.92	86.18	82.43 82.28 82.26	
STM MH#20	NW NE SE SW	450 300 525 250	2.19 1.84 2.20 2.17	84.88	82.69 83.04 82.68 82.71	
STM MH#21	NE SE SW	250 250 250	1.36 1.15 1.40	84.48	83.12 83.33 83.08	
STM MH#22	NW SE	100 600	2.08 2.10	84.54	82.46 82.44	NW-REDUCED PIPE
STM MH#23	NW SW	525 525	4.70 4.73	87.27	82.57 82.54	
STM MH#24	N NE SE	450 450 450	2.20 2.18 2.22	85.15	82.95 82.97 82.93	
STM MH#25	NW NW NE S	450 100 450 450	1.57 1.76 1.62 1.87	85.16	83.59 83.40 83.54 83.29	
STM MH#26	*S	*250	N/A	N/A	N/A	UNABLE TO ACCESS
STM MH#27	NW NE	300 450	2.31 ±2.32	86.26	83.95 ±83.94	
STM MH#28	NW NE SW	150 450 450	1.74 1.87 1.88	85.99	84.25 84.12 84.11	
STM MH#29	NE SW	450 450	1.60 1.62	84.94	83.34 83.32	
STM MH#30	NW E SW	450 300 450	1.03 1.06 1.10	84.98	83.95 83.92 83.88	
STM MH#31	NW SE	450 450	1.14 1.20	85.17	84.03 83.97	
STM MH#32	*N *SW	*250 *250	N/A N/A	86.72	N/A N/A	BOLTED SHUT
SAN MH#1	NE SW	1050 1050	5.80 5.77	85.10	79.30 79.33	
SAN MH#2	NW NW' SE	150 150 200	1.37 2.62 2.63	85.06	83.69 82.44 82.43	NW'-DROP
SAN MH#3	SE W	150 150	2.81 2.77	84.50	81.69 81.73	
SAN MH#4	NW NE SW	200 1050 1050	4.38 5.13 5.10	84.29	79.91 79.16 79.19	
SAN MH#5	N SE	200 200	4.23 4.25	84.45	80.22 80.20	
SAN MH#6	NW S	200 200	4.07 4.22	84.53	80.46 80.31	
SAN MH#7	N NE SE	200 200 200	3.56 3.40 3.60	84.94	81.38 81.54 81.34	
SAN MH#8	NW NE S SW	150 200 200 150	2.74 3.02 3.04 2.97	85.06	82.32 82.04 82.02 82.09	
SAN MH#9	NE SW	150 150	3.09 3.08	85.23	82.14 82.09	
SAN MH#10	SE W	150 150	2.00 1.98	85.29	83.29 83.31	
SAN MH#11	E SW	150 150	2.17 2.10	85.94	83.77 83.84	
SAN MH#12	N S	200 200	2.07 1.96	87.91	85.84 85.95	
SAN MH#13	NE SW	*1050 *1050	6.50 6.40	85.27	78.77 78.87	W/ PLATFORM
SAN MH#14	NE SW	200 200	1.81 2.30	84.91	83.10 82.61	
SAN MH#15	*NW *NW *NE *SW	*150 *150 *1050 *1050	*3.95 *6.54 *7.41 *7.41	*±86.56	*±82.61 *±79.02 *±79.15 *±79.15	UNDER STACKED PALLETS; *NW-DROP
SAN MH#16	*NE *S	*200 *200	*2.90 *2.30	*86.80	*83.90 *84.50	UNABLE TO FOUND
SAN MH#17	*SE	*200	N/A	N/A	N/A	UNABLE TO FOUND
MH#1	NW SE	±1000 ±1000	2.50 2.50	86.34	83.84 83.84	POSSIBLY STORM MANHOLE
MH#2	NW SE	±1000 ±1000	2.90 2.92	85.62	82.72 82.70	POSSIBLY STORM MANHOLE

*INFORMATION OBTAINED FROM RECORDS FROM CLIENT, REGION OF DURHAM AND CITY OF PICKERING; NOT FIELD VERIFIED BY ONSITE LOCATES INC.

SEWER INVERT NOTE:

SEWER INVERT DEPTHS ARE MANUALLY MEASURED FROM THE LID/GRATE OF THE GIVEN FEATURE.

ANNOTATIONS DISPLAYED AS *ITALICIZED* WITH AN ASTERISK* HAVE BEEN INTERPOLATED FROM RECORDS AND WERE NOT FIELD VERIFIED BY ONSITE LOCATES LTD.

INVERT DEPTH MEASUREMENTS ARE FROM THE ASSUMED BOTTOM OF THE FACILITY STRUCTURE.

DEPTHS ARE NOT SUITABLE FOR EXCAVATION PURPOSES. SEWER NETWORK CONNECTIONS WERE COMPILED WHERE FIELD EVIDENCE COINCIDED WITH AS-BUILT RECORDS

WHERE NO DEPTH INFORMATION COULD BE OBTAINED, UTILITIES ARE ASSUMED TO BE AT STANDARD INSTALLATION DEPTH FOR THE SPECIFIC TYPE OF UTILITY.

THE MOST RELIABLE WAY TO PRECISELY DETERMINE THE HORIZONTAL AND VERTICAL LOCATION OF AN UNDERGROUND UTILITY IS THROUGH PHYSICAL EXPOSURE USING SAFE DIGGING TECHNIQUES (COMMONLY PERFORMED WITH HYDRO VACUUM EXCAVATION)

INVERT DEPTH MEASUREMENTS HEREON ARE PROVIDED IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

UNDERGROUND UTILITY NOTES

THE UTILITY DATA DEPICTED ON THIS DRAWING WERE ACQUIRED IN ACCORDANCE WITH ASCE STANDARD 38-02. THE INFORMATION IS SHOWN BY ATTRIBUTED QUALITY LEVELS WHICH ARE DEFINED AS FOLLOWS:

DATA QUALITY LEVEL

HIGHEST QUALITY
- QUALITY LEVEL A
- QUALITY LEVEL B
- QUALITY LEVEL C
- QUALITY LEVEL D

LOWEST QUALITY

QUALITY LEVEL "A" - INFORMATION OBTAINED BY ACTUAL PHYSICAL EXPOSURE OF TARGETED UTILITIES AND SUBSEQUENT MEASUREMENT OF THE EXPOSED PRECISE HORIZONTAL AND VERTICAL POSITION.

QUALITY LEVEL "B" - INFORMATION OBTAINED USING GEOPHYSICAL LOCATE TECHNIQUES TO IDENTIFY THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF THE DESIGNATED UTILITIES.

QUALITY LEVEL "C" - INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO THE QUALITY "D" INFORMATION OBTAINED.

QUALITY LEVEL "D" - INFORMATION DERIVED FROM UTILITY RECORDS OR VERBAL RECOLLECTIONS

ALL SERVICES ARE QUALITY "D" UNLESS NOTED OTHERWISE.
LEVEL "D" RECORD INFORMATION SHOWN ON THIS PLAN HAVE BEEN PLOTTED APPROXIMATELY AS PER THE RECORDS FOUND AND COULD NOT BE FIELD VERIFIED WITHIN THE SCOPE OF THIS PROJECT. IF FURTHER VERIFICATION IS REQUIRED, IT IS SUGGESTED THAT LEVEL "A" METHODOLOGIES BE EMPLOYED.

LOST SIGNAL- DENOTES/INDICATES A POINT WHERE QL-B METHODS COULD NO LONGER ASCERTAIN THE HORIZONTAL POSITION OF A FACILITY.

QUALITY LEVEL "D" INFORMATION COMPILED FROM RECORDS PROVIDED BY BELL CANADA MU#49805; CITY OF PICKERING FILE NAME WALNUTLANE.PDF AND OVERALLSITEGRADINGPLAN.PDF; DURHAM REGION FILE NAME PIC-0882.PDF, PIC-1115.PDF, PIC-1117.PDF, PLATE003REGIONALHIGHWAY02KINGSTONROAD(1).PDF, SANITARY_DSHEETS_02CITYOFPICKERINGFRENCHMANSBAYAJAXDEPOT(6).PDF, AND WATER_DSHEETS_02CITYOFPICKERINGFRENCHMANSBAYAJAXDEPOT(6).PDF; ENBRIDGE FILE #39655966; ELEXICON FILE NAME 2022477384_24x36LANDSCAPE.PDF; FROM CLIENT FILE NAME P-07-014.PD.

PLAN OF SURVEY OF

PART OF LOTS 23 AND 24 CONCESSION 1

(GEOGRAPHIC TOWNSHIP OF PICKERING)
NOW IN THE

CITY OF PICKERING

REGIONAL MUNICIPALITY OF DURHAM

SCALE 1 : 500

10 0 10 20 30 metres

J.D. BARNES LIMITED

METRIC DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

BENCHMARK

ELEVATIONS HEREON ARE GEODETIC AND ARE REFERRED TO CITY OF PICKERING BENCHMARK No. 1-059, HAVING A PUBLISHED ELEVATION OF 84.111m (CGVD-1928:1978).

NOTES

BEARINGS ARE UTM GRID, DERIVED FROM SPECIFIED CONTROL POINTS (SCPs), 00919680467 AND 00819870002, UTM ZONE 17, NAD83 (ORIGINAL).

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999876.

THE LOCATION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND ANY OTHER UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THIS PLAN AND WHERE SHOWN THE ACCURACY OF THE LOCATION OF SUCH UTILITIES AND STRUCTURES ARE NOT GUARANTEED. THE CONTRACTOR SHALL CONFIRM THE EXACT LOCATION AND INVERT MEASUREMENTS OF ALL SUCH UTILITIES AND STRUCTURES PRIOR TO CONSTRUCTION AND SHALL ASSUME LIABILITY FOR ANY DAMAGE TO THEM.

INTEGRATION DATA

SPECIFIED CONTROL POINTS (SCPs): UTM ZONE 17, NAD83 (ORIGINAL).

COORDINATES TO URBAN ACCURACY PER SECTION 14 (2) OF O.REG 216/10.

POINT ID	EASTING	NORTHING
SCP 00919680467	653 923.28	4 854 259.48
SCP 00819870002	653 632.50	4 855 014.92

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

THE RESULTANT TIE BETWEEN SCP 00919680467 AND SCP 00819870002 IS 809.58m, N21°03'10"W.

FOR BEARING COMPARISONS, THE FOLLOWING ROTATIONS WERE APPLIED TO CONVERT TO GRID BEARINGS:

PLAN	COUNTER-CLOCKWISE ROTATION
P1,P5,P6,P8,P9,P10,P11	1°18'55"
P3,P4	1°02'00"

LEGEND

■	DENOTES	SURVEY MONUMENT FOUND
□	DENOTES	SURVEY MONUMENT SET
SIB	DENOTES	STANDARD IRON BAR
SSIB	DENOTES	SHORT STANDARD IRON BAR
IB	DENOTES	IRON BAR
PB	DENOTES	PLASTIC BAR
CC	DENOTES	CUT CROSS
CP	DENOTES	CONCRETE PIN
WIT	DENOTES	WITNESS
MEAS	DENOTES	MEASURED
JDB	DENOTES	J.D. BARNES LIMITED
DFP	DENOTES	DONEVAN FLEISCHMANN PETRICH LTD., O.L.S.
MTC	DENOTES	MINISTRY OF TRANSPORTATION AND COMMUNICATIONS
MTO	DENOTES	MINISTRY OF TRANSPORTATION OF ONTARIO
RPE	DENOTES	RADY-PENTEK & EDWARD SURVEYING LTD., O.L.S.
1370	DENOTES	KRCMAR SURVEYORS LTD., O.L.S.
OU	DENOTES	ORIGIN UNKNOWN
S.T.E.	DENOTES	SUBJECT TO EASEMENT
P1	DENOTES	SURVEYOR'S REAL PROPERTY REPORT BY RADY-PENTEK & EDWARD SURVEYING LTD., O.L.S., DATED NOVEMBER 14, 2012 (JOB No. 04-228)
P2	DENOTES	PLAN OF SURVEY BY J.D. BARNES LIMITED, DATED DECEMBER 17, 2020 (JDB REF No. 20-25-858-01)
P3	DENOTES	PLAN 40R-30718
P4	DENOTES	PLAN 40R-21642
P5	DENOTES	PLAN 40R-25448
P6	DENOTES	PLAN 40R-26227
P7	DENOTES	PLAN 40R-30189
P8	DENOTES	PLAN 40R-25266
P9	DENOTES	PLAN 40R-12678
P10	DENOTES	PLAN 40R-22390
P11	DENOTES	PLAN 40R-16455
P12	DENOTES	PLAN 40R-31388
CALC1	DENOTES	CALCULATED FROM P5
CB	DENOTES	CATCHBASIN
DCB	DENOTES	DOUBLE CATCHBASIN
HC	DENOTES	HYDRO CHAMBER
HJB	DENOTES	HYDRO JUNCTION BOX
GK	DENOTES	GAS KEY
G METER	DENOTES	GAS METER
HW	DENOTES	HANDWELL
HMH	DENOTES	HYDRO MANHOLE
MH	DENOTES	MANHOLE
SAN MH	DENOTES	SANITARY MANHOLE
STM MH	DENOTES	STORM MANHOLE
TMH	DENOTES	TELEPHONE MANHOLE
HP	DENOTES	HYDRO POLE
LS	DENOTES	LIGHT STANDARD
BL	DENOTES	BOLLARD LIGHT
TL	DENOTES	TRAFFIC SIGNAL
TJB	DENOTES	TELEPHONE JUNCTION BOX
PED	DENOTES	TELEPHONE PEDESTAL
OPI	DENOTES	OPTICAL PLANT INTERFACE
H	DENOTES	FIRE HYDRANT
WK	DENOTES	WATER KEY
WV	DENOTES	WATER VALVE
HT	DENOTES	HYDRO TRANSFORMER
R/W	DENOTES	RETAINING WALL
BC	DENOTES	BACK OF CURB
DS	DENOTES	DOOR SILL ELEVATION
GS	DENOTES	GARAGE SILL ELEVATION
FFL	DENOTES	FINISHED FLOOR ELEVATION
BFP	DENOTES	BARRIER-FREE PARKING SPACE
—OC—	DENOTES	OVERHEAD CABLE
—SAN—	DENOTES	UNDERGROUND SANITARY SEWER
—STM—	DENOTES	UNDERGROUND STORM SEWER
—G—	DENOTES	UNDERGROUND GAS LINE
—W—	DENOTES	UNDERGROUND WATER LINE
—UE—	DENOTES	UNDERGROUND HYDRO LINE
—UC—	DENOTES	UNDERGROUND CABLE LINE
—UT—	DENOTES	UNDERGROUND TELEPHONE LINE
—FO—	DENOTES	UNDERGROUND FIBRE OPTIC LINE
—UNK—	DENOTES	UNDERGROUND UNKNOWN LINE
]	DENOTES	ENDCAP/PLUG
P.A/R	DENOTES	POSSIBLY ABANDONED/REMOVED

CAUTION: CALL BEFORE YOU DIG

THIS PLAN IS INTENDED FOR DESIGN PURPOSES ONLY. OTHER BURIED UTILITIES MAY EXIST WHICH ARE NOT SHOWN DUE TO INSUFFICIENT INFORMATION OR IMPROPER INSTALLATION. CONTACT ALL POTENTIAL OWNERS OF UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION OR BREAKING GROUND.
IT IS THE RESPONSIBILITY OF THE CONTRACTOR/BUILDER TO ENSURE THE APPROPRIATE LEGAL REQUIREMENTS ARE MET.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON OCTOBER 17, 2022.

DATE

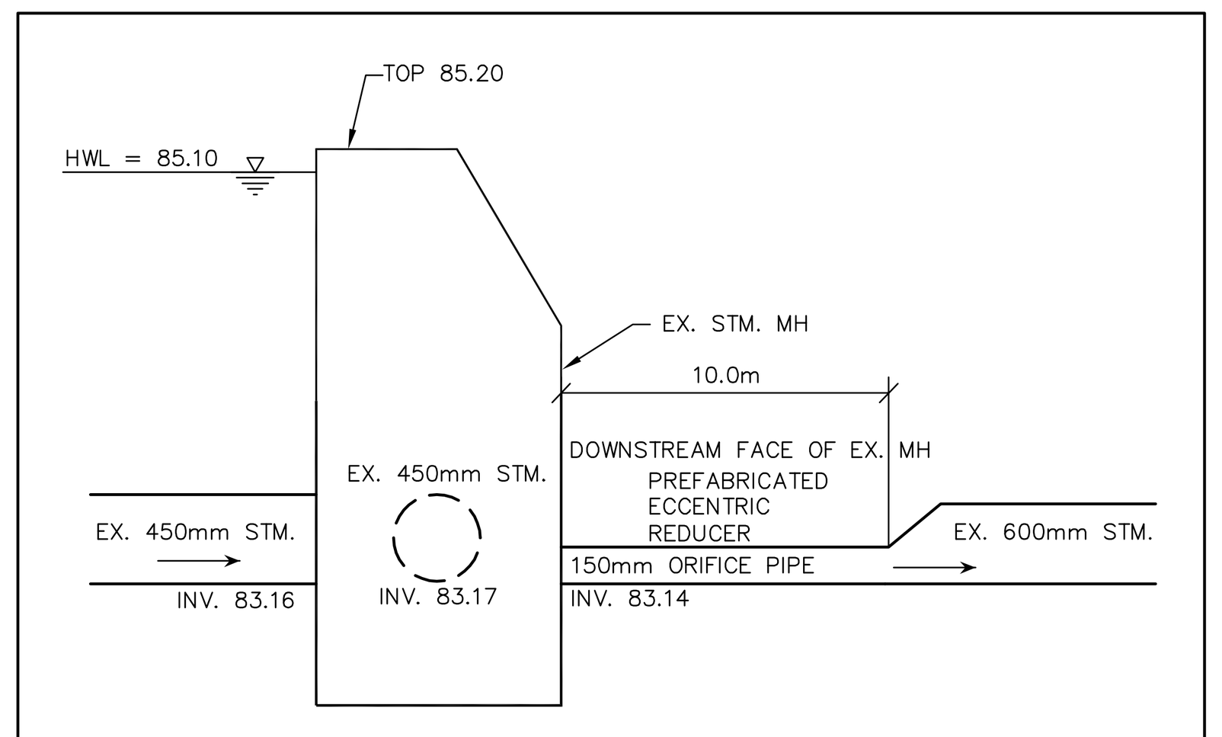
G.C. LAFRAMBOISE
ONTARIO LAND SURVEYOR

PLAN UPDATED FEBRUARY 2, 2023 TO INCLUDE SUBSURFACE UTILITY FIELD WORK AS COMPLETED ON JANUARY 20, 2023.

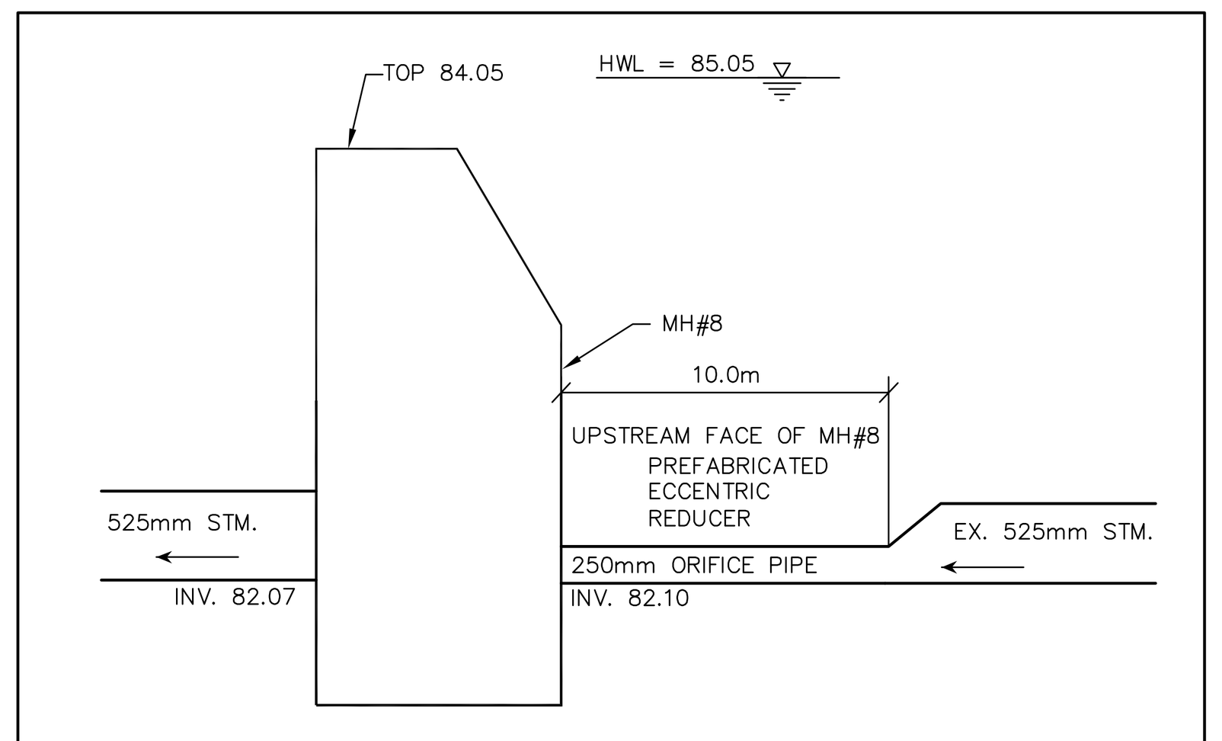
J.D.BARNES LIMITED
SURVEYING MAPPING GIS
LAND INFORMATION SPECIALISTS
110 SCOTIA COURT, UNIT 38, WHITBY, ON L1N 8Y7
T: (905) 723-1212 F: (905) 723-4234 www.jdbarnes.com

DRAWN BY: M.R.	CHECKED BY: G.C.L.	REFERENCE NO.: 22-25-073-00
FILE: G:\22-25-073\00\22-25-073-00.dgn		DATED: 2/2/2023

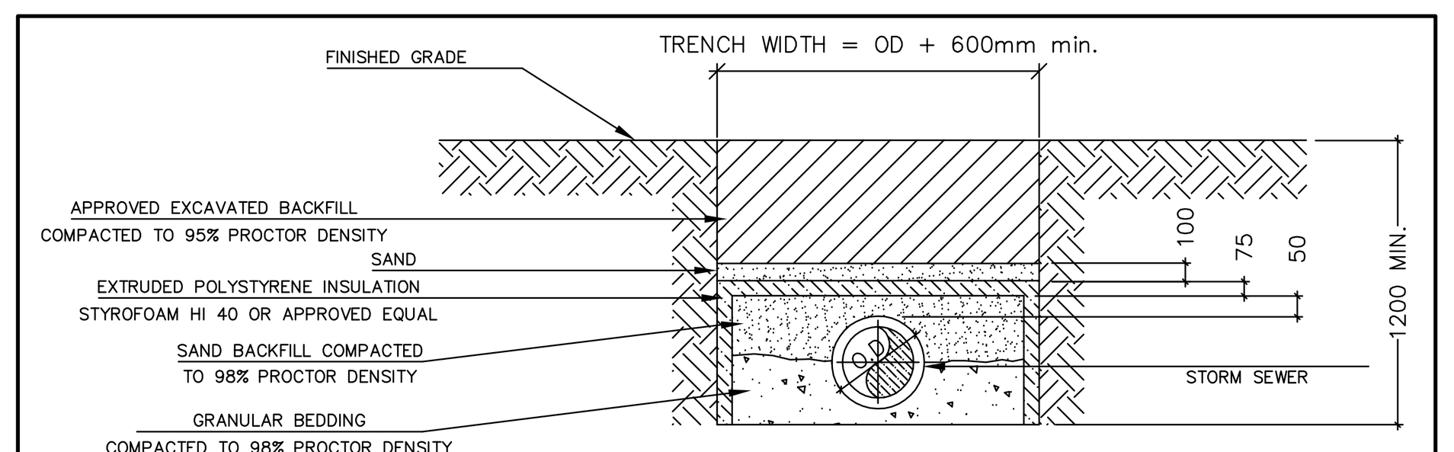
PLOTTED: 2/2/2023



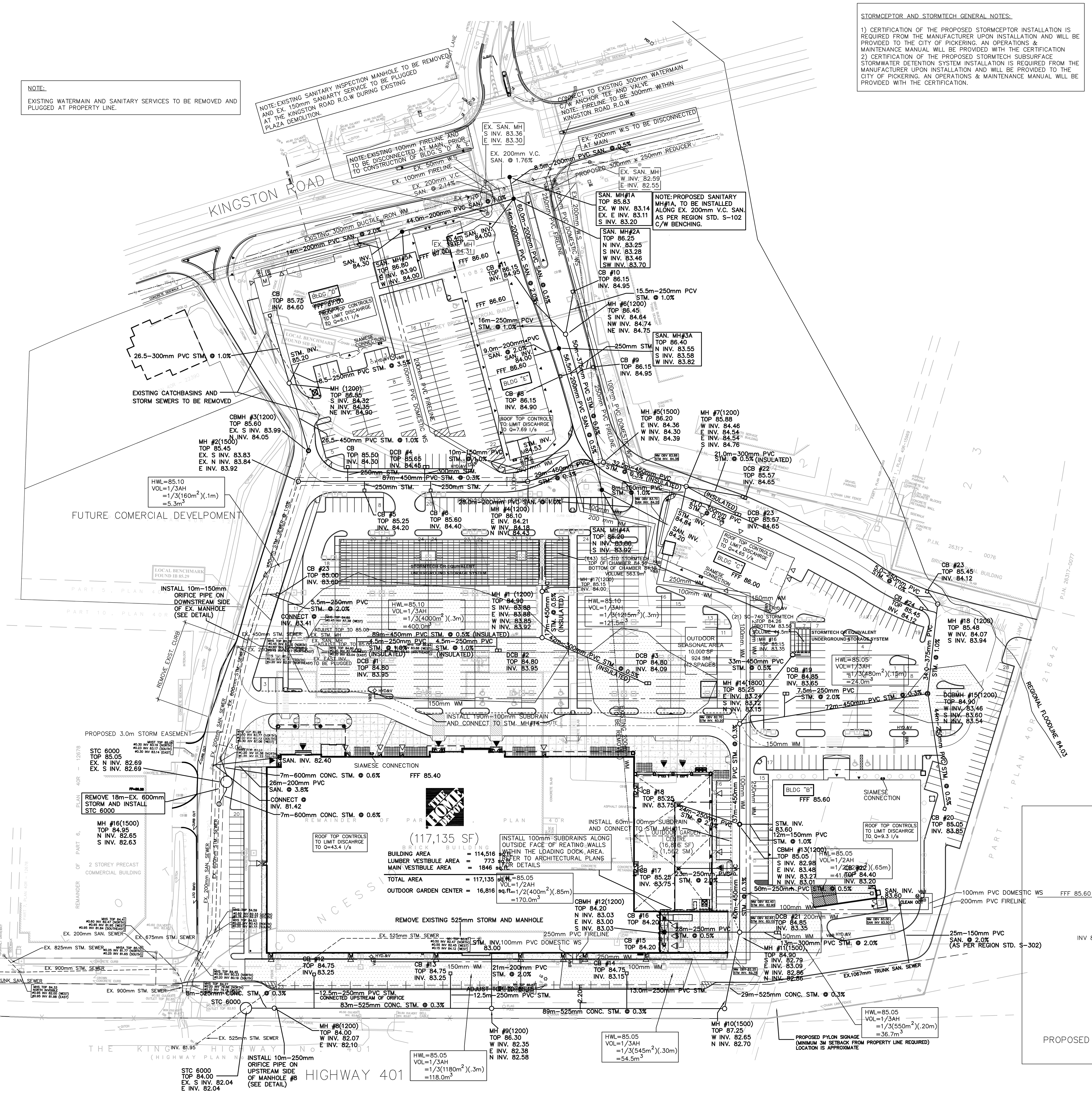
150mm ORIFICE PIPE DETAIL
N.T.S



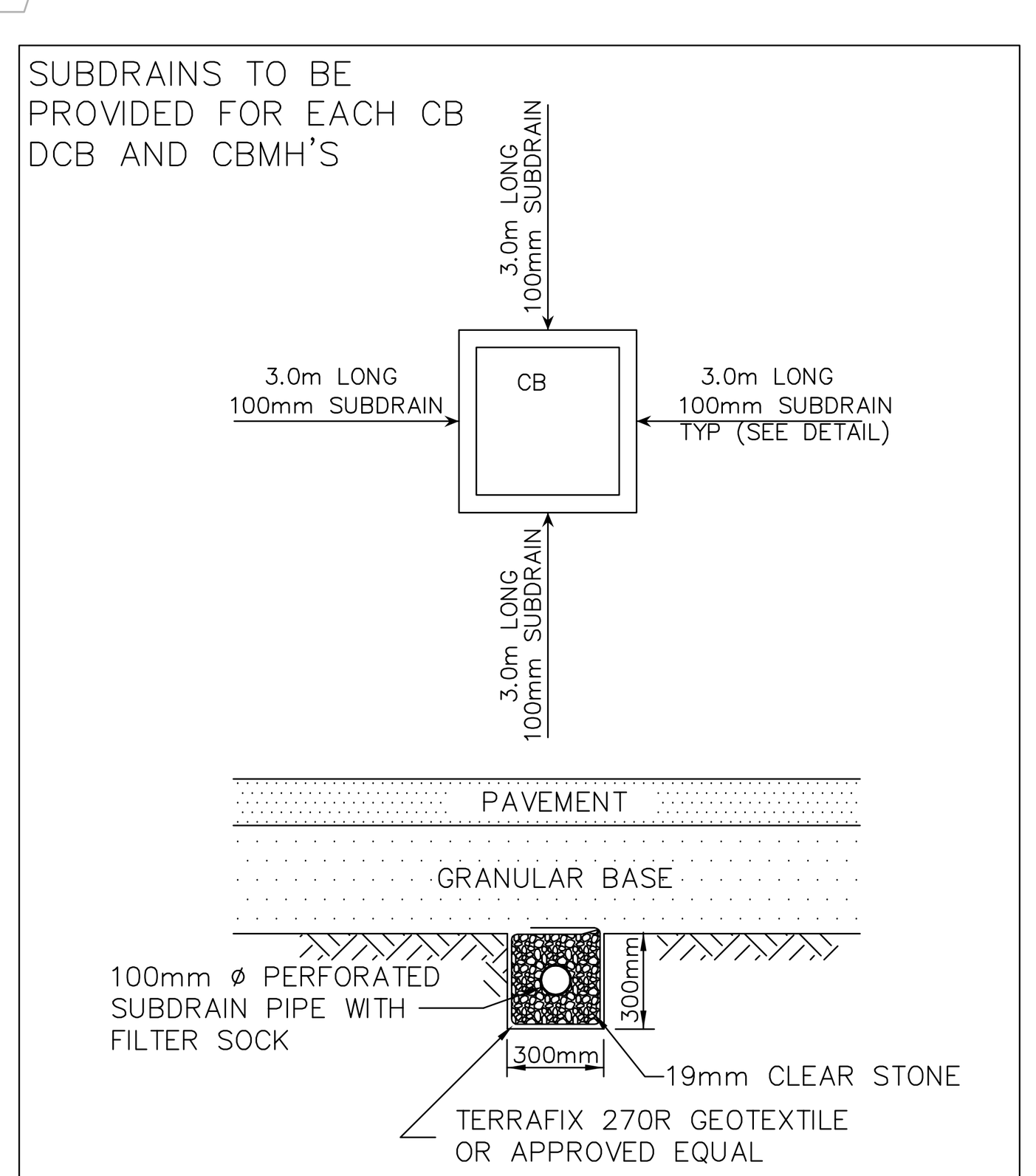
250mm ORIFICE PIPE DETAIL
N.T.S



STORM SEWER INSULATION DETAIL
WHERE DEPTH TO OBVERT IS LESS THAN 1.2m
N.T.S.



NOTE: ALL STORM, SANITARY AND WATER SERVICES TO BE INSTALLED TO 1.5m FROM THE PROPOSED BUILDINGS BY THE SITE SERVICING CONTRACTOR



SUBDRAIN
CROSS SECTION
N.T.S.

STORMCEPTOR AND STORMTECH GENERAL NOTES:

1) CERTIFICATION OF THE PROPOSED STORMCEPTOR INSTALLATION IS REQUIRED FROM THE MANUFACTURER UPON INSTALLATION AND WILL BE PROVIDED TO THE CITY OF PICKERING. AN OPERATIONS & MAINTENANCE MANUAL WILL BE PROVIDED WITH THE CERTIFICATION
2) CERTIFICATION OF THE PROPOSED STORMTECH SUBSURFACE STORMWATER DETENTION SYSTEM INSTALLATION IS REQUIRED FROM THE MANUFACTURER UPON INSTALLATION AND WILL BE PROVIDED TO THE CITY OF PICKERING. AN OPERATIONS & MAINTENANCE MANUAL WILL BE PROVIDED WITH THE CERTIFICATION.

BENCHMARK

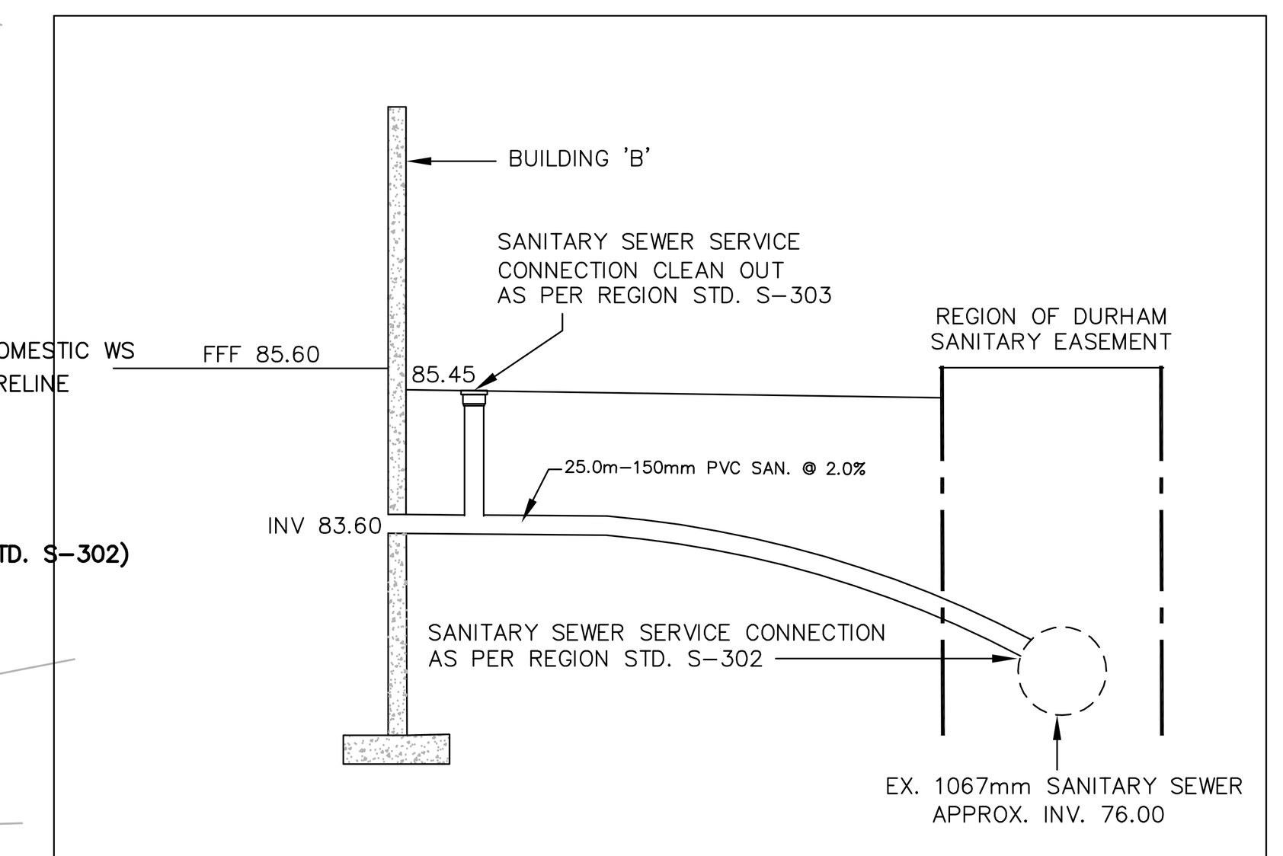
ELEVATIONS ARE GEODETIC AND ARE REFERRED TO THE TOWN OF PICKERING BENCHMARK No. 1-064 HAVING AN ELEVATION OF 91.914 METRES. BRASS CAP SET VERTICALLY IN CHANCE ANCHOR. LOCATED AT ±33m WEST OF CENTRELINE OF THE DIXIE ROAD AND 27.7m SOUTH OF THE EASTERLY PRODUCTION OF CLOUDBERRY COURT. CAP IS LOCATED 0.20 BELOW GRADE.

SERVICING NOTES:

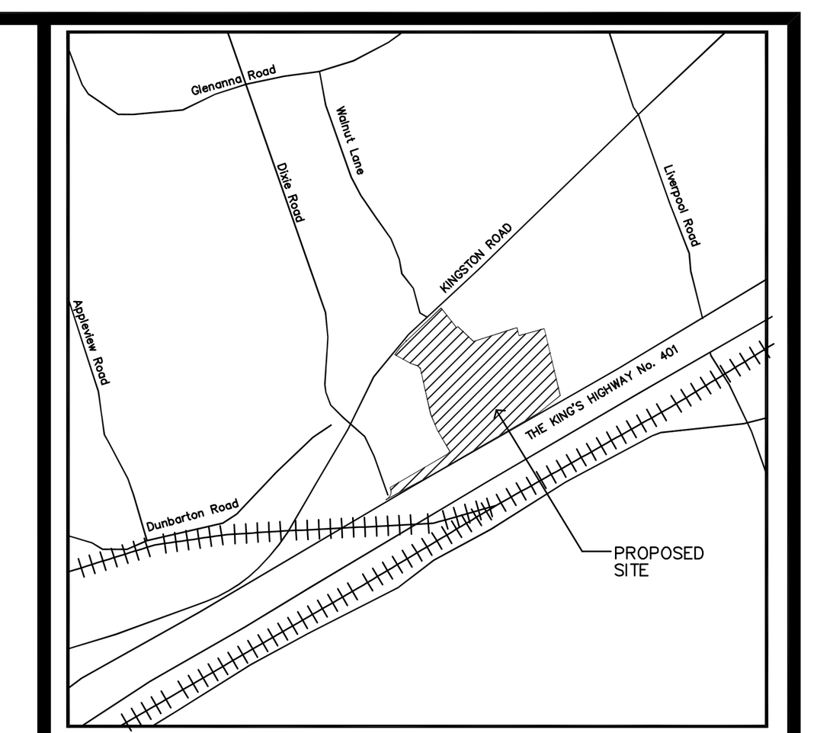
1) ALL SANITARY SEWERS, WATERMAINS AND APPURTENANCES TO COMPLY WITH REGION OF DURHAM STANDARDS AND THE ONTARIO BUILDING CODE
2) SANITARY SEWER CONNECTION TO BE MINIMUM OF 150mm DR28 PVC PIPE, CLASS P BEDDING
3) SANITARY MANHOLES AS PER OPSD 701.010, C/W GRATE AS PER OPSD 401.010
4) ALL STORM SEWERS AND APPURTENANCES TO COMPLY WITH THE ONTARIO PROVINCIAL STANDARDS AND BUILDING CODE
5) STORM SEWER PIPE 450mm AND SMALLER SHALL BE DR35 PVC PIPE, CLASS P BEDDING
6) ALL MANHOLES AND CATCHBASIN MANHOLES AS PER ONTARIO PROVINCIAL STANDARDS
7) ALL CATCHBASINS AS PER THE ONTARIO PROVINCIAL STANDARDS OPSD 705.010, 705.020, C/W GRATE AS PER OPSD 400.020
8) THE FIRST PIPE LENGTH IN AND OUT OF MANHOLES SHALL BE CONCRETE CRADLED TO THE FIRST JOINT
9) BACKFILL ALL MANHOLES WITH COMPACTED GRANULAR MATERIAL WITHIN 1.0m OF THE STRUCTURE
10) ALL TRENCHES TO BE BACKFILLED IN ACCORDANCE WITH THE MUNICIPAL AND REGIONAL STANDARDS
11) GENERALLY A MINIMUM OF 0.25m SHALL BE PROVIDED BETWEEN THE OUTSIDE OF THE PIPE BARRELS AT THE POINT OF CROSSING FOR STORM AND SANITARY SEWERS. A MINIMUM OF 0.5m SHALL BE PROVIDED BETWEEN THE OUTSIDE OF THE PIPE BARRELS AT THE POINT OF CROSSING FOR ALL SEWERS AND WATERMAINS
12) WATERMAINS SHALL BE PVC AS PER A.W.W.A. C-900 (DR18) CLASS P BEDDING. PROVIDE 1.80m MINIMUM COVER ON ALL WATERMAINS AND SERVICE CONNECTIONS

LEGEND

- CATCHBASIN
- DOUBLE CATCHBASIN
- PROPOSED STORM MANHOLE
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED SANITARY MANHOLE
- VALVE AND BOX
- VALVE AND CHAMBER
- HYDRANT AND VALVE
- 85.20 PROPOSED ELEVATION
- × 86.20 EXISTING ELEVATION
- STORMWATER PONDING AREAS



PROPOSED SANITARY SERVICE CONNECTION FOR BUILDING 'B'
SCALE: N.T.S



KEY PLAN
NTS

NO.	DATE	REVISIONS	BY
20	MAY 21/10	RE-ISSUED FOR SPA AND BUILDING 'C' PERMIT	D.C.
19	NOV.23/09	REV. WATERMAIN LAYOUT TO BUILDING 'E'	D.P.
18	SEPT.3/09	RE-ISSUED FOR SPA AND BUILDING 'E' PERMIT	D.C.
17	APR.9/09	REV. GRADING FOR BLDG. 'D'&'E' AS PER CITY COMMENTS	D.C.
16	MAR.18/09	ISSUED FOR BLDG. 'D' PERMIT	D.C.
15	MAR. 3/09	REV. WATER SERVICE FOR BLDG. D & GRADING AT EAST SIDE BLDG. E	D.C.
14	JAN.26/09	ISSUED FOR SPA	D.C.
13	AUG.19/08	REVISED SITE PLAN APPROVAL	D.C.
12	APR.8/08	REVISED METER ROOM LOCATION	D.C.
11	NOV.29/07	ISSUED FOR FINAL APPROVAL	D.C.
10	NOV.16/07	ISSUED FOR FINAL APPROVAL	D.C.
9	OCT.31/07	REVISED AS PER CITY COMMENTS	D.C.
8	OCT.4/07	ISSUED FOR SPA & PERMIT	D.C.
7	SEPT.18/07	REVISED AS PER CITY COMMENTS AND NEW SITE PLAN	D.C.
6	JULY 18/07	ISSUED FOR SPA	D.C.
5	JULY 16/07	REVISED AS PER NEW SITE PLAN	D.C.
4	JUNE 22/07	REVISED AS PER NEW SITE PLAN	D.C.
3	MAY 29/07	REVISED AS PER NEW SITE PLAN	D.C.
2	APR. 7/06	REVISED AS PER NEW SITE PLAN	D.C.
1	JAN.24/06	ISSUED FOR SPA	D.C.

DRAWING ISSUE

DATE	PARTICULARS	BY
	Issued for Design Approval	
	Issued for Site Plan Approval	
	Issued for Pricing and Budgeting	
	Issued for Building Permit	
	Issued for Tendering	
	Issued for Construction	
	Issued for Record Set of Dwgs.	

CONTRACTOR TO BE RESPONSIBLE FOR VERIFYING THE LOCATIONS OF ALL EXISTING UNDERGROUND AND ABOVE UTILITIES AND SERVICES. THE CONTRACTOR SHALL ADVISE THE ENGINEER OF ANY DISCREPANCIES PROIR TO PROCEEDING WITH CONSTRUCTION. VARIOUS UTILITIES CONCERNED TO BE GIVEN REQUIRED ADVANCED NOTICE PRIOR TO ANY DIGGING, FOR STAKE OUT. A.M. CANDARAS ASSOCIATES INC. ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE LOCATION OF EXISTING UTILITIES AS INDICATED ON THIS DRAWING.

a.m.candaras associates inc.
consulting engineers
8551 Weston rd., suite 203
Woodbridge ont. L4L 9R4
905-850-8020 Fax 905-850-8099
Email: civil@amcai.com

PROJECT

PROPOSED COMMERCIAL DEVELOPMENT FOR BROOKDALE CENTRES INC.

1105 KINGSTON ROAD
PICKERING, ONTARIO

DRAWING NAME
SITE SERVICING & STORM WATER MANAGEMENT PLAN

SCALE	DATE OF DWG.	PROJECT NO.
1:750	JAN.24/06	0589
DRAWN BY: DMC	SHEET NO.	G2
CHKD BY: AMC		

FILENAME: 0:\0589\0589-G1.dwg
PLOTDATE: Sep 11, 2012 - 3:21pm
PLOTTED BY: doris