

**FUNCTIONAL SERVICING and STORMWATER MANAGEMENT REPORT**

**IN SUPPORT OF**

**ZONING BY LAW-AMENDMENT and PLAN OF SUBDIVISION**

**CITY PARK (DIXIE ROAD) INC.**

**2103-2119 PRIMATE RD., 1351 & 1357 WEALTHY PL., 2116 & 2112 DIXIE RD.**

**CITY OF MISSISSAUGA**

**REGIONAL MUNICIPALITY OF PEEL**

CONDELAND  
ENGINEERING LTD.

CE

CONDELAND  
ENGINEERING

**January 31, 2018**

**C.E. FILE: 17-017**



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## **A.O. - INTRODUCTION**

The property is located on the West side of Dixie Road, East of Pimate Road, and North of Wealthy Place, City of Mississauga, see Appendix 'A' for Key Map. The subject site is known as 2103-2119 Pimate Road, 1351 & 1357 Wealthy Place, 2116 & 2112 Dixie Road, City of Mississauga, Regional Municipality of Peel and is approximately 1.2651 Ha in size. The subject lands are located within a residential area. Due to the established Regional Road Widening of Dixie Road, the total developable area has been reduced to 1.1118ha. The site location is within Lake Ontario Shoreline East Tributaries Subwatershed. Refer to Credit Valley Conservation Watersheds & Subwatersheds Map in Appendix 'B'. The proposal consists of a 8 Freehold detached units fronting existing municipal Pimate Road, and 18 condominium detached units fronting a proposed common element condo road. In support of the proposed development, we provide this report to identify the methodology of the municipal servicing. More specifically the report will substantiate the ability to provide municipal sanitary, water servicing, and provide a conceptual resolution for storm water management.





## **B.O. - EXISTING TOPOGRAPHICAL CHARACTERISTICS**

See attach Appendix "C" Topographic Survey. The site consists of 8 existing detached homes situated on developed residual lots, with sparse tree covering. The properties also have pool and shed structures. These will be removed to accommodate the development. The majority (90.4%) of the property presently drains in a Southerly direction towards the road ditches of Wealthy Place and Primate Road R.O.W at average slope of 1.2%. The balance of the subject lands; approximately 9.6% drains Northerly towards the regional Dixie Road R.O.W. at average slope of 4.1%.

The existing grading of the Site is comprised of moderate slopes, with an approximately 2.8 metre difference in elevation between the highest and lowest point of the site. The highest grade is at an elevation of 111.59 m adjacent to North property line of the subject lands, and the lowest elevation is 108.77m at the Southeast corner. 325 sq.m. of external area drains to the proposed site, the rear yards of existing residential lot fronting Primate Road.



## **C.O. WATER**

The water supply capacity must be confirmed to ensure the proposed site plan development can be adequately serviced per Region of Peel requirements. As per the e-mail correspondence with Region of Peel dated November 3, 2017, Appendix 'D', external modelling information will be provided by the Region after the first submission of the Functional Servicing Report. Watermain analysis will be carried out after the modelling information is provided.

The 8 freehold detached dwellings fronting Primate Road will be serviced by the existing 150mm dia. main via. New 25mm dia. copper services.

The site plan will be serviced by a single 150mm dia. main connection to Wealthy Place. A valvebox and detector valve is placed at the property line on Wealthy Place per City standards. Internally 150mm dia. main will be looped to provide better circulation. Two private hydrant are proposed to provide 75m fire coverage for the site plan. The hydrant on the North side also serves as a flushing point. Each detach unit will have a separate 25mm dia. copper service complete with a waterbox. The watermain layout has been presented on the Servicing Plan - Drawing # 17-017-02, Appendix "E". It is expected that no future/external developments will be connecting to this site plan, thus the mains do not need to be oversized. Once the deep services have been constructed up to base asphalt, full occupancy demands are expected to occur in a year.



## **D.O. WASTEWATER**

### **EXISTING SANITARY SERVICES**

There are 8 existing detached homes on the subject property that are to be demolished. Two homes are serviced from Dixie Road sanitary sewer, two homes are serviced from Wealthy Place, and three homes are serviced from Primate Road. The 8 service connections are to be de-commissioned.

### **D.1. SITE PLAN (LOTS 1 – 18)**

The proposed development is comprised of 18 detached condominium dwellings (Lot 1 – 18) on 0.8836ha fronting onto a condominium road. Based on Region of Peel's "Sanitary Sewer Design Criteria Manual –Section 2" criteria the peak sanitary flow from the proposed development is calculated as follows:

#### **Residential population estimation**

(Based on 50 persons per hectare)

$$= 50 \text{ persons/hectare} \times 0.8836\text{ha} = 44.18 \text{ persons}$$

#### **Average daily flow**

(Based on 302.8 litres / capita / day)

$$= 44.18 \text{ persons} \times 302.8 / (24 \times 60 \times 60) = 0.15 \text{ litres / second}$$

#### **Peaking Factor**

(Based on the Harmon formula)

$$K = 1 + 14 / (4 + P^{1/2}), \text{ where } P \text{ is population in thousands}$$

$$K = 1 + 14 / (4 + (44.18/1000)^{1/2}) = 4.32, \text{ however the peaking factor is limited to the range of } 2 - 4.$$

#### **Maximum Sanitary Flow**

(Based on Avg. daily flow times the Peaking factor)

$$\text{Max. Sanitary Flow} = 0.15 \text{ litres / second} \times 4 = 0.60 \text{ litres / second}$$



### Wet Weather Infiltration

Area ( 0.2 litres / second / gross hectare ) =  $0.2 \times 0.8836 = 0.18$  litres / second

Manhole ( 0.28 litres / second / manhole ) =  $0.28 \times 5 = 1.4$  litres / second

Sewer ( 0.028 litres / second / m ) =  $0.028 \times 190.1 = 5.3$  litres /second

Total =  $0.18 + 1.4 + 5.3 = 6.9$  litres / second

### Total Design Sanitary Flow

(Based on Max. Sanitary Flow + Infiltration)

Total Design Sanitary Flow =  $0.60 + 6.9 = 7.5$  litres / second

To service the site for sanitary sewage a 250mm diameter connection, Region's minimum size, is proposed to connect to the existing 250 mm diameter municipal sanitary sewer within Wealthy Place. Refer to the Site Servicing Plan (Dwg# 17-017-02) for details of the proposed connection. A 250mm diameter sewer at 0.5% slope has a full flow capacity of 42.01 litres per second well above the calculated total design flow of 7.5 litres per second (approximately 17.9%). See attach Sanitary Sewer Design Chart, Appendix 'F'. It is expected that no future/external development will be connected to this site plan, thus sewer do not to be oversized. Once the sewers have been constructed up to base asphalt, full occupancy demands are expected to occur in a year. As per the external sanitary sewer drainage plan Appendix "G" the site discharge is conveyed by a 250mm sewer along Wealthy Place, Courtland Crescent, Harvest Road before ultimately discharging to a 1050mm dia. sanitary trunk sewer on North Service Road.



## D.2. FREE HOLDS (LOTS 19 – 26)

There are 8 detached homes on 0.2282ha fronting onto municipal Primate Road.

### Residential population estimation

(Based on 50 persons per hectare)

$$= 50 \text{ persons/hectare} \times 0.2282\text{ha} = 11.41 \text{ persons}$$

### Average daily flow

(Based on 302.8 litres / capita / day)

$$= 11.41 \text{ persons} \times 302.8 / (24 \times 60 \times 60) = 0.04 \text{ litres / second}$$

### Peaking Factor

(Based on the Harmon formula)

$$K = 1 + 14 / (4 + P^{1/2}), \text{ where } P \text{ is population in thousands}$$

$$K = 1 + 14 / (4 + (44.18/1000)^{1/2}) = 4.41, \text{ however the peaking factor is limited to the range of } 2 - 4.$$

### Maximum Sanitary Flow

(Based on Avg. daily flow times the Peaking factor)

$$\text{Max. Sanitary Flow} = 0.04 \text{ litres / second} \times 4 = 0.16 \text{ litres / second}$$

### Wet Weather Infiltration

$$\text{Area ( 0.2 litres / second / gross hectare)} = 0.2 \times 0.2282 = 0.05 \text{ litres / second}$$

$$\text{Manhole ( 0.28 litres / second / manhole )} = \text{Existing}$$

$$\text{Sewer ( 0.028 litres / second / m )} = \text{Existing}$$

### Total Design Sanitary Flow

(Based on Max. Sanitary Flow + Infiltration)

$$\text{Total Design Sanitary Flow} = 0.16 + .05 = 2.1 \text{ litres / second}$$

To service these 8 lots, residential service connections will be made to the existing 250mm diameter sewer on Primate Road. The existing 250mm diameter sewer at 0.81% slope has a full flow capacity of



53.47 litres per second well above the calculated total design flow of 2.1 litres per second (approximately 3.9%). Similar to the site plan, the freehold lots discharge is conveyed by a 250mm sewer along Primate Road, Courtland Crescent, Harvest Road before ultimately discharging to a 1050mm dia. sanitary trunk sewer on North Service Road.



## **€.0. - STORM WATER MANAGEMENT**

### **€.1. QUALITY CONTROL MEASURES**

As per e-mail correspondence with the City, no quality control will be required, see Appendix "H".

### **€.2. WATER BALANCE ANALYSIS**

The water balance target for the subject development is based on the following criteria: *the minimum on-site runoff retention requires the proponent to retain all runoff from a small design rainfall event, typically 5mm through infiltration, evapotranspiration and rainwater reuse.*

Given the type of development being townhouses; Chambermaxx have been proposed for onsite retention as the Low Impact Development (LID) practice. A geotechnical report is not available at the time of this report to determine if groundwater levels and percolation rates allow for infiltration trenches.

This technique is highly effective for infiltration, however it is dependent that the in-situ soils have adequate percolation rates; the minimum Ministry of Environment (M.O.E.) level is 15 mm/hour. The chambermaxx system will capture drainage from the majority of the site, excluding the front yards of Lots 19 - 26. Prior to construction; field soils percolation rate testing of the native soils will be required for the design of infiltration facilities. These infiltration trenches were designed for the entire site based on the mentioned percolation rate and target water retention of 5mm retention over a 48hr drawdown time.

Please Refer to Appendix 'I' for the Infiltration Quantity Analysis and Chambermaxx design details.

The runoff volume required to be retained on site is 33.30cu.m. The Chambermaxx alone provides 41.23cu.m, of runoff volume storage below the outlet invert. In terms of infiltration surface area, 115.61sq.m. is required for a 48hr drawdown time, 229.04sq.m is provided.



### €.3. STORMWATER QUANTITY CONTROL

City criteria for this site requires the 100 year post- development flows must be equal to or less than the 2 year pre-development flows.

As mentioned in a previous section, section *A.O.*, the total developable land is 1.11 Ha. This excludes the lands that will be conveyed for Regional road widening, which will be graded uncontrolled towards Dixie Road. The front yards of Lots 19 – 26, 0.08ha, will be graded uncontrolled towards Primate Road. The balance of the site, 1.03ha, will be controlled internally by the site plan sewers and discharged to an upsized 250mm dia. storm sewer on Wealthy Place. No additional storm drainage shall be conveyed from the subject lands to Dixie Road.

Under pre-development conditions a total of 0.11 hectares in area drains Northerly towards Dixie Road. The balance of the tributary area equal to 1.00 hectares drains Southerly to Primate Road and Wealthy Place.

### €.4. PRIMATE ROAD / WEALTHY PLACE OUTLET

The Wealthy Place Outlet defines the primary stormwater outlet for proposed development limiting the maximum Site discharge to pre-development levels. The maximum allowable site discharge is limited to the 2-year pre-development discharge of 50.29 lps. A SWM control system is proposed to provide sufficient quantity control and on-Site storage restricting discharge to the maximum allowable 2-year pre-development level. A 100 mm diameter orifice pipe is proposed at MH1. A controlled discharge of 40.93 lps (over-controlled) will outlet via the orifice into the 250mm dia. storm sewer on Primate Road. The existing 250mm dia. storm sewer drains southerly.





Please find within Appendix 'J', the Stormwater Management Quantity Analysis (using the modified 'Rationale' method) with the applicable calculations.

Refer to these calculations for details of control, on-site underground storage within the proposed sewer SWM system, and orifice pipe design for the Storm Control manhole. The 100-yr storm event post development analysis has been completed. The proposed storm sewer system layout is indicated on the Servicing Plan Dwg# 17-017-02.

## **€.5. PAVEMENT / WALKWAYS, ROOF AND LANDSCAPED AREAS**

As previously indicated, the maximum allowable Site discharge to Wealthy Place Storm Sewer must be limited to 50.29 lps under post-development conditions for all storm events up to and including the 100-year storm. Due to constraints related to existing grading, there is a total uncontrolled drainage area of 783 sq.m. of front-yard grassed area (Lot 19 - 26) that drains directly to Primate Road ditch boulevards. The allowable site discharge has been reduced in accordance with the uncontrolled flow rate. The maximum storage required during the 100-year storm event is 236.03 cubic metres. For a design head of 2.06 metres; representative of a maximum Top of Water Level (TWL) elevation of 108.60. metres the underground storage (storm sewer pipe network & chambermaxx) within the proposed storm sewer system totals 246.07 cu.m., thereby meeting the storage requirement of 236.03 cu.m.

To control discharge a standard 100mm dia. orifice plate (@ Inv 106.49 ) is proposed immediately upstream of MH1. The resultant 100mm diameter orifice pipe controlled discharge is equal to 40.93 lps based on a design head of 2.06 m, which is less than the 2-yr pre-development level.



## **F.O. DESIGN BASIS**

Below are the assumptions used in the analysis:

1. No storm quality control required per City.
2. No future/external development will be connecting the site plan, thus the sewers have been nominally sized for this project.
3. Geotechnical or Hydrogeological Report not available at the time of preparing this report.  
Assumed percolation rate of 15mm/hr until in-situ testing can be done.



## **G.O. CONCLUSIONS AND RECOMMENDATIONS**

In summary, the existing municipal services are such that they can support the subject development.

On a basis of our investigation and examination, it is the conclusion of the writer that:

- The subject development can be drained for sanitary sewage purposes.
- The existing municipal water supply can adequately service the subject development;
- Adequate storm drainage and storm water management facilities qualitative can be provided within the subject development area to neutralize the impact of urbanized runoff.
- No additional storm runoff shall be conveyed from the subject lands to Dixie Road
- The first 5mm of daily rainfall will be retained On-Site.

In summary, the existing municipal services are such that they can support the subject development.

Respectfully Submitted:

**CONDELAND ENGINEERING LIMITED**

PLANNERS, PROJECT MANAGERS AND CONSULTING ENGINEERS

Steven Nguyen, P.Eng.

Intermediate Designer



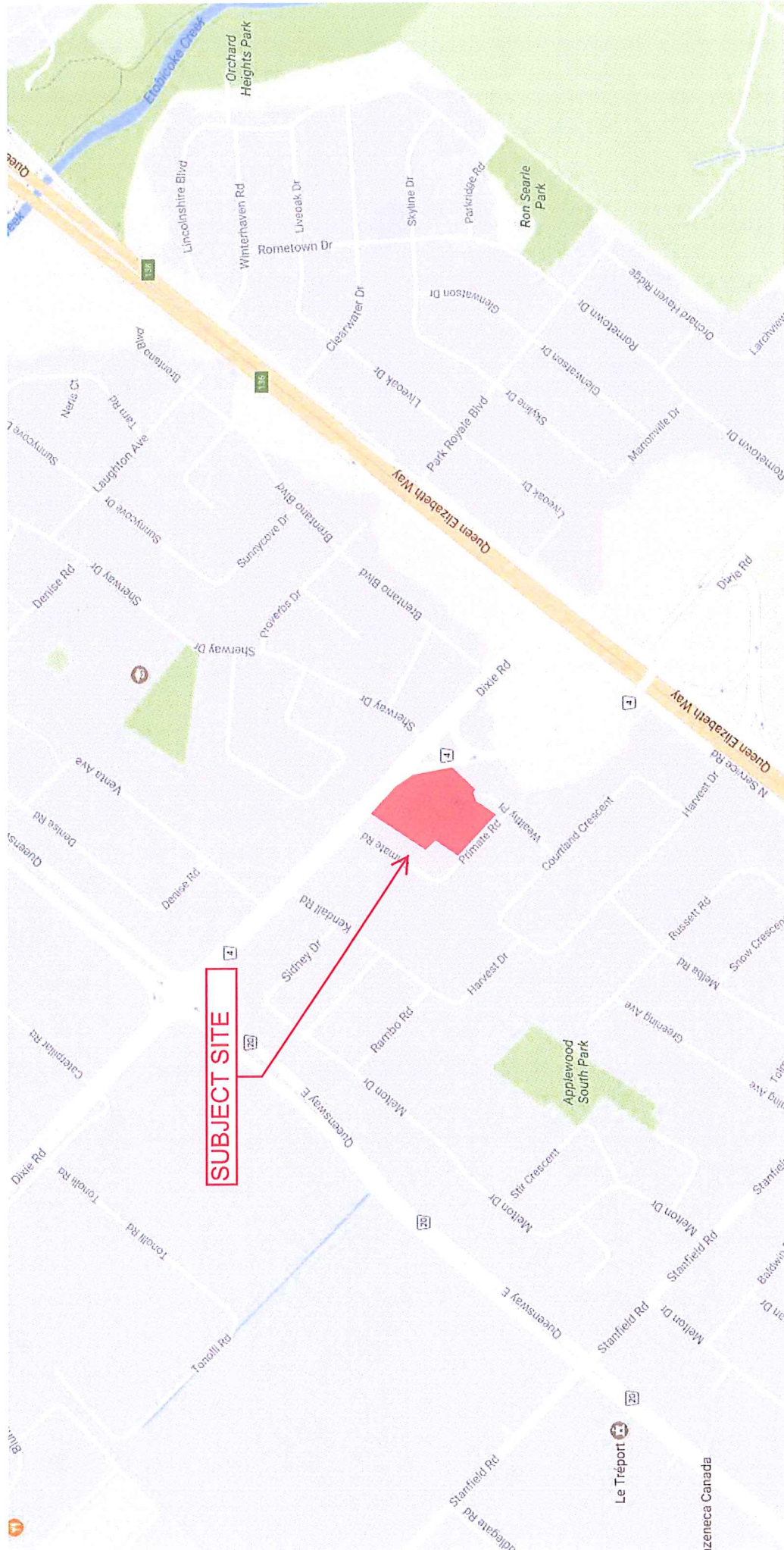
Michael Hall, P.Eng.

Senior Engineer



## ***APPENDIX 'A'***

### ***- Key Map***



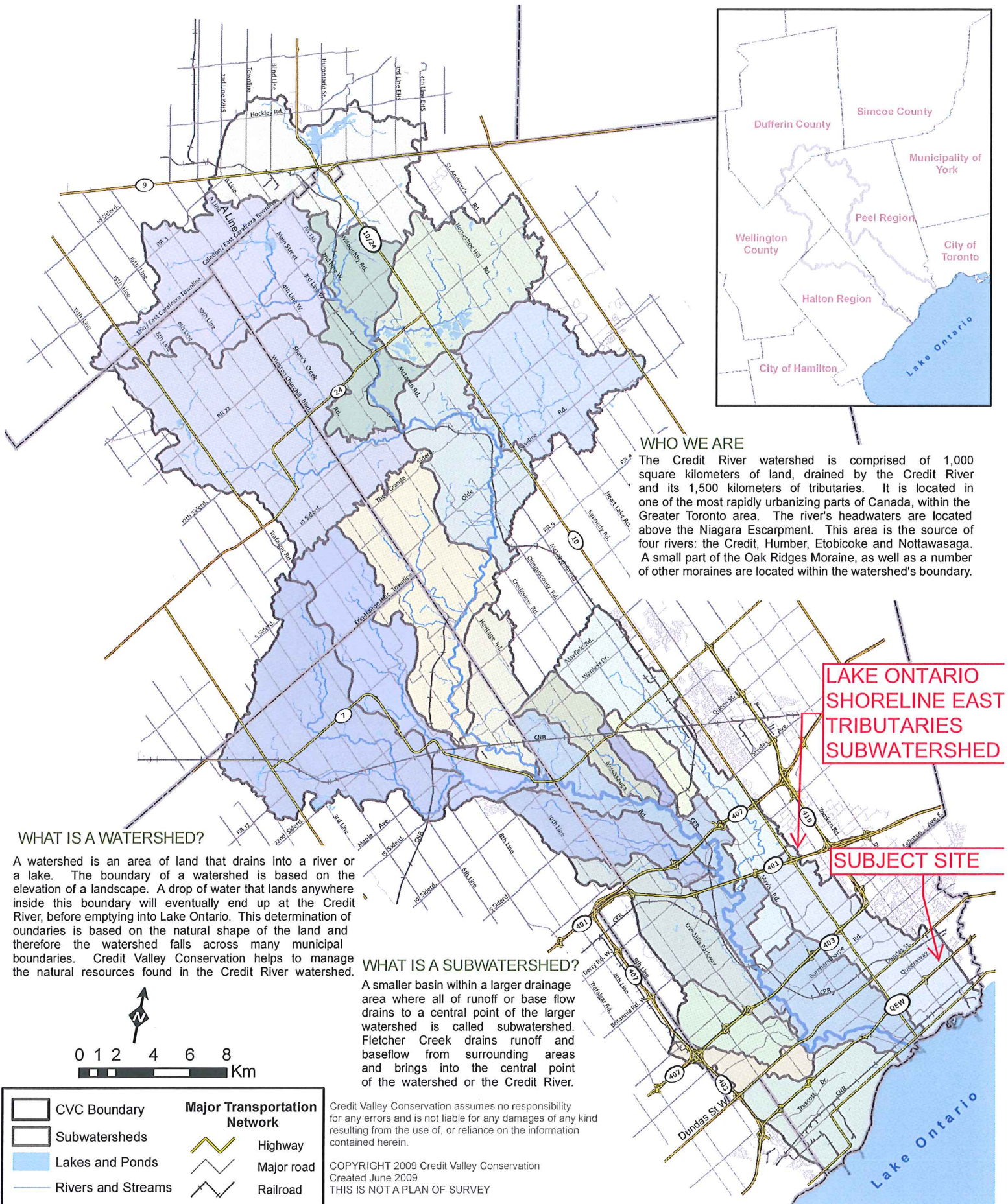
KEY MAP N.T.S.



## ***APPENDIX 'B'***

***- Credit Valley Conservation Watershed Map***





## ***APPENDIX 'C'***

### ***- Topographic Survey***







## ***APPENDIX 'D'***

- E-mail correspondence with Region of Peel with regards to Watermain Distribution Modelling dated November 3, 2017.***





Steven Nguyen &lt;steven@condeland.com&gt;

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**City Park (Dixie) Inc. - Watermain Connection Site Plan**

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**Clark, Carol** <carol.clark@peelregion.ca>

Fri, Nov 3, 2017 at 2:18 PM

To: Steven Nguyen &lt;steven@condeland.com&gt;

Cc: "Sniatenchuk, Bernadette" &lt;bernadette.sniatenchuk@peelregion.ca&gt;, "Frandsen, Iwona" &lt;iwona.frandsen@peelregion.ca&gt;

Good Afternoon Steven,

This site has not been circulated to the Region of Peel, for Site Plan approval and therefore is premature for Site Plan Servicing review. We were also recently requested to provide modelling for this site and advised that Site Plan circulation is required, per the attached email.

With the future Site Servicing Submission, please include the non-refundable \$400 First Submission application fee as per current fee by-law 60-2016. Payment shall be in the form of a certified Cheque, money order or bank draft and made payable to the Region of Peel. All fees may be subject to change on annual basis pending Council approval. Once your application is received, it will be forwarded to a Servicing Technical Analyst for review and comments.

Please Refer to the most current Region of Peel Standards and Design Criteria per the links below. This will assist you with your servicing layout. Servicing for the proposed development must comply with the Local Municipality's Requirements for the Ontario Building Code and most current Region of Peel standards.

Complete Public Works Design, Standards Specification & Procedures Manual: <http://www.peelregion.ca/pw/other/standards/>

Water Design Criteria: <http://www.peelregion.ca/pw/other/standards/linear/design/pdfs/water-design.pdf>

Sanitary Sewer Design Criteria: <http://www.peelregion.ca/pw/other/standards/linear/design/pdfs/sani-sewer.pdf>

Storm Sewer Design Criteria: <http://www.peelregion.ca/pw/other/standards/linear/design/pdfs/sewer-design.pdf>

For location of existing water and sanitary sewer Infrastructure please contact Records at 905-791-7800 extension 7882 or by e-mail at

[PWSERVICERequests@peelregion.ca](mailto:PWSERVICERequests@peelregion.ca).

Please note that Site Servicing approvals are required prior to the local municipality issuing Building Permit.

Regards,

Carol Clark  
Supervisor, Site Plan Servicing  
Engineering, Development Services  
Public Works

(905) 791-7800 ext. 7838  
(905) 791-1442  
carol.clark@peelregion.ca



**From:** Steven Nguyen [mailto:steven@condeland.com]  
**Sent:** November 3, 2017 10:04 AM  
**To:** Clark, Carol  
**Subject:** City Park (Dixie) Inc. - Watermain Connection Site Plan

[Quoted text hidden]

----- Forwarded message -----

From: "Clark, Carol" <carol.clark@peelregion.ca>  
To: "Kumar, Abhi" <Abhi.Kumar@wsp.com>, "Sniatenchuk, Bernadette" <bernadette.sniatenchuk@peelregion.ca>  
Cc:  
Bcc:  
Date: Fri, 20 Oct 2017 14:47:21 +0000  
Subject: RE: FW: Hydraulic Model Request

Good Morning Abhi,

Thank you, the information you provided is very helpful.

During the Pre-consultation (application number DARC 17-192) comments were provided that modelling will be done with the Plan of Subdivision through the receipt of a Functional Servicing Report. Please refer to the attached link for Functional Servicing Report criteria: <http://www.peelregion.ca/pw/other/standards/linear/reports/pdfs/swm-fsr-final-july2009.pdf>

We require this report before we can conduct the modelling. If you provide the report and the Subdivision application number, we will review the report and if it is satisfactorily completed, we will forward it for modelling.

Sincerely,

Carol Clark  
Supervisor, Site Plan Servicing  
Engineering, Development Services  
Public Works

(905) 791-7800 ext. 7838  
(905) 791-1442  
carol.clark@peelregion.ca



**From:** Kumar, Abhi [mailto:[Abhi.Kumar@wsp.com](mailto:Abhi.Kumar@wsp.com)]

**Sent:** October 20, 2017 9:50 AM

**To:** Clark, Carol

**Subject:** Re: FW: Hydraulic Model Request

Hey Carol,

Please see my answers highlighted below; I have also attached a site plan for your perusal.

Please let me know if any other info. is needed. Thanks.

- Site Plan number and/or Plan of Subdivision number or any other Planning application number associated with your development

DARC 17-192

- Site address and/or legal description

2103-2119 Primate Road, 1351 & 1357 Wealthy Place, 2116 & 2112 Dixie Road, Mississauga (see attachment)

- Connection points and sizes to Peel's infrastructure

150mm dia. PVC connection to Primate Road, see attach preliminary servicing plan.

- Type of residential development i.e. single family dwelling, townhouses etc.

8 single detach freehold units and 18 pottls single detach.

Thanks,

Abhi

**Abhishek Kumar, MSc, EIT**

Engineering Intern

Hydrualics



T+ 1 905-882-1100 #6475

100 Commerce Valley Drive W

Thornhill, Ontario,

L3T 0A1, Canada

***APPENDIX 'E'***

***- Servicing Plan***

***- Grading Plan***

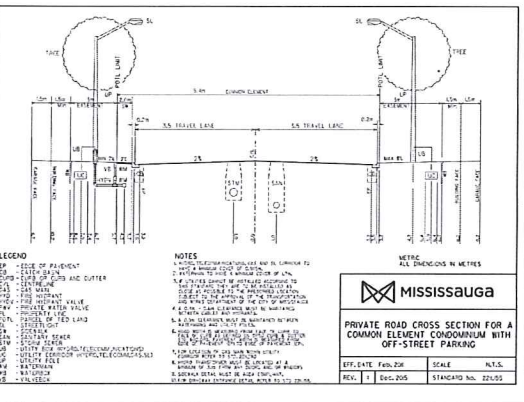


# A) PLANNING AND BUILDING DEPARTMENT

- I) "I HEREBY CERTIFY THAT THIS DRAWING CONFORMS IN ALL RESPECTS TO THE SITE DEVELOPMENT PLANS AS APPROVED BY THE CITY OF MISSISSAUGA UNDER FILE NUMBER \_\_\_\_\_"
- II) "THE CITY OF MISSISSAUGA REQUIRES THAT ALL WORKING DRAWINGS SUBMITTED TO THE BUILDING DIVISION AS PART OF AN APPLICATION FOR THE ISSUANCE OF A BUILDING PERMIT SHALL BE CERTIFIED BY THE ARCHITECT OF ENGINEER AS BEING IN CONFORMITY WITH THE SITE DEVELOPMENT PLAN AS APPROVED BY THE CITY OF MISSISSAUGA."
- III) "GRADES WILL BE MET WITHIN A 33% MAXIMUM SLOPE AT THE PROPERTY LINES AND
- IV) "THE STRUCTURAL DESIGN OF ANY RETAINING WALL OVER 0.60M IN HEIGHT OR ANY RETAINING WALL LOCATED ON A PROPERTY LINE IS TO BE SHOWN ON THE SITE GRADING PLAN FOR THIS PROJECT AND IS TO BE APPROVED BY THE CONSULTING ENGINEER FOR THE PROJECT."

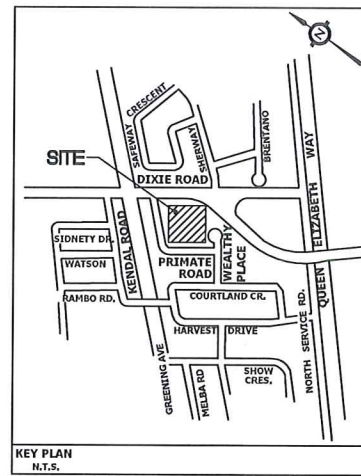
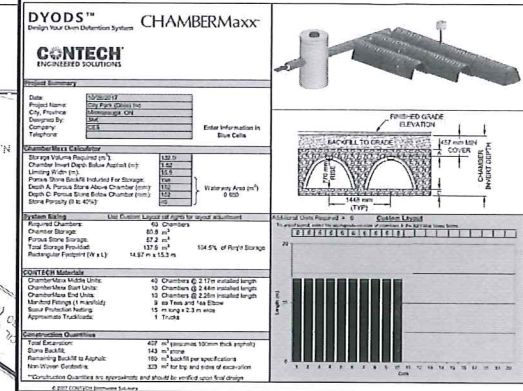
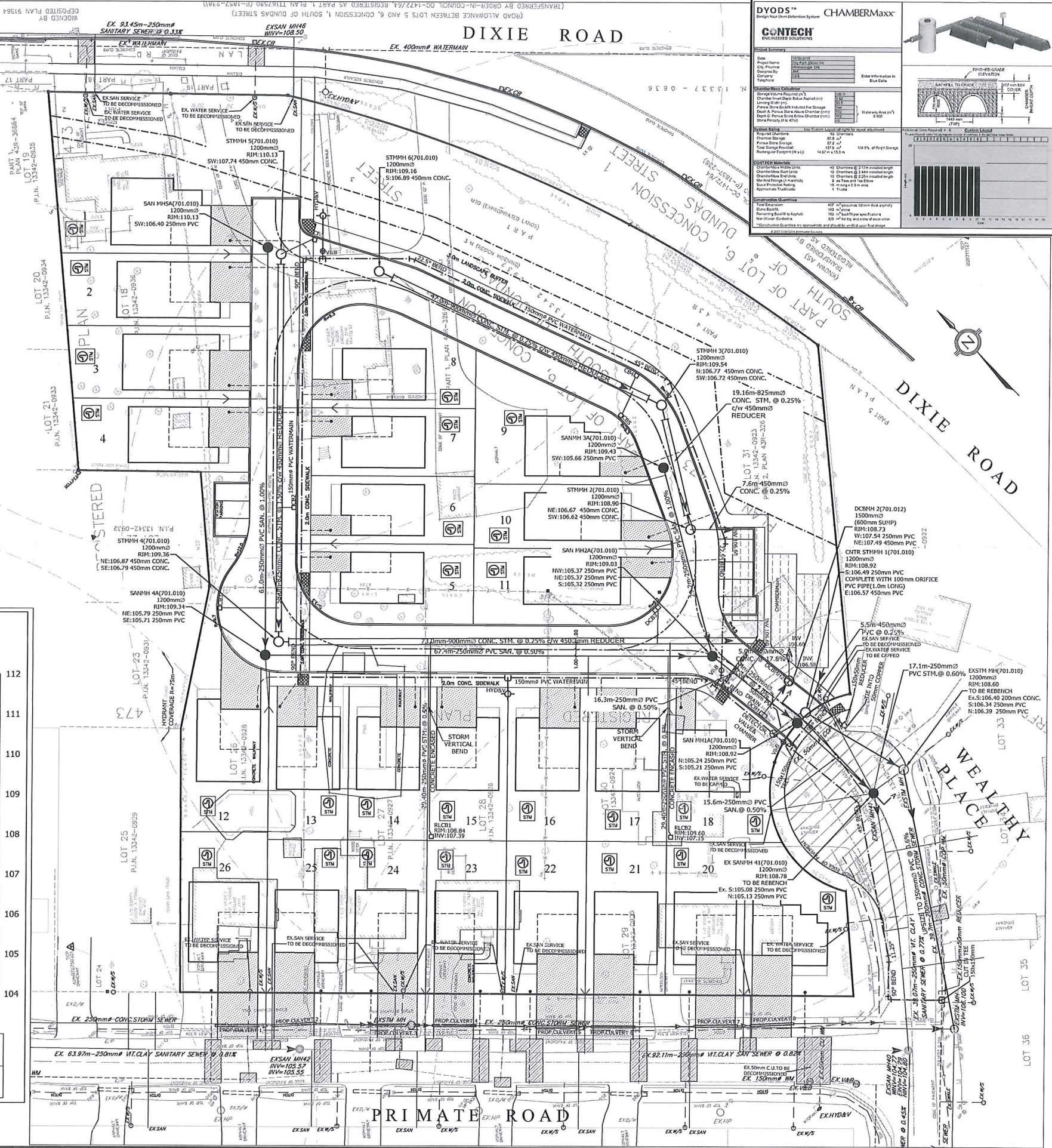
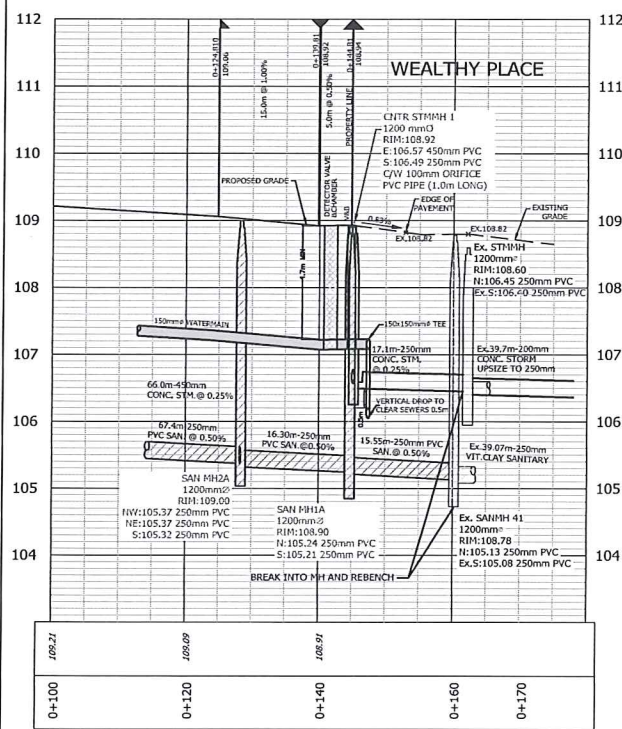
## CONSTRUCTION & RESTORATION WORKS FOR MUNICIPAL R.O.W.s, PRIMATE ROAD AND WEALTHY PLACE

1. PROPOSED STORM, SANITARY, AND WATER BUILDING CONNECTIONS WITHIN EXISTING MUNICIPAL R.O.W.s ARE TO BE BACKFILLED WITH UNSHRINKABLE FILL UP TO BASE OF EXISTING ROAD GRANULAR, EXISTING ROAD GRANULAR AND ASPHALT TO BE MATCHED WITH MINIMUM THICKNESSES IN ACCORDANCE WITH CITY STANDARD 2220.03.
2. TRENCH CONSTRUCTION / RESTORATION SHALL BE IN ACCORDANCE WITH CITY STANDARDS 2220.03, 2220.031, AND 2220.032.
3. BOULEVARD AREAS SHALL BE RESTORED TO EXISTING CONDITIONS OR BETTER.



NOTE:  
EXISTING CULVERTS TO BE REMOVED

## SITE PLAN CONNECTION A-A



## LEGEND

- VC VALVE AND CHAMBER
- VB VALVE AND BOX
- EX. MANHOLE
- PROPOSED STM MANHOLE
- PROPOSED SAN MANHOLE
- PROPOSED CATCHBASIN
- PROP. FIRE HYDRANT
- SUMP PUMP DISCHARGE TO SURFACE
- LIMIT OF BOUNDARY
- HYDRANT 75m RADIUS COVERAGE CONFIRMATION
- EXISTING CULVERT
- PROPOSED CULVERT
- PROPOSED WATERMAIN
- PROPOSED SAN SERVICE
- PROPOSED 250mm WATER SERVICE AND CURB STOP
- PROPOSED DITCH
- EXISTING DITCH
- PROPOSED CENTERLINE/STA
- LOT LINE
- TACTILE SURFACE
- RETAINING WALL

BENCHMARK NOTE  
ELEVATIONS SHOWN HEREON ARE REFERRED TO THE CITY OF MISSISSAUGA BENCHMARK No. 551 HAVING AN ELEVATION OF 108.675 METRES LOCATED ON THE EAST FACE AT THE MAIN ENTRANCE OF APPLEWOOD PUBLIC SCHOOL, ON THE WEST SIDE OF HARVEST DRIVE, 30.5 METRES SOUTH OF KENDALL ROAD.

1. FIRST SUBMISSION	JAN.09.18	S.Ng.
REVISION BLOCK	DATE	APPR. BY

**CITY PARK (DIXIE) INC.**  
2103-2119 PRIMATE ROAD, 1351 & 1357 WEALTHY PLACE, 2116& 2112 DIXIE ROAD



APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF CONDELAND ENGINEERING LIMITED AS TO DESIGN AND SPECIFICATION  
DIRECTOR OF DEVELOPMENT/TRANSPORTATION ENGINEERING  
DATE:

**CE CONDELAND ENGINEERING LTD.**

Consulting Engineers and Project Managers  
350 CREDITSTONE ROAD, UNIT 800  
CONCORD, ON, L4H 3Z2  
PHONE: (905) 695-8006  
FAX: (905) 695-8009



## SERVICING PLAN

DESIGNED BY: S.NG.	DATE: JANUARY 2018	CHECKED BY: M.E.H.
DRAWN BY: G.M.	DRAWING NO.	
SCALES		CITY FILE
HOR 1:300	17-017-02	DARC 17-192



1. ALL SURFACE DRAINAGE WILL BE SELF CONTAINED, COLLECTED AND DISCHARGED AT A LOCATION TO BE APPROVED PRIOR TO THE ISSUANCE OF A BUILDING PERMIT.
2. THE PORTIONS OF THE DRIVEWAY WITHIN THE MUNICIPAL BOULEVARD WILL BE PAVED BY THE APPLICANT.
3. ALL EXCESS EXCAVATED MATERIAL WILL BE REMOVED FROM THE SITE
4. THE EXISTING DRAINAGE PATTERN WILL BE MAINTAINED

A) PLANNING AND BUILDING DEPARTMENT

i) "I HEREBY CERTIFY THAT THIS DRAWING CONFORMS IN ALL RESPECTS TO THE SITE DEVELOPMENT PLANS AS APPROVED BY THE CITY OF MISSISSAUGA UNDER FILE NUMBER

ii) "THE CITY OF MISSISSAUGA REQUIRES THAT ALL WORKING DRAWINGS SUBMITTED TO THE BUILDING DIVISION AS PART OF AN APPLICATION FOR THE ISSUANCE OF A BUILDING PERMIT SHALL BE CERTIFIED BY THE ARCHITECT OF ENGINEER AS BEING IN CONFORMITY WITH THE SITE DEVELOPMENT PLAN AS APPROVED BY THE CITY OF MISSISSAUGA."

iii) "GRADES WILL BE MET WITHIN A 33% MAXIMUM SLOPE AT THE PROPERTY LINES AND

iv) "THE STRUCTURAL DESIGN OF ANY RETAINING WALL OVER 0.60M IN HEIGHT OR ANY RETAINING WALL LOCATED ON A PROPERTY LINE IS TO BE SHOWN ON THE SITE GRADING PLAN FOR THIS PROJECT AND IS TO BE APPROVED BY THE CONSULTING ENGINEER FOR THE PROJECT."

CONSTRUCTION & RESTORATION WORKS FOR MUNICIPAL R.O.W.S.  
PRIMATE ROAD AND WEALTHY PLACE

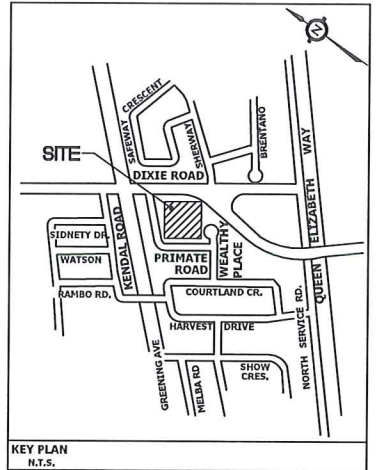
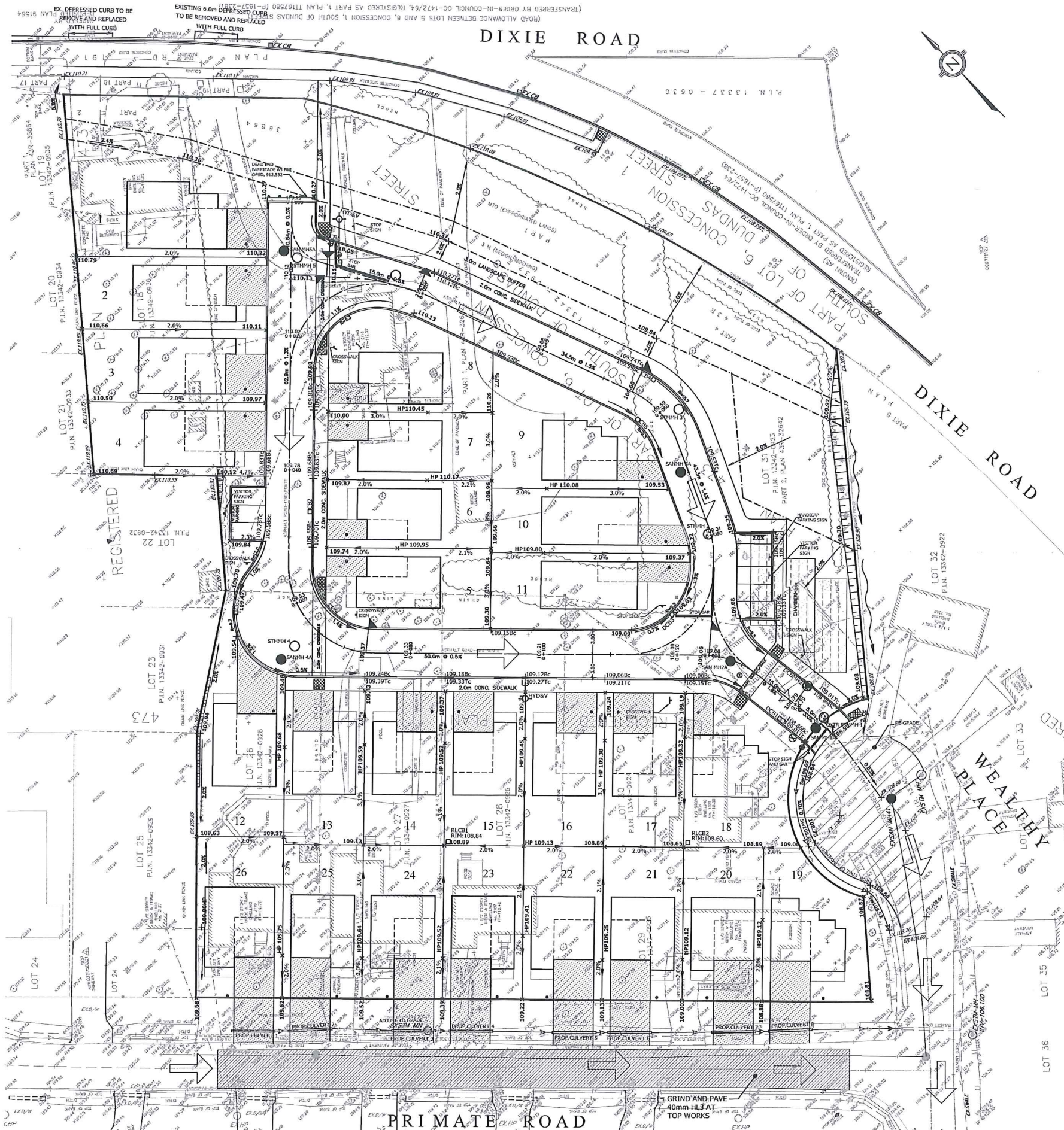
1. PROPOSED STORM, SANITARY, AND WATER BUILDING CONNECTIONS WITHIN EXISTING MUNICIPAL R.O.W.S ARE TO BE BACKFILLED WITH UNSHRINKABLE FILL UP TO BASE OF EXISTING ROAD GRANULAR, EXISTING ROAD GRANULAR AND ASPHALT TO BE MATCHED WITH MINIMUM THICKNESSES IN ACCORDANCE WITH CITY STANDARD 2220.03.

2. TRENCH CONSTRUCTION / RESTORATION SHALL BE IN ACCORDANCE WITH CITY STANDARDS 2220.03, 2220.031, AND 2220.032.

3. BOULEVARD AREAS SHALL BE RESTORED TO EXISTING CONDITIONS OR BETTER.

PROPOSED CULVERT TABLE				
LOT No	SIZE	LENGTH	E INV	W INV
LOT 26	300mmØ	6.6m	108.86	108.81
LOT 25	300mmØ	6.6m	108.78	108.73
LOT 24	300mmØ	6.6m	108.58	108.53
LOT 23	300mmØ	6.6m	108.45	108.40
LOT 22	300mmØ	6.6m	108.30	108.25
LOT 21	300mmØ	6.6m	108.21	108.16
LOT 20	300mmØ	6.6m	108.12	108.07
LOT 19	300mmØ	6.6m	108.08	108.03

NOTE:  
EXISTING CULVERTS TO BE REMOVED



LEGEND

- EX. MANHOLE
- PROPOSED STM MANHOLE
- PROPOSED SAN MANHOLE
- PROPOSED CATCHBASIN
- PROP. FIRE HYDRANT
- SUMP PUMP (DETAIL REFER TO DWG 15-048-09)
- LIMIT OF BOUNDARY
- PROP.CHAIN LINK FENCE
- PROP. WOOD ACOUSTIC FENCE
- PROP. TRANSFORMER
- PROP. LIGHT STANDARD
- 180.00 PROPOSED ELEVATION
- 215.93 EXISTING ELEVATION
- LS 8 EXIST. LIGHT STANDARD
- HP EXIST. HYDRO POLE
- STB STANDARD IRON BAR
- W EXIST. WATER METER LOCATION
- PROP. DRAINAGE ARROW
- EXISTING DRAINAGE PATTERN
- EMERGENCY OVER LAND FLOW ROUTE
- RETAINING WALL
- 3:1 SLOPE
- SWALE

BENCHMARK NOTE  
ELEVATIONS SHOWN HEREON ARE REFERRED TO THE CITY OF MISSISSAUGA BENCHMARK No. 351 HAVING AN ELEVATION OF 108.875 METRES LOCATED ON THE EAST FACE AT THE MAIN ENTRANCE OF APPLEWOOD PUBLIC SCHOOL ON THE WEST SIDE OF HARVEST DRIVE, 30.5 METRES SOUTH OF KENDALL ROAD.

1. FIRST SUBMISSION	JAN.09.18	S.Ng
REVISION BLOCK	DATE	APPR. BY

CITY PARK (DIXIE) INC.  
2103-2119 PRIMATE ROAD, 1351 & 1357  
WEALTHY PLACE, 2116& 2112 DIXIE ROAD



APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF CONDELAND ENGINEERING LIMITED AS TO DESIGN AND SPECIFICATION

DIRECTOR OF DEVELOPMENT/TRANSPORTATION ENGINEERING  
DATE:

CE CONDELAND ENGINEERING LTD.

Consulting Engineers and Project Managers

350 CRESTSTONE ROAD, UNIT 800  
CONCORD, ON, L4H 3Z2

PHONE (905) 675-8096  
FAX (905) 675-8099



GRADING PLAN

DESIGNED BY: S.NG.	DATE: JANUARY 2018	CHECKED BY: M.E.H.
DRAWN BY: G.M.	DRAWING NO.	
SCALES		CITY FILE
HOR 1:300	17-017-03	DARC 17-192





## ***APPENDIX 'F'***

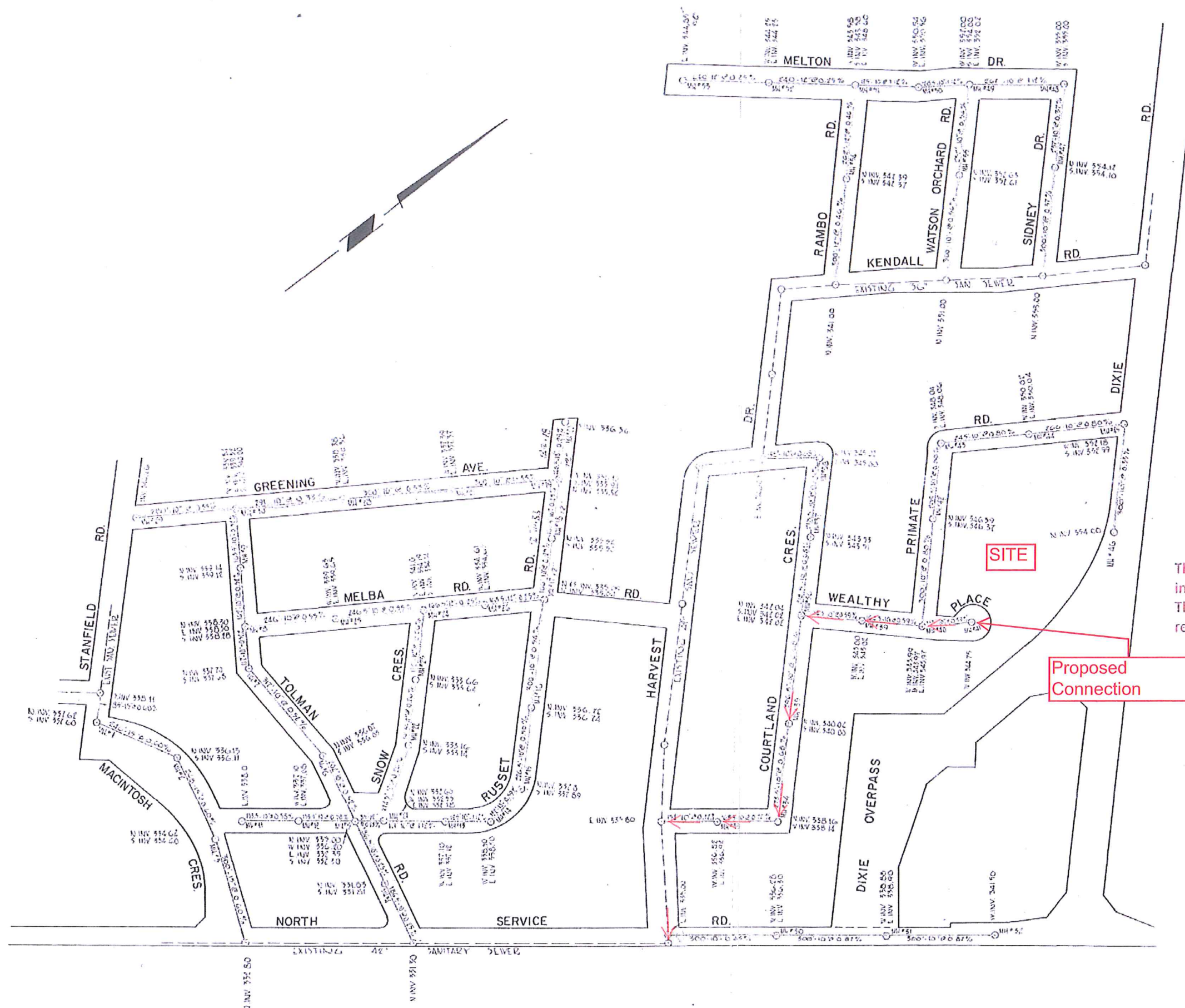
### ***- Sanitary Design Sheet***

LOCATION	FROM M.H.	TO M.H.	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (ha)	CUMULATIVE POPULATION	PEAKING FACTOR	PEAK DAY FLOW = (7)(8)/192(L/s)	INFILTRATION (L/s)	TOTAL FLOW = (9) + (12) (L/s)	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	FULL FLOW CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	ACTUAL FLOW VELOCITY (m/s)	UPPER END INVERT (m)	UPPER END MH LOSSES (m)	LOWER END INVERT (m)	PERCENTAGE UTILIZATION (%)
CITY PARK (DIXIE ROAD) INC. SITE - 2103-2119 PRIMATE RD., 1351 & 1357 WEALTHY PL., 2116 & 2112 DIXIE RD.																					
CITY PARK (DIXIE ROAD) INC. SITE																					
Private Road	MH5A	MH4A	0.3186	50.00	16	0.3186	16	4.00	0.223	2.052	2.275	61.0	250	1.00%	59.41	1.21	0.57	106.40		105.79	3.8%
Private Road	MH4A	MH2A	0.2704	50.00	14	0.5890	29	4.00	0.413	4.273	4.686	67.4	250	0.50%	42.01	0.86	0.56	105.71	0.080	105.37	11.2%
Private Road	MH3A	MH2A	0.2627	50.00	13	0.2627	13	4.00	0.274	1.150	1.424	29.2	250	1.00%	59.41	1.21	0.49	105.66		105.37	2.4%
Private Road	MH2A	MH1A	0.0319	50.00	2	0.8836	44	4.00	0.920	6.166	7.086	16.3	250	0.50%	42.01	0.86	0.63	105.32	0.050	105.24	16.9%
MUNICIPAL ROAD																					
Wealthy Place	MH1A	EX.MH41			0	0.8836	44	4.00	0.920	6.880	7.800	15.5	250	0.50%	42.01	0.86	0.65	105.21	0.030	105.13	18.6%
Wealthy Place	EX.MH41	EX.MH40			0	0.8836	44	4.00	0.920	6.546	7.466	39.1	250	0.77%	52.13	1.06	0.74	105.08	0.050	104.80	14.3%
REGION OF PEEL CRITERIA					PROJECT: CITY PARK (DIXIE ROAD) INC.										CITY OF MISSISSAUGA / REGION OF PEEL						
POPULATION DENSITY CRITERIA:					CONTRACT NO: 17-017																
Single Detached = 50 persons / ha					LOCATION: 2103-2119 PRIMATE RD., 1351 & 1357 WEALTHY PL., 2116 & 2112 DIXIE RD.										SANITARY SEWER DESIGN SHEET						
Dom. Sewage Flows = 302.8 L/cap/day																					
PEAKING FACTOR = 1 + 14/(4+P <sup>(1/2)</sup> ), (min. 2 - max. 4)					MISSISSAUGA, ONTARIO										SHEET 1 OF 1						
WET WEATHER INFILTRATION																					
(area) = 0.2 L/s/ha					CONSULTANT: CONDELAND ENGINEERING LIMITED										DESIGNED BY : S.N. CHECKED BY: M.E.H. DATE: October 31, 2017						
(manhole)= 0.28 L/s/mh																					
(Sewer)= 0.028 L/s/m																					



## ***APPENDIX 'G'***

***- External Sanitary Sewer Drainage Plan – Applewood East Acres***



# **DISCLAIMER**

These records are based upon available and unverified information and may prove inaccurate. The Region of Peel disclaims any responsibility should these records be relied upon to the detriment of any person.

## **EXTERNAL SANITARY SEWER DRAINAGE PLAN**

TOWNSHIP OF TORONTO			
COUNTY OF PEEL			
ENGINEERING DEPARTMENT			
PROPOSED SANITARY SEWERS			
APPLEWOOD - EAST ACRES			
PN 27-61			
DATE	6 8 7	DESIGNED BY	I. S. D. S.
DATE	I. S. 2	DRAWN BY	G. SUKKE
JULY 20, 1961			



## ***APPENDIX 'H'***

- E-mail correspondence with City with regards to storm quality control requirements.***



350 Creditstone Road, Unit 200,  
Concord, Ontario, L4K 3Z2

Tel: (905) 695-2096 (ext. 26), Fax: (905) 695-2099  
Email: [mike@condeland.com](mailto:mike@condeland.com)

**NOTE: The information in this electronic mail is private and confidential, and only intended for the addressee. Should you receive this message in error, you are hereby notified that any disclosure, reproduction, distribution or use of this message is strictly prohibited. Please inform the sender by reply transmission and delete the message without copying or opening any attachments.**

On Mon, Jun 5, 2017 at 10:12 AM, Ghazwan Yousif <[Ghazwan.Yousif@mississauga.ca](mailto:Ghazwan.Yousif@mississauga.ca)> wrote:

Hi Michael,

For the first site Dixie Road, Primate Road and Wealthy Place, this site within the Applewood watershed, which required to control 100 year post development flow to the 2 year pre development level. Outlet is the existing 250mm storm sewer on Primate Rd. the Plan and profile drawing # C05179. No quality control will be required. For water balance first 5mm of rain to be retained within your site. I will send you the drainage plan and design sheet later

For the North-west corner of Main Street and Wyndham Street, this site within the Streetsville area which is under special requirements so you require to control 100 year post to the 2 year pre. Storm sewer outlet is the existing 250mm storm sewer on Wyndham Street also 450mm on Main Street. The Plan and profile drawing # C12986, C21791. **Please note that this site within the CVC regulated area.** No quality control will be required. For water balance first 5mm of rain to be retained within your site. I will send you the drainage plan and design sheet later

Regards,

Ghazwan



## ***APPENDIX 'I'***

- Infiltration Quantity Analysis.***
- ChamberMaxx Design Specifications***

**INFILTRATION QUANTITY ANALYSIS - CITY PARK (DIXIE) INC.****\*Percolation Rate Used=****15** (mm/hr)**\* In-situ Percolation Rate for the site not available yet.****The minimum percolation rate of 15mm/hr required for infiltration is used.****Trench Design**

Calculate Trench Bottom Area Using Equation = 4.3 (MOE SWM Manual)

$$A = 1000 V / PnT$$

Where

A = Trench Bottom Area (sq.m)

V = Runoff Volume to be infiltrated

P = Percolation rate in mm/hr

n = Porosity of the Storage Media (Clear Stone = 0.33, as per Geotechnical Consultant)

T = Retention Time in hours

**Calculating Runoff Volume to be infiltrated**

	<b>Area</b>	<b>100-yr Co-efficient</b>	<b>Approx. Imp. Area</b>
<b>Total Roof Area</b>	3477.00 m <sup>2</sup>	0.9	3129.30 m <sup>2</sup>
<b>Total Road Area</b>	2493.00 m <sup>2</sup>	0.9	2243.70 m <sup>2</sup>
<b>Total Landscape f:</b>	5144.00 m <sup>2</sup>	0.25	1286.00 m <sup>2</sup>

First 5mm of every rainfall event must be retained on-site, therefore:

5.0 mm

**Total Site****33.30 cu.m.****Total Volume Required****33.30 cu.m.****Calculating Required Trench Bottom Area**

P (percolation rate mm/h) =

**15**

n = Porosity of storage media (clear stone)

**0.4**

	<b>Runoff Volume</b> (cu.m)	<b>Retention Time (T) hrs</b>	<b>Required Trench</b> <b>Bottom Area (sq.m)</b>
<b>Total Site</b>	33.30	48.00	115.61



### Calculating Depth of Storage Media (Trench Depth)

Using Equation 4.2 (MOE SWM Manual)

$$D = PT/1000$$

Where

D = Depth of Storage Media (m)

P = Percolation Rate (mm/hr) =

15.00

T = Drawdown Time (hrs) =

48.00

Depth (m) = D = 0.72

Use Depth(m) = 0.75

### Percolation Rate Over Trench Area, or $Q_{infiltration}$

Location	Total Trench Bottom Area (sq.m)	$Q_{infiltration}$ (m <sup>3</sup> /h)	$Q_{infiltration}$ (lps)
Chambermaxx (below outlet invert)	229.04	0.011	0.003
<b>Total</b>	<b>229.04</b>		

### Checking Storage availability (Chambermaxx below outlet invert)

Location	Trench Bottom Area (sq.m)	Depth (m)	Trench Volume (cu.m)	Storage Media Volume (cu.m)
Chambermaxx	229.04	0.45	103.07	41.23
<b>Total Volume Provided</b>				<b>41.23</b>

DYODS™

Design Your Own Detention System

CHAMBERMaxx™



Project Summary

Date:

Project Name:

City, Province:

Designed By:

Company:

Telephone:

10/26/2017

City Park (Dixie) Inc

Mississauga, ON

JAK

CES

Enter Information in  
Blue Cells

ChamberMaxx Calculator

Storage Volume Required (m<sup>3</sup>):

Chamber Invert Depth Below Asphalt (m):

Limiting Width (m):

Porous Stone Backfill Included For Storage:

Depth A: Porous Stone Above Chamber (mm):

Depth C: Porous Stone Below Chamber (mm):

Stone Porosity (0 to 40%):

132.0

1.52

15.0

Yes

152

152

40

Waterway Area (m<sup>2</sup>)  
0.980

System Sizing

Required Chambers:

Chamber Storage:

Porous Stone Storage:

Total Storage Provided:

Rectangular Footprint (W x L):

Use Custom Layout (at right) for layout adjustment

60 Chambers

80.8 m<sup>3</sup>

57.2 m<sup>3</sup>

137.9 m<sup>3</sup>

14.97 m x 15.3 m

104.5% of Req'd Storage

CONTECH Materials

ChamberMaxx Middle Units:

ChamberMaxx Start Units:

ChamberMaxx End Units:

Manifold Fittings (1 manifold):

Scour Protection Netting:

Approximate Truckloads:

40 Chambers @ 2.17m installed length

10 Chambers @ 2.44m installed length

10 Chambers @ 2.26m installed length

9 ea Tees and 1 ea Elbow

15 m long x 2.3 m wide

1 Trucks

Construction Quantities

Total Excavation:

Stone Backfill:

Remaining Backfill to Asphalt:

Non-Woven Geotextile:

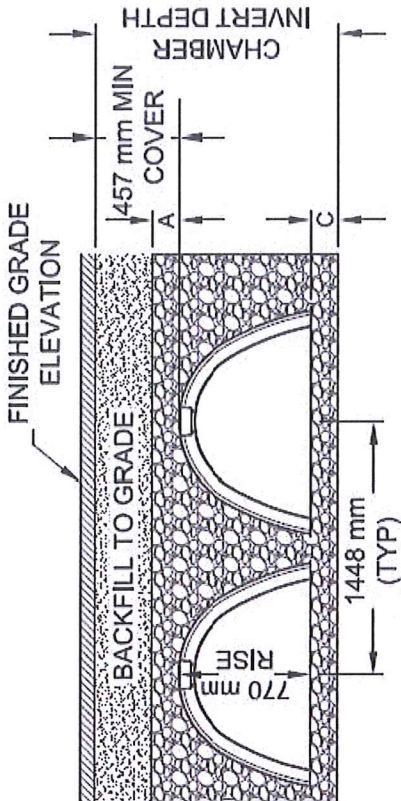
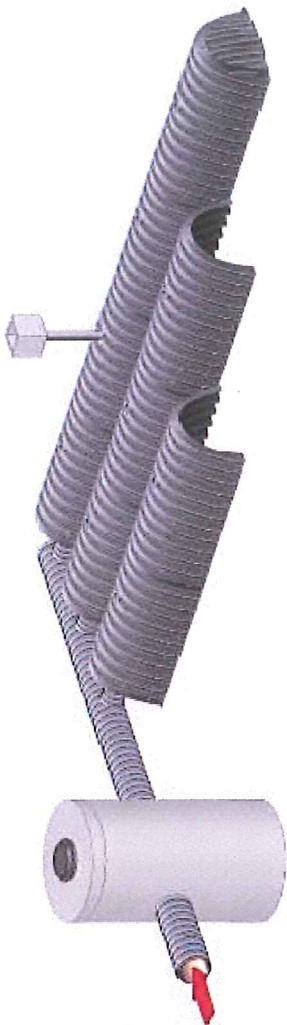
407 m<sup>3</sup> (assumes 100mm thick asphalt)

143 m<sup>3</sup> stone

160 m<sup>3</sup> backfill per specifications

323 m<sup>2</sup> for top and sides of excavation

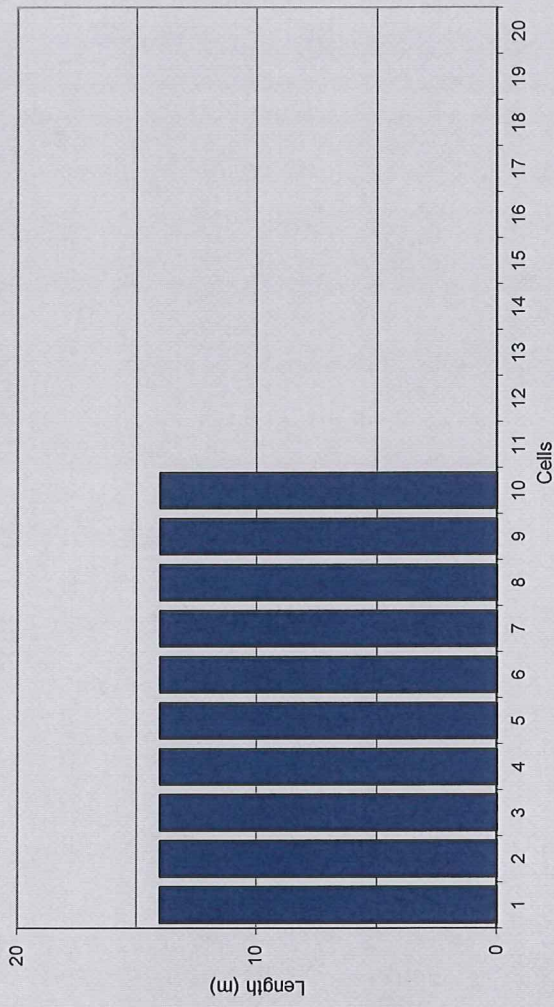
**\*\*Construction Quantities are approximate and should be verified upon final design**



Additional Units Required = 0 Custom Layout

To adjust layout, select the appropriate number of chambers in the light blue boxes below.

6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---





## ***APPENDIX 'J'***

- ***Stormwater Quantity Control Analysis***
  - ***Stage Storage Analysis***
  - ***100-year RLCB Capacity Check***
- ***Pre-development Storm Tributary Plan***
- ***Post-development Storm Tributary Plan***

\*\*\*\*\*

CONELAND ENGINEERING LIMITED  
TECHNICAL DIVISION  
SITE PLAN STORM WATER MANAGEMENT

\*\*\*\*\*

PROJECT NUMBER: 17-017  
PROJECT LOCATION: 2103-2119 Primate Rd, 1351 & 1357 Wealthy Pl, 2116 & 2112 Dixie rd  
CITY OF MISSISSAUGA

CLIENT: CITY PARK (DIXIE ROAD) INC. 9/29/2017

\*\*\*\*\*

A. SITE CRITERIA

TOTAL DEVELOPABLE SITE AREA:		11118.00	SQ.M.	
<u>EXISTING CONDITIONS</u>		(Site Area) 10051.00 SQ.M.	(External Area) 0.00 SQ.M.	(Total Area) 10051.00 SQ.M.
Site Area draining to Primate Rd./ Wealthy Pl.		10051.00 SQ.M.	0.00 SQ.M.	10051.00 SQ.M.
HARD SURFACES		2144.00 SQ.M.	0.00 SQ.M.	2144.00 SQ.M.
SOFT SURFACES		7907.00 SQ.M.	325.00 SQ.M.	8232.00 SQ.M.
				2yr-Runoff Coefficient 0.30 0.45 0.25
<u>PROPOSED CONDITIONS</u>		Controlled Area 10657.00 SQ.M.	Un-Controlled Area 783.00 SQ.M.	Total Area 11115.00 SQ.M.
HARD SURFACES		5500.00 SQ.M.	470.00 SQ.M.	5970.00 SQ.M.
SOFT SURFACES		4832.00 SQ.M.	313.00 SQ.M.	5145.00 SQ.M.
SOFT SURFACES (EXTERNAL)		325.00 SQ.M.	0.00 SQ.M.	0.00 SQ.M.
		Un-Controlled Area		Runoff Coefficient 0.64
<u>PROPOSED CONDITIONS</u>		783.00 SQ.M.		100 yr-Runoff Coefficient 0.59 0.90 0.25 0.25



**B. SITE CONTROL REQUIREMENTS**  
(NO ROOF TOP CONTROLS HAVE BEEN IMPLEMENTED, THEREFORE BUILDING AND PAVEMENT AREAS WILL BE COMBINED BELOW:)

MAX ALLOWABLE SITE DISCHARGE (BASED ON 2YRS, 15min. TC, 0.30 runoff coeff.) =  $(10051 \times 0.30) \times (2.778 \times (610 \times (15 + 4.6 \times (-0.78))) / 10000)$   
(2-YR PRE-DEVELOPMENT FLOW TO PRIMATE ROAD & WEALTHY PLACE) **50.29 LPS**

UNCONTROLLED OVERLAND FLOW (BASED ON 2YRS, 15min. TC, 0.64 runoff coeff.) = **8.34 LPS**  
(2-YR POST-DEVELOPMENT FLOW TO PRIMATE ROAD)

MAX ALLOWABLE SITE DISCHARGE REDUCED FOR UNCONTROLLED OVERLAND FLOW = **41.95 LPS**

**C. STORM NETWORK**

**C.1 PAVEMENT CONTROLLED AND UNCONTROLLED RUNOFF AREA**

CONTROLLED AREA	UN-CONTROLLED AREA	100 YR-RUNOFF COEFFICIENT
EXTERNAL AREA	0.00 SQ.M.	0.25
PAVEMENT / DRIVEWAY / WALKWAY AREA:	470.00 SQ.M.	0.90
SOFT LANDSCAPE	313.00 SQ.M.	0.25
TOTAL AREA=	783.00 SQ.M.	

**C.2. EQUIVALENT RUNOFF COEFFICIENT FOR P&B&L AREAS**

R(100YR)= CONTROLLED 0.6402

**C.3. STORAGE REQUIREMENTS FOR P&B&L AREAS**

100-YR STORM CONTROL  
RAN (CONTROLLED)= 1.7333

RAN (UNCONTROLLED)= 0.1392

The maximum Controlled discharge is the maximum allowable Site discharge less the Uncontrolled discharge = 50.29 LPS  
2.06 M  
HOWEVER FOR 100mm DIA SHORT TUBE ORIFICE (SECT.I) WITH HEAD  
MAXIMUM ORIFICE DISCHARGE IS = 41.95 LPS  
Qctrl-discharge = 40.93 LPS

TIME (min)	INTENSITY mm/hr	Qcontrolled lps	Qtotal lps	Qctrl-discharge lps	change in flow lps	storage volume cu.m.
10.00	203.31	352.38	352.38	40.93	311.45	186.87
15.00	158.27	274.32	274.32	40.93	233.39	210.05
20.00	130.68	226.50	226.50	40.93	185.56	222.68
25.00	111.89	193.94	193.94	40.93	153.01	229.51
30.00	98.21	170.23	170.23	40.93	129.29	232.72
35.00	87.76	152.11	152.11	40.93	111.18	233.47
40.00	79.50	137.79	137.79	40.93	96.85	232.44
45.00	72.78	126.15	126.15	40.93	85.21	230.07
50.00	67.21	116.49	116.49	40.93	75.55	226.66
				therefore total storage required= during the 100 yr storm	233.47	C.U.M.

#### C.4. STORAGE PROVIDED

TOTAL UNDER GROUND STORAGE @ MAX. TOP OF WATER LEVEL (T.W.L.) = 108.60 M

SEE STORAGE DATA ATTACHED

246.07

#### C.5. ORIFICE DESIGN

TOTAL STORAGE PROVIDED =

246.07 C.U.M.

> 233.47 (VERIFIED)

FOR A STANDARD 100MM DIA. ORIFICE PIPE

MAX. PIPE OUTFLOW=  
UNCONT. OUTFLOW =

40.93 LPS  
8.34 LPS

(Overland flow to Primate Road)

TOTAL SITE MAX. OUTFLOW (Overcontrolled)=

49.27 LPS

<= 2yr pre-develop = 50.29 l/s

#### MAX. STORAGE LEVEL

MAX. T.W.L.=  
PIPE INVERT =  
HEAD =

108.60 M  
106.49 M  
2.06 M

STORAGE REQ. = 233.47 C.U.M.  
STORAGE PROV. = 246.07 C.U.M.

Q=

ca(2gh)<sup>0.5</sup>

0.82

A=  
diameter=

0.0079 sq.m.  
100.00 mm

THEREFORE A 100mm DIA. ORIFICE PIPE IS VERIFIED

prepared by,  
CONDELAND ENGINEERING LIMITED

Steven Nguyen P.Eng.

Mike Hall, P.Eng.

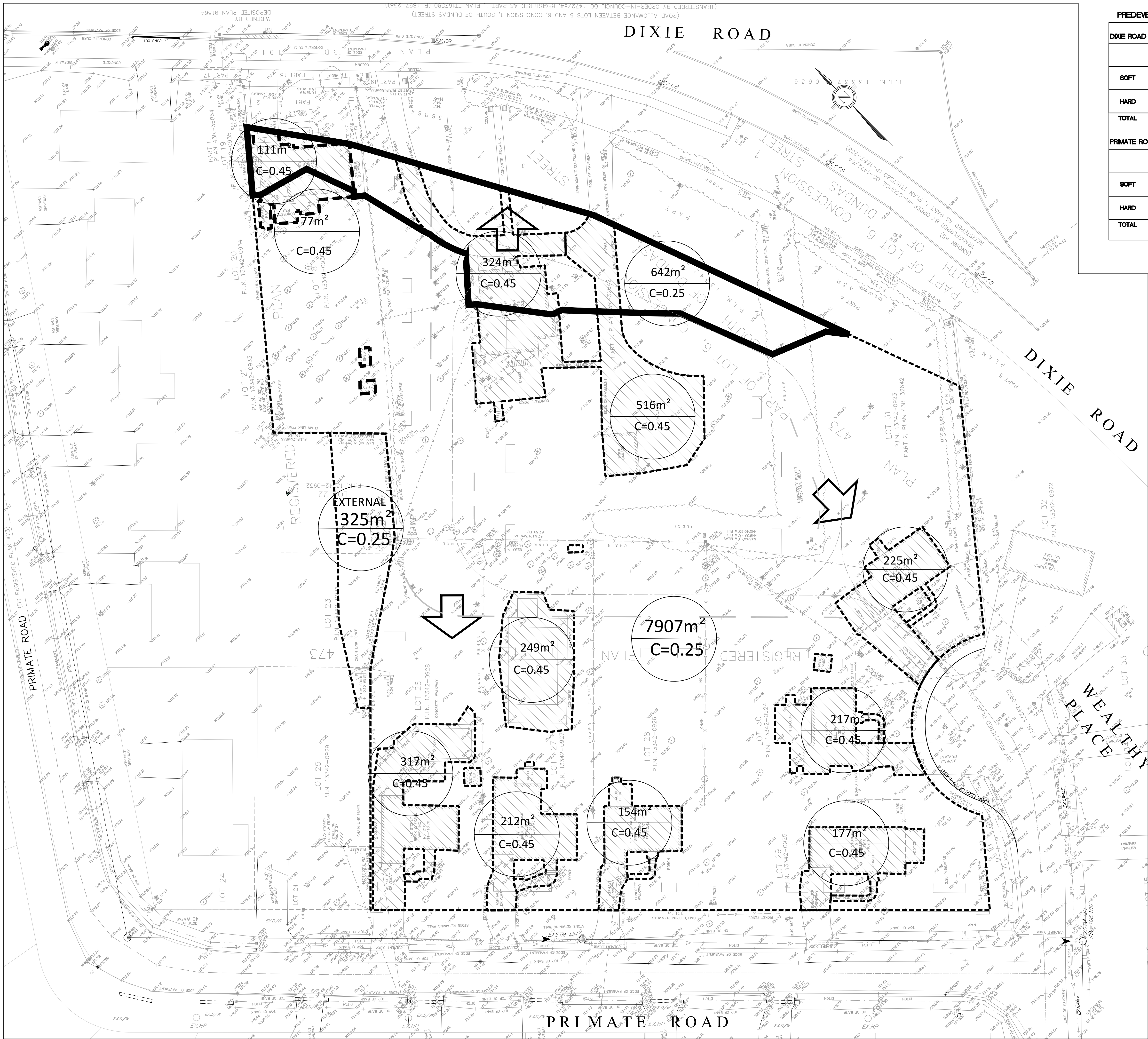
RUNOFF COEFFICIENTS (R)		Q = 0.0028CIA		a=		1450		CE#17-017		PROJECT: CITY PARK (DIXIE ROAD) INC.		CITY OF MISSISSAUGA							
10 MINUTE ENTRY TIME		15.00		b=		4.9		LOCATION: CITY OF MISSISSAUGA		DESIGNED BY: S.N. P.Eng.		100-YEAR CAPTURE CHECK							
0.25: SOFT SURFACES				c=		0.78		CHECKED BY: M.E.H. P.Eng.				STORM SEWER DESIGN SHEET							
0.90: HARD SURFACES								STORM: 100		-YEAR RAINFALL									
LOCATION	UPSTREAM MANHOLE		DOWNSTREAM		CATCHMENT		RUNOFF FACTOR (R)	A x R	ACCUM. A x R	INTENSITY (mm/hr)	Q (cms)	PIPE DIA. (mm)	GRADE (%)	CAPACITY (cms)	VELOCITY Y (m/s)	LENGTH (m)	SECT. TIME (min.)	TOTAL TIME FULL, Tc	% FULL
	ID	INV.	DROP	ID	INV.	ID													
UNIT 15									0.077	140.69	0.030	250	0.50%	0.044	0.86	29.4	0.57	15.00	69.5%
UNIT 18									0.064	140.69	0.025	250	0.50%	0.044	0.86	29.4	0.57	15.00	57.9%

	MANHOLE		LENGTH	SEWER		INVERT	INVERT ELEVATION				PIPE WATER DEPTH		PIPE WATER DEPTH		FULL PIPE	PARTIAL AREA		PIPE	1.0m of 450mm REDUCER
STREET			(M)	SLOPE	SIZE	DROP	UPPER	MANHOLE	LOWER		(M)		PERCENTAGE (%)		AREA	PERCENTAGE (%)		VOLUME	PIPE ADJUSTMENT
	FROM	TO		%	(MM)		END	LOSSES	END		UPPER	LOWER	UPPER	LOWER	(SQM)	UPPER	LOWER	(CU.M)	(CU.M)
REAR LOT CATCHBASINS CONNECTED TO STORAGE PIPE																			
UNIT 15	RLCB1	MAIN	29.4	0.5%	250	0.15	107.39		107.24		0.25	0.25	100.0%	100.0%	0.0491	100.0%	100.0%	1.44	1.44
UNIT 18	RLCB2	MAIN	29.4	0.5%	250	0.15	107.15		107.00		0.25	0.25	100.0%	100.0%	0.0491	100.0%	100.0%	1.44	1.44
STORAGE PIPE (100-YEAR)																			
TOP OF WATER LEVEL =		108.60		100-Year Storm															
	MH5	MH4	58.0	1.50%	825	0.87	107.74		106.87		0.83	0.83	100.0%	100.0%	0.5346	100.0%	100.0%	31.00	30.25
	MH4	Chambermax	73.0	0.25%	900	0.18	106.79	0.08	106.60		0.90	0.90	100.0%	100.0%	0.6362	100.0%	100.0%	46.44	45.49
	MH6	MH3	47.0	0.25%	900	0.12	106.89		106.77		0.90	0.90	100.0%	100.0%	0.6362	100.0%	100.0%	29.90	28.95
	MH3	MH2	19.2	0.25%	825	0.05	106.72	0.05	106.67		0.83	0.83	100.0%	100.0%	0.5346	100.0%	100.0%	10.26	9.51
	MH2	Chambermax	7.6	0.25%	450	0.02	106.62	0.05	106.60		0.45	0.45	100.0%	100.0%	0.1590	100.0%	100.0%	1.21	1.21
	DCBMH2	Chambermax	5.0	17.80%	450	0.89	107.49	0.05	106.60		0.45	0.45	100.0%	100.0%	0.1590	100.0%	100.0%	0.80	0.80
	Chambermaxx	MH1	5.5	0.25%	450	0.01	106.58	0.02	106.57		0.45	0.45	100.0%	100.0%	0.1590	100.0%	100.0%	0.87	0.87
	Manholes		5.0	120.0%	2.20 m														3.11
	Chambermaxx																		123.00
	ORIFICE CONTROL DOWNSTREAM MH1																		
	INV:	106.49													TOTAL STORAGE PROVIDED =				246.07



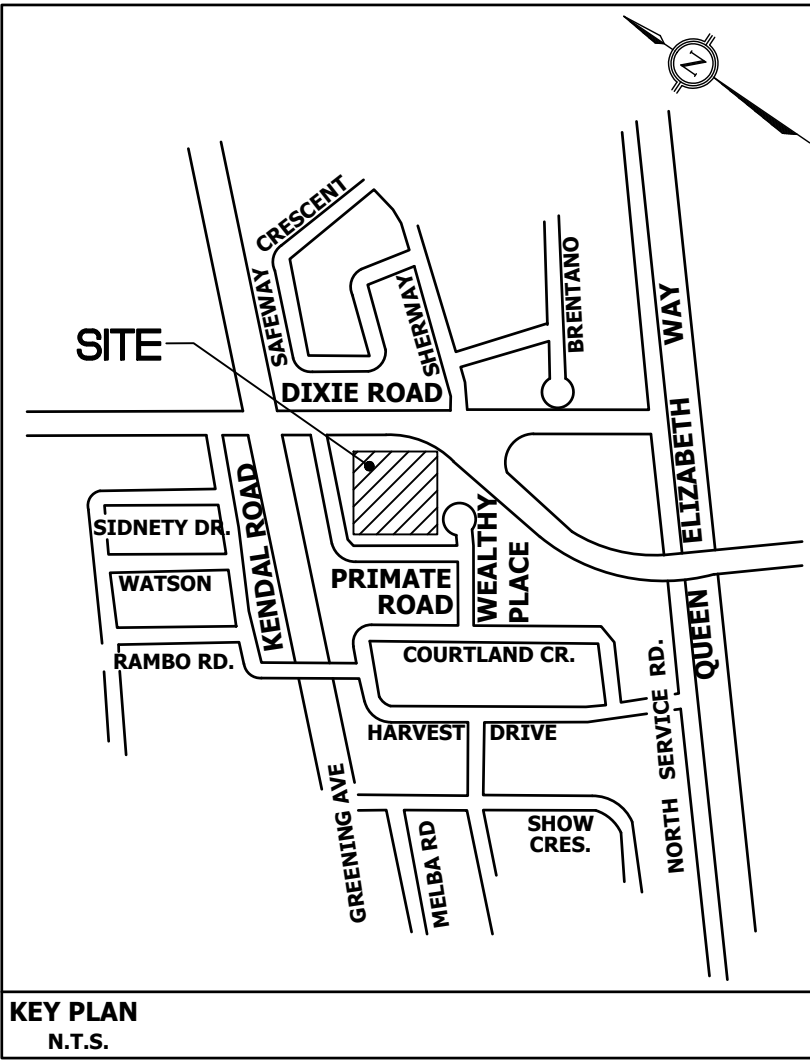
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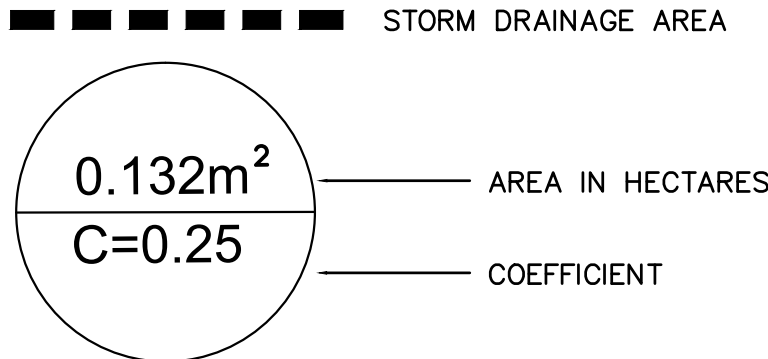


PREDEVELOPMENT FLOW SUMMARY

DIXIE ROAD		
	W EXTERNAL	AREA (SQ.M)
SOFT	0.25	641
HARD	0.45	426
TOTAL	0.33	1067
PRIMATE ROAD/WEALTHY PLACE		
	W EXTERNAL	AREA (SQ.M)
SOFT	0.25	7934
HARD	0.45	217
TOTAL	0.29	10051



LEGEND



BENCHMARK NOTE  
ELEVATIONS SHOWN HEREON ARE REFERRED TO THE CITY OF MISSISSAUGA BENCHMARK NO. 351 HAVING AN ELEVATION OF 108.675 METRES LOCATED ON THE EAST FACE AT THE MAIN ENTRANCE OF APPLEWOOD PUBLIC SCHOOL ON THE WEST SIDE OF HARVEST DRIVE, 30.5 METRES SOUTH OF KENDALL ROAD.

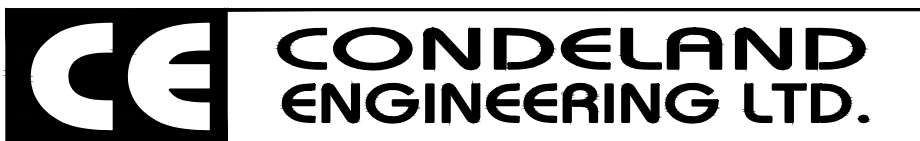
FIRST SUBMISSION	JAN.09.18	S.Ng
REVISION	BLOCK	DATE
		APPR. BY

CITY PARK (DIXIE) INC.  
2103-2119 PRIMATE ROAD, 1351 & 1357  
WEALTHY PLACE, 2116& 2112 DIXIE ROAD



APPROVED AS TO FORM IN RELIANCE  
UPON THE PROFESSIONAL SKILL AND  
ABILITY OF CONDELAND  
ENGINEERING LIMITED AS TO DESIGN  
AND SPECIFICATION

DIRECTOR OF DEVELOPMENT/  
TRANSPORTATION ENGINEERING  
DATE:



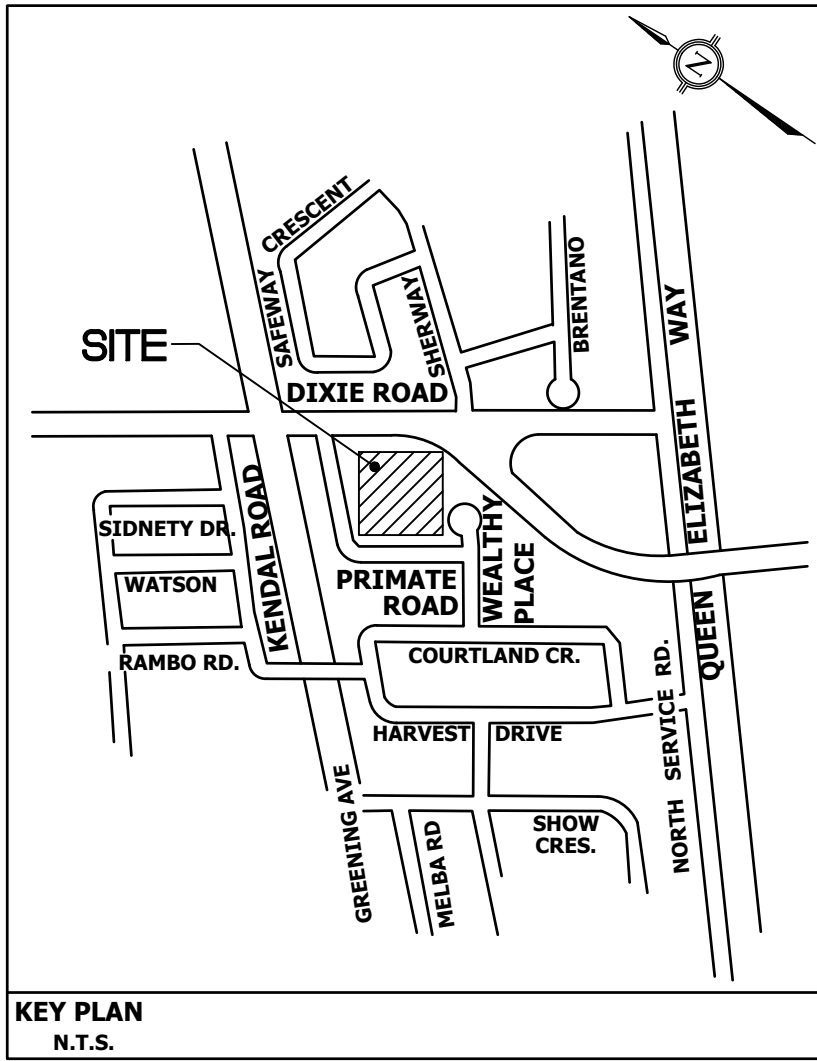
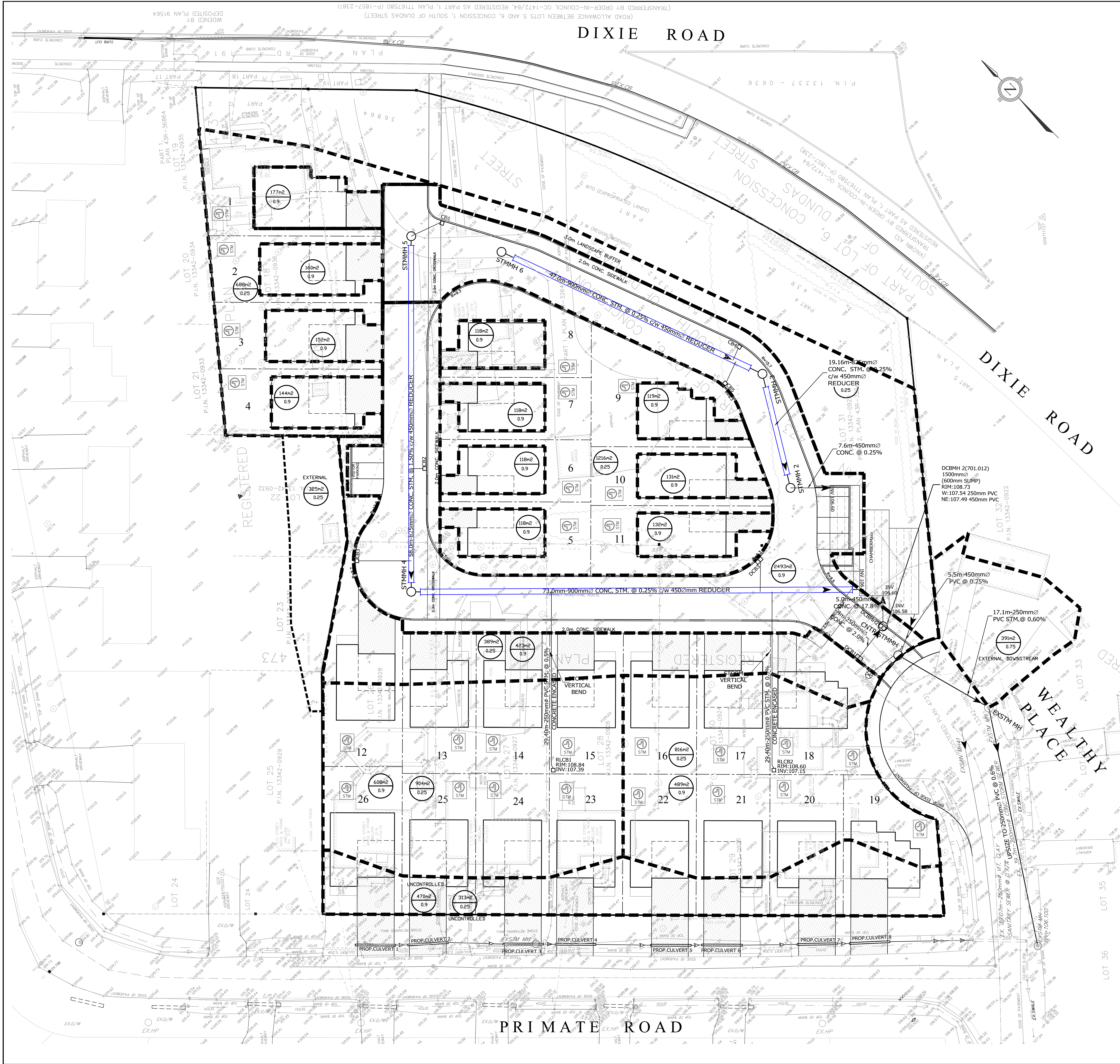
Consulting Engineers and Project Managers  
350 CREDITSTONE ROAD, UNIT 200  
CONCORD, ON, L4M 3Z2  
PHONE: (905) 695-8006  
FAX: (905) 695-8099



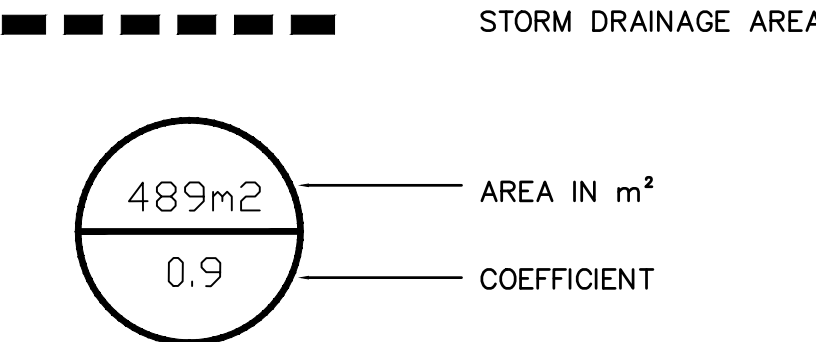
PREDEVELOPMENT STORM TRIBUTARY PLAN

DESIGNED BY: S.NG.	DATE: JANUARY 2018	CHECKED BY: M.E.H.
DRAWN BY: G.M.	DRAWING NO.	
SCALES		CITY FILE
HOR 1:300	17-017-05	DARC 17-192





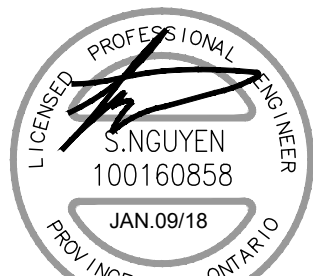
LEGEND



BENCHMARK NOTE  
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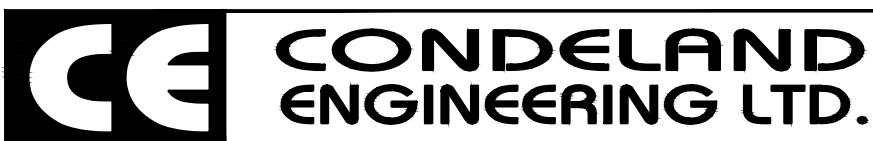
1.	FIRST SUBMISSION	JAN.09.18	S.Ng
REVISION	BLOCK	DATE	APPR. BY

CITY PARK (DIXIE) INC.  
2103-2119 PRIMATE ROAD, 1351 & 1357 WEALTHY PLACE, 2116& 2112 DIXIE ROAD



APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF CONDELAND ENGINEERING LIMITED AS TO DESIGN AND SPECIFICATION

DIRECTOR OF DEVELOPMENT/TRANSPORTATION ENGINEERING  
DATE:



Consulting Engineers and Project Managers

350 CREDITON ROAD, UNIT 200  
CONCORD, ON, L4H 3Z2

PHONE: (905) 695-8096  
FAX: (905) 695-8099



STORM TRIBUTARY PLAN

DESIGNED BY: S.NG.	DATE: JANUARY 2018	CHECKED BY: M.E.H.
DRAWN BY: G.M.	DRAWING NO.	
SCALES		CITY FILE
HOR 1:300	17-017-06	DARC 17-192