

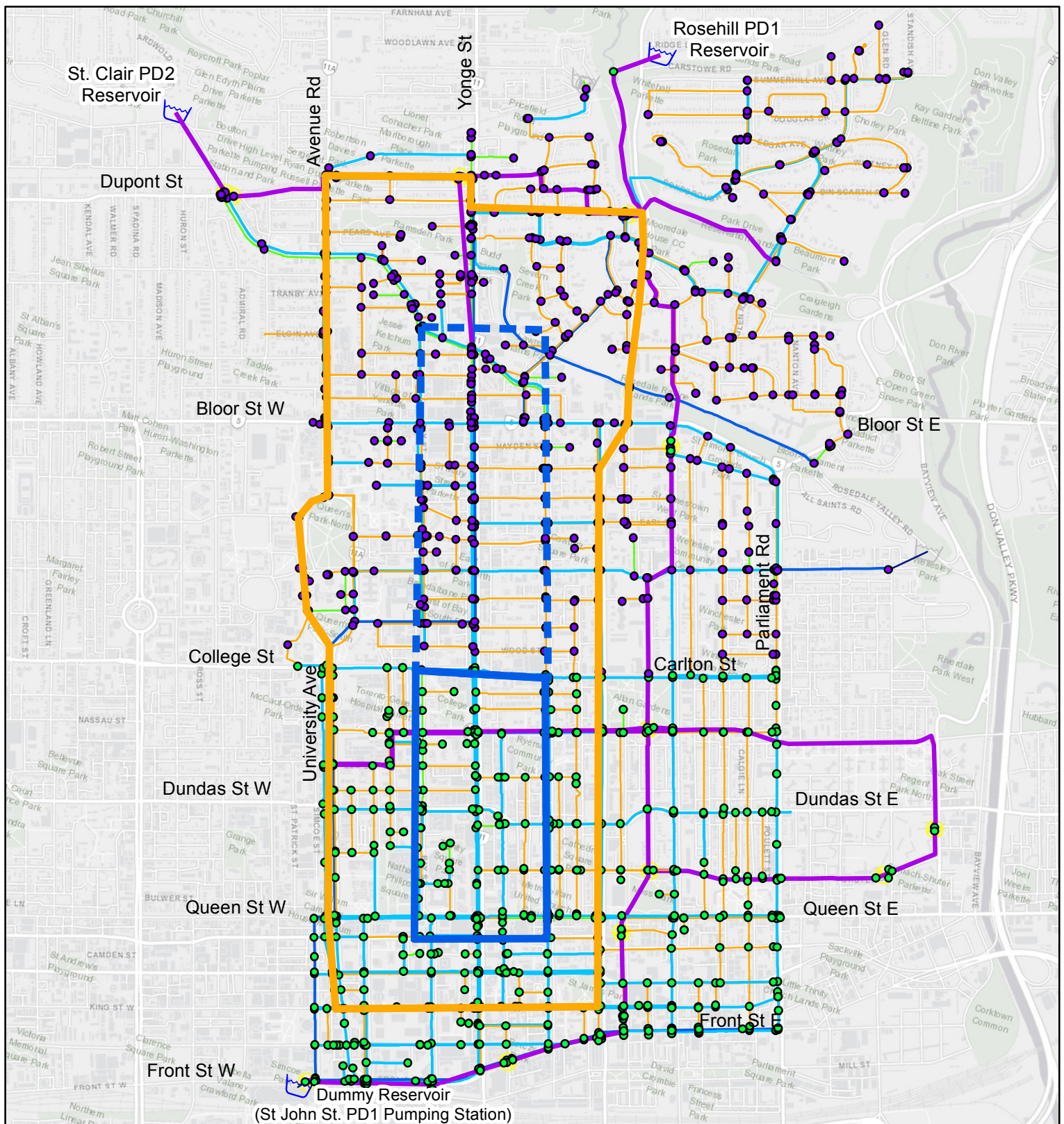
APPENDIX D
InfoWorks Digital Model

APPENDIX D

Appendix F-B

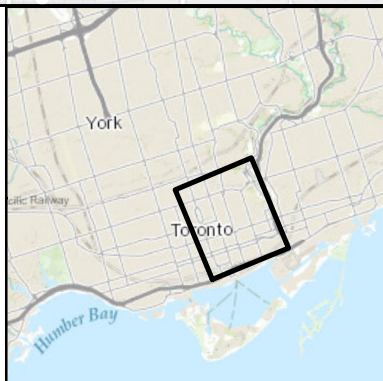
Future Water System Analysis

- F-B-1 InfoWater Model Layout of Water System for Future Condition
- F-B-2 Water System Pressure under Future Condition for Peak Hour Design Condition
- F-B-3 Water System Pressure under Future Condition for Maximum Day plus Fire Flow
- F-B-4 Water Demand Estimation

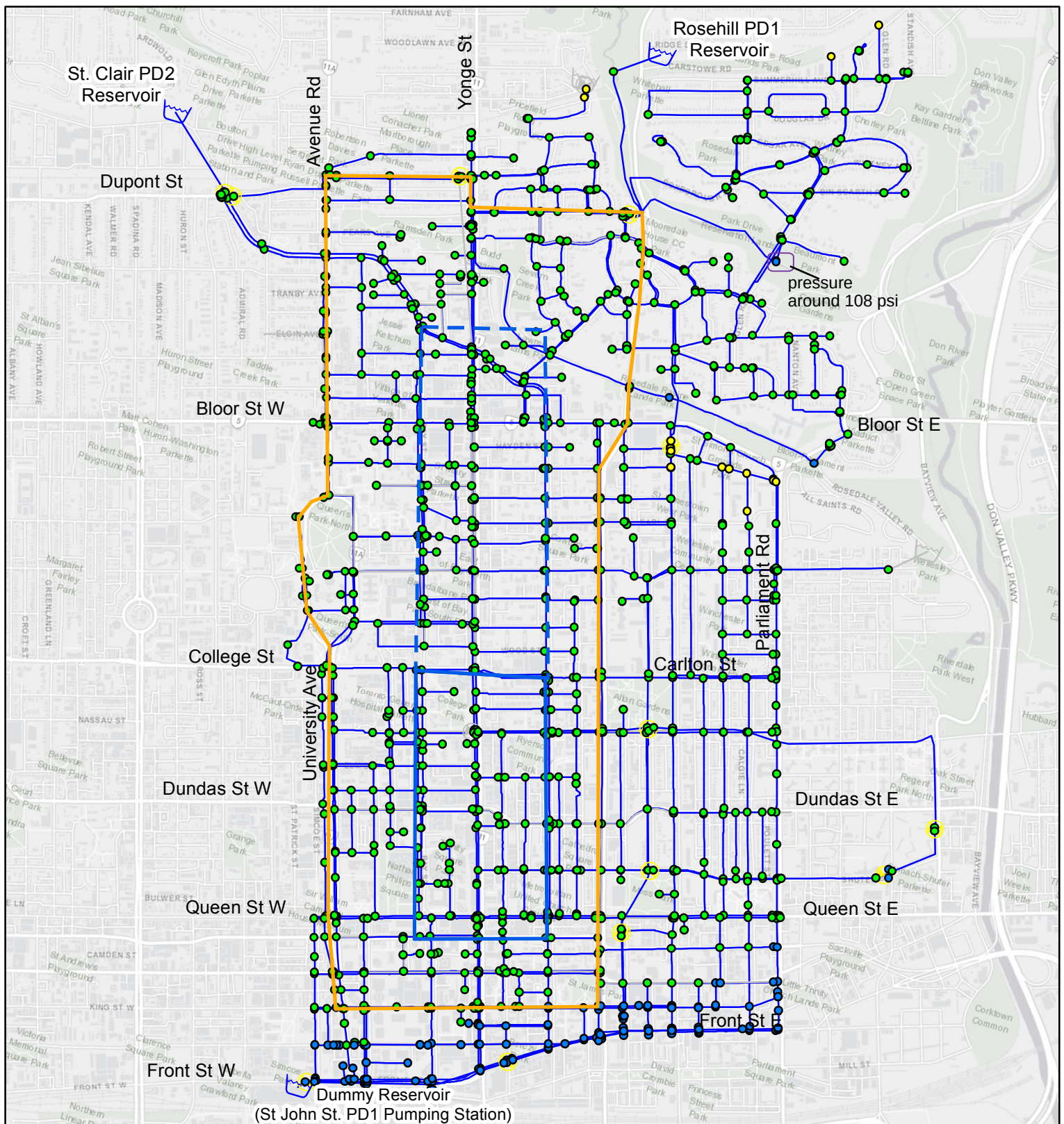


LEGEND

Junction	Pipes_19May2020	Extended Study Area Boundary
ZONE	<all other values>	Study Area Boundary
2	Diameter (mm)	Focus Area Boundary
1	50 - 75	
	100 - 150	
	100 - 250	
	300	
	400 - 600	
	750 - 1650	

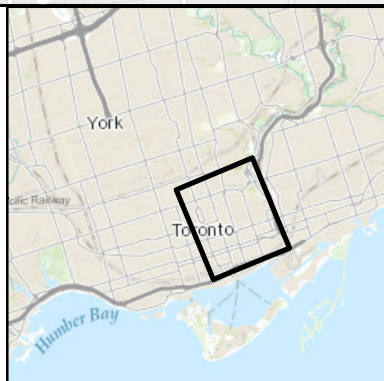


SCALE 	
PROJECT Yonge TOmorrow EA City of Toronto	
TITLE Infowater Layout of Water System	
DATE: 5/19/2020	PROJECT: 2017-0591



LEGEND

- Junction**
- PRESSURE**
- <20 psi
 - 20 ~ 40
 - 40 ~ 80
 - 80 ~ 100
- Extended Study Area Boundary
 - Study Area Boundary
 - Focus Area Boundary



SCALE

0 100 200 400 600 800 Meters

PROJECT

Yonge TOmorrow EA
City of Toronto

TITLE

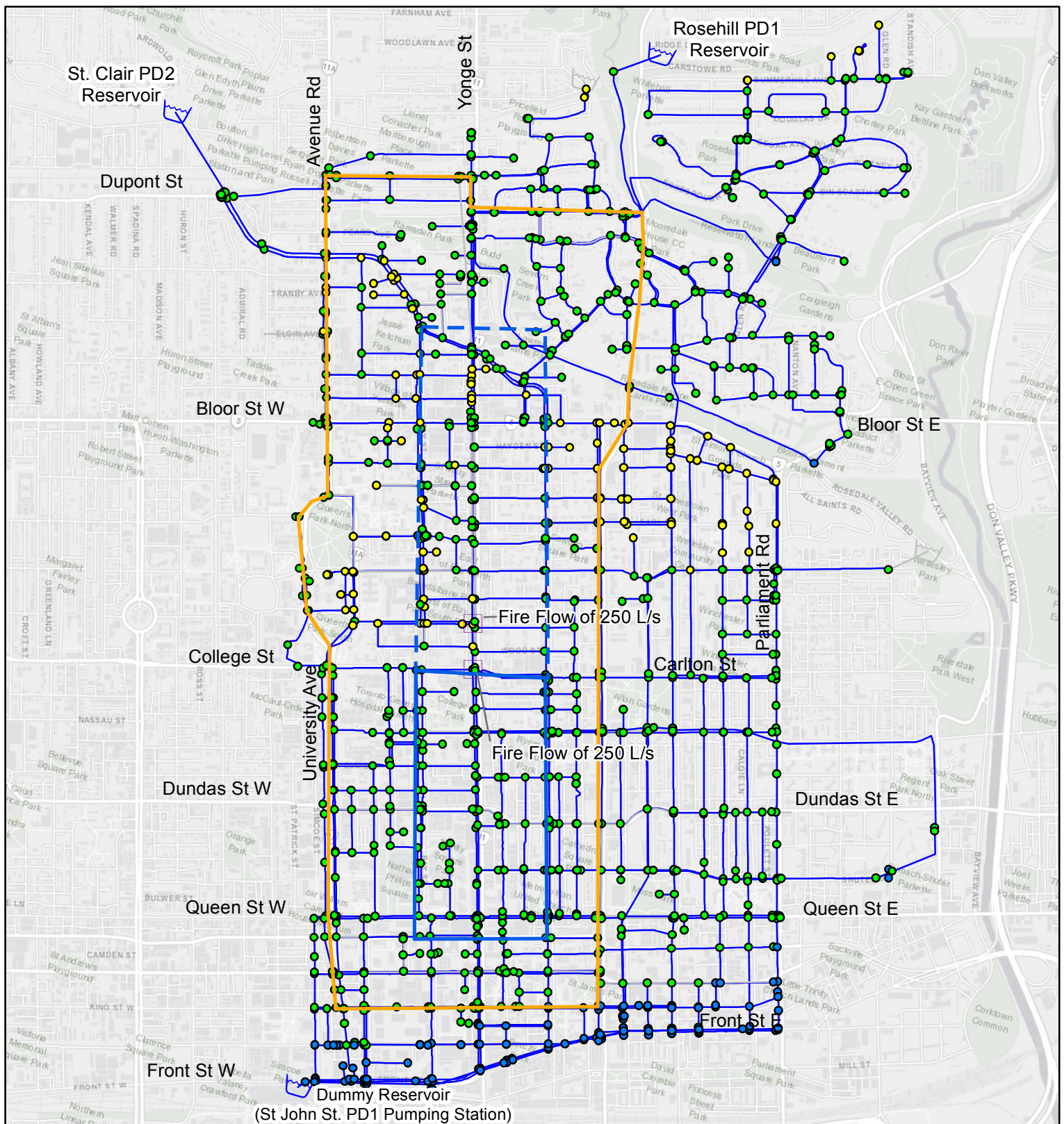
**System Pressure Under Future
Condition During Peak
Employment Hour (10:00 AM)**

DATE:

5/20/2020

PROJECT:

2017-0591



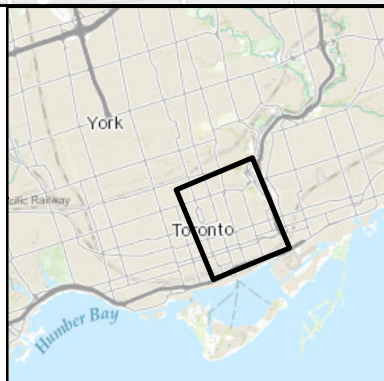
LEGEND

- Fire Flow Location
- Extended Study Area Boundary
- Study Area Boundary
- Focus Area Boundary

Junction

PRESSURE

- > 20 psi
- 20 ~ 40
- 40 ~ 80
- 80 ~ 100



SCALE
0 100 200 400 600 800 Meters

PROJECT
Yonge TOMorrow EA
City of Toronto

TITLE
**System Pressure Under Future
Condition During Maximum Day
Demand Plus Fire Flow**

DATE:
5/20/2020

PROJECT:
2017-0591

Water Demand Estimation

Project:2017-0591

Date: May 2020

City Design Criteria

Domestic Average Day Demand 191
Employment Average Day Demand* 191 L/Cap/day

Residential:

Minimum Hour Factor 0.84
Maximum Day Demand (MDD) factor 1.3
Peak hour (PH) Factor 2.5

Commercial:

Minimum Hour Factor 0.84
Maximum Day Demand (MDD) factor 1.10
Peak hour (PH) Factor 1.20

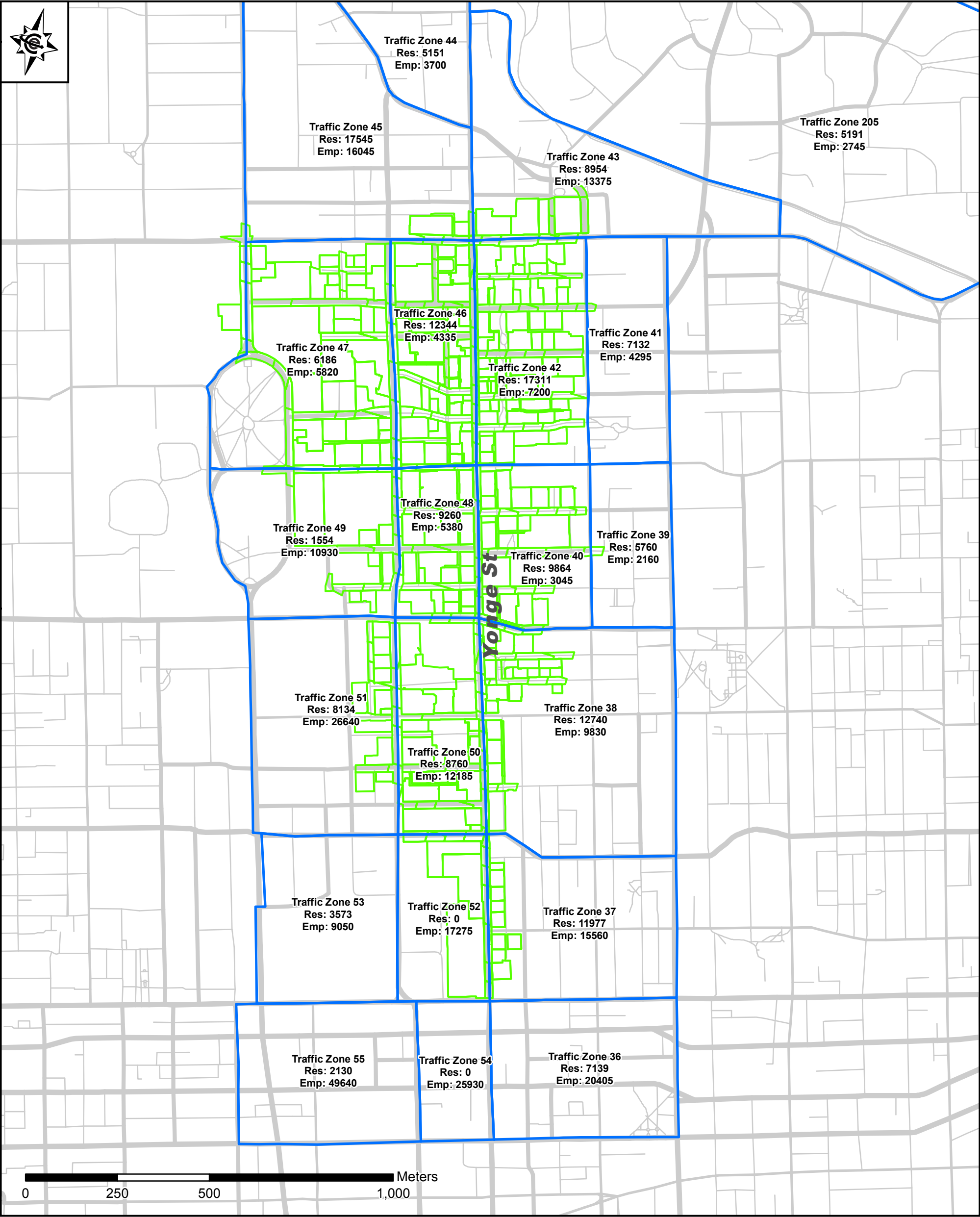
Traffic Zone	Residential, R2	Employment, E3	Design Flow (L/s)			
	2041	2041	Ave. Day	Min. Hour	Max. Day	Peak Hour
36	7,139	20,405	61	51	70	94
37	11,977	15,560	61	51	72	107
38	12,740	9,830	50	42	61	96
39	5,760	2,160	18	15	22	38
40	9,864	3,045	29	24	36	63
41	7,132	4,295	25	21	31	51
42	17,311	7,200	54	46	67	115
43	8,954	13,375	49	41	58	85
44	5,151	3,700	20	16	24	38
45	17,545	16,045	74	62	89	140
46	12,344	4,335	37	31	46	80
47	6,186	5,820	27	22	32	50
48	9,260	5,380	32	27	40	65
49	1,554	10,930	28	23	31	38
50	8,760	12,185	46	39	55	81
51	8,134	26,640	77	65	88	116
52	0	17,275	38	32	42	46
53	3,573	9,050	28	23	32	44
54	0	25,930	57	48	63	69
55	2,130	49,640	114	96	127	143
205	5,191	2,745	18	15	22	36
sub-toal	160,705	265,545	942	792	1,108	1,593



Appendix F-C

Future Combined Sewer Analysis

Figure F-C.1 - 2041 Population Projections by Traffic Zone
(Growth Plan 2012 Maximum, High with SmartTrack)



Legend

- Yonge EA Contributing Area
- Model Subcatchments

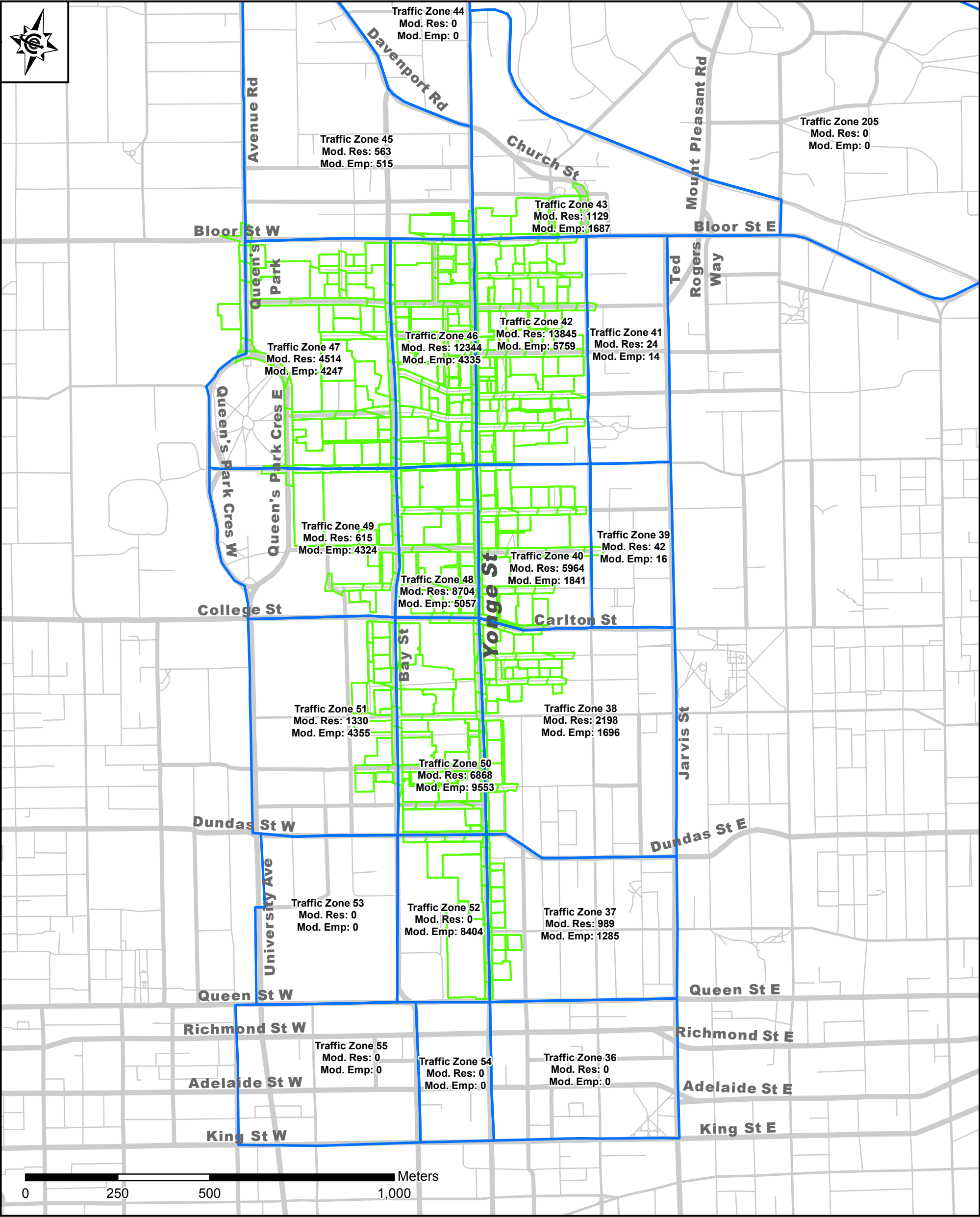
Sewer Capacity Assessment
Yonge Toronto EA
City of Toronto



Project No.:
2017-0591

Date:
May 2020

Figure F-C.2 - Modelled 2041 Population Distribution



Legend

- Yonge EA Contributing Area
- Model Subcatchments

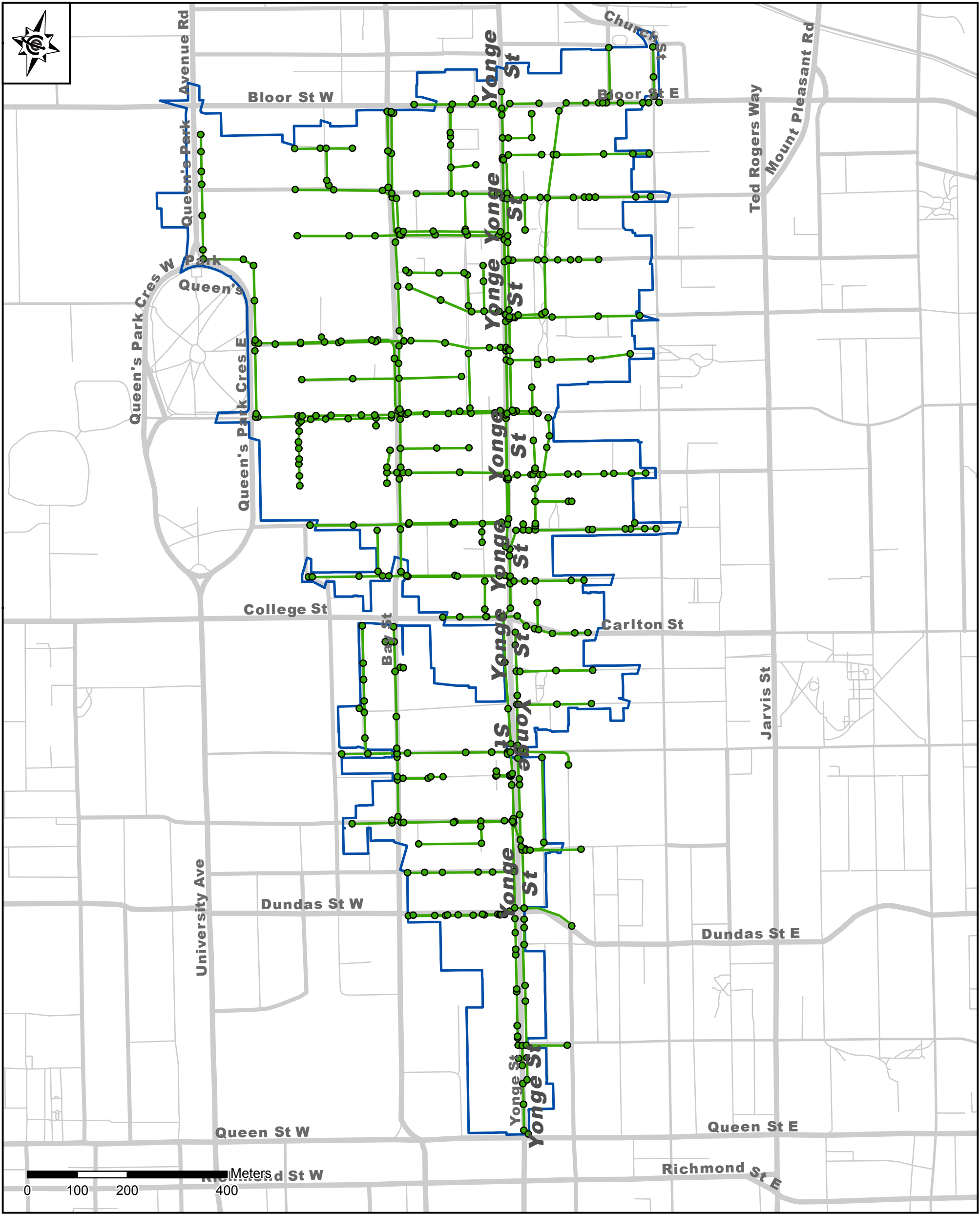
Sewer Capacity Assessment
Yonge Toronto EA
City of Toronto

COLE

Project No.:
2017-0591

Date:
May 2020

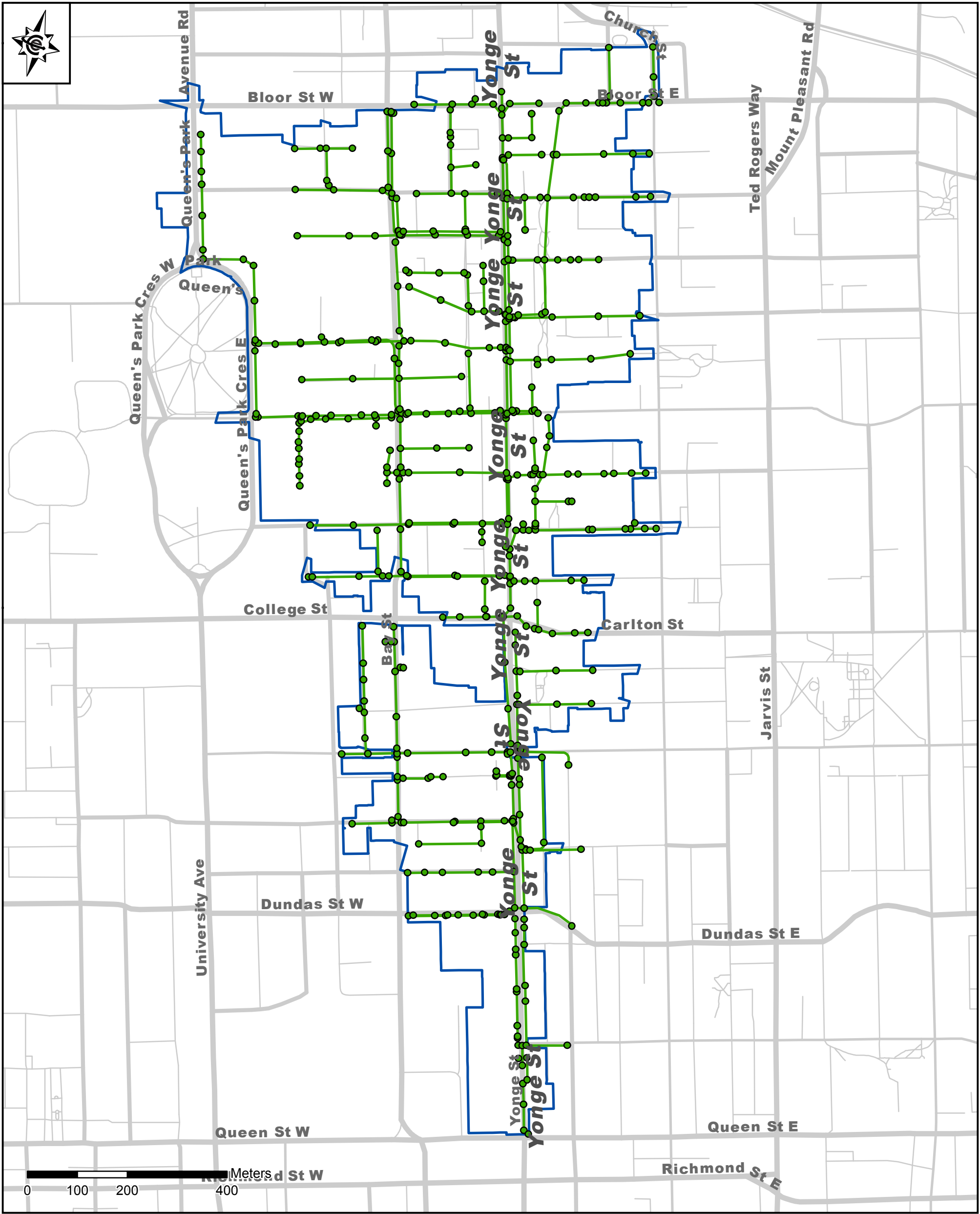
Figure F-C.3 - Dry Weather Flow Results
Future Conditions Scenario 1



Legend	HGL Results at Nodes	Sewer Capacity Results
● Freeflow, or Freeboard > 1.8 m	— Free Flowing Sewer	— Surcharged Sewer (Backwater)
		— Surcharged Sewer (Over Capacity)
		 Yonge EA Contributing Area
Per capita flow rates: Residential: 240 l/cap/day Employment: 250 l/cap/day		

Sewer Capacity Assessment Yonge Toronto EA City of Toronto	
 COLE	
Project No.: 2017-0591	Date: May 2020

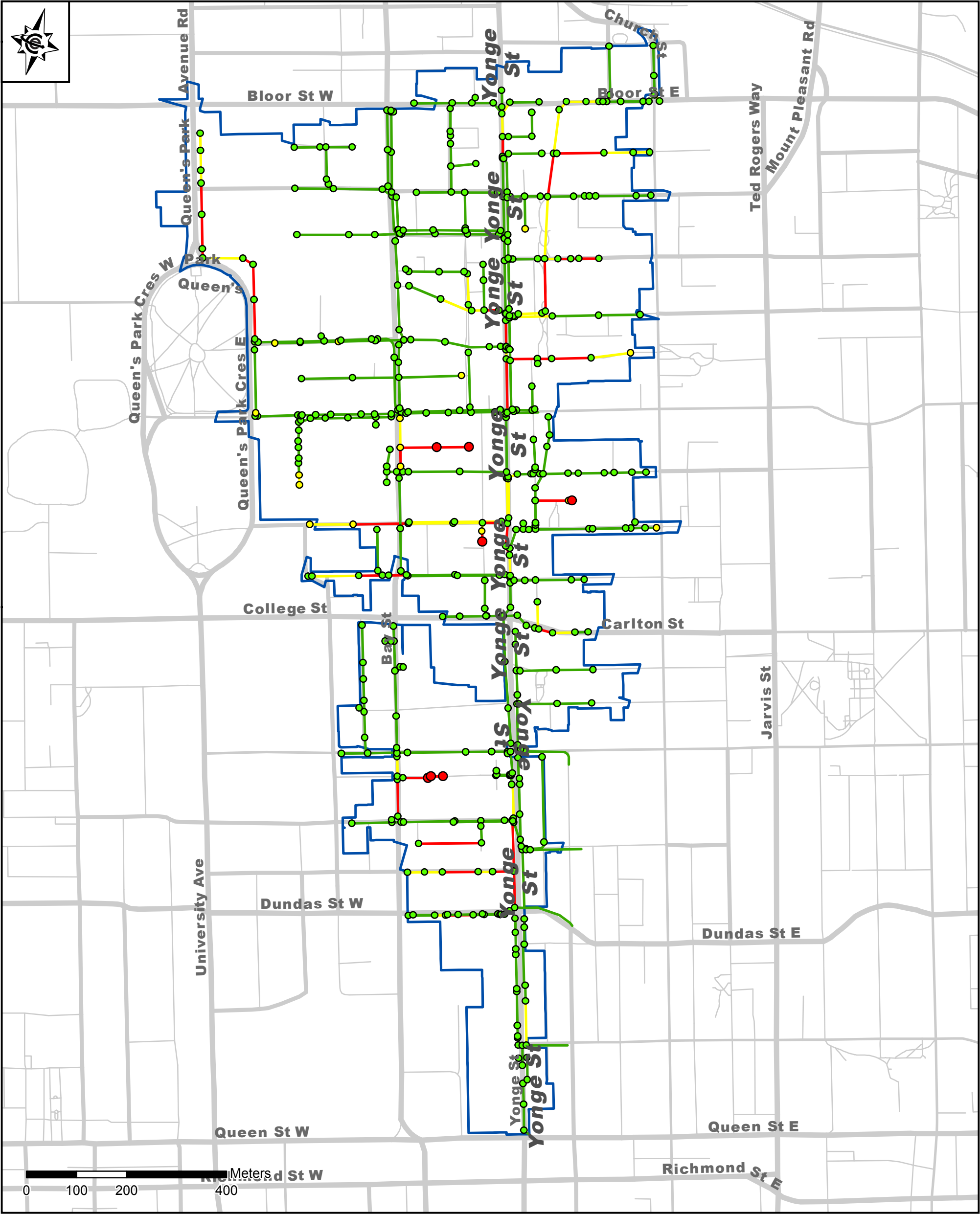
Figure F-C.4 - Dry Weather Flow Results
2041 Ultimate Conditions Scenario 2



Legend	
HGL Results at Nodes	Sewer Capacity Results
● Freeflow, or Freeboard > 1.8 m	— Free Flowing Sewer
	— Surcharged Sewer (Backwater)
	— Surcharged Sewer (Over Capacity)
	□ Yonge EA Contributing Area
Per capita flow rates: Residential: 450 l/cap/day Employment: 450 l/cap/day	

Sewer Capacity Assessment Yonge Toronto EA City of Toronto	
Project No.: 2017-0591	Date: May 2020

Figure F-C.5 - 2-year Design Storm Results
2041 Ultimate Conditions Scenario 1



Legend

HGL Results at Nodes

- Freeflow, or Freeboard > 1.8 m
- Freeboard < 1.8 m
- Surface Flooding

Sewer Capacity Results

- Free Flowing Sewer
- Surcharged Sewer (Backwater)
- Surcharged Sewer (Over Capacity)
- Yonge EA Contributing Area

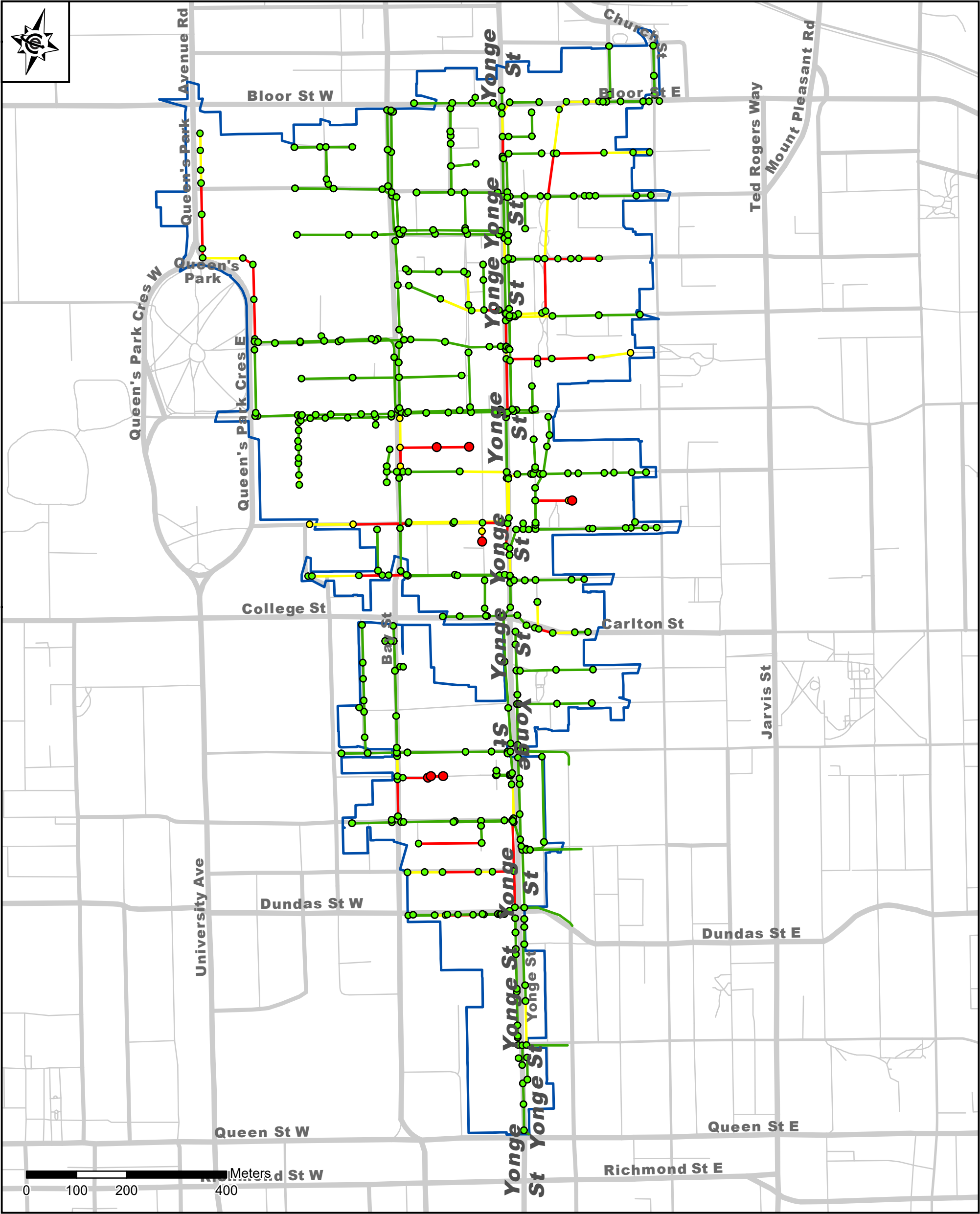
Per capita flow rates:
Residential: 240 l/cap/day Employment: 240 l/cap/day

Sewer Capacity Assessment
Yonge Toronto EA
City of Toronto

COLE

Project No.: 2017-0591	Date: May 2020
---------------------------	-------------------

Figure F-C.6 - 2-year Design Storm Results
2041 Ultimate Conditions Scenario 2



Legend

HGL Results at Nodes

- Freeflow, or Freeboard > 1.8 m
- Freeboard < 1.8 m
- Surface Flooding

Sewer Capacity Results

- Free Flowing Sewer
- Surcharged Sewer (Backwater)
- Surcharged Sewer (Over Capacity)
- Yonge EA Contributing Area

Per capita flow rates:
Residential: 450 l/cap/day Employment: 450 l/cap/day

Sewer Capacity Assessment
Yonge Toronto EA
City of Toronto



COLE

Project No.:
2017-0591

Date:
May 2020

Figure F-C.7 – HGL elevations relative to Gloucester St Weir, with and without design baseflow

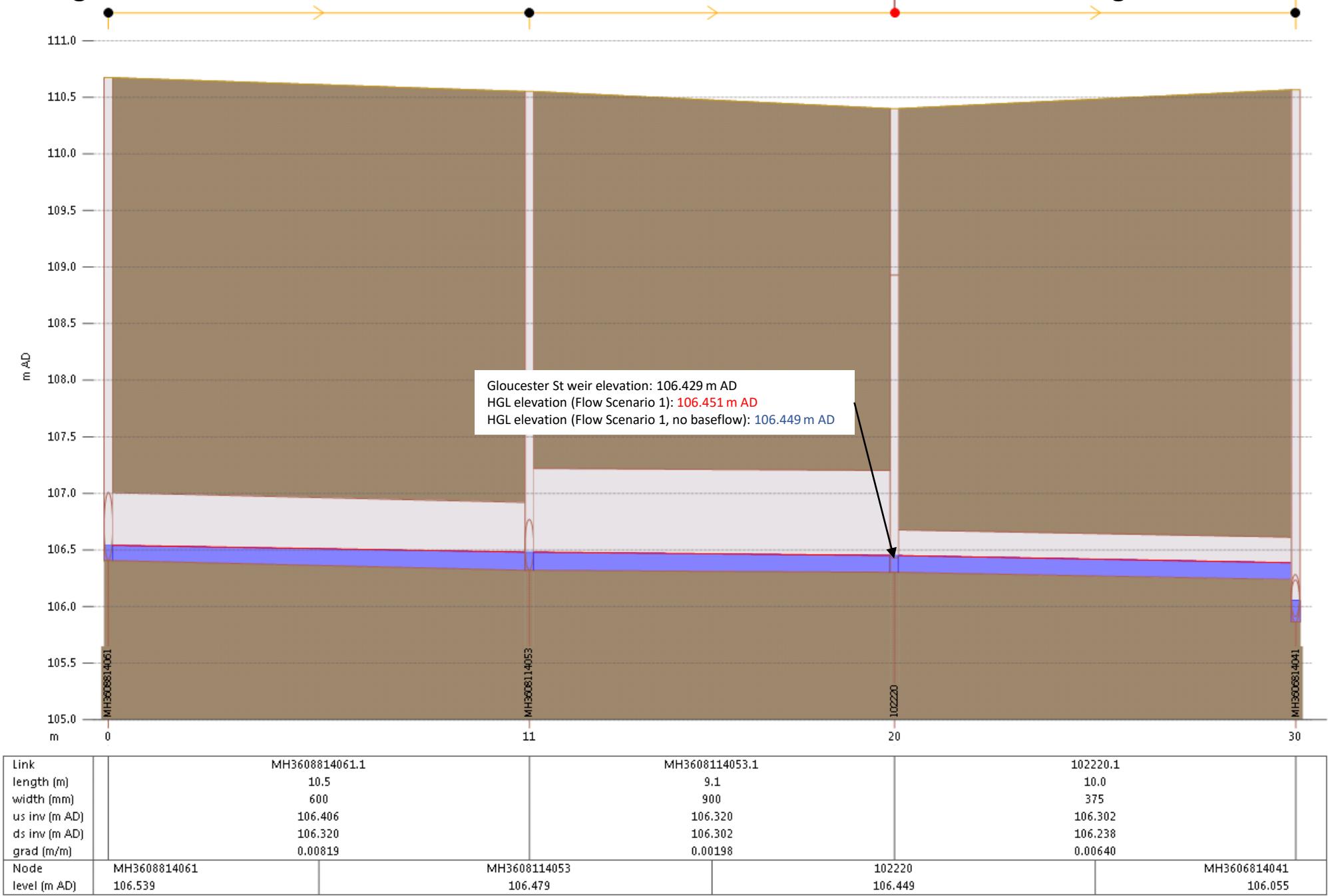


Figure F-C.8 – HGL elevations relative to Gloucester St Weir, with improvement option 1

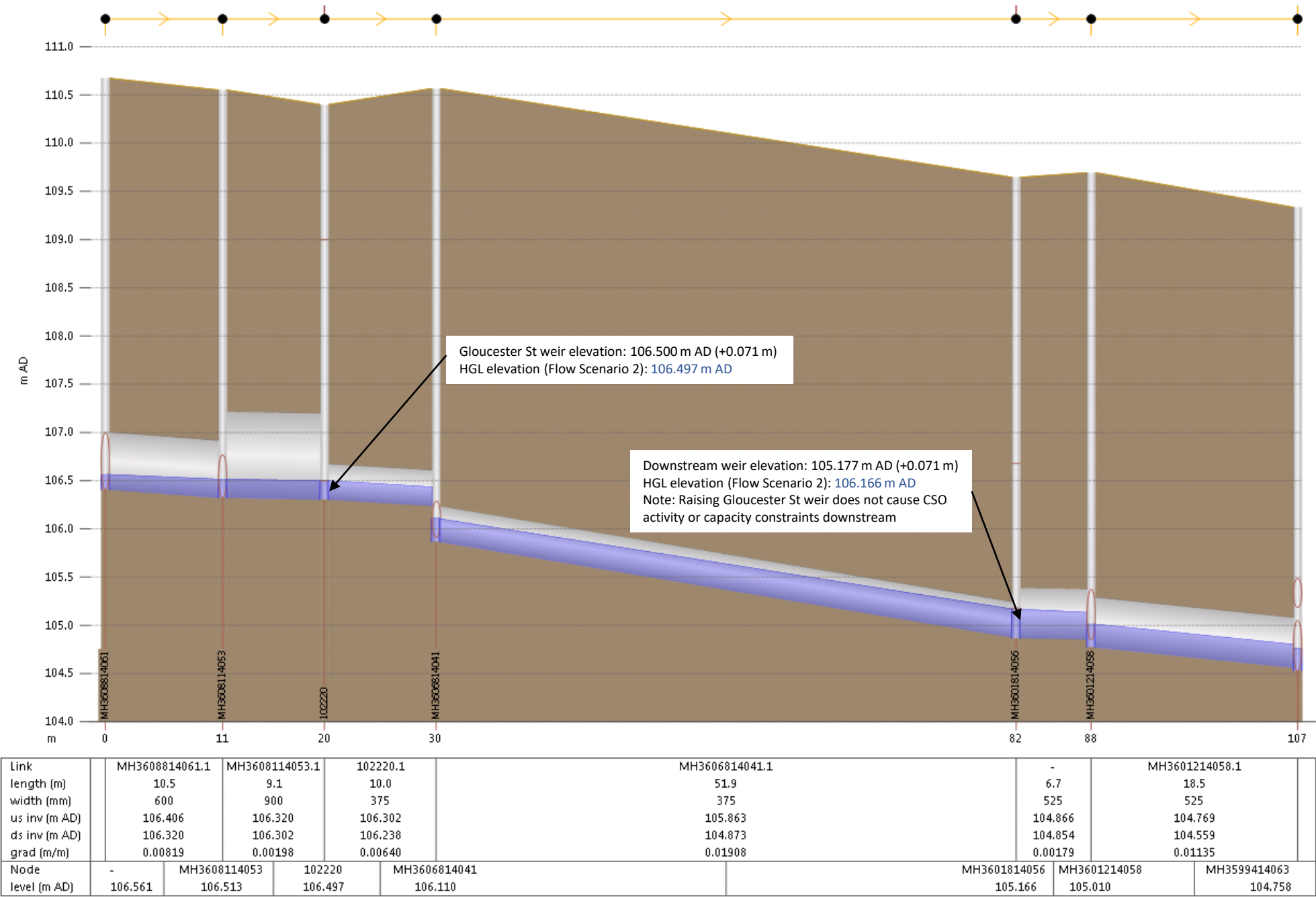
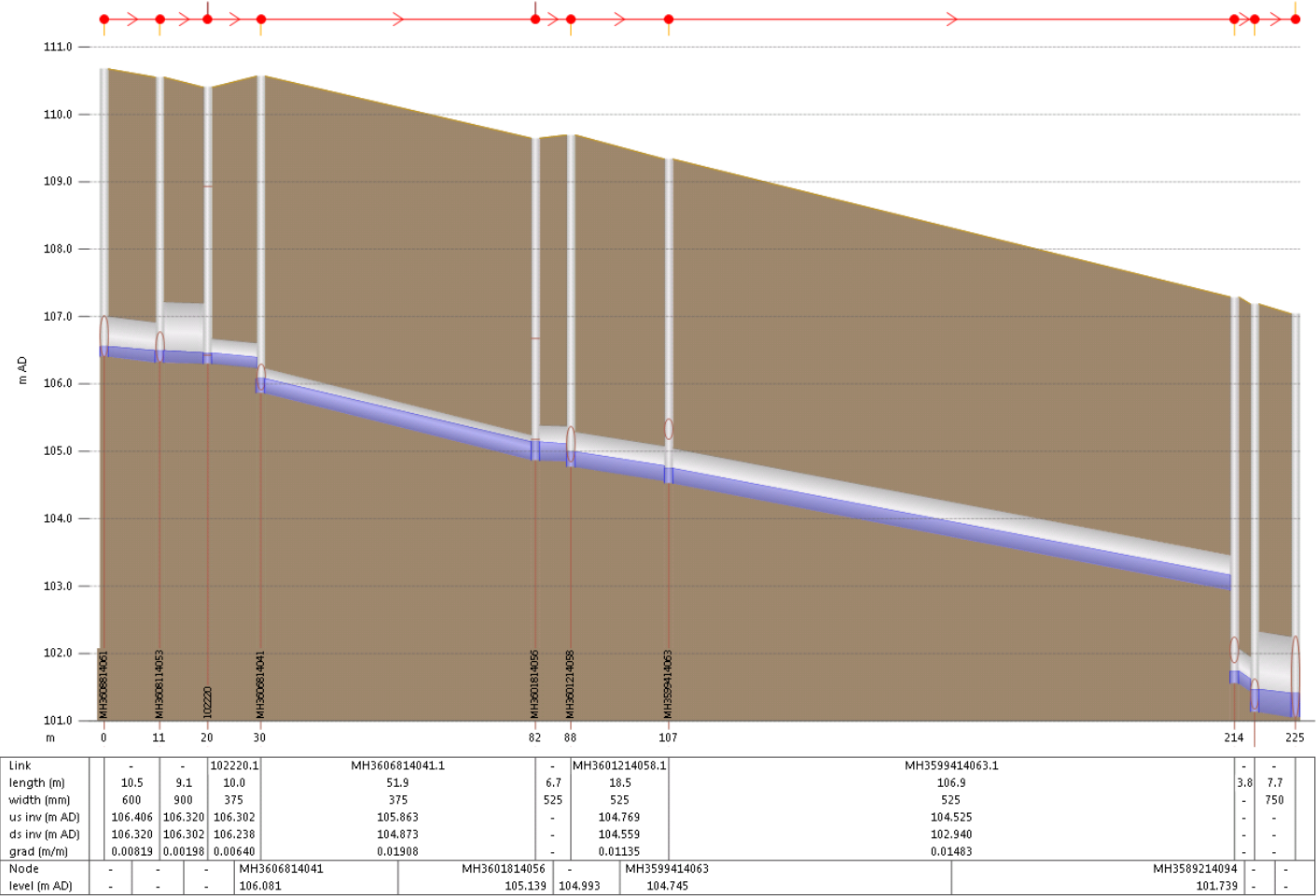
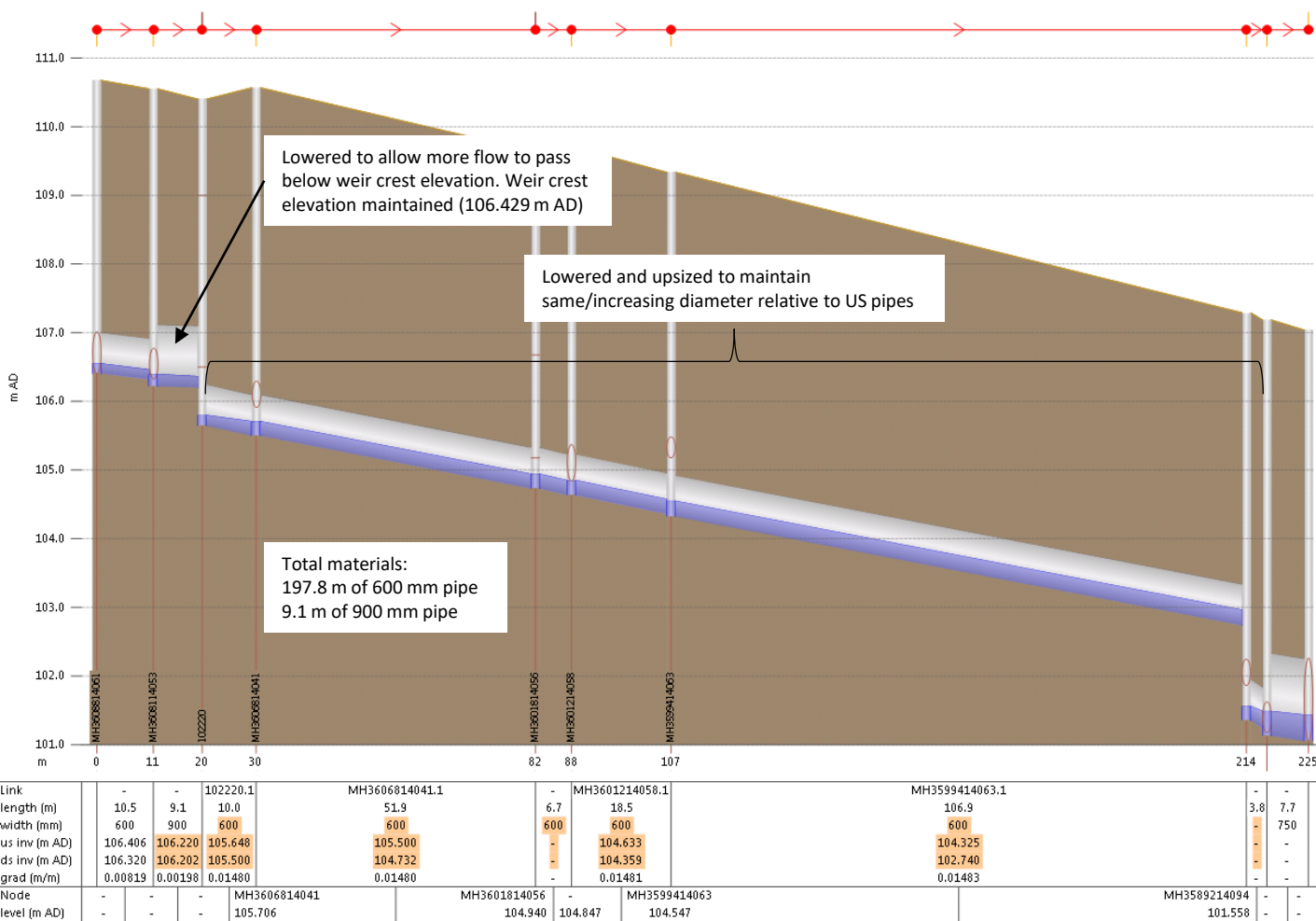


Figure F-C.8 – HGL elevations relative to Gloucester St Weir, with improvement option 2

Existing Profile



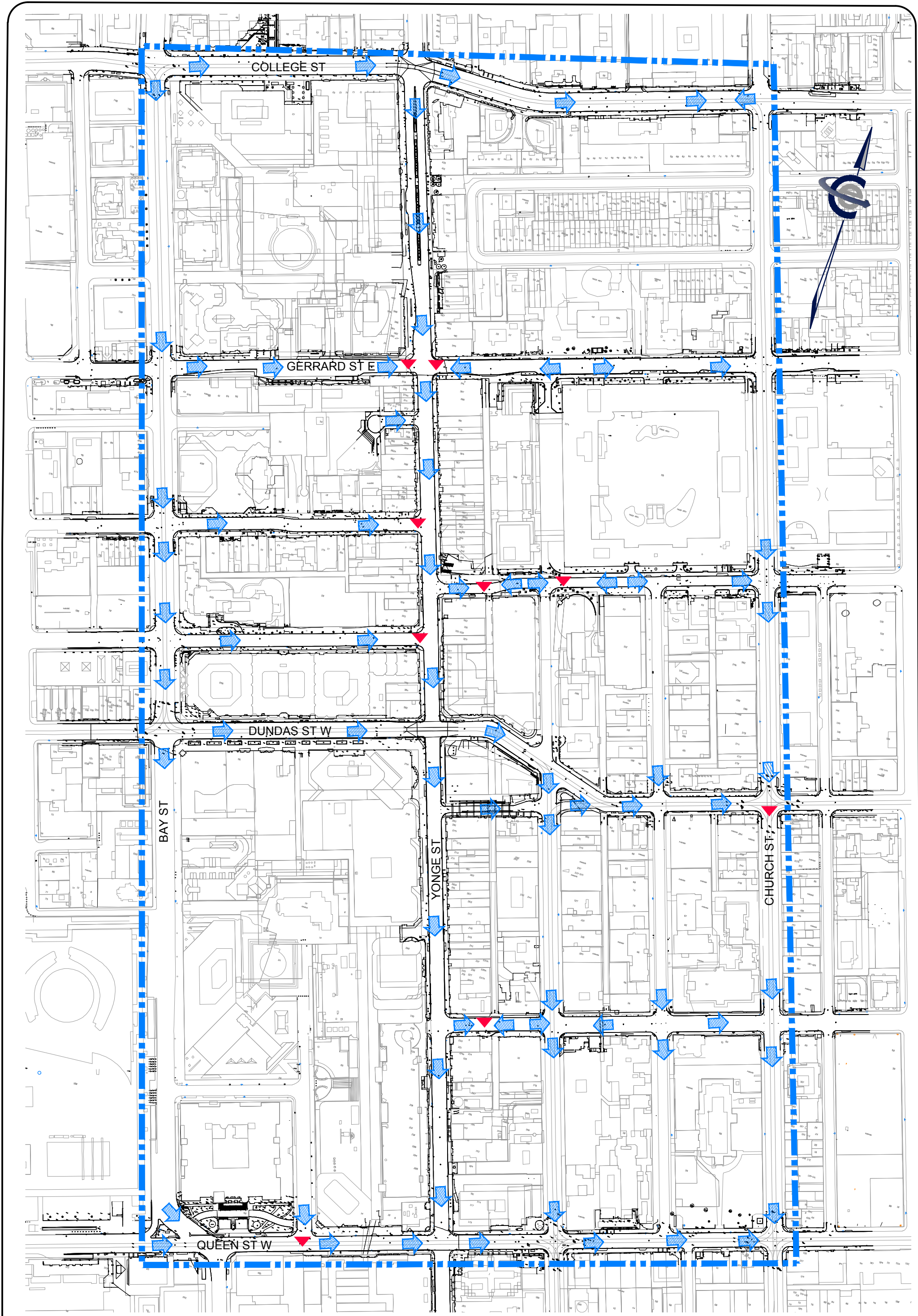
Proposed Improvements





Appendix F-D

Future Overland (Major System) Analysis



LEGEND

OVERLAND FLOW DIRECTION

FOCUS AREA

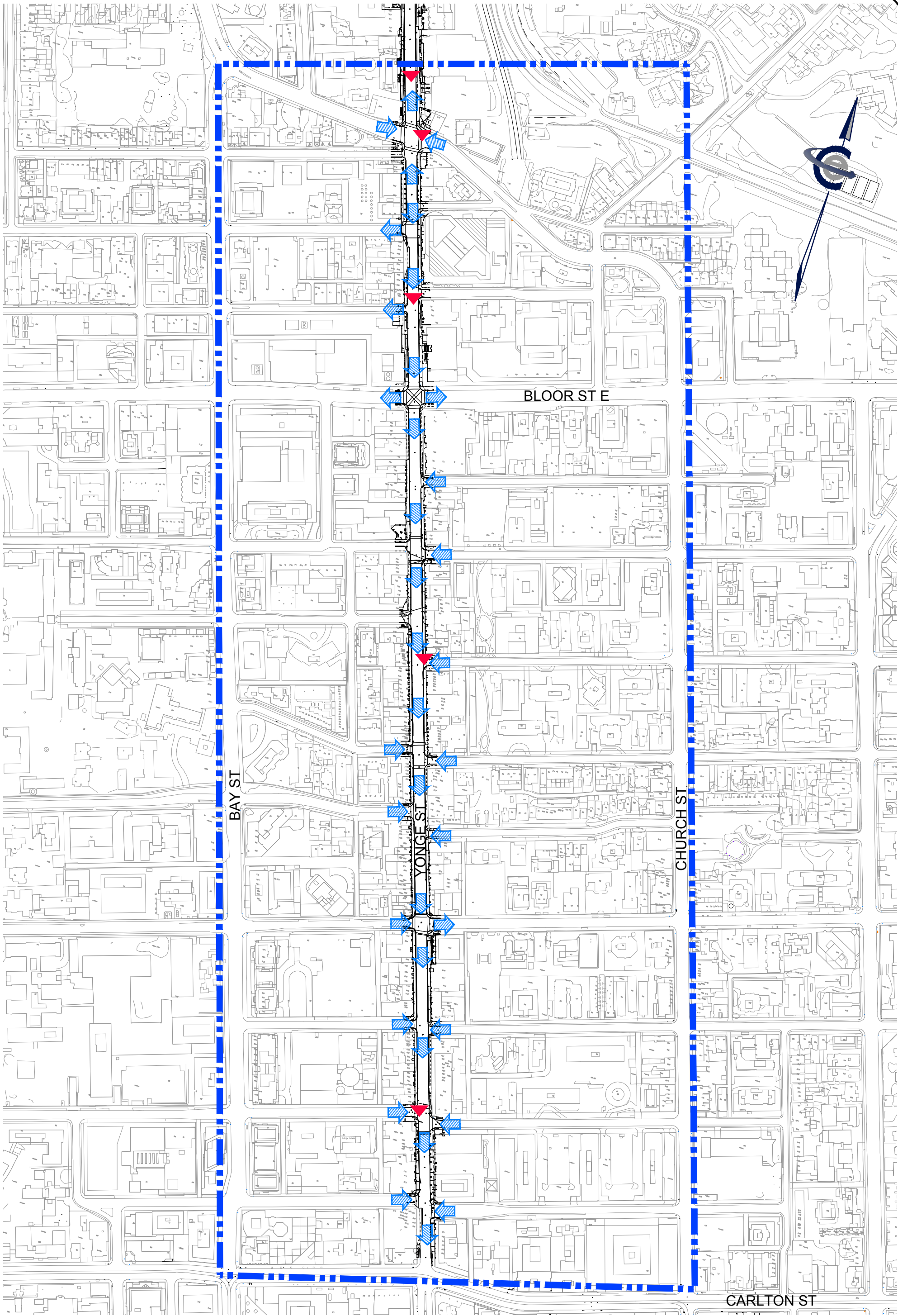
LOCAL LOW POINT

OVERLAND FLOW ROUTES

YONGE STREET EA STUDY

CITY OF TORONTO

DATE:	FEBRUARY 2019	PROJECT No.:	2017-0591
SCALE:	1:3000	FIGURE No.:	



COLE

LEGEND

-  OVERLAND FLOW DIRECTION
-  EXTENDED FOCUS AREA BOUNDARY
-  LOCAL LOW POINT

OVERLAND FLOW ROUTES
YONGE STREET EA STUDY
CITY OF TORONTO

DATE:	FEBRUARY 2019	PROJECT No.:	2017-0591
SCALE:	1:4000	FIGURE No.:	



Appendix F-E

Projected Future Population

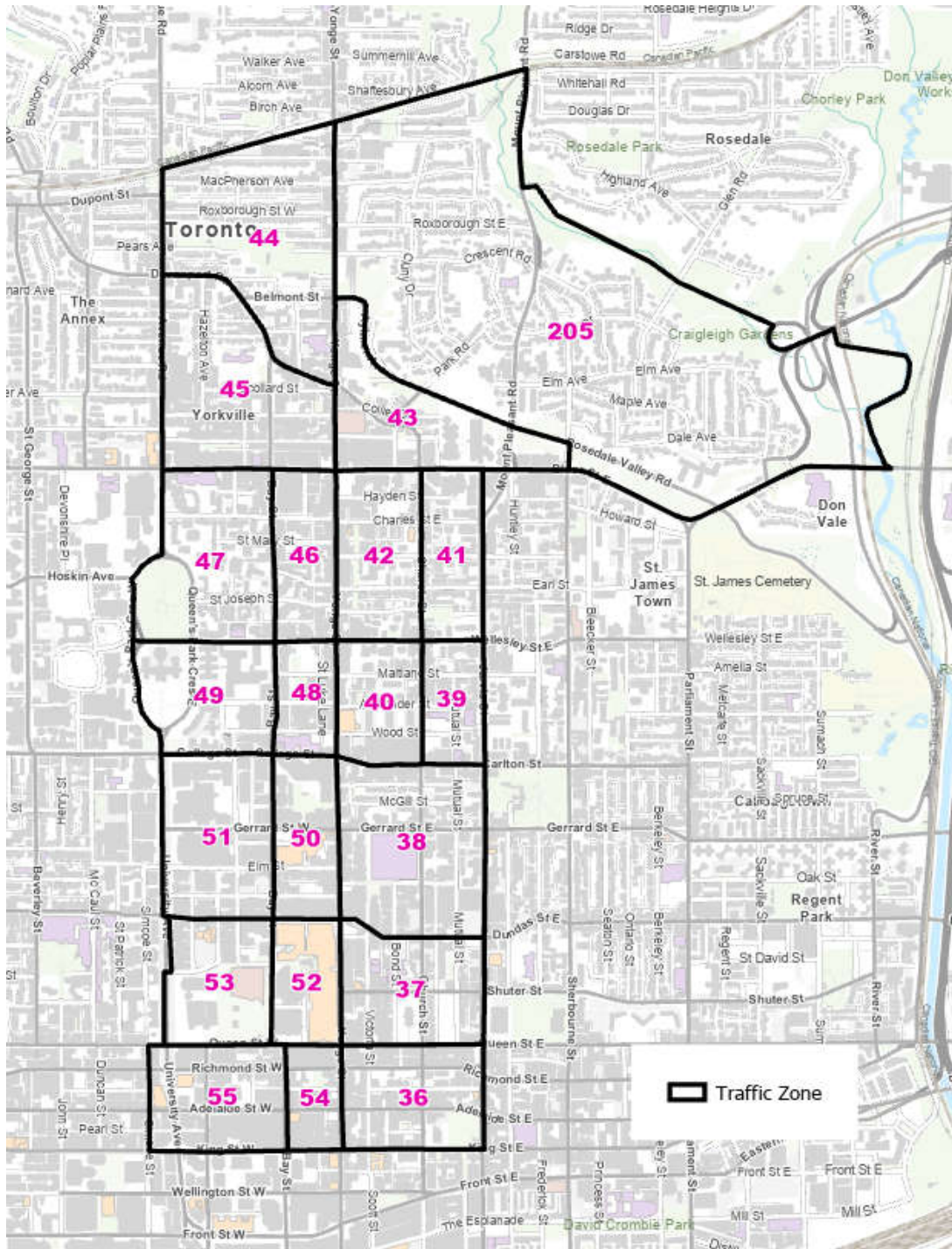
Key Map to Traffic Zones in the Yonge Tomorrow Study Area

Data Source: Traffic Zones, 2006 Geography, City of Toronto

Prepared by: City Planning, Strategic Initiatives, Policy & Analysis, Research and Information

Date: December 19, 2019

Traffic Zone ID numbers are shown in pink.



Projected Population for Selected Traffic Zones in the Yonge TOmorrow Study Area

Data Source: Municipal Comprehensive Review Population Projections by Traffic Zone (2006 Geography), City of Toronto

Prepared by: City Planning, Strategic Initiatives, Policy & Analysis, Research and Information

Date: December 19, 2019

		R1			R2		
		Growth Plan 2012 Scenario			Growth Plan Maximum Scenario		
Traffic Zone	2011	2021	2031	2041	2021	2031	2041
36	2,325	2,700	4,365	5,701	4,211	5,373	7,139
37	3,275	4,962	8,139	10,858	7,734	9,198	11,977
38	6,405	7,486	8,782	11,085	8,742	10,059	12,740
39	2,355	2,557	3,447	5,445	3,428	4,682	5,760
40	3,560	4,217	7,390	9,334	6,757	9,233	9,864
41	4,540	6,018	6,082	6,998	6,098	6,657	7,132
42	4,725	8,007	11,172	14,167	11,199	12,895	17,311
43	3,010	3,499	3,869	4,028	3,702	3,940	8,954
44	3,685	4,250	4,399	4,643	4,378	4,541	5,151
45	3,270	6,988	12,002	13,365	12,367	13,305	17,545
46	6,715	8,512	9,484	10,058	9,559	9,889	12,344
47	1,410	4,735	5,438	5,483	5,482	5,495	6,186
48	3,300	4,835	7,087	8,876	7,088	8,331	9,260
49	0	871	871	871	871	871	1,554
50	4,190	6,364	7,620	7,710	7,610	7,714	8,760
51	1,930	3,284	5,258	7,518	5,089	6,829	8,134
52	0	0	0	0	0	0	0
53	1,135	1,798	1,803	2,962	1,798	2,463	3,573
54	0	0	0	0	0	0	0
55	0	1,396	2,089	2,089	2,130	2,130	2,130
205	5,075	5,046	5,039	5,063	5,209	5,195	5,191

Projected Employment for Selected Traffic Zones in the Yonge TOmorrow Study Area

Data Source: SmartTrack Employment Projections by Traffic Zone (2006 Geography), City of Toronto

Prepared by: City Planning, Strategic Initiatives, Policy & Analysis, Research and Information

Date: December 19, 2019

		E1			E2			E3		
		Low No SmartTrack			Medium with SmartTrack			High with SmartTrack		
Traffic Zone	2011	2021	2031	2041	2021	2031	2041	2021	2031	2041
36	18,195	20,265	20,575	20,985	20,050	21,110	22,170	19,530	19,945	20,405
37	10,970	11,875	12,245	12,425	12,540	13,695	14,470	13,145	14,390	15,560
38	8,150	8,365	8,485	8,535	8,585	9,070	9,440	8,890	9,370	9,830
39	1,490	1,585	1,635	1,665	1,660	1,850	1,970	1,810	1,990	2,160
40	2,795	2,870	2,870	2,875	2,870	2,910	2,950	2,955	2,990	3,045
41	3,825	3,935	3,950	3,960	4,045	4,140	4,230	4,065	4,170	4,295
42	5,950	6,200	6,280	6,300	6,430	6,715	6,925	6,575	6,890	7,200
43	12,020	12,215	12,270	12,280	12,530	12,845	13,135	12,665	12,995	13,375
44	2,790	2,965	3,040	3,060	3,120	3,330	3,490	3,245	3,490	3,700
45	14,665	14,890	14,935	14,950	15,230	15,560	15,865	15,320	15,655	16,045
46	3,980	4,030	4,035	4,040	4,110	4,205	4,285	4,145	4,235	4,335
47	5,185	5,260	5,295	5,295	5,390	5,555	5,700	5,485	5,645	5,820
48	4,670	4,730	4,765	4,755	4,825	5,050	5,195	4,995	5,175	5,380
49	8,755	9,785	9,785	9,795	8,990	9,140	9,300	10,660	10,755	10,930
50	11,125	11,495	11,480	11,480	11,390	11,535	11,695	11,890	12,000	12,185
51	20,875	22,015	22,455	22,715	22,885	24,420	25,450	23,545	25,110	26,640
52	15,940	15,955	15,385	15,205	16,335	16,520	16,870	16,290	16,285	17,275
53	8,240	8,300	8,020	7,935	8,500	8,630	8,840	8,475	8,495	9,050
54	20,900	21,810	23,105	24,280	23,670	26,190	26,755	24,090	24,230	25,930
55	37,000	41,625	40,975	40,500	42,920	44,895	46,030	46,105	46,250	49,640
205	1,990	2,125	2,200	2,215	2,235	2,410	2,565	2,350	2,550	2,745

Water Demand Estimation

Project:2017-0591

Date: May 2020

City Design Criteria

Domestic Average Day Demand 191
Employment Average Day Demand* 191 L/Cap/day

Residential:

Minimum Hour Factor 0.84
Maximum Day Demand (MDD) factor 1.3
Peak hour (PH) Factor 2.5

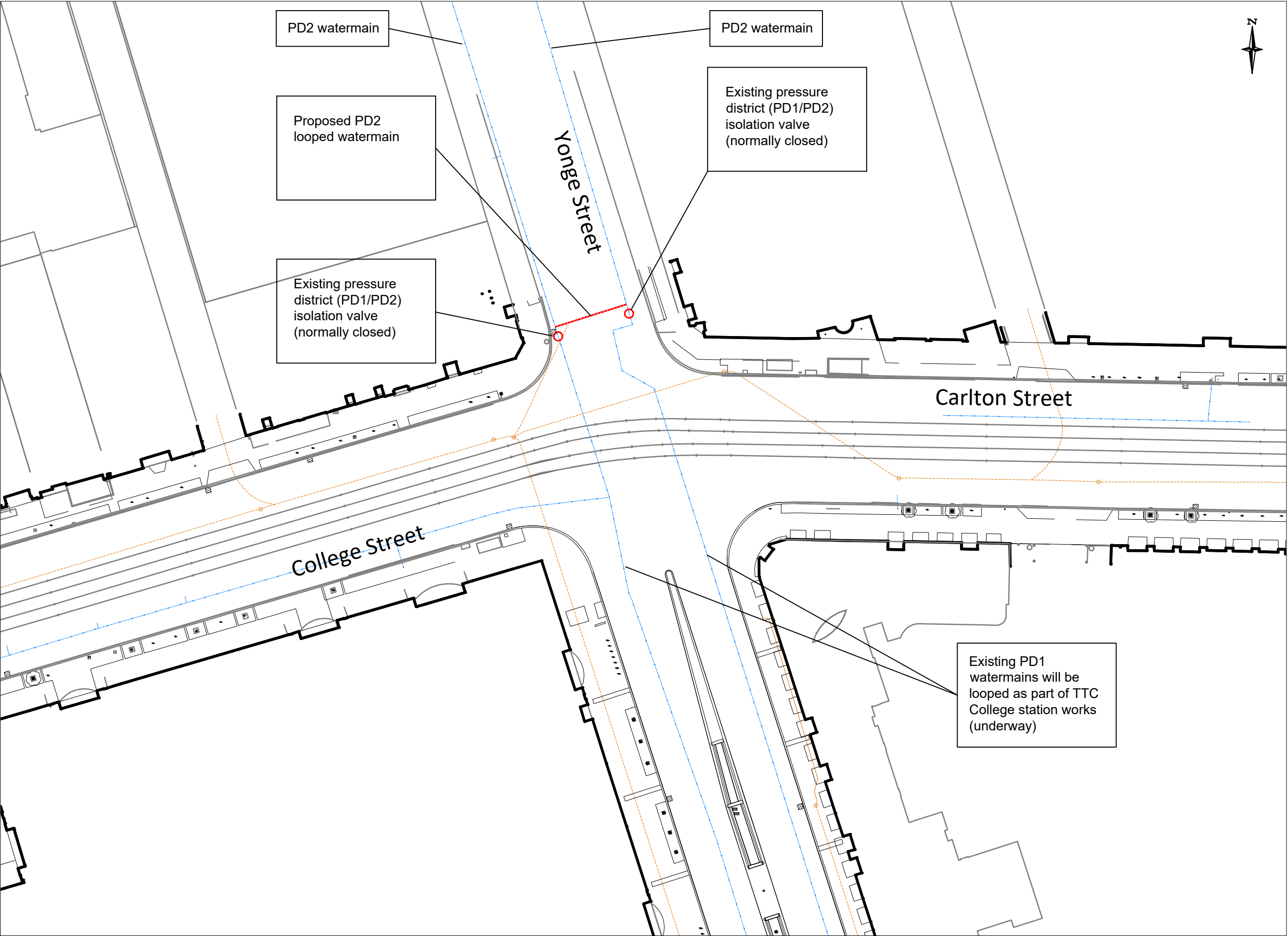
Commercial:

Minimum Hour Factor 0.84
Maximum Day Demand (MDD) factor 1.10
Peak hour (PH) Factor 1.20

Traffic Zone	Residential, R2	Employment, E3	Design Flow (L/s)			
	2041	2041	Ave. Day	Min. Hour	Max. Day	Peak Hour
36	7,139	20,405	61	51	70	94
37	11,977	15,560	61	51	72	107
38	12,740	9,830	50	42	61	96
39	5,760	2,160	18	15	22	38
40	9,864	3,045	29	24	36	63
41	7,132	4,295	25	21	31	51
42	17,311	7,200	54	46	67	115
43	8,954	13,375	49	41	58	85
44	5,151	3,700	20	16	24	38
45	17,545	16,045	74	62	89	140
46	12,344	4,335	37	31	46	80
47	6,186	5,820	27	22	32	50
48	9,260	5,380	32	27	40	65
49	1,554	10,930	28	23	31	38
50	8,760	12,185	46	39	55	81
51	8,134	26,640	77	65	88	116
52	0	17,275	38	32	42	46
53	3,573	9,050	28	23	32	44
54	0	25,930	57	48	63	69
55	2,130	49,640	114	96	127	143
205	5,191	2,745	18	15	22	36
sub-toal	160,705	265,545	942	792	1,108	1,593

Appendix F-F

Proposed PD2 Looped Watermains and Typical
Road Cross-Section along Yong St. within Study
Area



Notes

- 1. All utility information is indicative and is presented at SUE level B.

Key

- Existing watermain
- Existing sewer
- Proposed watermain
- Proposed curb

P3	3/21	NORTHPOINT CORRECTED	ADB	ADB	ADB
P2	8/20	GENERAL UPDATE	ADB	ADB	ADB
P1	8/20	ORIGINAL ISSUE	UG	ADB	ADB
REV	DATE	DESCRIPTION	DES	CHK	APP

steer

www.steergroup.com

Client: City of Toronto

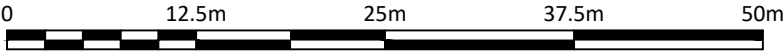
Project Title: Yonge Street EA Study

Drawing Title:
Watermain Proposals
01

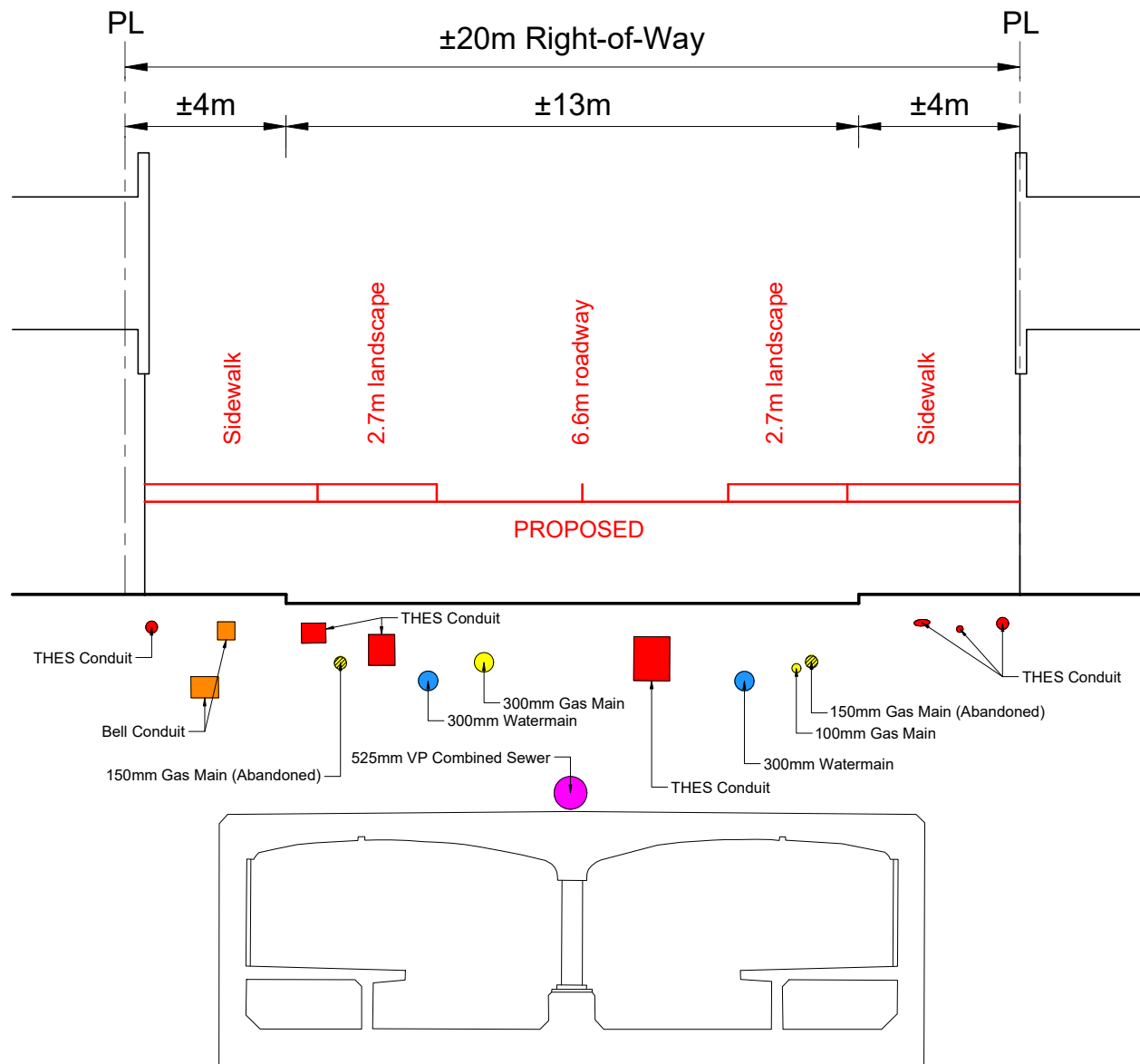
Status: FIT FOR INFORMATION

Size: B	Scale: 1:500	Suitability S2	Rev. P3
---------	--------------	----------------	---------

Drawing No.
23079001-SK-WATER01

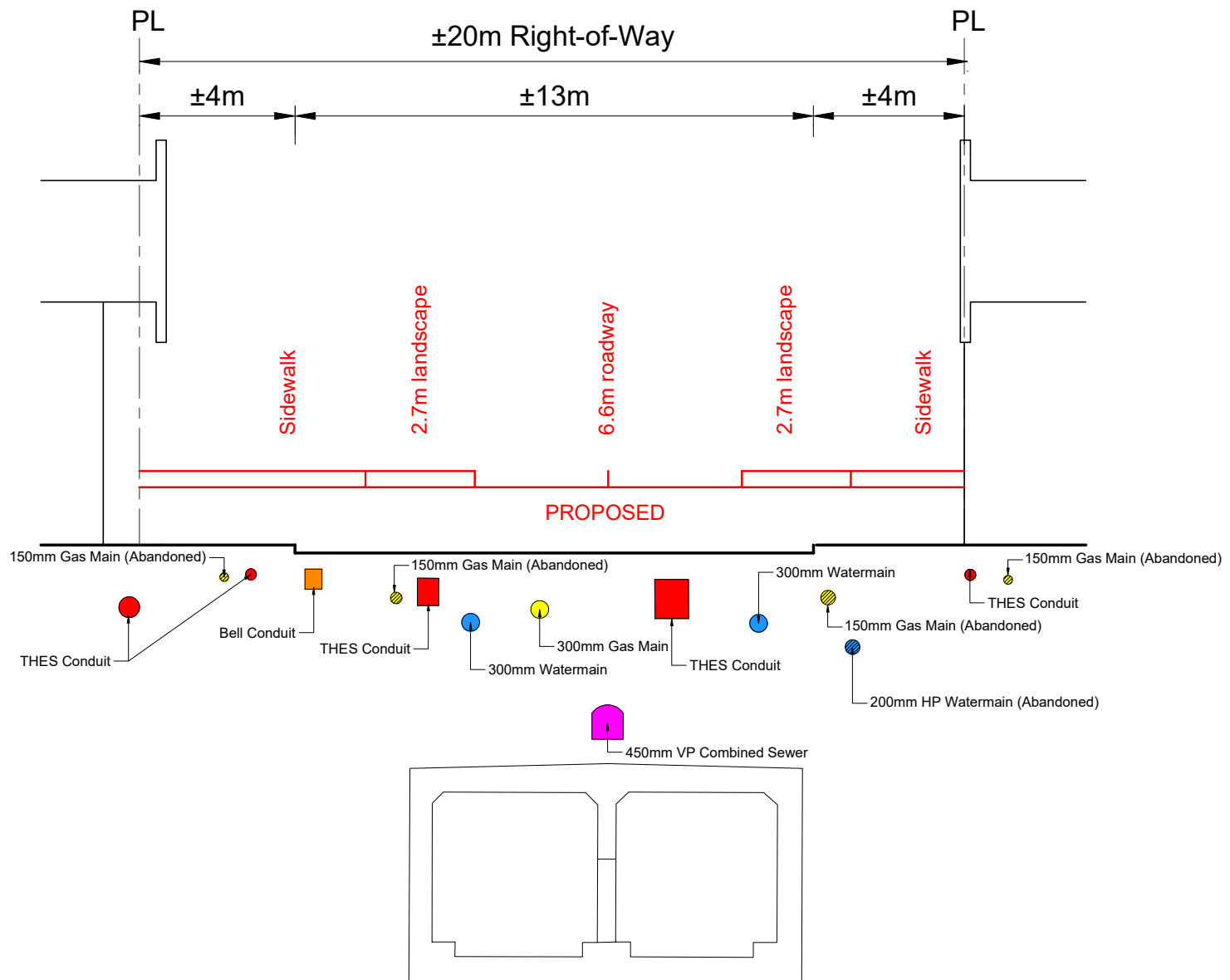


DATE: 2/20/2023 CAD REFERENCE: C:\Users\jbarber\Documents\working\Yonge drawing entry\23079001-SK-WATER01.dwg



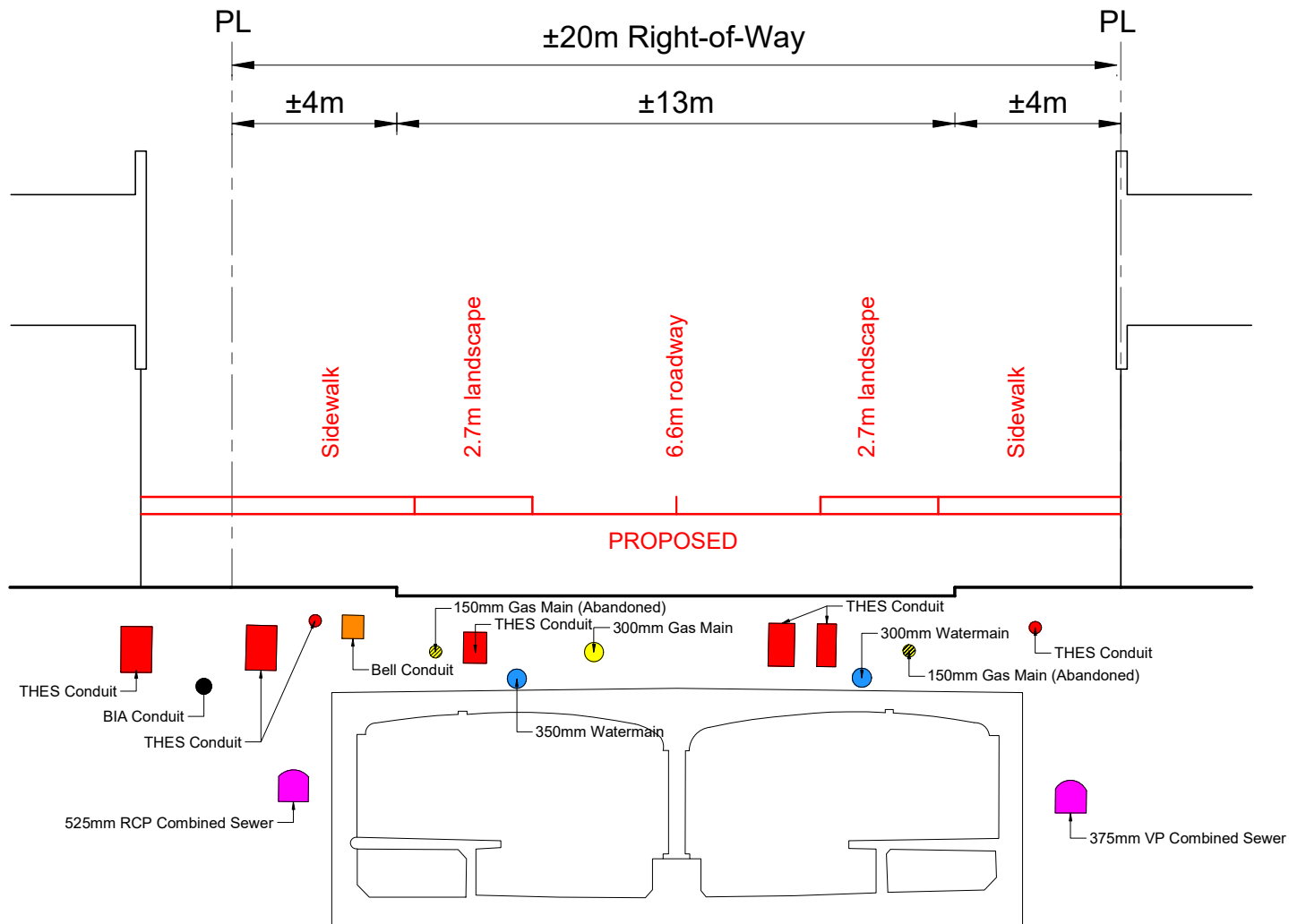
Between Queen St and Dundas St
 30m North of Yonge St and Queen St
 (Looking North)

Source: Steer Group



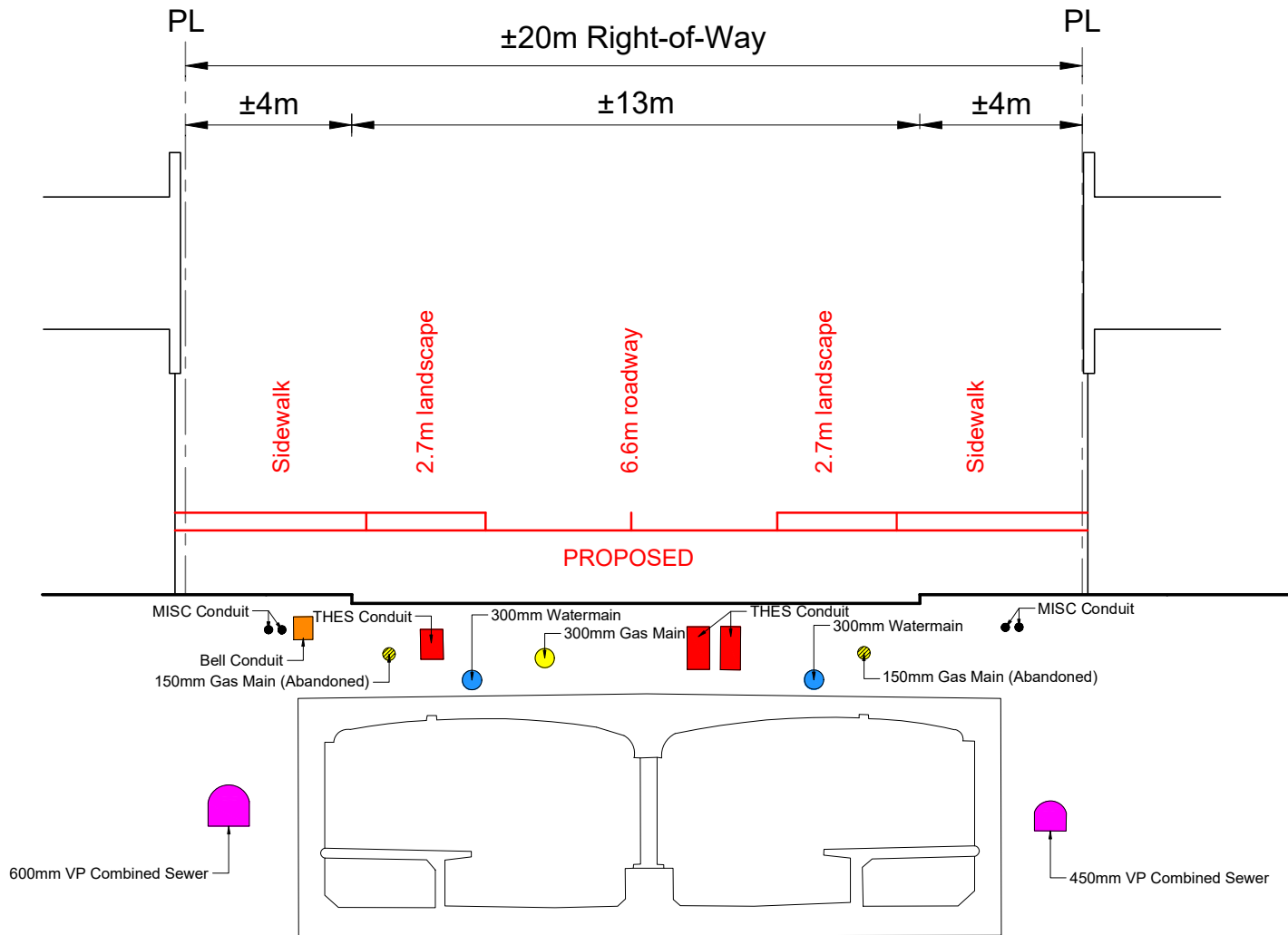
Between Queen St and Dundas St
 30m South of Yonge St and Shuter Street
 (Looking North)

Source: Steer Group



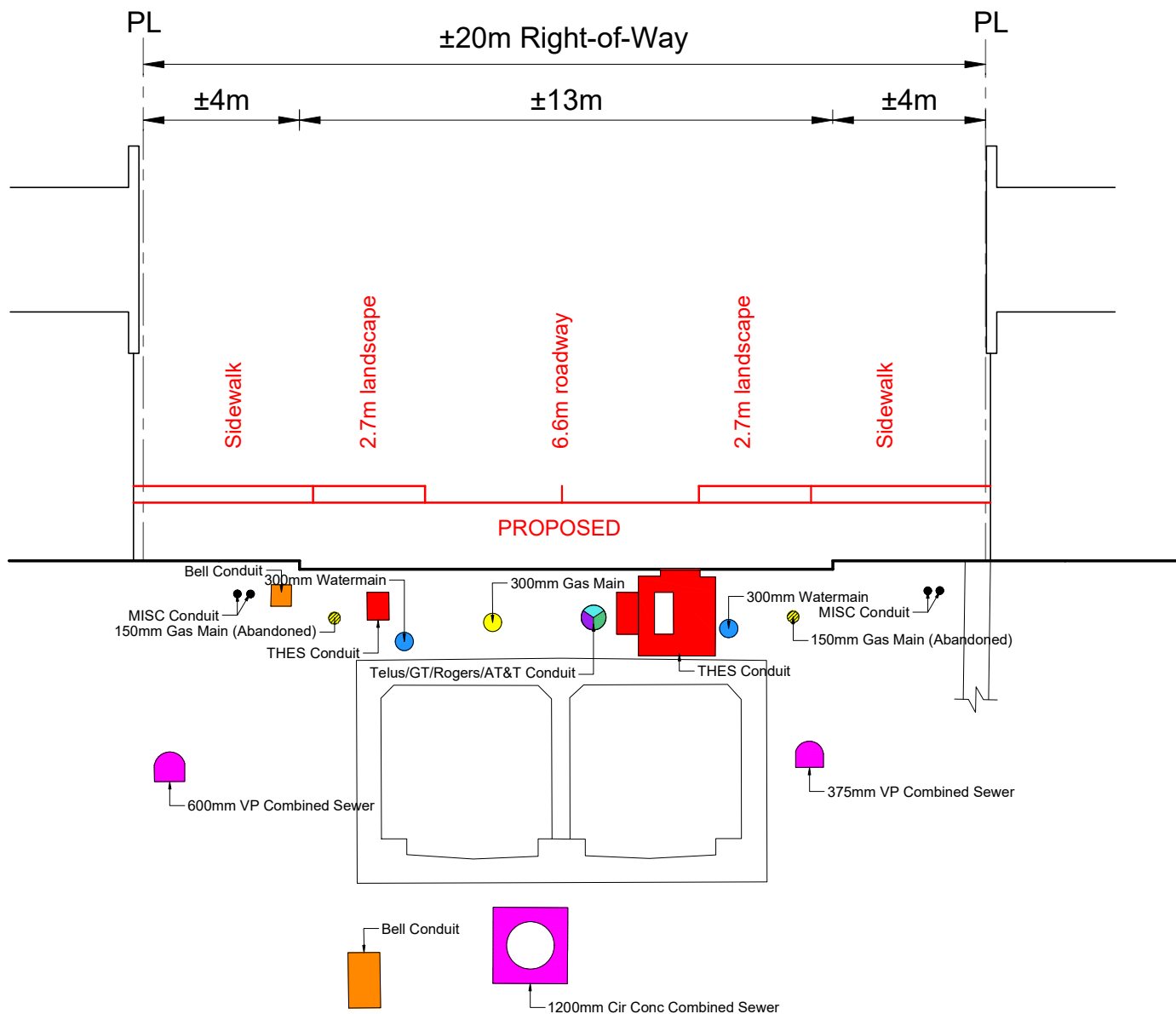
Between Queen St and Dundas St
 40m South of Yonge St and Dundas St
 (Looking North)

Source: Steer Group



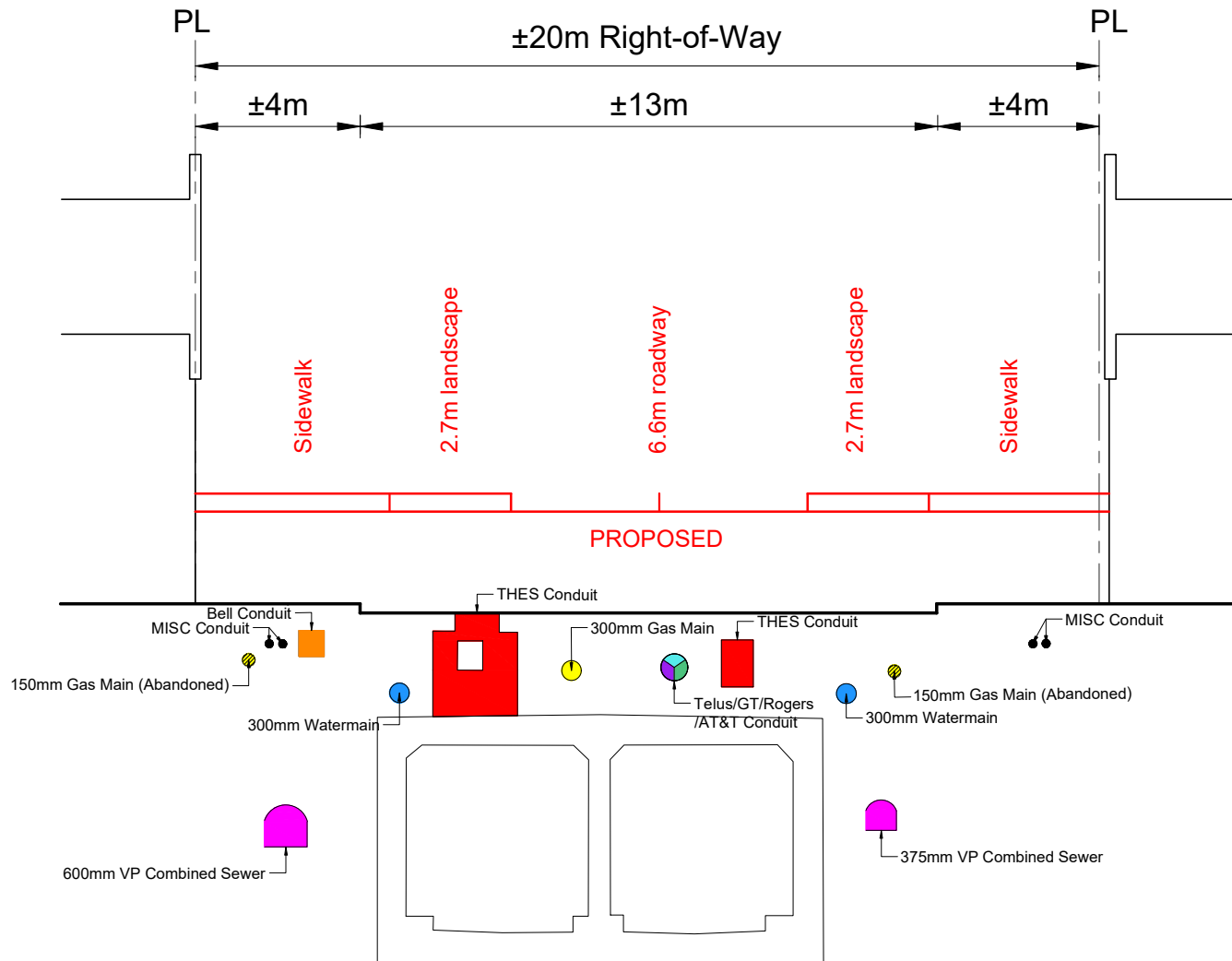
Between Dundas St and Edward St
 50m North of Yonge St and Dundas St
 (Looking North)

Source: Steer Group



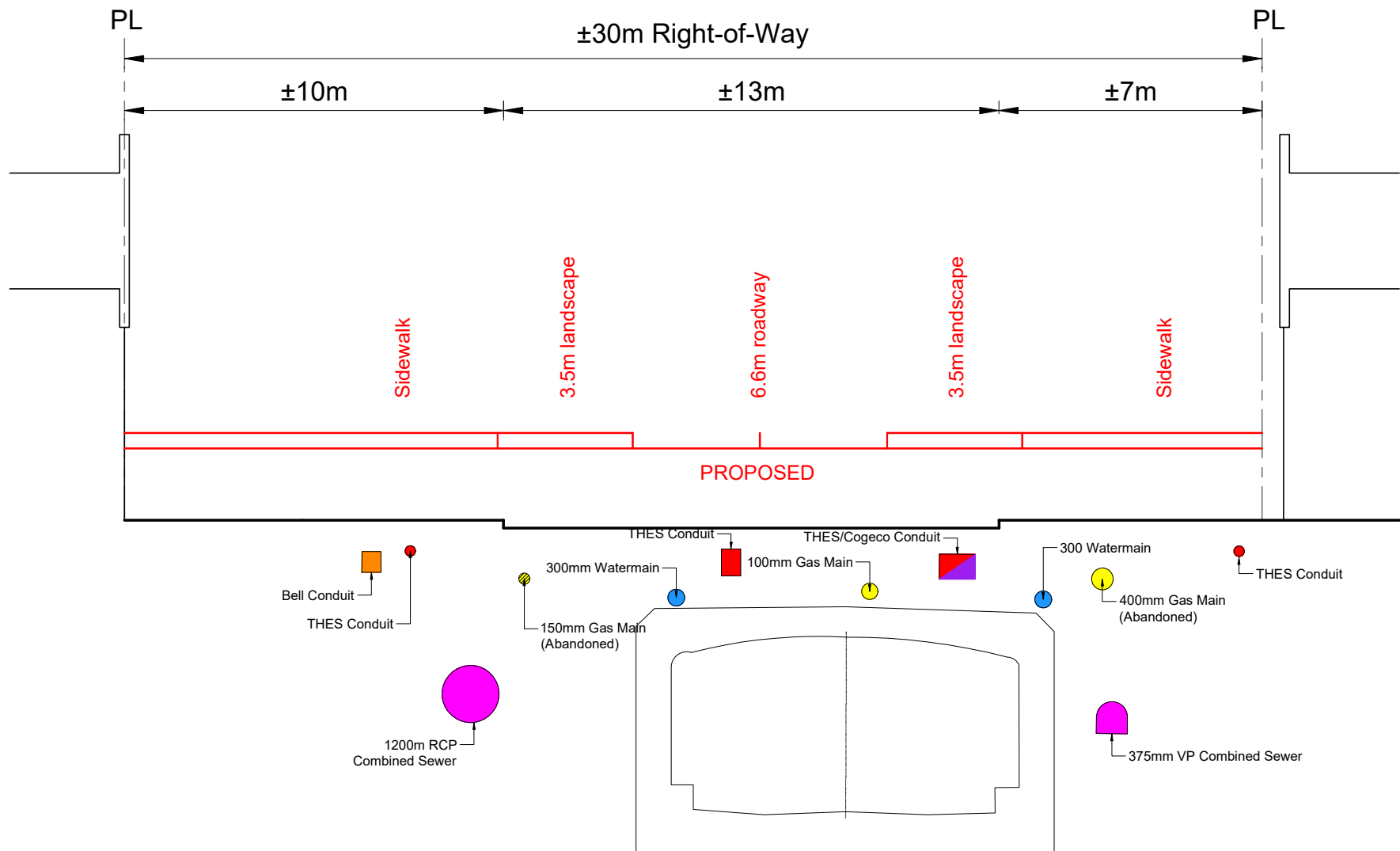
Between Gould St and Elm St
35m North of Gould St and Yonge St
(Looking North)

Source: Steer Group



Between Walton St and Gerrard St
 25m South of Yonge St and Gerrard St
 (Looking North)

Source: Steer Group



Between Gerrard St and Carlton (College)
 60m North of Yonge St and Gerrard St
 (Looking North)

Source: Steer Group



Appendix F-G

InfoWorks Digital Future Model

City of Toronto

steergroup.com

steer