

Functional Servicing Report - 2

**Century Park Urban Village
Edmonton, AB**



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Project #1161-103870



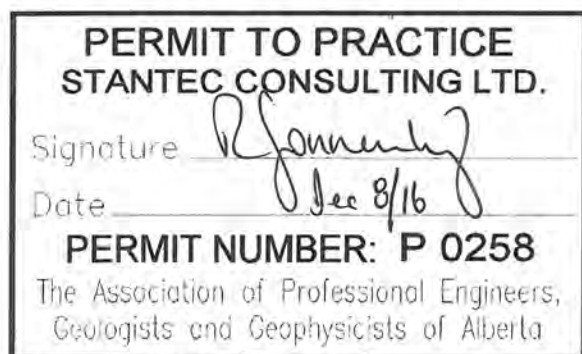
CORPORATE

AUTHORIZATION

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Corporate Permit



Engineer: Nathan Eriksson, P.Eng.

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1. INTRODUCTION

Stantec Consulting Limited has been retained by ProCura Real Estate Services Ltd. to prepare a Functional Servicing and Storm-water Management Report in support of the proposed Century Park Urban Village in the City of Edmonton.

The original purpose of this report was to address the overall servicing strategies for the entire 12.65 hectare Century Park Urban Village re-development. This report has been revised from the previously approved Functional Servicing Report – 1 (FSR-1) to support the re-zoning of Century Park Urban Village reflecting a revised layout, increased density onsite and to ensure a major storm outlet for the development and adjacent transit center.

Servicing strategies include sanitary servicing, storm servicing, stormwater management, grading design, and erosion & sediment control during construction. A review of the water supply has been submitted separately to EPCOR as per their HNA requirements.

2. SITE LOCATION AND DESCRIPTION

The proposed Century Park Urban Village site is located in south Edmonton north-east of 111th Street and 23rd Avenue and has an area of 12.65 hectares. The site formerly contained Heritage Mall and is bordered by 109th Street NW to the east, existing commercial development to the south, the transit center and 111th Street to the west and existing high-rise residential towers to the north (see Overall Site Plan Drawing 1 for location).




The majority of the property is currently undeveloped; with portions of the site being utilized as a Park'n'Ride facility for the nearby transit center. Proposed mixed-use development is to occur in phases and includes street level retail, townhouse blocks, and residential towers.

There are four proposed transportation accesses to the Century Park Urban Village from 109th Street NW; 110th Street; 28th Avenue; 26th Avenue; and 25th Avenue. There are two transportation accesses from 23rd Avenue NW; 110th Street; and 109A Street and an anticipated two transportation accesses from 111th Street connecting to 110A Street. Existing 28th Avenue, 26th Avenue and 25th Avenue currently terminate at the east side of the future development of parcel F, I & K (refer to Overall Site Plan, Drawing 1). It is anticipated that the aforementioned roadways will be extended westward, and 110th Street constructed in conjunction with the continued servicing of the Century Park Urban Village.

Time Square (Parcel K) & The Louvre (Parcel J) sites are proposed for development currently and are located south of 26th Avenue, North of 25th Avenue, East of 110A Street and West of 109A Street.



Legend



CONTRIBUTING AREA

DEVELOPMENT BASIN BOUNDARY

LOT BASH BOUNDARY

Notes

Development Engineer, Sustainable Development			
Approvals			YY.MM.DD
Revision	By	Appd.	YY.MM.DD
Issued	By	Appd.	YY.MM.DD
File Name: OverallSitePlan.dwg			
	Dwn.	Chkd.	Dsgn.
			YY.MM.DD

Permit-Seal

Client/Project
PROCURA REAL ESTATE SERVICES

CENTURY PARK - TIMES SQUARE

Edmonton, AB

Title
OVERALL SITE PLAN

3. SANITARY SERVICING

3.1 Existing Sanitary South Leg

An existing 300mm diameter sanitary sewer on 26th Avenue discharges east towards a 600mm diameter sanitary trunk sewer on 109th Street. This sanitary sewer extends from 109th Street west on 26th Avenue, to a manhole (MH S-4) at the 26th Avenue/109A Street intersection. From this manhole, sewers extend north, west and south to service the southern half of the Century Park Urban Village.

Sanitary flows are conveyed from a stub on 109A Street, north of 26th Avenue by an existing 200mm diameter sanitary sewer and discharge into MH S-4. Similarly, a 250mm diameter sanitary sewer is stubbed out on 26th Avenue just west of 109A Street and discharges into MH S-4. Lastly a 200mm diameter sewer stubbed out at 25th Avenue discharges into MH S-6 at 25th Avenue/109A Street intersection where it is conveyed north by the existing 250mm diameter sewer towards MH S-4.

3.2 Existing Sanitary North Leg

In the northern portion of Century Park Urban Village there is an existing 375mm sanitary sewer on 28th Avenue that discharges east through a 300mm sanitary sewer into the 600mm existing sanitary trunk sewer on 109th Street. Immediately upstream is a 375mm storm sewer that extends west in 28th Avenue from 109th Street, to MH S-14 at the 109A Street/28th Avenue intersection. From this manhole, sewers extend north, west and south to service the northern half of the Century Park Urban Village.

Sanitary flows are conveyed from Parcel G on 109A Street, south of 28th Avenue by an existing 200mm diameter sanitary sewer and discharge into MH S-14. Similarly, a 375mm diameter sanitary sewer is stubbed out on 28th Avenue just west of 109A Street and discharges into MH S-14. Lastly a 250mm diameter sanitary sewer stubbed out at 109A Street, north of 28th Avenue discharges into MH S-14 at 28th Avenue/109A Street intersection.

The aforementioned existing sanitary sewers were installed with the Century Park Subdivision Phase 1 & 2 development. The location of existing sanitary sewers is as indicated on Stantec Consulting Ltd. Overall Sanitary Basin Plan Figure in Appendix A.

3.3 Existing Offsite Sanitary

Sanitary flows from Century Park discharge into an existing 600mm Sanitary Sewer Trunk on 109th Street flowing north & west to 111 Street. Sanitary flows continue north along 111 Street and then eastward on 34th Avenue to 106th Street. From 106th Street sanitary flows continue northwards towards pump well 105. The location of the existing offsite sanitary sewers is as indicated on Sameng Inc. Southwest existing sanitary and combined sewer system with sanitary catchments in Appendix A Section 8.3.2

3.4 Proposed Sanitary Sewers

Sanitary sewers proposed as part of the revised layout and continued development of Century Park Urban Village include:

- **South Leg (Servicing Parcels J & K, Existing Site 1 & Existing Site 4 South)**
 - Tie into the existing 250mm stub from ex. MHS-4 on 26th Avenue and extend west to MHS-9.
 - Install a 250mm sanitary line west from MH S-8A to MHS-9 on 26th Avenue.
 - Extend the 250mm sanitary line south from MH S-9 to MH S-11 on 110A Street.
 - Extend a 250mm sanitary line south from MH S-8 to MH S-8B on 110th Street.
 - Tie into the existing 200mm stub on 25th Avenue and extend west to MH S-7A.
 - The South Leg is expected to be developed with Time Square (Parcel K) & The Louvre (Parcel J) subdivision.
- **North Leg (Servicing Parcels A-I, Parcel L & Existing Site 4 North)**
 - Tie into the existing 375mm diameter stub on 28th Avenue and extend west to MH S-16.
 - Install a 300mm sanitary line west on 28th Avenue from MH S-16 to MH S-18.
 - Install a 250mm sanitary line west on 28th Avenue from MH S-18 to MHS-19.
 - Extend a 250mm sanitary line south on 110A Street from MHS-19 to MH S-21.
 - Extend a 200mm sanitary line north on 28A Avenue from MHS-10 to MHS-20.
 - Extend a 250mm sanitary line south on 110th Street from MHS-17 to MHS-17A.

3.5 Design Criteria

The design criteria used in this study are based on the most recent City of Edmonton Design and Construction Standards:

- a) The sanitary sewers were sized using the Manning Equation with a Manning roughness ("n") coefficient of 0.013.
- b) The residential peak sanitary flow rate was determined using the following formula:

$$Q = \frac{G * P * PF}{86400}$$

Where,

Q = peak dry weather flow rate (L/s)

G = per capita daily sewage flow generation = 300 L/day/person

P = design population

PF = peaking factor

For residential flows, the peaking factor was determined based on the following formula with a minimum peaking factor of 1.5:

$$PF = 2.6 P^{-0.1}$$

Where, P is the design contributing population in 1000's

- c) An allowance of 0.28 l/s/ha was used for inflow and infiltration.
- d) Commercial flow values used were 0.20 l/s/ha.
- e) Peaking factor for non-residential areas: $PF = 10Q_{avg}^{-0.45}$ with a maximum value of 25.0 and a minimum value of 2.5. Q_{avg} = average flow rate in l/sec.
- f) The Servicing Standards require that the sanitary pipes be sized to convey the total design peak flow at no more than 80% of the full flow pipe depth.

Therefore, the required flow capacity for sizing the sewer was computed using the following relationship:

$$\text{Required full flow sewer capacity} = \frac{\text{total design peak flow rate}}{0.86}$$

The proposed sanitary servicing will be stubbed out through the phases of development and site plan approval to facilitate connection and servicing of the future development parcels in the Century Park Urban Village. The existing and proposed sanitary sewers will be contained in easements to the public road right of way on 109th Street.

The expected flow from Century Park Urban Village is expected to increase from the previously approved FSR-1 report of 82L/s to 118.1L/s as a result of the re-zoning. The proposed onsite sanitary sewers have been designed to accommodate this increase in flow. Confirmation of downstream capacity for 129.8L/s as per FSR-2 - 2nd submission was received from the City of Edmonton September 9th, 2016 and can be found in Appendix A Section 8.3.3.

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Legend

- U = 200 Units
C = 500 sq.m CONTRIBUTING AREA
A = 0.600 ha
- DEVELOPMENT BASIN BOUNDARY
LOT BASH BOUNDARY
PROPOSED SANITARY SEWER
EXISTING SANITARY SEWER

Notes

Development Engineer, Sustainable Development			
Approvals			YY.MM.DD
Revision	By	Appd.	YY.MM.DD
Issued	By	Appd.	YY.MM.DD
File Name: Sanitary-Basin_2016_10_06.dwg	Dwn.	Chkd.	Dsgn.
			YY.MM.DD

Permit-Seal

Client/Project

PROCURA REAL ESTATE SERVICES

CENTURY PARK - TIMES SQUARE

Edmonton, AB

Title

OVERALL SANITARY BASIN PLAN

Project No.
1161-103870

Scale
1:1000

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2016-10-06 11:37am BY:NERIKSSON

Drawing No.

2



SANITARY SEWER

PROJECT : Century Park Urban Village - FSR-2
JOB No. : 1161-103870
DATE : October 6, 2016
DES. BY : Nathan Eriksson

				RESIDENTIAL										COMMERCIAL				OFFICE																		
From	To	ADDED AREA	TOTAL AREA	High Rise Apartment RA9		Medium Rise Apartment RA8		Low Rise Apartment RA7		Row Housing RF5		SUM POP.	AVERAGE SEWER FLOW (L/s)	PEAK FLOW FACTOR	AREA (m ²)	SUM AREA (m ²)	AVERAGE FLOW (L/s)	PEAK FLOW FACTOR	AREA (m ²)	SUM AREA (m ²)	AVERAGE FLOW (L/s)	PEAK FLOW FACTOR	INFILT. (L/s)	DESIGN Q	REQUIRED CAP. Q/0.86	FULL PIPE CAP.	Req'd CAP / Full	FULL VEL	Design Flow VEL	Nominal Dia.	Slope	Length	Surface Elevation	From	To	Upstream Manhole Depth
MH	MH	Ha	Ha	# Of Units	Pop.	# Of Units	Pop.	# Of Units	Pop.	# Of Units	Pop.													L/s	L/s	L/s	%	m/s		(mm)	(%)	(m)	(m)	(m)	(m)	(m)
SOUTH BASIN																																				
Parcel J (W)	S-11	0.37	0.37	184	348	0	0	0	0	0	0	348	1.21	2.89	1858	1858	0.34	16.16	9290	9290	2.29	6.88	0.10	24.9	29.0	46.4	63%	1.48	1.50	200	2.00	10.00	676.65	672.669	672.469	3.981
S-11	S-10	0.00	0.37	0	0	0	0	0	0	0	0	348	1.21	2.89	0	1858	0.34	16.16	0.00	9290	2.29	6.88	0.10	24.9	29.0	59.5	49%	1.21	1.16	250	1.00	43.23	676.65	672.409	671.977	4.241
S-10	S-9	0.00	0.37	0	0	0	0	0	0	0	0	348	1.21	2.89	0	1858	0.34	16.16	0.00	9290	2.29	6.88	0.10	24.9	29.0	42.0	69%	0.86	0.89	250	0.50	45.57	675.43	671.917	671.689	3.513
S-9	S-9A	0.00	0.37	0	0	0	0	0	0	0	0	348	1.21	2.89	0	1858	0.34	16.16	0.00	9290	2.29	6.88	0.10	24.9	29.0	42.5	68%	0.87	0.90	250	0.51	64.41	674.94	671.629	671.301	3.311
Parcel J (N)	S-9A	0.37	0.37	184	348	0	0	0	0	0	0	348	1.21	2.89	0	0	0.00	0.00	0.00	0	0.00	0.00	0.10	3.6	4.2	46.4	9%	1.48	0.88	200	2.00	9.00	676.04	671.482	671.302	4.558
	S-9A	0.00	0.74	0	0	0	0	0	0	0	0	696	2.42	2.70	0	1858	0.34	16.16	0.00	9290	2.29	6.88	0.21	28.1	32.6	42.0	78%	0.86	0.92	250	0.50	55.47	676.04	671.242	670.965	4.798
Parcel J (E)	S-8B	0.37	0.37	184	348	0	0	0	0	0	0	348	1.21	2.89	0	0	0.00	0.00	0.00	0	0.00	0.00	0.10	3.6	4.2	46.4	9%	1.48	0.88	200	2.00	9.00	677.13	671.744	671.564	5.386
Parcel K (W)	S-8B	0.28	0.28	114	215	0	0	0	0	0	4	228	0.79	3.01	0	0	0.00	0.00	0.00	0	0.00	0.00	0.08	2.5	2.9	46.4	6%	1.48	0.78	200	2.00	10.00	677.13	671.764	671.564	5.366
	S-8B	0.00	0.65	0	0	0	0	0	0	0	0	576	2.00	2.75	0	0	0.00	0.00	0.00	0	0.00	0.00	0.18	5.7	6.6	32.8	20%	1.04	0.78	200	1.00	55.71	677.13	671.522	670.965	5.608
S-8	S-8A	0.00	1.39	0	0	0	0	0	0	0	0	1271	4.41	2.54	0	1858	0.34	16.16	0.00	9290	2.29	6.88	0.39	32.9	38.3	42.0	91%	0.86	0.95	250	0.50	59.29	677.03	670.905	670.609	6.125
	S-8A	0.28	0.28	109	206	0	0	0	0	8	25	231	0.80	3.01	0	0	0.00	0.00	0.00	0	0.00	0.00	0.08	2.5	2.9	46.4	6%	1.48	0.79	200	2.00	9.00	676.95	670.788	670.608	6.162
S-8A	Ex. S-4	0.00	1.67	0	0	0	0	0	0	0	0	1503	5.22	2.50	0	1858	0.34	16.16	0.00	9290	2.29	6.88	0.47	34.8	40.5	41.2	98%	0.84	0.94	250	0.48	60.48	676.95	670.548	670.258	6.402
Parcel K (SW)	S-7A	0.14	0.14	117	221	0	0	0	0	0	0	221	0.77	3.02	0	0	0.00	0.00	0.00	0	0.00	0.00	0.04	2.4	2.7	46.4	6%	1.48	0.77	200	2.00	10.00	677.65	671.932	671.732	5.718
	S-7A	0.00	0.14	0	0	0	0	0	0	0	0	221	0.77	3.02	0	0	0.00	0.00	0.00	0	0.00	0.00	0.04	2.4	2.7	32.8	8%	1.04	0.61	200	1.00	29.00	677.65	671.672	671.382	5.978
Parcel K (S)	S-7	0.13	0.13	0	0	0	0	0	0	0	0	0	0.00	0.00	1403	1403	0.26	18.34	0.00	0	0.00	0.00	0.04	4.8	5.6	46.4	12%	1.48	0.96	200	2.00	10.00	677.03	671.582	671.382	5.448
	Ex. S-6	0.00	0.270	0	0	0	0	0	0	0	0	221	0.77	3.02	0	1403	0.26	18.34	0.00	0	0.00	0.00	0.08	7.2	8.3	23.2	36%	0.74	0.65	200	0.50	58.63	677.03	671.322	671.029	5.708
	Ex. S-6	0.00	0.270	0	0	0	0	0	0	0	0	221	0.77	3.02	0	1403	0.26	18.34	0.00	0	0.00	0.00	0.08	7.2	8.3	42.5	20%	0.87	0.64	250	0.51	27.50	676.04	670.968	670.827	5.072
Parcel K (E)	Ex. S-5	0.28	0.28	116	219	0	0	0	0	0	0	219	0.76	3.03	0	0	0.00	0.00	0.00	0	0.00	0.00	0.08	2.4	2.8	46.4	6%	1.48	0.77	200	2.00	10.00	676.11	671.027	670.827	5.083
	Ex. Site 1 (S)	0.60	0.60	0	0	76.5	166	26.5	54	0	0	220	0.76	3.02	0	0	0.00	0.00	0.00	0	0.00	0.00	0.17	2.5	2.9	32.8	9%	1.04	0.62	200	1.00	19.14	676.11	671.007	670.816	5.103
	Ex. S-5	0.00	1.15	0	0	0	0	0	0	0	0	660	2.29	2.71	0	1403	0.26	18.34	0.00	0	0.00	0.00	0.32	11.3	13.1	23.2	57%	0.74	0.73	200	0.50	91.82	676.11	670.767	670.308	5.343
Stub (N)	Ex. S-4	0.00	0.000	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0.0	0.0	23.2	0%	0.74	0.00	200	0.50	15.82	676.76	670.387	670.308	6.373
Ex. S-4	Ex. S-3	0.00	2.82	0	0	0	0	0	0	0	0	2163	7.51	2.41	0	3261	0.60	12.55	0.00	9290	2.29	6.88	0.79	42.2	49.1	61.2	80%	0.87	0.93	300	0.40	66.71	676.76	670.208	669.941	6.552
Ex. Site 1 (N)	Ex. S-3	0.60	0.60	0	0	76.5	166	26.5	54	0	0	220	0.76	3.02	0	0	0.00	0.00	0.00	0	0.00	0.00	0.17	2.5	2.9	32.8	9%	1.04	0.62	200	1.00	17.55	676.21	670.152	669.972	6.055
Ex. Site 4 (S)	Ex. S-3	0.65	0.65	0	0	72	156	22	45	0	0	201	0.70	3.05	0	0	0.00	0.00	0.00	0	0.00	0.00	0.18	2.3	2.7	32.8	8%	1.04	0.60	200	1.00	16.02	676.21	670.152	669.972	6.055
Ex. S-3	Ex. S-2	0.00	4.07	0	0	0	0	0	0	0	0	2584	8.97	2.36	0	3261	0.60	12.55	0.00	9290	2.29	6.88	1.14	45.7	53.2	61.2	87%	0.87	0.95	300	0.40	25.07	676.21	669.881	669.782	6.326
Ex. S-2	Ex. MH201292	0.00	4.07	0	0	0	0	0	0	0	0	2584	8.97	2.36	0	3261	0.60	12.55	0.00	9290	2.29	6.88	1.14	45.7	53.2	136.8	39%	1.93	1.74	300	2.00	38.75	675.51	669.732	668.957	5.775
SOUTH BASIN TOTAL			4.070	1008		225		75		12		2584				3261				9290				45.7												

				RESIDENTIAL								COMMERCIAL				OFFICE				INFILT. (L/s)	DESIGN Q	REQUIRED CAP. Q/0.86 L/s	FULL PIPE CAP. L/s	Req'd CAP / Full %	FULL VEL m/s	Design Flow VEL	Nominal Dia.	Slope	Length	Surface Elevation	From	To	Upstream Manhole Depth																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
From	To	ADDED AREA	TOTAL AREA	High Rise Apartment RA9		Medium Rise Apartment RA8		Low Rise Apartment RA7		Row Housing RF5		SUM POP.	AVERAGE SEWER FLOW (L/s)	PEAK FLOW FACTOR	AREA (m²)	SUM AREA (m²)	AVERAGE FLOW (L/s)	PEAK FLOW FACTOR	AREA (m²)															SUM AREA (m²)	AVERAGE FLOW (L/s)	PEAK FLOW FACTOR																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
MH	MH	Ha	Ha	# Of Units	Pop.	# Of Units	Pop.	# Of Units	Pop.	# Of Units	Pop.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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RESIDENTIAL

RA9 - HIGH RISE APARTMENT - 1.89 persons/unit
RA8 - MEDIUM RISE APARTMENTS - 2.17 persons/unit
RA7 - LOW RISE APARTMENT - 2.04 persons/unit
RF5 - ROW HOUSING - 3.17 persons/unit
AVERAGE SEWAGE FLOW - 300 liters/persons/day
INFILTRATION - 0.28 litres/hectare/sec
PEAKING FACTOR = 2.6 x (population in 1000s)^{-0.1} (Min. of 1.50)

ASSUMPTIONS

Commercial Retail Space average sewer flow(l/s) would be over 12 hours per day
Office space average sewer flow(l/s) would be over an average of 9 hours per day
n=0.013

COMMERCIAL

AVERAGE SEWAGE FLOW - 8 litres/day/m2 of floor area over 12 hours
INFILTRATION - 0.28 litres/ hectare/sec
PEAKING FACTOR - 10 x Q^{(-0.45)} (Min. 2.50, Max. 25.0)

OFFICE BUILDINGS

AVERAGE SEWAGE FLOW - 8 litres/day/m2 of floor area over 9 hours
INFILTRATION - 0.28 litres/ hectare/sec
PEAKING FACTOR - 10 x Q^{(-0.45)} (Min. 2.50, Max. 25.0)



4. STORM SERVICING & STORMWATER MANAGEMENT

4.1 Existing Storm South Leg

The southern portion of Century Park Urban Village is currently serviced by an existing 600mm diameter storm sewer on 26th Avenue which discharges east towards a 2100mm diameter storm trunk sewer on 109th Street. This 600mm storm sewer extends west in 26th Avenue from 109th Street, to MH R-5 at the 26th Avenue/109A Street intersection. From this manhole, sewers extend north, west and south to service the southern half of the Century Park Urban Village.

Storm flows are conveyed from a stub on 109A Street, north of 26th Avenue by an existing 250mm diameter storm sewer and discharge into MH R-5. Similarly, a 525mm diameter storm sewer is stubbed out on 26th Avenue just west of 109A Street and discharges into MH R-5. In addition a 250mm diameter storm sewer conveys flow at 25th Avenue from MH R-11 (connected to an existing storm water storage tank) east of 109A Street, as well as west of 109A Street and discharges into MH R-9 at 25th Avenue/109A Street intersection. Flows from MH R-9 are conveyed north on 109A Street by an existing 300mm diameter storm sewer towards MH R-5.

4.2 Existing Storm North Leg

In the northern portion of Century Park Urban Village there is an existing 600mm storm sewer on 28th Avenue that discharges east into a 2100mm existing storm trunk sewer on 109th Street. This 600mm storm sewer extends west in 28th Avenue from 109th Street, to MH R-18 at the 109A Street/28th Avenue intersection. From this manhole, sewers extend north, west and south to service the northern half of the Century Park Urban Village.

Storm flows are conveyed on 109A Street, south of 28th Avenue by an existing 300mm diameter storm sewer and discharge into MH R-18. Similarly, a 525mm diameter storm sewer is stubbed out on 28th Avenue just west of 109A Street and discharges into MH R-18. Lastly a 375mm diameter storm sewer stubbed out at 109A Street, north of 28th Avenue/109A Street intersection and also discharges into MH R-18.

The aforementioned existing storm sewers were installed with the Century Park Subdivision Phase 1 and 2 developments. The location of existing storm sewers is as indicated on Stantec Consulting Ltd. *Overall Storm Basin Plan in Appendix A.*

4.3 Existing Offsite Storm

Storm flows from Century Park discharge into an existing 2100mm storm sewer trunk on 109th Street flowing north and west to the intersection of 29A Ave & 109th Street where it turns north tying into the 30 Ave utility corridor right of way. From the 30 Ave utility corridor right of way it flows west crossing Whitemud Creek eventually discharging into the North Saskatchewan River. Additionally an overflow facility Outfall OF#335407 is located at the Whitemud Creek Crossing for peak rainfall events. The location of the existing offsite storm sewers is as indicated on Sameng

Inc. Southwest Area Existing Storm Sewer System in Appendix A Section 8.3.2. Confirmation of downstream capacity for storm flows was received from the City of Edmonton September 9th, 2016 and can be found in Appendix A Section 8.3.3.

4.4 Proposed Storm Sewers

Storm sewers proposed as part of the continued development of the Urban Village include:

- **South Leg**
 - Extend the 525mm diameter sewer westward along 26th Avenue from MH R-10 to MH R-14A
- **Middle Leg (Existing North Leg)**
 - Due to a revised grading plan no additional storm sewers are proposed to tie into this leg.
- **North Leg**
 - Connect a 600mm diameter sewer into COE MH 201331 and extend the storm sewer southward along 110th Street to MH R-30 reducing to a 525mm diameter sewer at MH R-26 and to a 450mm diameter sewer at MH R-29.
 - Install a 375mm diameter sewer eastward along Main Street (27th Avenue) from MH R-30 to MH R-3, reducing to a 300mm diameter sewer from MH R-31 to MH R-32.
 - Extend two 300mm diameter sewers north and south of Main Street (27th Avenue) on Century Park Way from MHR-32 to MH R-33 & R-34.
 - Extend a 300mm diameter sewer eastward along 28th Avenue from MH R-27 to MH R-28.
 - Extend a 375mm storm sewer eastward along 28A Avenue from MH R-23 to MH R-24 reducing to a 300mm diameter sewer from MH R-24 to MH R-25.

4.5 Design Criteria

The following design criteria based on December 2014 City of Edmonton Design and Construction Standards were used in the assessment of the existing and proposed storm drainage systems.

- a) **Minor System** – Designed based on a 1:5 year storm event for the private roads and adjacent boulevards. Private lots will have a restricted discharge of 35L/s/ha with 100 year storage to the minor system. The existing and proposed minor system will be contained in easements to the public road right of way on 109th Street.

Table 5.2 summarizes the criteria used to design the new sewer main sizes and storage requirement for the onsite storage requirements.

Table 5.2 Design Criteria for Minor Storm System

Parameter	City of Edmonton Design and Construction Standards
Minimum Velocity (m/s)	0.6
Maximum Velocity (m/s)	3.0
Minimum Depth of Cover (m)	2.2 (<610mm) 1.5 (>610mm)
Minimum Sewer Size (mm)	300 – Except where tying into existing stubs.
Design Inlet Time (min)	8
Minor System	1:5 storm event level with major overflow route
Storage Requirement Onsite - Developments	1:100 year storm event with 35 L/s/ha discharge rate.
Manning's n	0.013
Minimum Slope (%)	0.10
Max Distance Runoff Shall Flow Along Roadway (m)	120
Maximum Manhole Spacing (m)	150

- b) **Major System** – Private roadways will be graded to convey overland flows in easements to the four accesses on 109th Street.

- c) **Site Storage** - Storage facilities are to be provided by each lot to contain a 1:100 year storm event with a maximum 35 L/s/ha discharge rate. Storage details are to be provided with the onsite design of each parcel.
- d) **Existing Transit Center** – The existing storm system for the transit center and Century Park are to operate separately up to 1:100 year storm event. The existing 1:100 year emergency tip over elevation of 674.984m from the transit center to Century Park is being accommodated in the Century Park design by directing the major overland flow contained in easements to 109th Street & 29th Avenue.

The proposed storm servicing will be stubbed out through the phases of development and site plan approval to facilitate connection and servicing of the future development parcels in the Century Park Urban Village.






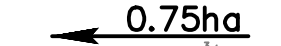


4.6 Storm Water Management

The approved storm servicing strategy for the Century Park Urban Village indicates that storm runoff generated on areas within the site (building rooftops, paved parking/driveway areas, and amenity areas) is to be collected and controlled to a release rate of 35 L/s/ha, for all storm events up to and including the 1:100 year design storm event. It is anticipated that each site within the Urban Village be designed to have underground storage as a storm water management strategy as well as incorporate Low Impact Development (LIDs) into each site development. Examples of possible LID that can be utilized onsite include green roofs, rain gardens, box planters, Silvia cells, and the re-use of rain-water. Detailed storage and LID's will be determined and calculated with each onsite plan at the time of development permit. The servicing strategy allows for the private/common roadways and adjacent boulevards to drain without storm water management control up to 1:5 year storm events. When fully developed Century Park Urban Village will have a discharge of 0.904m³/s to the 2100mm storm trunk located on 109th Street in a 5 year event. This compares to a current uncontrolled discharge rate of 2.120m³/s in a 5 year event.

For areas not subject to storm water management quantity control (common areas - shared roadways and site boulevards), storm water runoff will be collected through proposed roadside catch basins and conveyed by the proposed storm sewers. The proposed storm sewers have been sized to convey the expected 1:5 year design storm. For storms in excess of the minor system capacity, the grading design of the proposed common/shared roadways provides for overland flow relief, with overland flow generally directed to the east of the site to 109th Street.

For storm events less than 1:100 years Century Park and the adjacent Transit Center are designed to operate independently of each other. For 1:100 year storm events or greater the transit center currently tips over to Century Park utilizing any spare capacity available in the storm network. If no capacity is available in the storm network the Transit Center and Century Park site will drain along the major storm route to 109th Street and 29th Avenue.

Legend

	DEVELOPMENT AREA STORM BASIN
	1:100 STORM CONTROLLED RELEASE BOUNDARY
	ROAD AND COMMON UNCONTROLLED AREA BOUNDARY
	PROPOSED STORM SEWER
	EXISTING STORM SEWER
	CONTROLLED AREA
	CONTROLLED FLOW
	UNCONTROLLED AREA

Development Engineer, Sustainable Development			
Approvals			YY.MM.DD
Revision	By	Appd.	YY.MM.DD
Issued	By	Appd.	YY.MM.DD
File Name: Storm.dwg	Dwn.	Chkd.	Dsgn.
			YY.MM.DD

Permit-Seal


Client/Project
PROCURA REAL ESTATE SERVICES

CENTURY PARK - TIMES SQUARE

Edmonton, AB

Title
OVERALL STORM BASIN PLAN

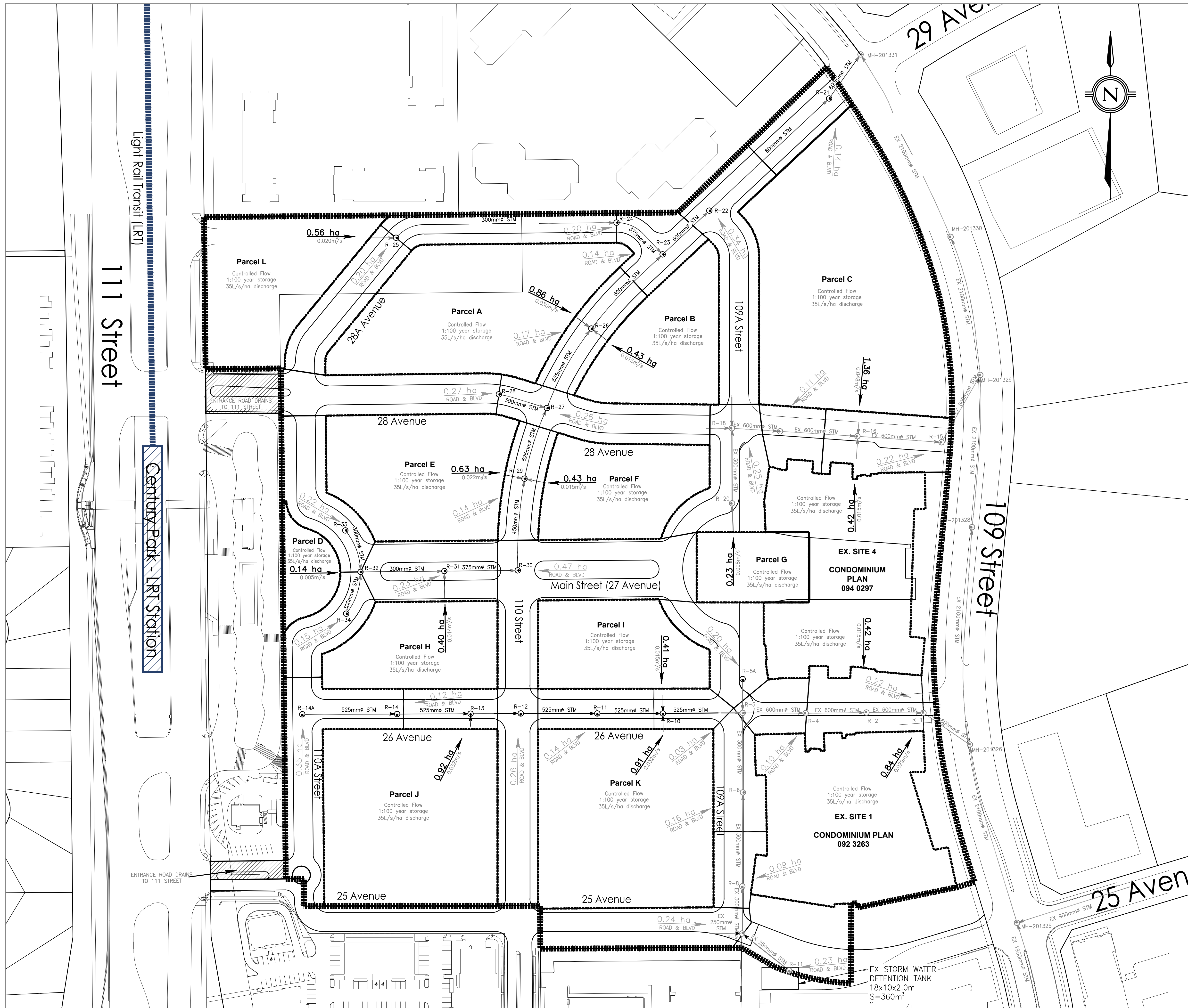
Project No.
1161-103870

Scale
1:1000


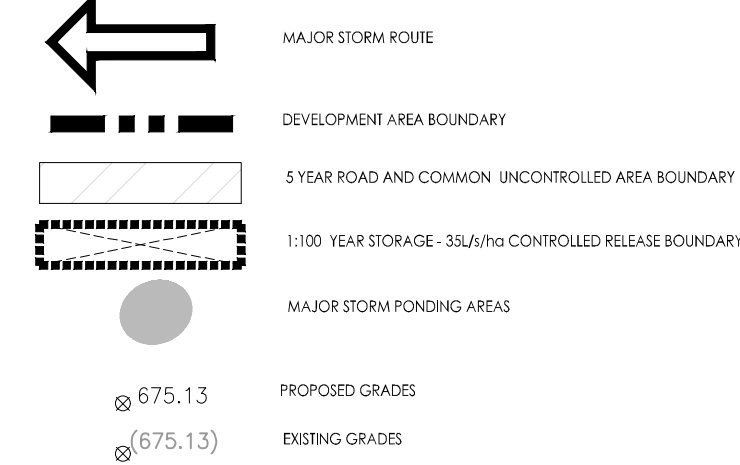
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Drawing Update\Storm.dwg
2016-6-20 12:14pm BY: NERISSON

Drawing No.

3



Legend



Notes

Development Engineer, Sustainable Development			
Approvals			YY.MM.DD
Revision	By	Appd.	YY.MM.DD
Issued	By	Appd.	YY.MM.DD
File Name: Grading.dwg	Dwn.	Chkd.	Dsgn. YY.MM.DD

Permit-Seal

Client/Project
PROCURA REAL ESTATE SERVICES

CENTURY PARK - TIMES SQUARE

Edmonton, AB

Title
OVERALL GRADING PLAN

Project No. 1161-103870
Scale 0 10 20 30 40 50
1:1000

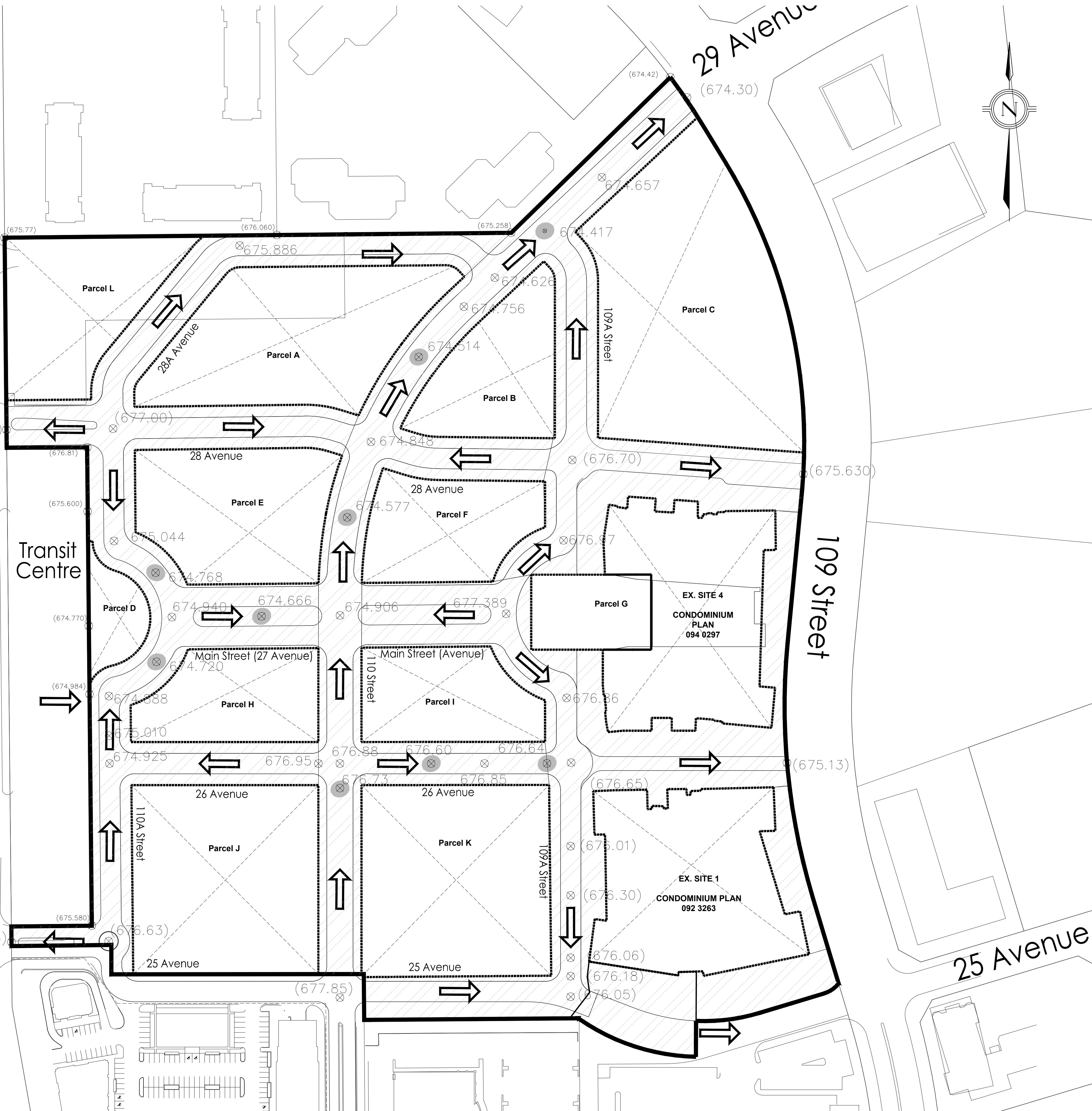
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2016-12-08 11:00am BY:NERIKSSON
Drawing No. 4

Light Rail Transit (LRT)

111 Street

Century Park - LRT Station

111A CT



STORM SEWER

PROJECT :Century Park Urban Village - FSR - 2
JOB No. :1161-103870
DATE :20-Jun-16
DES. BY :Nathan Eriksson

Manning's n = 0.013

From MH	To MH	Storm Event	Area Added (ha)	Area Sub-Total (ha)	Area Total (ha)	C	CA	Sub-Total CA	Total CA	Initial Time (min)	Over-Write tc	Time in Pipe (min)	Total Time (min)	Int. (mm/hr)	# of Lots w/ Foundation Drain	Event Flow (m³/s)	Added Flow (Enter)	Added Flow (m³/s)	Design Flow (m³/s)	Length (m)	Pipe Diameter (mm)	Slope %	Cap. (m³/s)	Vel. (m/s)	Normal Depth (mm)	Froude Number	Supercritical or Subcritical	Subsequent Depth y2 (mm)	Y2<80% Pipe Diameter	Surf. Elev.	Invert Out	Invert In	Avg. Depth Range
North Leg																																	
R-34	R-32	5-yr	0.15	0.15	0.15	0.70	0.11	0.11	0.11	8.00		0.47	8.47	76.68		0.022		0.000	0.022	24.58	300	0.40	0.061	0.865	123	0.83	Subcritical			674.77	671.368	671.270	3.54
R-33	R-32	5-yr	0.22	0.22	0.22	0.70	0.15	0.15	0.15	8.00		0.47	8.47	76.68		0.033		0.000	0.033	24.58	300	0.40	0.061	0.865	156	0.80	Subcritical			674.77	671.368	671.270	3.54
Parcel D	R-32	Controlled Flow 35L/s/ha (0.14ha)			0.00				0.00								0.005	0.005	0.005	10.00	300	1.00	0.097	1.368	45	1.28	Supercritical	62	Acceptable	674.94	671.540	671.440	3.45
R-32	R-31	5-yr	0.00	0.37	0.37	0.70	0.00	0.26	0.26	8.47		0.79	9.26	74.29		0.053		0.005	0.058	45.71	300	0.50	0.068	0.967	210	0.79	Subcritical			674.94	671.210	670.981	3.71
Parcel H	R-31	Controlled Flow 35L/s/ha (0.40ha)			0.00				0.00								0.014	0.014	0.014	10.00	300	1.00	0.097	1.368	72	1.32	Supercritical	104	Acceptable	674.67	671.270	671.170	3.45
R-31	R-30	5-yr	0.23	0.60	0.60	0.70	0.16	0.42	0.42	9.26		0.59	9.85	70.70		0.082		0.019	0.101	40.00	375	0.50	0.124	1.123	251	0.84	Subcritical			674.67	670.906	670.706	3.98
R-30	R-29	5-yr	0.47	1.07	1.07	0.70	0.33	0.75	0.75	9.85		0.65	10.51	68.27		0.142		0.019	0.161	50.25	450	0.50	0.210	1.281	288	0.89	Subcritical			674.91	670.631	670.380	4.24
Parcel E	R-29	Controlled Flow 35L/s/ha (0.63ha)			0.00				0.00								0.022	0.022	0.022	10.00	300	1.00	0.097	1.368	96	1.33	Supercritical	139	Acceptable	674.58	671.180	671.080	3.45
Parcel F	R-29	Controlled Flow 35L/s/ha (0.43ha)			0.00				0.00								0.015	0.015	0.015	10.00	300	1.00	0.097	1.368	78	1.33	Supercritical	113	Acceptable	674.58	671.180	671.080	3.45
R-29	R-27	5-yr	0.14	1.21	1.21	0.70	0.10	0.85	0.85	10.51		0.48	10.98	65.83		0.155		0.056	0.211	40.49	525	0.50	0.317	1.419	305	0.95	Subcritical			674.58	670.305	670.103	4.51
R-28	R-27	5-yr	0.27	0.27	0.27	0.70	0.19	0.19	0.19	8.00		0.47	8.47	76.68		0.040		0.000	0.040	27.24	300	0.50	0.068	0.967	162	0.88	Subcritical			675.29	671.889	671.753	3.25
R-27	R-26	5-yr	0.26	1.74	1.74	0.70	0.18	1.22	1.22	10.98		0.59	11.57	64.18		0.217		0.056	0.273	49.89	525	0.50	0.317	1.419	368	0.87	Subcritical			674.85	670.043	669.794	4.76
Parcel A	R-26	Controlled Flow 35L/s/ha (0.86ha)			0.00				0.00								0.030	0.030	0.030	10.00	300	1.00	0.097	1.368	111	1.32	Supercritical	159	Acceptable	674.51	671.110	671.010	3.45
Parcel B	R-26	Controlled Flow 35L/s/ha (0.43ha)			0.00				0.00								0.015	0.015	0.015	10.00	300	1.00	0.097	1.368	78	1.33	Supercritical	113	Acceptable	674.51	671.110	671.010	3.45
R-26	R-23	5-yr	0.17	1.91	1.91	0.70	0.12	1.34	1.34	11.57		0.60	12.17	62.29		0.231		0.101	0.332	56.15	600	0.50	0.454	1.553	375	0.94	Subcritical			674.51	669.719	669.438	4.99
Parcel L	R-25	Controlled Flow 35L/s/ha (0.56ha)			0.00				0.00								0.020	0.020	0.020	10.00	300	1.00	0.097	1.368	90	1.33	Supercritical	130	Acceptable	676.05	672.650	672.550	3.45
R-25	R-24	5-yr	0.20	0.20	0.20	0.70	0.14	0.14	0.14	8.00		2.11	10.11	76.68		0.030		0.020	0.050	122.40	300	0.50	0.068	0.967	188	0.84	Subcritical			676.05	672.490	671.878	3.30
R-24	R-23	5-yr	0.20	0.40	0.40	0.70	0.14	0.28	0.28	10.11		0.47	10.58	67.30		0.052		0.020	0.072	31.68	375	0.50	0.124	1.123	203	0.92	Subcritical			674.92	671.803	671.645	3.05
R-23	R-22	5-yr	0.14	2.45	2.45	0.70	0.10	1.72	1.72	12.17		0.37	12.55	60.49		0.288		0.121	0.409	34.91	600	0.50	0.454	1.553	444	0.85	Subcritical			674.63	669.378	669.203	5.23
R-22	R-21	5-yr	0.34	2.79	2.79	0.70	0.24	1.95	1.95	12.55		0.88	13.42	59.43		0.322		0.121	0.443	89.46	600	0.60	0.497	1.701	435	0.95	Subcritical			674.42	669.143	668.606	5.48
R-21	Ex. MH 201331	5-yr	0.14	2.93	2.93	0.70	0.10	2.05	2.05	13.42		0.29	13.71	57.13		0.325		0.121	0.446	29.51	600	0.60	0.497	1.701	435	0.95	Subcritical			674.30	668.546	668.369	-331.31
Middle Leg																																	
Stub (West)	Ex. R-18	5-yr	0.00	0.00	0.00	0.70	0.00	0.00	0.00	8.00		0.16	8.16	76.68		0.000		0.000	0.000	14.00	525	0.50	0.317	1.419	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	676.65	670.586	670.516	6.10
Stub (North)	Ex. R-18	5-yr	0.00	0.00	0.00	0.70	0.00	0.00	0.00	8.00		0.27	8.27	76.68		0.000		0.000	0.000	18.00	375	0.50	0.124	1.123	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	676.65	670.831	670.741	5.86
Parcel G	Ex. R-20	Controlled Flow 35L/s/ha (0.23ha)			0.00				0.00								0.008	0.008	0.008	16.00	300	1.00	0.097	1.368	54	1.30	Supercritical	76	Acceptable	676.85	671.931	671.771	5.00
Ex. R-20	Ex. R-18	5-yr	0.00	0.00	0.00	0.50	0.00	0.00	0.00	8.00		0.68	8.68	76.68		0.000		0.008	0.008	39.48	300	0.50	0.068	0.967	63	0.93	Subcritical			676.85	670.938	670.741	5.91
Ex. R-18	Ex. R-17	5-yr	0.25	0.25	0.25	0.50	0.13	0.13	0.13	8.68		0.28	8.96	73.31		0.025		0.008	0.033	26.15	600	0.50	0.454	1.553	90	1.02	Supercritical	92	Acceptable	676.65	670.441	670.310	6.12
Ex. R-17	Ex. R-16	5-yr	0.11	0.36	0.36	0.50	0.06	0.18	0.18	8.96		0.46	9.42	72.02		0.036		0.008	0.044	42.50	600	0.50	0.454	1.553	108	1.03	Supercritical	113	Acceptable	676.35	670.260	670.048	6.00
Ex. Site 4 (N)	Ex. R-16	Controlled Flow 35L/s/ha (0.42ha)			0.00				0.00								0.015	0.015	0.015	12.30	300	1.00	0.097	1.368	78	1.33	Supercritical	113	Acceptable	675.95	672.923	672.800	3.09
Parcel C	Ex. R-16	Controlled Flow 35L/s/ha (1.36ha)			0.00																												

5. GRADING

The site grading design will be in conformance with City standards for minimum and maximum slopes, will provide adequate cover on proposed underground servicing, will be compatible with the architectural vision for the development, and will match grades along existing Park Drive South to the east. Detailed grading of internal sites will be completed through the phases of development and at the time of site plan approval of each site.

6. EROSION AND SEDIMENT CONTROL

Erosion and sediment control (ESC) during construction are to be provided, and will be detailed on the civil engineering drawings and notes with each site plan approval. ESC measures will prevent the release of silt laden runoff from the site, and will include:

- Sediment control fencing;
- Granular mud mat(s) for construction access;
- Settling basins; and
- Dewatering bags.

During construction, ESC measures will be continuously evaluated and replaced/maintained as required to ensure their effectiveness. The ESC measures will be inspected after any rain or snow melt event, and any maintenance/repair/replacement required will be done within 48 hours. All catch basins will be protected immediately after their installation, and existing catch basins will be protected prior to start of construction.

The contractor will undertake measures to control dust during construction, related soil excavation or during soil remediation/excavation activities, and will include the following as applicable:

- The daily, or more frequently if required, wetting of all soft and hard surfaces and any excavation face on the site, with the addition of calcium chloride or other recognized materials as a dust suppressant, if required; and
- The daily cleaning of the affected road pavement and sidewalks for the entire frontages of the site.

7. CONCLUSIONS

Based on the findings of this report, the conclusions are as follows:

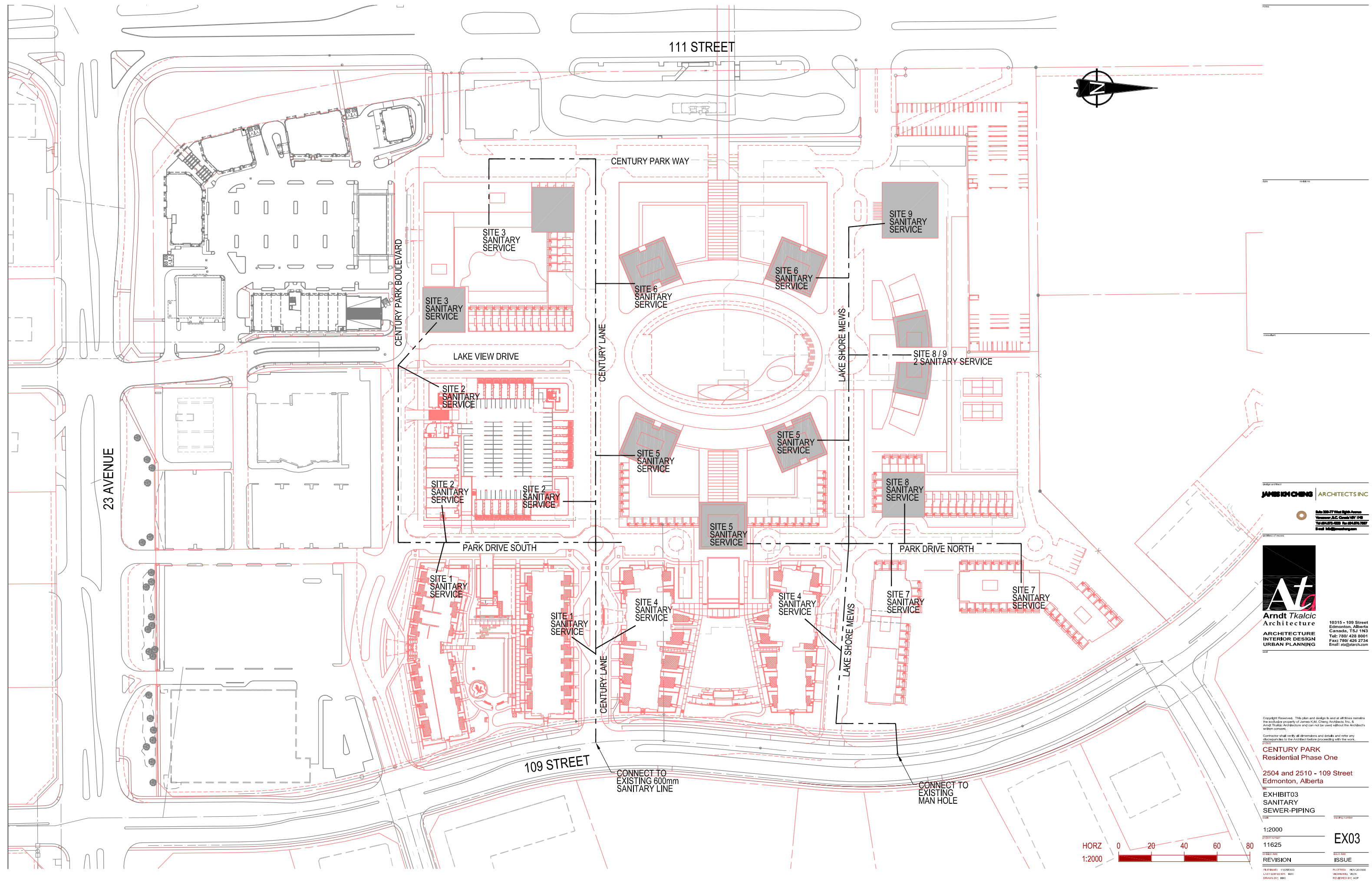
- Sanitary service to the overall site will be provided by means of connection to the existing municipal sanitary sewers in the Century Park Urban Village. Sanitary flows from the Century Park Urban Village are tributary to the 600mm diameter sanitary trunk in the 109th Street right of way, flowing northward to pump well 105 located north of the Whitemud Drive Freeway & 106th Street. Confirmation of downstream capacity has been received from the City of Edmonton.
- Storm service to the overall site will be provided by means of connection to the existing municipal storm sewers in the Century Park Urban Village and 109th Street NW. Extensions of storm sewers proposed through the various phases of development will include stubs to accommodate the development of future parcels in the Century Park Urban Village. Storm flows from the Century Park Urban Village are tributary to the 2100mm diameter storm trunk in the 109th Street right of way, flowing westward to the North Saskatchewan River, crossing underneath Whitemud Creek. Confirmation of downstream capacity has been received from the City of Edmonton.
- The approved storm servicing strategy for the Century Park Urban Village indicates that storm runoff generated on areas within the site (building rooftops, paved parking/driveway areas, and amenity areas) is to be collected and controlled to a release rate of 35 L/s/ha, for all storm events up to and including the 1 in 100 year design storm event. Detailed storage and LID's will be determined and calculated with each site plan when submitted.
- For areas not subject to storm water management quantity control (common/shared roadways and site boulevards), storm water runoff will be collected through proposed roadside catch basins and conveyed by the proposed common/shared storm sewers in easements to the public road right of ways.. The proposed common/shared storm sewers have been sized to convey the expected 1 in 5 year design storm.
- When fully developed, Century Park Urban Village will have a discharge of 0.904m³/s to the 2100mm storm trunk located on 109th Street in a 5 year event. This compares to a current uncontrolled discharge rate of 2.120m³/s in a 5 year event.
- The proposed grading of the common road areas has been designed to accommodate the major storm system of the site and direct it to 109th Street & 29th Avenue intersection.
- The existing transit center and proposed storm system in Century Park are designed to operate independently in storm events less than 100 years. For storm events greater than 100 years the transit center will tip over to Century Park utilizing any additional spare capacity in the system. If no spare capacity exists the emergency overflow

route will follow the onsite major storm system to 109th Street & 29th Avenue intersection.

- The site grading design will be completed at the time of site plan approval and will be in conformance with City standards for minimum and maximum slopes, provide adequate cover on proposed underground servicing, be compatible with the architectural vision for the development, and match grades along existing Park Drive South to the east.
- Erosion and sediment control measures are to be implemented during construction to prevent the release of silt laden runoff from the site.

8. APPENDIX A – BACKGROUND STUDIES

8.1 Original Servicing Plan



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CENTURY PARK

Residential Phase One

2504 and 2510 - 109 Street
Edmonton, Alberta

EXHIBIT03
SANITARY
SEWER-PIPING

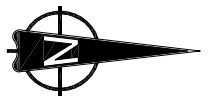
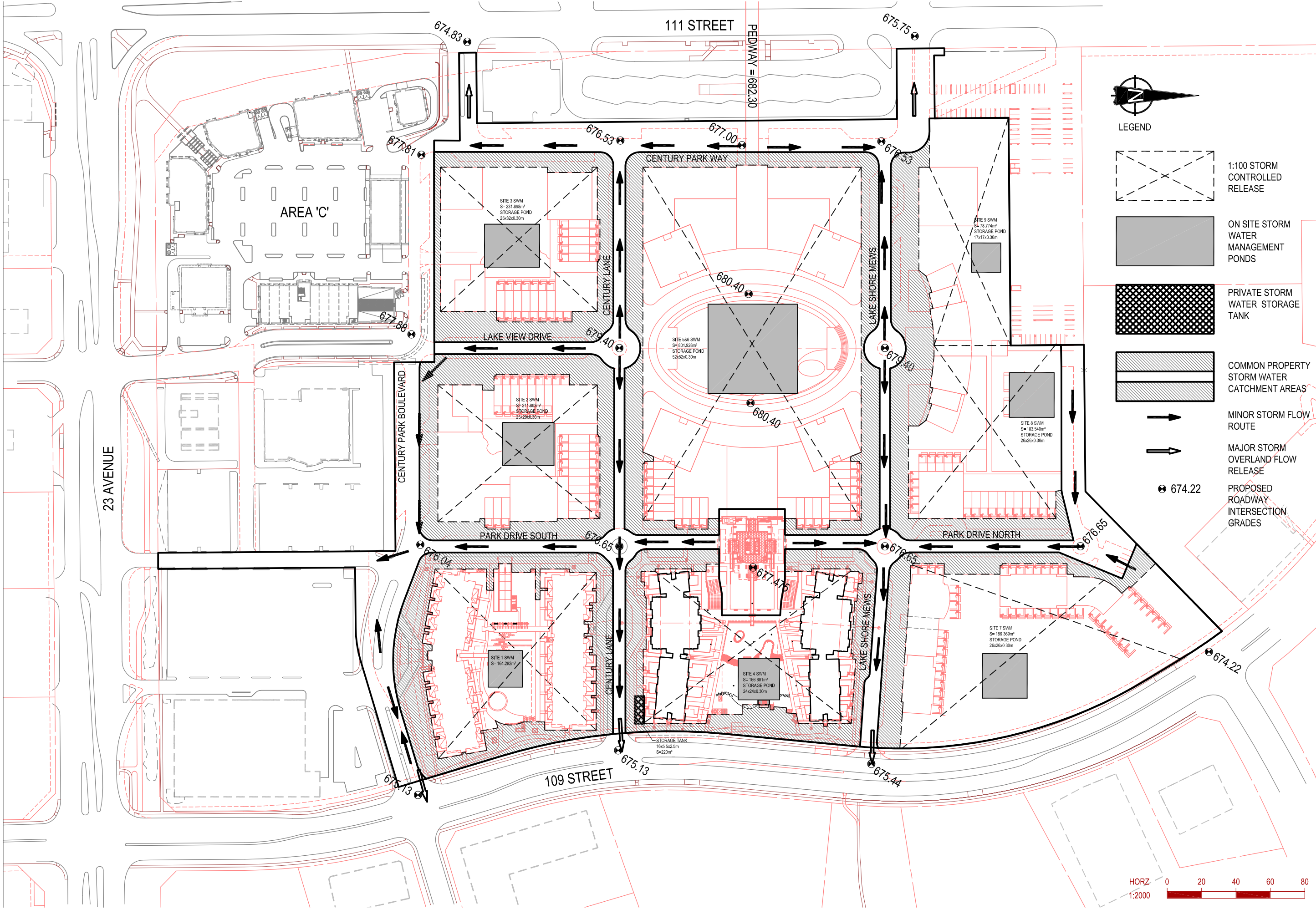
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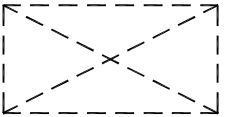
EX03

revision date	issue date
REVISION	ISSUE

RELEASE: 11626EX03	PLOTTED: NOV 30 2006
LAST EDITED BY: BGC	VIEWNAME: VIEW
DRAWN BY: BGC	REVIEWED BY: ACP



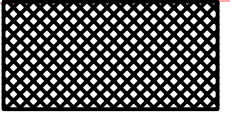
LEGEND



1:100 STORM
CONTROLLED
RELEASE



ON SITE STORM
WATER
MANAGEMENT
PONDS



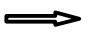
PRIVATE STORM
WATER STORAGE
TANK



COMMON PROPERTY
STORM WATER
CATCHMENT AREAS



MINOR STORM FLOW
ROUTE



MAJOR STORM
OVERLAND FLOW
RELEASE

674.22

PROPOSED
ROADWAY
INTERSECTION
GRADES

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Edmonton, Alberta

EXHIBIT01R
STORM-WATER
BASINS

1:2000

11625

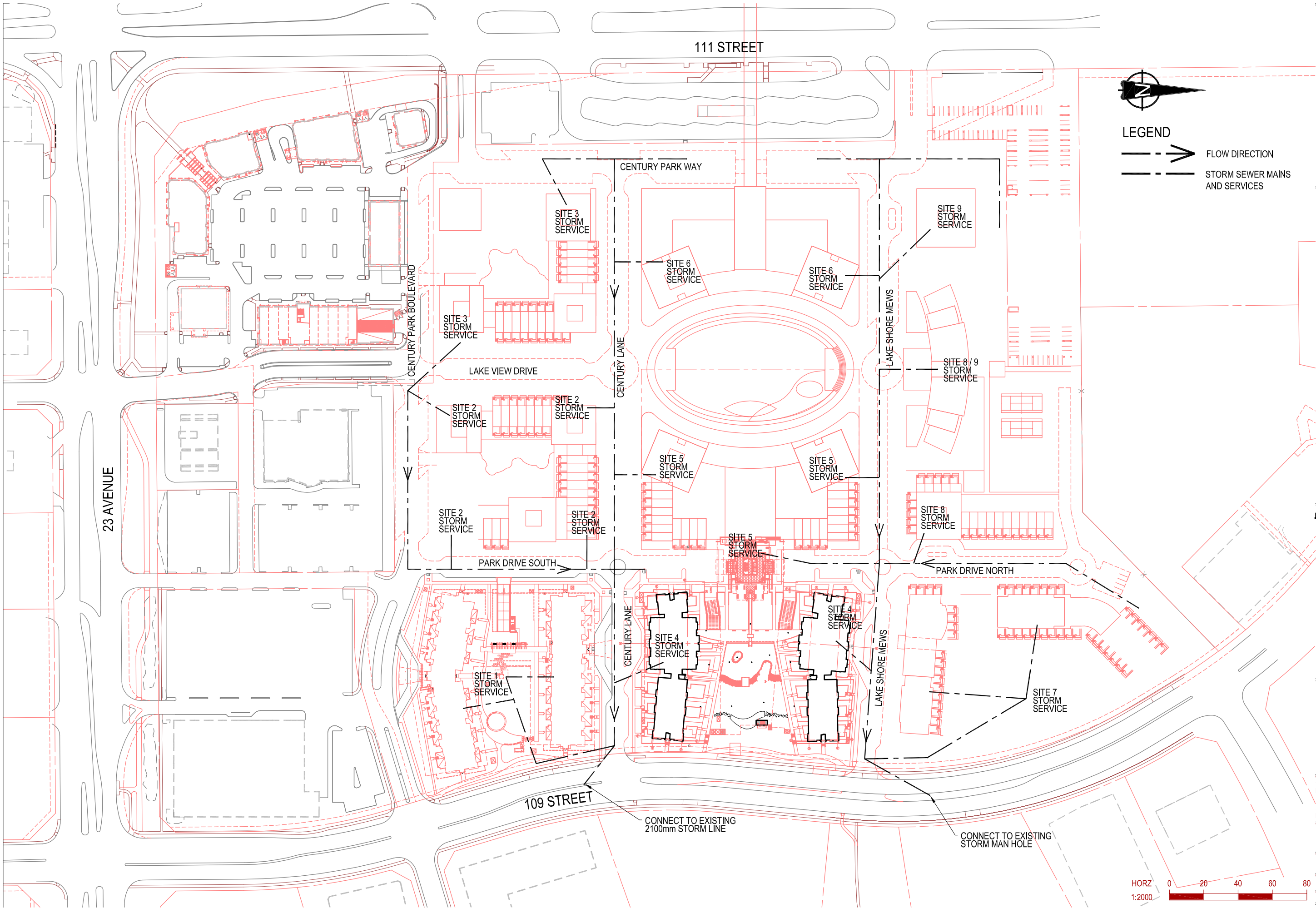
REVISION

EX01R

ISSUE



PLANNED: 11/08/2018 PLOTTED: 08/11/2018
LAST EDITED BY: BGC VERIFIED: VIEW
DRAWN BY: BGC REVISIONED BY: ACP



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Century Park Residential Phase One

2504 and 2510 - 109 Street
Edmonton, Alberta

EXHIBIT02R
STORM
SEWER-MAINS

Scale

1:2000

11625

Revision

Issue

Plot Date: 11/20/2008
Last Edited By: BCC
Drawn By: BCC

Plot Date: 11/20/2008
Last Edited By: BCC
Drawn By: BCC

8.2 Drainage Report (2008)

September 24, 2008

Our Reference: 11625

City of Edmonton
Drainage Branch
6th Floor, Century Place
9803 – 102A Avenue NW
Edmonton, Alberta
T5J 3A3

Attention: Mr. Jim Eckert, P.Eng.

Dear Sir:

Reference: Century Park Club & Residences
Storm Drainage Update Report

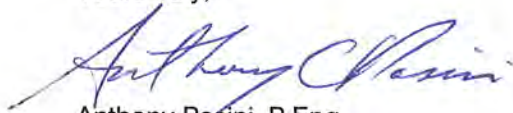
As requested, ISL Engineering and Land Services have completed an in-depth review of the proposed storm drainage system at the above noted development based upon the comments received from your office. The following letter report provides a summary of the design approach taken to address your concerns. The original report was submitted in December 2006.

As discussed at our recent meetings, surface runoff from the outdoor amenity areas for each ground floor living unit has been addressed in the design and they are drained to the weeping tile system through high capacity drainage mats and not to the roadways.

Included in the attached exhibits is a plan showing the overland flow routes and the surface ponding areas that would occur at roadway sags before releasing to the municipal roadways. A surface drainage easement would be prepared to cover the ponding encroachments onto the individual parcels. The ponding depths are relatively shallow (less than 300 mm) but the extent into the adjacent parcels in a couple locations is significant due to the rolled curb and gutter and large landscape pockets. The overlay is also a work in progress as it will change as the design for future phases occurs.

Should you have any concerns or require clarification, please call at your convenience.

Yours truly,



Anthony Pasini, P.Eng.
Sr. Project Engineer

ACP/

cc: City of Edmonton, Drainage – Dennis Tymchak
Westbank Projects – Masa Matsubara
ProCura – Ed Stanyk
Architecture ATB – Rick Arndt
IBI Group – John Byrne

Overall Site Drainage Strategy - Update

Background

Century Park Club and Residences is a 17.42 ha (43.05 acres) mixed-use urban redevelopment of the former Heritage Mall site located north of 23 Avenue between 109 and 111 Streets. The development is supported by Bylaw 13852.

Area 'C' is (2.84 ha) of street oriented, low scale commercial development that was completed in 2007. The balance of the site which is addressed in this report is an area of 14.58 ha which is comprised of about nine development parcels, common roadways, pedestrian mews and amenity spaces.

The overall development will provide for some 2,880 residential housing units and upwards of 28,430 sq.m. (306,000 sq. ft.) of office/commercial space.

The parcel was originally developed as a regional shopping centre with a significant building footprint and the majority of the balance of the site hard surfaced parking and roadways. The site was serviced from the adjacent roadways with water, sanitary, storm, power, telephone, cable and gas.

This report update is in response to questions arising from a review of the design drawings for the Phase I residential development located in the southeast corner of the overall parcel by the Drainage Branch. The questions relate to:

- Cross lot drainage from Phase I (Lot 13, Block 32, Plan 072 6235) to the remainder of the parcel as well as from several future parcels yet to be designed.
- Management of surface runoff from minor and major events onto the private roadways.
- Use of flow control devices within the municipally owned and operated portion of the drainage system. The Drainage Branch does not want control devices in their system.
- Storm water storage tanks within the private roadway system that collect and detain runoff from multiple parcels. This presents ownership and maintenance issues.

Staging

The proposed development will be staged over the next eight to ten years with a logical progression from the municipal service connections into the site. In some instances, utilities will have to enter the property through undeveloped areas to ensure a satisfactory level of service.

Municipal services will enter the parcel through "common property" of Lot 5A, Block 32, Plan 002 2925. The water, sanitary and storm mains will be protected in a 7.0m easement. Separate blanket easements will be arranged for gas and other franchise utilities. See Exhibit 11625EX09 for an understanding of the typical utility easement on the private roadways.

Provisions will be made during each construction stage to pre-service the adjacent building parcels, however, as the final design of the buildings evolves, changes to the service locations may be required.

The current staging plan includes subdivision of the original Lot 5A with the creation of three smaller parcels along 109 Street. It is possible that further subdivision may be required to satisfy all the requirements of a staged development. Each subdivision parcel will be bounded by a portion of Lot 5A on at least one side to provide a "common property" through which the municipal services can be constructed. The municipal services will be protected by easement.

Site Grading and Drainage - General

The overall site design recognizes the need for possible subdivision and the requirement to manage not only minor rainfall events but also major events and route them through the development along the private roadways and pedestrian mews. The design criteria for the entire parcel is to control site discharge up to the 1 in 100 year event to an allowable rate of 35 L/s/ha. See Exhibit 11625EX01R for an overview of the proposed site elevations at key intersections, site basin areas, surface drainage directions, proposed storage and release points. Please note that the large lake amenity is located at the highest point on the site and that surface drainage once it reaches the roadways generally flows towards 109th Street or 111th Street via the private roadways/pedestrian mews.

In general, the design philosophy is to contain and manage the 1 in 100 year event within the footprint of each building pocket including courtyard areas and then release to the adjacent storm sewer at 35 L/s/ha. Beyond the buildings, storm runoff will be managed on the private roadways and directed to the storm sewer system for minor flows. Major flows will route through the site and release to the adjacent municipal roadways. The municipal storm sewer network within the site follows the private roadways and pedestrian mews. See Exhibit 11625EX02R for an overview of the municipal storm sewer network on site as well as the service points into each parcel. Roadway catch basins are not shown for clarity.

As the project has progressed from design development through to detailed design and construction documents on Phase I, II and III as well as the introduction of the subdivision it has become apparent that there are several challenges associated with the drainage design approach. The primary challenge and concern identified by the Drainage Branch is the cross-lot drainage of not only major but also minor storm events which creates liability issues between the various Condominium Associations and the City. At a meeting with the Drainage Branch and City Solicitor's office it was determined that with some compromise and surface drainage easements on the roadways that the concern could be satisfactorily addressed. See Exhibit 11625EX10 for the location of the roadway sags and the ponding areas adjacent to sites 1, 4 and 7.

A follow up meeting with the Drainage Branch discussed in more detail the surface characteristics of the Amenity areas and the lands beyond the foundation walls of the proposed buildings. It was generally agreed that if the Amenity area (hard surface) drainage could be collected such that it did not contribute to the surface runoff on the roadways that:

- Consideration would be given to allowing the private roadways and adjacent boulevards to drain without storm water management control.
- This would remove the proposed orifice plates and storage tanks from the roadway system.
- A surface drainage easement covering the roadways and sag locations on the boulevards would address the Sewers Bylaw requirements.

Amenity Areas (Private)

The private amenity areas associated with the ground floor housing units in several of the parcels are a combination of paving stones and large landscape pockets surrounded by a landscape wall. There is also an access stair to the amenity area from the street. The amenity areas are generally constructed about 1000 mm above the finished roof of the underground parkade with the surface graded to drain into the landscape pockets. The typical amenity area is about 20 sq. metres of pavers and a similar area of landscape bed. Surface water is directed into the landscape bed which is surrounded on all sides by a vertical drainage mat (Colphene 800 AG) and on the bottom (top of the parkade roof) by another drainage mat (Sopradrain Eco-Vent). See attached technical literature for the drainage mats. The drainage mats have a flow rating under the proposed design conditions of 225 to 276 litres per minute per metre of width. The typical amenity area has a 1 in 100 year rainfall peak flow rate of 93.5 litres per minute whereas the drainage mats are capable of handling over 2,000 litres per minute. Therefore the amenity areas will not contribute to the surface runoff

on the adjacent roadways.

Boulevard Development

The boulevards within the development range from heavily landscaped lawns and planters to more formal sidewalk café style open spaces around the commercial retail developments in the southwest corner of the site. There will be considerable tree and shrub plantings within the sidewalk café areas to intercept and reduce surface runoff.

Parcel Development

The majority of the parcels are being developed as high rise towers on large podiums (zero lot line) with some stacked housing on the periphery of the towers. The three parcels fronting onto 109th Street are four to eight storey developments with open courtyards. Except for the three parcels on 109th Street, the courtyards for the balance of the parcels will be located on the roofs of the parkades and surrounded by living units. These courtyards will be designed to store the 1 in 100 year rainfall event and then release at 35 litres per second per hectare to the municipal storm sewer system. The SWMF will be owned and operated by the specific Condominium Association. The large lake amenity will also serve as a SWMF for the two adjacent parcels. The courtyards of the parcels on 109th Street will be used as SWMF for their respective developments for only that portion of the parcel that can be captured and drained to the area.

Underground parkades are being constructed under all buildings and in several instances extend beyond the building floor plates and into the courtyard and streetscape. The entire parkade roof beyond the buildings is buried under 450 to 1200 mm of soft landscaping.

Underground storage tanks are also being incorporated into the design to accommodate the 1 in 100 year storage requirements on some sites.

Storm Water Management Design Calculations

Of the 14.58 hectares on the site (Lot 5A), 12.28 hectares are located within the parcels of which 9.14 hectares are storm water managed within their respective parcels, 2.91 hectares primarily landscaping releases to the private roadways and 0.23 hectares on the east boundary releases directly to 109th Street. The remaining 2.31 hectares are comprised of roadways, pedestrian mews, median and boulevards.

The Amenity areas (0.39 ha) are considered to be part of the controlled flow area although their contribution will be subject to time of travel through the drainage mat and weeping tile system.

If the entire site was controlled to 35 L/s/ha the release rate to the municipal sewer on 109th Street would be 0.51 cms. Whereas if the site was allowed to release uncontrolled to the municipal distribution system as was the case for the original mall development the release rate would be 1.67 cms for the five year event. Subdivision of the parcel creates several separately titled parcels and a separately titled roadway within the subdivision. The Drainage Branches request to store runoff only within the titled parcels results in uncontrolled flows within the roadway system as well as some release from the adjoining titled parcels.

Using a combination of controlled parcels and uncontrolled roadways, the resultant release rate to the municipal system on 109th Street is 0.72 cms which is 43% of an uncontrolled site flow rate for the 1 in 5 year event.

As the development moves forward, wherever possible, additional site area will be included within the controlled release basin areas.

Attachments

The following attachments form part of this report:

- Exhibit 11625EX01R
- Exhibit 11625EX02R
- Exhibit 11625EX09
- Exhibit 11625EX10
- Colphene 800AG Drainage Mat data sheet
- Sopradrain ECO Vent data sheet

■ Calgary ☎ 403-248-8837 ■ Edmonton ☎ 780-435-2800 ■ London ☎ 519-672-5561 ■ Moncton ☎ 506-384-6101
■ Montreal ☎ 450-655-6676 ■ Ottawa ☎ 613-741-4591 ■ Quebec ☎ 418-681-8788 ■ Saskatoon ☎ 306-651-2647
■ Toronto ☎ 905-265-8088 ■ Vancouver ☎ 604-522-3944 ■ Winnipeg ☎ 204-694-2849

COLPHENE 800 AG

Description: **COLPHENE 800 AG** is a high-density polyethylene dimpled foundation protection sheet used as a drainage board on foundation walls. Installed directly on concrete, concrete block or ICF forms, the **COLPHENE 800 AG** keeps water from reaching the wall surfaces and provides an air gap over these surfaces, reducing humidity levels.

Advantages:

- Quick and easy to install using **COLPHIX** washers and **COLSTRIP** finishing strips
- Reduces construction delays, can be installed over green concrete
- Bridges cracks
- Durable, rot-proof and impervious to root penetration
- Can be backfilled immediately after installation
- Can also be used as a drainage layer over conventional waterproofing systems

Properties: (**COLPHENE 800 AG** is covered by CCMC 13169-R and CCMC 13182-R)

Properties	COLPHENE 800 AG
Roll Dimensions (m)	1.98 m x 20 m (6.5 x 65.5 ft) 1.85 m x 20 m (6 x 65.5 ft) 1.68 m x 20 m (5.5 x 65.5 ft)
Dimple Height (mm)	8 (0.3 in)
Area Weight (g/m ²)	878
Compressive Strength (kPa)	419 (8900 psf)
Service Temperature Range (°C)	-40 to 80
Air-Gap Volume between dimples (l/m ²)	5.3
Maximum In-Plane Flow Rate (l/min·m)	276 (22.4 gal/min·ft)

(All values are nominal)

Application:

- Install **COLPHENE 800 AG** from the footing to finish grade level.
- Fasten **COLPHENE 800 AG** in the smooth tab using **COLPHIX** washers and concrete nails at every 200 to 300 mm (8 to 12 in).
- Install, 450 mm (18 in) below the smooth tab, a second row of fasteners at every 400 to 600 mm (16 to 24 in) and a final row 300 mm (12 in) above the footing at every 3 m (10 ft).
- At all joints, overlap **COLPHENE 800 AG** by at least 200 mm (8 in) and secure with **COLPHIX** washers at every 200 mm (8 in).
- Install **COLPHIX** washers near the top and bottom of the panel at 150 mm (6 in) from outside and inside corners.
- Cut the panel at door and window openings and fasten at every 200 to 300 mm (8 to 12 in). Install **COLSTRIP** finishing strip at every cut edges and panel junctions without smooth tab.
- Seal all penetrations, smooth tabs and **COLSTRIP** finishing strips using **SOPRAMASTIC**. For ICF substrates, use solvent-free caulking.
- Ensure that foundation drainage is installed at least 150 mm (6 in) higher than **COLPHENE 800 AG** bottom termination.

NOTE: SOPREMA INC. may modify the composition and/or utilisation of its products without prior notice. Consequently orders will be filled according to the latest specification.

SOPRADRAIN ECO-VENT

Description: *SOPRADRAIN ECO-VENT* is one of a new generation of environmentally conscious products from SOPREMA. This drainage composite consists of a post-industrial recycled polypropylene drainage core of fused, entangled filaments and a geocomposite fabric bonded to each side. The entangled filaments are moulded into a square waffle pattern that maintains the flexible design. This product, because it exceeds 40 % post-industrial recycled content, can help contribute up to 2 LEED points when used in conjunction with other recycled content products in a LEED project. *SOPRADRAIN ECO-VENT* can contribute towards additional LEED points when used with a green roof by reducing stormwater runoff (credit 6.1), heat islands (credit 7.2), and energy consumption.

Applications:

- Foundation walls
- Garden roofs
- Plaza decks
- Retaining walls
- Beneath slabs
- Earth sheltered homes
- Underground parking
- Exterior planters

Advantages:

- Excellent durability
- Protects waterproofing during and after backfill
- Conforms to irregular surfaces and corners
- Waffle design creates open flow path — even during backfill
- Provides continuous flow even under high loads
- Long rolls reduce installation costs by reducing butt seams and eliminating interlocking
- Recycled content polymer can contribute towards LEED® points such as MR 4.1 and MR 4.2
- Increased flow rates over same thickness nylon and HDPE drains
- 75 mm (3 in) fabric overlap flap on both sides
- Can contribute to over 9 LEED® points*¹

Polymer Properties: Polypropylene has excellent resistance to organic solvents, degreasing agents, acids, and alkalines. It has tensile strength superior to high density polyethylene. It has low moisture absorption rate, resistance to staining and is a very lightweight product.

Properties:

Drainage Core	Metric Units	English Units
Core Material	Recycled Polypropylene	
Thickness	11.43 mm	0.45 in
Total Weight	803.7 g/m ²	23.7 oz/yd ²
Core Weight	542.6 g/m ²	16.0 oz/yd ²
Core Width	99.1 cm	39.0 in
Length	30.5 m	100.0 ft
Gross net coverage	30.1 m ²	324.0 ft ²
Roll Diameter	68.6 cm	27.0 in
Gross Roll Weight	29.1 kg	64.2 lbs
Compressive Load Test*	1436 kPa	30 000 psf

(All values are nominal)

* Failure defined as reaching yield point or no continued measurable flow under stated load.

*¹ For more information on LEED®, visit www.cagbc.org or contact your Soprema representative at 1-877-MAMMOUTH.

Geotextile Properties (Polypropylene)	Standards	Metric Units	English Units
Polymer	-	Polypropylene	
Fabric Color	-	Black	
Weight	ASTM D 5261	152.6 g/m ²	4.5 oz/yd ²
Grab Strength	ASTM D 4632	540 N	120 lbf
Grab Elongation	ASTM D 4632	50 %	50 %
Trapezoidal Tear	ASTM D 4533	220 N	50 lbf
Puncture Strength	ASTM D 4833	310 N	70 lbf
Apparent Opening Size	ASTM D 4751	0.212 mm	70 US Sieve
Flow Rate	ASTM D 4491	81.5 l/sec/m ² 120	gal/min/ft ²
Permittivity	ASTM D 4491	1.8 sec ⁻¹	1.8 sec ⁻¹

(All values are nominal)

Geotextile Properties (Coated Polyester)	Standards	Metric Units	English Units
Polymer	-	Coated Polyester	
Fabric Color	-	Grey	
Weight	ASTM D 5261	120.0 g/m ²	3.54 oz/yd ²
Grab Strength	ASTM D 4632	556 N	125 lbf
Grab Elongation	ASTM D 4632	40 %	40 %
Trapezoidal Tear	ASTM D 4533	178 N	40 lbf
Puncture Strength	ASTM D 4833	155 N	35 lbf
Apparent Opening Size	ASTM D 4751	0.357 mm	-
Flow Rate	ASTM D 4491	125.6 l/sec/m ² 185	gal/min/ft ²
Permittivity	ASTM D 4491	2.5 sec ⁻¹	2.5 sec ⁻¹

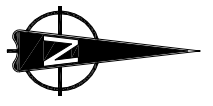
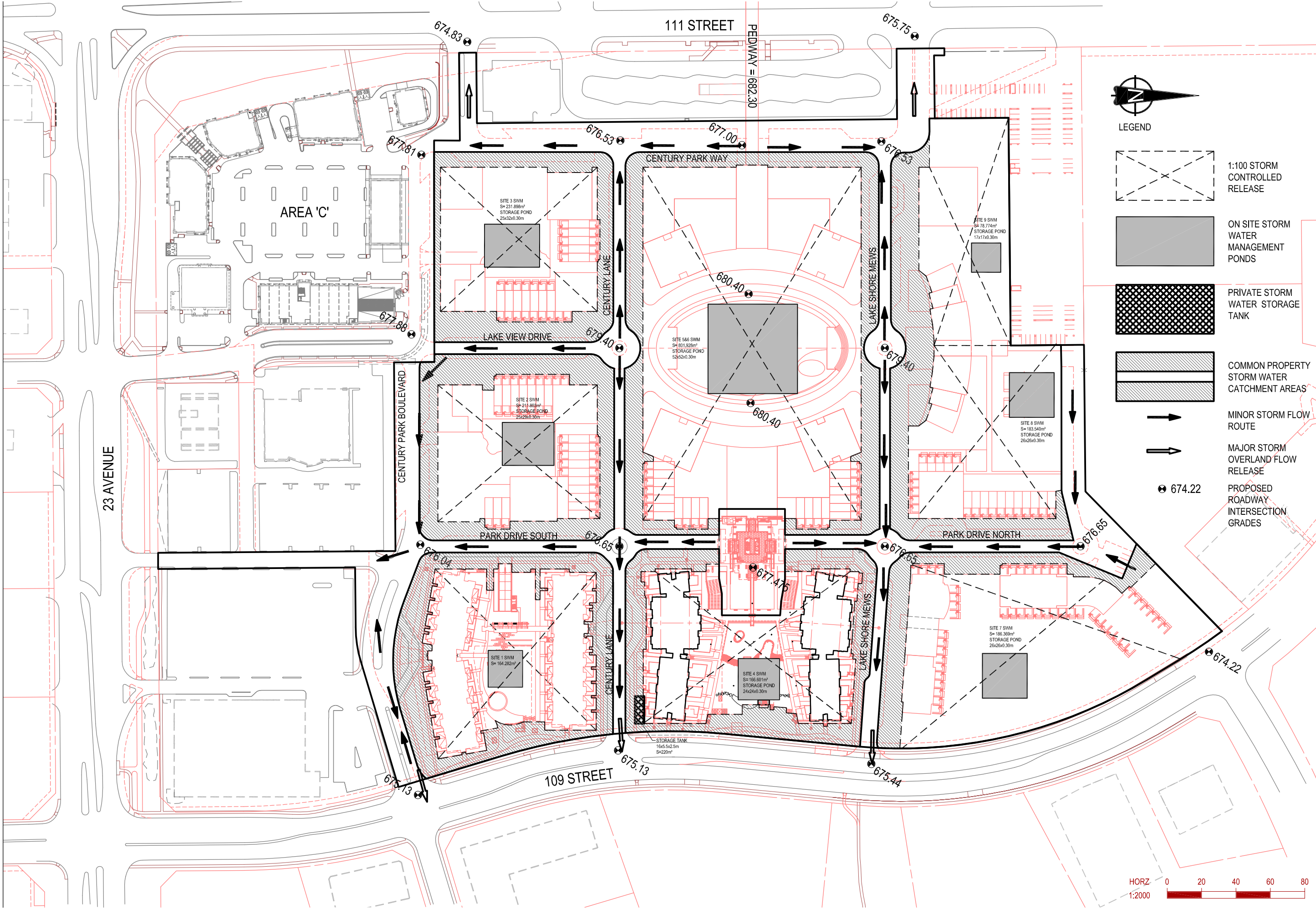
(All values are nominal)

Flow Rates	1.0 Gradient		0.2 Gradient	
Compressive load	Metric Units	English Units	Metric Units	English Units
250 psf	251 l/min/m	20.2 gal/min/ft	96 l/min/m	7.7 gal/min/ft
500 psf	225 l/min/m	18.1 gal/min/ft	91 l/min/m	7.3 gal/min/ft
1000 psf	223 l/min/m	17.9 gal/min/ft	90 l/min/m	7.2 gal/min/ft
2000 psf	209 l/min/m	16.8 gal/min/ft	87 l/min/m	7.0 gal/min/ft
3000 psf	160 l/min/m	12.9 gal/min/ft	61 l/min/m	4.9 gal/min/ft
3600 psf	107 l/min/m	8.6 gal/min/ft	35 l/min/m	2.8 gal/min/ft
5000 psf	47 l/min/m	3.8 gal/min/ft	16 l/min/m	1.3 gal/min/ft
8000 psf	21 l/min/m	1.7 gal/min/ft	6 l/min/m	0.5 gal/min/ft

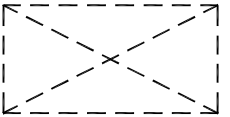
Typical flow vs. pressure for vertical applications (ASTM D 4716) Sample Configuration: Plate/SOPRADRAIN ECO-VENT/Plate.
(Values are average of machine direction and cross machine direction test results.)

INTERNATIONAL
www.soprema.ca

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LEGEND



1:100 STORM
CONTROLLED
RELEASE



ON SITE STORM
WATER
MANAGEMENT
PONDS



PRIVATE STORM
WATER STORAGE
TANK



COMMON PROPERTY
STORM WATER
CATCHMENT AREAS



MINOR STORM FLOW
ROUTE



MAJOR STORM
OVERLAND FLOW
RELEASE

674.22

PROPOSED
ROADWAY
INTERSECTION
GRADES

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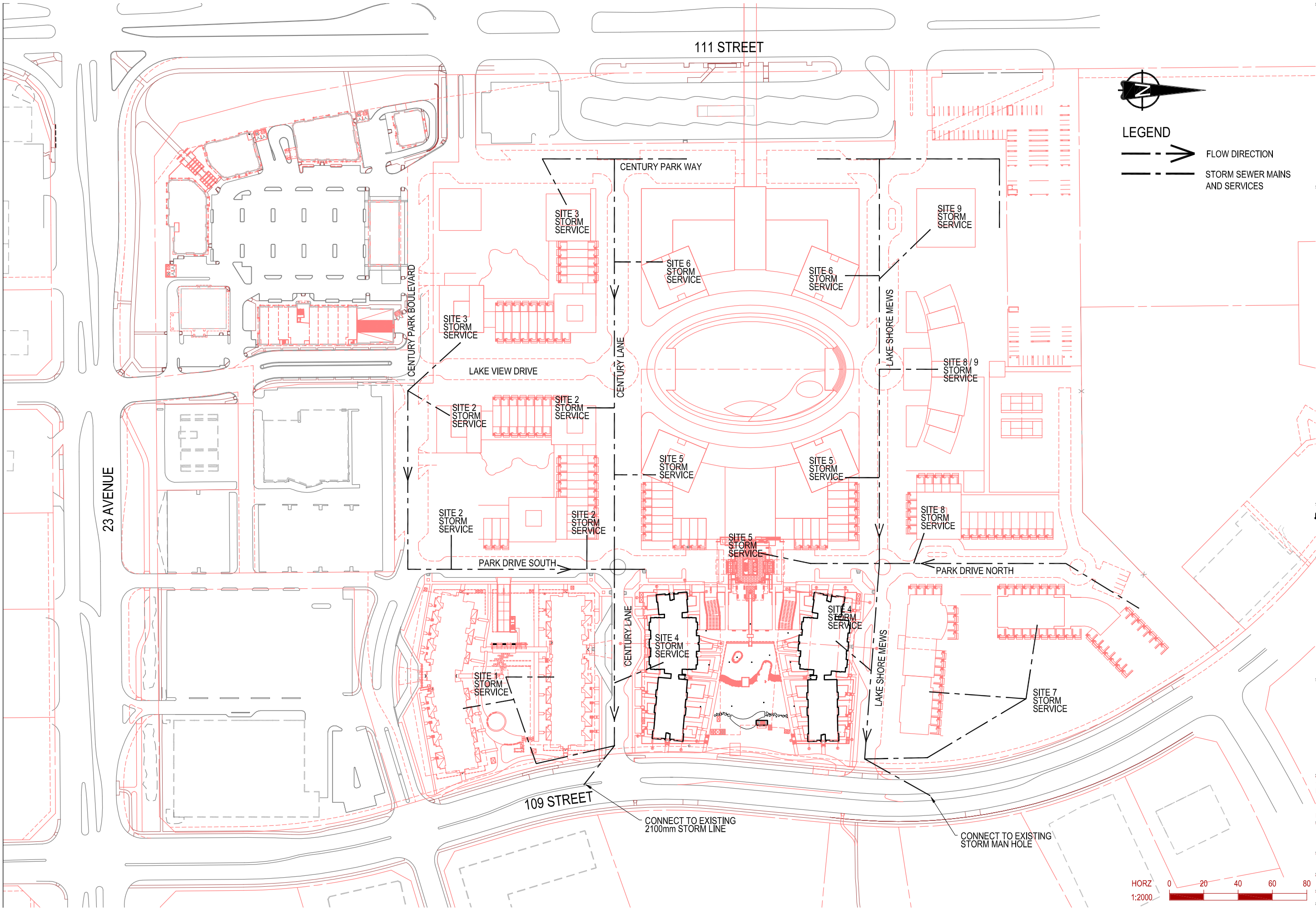
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Edmonton, Alberta
EXHIBIT01R
STORM-WATER
BASINS

Scale	1:2000	Sheet number	11625	Issue	EX01R
Revision		Issue		Issue	



PLANNED: 11/08/2018
LAST EDITED BY: BGC
DRAWN BY: BGC
PLOTTER: HPRT-1000R
VIEWNAME: VIEW
REVIEWED BY: ACP



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Century Park Residential Phase One

2504 and 2510 - 109 Street
Edmonton, Alberta

EXHIBIT02R
STORM
SEWER-MAINS

Scale

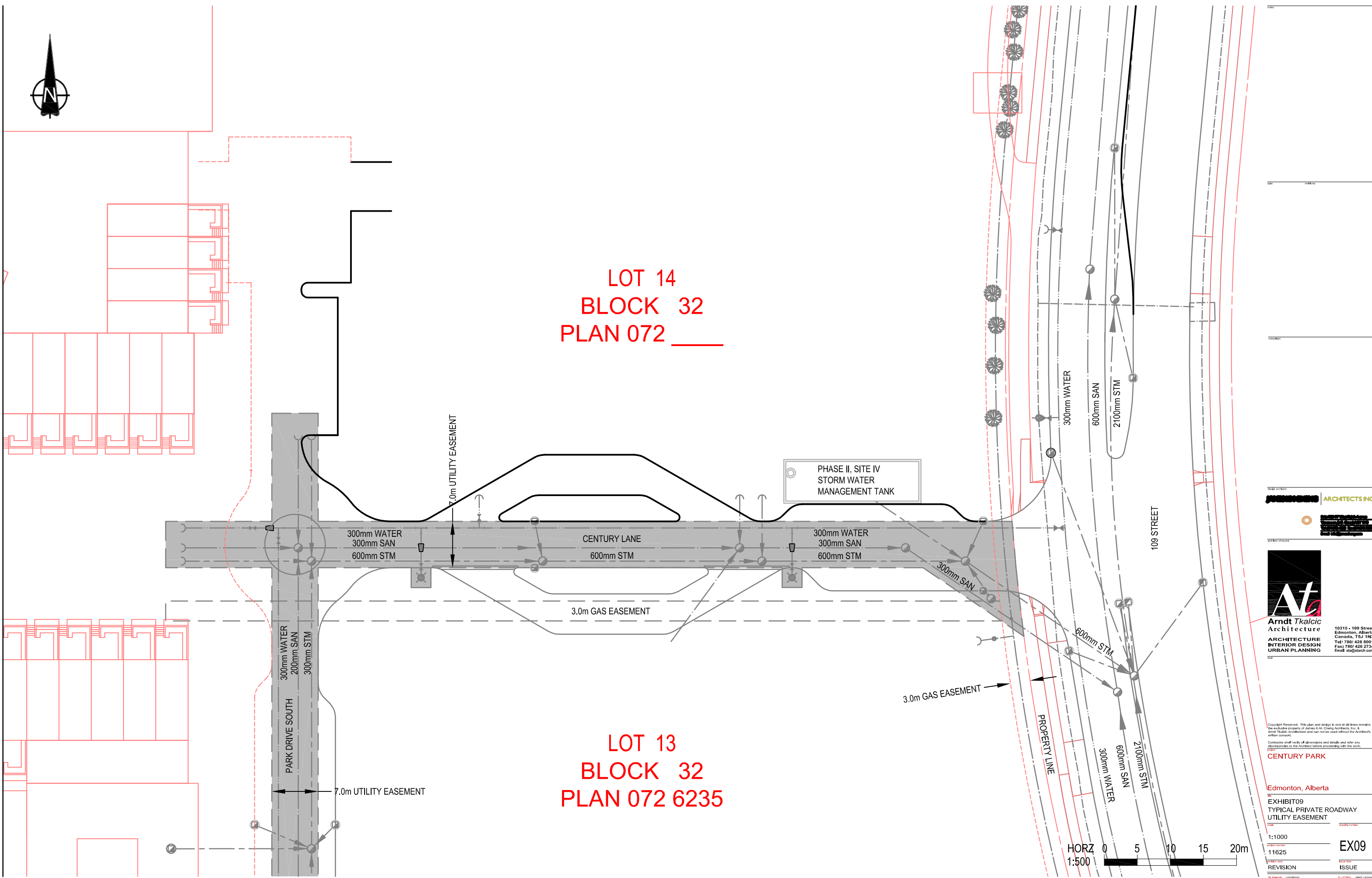
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11625

Revision

Issue

Plotted by: JKC
Checked by: JKC
Reviewed by: JKC



LOT 13
BLOCK 32
PLAN 072 6235

[illegible]



DATE: 2024-03-27
A.S. CHENG ARCHITECTS INC.

LEGEND

PONDING AREAS @ SAG LOCATIONS

OVERLAND FLOW ROUTE

D = PONDING DEPTH (mm)

LOT 14
BLOCK 32
PLAN 072

LOT 13
BLOCK 32
PLAN 072 6235

111 STREET

109 STREET

109 STREET

25 AVENUE

HORZ 0 20 40 60 80m
1:2000

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Canada, T5J 1N3
Tel: 780/ 428 8001
Fax: 780/ 426 2734
Email: at@atarch.com

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Contractor shall verify all dimensions and details and refer any discrepancies to the Architect before proceeding with the work.

DATE: 2024-03-27
PROJECT: EXHIBIT 10
SAG PONDING

Edmonton, Alberta

EXHIBIT 10
PRIVATE ROADWAY
SAG PONDING

1:500
11625

REVISION
ISSUE

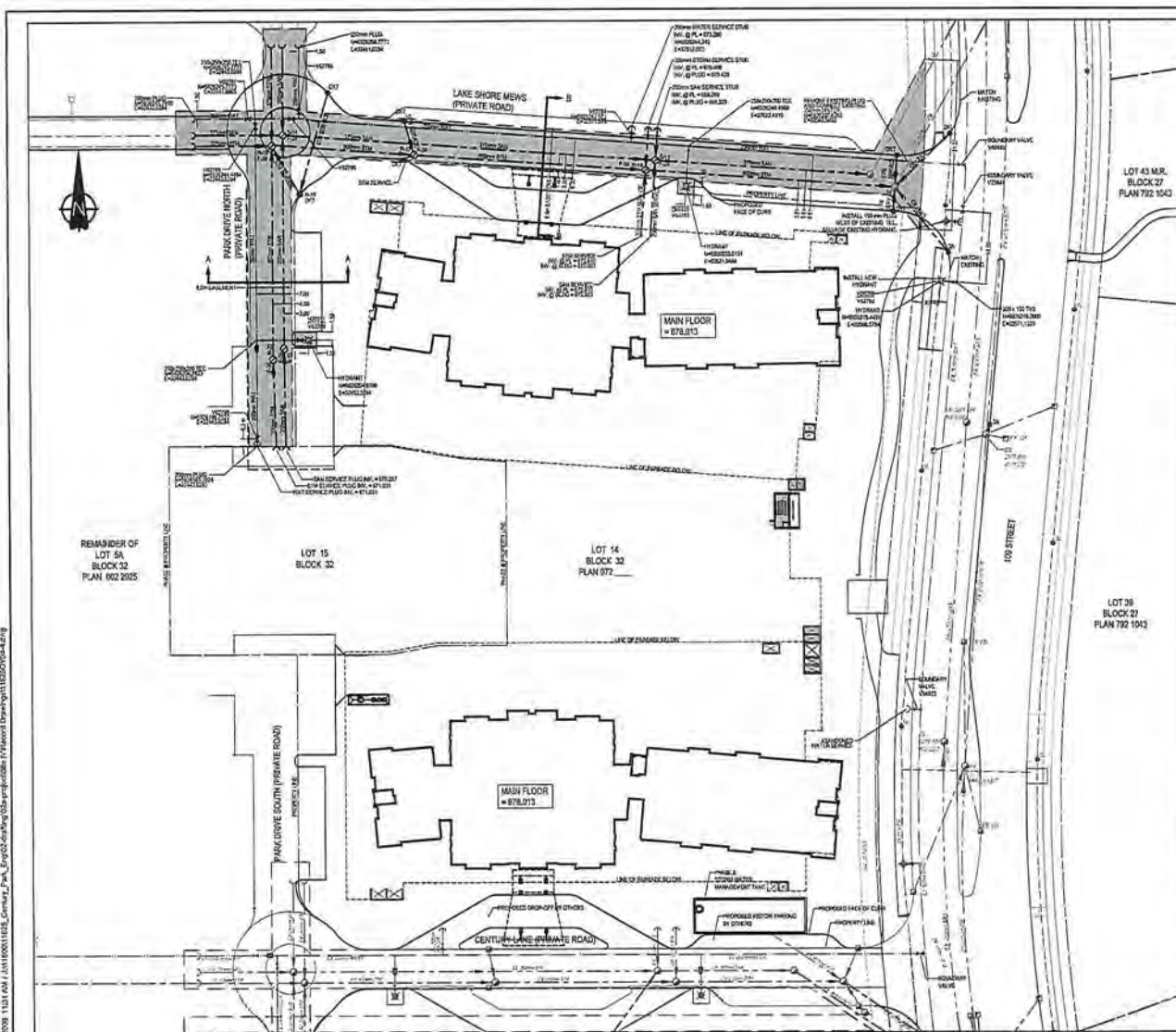
PREPARED BY: J.K.M. CHENG
LAST EDITED BY: J.K.M. CHENG
DRAWN BY: J.K.M. CHENG
PLOTTER: HP DesignJet 2445C
VENDOR: HP
REVIEWED BY: J.K.M. CHENG

8.3 Existing Tie In's

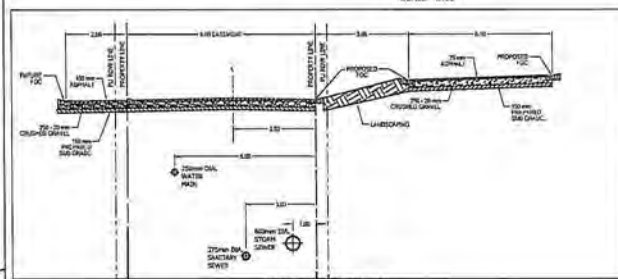
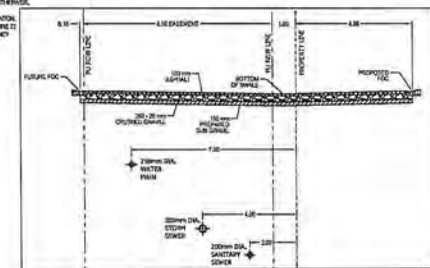
8.3.1 Century Park Phase 1 & 2 – ISL Engineering

8.3.2 Offsite Sanitary & Storm – Sameng Inc.

8.3.3 Downstream Modeling Confirmation



- [illegible]



6	RE-QUEUED FOR FINAL APPROVAL	IBC	06/21/08
5	ISSUED FOR FINAL APPROVAL	MA	04/05/07
4	ISSUED FOR UNDERGROUND TENDER	IBC	03/03/09
3	ISSUED FOR THIRD SUBMISSION	MA	03/05/09
2	ISSUED FOR SECOND SUBMISSION	IBC	10/14/08
7	NEEDED DRAWING	IBC	04/09/12
No.	DESCRIPTION	BY	DATE

Scale: AS SHOWN

ISL Engineering and Land Services

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CENTURY PARK DEVELOPMENTS LTD.

CENTURY PARK
SUBDIVISION - PHASE II

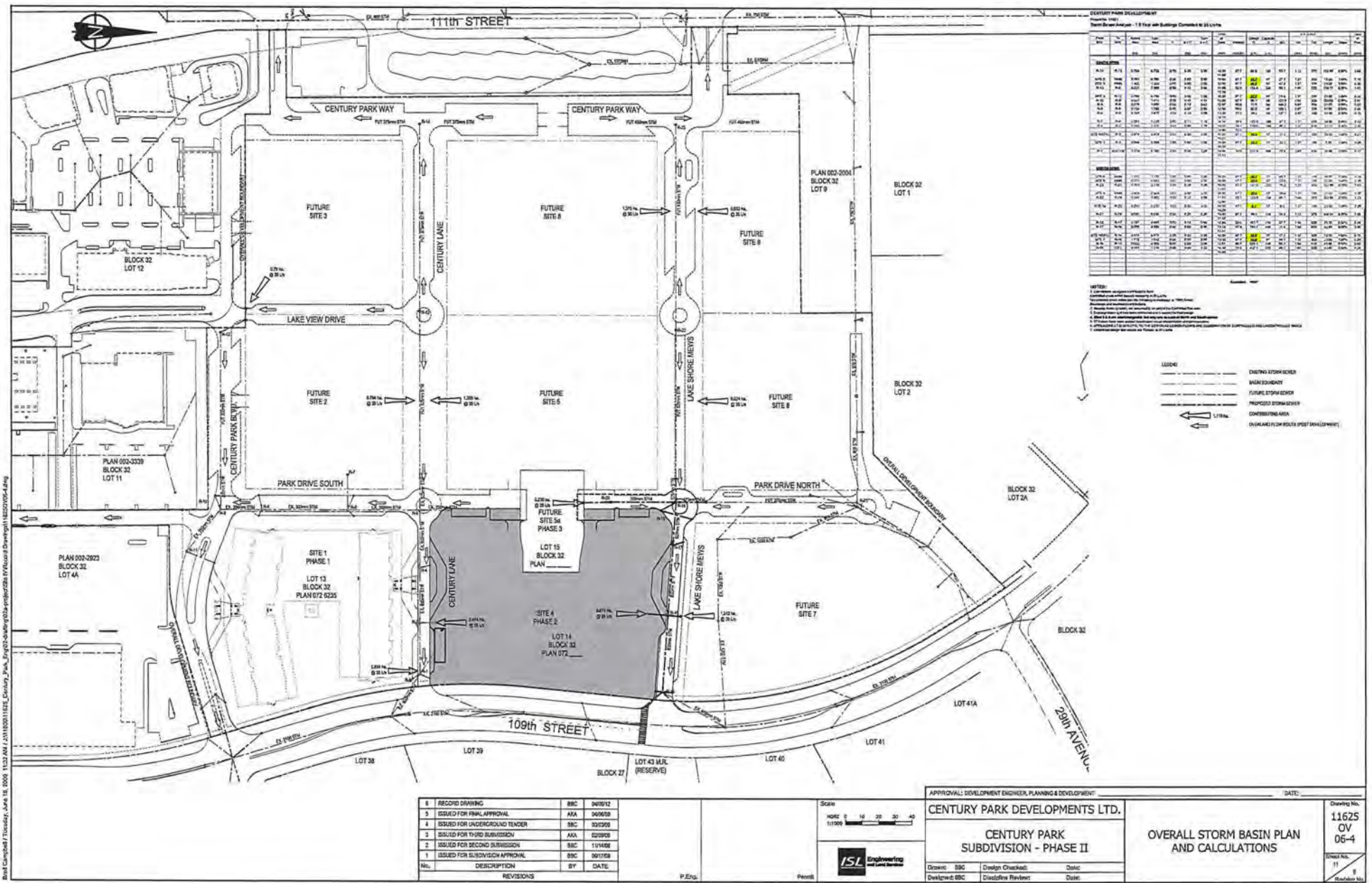
PHASE II UNDERGROUND UTILITIES PLAN

Drawn: SSC	Design Checked:	Date:
Designed: SSC	Discipline Review:	Date:

Drawing No.
11625
OV
04-4

Project No.
9
7

Revision No.



8	RECORD DRAWING	BBC	04/07/12
7	ISSUED FOR FINAL APPROVAL	AKA	04/06/09
6	ISSUED FOR UNDERGROUND TENDER	BBC	03/03/08
5	ISSUED FOR THIRD SUBMISSION	AKA	02/09/08
4	ISSUED FOR SECOND SUBMISSION	BBC	11/14/06
3	ISSUED FOR SUBDIVISION APPROVAL	BBC	06/17/06
2	ISSUED FOR SUBDIVISION APPROVAL	BBC	06/17/06
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REV.	DESCRIPTION	BY	DATE

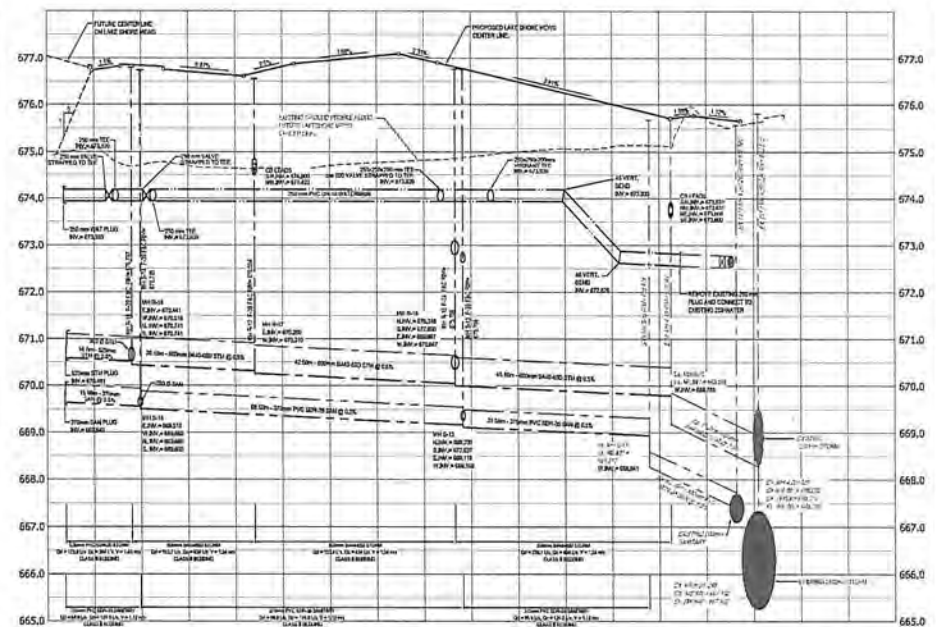
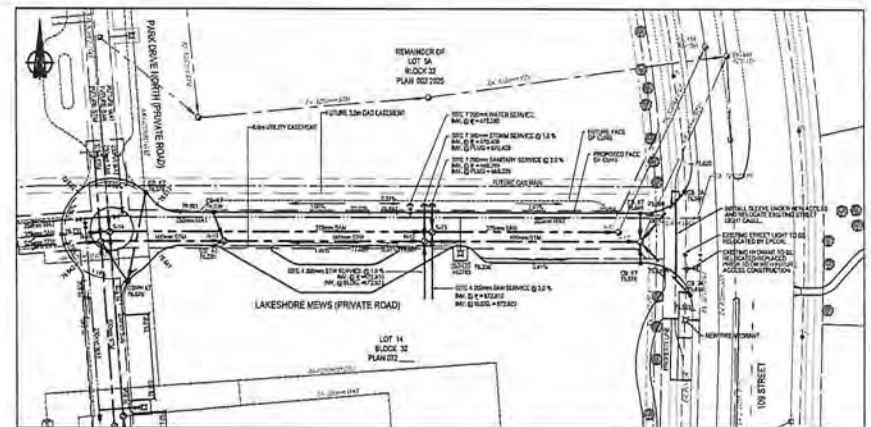
Scale
 1" = 100'
 0 10 20 30 40
 Feet

ISL Engineering
 Inc.

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CENTURY PARK DEVELOPMENTS LTD.
CENTURY PARK SUBDIVISION - PHASE II
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 Drawn: BBC Design Checked: Date:


OVERALL STORM BASIN PLAN AND CALCULATIONS

Sheet No.
 11
 8
 11625
 OV
 06-4

[illegible]

WSP to (mm)	WSP 150/157	WSP 200/207	WSP 300
100	1.85	1.86	1.90
200	1.96	1.97	1.92
300	2.08	2.05	2.04
400	2.61	2.58	2.60

6	ISSUED FOR FINAL APPROVAL	BBC	02/27/09
5	ISSUED FOR FINAL APPROVAL	AKA	04/05/09
4	ISSUED FOR UNDERGROUND TENDER	BBC	03/20/09
3	ISSUED FOR THIRD SUBMISSION	AKA	02/09/09
2	ISSUED FOR SECOND SUBMISSION	BBC	1/14/08
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No.	DESCRIPTION	BY	DATE


 ISL Engineering
and Local Services

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CENTURY PARK
SUBDIVISION - PHASE II

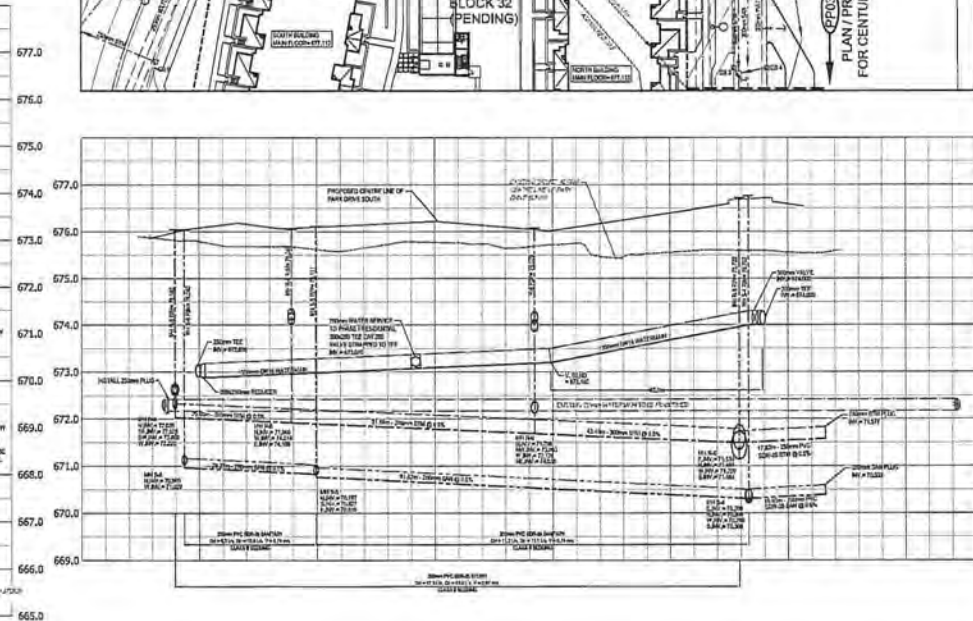
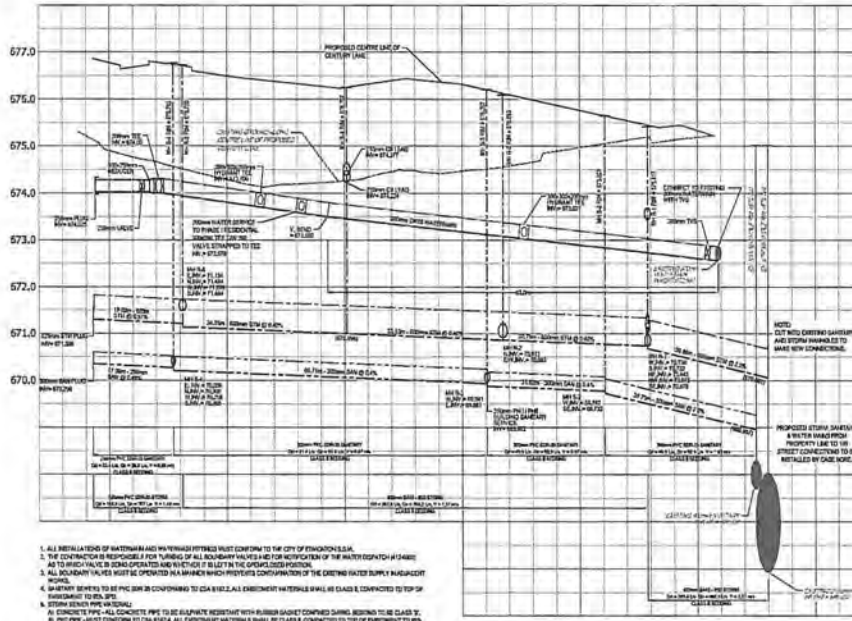
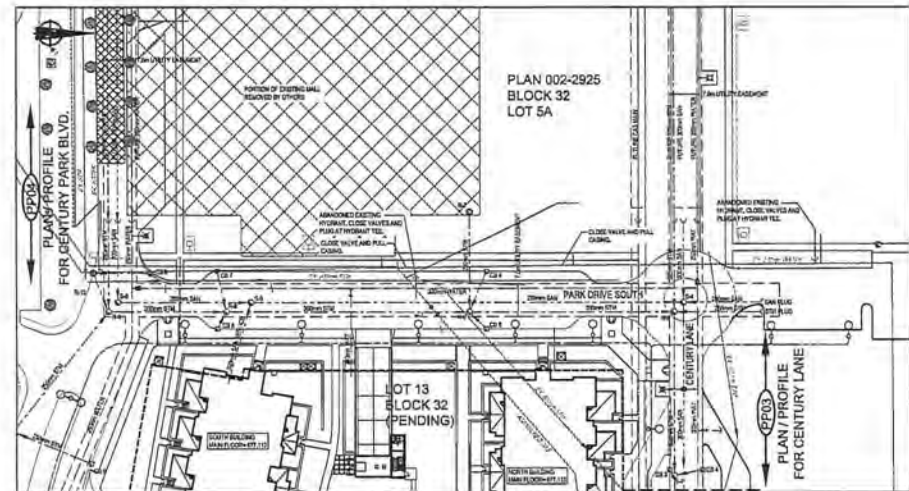
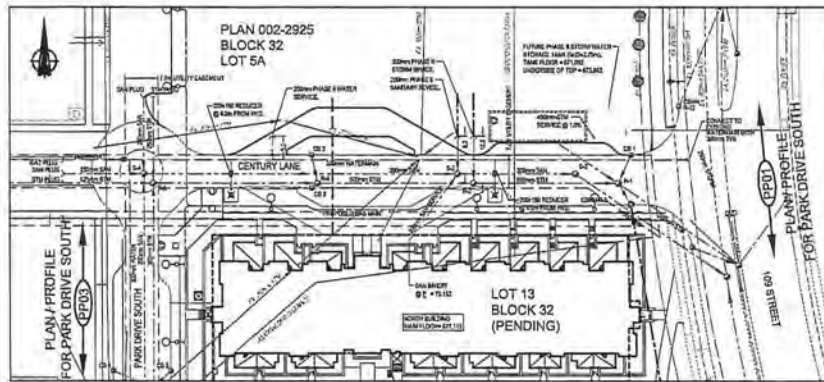
Drawn: BSC	Design Checked:	Date:
Described: BSC	Discipline Review:	Date:

DATE: _____

PLAN / PROFILE
LAKESHORE MEWS &
PARK DRIVE NORTH

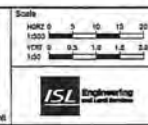
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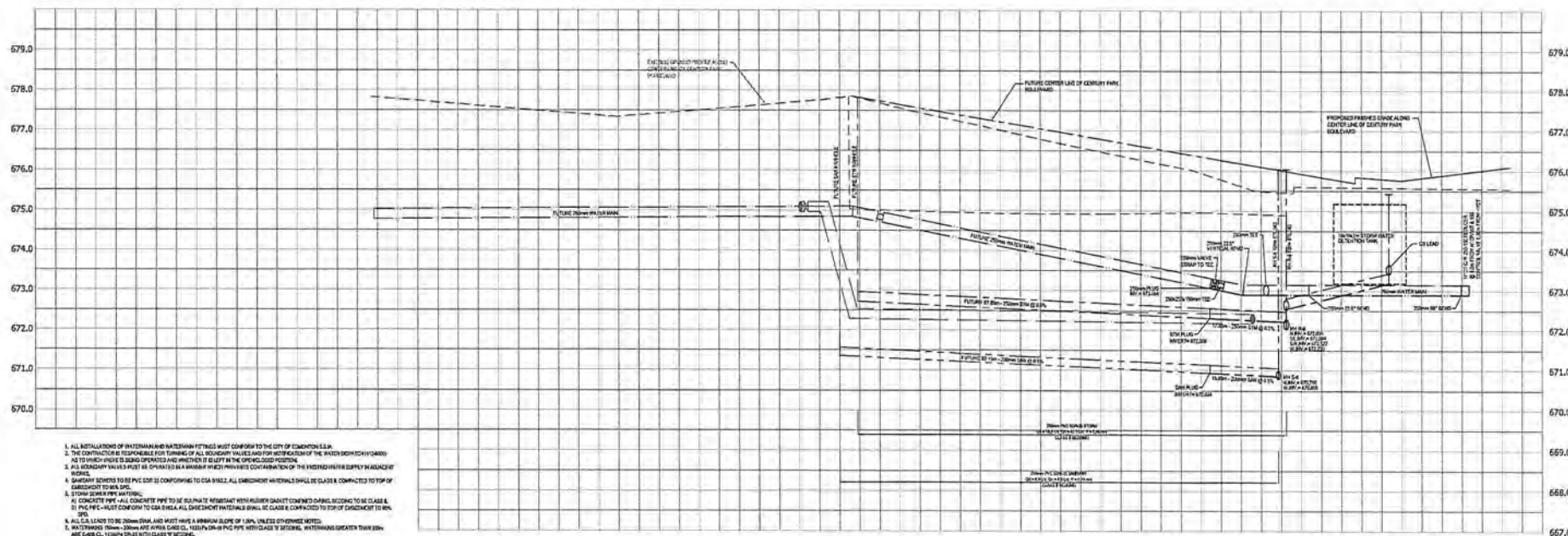
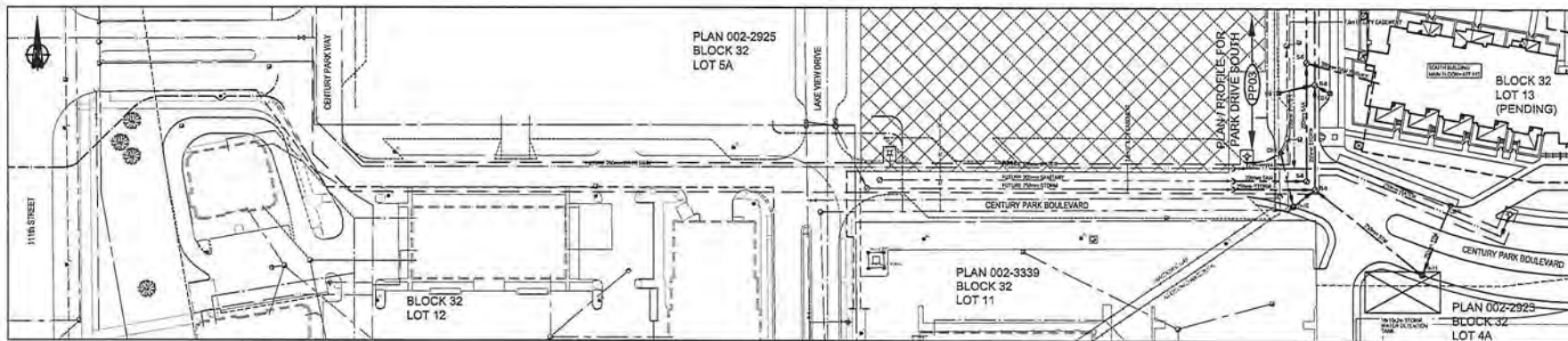


1. ALL INSTALLATIONS OF WATERMAIN AND WATERWATER FITTINGS MUST CONFORM TO THE CITY OF EDMONTON S.D.A.
2. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND FOR THE PROTECTION OF THE WATER CONDUIT (IF APPLICABLE) TO BE INSTALLED IN THE SUBDIVISION.
3. ALL EXISTING UTILITIES MUST BE PROTECTED BY A MINIMUM OF 18" OF COVER AND THE EXISTING WATER SUPPLY MAINS MUST BE PROTECTED BY A MINIMUM OF 24" OF COVER.
4. WATER MAINS SHALL BE 30" DIA. AND SHALL BE INSTALLED IN THE SUBDIVISION.
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NO.	DESCRIPTION	BY	DATE
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2	REVISED DRAWING	BBC	11/14/07
3	REVISED DRAWING	BBC	01/21/07
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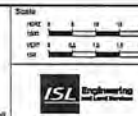


APPROVALS: DEVELOPMENT ENGINEER, PLANNING & DEVELOPMENT		DATE:
CENTURY PARK DEVELOPMENTS LTD.		
CENTURY PARK SUBDIVISION - PHASE I		
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Designed: BBC	Discipline Review:	Date:
PLAN / PROFILE CENTURY LANE & PARK DRIVE SOUTH		Drawing No. 11625 PP 03 Sheet No. 18 of 19



1. ALL INSTALLATIONS OF WATERMAIN AND WATERMAIN FITTINGS MUST CONFORM TO THE CITY OF EDMONTON S.M.
2. THE CONTRACTOR IS RESPONSIBLE FOR TYPING OF ALL DOCUMENTS AND FOR THE PROTECTION OF THE WATER BENT SYSTEMS AS TO PROTECT THEM FROM DAMAGE AND TO PROTECT THEM FROM THE EFFECTS OF THE WATER BENT SYSTEMS.
3. ALL EXISTING WATER MAINS MUST BE OPENED BY A WATER MAIN SPECIALIST OR A PERSON QUALIFIED TO DO SO.
4. EXISTING WATER MAINS MUST BE OPENED BY A WATER MAIN SPECIALIST OR A PERSON QUALIFIED TO DO SO.
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NO.	DESCRIPTION	BY	DATE
1	RECORD DRAWING	BBC	04/09/12
2	5th SUBMISSION	BBC	01/13/12
3	4th SUBMISSION	BBC	02/22/12
4	3rd SUBMISSION	BBC	04/11/12
5	2nd SUBMISSION	BBC	02/22/12



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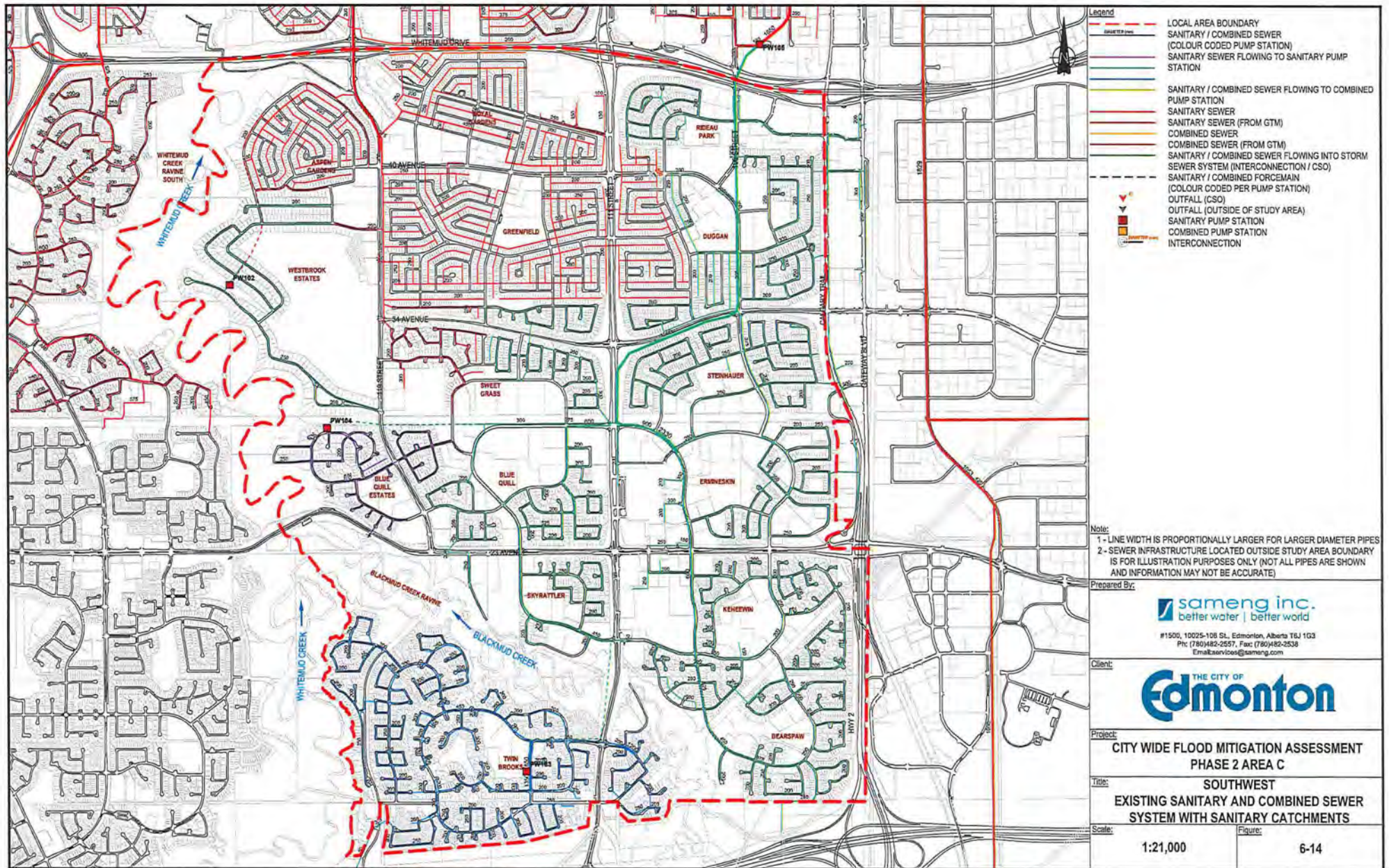
CENTURY PARK
SUBDIVISION - PHASE I

Drawn: BBC Design Checked: Date: 04/09/12
Designed: BBC Checked: Date: 04/09/12

PLAN / PROFILE
CENTURY PARK BOULEVARD

Drawing No.
11625
PP
04
Sheet No.
18
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Production No.

Drawing No.
11625
PP
05



sameng inc.
better water | better world

#1500, 10025-108 St., Edmonton, Alberta T6J 1G3
Ph: (780)482-2557, Fax: (780)482-2538
Email: sales@sameng.com

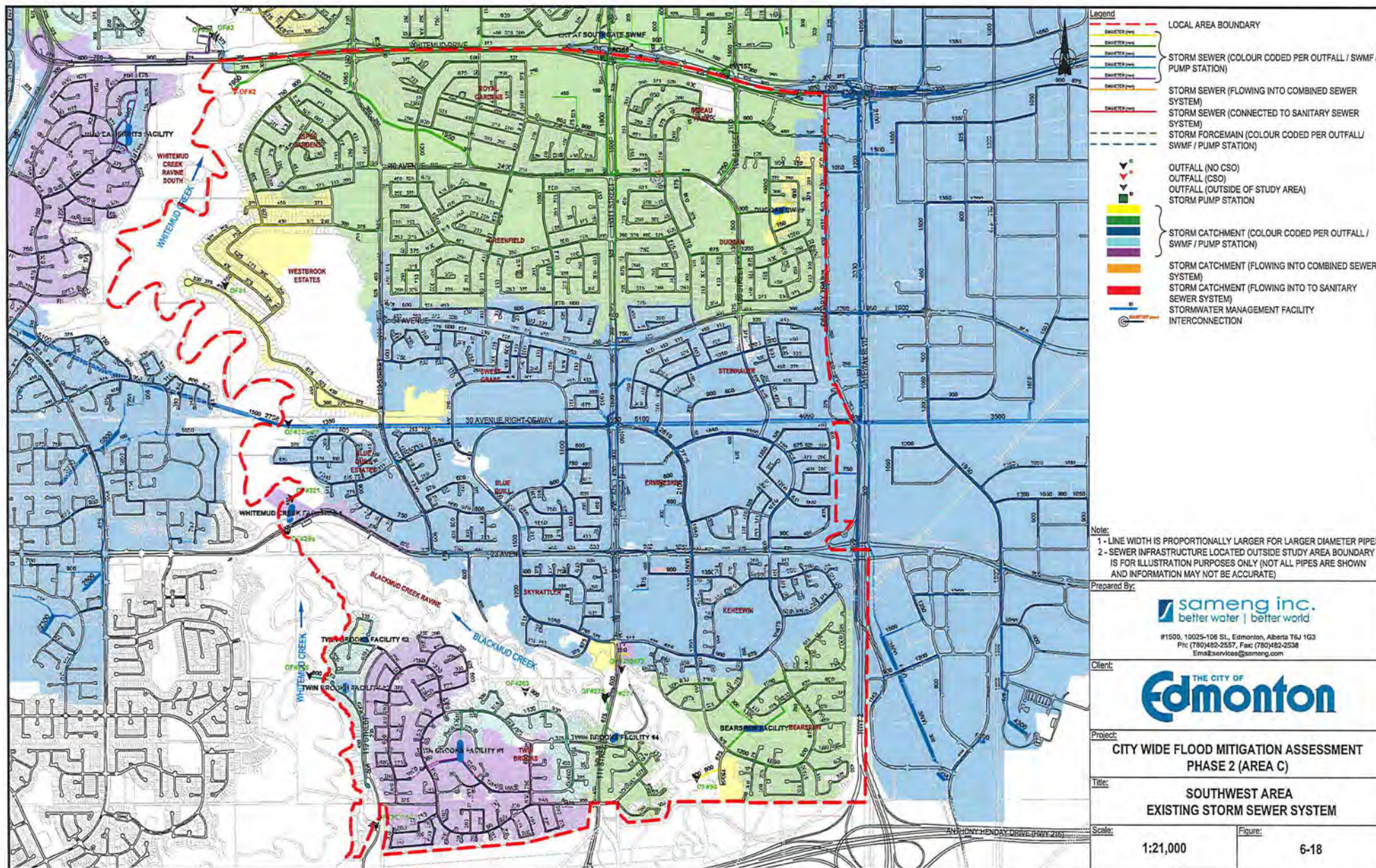
THE CITY OF
Edmonton

**CITY WIDE FLOOD MITIGATION ASSESSMENT
PHASE 2 AREA C**

**SOUTHWEST
EXISTING SANITARY AND COMBINED SEWER
SYSTEM WITH SANITARY CATCHMENTS**

1:21,000

6-14



From: [Bill Harris](#)
To: [Petrin, Kim](#)
Cc: [Mikaela Hanley \(mikaela.hanley@edmonton.ca\)](#); [Sonnenberg, Randall](#); [Eriksson, Nathan](#); [kyle.witiw@edmonton.ca](#); [Sam Saleh \(sam.saleh@procura.ca\)](#); [Raj Sisupal \(rsisupal@procura.ca\)](#)
Subject: Re: Century Park - Drainage follow up
Date: Friday, September 09, 2016 8:56:59 AM
Attachments: [300 Ermineskin ND 20160824 Pages from Modelling Century Park Urban Village.pdf](#)

Hi Kim,

Attached is an excerpt of the results of modelling for the proposed Century Park development from our Systems Assessment team.

There was a need to reconstruct part of the model and recalibrate the model, but it appears that the existing system can handle the additional flows as indicated in the attached.

Regards,



Bill Harris, MBA P.Eng.

SENIOR DEVELOPMENT ENGINEER
DRAINAGE PLANNING AND ENGINEERING | GROWTH AND LAND DEVELOPMENT
SUSTAINABLE DEVELOPMENT | CITY PLANNING

[780-442-0810](tel:780-442-0810) OFFICE

City of Edmonton
5/F Century Place
9803 102A Ave NW
Edmonton AB T5J 3A3

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[We are one city](#) | [We are proud to serve the public](#) | [As stewards we lead](#) | [We do as we say](#) | [I make a difference every day](#)

On 19 August 2016 at 13:51, Petrin, Kim <Kim.Petrin@stantec.com> wrote:

Hello.

Just following up from our meeting on August 11 - Drainage was to provide Stantec a model (within a week or so) to review capacity and determine if any surcharge needed to be mitigated.

Please let us know if there is anything you need from us in advance and hope to receive something from Drainage next week.

Thank you and have a great weekend.

Kim Petrin
Senior Associate, Community Development - Planning
Stantec
10160 112 Street Edmonton AB T5K 2L6
Phone: [780-917-8129](tel:780-917-8129)
Cell: [780-231-3046](tel:780-231-3046)

Summary

Sanitary

Detailed Model was developed to include development location and all upstream system for sanitary. Model Calibrated to stn 265, outlet of the sewershed.

Results

- No significant impact on DWF conditions.
- There is high inflow and infiltration observed within and upstream of the location
- HGL can rise high enough to cause basement flooding in the neighbourhood during intense rainfall due to back from downstream trunk system

Summary

Storm

- 30Ave Storm basin Model results show adjacent 1200mm storm trunk along 109 st is not surcharged for 100 yr 4hr event.
- Local pipe have to been assessed

Development Info

Century Park LRT Station

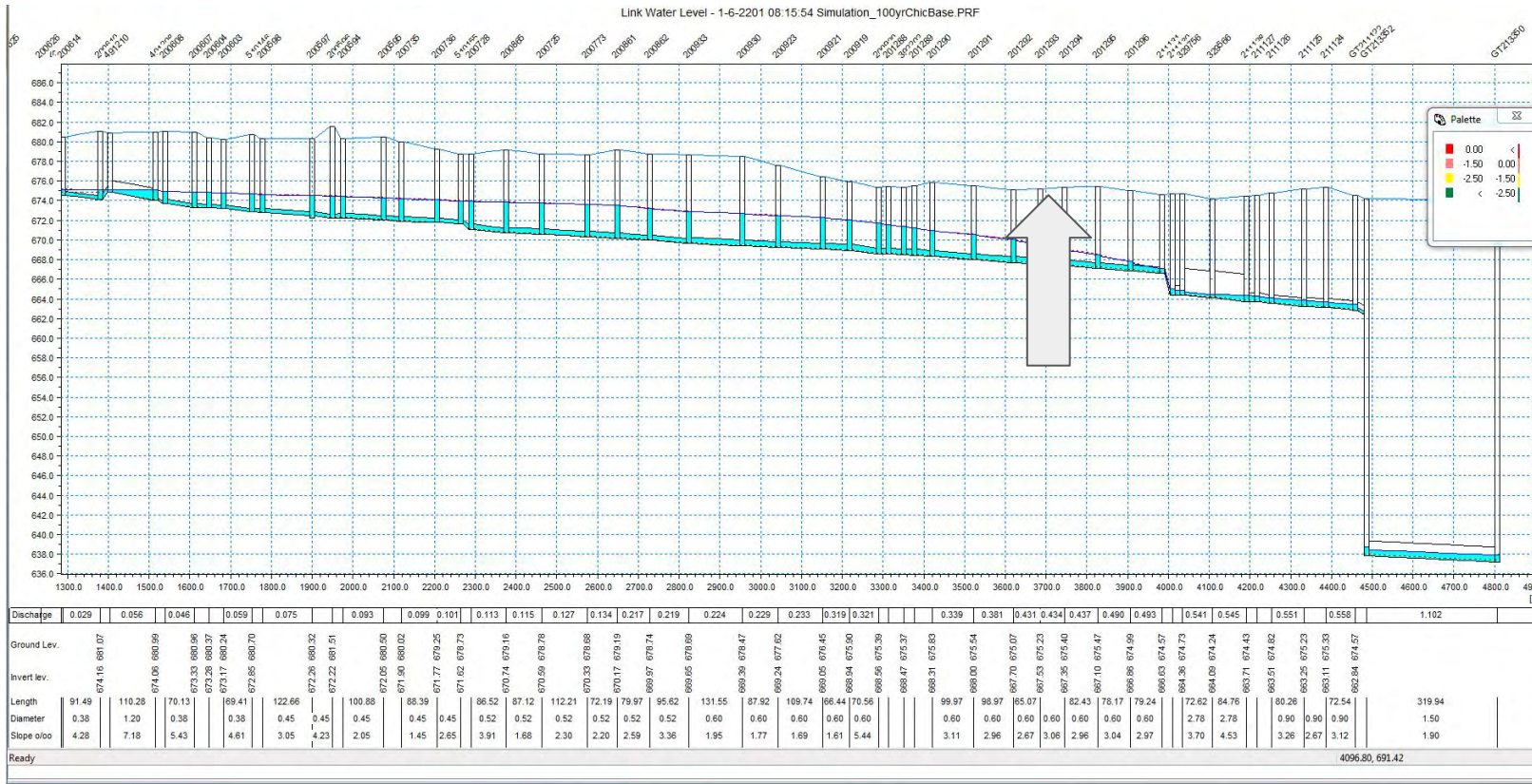
Current Commercial/Industrial, about 50% impervious

Proposed 5841 persons at location 201295 and 2649 at 201292

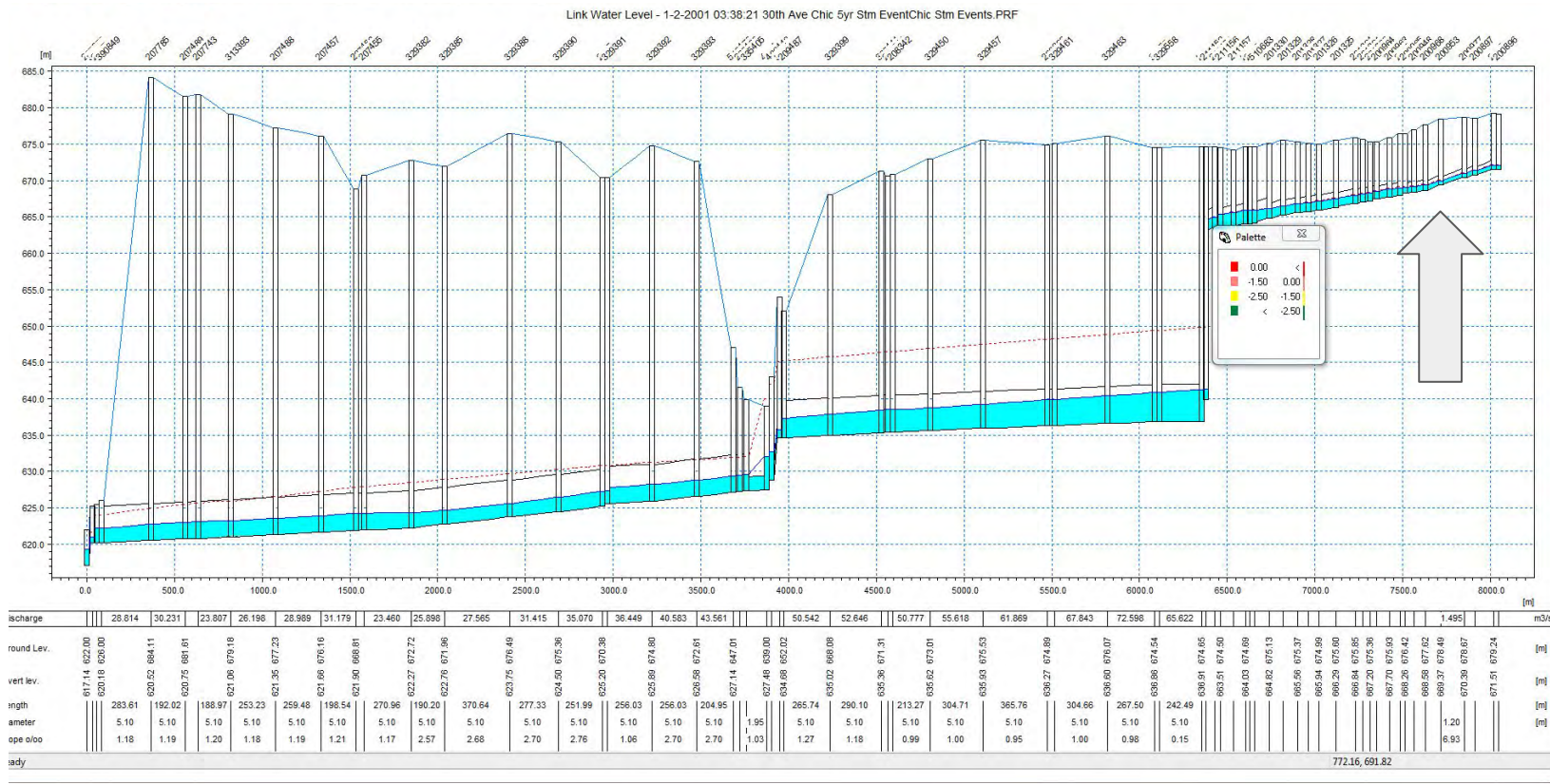
Existing PDWF along pipe Stn 265 ~65 l/s, resulting PDWF after development ~95 l/s , about 45% increase in dwf (Full pipe capacity of 900mm pipe~1000 l/s)

Existing PDWF along Pipe stn 61~10 l/s, upstream of development

100 yr 4 hr HGL



5 yr HGL storm



100 yr 4hr storm

