

**East LeBreton Flats
201, 301 and 324 Lett Street
450 Lloyd Avenue
133 Booth Street**

Serviceability Report

Prepared for:

Claridge Homes

Prepared By:

NOVATECH
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6

October 2017

Novatech File: 116042
Ref No. R-2017-113

October 11, 2017

City of Ottawa
Planning, Infrastructure and Economic Development Department
Planning and Infrastructure Approvals Branch
110 Laurier Avenue West, 4th Floor
Ottawa ON, K1P 1J1

Attention: Mr. Abdul Mottalib, M. Eng., P. Eng.

Dear Sir:

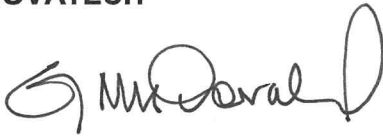
**Reference: LeBreton Flats East- Claridge Phase IV
Serviceability Report**

Enclosed is the Serviceability Report for the proposed LeBreton Flats East (Phase IV) development located on Lett Street and Lloyd Street in the City of Ottawa. This report is submitted in support of the official plan and zoning by-law amendment applications and outlines how the site will be serviced with public infrastructure.

Trusting this report is adequate for your purposes. Should you have any questions, or require additional information, please contact me.

Yours truly,

NOVATECH



Greg MacDonald, P. Eng.
Director, Land Development and Public Sector Infrastructure

cc: Shawn Malhotra (Claridge Homes)

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1.0 INTRODUCTION

This Serviceability Study has been prepared in support of a Zoning By-law and Official Plan Amendment application for the Claridge lands east of Booth Street as shown in **Figure 1 – Key Plan of LeBreton Flats East Phase IV Lands**. The subject lands will henceforth be referred to as the “LeBreton Flats East - Phase IV lands”. The site is 1.26 ha in area and is currently vacant, except for the Claridge sales center located at the Booth/Fleet intersection.

The lands are currently zoned GM17[120] H (40) S94 or R5O H (20) and are bounded by the following:

- To the north, Pimisi Park and Sir John A. MacDonald Parkway;
- To the south, the historic aqueduct and the Confederation Line LRT Route;
- To the east, existing residential development (Claridge Phase I, II and III);
- To the west, Booth Street and vacant land planned for future mixed-use development.

Figure 1: Key Plan of LeBreton Flats East Phase IV Lands



1.1 Proposed Development

The LeBreton Flats East Phase IV lands will consist of five buildings as shown in **Figure 2 – Proposed Claridge Phase IV Concept Plan**. It is intended that Buildings C and E will be a maximum of 25 storeys, Buildings B and D will be a maximum of 30 storeys and Building A will be a maximum of 45 storeys. The proposed development will accommodate approximately 1950 residential units, 95,000 square feet (8,826 m²) of commercial/retail development and 63,000 square feet (5,853 m²) of institutional development. The proposed developments will include underground parking garages with accesses on Lett Street and Lloyd Street. The estimated build-out date of the entire development is 2026.

Figure 2: Proposed Claridge Phase IV Concept Plan



2.0 SANITARY SEWER

The development will be serviced by the existing 375mm diameter sanitary sewer on Fleet Street, the existing 250mm diameter sanitary sewer on Lloyd Street, and the existing 250mm diameter sanitary sewer on Lett Street as shown in **Figure 3 - Existing Infrastructure**. These sewers have been sized for the development and have received Certificates of Approval (now Environmental Compliance Approvals) from the Ministry of Environment and Climate Change. Copies of these, along with the sanitary sewer design sheets and drainage area plans, are included in **Appendix A**.

The proposed development flows are based on the City of Ottawa Sewer Design Guidelines and are provided below.

2.1 Proposed Sanitary Flows from Development Site

Residential: $Q_{SAN\ AVE} = (1,950 \text{ units} \times 1.8 \text{ ppl/unit} \times 350 \text{ L/cap/day}) / 86,400 \text{ s/day} = 14.22 \text{ L/s}$

Commercial/Retail/Institutional: $Q_{SAN\ AVE} = (14,679 \text{ m}^2 \times 5 \text{ L/m}^2/\text{day}) / 86,400 \text{ s/day} = 0.85 \text{ L/s}$

Residential Peak Factor = $1 + [14 / (4 + P^{0.5})] = 3.38$ where $P = \text{population}/1000$

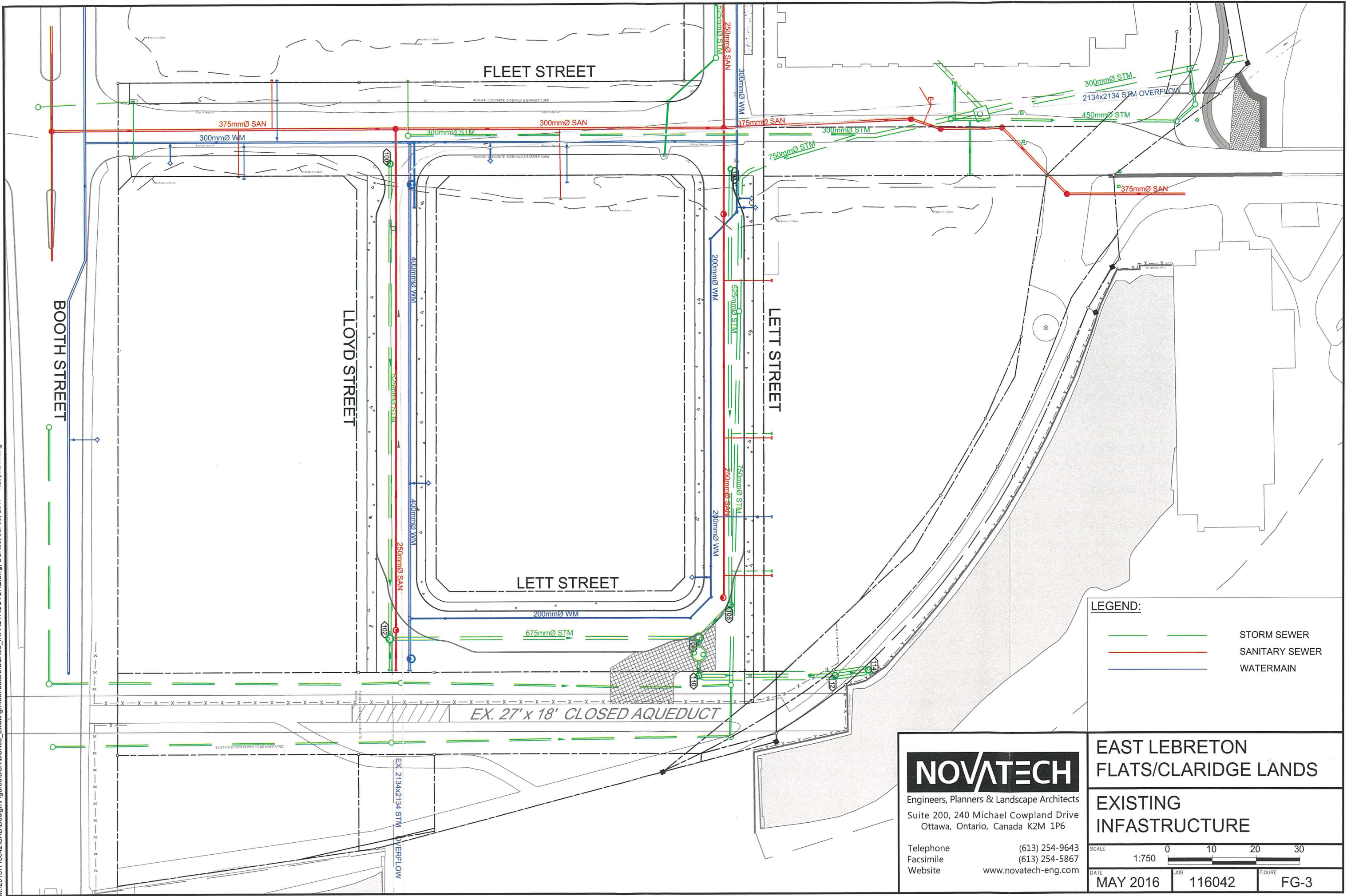
Commercial/Institutional Peak Factor = 1.5

Peak Infiltration Flow = $1.26 \text{ ha} \times 0.28 \text{ L/s/ha} = 0.35 \text{ L/s}$

Total Peak Sanitary Flow = $(14.22 \times 3.38) + (0.85 \times 1.5) + 0.35 = 52.83 \text{ L/sec}$

The sanitary sewers on Lett Street and Lloyd Street have been sized to accommodate a total number of 3,050 units for Phase IV (e.g. 3200 units less 150 units already built in Phase III). The sanitary sewer on Fleet Street has surplus capacity for development of the site as described in Section 2.2 below.

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2.2 Overall Sanitary Servicing Implementation Strategy

The Claridge Phase IV lands will form part of an overall development concept envisaged for the LeBreton Flats area. Various other development plans are proposed including the Rendezvous Proposal west of Booth Street, the City's Bayview Lands, City Centre, the new Ottawa Public Library and the Zibi Development on the Chaudière Islands. The current development concepts are shown in **Figure 4 - LeBreton Bayview Development Concept**. This section will discuss the servicing and implementation approach to servicing these development areas with sanitary sewer and will form part of an overall Servicing Assessment and Implementation Strategy for the LeBreton Bayview Development Area, which study is currently in the planning stages.

Figure 4 LeBreton Bayview Concept Plan



The lands east of Booth Street (referred to as LeBreton East) are partially developed and consist of Claridge's Phase I, II and III (450 residential units and 75 m² commercial/retail). Phase IV, current subject lands, will consist of approximately 1950 residential units and 14,679 m² of commercial/retail. The remaining lands are owned by the National Capital Commission which are north of Fleet Street between Booth Street and Lett Street. Although the NCC lands are currently used as a park the NCC has indicated that this is a temporary use and, as such, it is expected that these could develop similar to the surrounding lands and could support another 300 residential units. These areas will discharge to the existing Fleet Street Sewer.

The lands west of Booth Street (referred to as LeBreton West) are proposed to consist of 4400 residential units, an 18,500-seat sports arena, an outdoor gathering area suitable for 28,000 people and 2,800,000 square feet (260,000 m²) of retail/commercial area.¹ The LeBreton West A area north of the LRT, including the Sports Arena, will discharge to the Fleet Street Sewer. The area denoted as LeBreton West B and the LeBreton West A lands south of the LRT will discharge to the West Nepean Sanitary Collector.

The City's Bayview lands and the lands immediately south, including City Centre, were the subject of the Bayview Station District Community Design Plan (CDP) completed in 2013. The CDP envisions a high density mixed-use development with an estimated build-out of 5,900,000 square feet (548,000 m²) of development area which will include office, retail, community facilities and approximately 4000 residential units. These areas will be serviced to the West Nepean Sanitary Collector.

The lands which occupy Chaudière Island are planned to be developed as a mixed-use community which will include approximately 1411 residential units and 205,000 square feet of commercial/retail/office area. The Chaudière Island lands currently discharge by forcemain to the Ottawa Interceptor Sewer at a chamber located at the interception of Sparks Street and Bronson Avenue.

The new Ottawa Public Library will be located on the north side of Albert Street, east of Booth Street and the NCC parcel of land, overlooking the Fleet Street Pump Station and Open Aqueduct tail waters. These lands will discharge to the sewer on Albert Street which in turn discharges to the West Nepean Sanitary Collector.

According to the Master Servicing Study completed by Dessau Soprin², the 375 mm diameter sanitary sewer on Fleet Street is to service a drainage area of 12.32 hectares and a population of 3493 people along with 189,430 m² (2,039,000 ft²) of office/retail area. This drainage area includes the LeBreton Flats East lands, the lands north of Sir John A. MacDonald Parkway (War Museum and National Holocaust Monument), and the lands west of Booth Street depicted as LeBreton West A north of the LRT. The sewer design sheets and sanitary drainage area plan from the Dessau Soprin report are included in **Appendix B**.

An analysis was carried out to determine the sanitary flows from the total tributary area based on projected development yields proposed by the Rendezvous LeBreton Group as well as the lands east of Booth Street, and the War Museum. The analysis was carried out using current City of Ottawa criteria of 350 L/cap/day average domestic flow. A second analysis was undertaken using 280 L/cap/day which is closer to actual consumption flows based on monitored data for numerous sites. Results are summarized in **Table 1** and complete spreadsheet including overall sanitary drainage area plan is included in **Appendix C**.

¹ Rendezvous LeBreton Proposal

² LeBreton Flats Infrastructure and Remediation Project, Master Servicing Report, Final Report (5th Edition), February 2004

Table 1 Peak Sanitary Flows To Fleet Street Sewer and West Nepean Collector

Area ID	Area (ha)	Comm. Floor Area (m2)	Arena (Seats)	Residential Units	Peak Flow (350 l/c/d) L/sec	Peak Flow (280 l/c/d) (L/s)
To Fleet Street	17.6	124,000	18,500	4,050	116.3	97.4
To West Nepean Collector	23.0	220,000	2,000	2,900	93.8	80.1

The Chaudière Island lands currently discharge by forcemain to the Ottawa Interceptor Sewer at a chamber located at the interception of Sparks Street and Bronson Avenue as shown on the overall Sanitary Drainage Area Plan contained in Appendix C. Future servicing of this site will either continue to discharge to the Ottawa Interceptor or, alternatively, directly to the City of Gatineau. It is understood that the developer is having discussions with the City of Gatineau on this latter option.

The Fleet Street Sanitary Sewer (375 mm diameter at 0.45%) discharges to the Fleet Street Sanitary Sewer Station just east of the Pooley Mews Bridge. Under normal operating conditions, flows enter this station and discharge to the Ottawa Interceptor Sewer by gravity through a 250 mm diameter pipe. If the Ottawa Interceptor Sewer surcharges, a sluice gate closes at the Fleet Street Sewer Station and the flows are then pumped past the closed gate to the 250 mm outlet sewer then to the Interceptor Sewer.

The hydraulic capacities of this system are described below. Relevant drawings of the Fleet Street Sanitary Pump Station are also included in **Appendix D** along with the Certificate of Approval for the station.

- Capacity of 375 mm diameter sanitary sewer on Fleet Street: **117.6 L/sec**
- Capacity of 250 mm diameter gravity sewer from Fleet Street Sanitary Station to Ottawa Interceptor Sewer: **140 L/sec**
 - ★ Allowed to surcharge to elevation 47.0 m before sluice gate closes and pumps kick in. Obvert of 375 mm incoming Fleet Street Sanitary Sewer is 47.91 m.
- Capacity of Pumps when sluice gate is closed: **106-111 L/sec**
- Capacity of 250 mm diameter sewer to Interceptor under pumped conditions (based on maximum velocity of 3 m/sec): **152 L/sec**

As can be seen above, using current design flows of 350 L/c/day indicates that improvements to the existing Fleet Street Sanitary Pump Station may be required once the area is fully built out which could be 15 to 20 years from now. These improvements would require increasing the capacity of the pumps from 106 L/sec to 113.4 L/sec which can likely be achieved by simply replacing the pump impellers. However, using a more realistic per capita flow of 280 L/c/day shows that the exiting system is adequate for the full development area. AS site plan applications are reviewed, and based on timing, additional detailed analysis will be undertaken.

There are no known capacity restrictions on the West Nepean Collector. However, an assessment of the surcharge levels in the West Nepean would need to be undertaken which should not be a concern given the depth of the collector.

3.0 STORM SEWER AND STORMWATER MANAGEMENT

As part of this development, stormwater will be controlled on-site and discharged via 200mm dia. services that will connect to the 525mm dia. storm sewer on Lloyd Street, the 525mm dia. storm sewer on Lett Street or the 675mm dia. storm sewer on Lett Street. These sewers discharge to an MOE approved (Ref. No. 3575-95WJYL) STC 4000 Stormceptor on Lett Street, which has been sized to include the proposed lands and outlets via a 675mm dia. storm sewer to the tailrace as shown on **Figure 3 - Existing Infrastructure**. A copy of the MOE approval is included in **Appendix A**. All proposed storm services will be equipped with backwater valves.

The City will require that on-site stormwater management be implemented to control post-development stormwater discharge from the 5 and 100-year storm events based on an allowable runoff coefficient (C) of 0.70, the Old City of Ottawa IDF curves, a time of concentration (t_c) of 10 minutes, and 5-year storm control, which is consistent with the Dessau-Soprin LeBreton Flats Infrastructure and Remediation Project - Master Servicing Report (2004). Stormwater management will be achieved using rooftop controls.

The site will be graded such that flows more than the 100-year storm event will be conveyed overland to Lett Street and Lloyd Street. Erosion and sediment control measures will be implemented during all phases of construction and inspected regularly.

A detailed Stormwater Management Report addressing how the SWM criteria will be achieved will be prepared at the site plan application stage.

4.0 WATERMAIN

4.1 Domestic Water Demand

The proposed development will be serviced by the 400mm dia. watermain on Lloyd Street and the 200mm dia. watermain on Lett Street as shown in **Figure 3 - Existing Infrastructure**. Service connection locations will be determined at the time of site plan submission. Shutoff valves will be provided at property lines as per City of Ottawa Specifications. The water meters will be in the basement level mechanical rooms of the buildings. Similarly, remote receptacles will be located at the surface near the entrances to the buildings on the exterior.

Estimated domestic water demands for the development is estimated to be approximately equal to the development residential and commercial/retail/institutional sanitary flows listed above.

LeBreton Flats Blocks A, B, C, D & E

Average daily demand (L/sec): $Q_{\text{WATER}} = 14.22/\text{s} + 0.85\text{L}/\text{s} = 15.07 \text{ L/sec}$

Using a peak factor of 2.5, the required maximum daily demand yields:

$$Q_{\text{WATER}} = 37.67 \text{ L/sec}$$

Using a peak factor of 2.2, the required maximum hour demand yields:

$$Q_{\text{WATER}} = 82.88 \text{ L/sec}$$

4.2 Fire Demand

An estimate of the water required to meet firefighting demands is described below.

Section 4.2.11 of the City of Ottawa Water Design Guidelines reads:

“When calculating the fire flow requirements and affected pipe sizing, designers shall use the method developed by the Fire Underwriters Survey”, and

“The requirements for levels of fire protection on private property are covered in Section 7.2.11 of the Ontario Building Code.”

The Fire Underwriters Survey is used to assess the performance of the water distribution system on a “City Block” basis rather than an individual building basis. The Ontario Building Code governs the assessment of fire demand for individual buildings.

Section 7.2.11.1 of the Ontario Building Code states that the design, construction, installation and testing of fire service mains and water service pipe combined with fire service mains shall be in conformance with NFPA 24.

NFPA 24 is the standard for the “Installation of Private Fire Service Mains and their Appurtenances”. Chapter 13 of NFPA 24 discusses sizing the private service fire mains for fire protection systems which shall be approved by the authority having jurisdiction, considering the following factors:

- Construction and Occupancy of the Building
- Fire Flow and Pressure of the Water Required
- Adequacy of the Water Supply

It is expected that any future building on the site will be sprinklered per Section 3.2.2.45 of the OBC. Section 3.2.5.7 of the OBC requires that an adequate water supply for fire fighting be provided to each building, and references Appendix A of the OBC. Sentence 3 of Section A 3.2.5.7 of the OBC (Appendix A) states that NFPA 13 be used for determining both sprinkler and hose stream demands for a sprinklered building.

The design of the sprinkler system is completed by a Fire Protection Engineer, or typically computed by the sprinkler contractor and approved by the Fire Protection Engineer. This process involves detailed hydraulic calculations based on building layout, pipe runs, head losses, fire pump requirements, etc. At this stage in the planning and site design process, these details are not available. Therefore, this report will confirm the maximum anticipated sprinkler and hose stream demands as per NFPA 13.

Section 11.2.3 of the NFPA 13, “Water Demand Requirements – Hydraulic Calculations Methods” was used to estimate the sprinkler and hose stream demands. Figure 11.2.3.1.1 – Area/Density Curves confirms the sprinkler demand, assuming Ordinary 1 construction. Table 11.2.3.1.2 confirms the hose stream allowance and water supply demand requirements, assuming ordinary hazard construction.

For Ordinary 1 type construction, design is based on a density of 0.15 gpm (US), and a maximum area of sprinkler operation limited to 1500 ft² (139 m²). As per NFPA 13 Figure 11.2.3.1.1, the maximum anticipated sprinkler demand is 225 gpm (US). As per NFPA 13 Table 11.2.3.1.2, the maximum total combined inside and outside hose demand is 250 gpm (US) with a duration of 60-90 minutes.

Based on the calculations above, the total estimated sprinkler and hose demand for the development is 475 gpm (US). However, because the development has not been finalized to-date, it is recommended to add a 50% contingency. Therefore, a sprinkler demand of 713 gpm (US), 2700L/min, should be anticipated at this stage. Refer to **Appendix E** for excerpts from NFPA 13.

Boundary conditions and the performance of the surrounding watermain will be confirmed during detailed design of each building.

5.0 CONCLUSIONS

Based on the foregoing, adequate sanitary, storm and water services are available to support this development. Additional design analysis and details will be provided at the site plan application stage.

NOVATECH

Prepared by:



Greg MacDonald, P.Eng
Director, Land Development and Public Sector Infrastructure

APPENDIX A

**Existing Certificates of Approval,
Design Sheets and Drainage Area Plans
for Lloyd Street and Lett Street Sewers**

LEBRETON FLATS - Lett Street and Lloyd Street
SANITARYSEWER DESIGN SHEET

JOB# 105006



LOCATION			FLOW													PROPOSED SEWER						
STREET	FROM MH	TO MH	INVERTS		UNITS	RETAIL	INDIVIDUAL		CUMULATIVE		PEAK FACTOR (M)	POPUL. FLOW	RETAIL FLOW	PEAK EXTRAN. FLOW	PEAK DESIGN FLOW	LENGTH (m)	PIPE SIZE (mm)	TYPE	SLOPE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	RATIO (Q/Qfull)
			UPS	DWS	APT.	RETAIL AREA	POPUL (1000's)	AREA (ha.)	POPUL (1000's)	AREA (ha.)		Q(p) L/s	Q(r) L/s	Q(e) (L/s)	Q(d) (L/s)							
BLOCK 12 LLOYD	Cap	101	53.88	53.84	400	0	0.720	0.303	0.72	0.303	3.887	11.338	0	0.085	11.423	9.1	250	PVC	0.45	41.617	0.82	27%
	101	EX	53.30	52.89	1200	0	2.160	1.151	2.880	1.454	3.457	40.336	0	0.407	40.744	92.2	250	PVC	0.45	41.617	0.82	98%
LETT	103	EX	52.89	52.49	1600	0	2.880	0.910	2.88	0.910	3.457	40.336	0	0.255	40.591	87.0	250	PVC	0.45	41.617	0.82	98%

DESIGN PARAMETERS

Notes:

- 1) $Q(e) = 0.28 \text{ L/sec/ha}$
- 2) $Q(p) = (P \times q \times M / 86,400)$
- 3) $Q(d) = Q(p) + Q(e)$

Definitions:

where

P = Population (1.8 people/per Apartment Unit)
q = Average per capita flow = 350 L/person/day
M = Residential Peaking Factor (Harmon Formula from section 4.4.1 of the City Sewer Design Guidelines):
 $M = 1 + [14 / (4 + Pop / 1000)]^{1/2} - 1$ (Maximum of 4.0)
N = Industrial Peaking Factor (Appendix 4-B "Peaking Factor for Industrial Areas" from City Design Guidelines)
Q(d) = Design Flow (L/sec)
Q(p) = Population Flow (L/sec)
Q(r) = Retail Flow (L/sec)
Q(e) = Extraneous Flow (L/sec)



LeBreton Flats - Lett Street and Lloyd Street South of Fleet Street
SANITARY SEWER DESIGN SHEET

Date	July 26, 2012						
Design	B.H.B.						
Job No.		Dwg. Reference:		Checked and Stamped:			
105006-2		105006-2-SAN		G.J. MacDonald			

030310206/CAD/Drawn/Sheet/2010/1020605-SAH.dwg, SAN, Aug 03, 2012 - 11:48am, bharp

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS,
WATERMANS, SEWERS AND OTHER
UNDERGROUND AND OVERGROUND UTILITIES
AND STRUCTURES IS NOT NECESSARILY SHOWN
ON THE CONTRACT DRAWINGS, AND WHERE
SHOWN, THE ACCURACY OF THE POSITION OF
SUCH UTILITIES AND STRUCTURES IS NOT
GUARANTEED BEFORE STARTING WORK.
DETERMINE THE EXACT LOCATION OF ALL SUCH
UTILITIES AND STRUCTURES AND ASSUME ALL
LIABILITY FOR DAMAGE TO THEM.

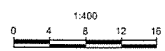
CLARIDGE HOMES
CLARIDGE HOMES
SUITE 2001,
210 GLADSTONE AVENUE,
OTTAWA, ONTARIO
K2P 0Y6.



6	ISSUED FOR MOE APPROVAL	AUG 03/12	GJM	
5	REVISED PER CITY COMMENTS	JUL 26/12	GJM	
4	REVISE & REISSUED FOR CITY REVIEW	MAR 12/12	GJM	
3	REISSUED TO CITY	FEB 01/11	GJM	
2	REISSUED TO CITY	OCT 27/10	BHB	
1	ISSUED FOR CITY REVIEW	JUN 01/10	BHB	

SCALE

1:400



DESIGN

BHB

CHECKED

GJM

DRAWN

SAM

CHECKED

BHB

APPROVED

FOR REVIEW ONLY



LOCATION
CITY OF OTTAWA
LEBRETON FLATS - PHASE 2

DRAWING NAME

SANITARY DRAINAGE PLAN

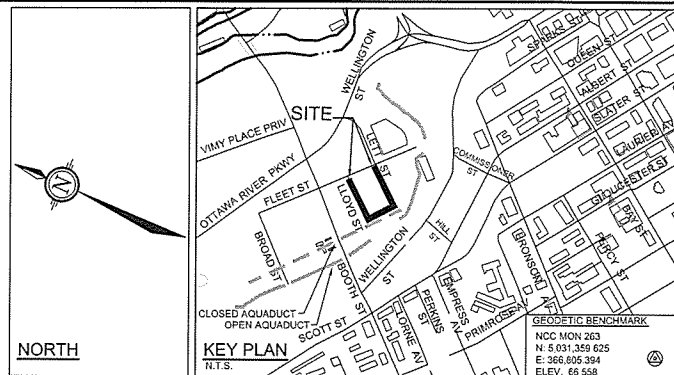
PROJECT No.

105006-2

REV

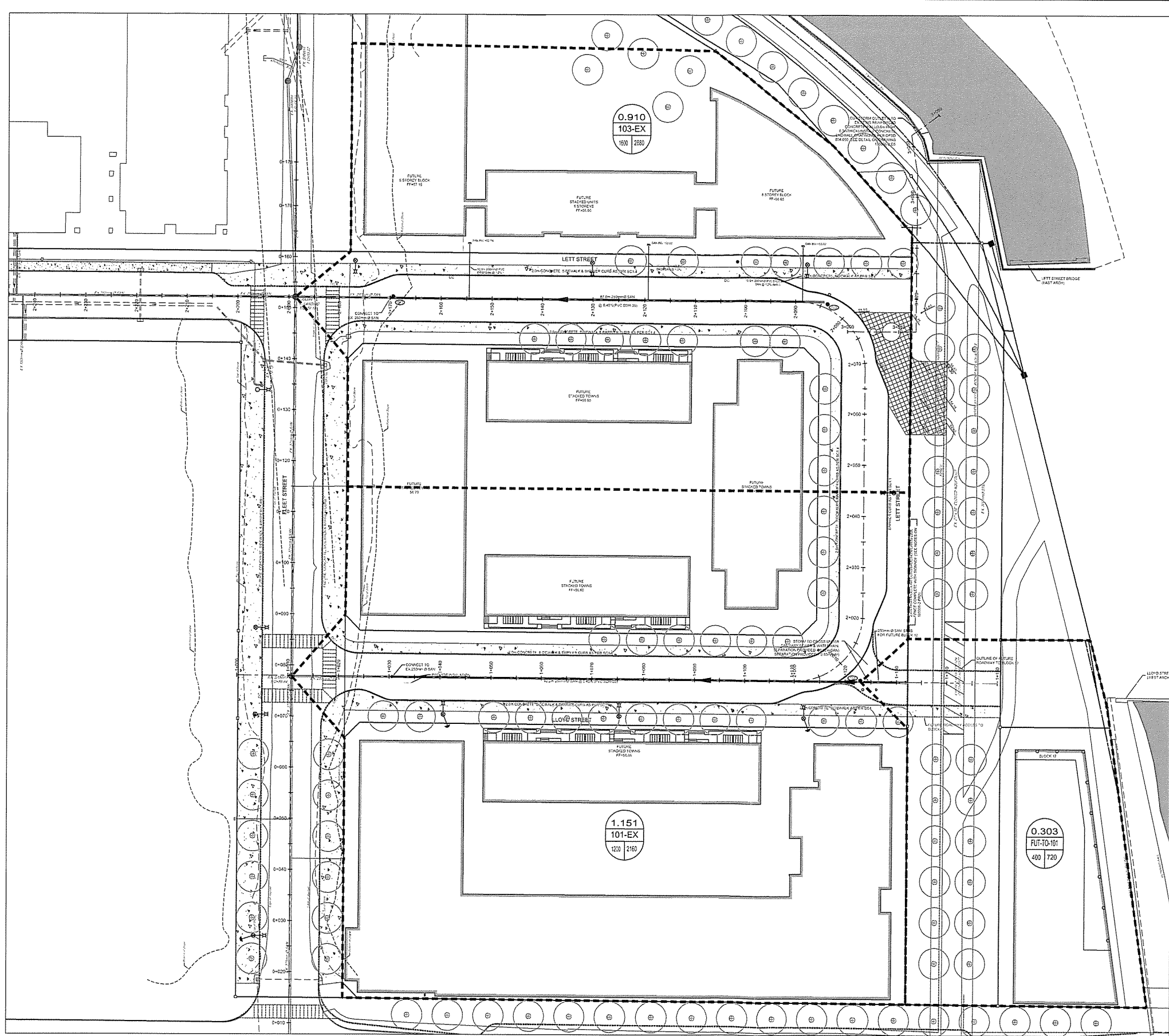
REV # 05

DRAWING No



LEGEND

- 1.200 AREA IN HECTARES
- 101-103 MANHOLE TO MANHOLE
- 250 525 POPULATION EQUIVALENT
- NUMBER OF UNITS
- SANITARY DRAINAGE AREA
- SAN MH PROPOSED SANITARY MANHOLE & SEWER



LEBRETON FLATS - Lett Street and Lloyd Street
STORM SEWER DESIGN SHEET (5-YEAR EVENT)

JOB# 105006



LOCATION			AREA (ha)				FLOW							PROPOSED SEWER								
STREET	FROM MH	TO MH	R=	R=	R=	R=	INDIV. 2.78 AC	ACCUMUL. 2.78 AC	TIME OF CONC.	DESIGN STORM	RAINFALL INTENSITY	Peak Flow (L/sec)		DIA. ACTUAL (mm)	DIA. (mm)	TYPE	SLOPE (%)	LENGTH (m)	CAPACITY (L/s)	VELOCITY (m/s)	FLOW TIME (min)	Ratio (Q/Qfull)
			0.20	0.35	0.70	0.90						Q 5YR	Q total									
LLOYD	100	102			1.05		2.04	2.04	10.00	5	104.19	212.9	212.9	0.533	525	CONC	0.25	106.2	224.2	1.00	1.76	95%
BLOCK 12	CAP	102		0.1	0.20		0.49	0.49	10.00	5	104.19	50.7	50.7	0.457	450	CONC	0.20	7.2	132.9	0.81	0.15	38%
									10.15													
LETT	102	104			0.12		0.23	2.76	11.76	5	95.71	264.5	264.5	0.686	675	CONC	0.12	70.1	303.6	0.82	1.42	87%
									13.19													
LETT	108	106			0.60		1.17	1.17	10.00	5	104.19	121.7	121.7	0.533	525	CONC	0.17	96.1	184.9	0.83	1.94	66%
LETT	106	104			0.00		0.00	1.17	11.94	5	94.97	110.9	110.9	0.533	525	CONC	0.17	10.3	184.9	0.83	0.21	60%
									12.14													
OUTLET	104	STC 4000					0.00	3.93	13.19	5	89.92	353.5	353.5	0.686	675	CONC	0.28	1.2	463.8	1.26	0.02	76%
OUTLET	STC 4000	110					0.00	3.93	13.20	5	89.86	353.2	353.2	0.686	675	CONC	0.28	3.6	463.8	1.26	0.05	76%
OUTLET	110	112					0.00	3.93	13.25	5	89.67	352.5	352.5	0.686	675	CONC	0.28	30.5	463.8	1.26	0.40	76%
OUTLET	112	114					0.00	3.93	13.65	5	88.17	346.6	346.6	0.686	675	CONC	0.28	7.6	463.8	1.26	0.10	75%
OUTLET	114	Outlet					0.00	3.93	13.76	5	87.81	345.2	345.2	0.686	675	CONC	0.28	1.2	463.8	1.26	0.02	74%
									13.20													
DESIGN PARAMETERS																						
Definitions: Q = 2.78 AIR, where Q= Peak Flow in Litres per Second (l/s) A= Area in hectares (ha) I= Rainfall Intensity (mm/hr) R= Runoff Coefficient												Notes: 1) Ottawa Rainfall-Intensity Curve 2) Min Pipe Velocity = 0.80 m/s 3) Tc =10 min (subdivision)										
												LeBreton Flats - Lett Street and Lloyd Street South of Fleet Street STORM SEWER DESIGN SHEET										
												Date	July 26, 2012									
												Design	B.H.B.									
												Job No.		Dwg. Reference:		Checked and Stamped:						
												105006-2		105006-2-STM		G.J. MacDONALD						





Stormceptor Design Summary

PCSWMM for Stormceptor

Project Information

Date	5/11/2012
Project Name	Lebreton Flats
Project Number	105006
Location	Ottawa, ON

Designer Information

Company	Novatech Engineering
Contact	David Smith

Rainfall

Name	OTTAWA MACDONALD-CARTIER INT'L A
State	ON
ID	6000
Years of Records	1967 to 2003
Latitude	45°19'N
Longitude	75°40'W

Notes

N/A

Water Quality Objective

TSS Removal (%)	80
-----------------	----

Drainage Area

Total Area (ha)	2.1
Imperviousness (%)	69

Upstream Storage

Storage (ha-m)	Discharge (L/s)
0	0

The Stormceptor System model STC 4000 achieves the water quality objective removing 80% TSS for a Fine (organics, silts and sand) particle size distribution.

Stormceptor Sizing Summary

Stormceptor Model	TSS Removal %
STC 300	56
STC 750	68
STC 1000	68
STC 1500	69
STC 2000	75
STC 3000	76
STC 4000	80
STC 5000	80
STC 6000	83
STC 9000	87
STC 10000	86
STC 14000	89



Particle Size Distribution

Removing silt particles from runoff ensures that the majority of the pollutants, such as hydrocarbons and heavy metals that adhere to fine particles, are not discharged into our natural water courses. The table below lists the particle size distribution used to define the annual TSS removal.

Fine (organics, silts and sand)							
Particle Size μm	Distribution %	Specific Gravity	Settling Velocity m/s		Particle Size μm	Distribution %	Specific Gravity Settling Velocity m/s
20	20	1.3	0.0004				
60	20	1.8	0.0016				
150	20	2.2	0.0108				
400	20	2.65	0.0647				
2000	20	2.65	0.2870				

Stormceptor Design Notes

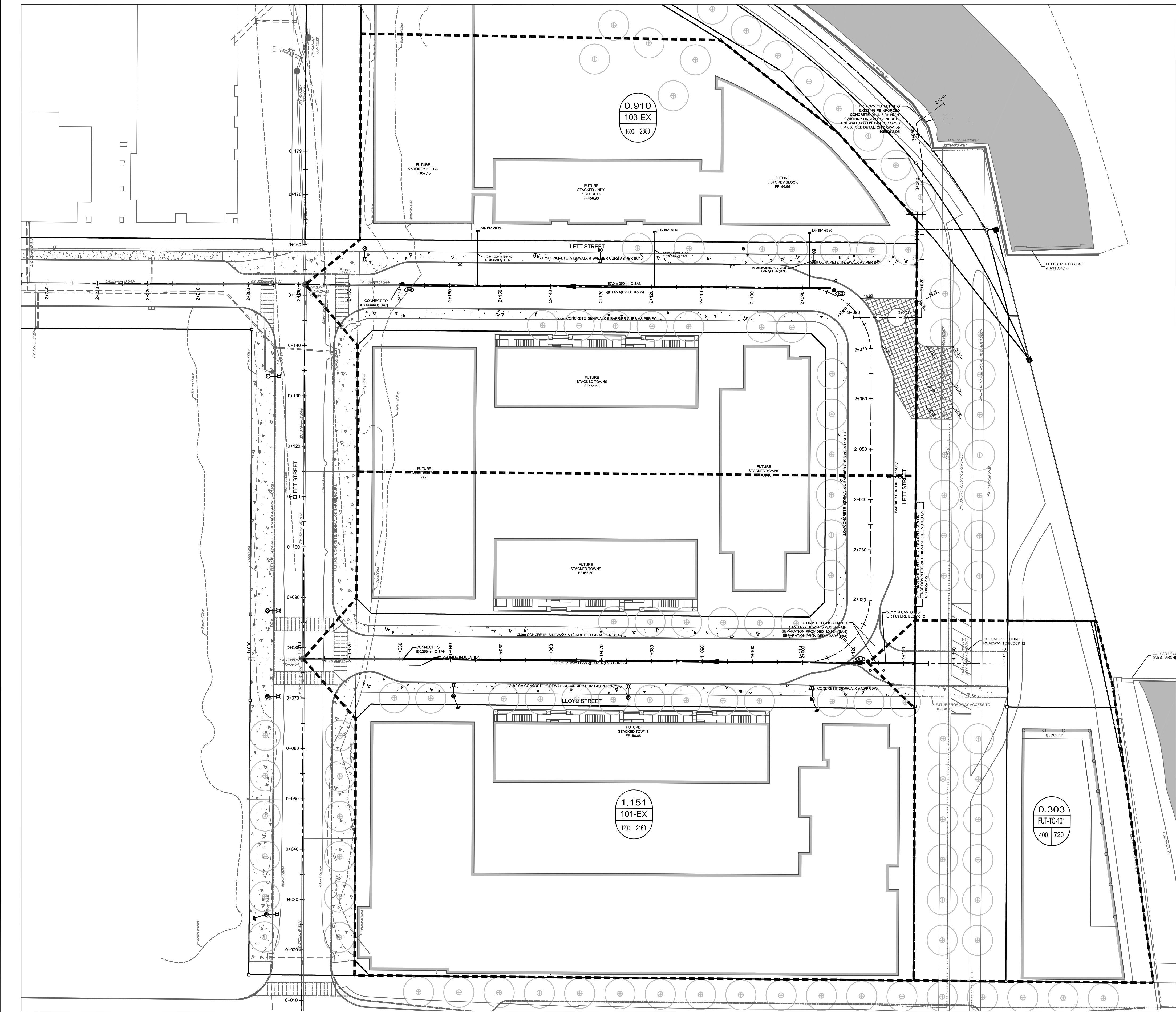
- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor version 1.0
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal.
- Only the STC 300 is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 750 to STC 6000 may accommodate multiple inlet pipes.
- Inlet and outlet invert elevation differences are as follows:

Inlet and Outlet Pipe Invert Elevations Differences

Inlet Pipe Configuration	STC 300	STC 750 to STC 6000	STC 9000 to STC 14000
Single inlet pipe	75 mm	25 mm	75 mm
Multiple inlet pipes	75 mm	75 mm	Only one inlet pipe.

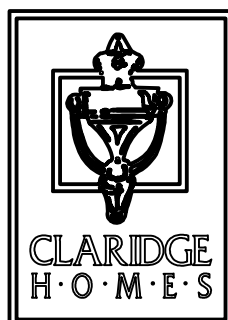
- Design estimates are based on stable site conditions only, after construction is completed.
- Design estimates assume that the storm drain is not submerged during zero flows. For submerged applications, please contact your local Stormceptor representative.
- Design estimates may be modified for specific spills controls. Please contact your local Stormceptor representative for further assistance.
- For pricing inquiries or assistance, please contact Imbrium Systems Inc., 1-800-565-4801.

M:\2005\105006\CA\Design\Sheet\2010\105006-SAN.dwg, SAN, Aug 03, 2012 - 11:48am, Kwang



NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS,
WATERMAINS, SEWERS AND OTHER
UNDERGROUND AND OVERGROUND UTILITIES
AND STRUCTURES IS NOT NECESSARILY SHOWN
ON THE CONTRACT DRAWINGS, AND WHERE
SHOWN, THE ACCURACY OF THE POSITION OF
SUCH UTILITIES AND STRUCTURES IS NOT
GUARANTEED, BEFORE STARTING WORK,
DETERMINE THE EXACT LOCATION OF ALL SUCH
UTILITIES AND STRUCTURES AND ASSUME ALL
LIABILITY FOR DAMAGE TO THEM.

CLARIDGE HOMES
CLARIDGE HOMES
SUITE 2001,
210 GLADSTONE AVENUE,
OTTAWA, ONTARIO
K2P 0Y6.



No.	REVISION	DATE	BY
6	ISSUED FOR MOE APPROVAL	AUG 03/12	GJM
5	REVISED PER CITY COMMENTS	JUL 26/12	GJM
4	REVISE & REISSUED FOR CITY REVIEW	MAR 12/12	GJM
3	REISSUED TO CITY	FEB 01/11	GJM
2	REISSUED TO CITY	OCT 27/10	BHB
1	ISSUED FOR CITY REVIEW	JUN 9/10	BHB

SCALE
1:400
0 4 8 12 16

DESIGN
BHB
CHECKED
GJM
DRAWN
SAM
CHECKED
BHB
APPROVED
GJM

FOR REVIEW ONLY



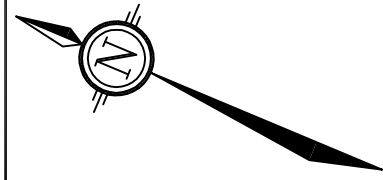
NOVATECH
ENGINEERING
CONSULTANTS LTD.
ENGINEERS & PLANNERS
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada
K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Email: novainfo@novatech-eng.com

LOCATION
CITY OF OTTAWA
LEBRETON FLATS - PHASE 2

DRAWING NAME
SANITARY DRAINAGE PLAN

PROJECT NO.	105006-2
REV	REV # 06
DRAWING NO.	105006-2-SAN

PLANS&DWG - 6/11/2012

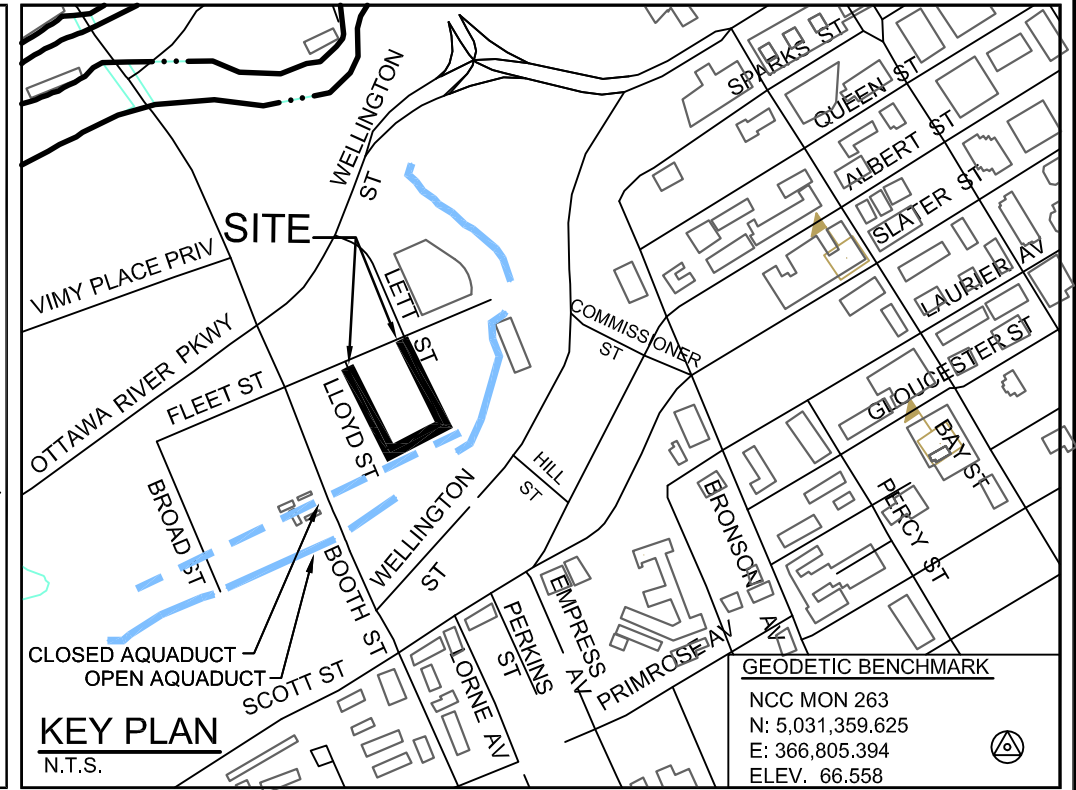


LEGEND

POST-DEVELOPMENT

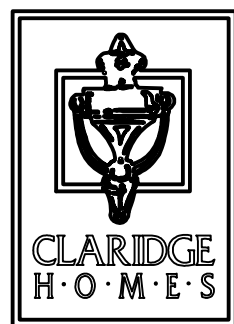
The diagram shows a circular manhole cover divided into four horizontal sections. The top section contains the number '0.2108', the second section contains '101', the third section contains '102-104', and the bottom section contains '0.90'. To the right of the cover, four labels with arrows point to these sections: 'DRAINAGE AREA(ha)' for the top, 'AREA NO.' for the second, 'MANHOLE TO MANHOLE' for the third, and 'RUN-OFF COEFFICIENT' for the bottom. Below the cover, a dashed line is labeled 'STORM DRAINAGE AREA'.

- 0.2108 — DRAINAGE AREA(ha)
- 101 — AREA NO.
- 102-104 — MANHOLE TO MANHOLE
- 0.90 — RUN-OFF COEFFICIENT
- STORM DRAINAGE AREA



NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

CLARIDGE HOMES
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SUITE 2001,
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7	ISSUED FOR MOE APPROVAL	AUG 03/12	GJM
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5	REVISED PER CIY COMMENTS	MAY 10/12	GJM
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3	REISSUED TO CITY	FEB 01/11	GJM
2	REISSUED TO CITY	OCT 27/10	BHB
1	ISSUED FOR CITY REVIEW	JUN 9/10	BHB
No.	REVISION	DATE	BY

1:500

1:500

10 15 20

CHECKED	GJM
DRAWN	SAM
CHECKED	BHE
APPROVED	GJM

A circular professional engineer seal for G.J. MacDonald, Province of Ontario. The seal contains the text "LICENSED PROFESSIONAL ENGINEER" at the top and "PROVINCE OF ONTARIO" at the bottom. The name "G.J. MacDonald" is in the center, with a handwritten signature below it.

NOVATECH
ENGINEERING
CONSULTANTS LTD.
ENGINEERS & PLANNERS
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada
K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Email: novainfo@novatech-eng.com

LOCATION
CITY OF OTTAWA
LEBRETON FLATS - PHASE 2

DRAWING NAME

STORM DRAINAGE PLAN

PROJECT No.	
-------------	--

REV 02/11/03

105006-2-STM

PLANA 1.DWG - 841mmx594mm



Ontario

Ministry
of the
Environment

Ministère
de
l'Environnement

CERTIFICATE OF APPROVAL
MUNICIPAL AND PRIVATE SEWAGE WORKS
NUMBER 3759-6JKN99
Issue Date: November 30, 2005

Claridge Homes (Lebreton Flats) Inc.
210 Gladstone Avenue
Ottawa, Ontario
K2P 0Y6

Site Location: Lebreton Flats Development
Lett Street, Block 1, Ward 14 (from Fleet Street to Lebreton Boulevard)
Ottawa City

You have applied in accordance with Section 53 of the Ontario Water Resources Act for approval of:

sanitary and storm sewers to be constructed in the City of Ottawa, on Lett Street, all in accordance with the application from Claridge Homes (Lebreton Flats) Inc., dated August 29, 2005, including final plans and specifications prepared by Novatech Engineering Consultants Ltd.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario

AND

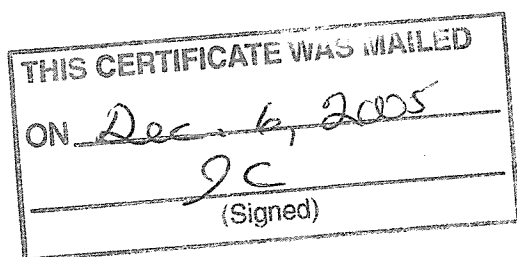
The Director
Section 53, *Ontario Water Resources Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario

RECEIVED DEC - 8 2005

* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca

The above noted sewage works are approved under Section 53 of the Ontario Water Resources Act.

DATED AT TORONTO this 30th day of November, 2005



Aziz Ahmed, P.Eng.
Director
Section 53, *Ontario Water Resources Act*

VT/
c: District Manager, MOE Ottawa
Greg MacDonald, P. Eng., Novatech Engineering Consultants Ltd. ✓
Pierre Pagé, City Clerk, City of Ottawa
Jean Lachance, MCIP, RPP, P. Eng., Program Manager, Infrastructure Approvals, City of Ottawa



Ministry of the Environment
Ministère de l'Environnement

ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 4962-8X9NYF
Issue Date: August 23, 2012

Claridge Homes (Lebreton Flats Phase 3) Inc.
210 Gladstone Avenue, Unit 2001
Ottawa, Ontario
K2P 0Y6

Site Location: Lett Street and Lloyd Street
City of Ottawa

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

storm sewers and **sanitary sewers** to be constructed in the City of Ottawa, as follows:

storm sewers on Lloyd Street (from Station 1+018.5 to Station 1+132), Lett Street (from Station 2+010 to Station 2+179.5) and on outlet/ aqueduct ROW from (Station 3+005 to Station 3+054); and

sanitary sewers on Lloyd Street (from Station 1+030 to 1+132) and Lett Street (from Station 2+084 to 2+169);

all in accordance with the application from Claridge Homes (Lebreton Flats Phase 3) Inc., dated **July 30, 2012**, including final plans prepared by Novatech Engineering Consultants Ltd.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;

5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

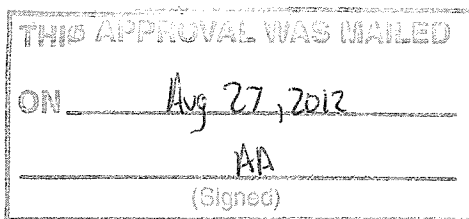
AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-4506 or www.ert.gov.on.ca

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 23rd day of August, 2012



Sherif Hegazy, P.Eng.

Director

appointed for the purposes of Part II.1 of the
Environmental Protection Act

AA/

- c: District Manager, MOE Ottawa
Greg MacDonald, Novatech Engineering Consultants Ltd. ✓
Richard Buchanan, Infrastructure Approvals
Linda Carkner, Program Manager, Infrastructure Services
M. Rick O'Connor, City Clerk & Solicitor, City Manager's Office, City of Ottawa (File No. D07-16-02-0019)

RECEIVED



Ministry of the Environment
Ministère de l'Environnement

ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 3575-95WJYL
Issue Date: March 25, 2013

Claridge Homes (Lebreton Flats Phase 3) Inc.
210 Gladstone Ave, No. 2001
Ottawa, Ontario
K2P 0Y6

Site Location: Lett Street and Lloyd Street
City of Ottawa

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

Stormwater management works, designed to service Claridge Homes (LeBreton Flats), a mix-use residential and commercial development, located at Lett Street and Lloyd Street, in the City of Ottawa, comprising;

- **one (1) oil/grit interceptor**, model Stormceptor STC 4000, servicing a drainage area of 2.1 hectares, providing Enhanced level of protection (long term average total suspended solids removal of 80%), having a sediment capacity of 16,490 Litres, an oil capacity of 3,360 Litres, a total holding capacity of 24,710 Litres and a maximum treatment flow rate of 260 Litres per second, discharging to existing sewers;

all in accordance with the application dated July 30, 2012 and received on August 16, 2012, and all supporting documentation and information including a Stormwater Design Brief, final plans and specifications prepared by Novatech Engineering Consultants Ltd.

For the purpose of this environmental compliance approval, the following definitions apply:

1. "Approval" means this Environmental Compliance Approval and any Schedules to it, including the application and supporting documentation;
2. "Director" means any Ministry employee appointed by the Minister pursuant to section 5 of the Part II.1 of the Environmental Protection Act;
3. "District Manager" means the District Manager of the Ottawa District Office of the Ministry;

4. "Ministry" means the Ontario Ministry of the Environment;
5. "Owner" means Claridge Homes (Lebreton Flats Phase 3) Inc., and includes its successors and assignees;
6. "Works" means the sewage works described in the *Owner's* application, this *Approval* and in the supporting documentation referred to herein, to the extent approved by this *Approval*.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

- 1.1 The *Owner* shall ensure that any person authorized to carry out work on or operate any aspect of the *Works* is notified of this *Approval* and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.
- 1.2 Except as otherwise provided by these Conditions, the *Owner* shall design, build, install, operate and maintain the *Works* in accordance with the description given in this *Approval*, the application for approval of the *Works* and the submitted supporting documents and plans and specifications as listed in this *Approval*.
- 1.3 Where there is a conflict between a provision of any submitted document referred to in this *Approval* and the Conditions of this *Approval*, the Conditions in this *Approval* shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.
- 1.4 Where there is a conflict between the listed submitted documents, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.
- 1.5 The requirements of this *Approval* are severable. If any requirement of this *Approval*, or the application of any requirement of this *Approval* to any circumstance, is held invalid or unenforceable, the application of such requirement to other circumstances and the remainder of this *Approval* shall not be affected thereby.

2. EXPIRY OF APPROVAL

This *Approval* will cease to apply to those parts of the *Works* which have not been constructed within five (5) years of the date of this *Approval*.

3. CHANGE OF OWNER

The *Owner* shall notify the *District Manager* and the *Director*, in writing, of any of the following

changes within thirty (30) days of the change occurring:

- (a) change of *Owner*;
- (b) change of address of the *Owner*;
- (c) change of partners where the *Owner* is or at any time becomes a partnership, and a copy of the most recent declaration filed under the Business Names Act, R.S.O. 1990, c.B17 shall be included in the notification to the *District Manager*; and,
- (d) change of name of the corporation where the *Owner* is or at any time becomes a corporation, and a copy of the most current information filed under the Corporations Information Act, R.S.O. 1990, c. C39 shall be included in the notification to the *District Manager*.

4. OPERATION AND MAINTENANCE

- 4.1 The *Owner* shall make all necessary investigations, take all necessary steps and obtain all necessary approvals so as to ensure that the physical structure, siting and operations of the stormwater management *Works* do not constitute a safety or health hazard to the general public.
- 4.2 The *Owner* shall design, construct and operate the oil-grit separator with the objective that the effluent from the *Works* is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film, sheen, foam or discolouration on the receiving waters.
- 4.3 The *Owner* shall carry out and maintain an annual inspection and maintenance program on the operation of the oil-grit separator in accordance with the manufacturer's recommendation.
- 4.4 After a two (2) year period, the *District manager* may alter the frequency of inspection of the stormwater management *Works* if he/she is requested to do so by the *Owner* and considers it acceptable upon review of information submitted in support of the request.
- 4.5 The *Owner* shall maintain a logbook to record the results of these inspections and any cleaning and maintenance operations undertaken, and shall make the logbook available for inspection by the *Ministry* upon request. The logbook shall include, but not necessarily be limited to, the following information:
 - (a) the name of the *Works* ; and
 - (b) the date and results of each inspection, maintenance and cleaning, including an estimate of the quantity of any materials removed.

5. RECORD KEEPING

The *Owner* shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the operation and maintenance activities required by this *Approval*.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the *Works* are built and operated in the manner in which they were described for review and upon which *Approval* was granted. This Condition is also included to emphasize the precedence of Conditions in the *Approval* and the practice that the *Approval* is based on the most current document, if several conflicting documents are submitted for review. The Condition also advises the *Owners* their responsibility to notify any person they authorized to carry out work pursuant to this *Approval* the existence of this *Approval*.
2. Condition 2 is included to ensure that, when the *Works* are constructed, the *Works* will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.
3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to approved *Works* and to ensure that subsequent *owners* of the *Works* are made aware of the *Approval* and continue to operate the *Works* in compliance with it.
4. Condition 4 is included as regular inspection and necessary removal of sediment and excessive decaying vegetation from this approved stormwater management *Works* are required to mitigate the impact of sediment, debris and/or decaying vegetation on the treatment capacity of the *Works*. It is also required to ensure that adequate storage is maintained in the stormwater management *Works* at all times as required by the design, and to prevent stormwater impounded in the *Works* from becoming stagnant. Furthermore, Conditions 4 is included to ensure that the stormwater management *Works* are operated and maintained to function as designed.
5. Condition 5 is included to require that all records are retained for a sufficient time period to adequately evaluate the long-term operation and maintenance of the *Works*.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
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5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

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Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

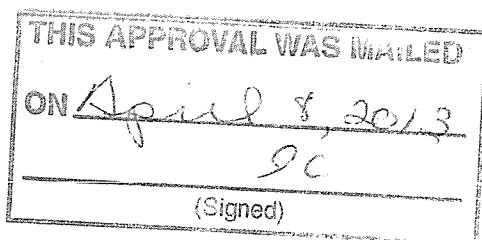
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The Director appointed for the purposes of
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M4V 1L5

* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-4506 or www.ert.gov.on.ca

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 25th day of March, 2013



Sherif Hegazy, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

KH/

c: District Manager, MOE Ottawa
Greg MacDonald, P.Eng., Novatech Engineering Consultants Ltd. ✓



Particle Size Distribution

Removing silt particles from runoff ensures that the majority of the pollutants, such as hydrocarbons and heavy metals that adhere to fine particles, are not discharged into our natural water courses. The table below lists the particle size distribution used to define the annual TSS removal.

Fine (organics, silts and sand)							
Particle Size μm	Distribution %	Specific Gravity	Settling Velocity m/s		Particle Size μm	Distribution %	Specific Gravity Settling Velocity m/s
20	20	1.3	0.0004				
60	20	1.8	0.0016				
150	20	2.2	0.0108				
400	20	2.65	0.0647				
2000	20	2.65	0.2870				

Stormceptor Design Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor version 1.0
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal.
- Only the STC 300 is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 750 to STC 6000 may accommodate multiple inlet pipes.
- Inlet and outlet invert elevation differences are as follows:

Inlet and Outlet Pipe Invert Elevations Differences

Inlet Pipe Configuration	STC 300	STC 750 to STC 6000	STC 9000 to STC 14000
Single inlet pipe	75 mm	25 mm	75 mm
Multiple inlet pipes	75 mm	75 mm	Only one inlet pipe.

- Design estimates are based on stable site conditions only, after construction is completed.
- Design estimates assume that the storm drain is not submerged during zero flows. For submerged applications, please contact your local Stormceptor representative.
- Design estimates may be modified for specific spills controls. Please contact your local Stormceptor representative for further assistance.
- For pricing inquiries or assistance, please contact Imbrium Systems Inc., 1-800-565-4801.



Stormceptor Design Summary

PCSWMM for Stormceptor

Project Information

Date	5/11/2012
Project Name	Lebreton Flats
Project Number	105006
Location	Ottawa, ON

Designer Information

Company	Novatech Engineering
Contact	David Smith

Notes

N/A

Drainage Area

Total Area (ha)	2.1
Imperviousness (%)	69

The Stormceptor System model STC 4000 achieves the water quality objective removing 80% TSS for a Fine (organics, silts and sand) particle size distribution.

Rainfall

Name	OTTAWA MACDONALD-CARTIER INT'L A
State	ON
ID	6000
Years of Records	1967 to 2003
Latitude	45°19'N
Longitude	75°40'W

Water Quality Objective

TSS Removal (%)	80
-----------------	----

Upstream Storage

Storage (ha-m)	Discharge (L/s)
0	0

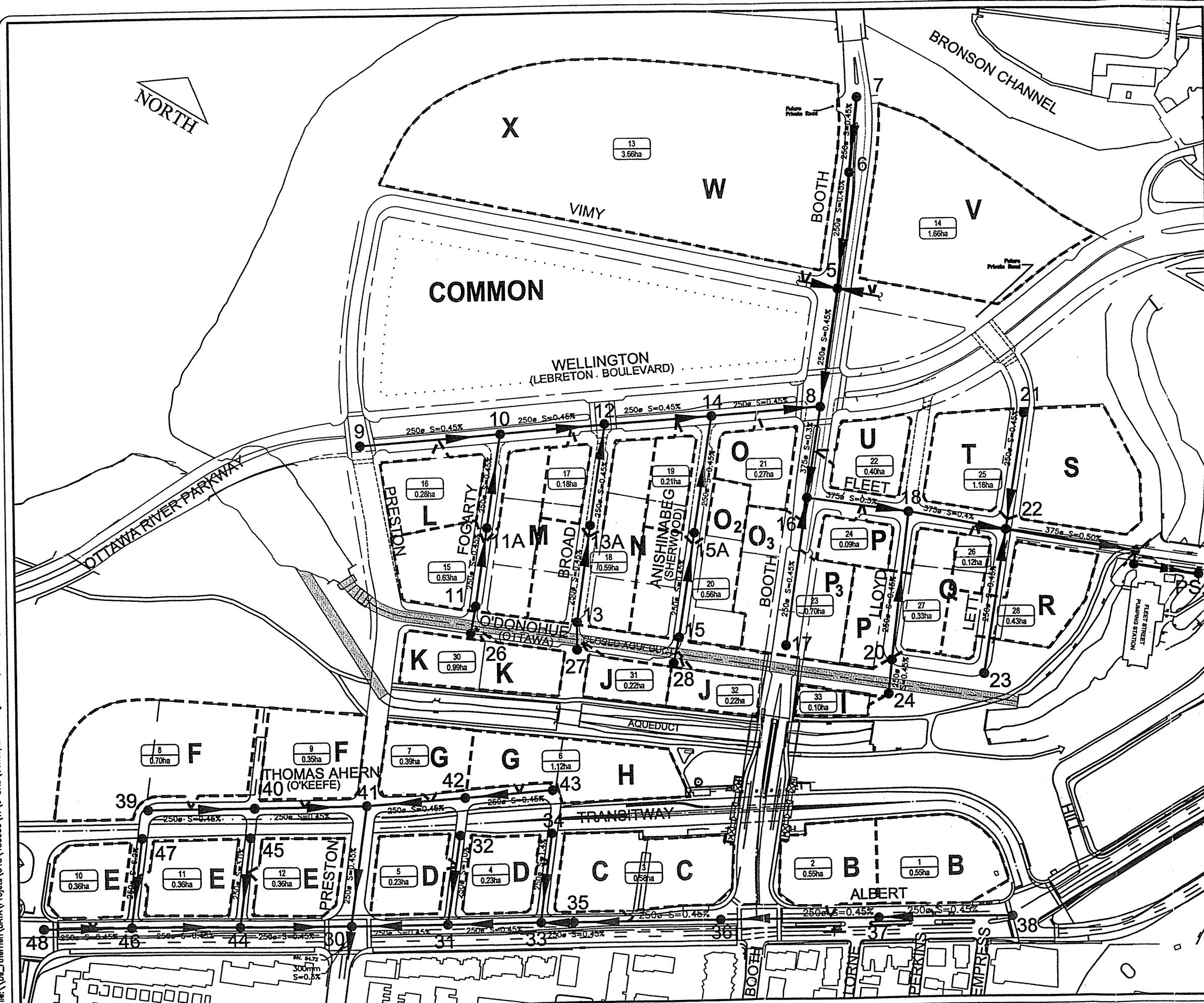
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Stormceptor Model	TSS Removal %
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STC 14000	89

APPENDIX B

**Excerpts from the Dessau-Soprin
LeBreton Flats Infrastructure and
Remediation Project -
Master Servicing Report (2004)**

\\De_rherrien\DATA\Projets\048\480000\W\0 DAO\Conceptual Design Plan\Dao 100\0480000100HYC002.dwg



Legend

- 250mm Proposed sanitary sewer
- G Block identification
- 15 Node number
- 5 Subcatchment number
0.92ha Land area in hectares
- Subcatchment areas

LEBRETON FLATS INFRASTRUCTURE AND REMEDIATION PROJECT MASTER SERVICING REPORT

SANITARY SUBCATCHMENT AREA PLAN



Dessau-Soprin
885, boul. de la Carrière
Hull (Québec)
Phone no.: (81)
Fax: (81)

Prepared N. Vekeman	Department Municipal	Project dir S. Dupl
Drawn L. De Gregorio	Scale Not to scale	
Verified D. Deveau	Date May 02, 2003	

Project	Work lot	Dept.	Drawing no.
0480000100HYC002			

SANITARY SEWER DESIGN SHEET - PRELIMARY

Dessau-Soprin inc.

February 6, 2004

SC-436

CLIENT: National Capital Commission

PROJECT: Le Breton Flats Infrastructure and Remediation Project

DESIGNED: Nicolas Vekeman, Dominique Deveau

Location				Description										Flows					Proposed sewer data**				
Street	From mh	To mh	Sub- catchment	Detail	Individual		Accumulative		Peak	Individual		Accumulative		Q _{res} (l/s)	Q _{extran} (l/s)	Q _{office} (l/s)	Q _{retail} (l/s)	Q _{total} (l/s)	Diameter (mm)	Slope (%)	Length (m)	Q _{cap.} (l/s)	Velocity (m/s)
					Pop. (persons)	Area (ha)	Pop. (persons)	Area (ha)	factor (M)	Office (m²)	Retail (m²)	Office (m²)	Retail (m²)										
Booth	5	8	13 & 14	X,W,V				5.32		64000		64000		0.0	1.5	5.6	0.0	7.0	250	0.45	90	39.9	0.81
Forgarty	26	11	30	K	202	0.49	202	0.49	4.15		400		400	3.4	0.1	0.0	0.0	3.6	250	0.45	60	39.9	0.81
Forgarty	11	11a	15	1/2L & 1/2M	480	0.63	682	1.12	3.90				400	10.8	0.3	0.0	0.0	11.1	250	0.45	60	39.9	0.81
Forgarty	11a	10					682	1.12	3.90				400	10.8	0.3	0.0	0.0	11.1	250	0.45	75	39.9	0.81
LeBreton	9	10	16	1/2L	252	0.28	252	0.28	4.11					4.2	0.1	0.0	0.0	4.3	250	0.45	90	39.9	0.81
LeBreton	10	12	17	1/4M	114	0.18	1048	1.58	3.79				400	16.1	0.4	0.0	0.0	16.6	250	0.45	80	39.9	0.81
Broad	27	13	31	1/2J	101	0.22	101	0.22	4.24		200		200	1.7	0.1	0.0	0.0	1.8	250	0.45	75	39.9	0.81
Broad	13	13a	18	1/4M & 1/2N	376	0.59	477	0.81	3.98				200	7.7	0.2	0.0	0.0	7.9	250	0.45	75	39.9	0.81
Broad	13a	12					477	0.81	3.98				200	7.7	0.2	0.0	0.0	7.9	250	0.45	80	39.9	0.81
LeBreton	12	14	19	1/4N	131	0.21	1656	2.6	3.65				600	24.5	0.7	0.0	0.1	25.3	300	0.4	75	61.2	0.87
Sherwood	28	15	32	1/2J	101	0.22	101	0.22	4.24		200		200	1.7	0.1	0.0	0.0	1.8	250	0.45	75	39.9	0.81
Sherwood	15	15a	20	O2 & 1/4N	332	0.56	433	0.78	4.01				200	7.0	0.2	0.0	0.0	7.3	250	0.45	80	39.9	0.81
Sherwood	15a	14					433	0.78	4.01				200	7.0	0.2	0.0	0.0	7.3	250	0.45	90	39.9	0.81
LeBreton	14	8	21	O		0.27	2089	3.65	3.57	19000	1000	19000	1800	30.2	1.0	1.6	0.2	33.0	300	0.4	85	61.2	0.87
Booth	8	16	22	U		0.4	2089	9.37	3.57	25200	1400	108200	3200	30.2	2.6	9.4	0.3	42.5	375	0.3	75	96.0	0.87
Booth	17	16	23	P3 & O3		0.7		0.7		34525	3305	34525	3305	0.0	0.2	3.0	0.3	3.5	250	0.45	115	39.9	0.81
Fleet	16	18	24	1/2P	104	0.09	2193	10.16	3.55		100	142725	6605	31.6	2.8	12.4	0.6	47.4	375	0.45	75	117.6	1.06
Lloyd	24	20	33	I	21	0.1	21	0.1	4.38		100		100	0.4	0.0	0.0	0.0	0.4	250	0.45	105	39.9	0.81
Lloyd	20	18	27	1/2P & 1/2Q	330	0.33	351	0.43	4.05		100		200	5.8	0.1	0.0	0.0	5.9	250	0.45	105	39.9	0.81

February 6, 2004

SC-436

CLIENT: National Capital Commission

PROJECT: Le Breton Flats Infrastructure and Remediation Project

DESIGNED: Nicolas Vekeman, Dominique Deveau

Location				Description										Flows					Proposed sewer data**				
Street	From mh	To mh	Sub- catchment	Detail	Individual		Accumulative		Peak	Individual		Accumulative		Q _{res} (l/s)	Q _{extran} (l/s)	Q _{office} (l/s)	Q _{retail} (l/s)	Q _{total} (l/s)	Diameter (mm)	Slope (%)	Length (m)	Q _{cap.} (l/s)	Velocity (m/s)
					Pop. (persons)	Area (ha)	Pop. (persons)	Area (ha)	factor (M)	Office (m²)	Retail (m²)	Office (m²)	Retail (m²)										
Fleet	18	22	26	1/4Q	114	0.12	2658	10.71	3.49			142725	6805	37.5	3.0	12.4	0.6	53.5	375	0.45	80	117.6	1.06
Lett	21	22	25	S & T	420	1.18	420	1.18	4.01	37800	2100	37800	2100	6.8	0.3	3.3	0.2	10.6	250	0.45	90	39.9	0.81
Lett	23	22	28	R & 1/4Q	415	0.43	415	0.43	4.01					6.7	0.1	0.0	0.0	6.9	250	0.45	110	39.9	0.81
Fleet	22	PS					3493	12.32	3.39			180525	8905	47.9	3.4	15.7	0.8	67.8*	375	0.45	80	117.6	1.06

Drawing Reference: 480000 (100) HY0001 and HYC002

Notes: Stacked and Townhouses 3.0 ppm
Low or Med-Rise 2.1 ppm
High-Rise 2.1 ppm

N-Value : 0,013

* Add 20 l/s to include
future development of Victoria Island.

** Pipes were designed to meet future Victoria
Island needs.

Design flow rates (Q) :

- Residential (res) : 350 l/pers/d
- Extraneous (extran) : 0,28 l/s/ha
- Office (office) : 5 l/d/m²
- Retail (retail) : 5 l/d/m²

Peaking Factor :

$$\text{Res.: } M = 1 + K \times \left(\frac{14}{4 + P^{1/2}} \right)$$

P = population in 1000's

$$K = 1$$

Office : 1,5

Retail : 1,5

APPENDIX C

Overall Sanitary Drainage Area Plan and Design Sheet

Table 2 - LeBreton Flats Sanitary Flows

LEBRETON FLATS SANITARY FLOW DESIGN SHEET																									
AREA	ID	INDIVIDUAL					CUMULATIVE					IND. RES. PEAK FACTOR (M)	CUM. RES. PEAK FACTOR (M)	COMM. PEAK FACTOR	INDIVIDUAL FLOWS					CUMULATIVE FLOWS					
		AREA (ha.)	COMM. FLOOR AREA (m²)	THEATRE / ARENA (SEATS)	RESIDENTIAL UNITS (apartments)	POPUL. (1000's)	AREA (ha.)	COMM. FLOOR AREA (m²)	THEATRE / ARENA (SEATS)	RESID. UNITS (apartments)	POPUL. (1000's)				PEAK POPUL. FLOW Q(p) L/s	PEAK COMM. FLOW Q(c) L/s	PEAK ARENA FLOW L/s	PEAK EXTR. FLOW Q(e) (L/s)	PEAK DESIGN FLOW Q(d) (L/s)	POPUL. FLOW Q(p) L/s	PEAK COMM. FLOW Q(c) L/s	PEAK THEATRE / ARENA FLOW L/s	PEAK EXTRAN. FLOW Q(e) (L/s)	PEAK DESIGN FLOW Q(d) (L/s)	
To Fleet Street Sewer																									
	WEST A	6.8	80000	18500	1500	2.700	6.8	80000	18500	1500	2.700	3.481	3.481	1.5	30.46	6.94	6.42	1.90	45.7	30.46	6.94	6.42	1.90	45.7	
	W	5.1	32000	0	0	0.000	11.9	112000	18500	1500	2.700	4.000	3.481	1.5	0.00	2.78	0.00	1.43	4.2	30.46	9.72	6.42	3.33	49.9	
	NCC1	1.3	0	0	300	0.540	13.2	112000	18500	1800	3.240	3.957	3.414	1.5	6.92	0.00	0.00	0.36	7.3	35.84	9.72	6.42	3.70	55.7	
	CL	4.4	12000	0	2400	4.320	17.6	124000	18500	4200	7.560	3.303	3.074	1.5	46.25	1.04	0.00	1.23	48.5	75.32	10.76	6.42	4.93	97.4	
To West Nepean Collector																									
	LEB S.	8.4	80000	2000	1400	2.520	8.4	80000	2000	1400	2.520	3.506	3.506	1.5	28.63	6.94	0.69	2.35	37.9	28.63	6.94	0.69	2.35	37.9	
	WEST B	11.2	100000	0	1500	2.700	19.6	180000	2000	2900	5.220	3.481	3.228	1.5	30.46	8.68	0.00	3.14	42.3	54.60	15.63	0.69	5.49	75.7	
	NCC2	2.0	20000	0	0	0.000	21.6	200000	2000	2900	5.220	4.000	3.228	1.5	0.00	1.74	0.00	0.56	2.3	54.60	17.36	0.69	6.05	78.0	
City	1.4	20000	0	0	0.000	23.0	220000	2000	2900	5.220	4.000	3.228	1.5	0.00	1.74	0.00	0.39	2.1	54.60	19.10	0.69	6.44	80.1		
Design Parameters:																LEBRETON FLATS SANITARY FLOW DESIGN SHEET									
1) Q(e) = 0.28 L/sec/ha 2) Q(p) = (P×q×M/86,400) 3) Q(pk) = 1000 L/d/ha x M 4) Q(c) = 50000 L/d/ha x N 5) Q(d) = Q(p) + Q(pk) + Q(c)+ Q(e) Definitions: P = Population PPU = 1.8 q = Average per capita flow = 280 L/cap/day M = Residential Peaking Factor (Harmon Formula from section 4.4.1 of the City Sewer Design Guidelines): M = 1+[14/(4+Pop/1000)]^1/2*1 (Maximum of 4.0) N =Commercial / Park Peaking Factor (1.5) from City Design Guidelines Q(d) = Design Flow (L/sec) Q(p) = Population Flow (L/sec) Q(pk) = Park Flow (L/sec) Q(c) = Commercial Flow (L/sec) Q(e) = Extraneous Flow (L/sec)																									
Date June 30, 2017																									
Design GJM																									
Job No.:																Dwg. Reference:				Checked:					
116042																									

Table 2 - LeBreton Flats Sanitary Flows

LEBRETON FLATS SANITARY FLOW DESIGN SHEET																											
AREA	ID	INDIVIDUAL					CUMULATIVE					IND. RES. PEAK FACTOR (M)	CUM. RES. PEAK FACTOR (M)	COMM. PEAK FACTOR	INDIVIDUAL FLOWS					CUMULATIVE FLOWS							
		AREA (ha.)	COMM. FLOOR AREA (m²)	THEATRE / ARENA (SEATS)	RESIDENTIAL UNITS (apartments)	POPUL. (1000's)	AREA (ha.)	COMM. FLOOR AREA (m²)	THEATRE / ARENA (SEATS)	RESID. UNITS (apartments)	POPUL. (1000's)				PEAK POPUL. FLOW Q(p) L/s	PEAK COMM. FLOW Q(c) L/s	PEAK ARENA FLOW L/s	PEAK EXTR. FLOW Q(e) (L/s)	PEAK DESIGN FLOW Q(d) (L/s)	POPUL. FLOW Q(p) L/s	PEAK COMM. FLOW Q(c) L/s	PEAK THEATRE / ARENA FLOW L/s	PEAK EXTRAN. FLOW Q(e) (L/s)	PEAK DESIGN FLOW Q(d) (L/s)			
To Fleet Street Sewer																											
	WEST A	6.8	80000	18500	1500	2.700	6.8	80000	18500	1500	2.700	3.481	3.481	1.5	38.07	6.94	6.42	1.90	53.3	38.07	6.94	6.42	1.90	53.3			
	W	5.1	32000	0	0	0.000	11.9	112000	18500	1500	2.700	4.000	3.481	1.5	0.00	2.78	0.00	1.43	4.2	38.07	9.72	6.42	3.33	57.5			
	NCC1	1.3	0	0	300	0.540	13.2	112000	18500	1800	3.240	3.957	3.414	1.5	8.66	0.00	0.00	0.36	9.0	44.81	9.72	6.42	3.70	64.6			
	CL	4.4	12000	0	2400	4.320	17.6	124000	18500	4200	7.560	3.303	3.074	1.5	57.81	1.04	0.00	1.23	60.1	94.15	10.76	6.42	4.93	116.3			
To West Nepean Collector																											
	LEB S.	8.4	80000	2000	1400	2.520	8.4	80000	2000	1400	2.520	3.506	3.506	1.5	35.79	6.94	0.69	2.35	45.1	35.79	6.94	0.69	2.35	45.1			
	WEST B	11.2	100000	0	1500	2.700	19.6	180000	2000	2900	5.220	3.481	3.228	1.5	38.07	8.68	0.00	3.14	49.9	68.25	15.63	0.69	5.49	89.4			
	NCC2	2.0	20000	0	0	0.000	21.6	200000	2000	2900	5.220	4.000	3.228	1.5	0.00	1.74	0.00	0.56	2.3	68.25	17.36	0.69	6.05	91.7			
City	1.4	20000	0	0	0.000	23.0	220000	2000	2900	5.220	4.000	3.228	1.5	0.00	1.74	0.00	0.39	2.1	68.25	19.10	0.69	6.44	93.8				
Design Parameters: 1) Q(e) = 0.28 L/sec/ha 2) Q(p) = (PxqxM/86,400) 3) Q(pk) = 1000 L/d/ha x M 4) Q(c) = 50000 L/d/ha x N 5) Q(d) = Q(p) + Q(pk) + Q(c)+ Q(e) Definitions: P = Population PPU = 1.8 q = Average per capita flow = 350 L/cap/day M = Residential Peaking Factor (Harmon Formula from section 4.4.1 of the City Sewer Design Guidelines): M = 1+[14/(4+Pop/1000)]^1/2*1 (Maximum of 4.0) N =Commercial / Park Peaking Factor (1.5) from City Design Guidelines Q(d) = Design Flow (L/sec) Q(p) = Population Flow (L/sec) Q(pk) = Park Flow (L/sec) Q(c) = Commercial Flow (L/sec) Q(e) = Extraneous Flow (L/sec)																LEBRETON FLATS SANITARY FLOW DESIGN SHEET											
Date																June 30, 2017											
Design																GJM											
Job No.:																Dwg. Reference:					Checked:						
116042																											

SUMMARY TABLE - DEVCORE CANDAREL DLS GROUP						
	ID	A (ha)	UNITS	FLOOR AREA (m²)	SEATS	NOTES
			RESIDENTIAL	RETAIL / COMMERCAIL / MUSUEM / PAVILLION	THEATRE / ARENA	
NORTH * OF LRT	W	5.1	2400	32000		5L/m³/day
	CL	4.2		12000		350L/cap/day 1.8 ppu
	NCC1	1.2				5L/m³/day 350L/cap/day 1.8 ppu
	LEBN	15.8	2200	100000	18000	18000 ARENA 28,000 LEBRETON SQUARE 350L/cap/day 1.8 ppu 5L/m³/day
SOUTH OF LRT	LEBS	8.6	2200	160000	2000	350L/cap/day 1.8 ppu
	NCC2	2.0		20000		5L/m³/day
	CITY	1.0		20000		5L/m³/day

* DENOTES AREAS TRIBUTARY TO THE FLEET STREET SANITARY PUMP STATION WHICH ARE NORTH OF THE LRT

LEGEND :

15.8

LEBN

900

136,416

AREA (ha)

ID

UNITS

FLOOR AREA - RETAIL/OFFICE/OTHER (m²)

Storm Inlet

Storm Outlet

Storm Manhole

Sanitary Manhole

Combined Manhole

Combined Pipe

Sanitary Pipe

Storm Pipe

Pipe Cap

Combined Trunk Sewer

Sanitary Trunk Sewer

Storm Trunk Sewer

Regulator

Storm Pumping Station

Storm Water Management Pond

Sanitary Pumping Station

Treatment Plant

Pipe Equivalents

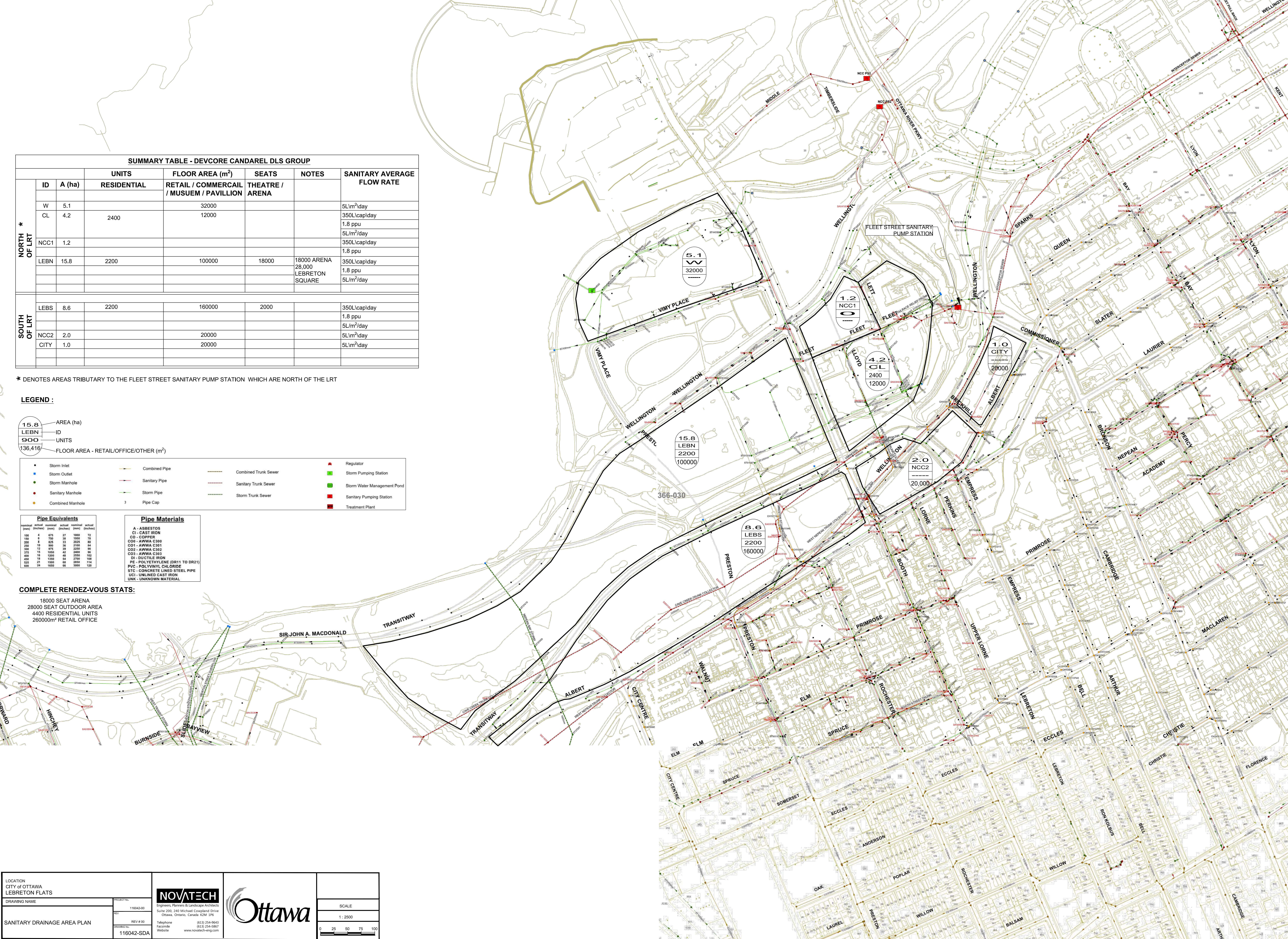
nominal (mm)	actual (mm)	nominal (mm)	actual (mm)	nominal (mm)	actual (mm)
100	6	125	37	150	72
150	6	175	39	180	72
200	6	225	37	250	80
250	10	275	36	300	84
300	12	325	39	350	90
375	15	375	42	400	96
450	18	425	48	450	102
525	21	475	54	500	108
600	24	525	60	600	120

Pipe Materials

A - ASBESTOS
CI - CAST IRON
CO - COPPER
CO1 - AWWA C300
CO2 - AWWA C301
CO3 - AWWA C302
CO4 - AWWA C303
DI - DUCTILE IRON
PE - POLYETHYLENE (DR11 TO DR21)
PVC - POLYVINYL CHLORIDE
STC - CONCRETE LINED STEEL PIPE
UCI - UNLINED CAST IRON
UNK - UNKNOWN MATERIAL

COMPLETE RENDEZ-VOUS STATS:

18000 SEAT ARENA
28000 SEAT OUTDOOR AREA
4400 RESIDENTIAL UNITS
260000m² RETAIL OFFICE



LOCATION
CITY OF OTTAWA
LEBRETON FLATS

DRAWING NAME
SANITARY DRAINAGE AREA PLAN

PROJECT NO.
116042-00

REV # 00

116042-SDA

NOVATECH

Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-9647
Website www.novatech-eng.com

Ottawa

SCALE
1:2500
0 25 50 75 100

APPENDIX D

Fleet Street Sanitary Pump Station Certificate of Approval and Drawings



Ministry of the Environment
Ministère de l'Environnement

CERTIFICATE OF APPROVAL
MUNICIPAL AND PRIVATE SEWAGE WORKS
NUMBER 9608-7L6RZV
Issue Date: November 10, 2008

City of Ottawa
100 Constellation Cres 6th Floor
Ottawa, Ontario
K2G 6J8

Site Location: 10 Fleet Street
10 Fleet St North East of Fleet Street Pumping Station, East of Tailrace Canal
Ottawa City,

You have applied in accordance with Section 53 of the Ontario Water Resources Act for approval of:

Inlet Gravity Sanitary Sewer

An existing 375mm diameter inlet gravity concrete sanitary sewer services the Lebreton Flats Development. Flow normally will pass through the Lebreton Flats Sanitary Pumping Station (LFPS) and the LFPS will only pump when levels in the receiving Interceptor Outfall Sewer (IOS) rise to a set level of 47.70m.

Sewage Pump Station

A sanitary sewage pump station with a rated firm capacity of 100 L/s to be constructed to serve the Lebreton Flats development, comprising of an in-ground cast-in-place flow through wet well located at the east end of Fleet Street just to the northeast of the Fleet Street Pumping Station (FSPS) at the corner of Fleet and the former Wellington Streets consisting of the following:

- A pre-cast maintenance hole (MH2) located immediately upstream of the flow through wetwell, equipped with 300mm diameter overflow to the FSPS tailrace. An emergency overflow float alarm at the wetwell will indicate if the overflow is in use.
- Sewage inflow to the wetwell is directed through a drop bowl.
- A cast-in-place flow through wetwell equipped with two (2) 11.2kW submersible pumps (one duty and one standby) of the non-clog type, each pump is capable of pumping up to 100 L/s at 6 m TDH, complete with soft starters, two (2) multitrodes for liquid level measurement and pump control (one duty / one backup). The wetwell is isolated by a 375mm duckbill check valve and a 400x400mm stainless steel sluice gate and actuator which is controlled by a multitrode located in the downstream maintenance hole (MH1).
- The wetwell is equipped with one (1) stainless steel vent, complete with bird screen.
- The six (6) meter ductile iron forcemain pumps sewage into the adjacent maintenance hole (MH1) which is equipped with vent to release air during high flow events in order to pressurize MH1 pump into the receiving IOS.
- An 80kW diesel engine generator set for standby power during emergencies to be located within the existing adjacent FSPS, including a 1250L capacity fuel storage facility to be located within a spill containment area.
- The controls located in the FSPS building will have electrical and control equipment, including a new Supervisory Control and Data Acquisition (SCADA) system.

All in accordance with the following submitted documents:

1. Application for Approval of Municipal and Private Sewage Works submitted under covering letter dated September 9, 2008 by James Ricker, P.Eng., Project Engineer, Environmental Infrastructure, Stantec Consulting Ltd., Consulting Engineers;

2. Design brief outlining description of proposed works prepared by Stantec Consulting Ltd., Consulting Engineer;
3. Geotechnical report entitled "Geotechnical Investigation for a Proposed Wet Well Chamber, Fleet Street Pumping Station, Ottawa, Ontario" prepared by Jacques Whitford;
4. Final plans entitled "Fleet Street Pumping Station Electrical Upgrade and Construction of the Lebreton Flats Sanitary Pumping Station" prepared by Stantec Consulting Ltd., Consulting Engineers;
5. Final specifications entitled "Fleet Street Pumping Station Electrical Upgrade and Construction of the Lebreton Flats Sanitary Pumping Station" prepared by Stantec Consulting Ltd., Consulting Engineers;
6. MOE Appendix H (Modified) – Sewage Pump Station Design - Table 1 and 2;
7. MOE Appendix I – Information Required for Pump Station Applications; and
8. Notice of Study Completion.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

1. "*Act*" means the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended;
2. "*Certificate*" means this entire certificate of approval document, issued in accordance with Section 53 of the *Act*, and includes any schedules;
3. "*Director*" means any *Ministry* employee appointed by the Minister pursuant to section 5 of the *Act*;
4. "*District Manager*" means the District Manager of the MOE, Ottawa District Office of the Ministry;
5. "*Ministry*" means the Ontario Ministry of the Environment;
6. "*Owner*" means City of Ottawa and includes its successors and assignees;
7. "*Regional Director*" means the Regional Director of the MOE, Ottawa Region of the Ministry;
8. "*Substantial Completion*" has the same meaning as "*substantial performance*" in the Construction Lien Act; and
9. "*Works*" means the sewage works described in the *Owner's* application, this *Certificate* and in the supporting documentation referred to herein, to the extent approved by this *Certificate*.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

- 1.1 The *Owner* shall ensure that any person authorized to carry out work on or operate any aspect of the *Works* is notified of this *Certificate* and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.
- 1.2 Except as otherwise provided by these Conditions, the *Owner* shall design, build, install, operate and maintain the *Works* in accordance with the description given in this *Certificate*, the application for approval of the works and the submitted supporting documents and plans and specifications as listed in this *Certificate*.
- 1.3 Where there is a conflict between a provision of any submitted document referred to in this *Certificate* and the Conditions of this *Certificate*, the Conditions in this *Certificate* shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.
- 1.4 Where there is a conflict between the listed submitted documents, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.
- 1.5 The requirements of this *Certificate* are severable. If any requirement of this *Certificate*, or the application of any requirement of this *Certificate* to any circumstance, is held invalid or unenforceable, the application of such requirement to other circumstances and the remainder of this *Certificate* shall not be affected thereby.

2. EXPIRY OF APPROVAL

2.1 The approval issued by this *Certificate* will cease to apply to those parts of the *Works* which have not been constructed within five (5) years of the date of this *Certificate*.

3. UPON THE SUBSTANTIAL COMPLETION OF THE WORKS

3.1 Upon the *Substantial Completion* of the *Works*, the Owner shall prepare a statement, certified by a Professional Engineer, that the works are constructed in accordance with this *Certificate*, and upon request, shall make the written statement available for inspection by Ministry personnel.

3.2 Within one year of the *Substantial Completion* of the *Works*, a set of as-built drawings showing the works “as constructed” shall be prepared. These drawings shall be kept up to date through revisions undertaken from time to time and a copy shall be retained at the *Works* for the operational life of the *Works*.

4. OPERATION AND MAINTENANCE

4.1 The *Owner* shall exercise due diligence in ensuring that, at all times, the *Works* and the related equipment and appurtenances used to achieve compliance with this *Certificate* are properly operated and maintained. Proper operation and maintenance shall include effective performance, adequate funding, adequate operator staffing and training, including training in all procedures and other requirements of this *Certificate* and the *Act* and regulations, adequate laboratory facilities, process controls and alarms and the use of process chemicals and other substances used in the *Works*.

4.2 The *Owner* shall prepare an operations manual within six (6) months of *Substantial Completion* of the *Works*, that includes, but not necessarily limited to, the following information:

- (a) operating procedures for routine operation of the *Works*;
- (b) inspection programs, including frequency of inspection, for the *Works* and the methods or tests employed to detect when maintenance is necessary;
- (c) repair and maintenance programs, including the frequency of repair and maintenance for the *Works*;
- (d) procedures for the inspection and calibration of monitoring equipment;
- (e) a spill prevention control and countermeasures plan, consisting of contingency plans and procedures for dealing with equipment breakdowns, potential spills and any other abnormal situations, including notification of the *District Manager*; and
- (f) procedures for receiving, responding and recording public complaints, including recording any follow-up actions taken.

4.3 The *Owner* shall maintain the operations manual current and retain a copy at the location of the *Works* for the operational life of the *Works*. Upon request, the *Owner* shall make the manual available to *Ministry* staff.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the *Works* are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the *Certificate* and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review. The condition also advises the *Owners* their responsibility to notify any person they authorized to carry out work pursuant to this *Certificate* the existence of this *Certificate*.
2. Condition 2 is included to ensure that, when the *Works* are constructed, the *Works* will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.
3. Condition 3 is included to ensure that the *Works* are constructed in accordance with the approval and that record

drawings of the *Works* "as constructed" are maintained for future references.

4. Condition 4 is included to require that the *Works* be properly operated, maintained, funded, staffed and equipped such that the environment is protected and deterioration, loss, injury or damage to any person or property is prevented. As well, the inclusion of a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the *Owner* and made available to the *Ministry*. Such a manual is an integral part of the operation of the *Works*. Its compilation and use should assist the *Owner* in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act as a benchmark for *Ministry* staff when reviewing the *Owner's* operation of the *Works*.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto, Ontario
M5G 1E5

AND

The Director
Section 53, *Ontario Water Resources Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted sewage works are approved under Section 53 of the Ontario Water Resources Act.

DATED AT TORONTO this 10th day of November, 2008

Zafar Bhatti, P.Eng.
Director
Section 53, *Ontario Water Resources Act*

AA/
c: District Manager, MOE Ottawa District Office
Pierre Pagé, City Clerk & Director, Secretariat Services, City of Ottawa
Joe Mojsej, P.Eng., City of Ottawa
James Ricker, Stantec Consulting Ltd.

Greg MacDonald

From: Zaknoun, Hasnaa <hasnaa.zaknoun@ottawa.ca>
Sent: Tuesday, February 02, 2016 10:38 AM
To: Greg MacDonald
Subject: RE: Fleet Street Sanitary Pump Station
Attachments: 163400648-PS105.pdf; 163400648-PS106.pdf; 163400648-PS301.pdf; 163400648-PS302.pdf; 163400648-PS501.pdf; 163400648-PS502.pdf; 163400648-PS503.pdf; 163400648-PS701.pdf; 163400648-PS101.pdf; 163400648-PS102.pdf; 163400648-PS103.pdf; 163400648-PS104.pdf; Lebreton Flats.JPG

Hello Greg,

I took a look at the Fleet Street Sanitary pumping station and since this station only operates during very high flows the amount of data is very limited, I think that last time this pumping station operated was in June 2014 due to a large rain event. There are two pumps operating in a lead/lag arrangement and the average capacity per pump is ~106L/s, the ECA states that the original design capacity for this station is 111L/s.

I have attached a screenshot of the HMI for this station and some drawings.

Please do not hesitate to contact me if you have any questions.

Thanks

Hasnaa Zaknoun

From: Greg MacDonald [mailto:g.Macdonald@novatech-eng.com]
Sent: Thursday, January 14, 2016 12:39 PM
To: Zaknoun, Hasnaa
Subject: Fleet Street Sanitary Pump Station

It was nice speaking with you, Hasnaa.

As I mentioned we are working with a developer, Claridge Homes, on their vacant site on LeBreton Flats located north of the Aqueduct and east of Booth Street. We have had discussions with the City (John Smit and Abdul Mottalib of PGM, Infrastructure Services Department) with respect to the sanitary servicing capacity in the area, and in particular the Fleet Street Sanitary Pump Station located in the vicinity of Pooley's Bridge. Would you have information on the existing capacity of this pump station? Any drawings that you have handy would also be very helpful.

Thank You in Advance for your assistance and I look forward to receiving any information which you have.

Yours truly,

Greg MacDonald, P. Eng.
Senior Project Manager

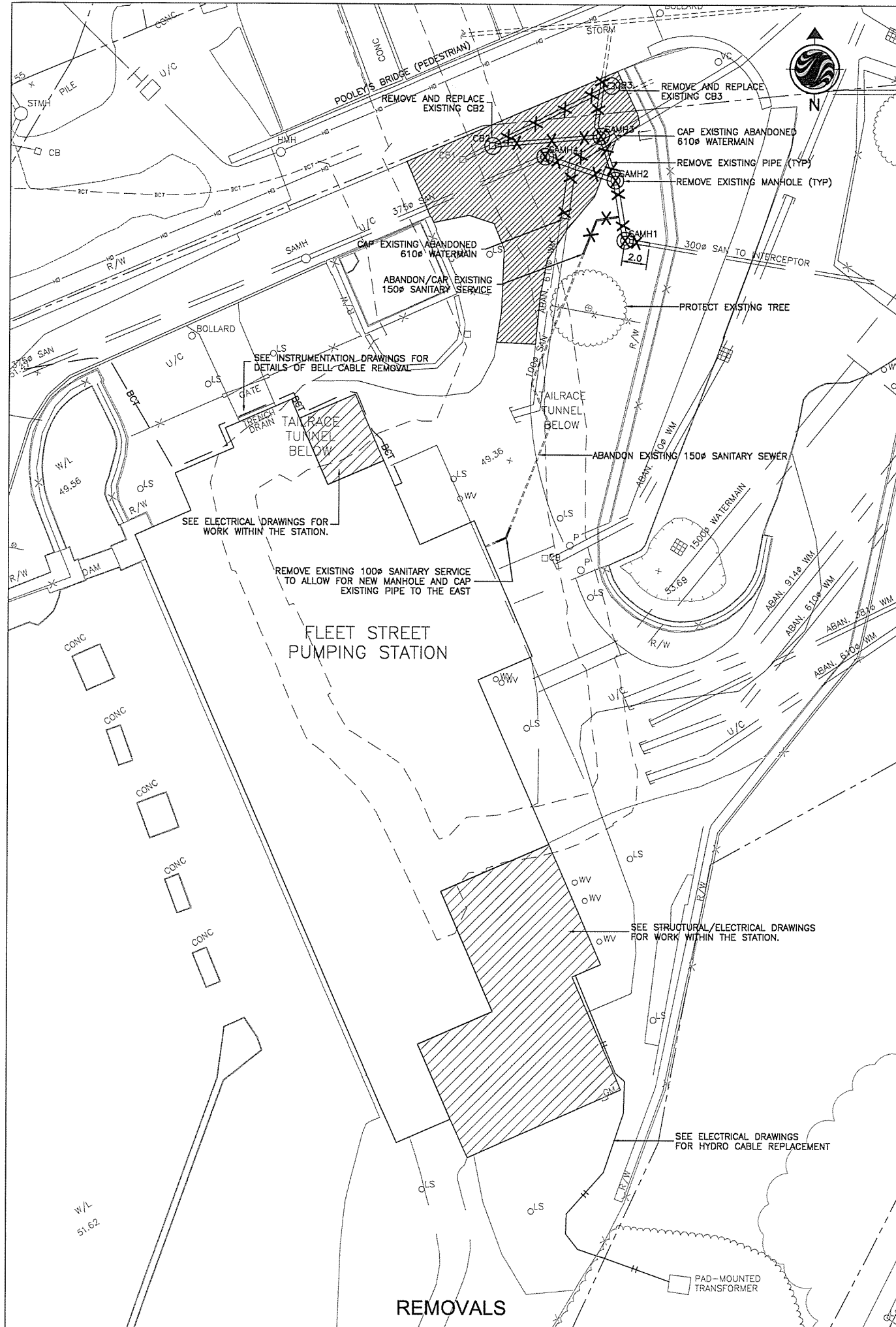
NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x279 | Cell: 613.890.9705 | Fax: 613.254.5867

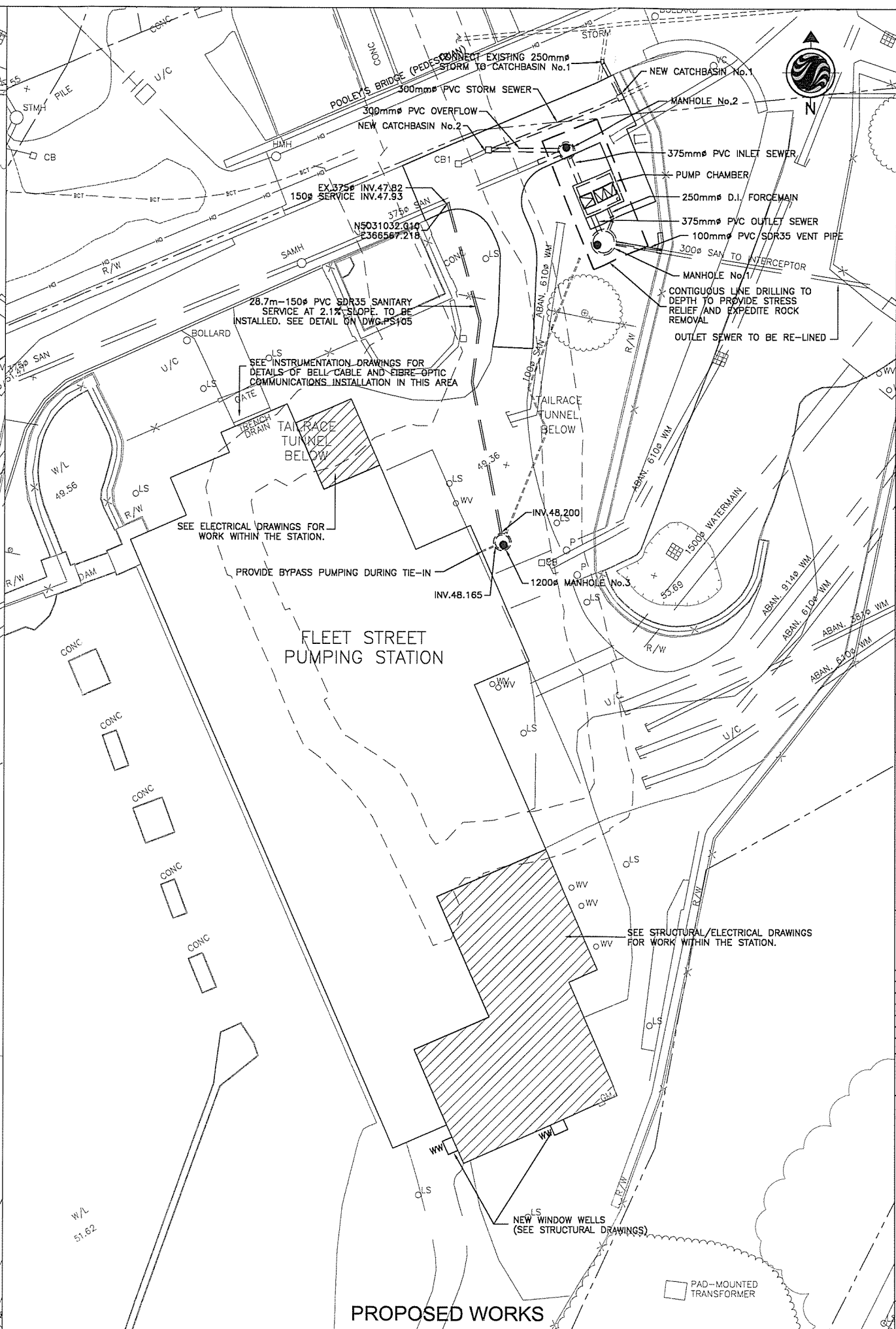
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REMOVALS



PROPOSED WORKS



PUBLIC WORKS AND SERVICES DEPARTMENT
UTILITY SERVICES BRANCH
R.G. Hewitt, P.Eng.
Deputy City Manager


Approved by:
Name: B. Byce
Signed: _____
Date: _____
Stamp (if applicable): _____

Designed by:
Name: J. Ricker
Signed: _____
Date: _____

Drawn by:
Name: E. Colberry
Date: 06.11.01

NOTES:
FOR BOREHOLE LOGS SEE DWG.No.13973-PS701
SANITARY FLOWS FROM LEBRETON FLATS TO BE PUMPED ACROSS SITE INTO RECEIVING INTERCEPTOR SEWER FOR DURATION OF CONTRACT AVERAGE FLOW=3 L/S.
POOLEY'S BRIDGE AND FLEET STREET PUMPING STATION ARE DESIGNATED HERITAGE STRUCTURES AND MUST BE PROTECTED FROM DAMAGE AT ALL TIMES. WHEN WORKING WITHIN 2.5 METRES OF THESE STRUCTURES, PLYWOOD HOARDING IS TO BE PROVIDED FOR THE WORKING AREA AND 2.5 METRES ON EITHER SIDE. MINIMUM HEIGHT OF HOARDING=2.4 METRES.
BEDROCK EXCAVATION: FOLLOW RECOMMENDATIONS AS SHOWN IN GEOTECHNICAL REPORT No.1012785 BY JACQUES WHITFORD, DATED SEPTEMBER 7, 2006.
SEE DRAWING No.13973-E101 FOR ADDITIONAL SITE WORK RELATED TO NEW UTILITIES AND ELECTRICAL SERVICES.

As Built Drawing
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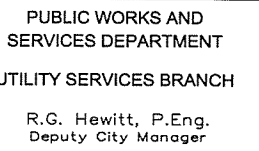
No.	Revision	Date
3	AS BUILT	10.03.10
2	ISSUED FOR CONSTRUCTION	09.01.29
1	ISSUED FOR TENDER	08.09.02
0	ISSUED FOR FINAL REVIEW	08.04.18
0	ISSUED FOR 90% REVIEW	07.03.23
0	ISSUED FOR 70% REVIEW	07.01.17

Scales
0 1 3 5m

DRAWING TITLE:
**FLEET STREET PUMPING STATION
ELECTRICAL UPGRADE AND
CONSTRUCTION OF LEBRETON
FLATS SANITARY PUMPING
STATION
CONTRACT No.ISB06-2021**

**SITE PLAN
REMOVALS AND
PROPOSED WORKS**

Drawing No.: 13973-PS101 Rev. No.: 3



Approved by:
Name: B. Byce _____
Signed: _____
Date: _____
Stamp (if applicable)

Designed by:
Name: J. Ricker
Signed: _____
Date: _____

Drawn by:
Name: E. Colberry
Date: 06.11.01

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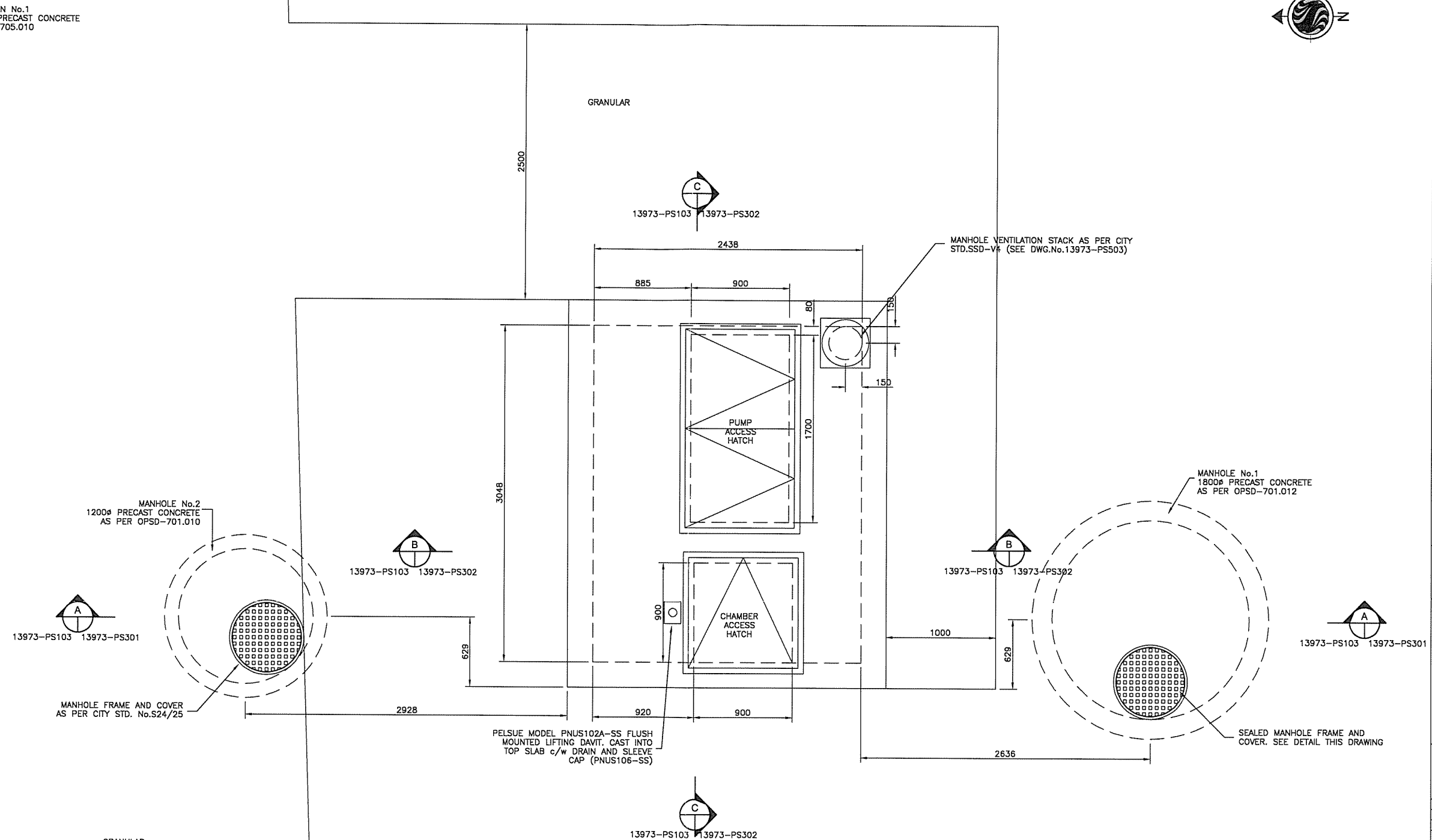
3	AS BUILT	10.03.10
2	ISSUED FOR CONSTRUCTION	09.01.29
1	ISSUED FOR TENDER	08.09.02
0	ISSUED FOR FINAL REVIEW	08.04.18
0	ISSUED FOR 90% REVIEW	07.03.23
0	ISSUED FOR 70% REVIEW	07.01.17
No.	Revision	Date

1992	1993	1994
Scales		

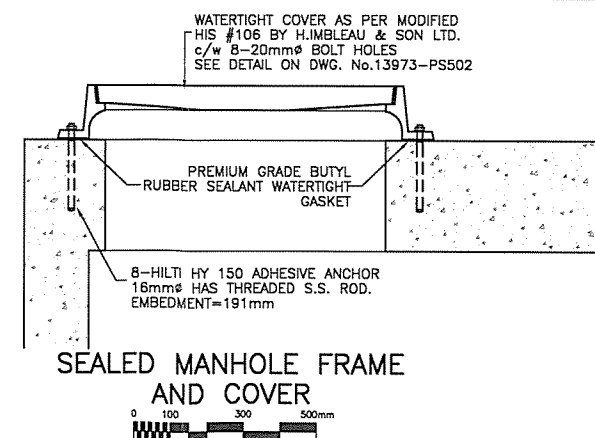
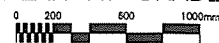
DRAWING TITLE:
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ELECTRICAL UPGRADE AND
CONSTRUCTION OF LEBRETON
FLATS SANITARY PUMPING
STATION
CONTRACT No.ISB06-2021

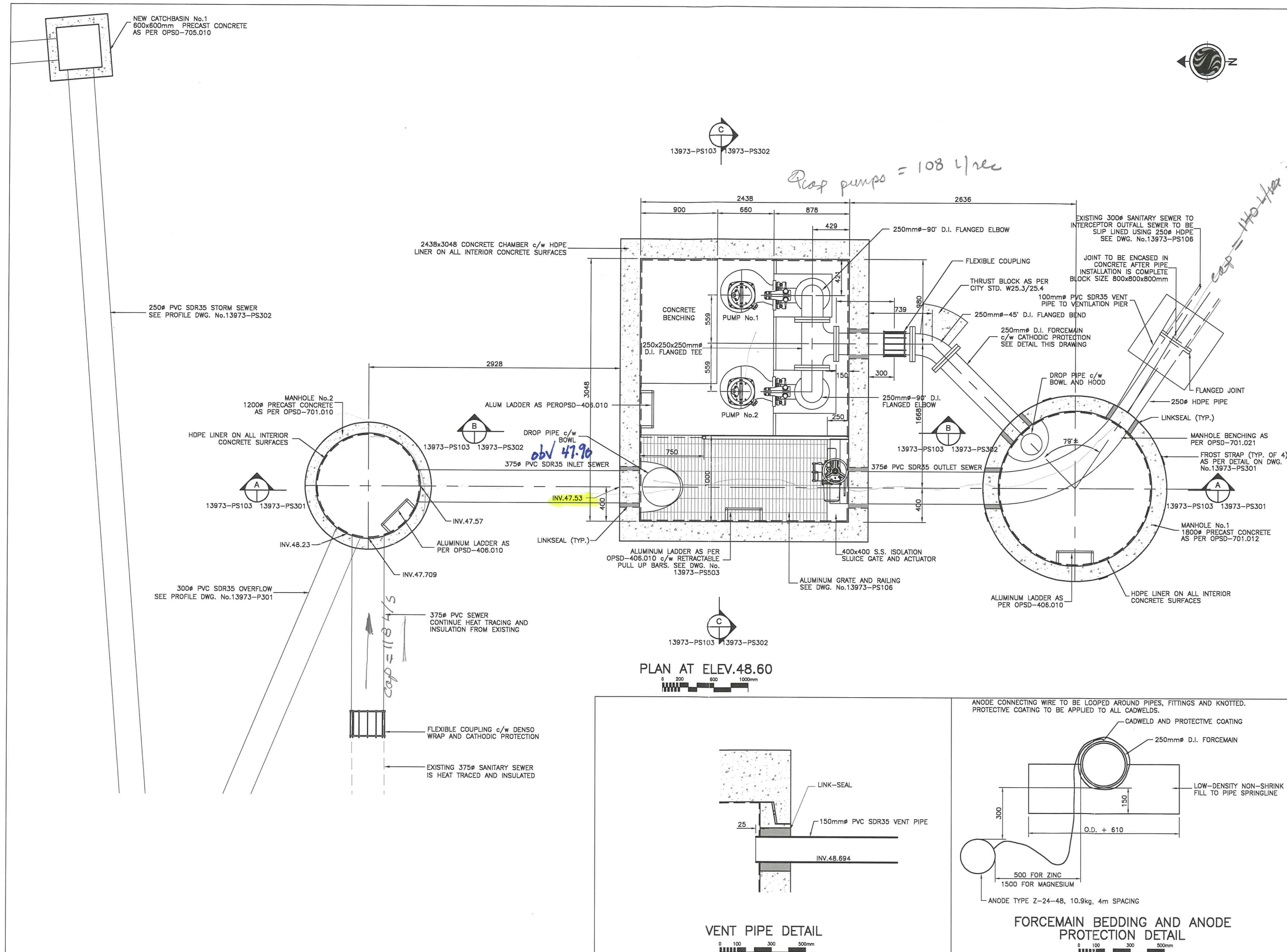
PLAN AT GRADE AND DETAILS

Drawing No.: 13973-PS103	Rev. No.: 3
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PLAN AT GRADE





PUBLIC WORKS AND SERVICES DEPARTMENT
UTILITY SERVICES BRANCH
R.G. Hewitt, P.Eng.
Deputy City Manager

Approved by:
Name: B. Byse
Signed: _____
Date: _____
Stamp (if applicable): _____

Designed by:
Name: J. Ricker
Signed: _____
Date: _____

Drawn by:
Name: E. Colberry
Date: 06.11.01

NOTES:
ALL DISCHARGE PIPING, FITTINGS AND FORCEMAIN TO BE DUCTILE IRON.
SEE DRAWING No.13973-PS105 FOR WET WELL DESIGN NOTES.
ALL INTERIOR CONCRETE SURFACES (INCLUDING BENCHING) IN THE WET WELL, MANHOLE No.1 AND MANHOLE No.2 ARE TO HAVE HDPE LINER.

As Built Drawing
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3	AS BUILT	10.03.10
2	ISSUED FOR CONSTRUCTION	09.01.29
1	ISSUED FOR TENDER	08.09.02
0	ISSUED FOR FINAL REVIEW	08.04.18
0	ISSUED FOR 80% REVIEW	07.03.23
0	ISSUED FOR 70% REVIEW	07.01.17

No. Revision Date

DRAWING TITLE:
FLEET STREET PUMPING STATION
ELECTRICAL UPGRADE AND
CONSTRUCTION OF LEBRETON
FLATS SANITARY PUMPING
STATION
CONTRACT No.ISB06-2021

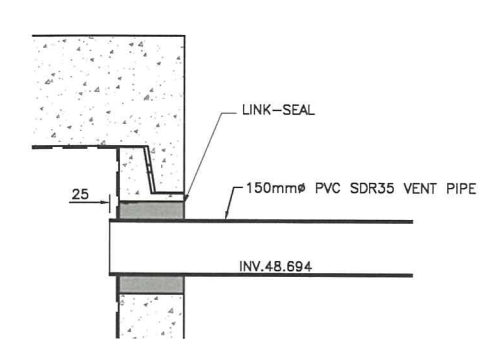
PLAN AT ELEV.48.600
AND DETAILS

Drawing No.: 13973-PS104
Rev. No.: 3

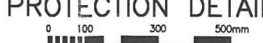
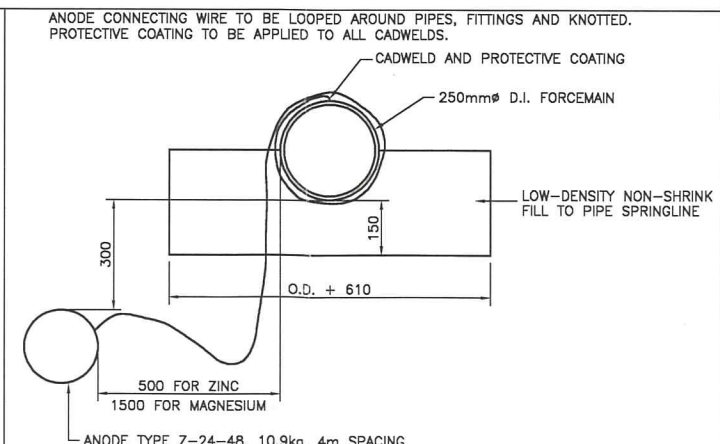
PLAN AT ELEV.48.60

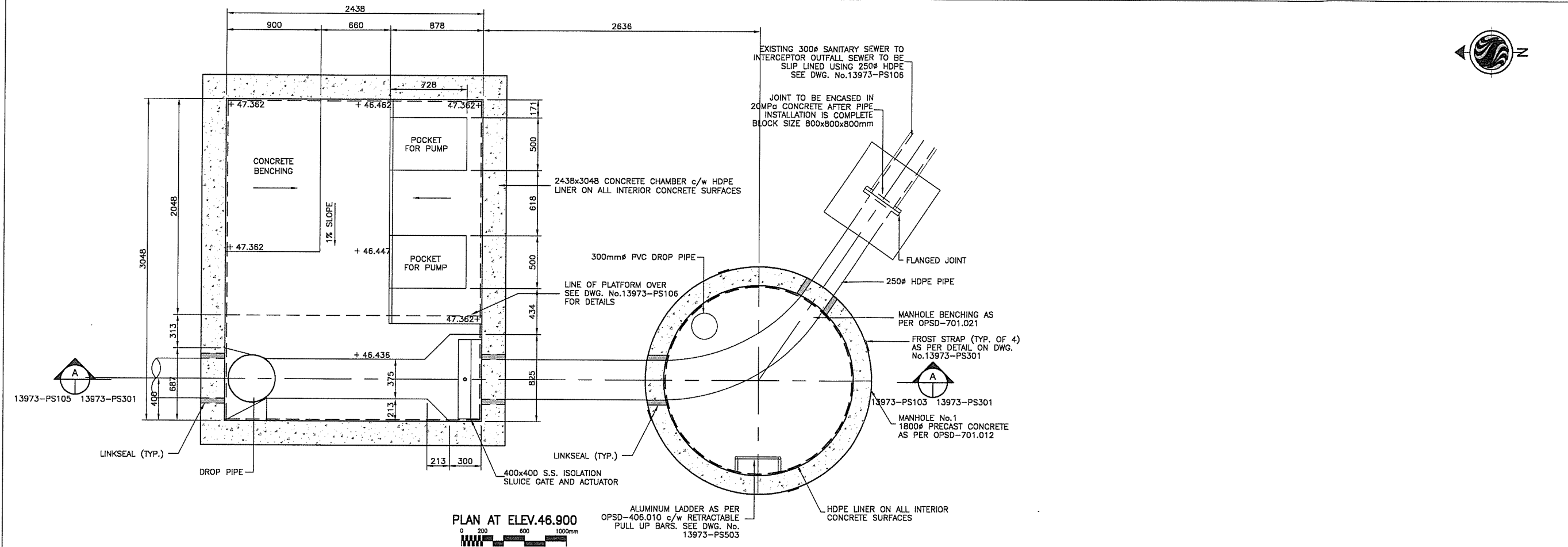


VENT PIPE DETAIL

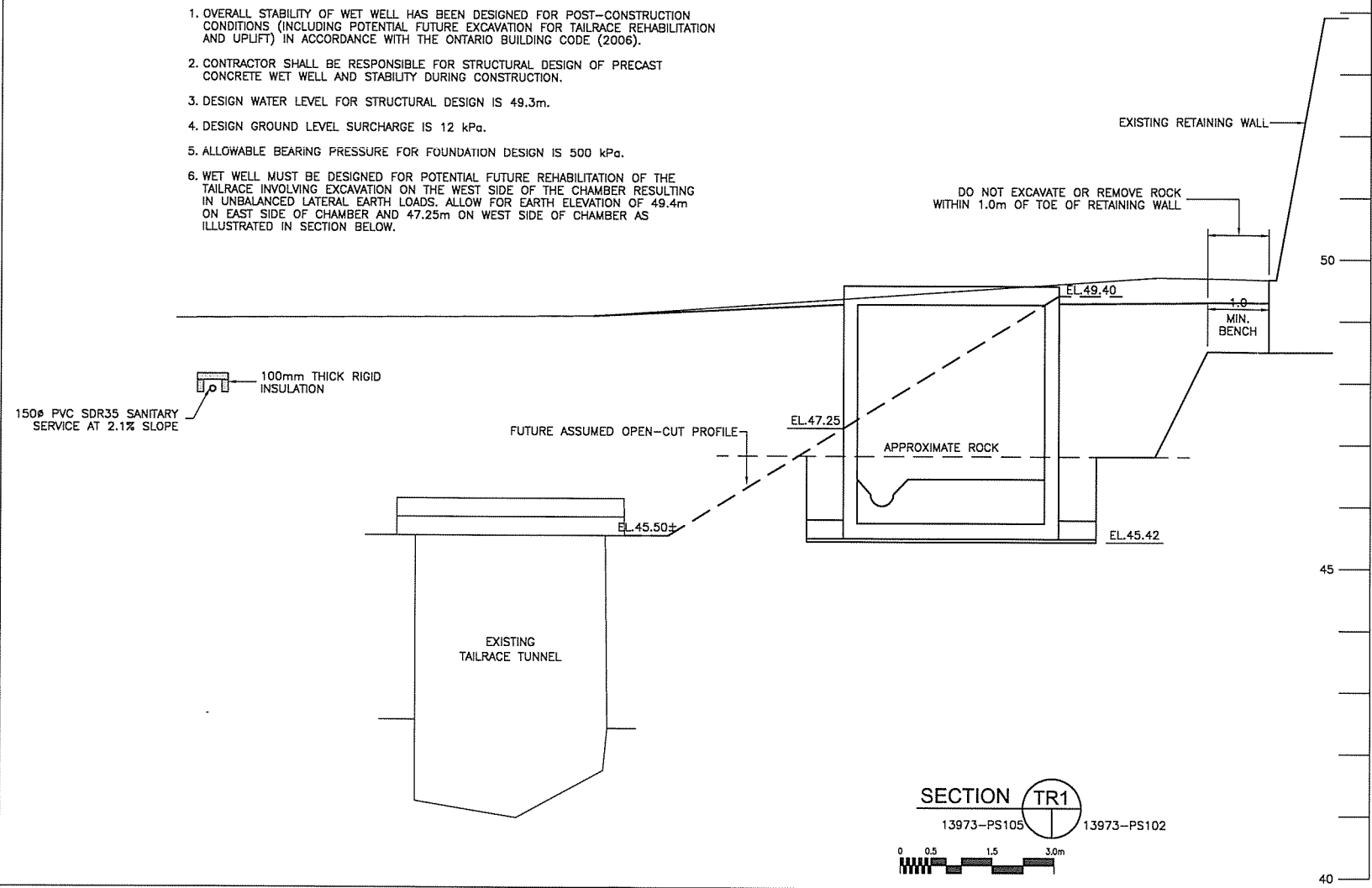


FORCEMAIN BEDDING AND ANODE PROTECTION DETAIL





1. OVERALL STABILITY OF WET WELL HAS BEEN DESIGNED FOR POST-CONSTRUCTION CONDITIONS (INCLUDING POTENTIAL FUTURE EXCAVATION FOR TAILRACE REHABILITATION AND UPLIFT) IN ACCORDANCE WITH THE ONTARIO BUILDING CODE (2006).
2. CONTRACTOR SHALL BE RESPONSIBLE FOR STRUCTURAL DESIGN OF PRECAST CONCRETE WET WELL AND STABILITY DURING CONSTRUCTION.
3. DESIGN WATER LEVEL FOR STRUCTURAL DESIGN IS 49.3m.
4. DESIGN GROUND LEVEL SURCHARGE IS 12 kPa.
5. ALLOWABLE BEARING PRESSURE FOR FOUNDATION DESIGN IS 500 kPa.
6. WET WELL MUST BE DESIGNED FOR POTENTIAL FUTURE REHABILITATION OF THE TAILRACE INVOLVING EXCAVATION ON THE WEST SIDE OF THE CHAMBER RESULTING IN UNBALANCED LATERAL EARTH LOADS. ALLOW FOR EARTH ELEVATION OF 49.4m ON EAST SIDE OF CHAMBER AND 47.25m ON WEST SIDE OF CHAMBER AS ILLUSTRATED IN SECTION BELOW.



PUBLIC WORKS AND SERVICES DEPARTMENT
UTILITY SERVICES BRANCH
R.G. Hewitt, P.Eng.
Deputy City Manager

Approved by:
Name: B. Byce
Signed: _____
Date: _____
Stamp (if applicable)

Designed by:
Name: J. Ricker
Signed: _____
Date: _____

Drawn by:
Name: E. Calberry
Date: 06.11.01

NOTES:

As Built Drawing

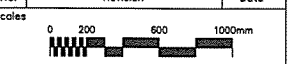
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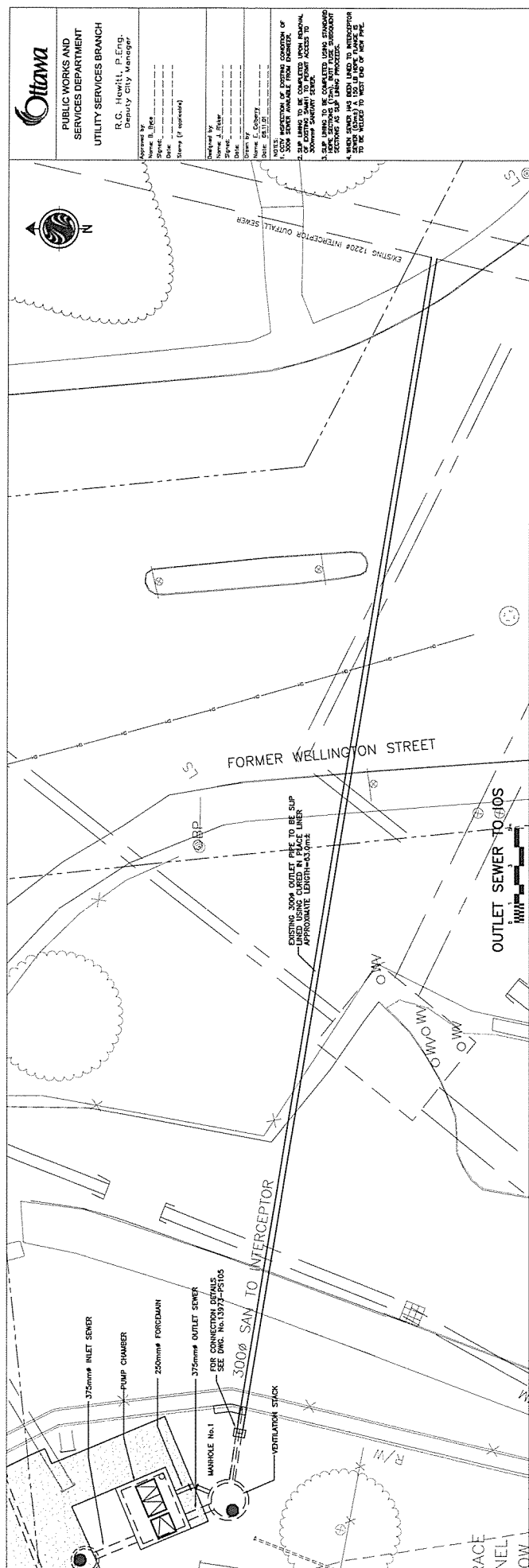
No.	Revision	Date
3	AS BUILT	10.03.10
2	ISSUED FOR CONSTRUCTION	09.01.29
1	ISSUED FOR TENDER	08.09.02
0	ISSUED FOR FINAL REVIEW	08.04.18
0	ISSUED FOR 80% REVIEW	07.03.23
0	ISSUED FOR 70% REVIEW	07.01.17



DRAWING TITLE:
FLEET STREET PUMPING STATION
ELECTRICAL UPGRADE AND
CONSTRUCTION OF LEBRETON
FLATS SANITARY PUMPING
STATION
CONTRACT No.ISB06-2021

PLAN AT ELEV.46.900
SECTION TR1

Drawing No.: 13973-PS105
Rev. No.: 3



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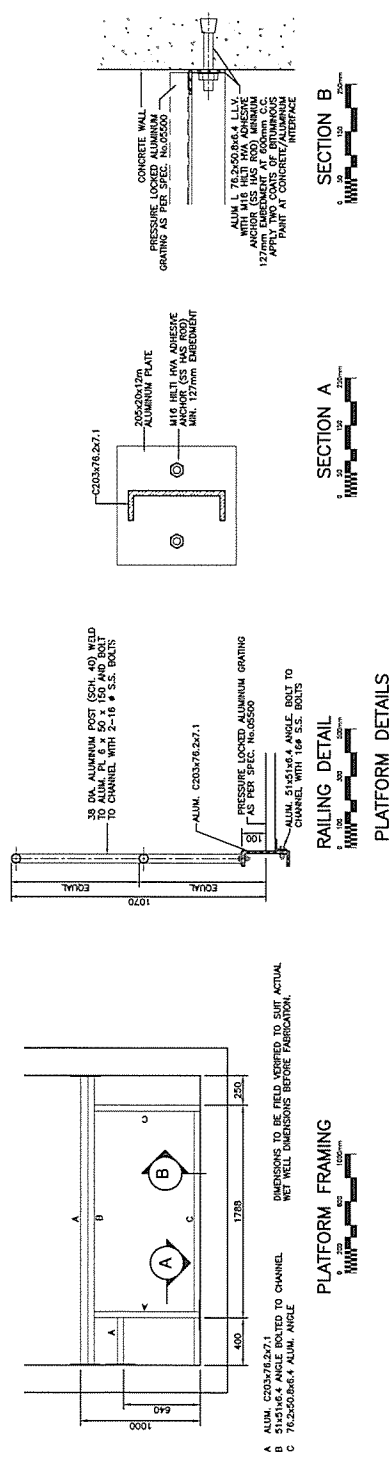
1	AS BUILT	16.03.19
2	RESULT FOR CONSTRUCTION	09.01.29
3	RESULT FOR TENDER	08.06.02
4	RESULT FOR FINAL REVIEW	08.04.18
5	RESULT FOR BSK REVIEW	07.01.23
6	RESULT FOR J20 REVIEW	07.06.17

Date	Revision	Issue
05/01/2011	1	Initial Issue
05/01/2011	2	Revised
05/01/2011	3	Revised
05/01/2011	4	Revised
05/01/2011	5	Revised

AWARD TITLE:
LEET STREET PUMPING STATION
ELECTRICAL UPGRADE AND
CONSTRUCTION OF LEBRETON
PLATS SANITARY PUMPING
STATION
CONTRACT No. ISB08-2021

OUTLET SEWER TO IOS PLATFORM DETAILS

13973-PS106	Rev. No. 3
-------------	------------



A ALUM. C203x76.2x7.1
B 51x51x6.4 ANGLE BOLTED TO CHANNEL
C 76.2x50.8x6.4 ALUM. ANGLE

Approved by:
Name: B. Byce
Signed: _____
Date: _____
Stamp (if applicable)

Designed by:
Name: J. Ricker
Signed: _____
Date: _____

Drawn by:
Name: E. Calberry
Date: 06.11.01

NOTES:
SEE ELECTRICAL DRAWINGS FOR DUCT BANK
DETAILS.

As Built Drawing

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No.	Revision	Date
3	AS BUILT	10.03.10
2	ISSUED FOR CONSTRUCTION	09.01.29
1	ISSUED FOR TENDER	08.09.02
0	ISSUED FOR FINAL REVIEW	08.04.18
0	ISSUED FOR 90% REVIEW	07.03.23
0	ISSUED FOR 70% REVIEW	07.01.17

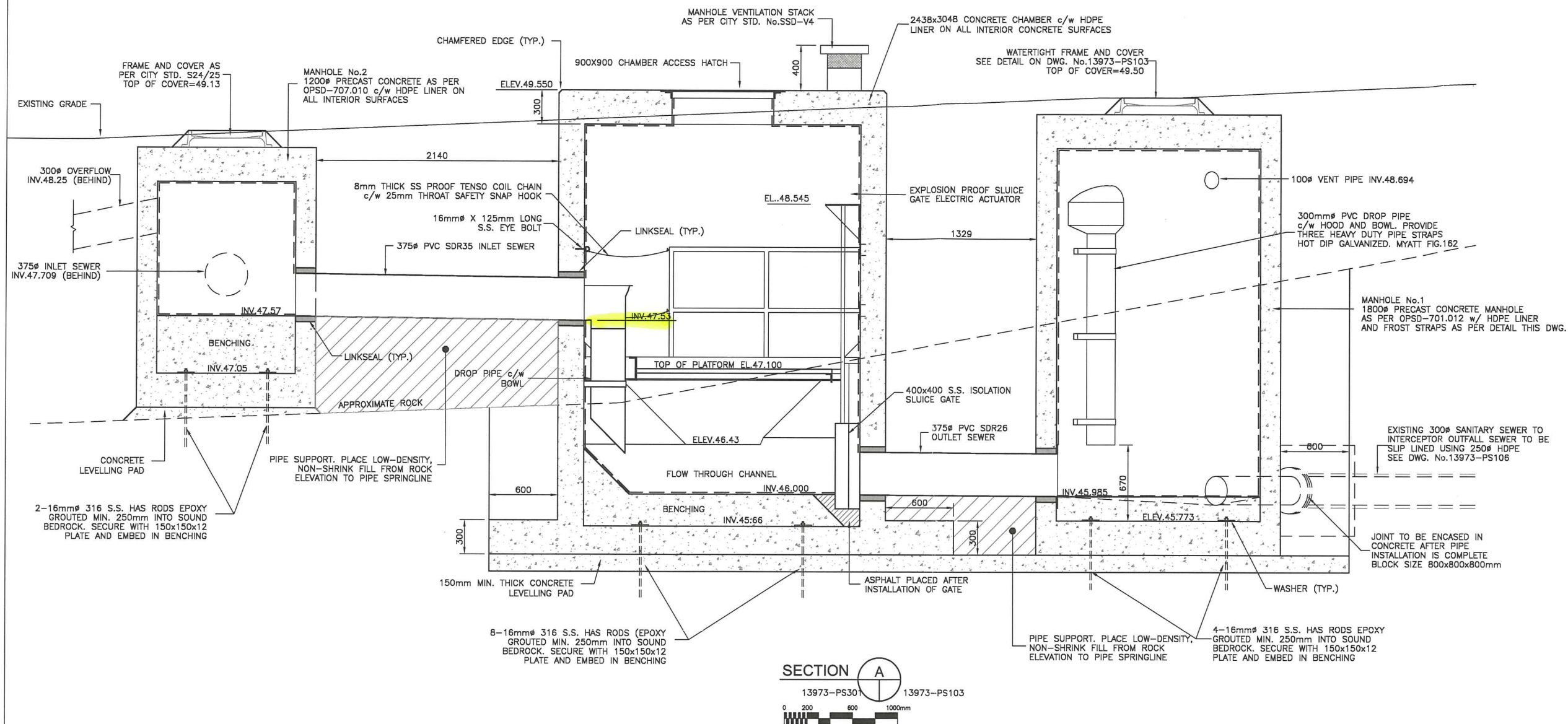
Scales

DRAWING TITLE:
**FLEET STREET PUMPING STATION
ELECTRICAL UPGRADE AND
CONSTRUCTION OF LEBRETON
FLATS SANITARY PUMPING
STATION
CONTRACT No.ISB06-2021**

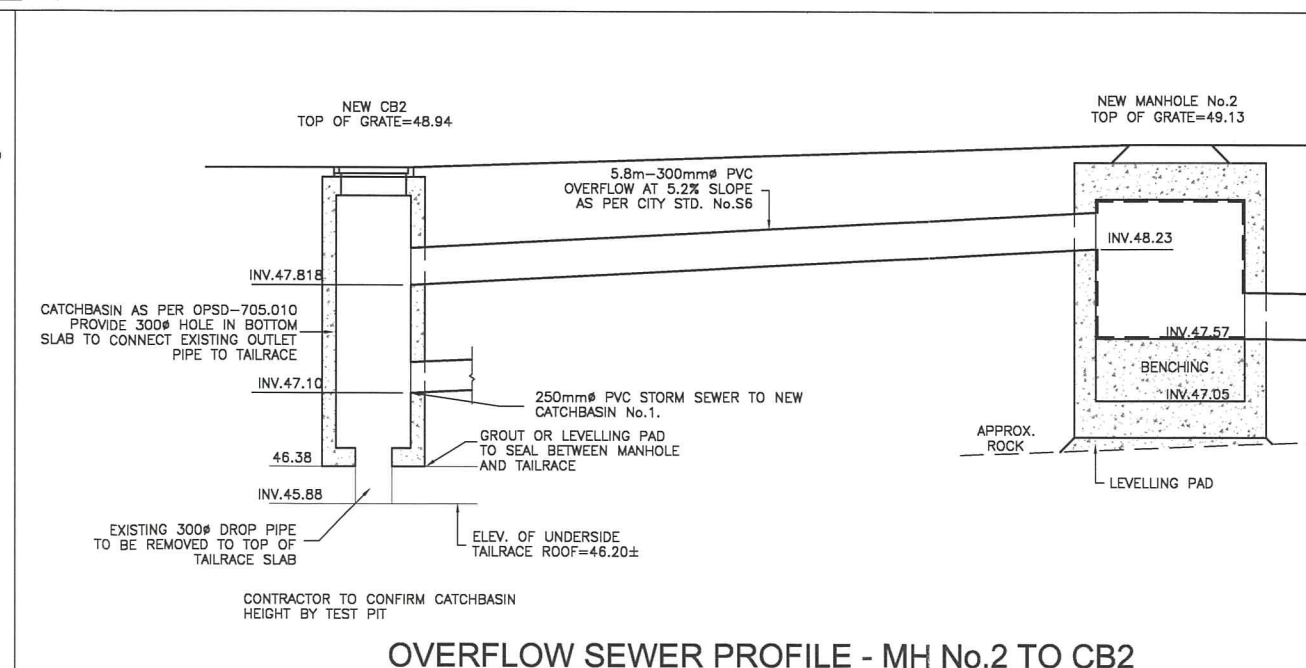
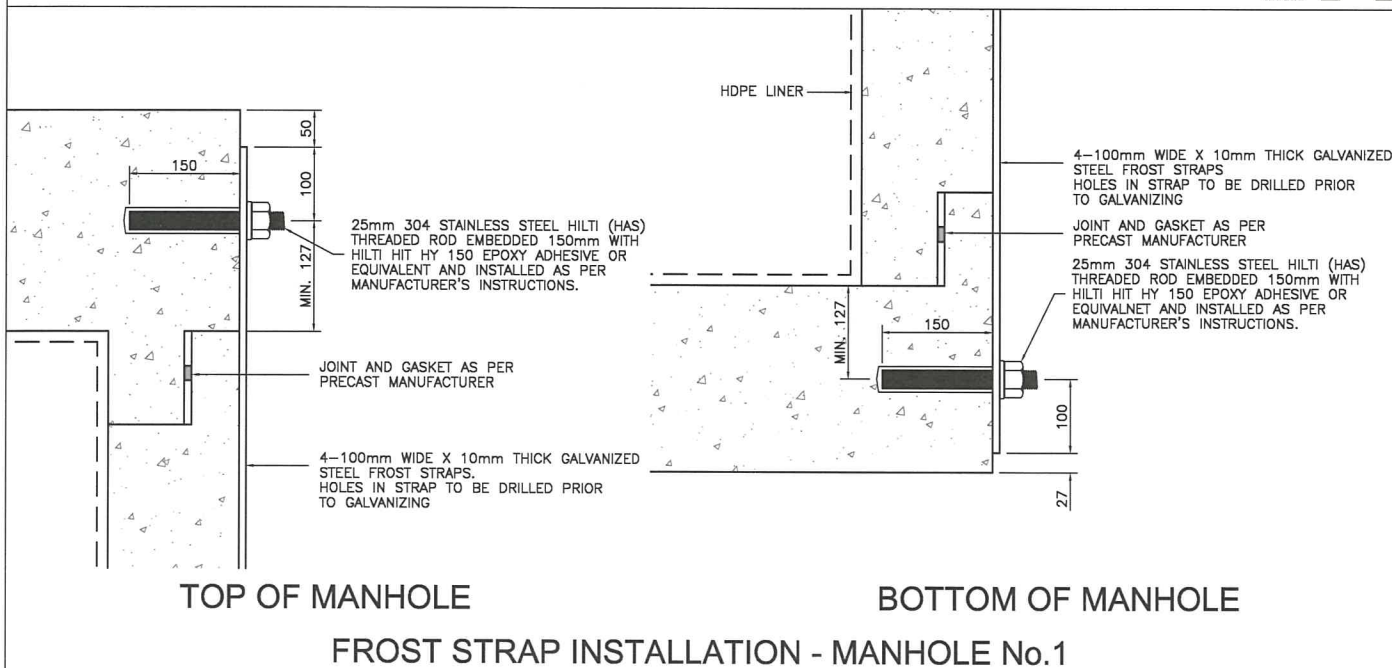
**SECTION A-A
FROST STRAP DETAIL
OVERFLOW SEWER PROFILE
MH No.2 TO NEW CB2**

Drawing No.:
13973-PS301

Rev. No.:
3



SECTION A
13973-PS301 13973-PS103
0 200 600 1000mm



OVERFLOW SEWER PROFILE - MH No.2 TO CB2

0 300 600 1500mm

Approved by:
Name: B. Byce
Signed: _____
Date: _____
Stamp (if applicable)

Designed by:
Name: J. Ricker
Signed: _____
Date: _____
Drawn by:
Name: E. Colberry
Date: 06.11.01

NOTES:

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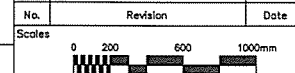


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3	AS BUILT	10.03.10
2	ISSUED FOR CONSTRUCTION	09.01.28
1	ISSUED FOR TENDER	08.09.02
0	ISSUED FOR FINAL REVIEW	08.04.18
0	ISSUED FOR 90% REVIEW	07.03.23
0	ISSUED FOR 70% REVIEW	07.01.17



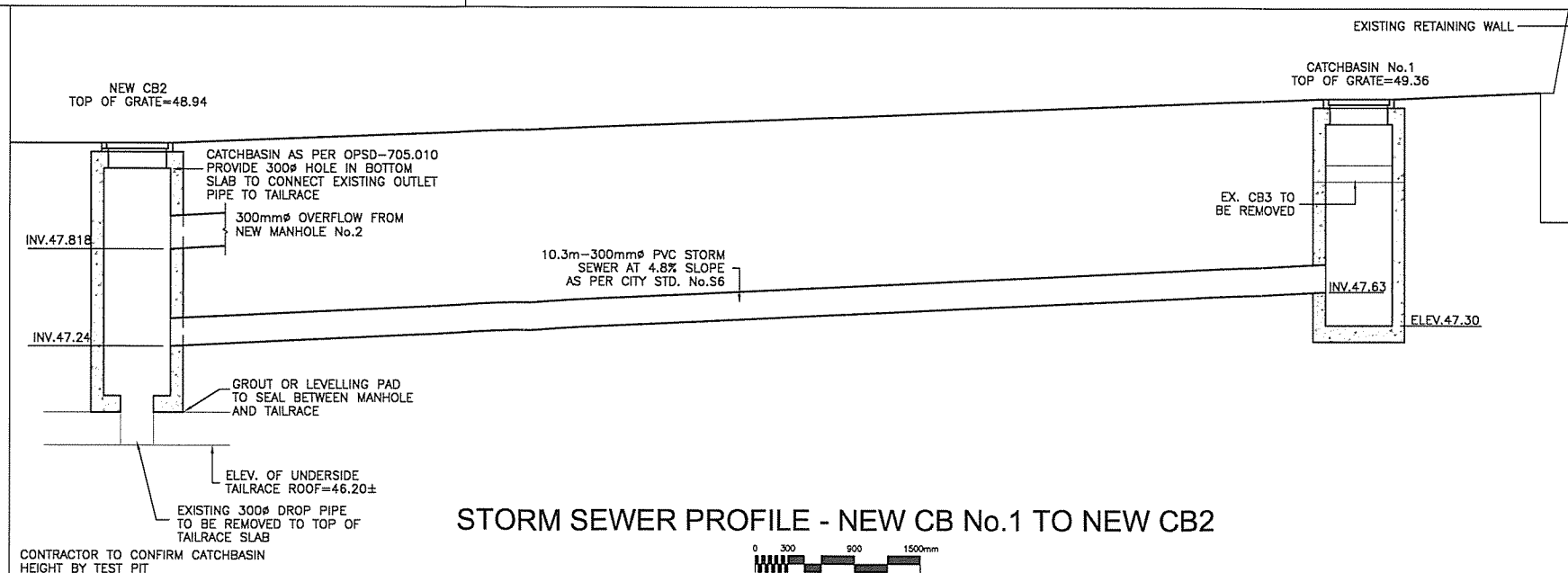
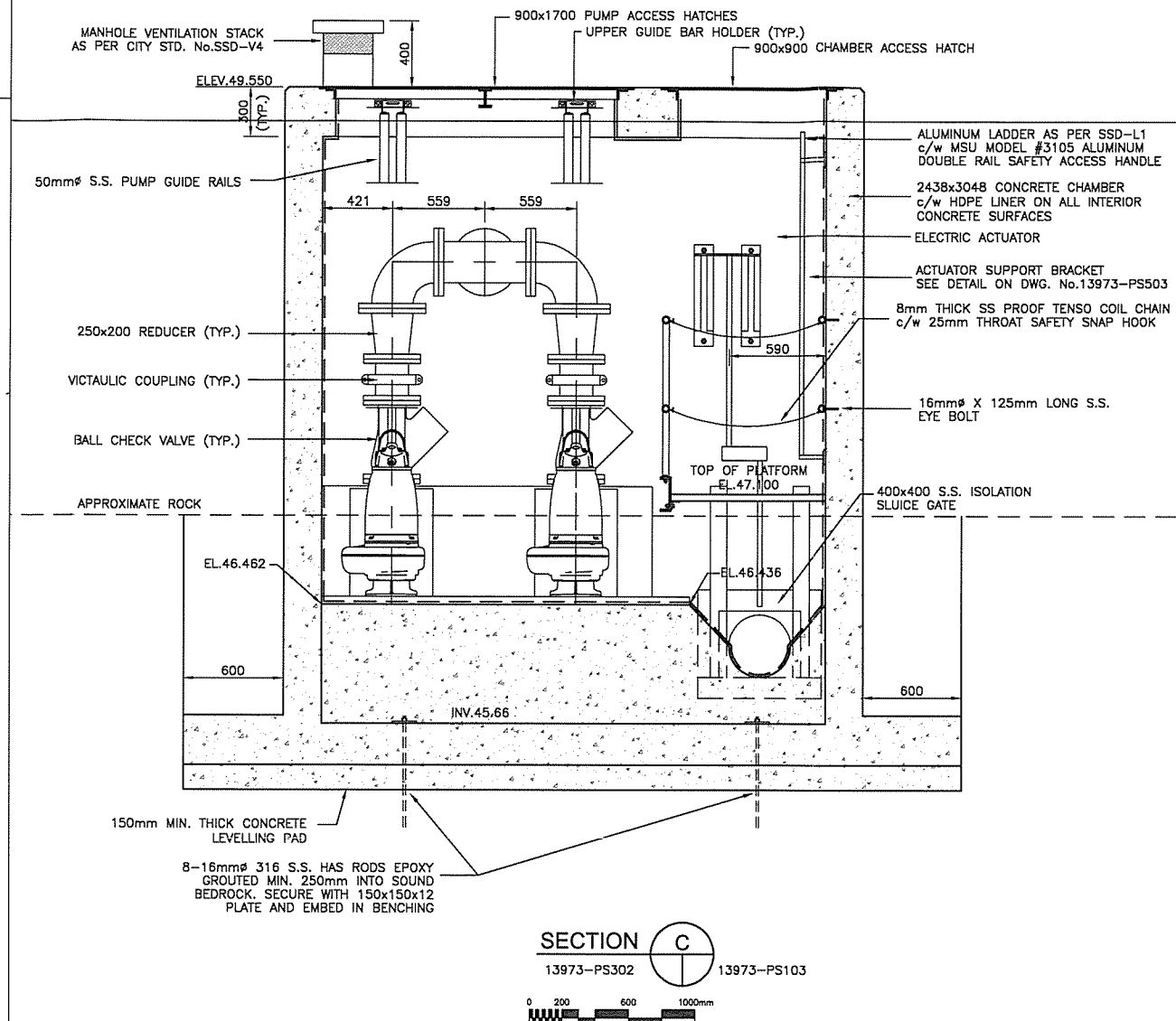
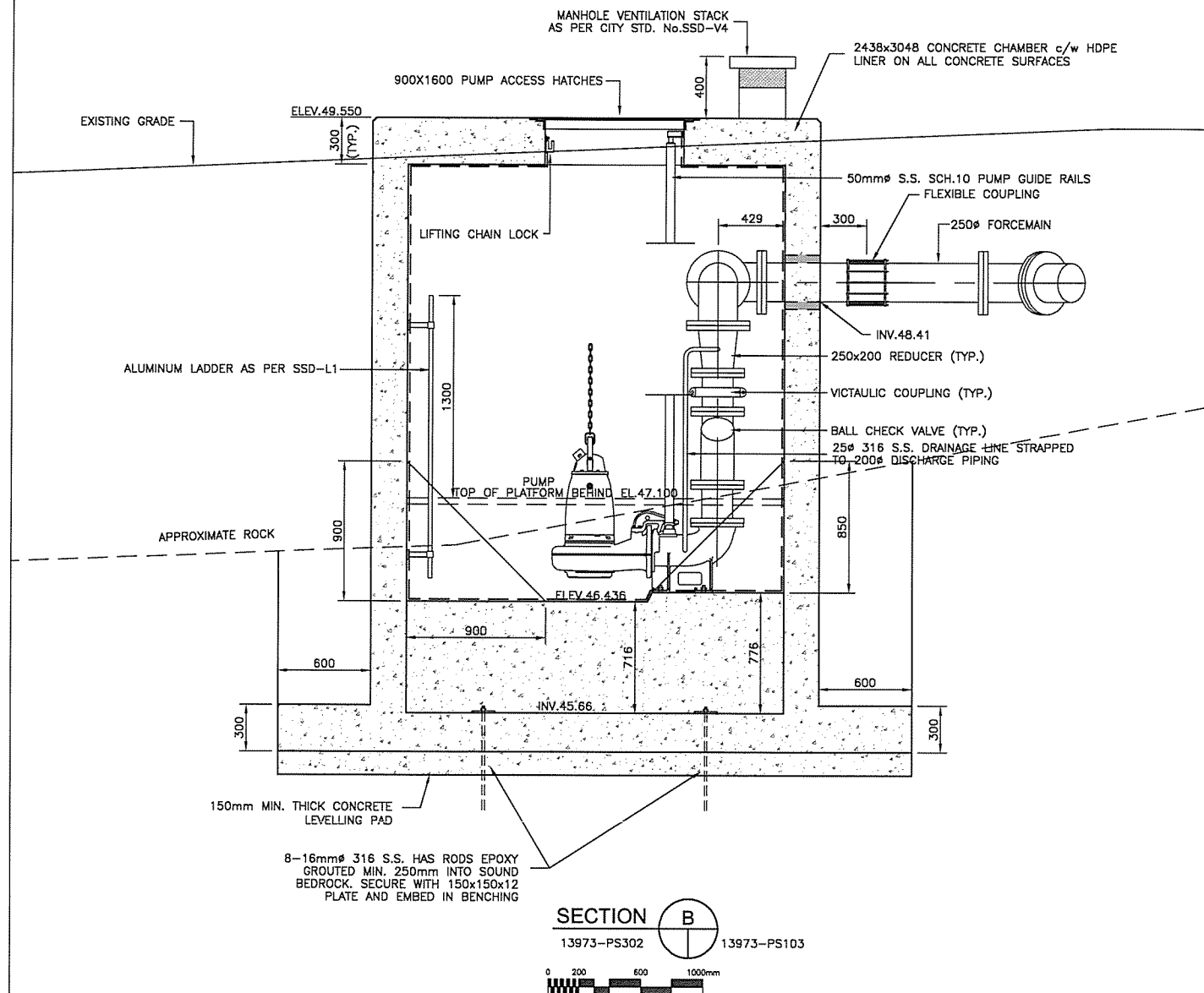
DRAWING TITLE:

FLEET STREET PUMPING STATION
ELECTRICAL UPGRADE AND
CONSTRUCTION OF LEBRETON
FLATS SANITARY PUMPING
STATION
CONTRACT No.ISB06-2021

SECTION B-B
SECTION C-C
STORM SEWER PROFILE
NEW CB1 TO NEW CB2

Drawing No.:
13973-PS302

Rev. No.:
3



STORM SEWER PROFILE - NEW CB No.1 TO NEW CB2

APPENDIX E

Fire Demand Data

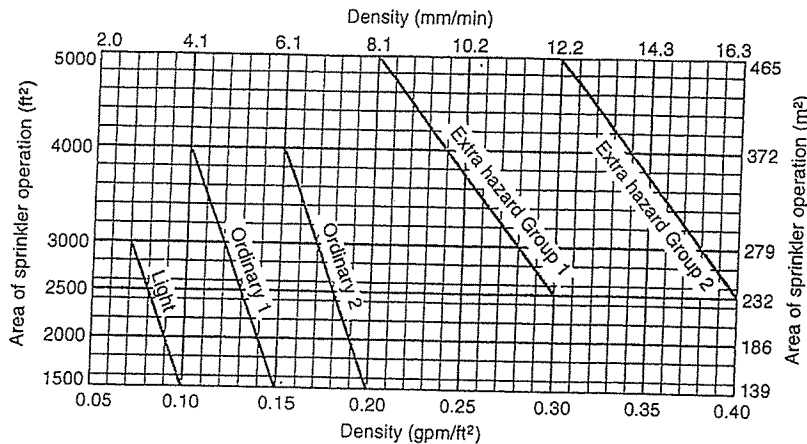


FIGURE 11.2.3.1.1 Density/Area Curves.

- (2) The room that creates the greatest demand in accordance with the room design method of 11.2.3.3
 (3) Special design areas in accordance with 11.2.3.4

11.2.3.1.2 The minimum water supply shall be available for the minimum duration specified in Table 11.2.3.1.2.

11.2.3.1.3 The lower duration values in Table 11.2.3.1.2 shall be permitted where the sprinkler system waterflow alarm device(s) and supervisory device(s) are electrically supervised and such supervision is monitored at an approved, constantly attended location.

11.2.3.1.4 **Restrictions.** When either the density/area method or room design method is used, the following shall apply:

- (1)*For areas of sprinkler operation less than 1500 ft² (139 m²) used for light and ordinary hazard occupancies, the density for 1500 ft² (139 m²) shall be used.
- (2) For areas of sprinkler operation less than 2500 ft² (232 m²) for extra hazard occupancies, the density for 2500 ft² (232 m²) shall be used.
- (3)*Unless the requirements of 11.2.3.1.4(4) are met for buildings having unsprinklered combustible concealed spaces, as described in 8.15.1.2 and 8.15.6, the minimum area of sprinkler operation for that portion of the build-

ing shall be 3000 ft² (279 m²). The design area of 3000 ft² (279 m²) shall be applied only to the sprinkler system or portions of the sprinkler system that are adjacent to the qualifying combustible concealed space. The term *adjacent* shall apply to any sprinkler system protecting a space above, below, or next to the qualifying concealed space except where a barrier with a fire resistance rating at least equivalent to the water supply duration completely separates the concealed space from the sprinklered area.

- (4) The following unsprinklered concealed spaces shall not require a minimum area of sprinkler operation of 3000 ft² (279 m²):
 - (a) Noncombustible and limited-combustible concealed spaces with minimal combustible loading having no access. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.
 - (b) Noncombustible and limited-combustible concealed spaces with limited access and not permitting occupancy or storage of combustibles. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.
 - (c) Combustible concealed spaces filled entirely with noncombustible insulation.
 - (d)*Light or ordinary hazard occupancies where noncombustible or limited-combustible ceilings are directly attached to the bottom of solid wood joists or solid limited-combustible construction or noncombustible construction so as to create enclosed joist spaces 160 ft³ (4.5 m³) or less in volume, including space below insulation that is laid directly on top or within the ceiling joists in an otherwise sprinklered concealed space.
 - (e) Concealed spaces where rigid materials are used and the exposed surfaces have a flame spread index of 25 or less and the materials have been demonstrated to not propagate fire more than 10.5 ft (3.2 m) when tested in accordance with ASTM E 84, *Standard Test Method of Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*, extended for an additional 20 minutes in the form in which they are installed in the space.

Table 11.2.3.1.2 Hose Stream Allowance and Water Supply Duration Requirements for Hydraulically Calculated Systems

Occupancy	Inside Hose		Total Combined Inside and Outside Hose		Duration (minutes)
	gpm	L/min	gpm	L/min	
Light hazard	0, 50, or 100	0, 189, or 379	100	379	30
Ordinary hazard	0, 50, or 100	0, 189, or 379	250	946	60-90
Extra hazard	0, 50, or 100	0, 189, or 379	500	1893	90-120

APPENDIX F

Servicing Study Guidelines Checklist

Development Servicing Study Checklist

4.1 General Content	Addressed (Y/N/NA)	Section	Comments
Executive Summary (for larger reports only).	NA		
Date and revision number of the report.	Y	Cover	
Location map and plan showing municipal address, boundary, and layout of proposed development.	Y	Fig 1	Municipal address not included
Plan showing the site and location of all existing services.	Y	Fig 3	
Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	NA		
Summary of Pre-consultation Meetings with City and other approval agencies.	NA		
Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defensible design criteria.	Y	2,3,4	
Statement of objectives and servicing criteria.	Y	1	
Identification of existing and proposed infrastructure available in the immediate area.	Y	Fig 3	
Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	N		Section 3 discusses the area has already received MOE approval
Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighboring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	NA		

Development Servicing Study Checklist

4.1 General Content	Addressed (Y/N/NA)	Section	Comments
Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	NA		
Proposed phasing of the development, if applicable.	Y	1	
Reference to geotechnical studies and recommendations concerning servicing.	NA		
All preliminary and formal site plan submissions should have the following information:			
Metric scale	Y		As indicated on the drawings and figures
North arrow (including construction North)	Y		
Key plan	Y	Fig 1	
Name and contact information of applicant and property owner	Y	1	
Property limits including bearings and dimensions	N		To be included on detailed design drawings
Existing and proposed structures and	Y	Fig 3	
Easements, road widening and rights-of-way	N		To be included on detailed design drawings
Adjacent street names	Y	Fig 1	

Development Servicing Study Checklist

4.2 Water	Addressed (Y/N/NA)	Section	Comments
Confirm consistency with Master Servicing Study, if available.	NA		
Availability of public infrastructure to service proposed development.	Y	4	
Identification of system constraints.	NA		
Identify boundary conditions.	NA		
Confirmation of adequate domestic supply and pressure.	Y	4	
Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Y	4	
Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	NA		
Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design.	NA		
Address reliability requirements such as appropriate location of shut-off valves.	NA		
Check on the necessity of a pressure zone boundary modification.	NA		
Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range.	Y	4	
Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	NA		
Description of off-site required feeder mains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	NA		
Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Y	4	
Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	NA		

Development Servicing Study Checklist

4.3 Wastewater	Addressed (Y/N/NA)	Section	Comments
Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed	Y	2	
Confirm consistency with Master Servicing Study and/or justifications for deviations.	Y	2	
Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N		
Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Y	2	
Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Y	2	
Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	NA		
Description of proposed sewer network including sewers, pumping stations, and forcemains.	Y	2	
Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	NA		
Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	Y	2	
Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	NA		
Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	NA		
Special considerations such as contamination, corrosive environment etc.	NA		

Development Servicing Study Checklist

4.4 Stormwater	Addressed (Y/N/NA)	Section	Comments
Description of drainage outlets and downstream constraints including legality of outlet (i.e. municipal drain, right-of-way, watercourse, or private property).	Y	3	
Analysis of the available capacity in existing public infrastructure.	Y	3	
A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns and proposed drainage patterns.	Y	Fig 4	
Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Y	3	
Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Y	3	
Description of stormwater management concept with facility locations and descriptions with references and supporting information.	Y	3	
Set-back from private sewage disposal systems.	NA		
Watercourse and hazard lands setbacks.	NA		
Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	NA		
Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	Y	3	
Storage requirements (complete with calcs) and conveyance capacity for 5 yr and 100 yr events.	NA		
Identification of watercourse within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	NA		
Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	NA		
Any proposed diversion of drainage catchment areas from one outlet to another.	NA		
Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and SWM	Y	3	
If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	NA		

Development Servicing Study Checklist

4.4 Stormwater	Addressed (Y/N/NA)	Section	Comments
Identification of municipal drains and related approval requirements.	NA		
Description of how the conveyance and storage capacity will be achieved for the development.	Y	3	
100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	NA		
Inclusion of hydraulic analysis including HGL elevations.	NA		
Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Y	3	
Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	NA		
Identification of fill constrains related to floodplain and geotechnical investigation.	NA		

Development Servicing Study Checklist

4.5 Approval and Permit Requirements	Addressed (Y/N/NA)	Section	Comments
Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	NA		
Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	NA		
Changes to Municipal Drains.	NA		
Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	NA		
4.6 Conclusion	Addressed (Y/N/NA)	Section	Comments
Clearly stated conclusions and recommendations.	Y	5	
Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	NA		
All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario.	Y	5	