120 Iber Road, Unit 103
Stittsville, Ontario K2S 1E9
Tel (613) 836-0856
Fax (613) 836-7183
www.dsel.ca

david schaeffer engineering ltd
SMART SUBDIVISIONS™

TECHNICAL MEMORANDUM

DATE: 2020-07-15 *EMAIL*

TO: **Mohammad Abdul Mottalib, P.Eng**

SUBJECT: **Zibi Ontario – Block 206, Servicing Brief**

OUR FILE: DSEL Project No. 20-1178

ATTACHMENTS:

- MSS Water Demand Calculation Sheet, prepared by DSEL – dated May 2018;
- Block 206 Water Demand Calculation Sheet, prepared by DSEL – dated July 2020;
- Block 206 FUS Calculation Sheet, prepared by DSEL – dated July 2020;
- Block 206 EPANET Model Schematic, prepared by DSEL – dated July 2020;
- EPANET Model Output Files, prepared by DSEL – Dated July 2020;
- Extracted Pages from Temporary Pump Station Design Report prepared by Hatch – dated November 23, 2018;
- Block 206 Wastewater Discharge Calculation Sheet, prepared by DSEL – dated July 2020;
- Ultimate Sanitary Design Sheet, prepared by DSEL – dated June 2019;
- Block 206 Storm Sewer Design Sheet, prepared by DSEL – dated July 2020;
- Zibi Ontario Master Plan, prepared by Fotenn Planning + Design – dated December 2016;
- Zibi Ontario Block 206 Site Plan and Site Statistics, prepared by Kohn Partnership Architects Inc.– dated July 6, 2020;

Windmill DREAM Developments has retained DSEL to prepare an amendment to the Functional Servicing and Stormwater Management Report in support of their Site Plan Control (SPC) application for Block 206 of the Zibi Ontario lands. The development of Block 206 was contemplated in the Master Servicing Plan, prepared by DSEL and dated June 2018 (***MSS***), refer to the Master Plan drawing in the ***Drawings/Figures*** folder of the attachments. The ***MSS*** contemplated approximately ***612 m²*** of retail space, ***198*** residential units and ***3,674 m²*** of office space for Block 206. The proposed Block 206 development results in an increase footprint to

Block 206 then contemplated in the ***MSS*** from a gross floor area of ***18,275 m²*** to ***20,554 m²*** including of ***799 m²*** of retail space and ***204*** residential units composed of; 95 single bedroom units; 64 2-bedroom units; and 45 co-living suites consisting of a total of 180 beds.

Phase 1 buildings as well as Block 207 and Block 211 are planned to be constructed prior Block 206 and are submitted under separate applications. They have been included in the calculations for water and wastewater for this report for consistency in water modelling and pump station sizing.

Water Servicing

As contemplated in the ***MSS***, water service for Block 206 will connect directly to the existing 200 mm diameter watermain within Chaudiere Private which was constructed during the first phase of the development.

The City of Ottawa was contacted to obtain boundary conditions for the full buildout of development and also boundary conditions for Phase 1 works which includes water demands for Blocks 205a, 208, 211, and 207.

The boundary conditions for proposed water demands are summarized in ***Table 1*** and ***Table 2*** below:

Table 1
Water Demand – MSS

Design Parameter	MSS Demand (L/min)	Boundary Condition[2] (m H_2O / kPa) Connection @ Booth Street		Boundary Condition[2] (m H_2O / kPa) Connection @ Wellington Street	
Average Daily Demand	685.1	61.2	600.4	59.7	585.9
Max Day + Fire Flow	1,427.2 + 22,000 = 23,427.2	46.5	456.2	52.6	516.2
Peak Hour	2,212.1	54.2	77.1	52.7	517.2

Table 2
Water Demand – Blocks 205a, 208, 211 and 207

Design Parameter	Blocks 205a, 208, 211 and 207 Demand (L/min)	Boundary Condition[2] (m H_2O / kPa) Connection @ Booth Street		Boundary Condition[2] (m H_2O / kPa) Connection @ Wellington Street	
Average Daily Demand	117.2	61.3	601.4	59.8	586.8
Max Day + Fire Flow	255.6 + 19,000 = 19,255.6	49.1	481.7	51.6	506.4
Peak Hour	426.9	53.6	525.8	52.1	511.3

As demonstrated, the development flow demands have little influence on the HGLs at the proposed connection locations.

The proposed water demands for the Block 206 development phase are summarized in ***Table 3*** below. Refer to ***Appendix B,*** in the attachments for water demand calculations.

Table 3
Water Demand – Blocks 205a, 208, 211, 207 and 206

Design Parameter	Blocks 205a, 208, 211, 207 and 206 Demand (L/min)
Average Daily Demand	254.20
Max Day + Fire Flow	547.76 + 21,000 = 21,547.76
Peak Hour	1039.68

Fire demand for Block 206 was calculated using the *City of Ottawa Technical Bulletin ISTB-2018-02*, and resulted in a fire flow of ***21,000 L/min***. Please refer to correspondence in the ***Appendix A*** confirming the building is equipped with a fully supervised sprinkler system.

The hydraulic model, per the ***Approved FSR,*** was updated to confirm adequate pressure and fire flow is available to service Block 206. Pressures are summarized in ***Table 4*** below:

Table 4
EPANET Results

Node ID	Pressure (kPa)		
	Average Day	Max Day + Fire Flow	Peak Hour
Block 206	605.4	175.3	520.1
Hydrant 4	600.1	240.7	515.7
Hydrant 5	590.6	142.6	506.2
Hydrant 6	605.4	178.0	520.2
Hydrant 7	592.7	219.1	508.4

Pressures during the fire flow scenario are above the minimum required per the ***City of Ottawa Water Supply Guideline (2010)***. Pressure during the Average Day scenario pressures exceed the recommended pressures**,** thus, pressure reducing valves may be required, to be confirmed through the mechanical design of the proposed building. Hydrants have been located in accordance with the ***MSS***.

Sanitary Servicing

Block 206 is proposed to be serviced by a connection to the 250 mm sanitary sewer within Chaudiere Private, constructed in Phase 1. The Phase 1 sanitary sewers were sized to convey the flow from Block 206, in accordance with the ***Approved FSR***.

As indicated in the ***Approved FSR***, a temporary pumping station was constructed within the footprint of the existing Building 535 to service the first phases of development The pump station design report, prepared by Hatch, and dated November 2018 (***Temp PS 2018***), indicates that the

temporary pumping station is designed to pump a peak wet weather flow of ***13 L/s***, refer to extracted pages from the ***Temp PS 2018*** report confirming the ***13 L/s*** of design capacity.

The interim pump station is to service the development phases until the sanitary flow directed to the pump station exceeds 80% (***10.4 L/s***) of the interim pump station capacity, at which point the ultimate pump station is to be constructed in accordance with the site plan conditions.

Table 5, below, summarizes the anticipated wastewater discharge from the proposed Phase 1, 2 and 3 and Block 206 development.

Table 5
Summary of Anticipated Wastewater Discharge

Design Parameter	Approved Flow (L/s)	Phase 1, Block 211, 207 & 206 Flow (L/s)
Average Dry Weather Flow Rate	3.0	4.4
Peak Dry Weather Flow Rate	6.8	10.0
Peak Wet Weather Flow Rate	7.2	10.7

As shown in ***Table 5,*** above, it is anticipated that Block 206 will result in an increase in sanitary discharge, refer to ***Appendix C*** for sanitary calculation sheets. The overall sanitary flow to the pump station is 82% of the total capacity of the interim pump station. Since the overall sanitary flow being directed to the pump station exceeds 80% of the total capacity of the interim pump station, the ultimate pump station will need to be constructed in order to service the development of Block 206. The design and capacity for the ultimate pump station will be provided under a separate cover.

The anticipated increase in sanitary flow still results in less flow than what was contemplated in the ***MSS***.

Stormwater Management

Storm water runoff from the proposed Block 206 development will discharge through a service connection to the 450mm diameter storm sewer within Chaudiere Private, which ultimately outlets to the north edge of Chaudière Island, east of Booth Street, consistent with the ***Approved FSR.***

The proposed building footprint of Block 206 has been updated from the contemplated footprint in the ***MSS***. Refer to the ***SWM-1*** drawing included in the attachments for updated catchment areas directed to the storm sewer. As shown in the revised storm design sheet, the sewers have sufficient capacity to convey the updated flows.

An Oil-Grit-Separator (***OGS***) was installed as part of Phase 1 development***,*** which will provide ***80% TSS Removal*** prior to discharging to the Ottawa River.The overall imperviousness is consistent with previous approvals; therefor, the oil/grit separator (OGS) will continue to function as intended.

Quantity controls are not required per the approved ***MSS***.

Required Permits / Approvals

The proposed development is subject to the site plan control approval process. The City of Ottawa must approve the engineering design drawings and reports prior to the issuance of site plan control.

An amendment to the previously issued Environmental Compliance Approval (ECA #1505-B96UCV) has been approved (ECA #6146-BQ8T7V) to reflect the new storm sewers; increase in service area to the interim pump station; and off-site sanitary infrastructure.

Yours truly,
David Schaeffer Engineering Ltd.

Per: Genavieve Greenberg

David Schaeffer Engineering Ltd.

Per: Brandon Chow

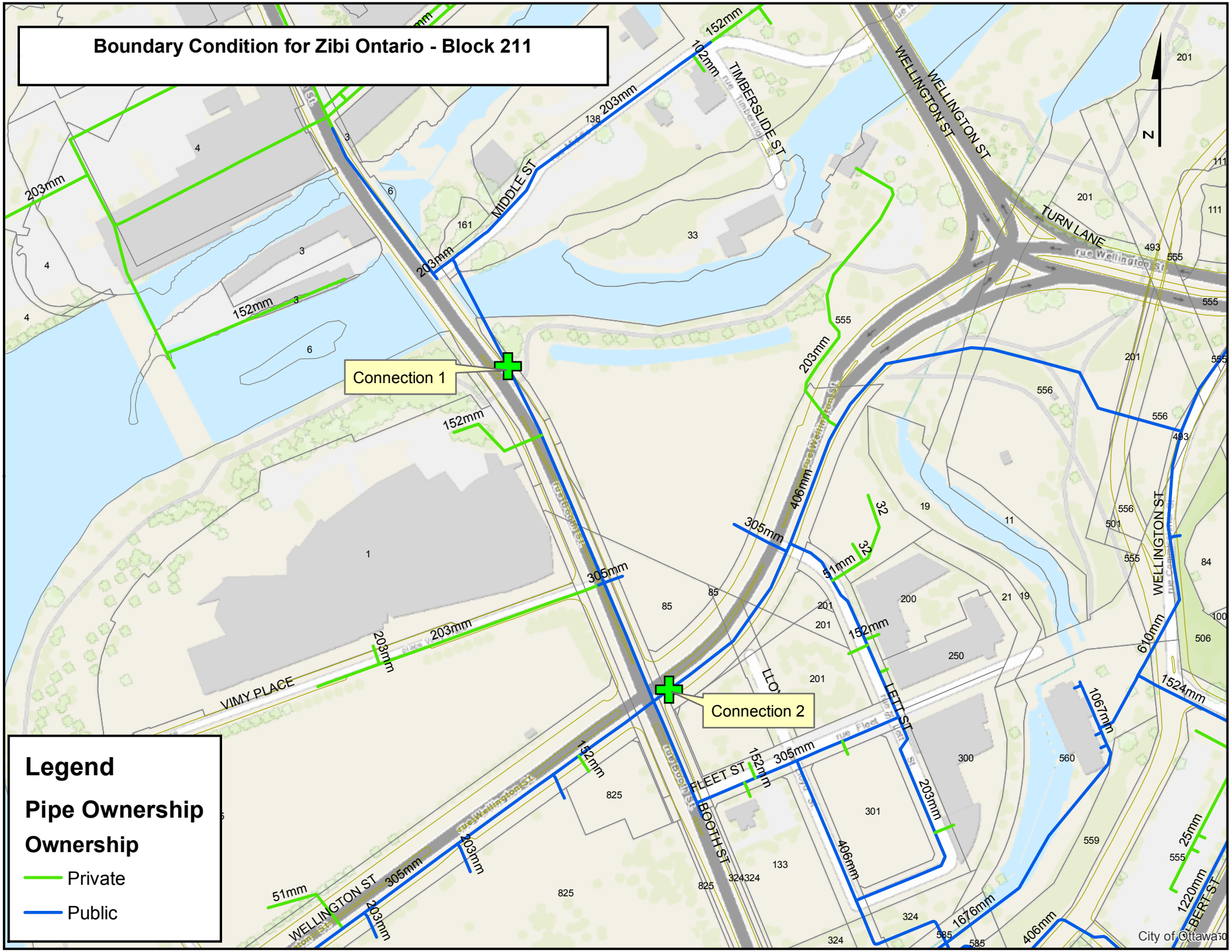
Reviewed by,
David Schaeffer Engineering Ltd.

Per: Adam Fobert, P. Eng

Z:\Projects\20-1178_Windmill_Zibi-Block-206-207\B_Design\B3_Reports\B3-2_Servicing (DSEL)\2020-06-01_Block 206_subm1\2020-07-13_1178_memo-ggg.docx

APPENDIX A

Pre-Consultation


Boundary Condition for Zibi Ontario - Block 211
Connection 1
Connection 2
MIDDLE ST
TIMBERSLIDE ST
WELLINGTON ST
TURN LANE
VIMY PLACE
FLEET ST
BOOTH ST
LETT ST
WELLINGTON ST
ALBERT ST
152mm
203mm
305mm
406mm
610mm
1524mm
1067mm
1676mm
1220mm
25mm
51mm
N
Legend
Pipe Ownership
Ownership
Private
Public
City of Ottawa

Steve Merrick

To: Robert Freel
Subject: RE: Chaudiere/Albert Island Development - Water Boundary Condition Request

---

From: Mottalib, Abdul [mailto:Abdul.Mottalib@ottawa.ca]
Sent: April-08-15 10:30 AM
To: 'Robert Freel'
Cc: Mottalib, Abdul; 'Adam Fobert'
Subject: FW: Chaudiere/Albert Island Development - Water Boundary Condition Request

Hi Bobby,

Please see below as requested.

Thanks,

Abdul Mottalib, P. Eng.

From:
Sent: April 08, 2015 10:20 AM
To: Mottalib, Abdul
Subject: RE: Chaudiere/Albert Island Development - Water Boundary Condition Request

The following are boundary conditions, HGL, for hydraulic analysis at the Chaudière/Albert Islands (Pressure Zone 1W), assumed to be connected to (see attached PDF for location):

1) 406mm on Wellington
2) 305mm on Booth

Minimum HGL = 108.1m (same at both locations)

Maximum HGL = 115.1m (same at both locations), the maximum pressure is estimated to be greater than 80 psi. A pressure check at completion of construction is recommended to determine if pressure control is required.

Fire Flow*	Connection 1 (Wellington)
150 L/s	110.6m
217 L/s	110.0m
250 L/s	109.6m
300 L/s	109.0m

367 L/s	108.0m

*Includes Max Day demands of 23.79 L/s distributed evenly between both connection points (i.e. 11.9 L/s at each connection point)

Fire Flow*	Connection 2 (Booth)
150 L/s	109.0m
217 L/s	107.0m
250 L/s	105.8m
300 L/s	103.7m
367 L/s	100.4m

*Includes Max Day demands of 23.79 L/s distributed evenly between both connection points (i.e. 11.9 L/s at each connection point)

These are for current conditions and are based on computer model simulation.

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.

From: Robert Freel [mailto:rfreel@dsel.ca]
Sent: April 01, 2015 5:21 PM
To: Mottalib, Abdul
Subject: RE: Chaudiere/Albert Island Development - Water Boundary Condition Request

Good afternoon Abdul,

We would like to request updated watermain boundary conditions for the above referenced site. Please see the anticipated demands below.

1. Location of Service / Street Number: Connection 1 and 2 as shown on the previous request attached

2. Type of development and the amount of fire flow required for the proposed development:

- Proposed development is a mixed use community.
- It is anticipated that the development will be services via a connections 1 and 2 as shown by the attached map.
- Can you provide the available fire flow for the following demands as determined by the FUS:
  - 9,000L/min
  - 13,000L/min
  - 15,000L/min
  - 18,000L/min

- 22,000L/min

3. The estimated demand for the proposed conditions is summarized below:

	L/min	L/s
Avg. Daily	685.1	11.42
Max Day	1427.2	23.79
Peak Hour	2212.1	36.87

Thanks,

Bobby Freel, P.Eng.

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 203
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.258
cell: (613) 314-7675
email: rfreel@DSEL.ca

Steve Merrick

From: Buchanan, Richard <Richard.Buchanan@ottawa.ca>
Sent: Thursday, June 6, 2019 12:18 PM
To: Steve Merrick
Subject: Zibi Ontario - Block 211 - Boundary Condition Request
Attachments: image006.emz; image011.emz; Zibi Ontario - Block 211 June 2019.pdf

Hi Steve

The following are boundary conditions, HGL, for hydraulic analysis at Zibi Ontario (zone 1W) assumed to be connected to the 406mm on Booth (connection 1) and 406mm on Wellington (connection 2). See attached PDF for locations.

The water demands provided include demands for Phase 1, Phase 2 and Block 211 (205A, 207, 208, 211)

Minimum HGL = 107.5m, same at both connections

Maximum HGL = 115.2m, same at both connections. The maximum pressure is estimated to be greater than 80 psi. A pressure check at completion of construction is recommended to determine if pressure control is required.

MaxDay + Fireflow (317 L/s) = 103.0m, Booth St connection

MaxDay + Fireflow (317 L/s) = 107.0m, Wellington connection

These are for current conditions and are based on computer model simulation.

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.

Richard Buchanan, CET

Coordinator, Front Ending Agreements and Brownfields Programs
Planning Services, Development Review Branch
Planning, Infrastructure and Economic Development Department
City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste 27801
ottawa.ca/planning / ottawa.ca/urbanisme

From: Steve Merrick <SMerrick@dsel.ca>
Sent: June 05, 2019 9:34 AM
To: Buchanan, Richard <Richard.Buchanan@ottawa.ca>
Subject: Zibi Ontario - Block 211 - Boundary Condition Request

Hi Richard,

Hope all is well, I wanted to reach out to obtain boundary conditions for the above noted site.

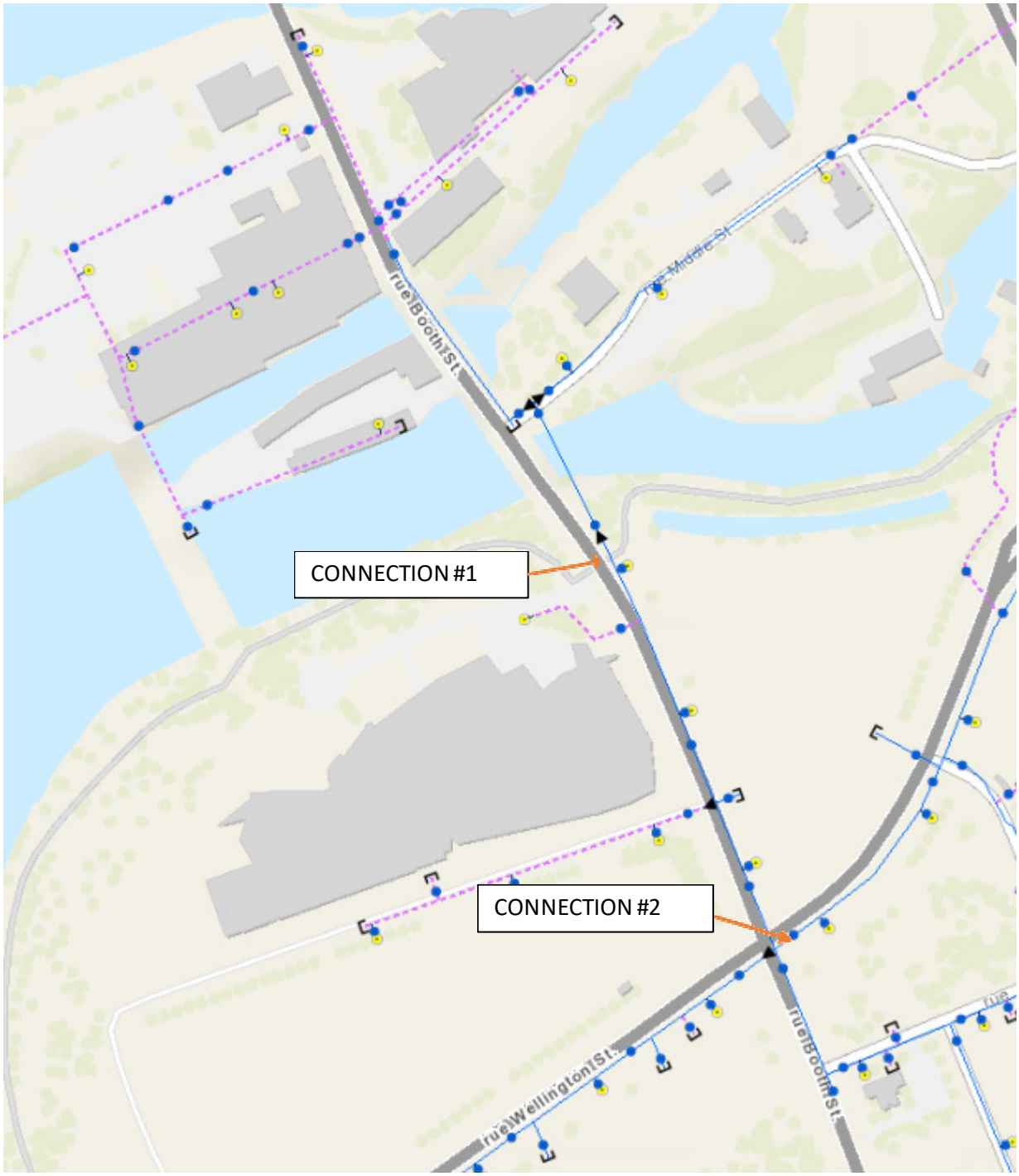
1. Location of Service / Street Number: **3 Booth Street**

2. Type of development: **The proposed next phase of development on Chaudiere Island east of Booth Street, known as Block 211. The proposed development is a 9 storey building consisting of 1140m^2 of retail space and 15164m^2 of office space and 2 levels of underground parking**

3. Proposed Connection points:
   - **Connection 1 to existing 406mm watermain with Booth Street North of War Museum**
   - **Connection 2 to existin 406mm watermain within Wellington Street @ Booth Street**
     Please see the diagram below for reference.

4. Please provide pressures for the following water demand scenarios required for the proposed development. The water demands below include demands for Phase 1, Phase 2 and Block 211 (205A, 207, 208, 211)

	L/min
Avg. Daily	117.4
Max Day + FUS 1	255.6 + 19,000 = 19255.6
Peak Hour	426.9



Steve Merrick, P.Eng.
Project Manager / Intermediate Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext. 561
cell: (613) 222-7816
email: smerrick@DSEL.ca

'

'

Genavieve Greenberg

From: Genavieve Greenberg
Sent: Thursday, July 9, 2020 12:46 PM
To: Genavieve Greenberg
Subject: FW: Block 206 - Ground Floor Coord

From: Ivana Masnikosa <imasnikosa@kohnarchitects.com>
Sent: June 17, 2020 2:07 PM
To: Brandon Chow <BChow@dsel.ca>
Cc: Cormac Murray <cmurray@teeplearch.com>; Sean Lawrence <slawrence@kohnarchitects.com>; tdiamant <tdiamant@teeplearch.com>; Shannon Card <card@csw.ca>
Subject: RE: Block 206 - Ground Floor Coord

Brandon, sorry, Restaurant number of seats: around 150, not around 200.
Regards,

Ivana Masnikosa BArch, OAA
Architect

Kohn Partnership Architects Inc.
116 Spadina Avenue, Suite 501, Toronto, ON, Canada, M5V 2K6
Telephone +1 416-703-6700 **Ext. 2031**
imasnikosa@kohnarchitects.com

From: Ivana Masnikosa
Sent: June 17, 2020 2:06 PM
To: Brandon Chow <BChow@dsel.ca>
Cc: Cormac Murray <cmurray@teeplearch.com>; Sean Lawrence <slawrence@kohnarchitects.com>; tdiamant <tdiamant@teeplearch.com>; Shannon Card <card@csw.ca>
Subject: RE: Block 206 - Ground Floor Coord

Hi Brandon,

Here are my answers:

Block 206
GFA: 20,567m2/221,382sf
Retail: 8,603sf
Residents' Amenity Areas: 11,790sf
No. of Residential units: 204

Block 207
GFA:7,238m2/77,914sf
Retail: 6,290 sf
Restaurant: 6,270 sf (if P1 level is included) / 4,230sf (only Ground Floor, without Restaurant space on P1 level)
Restaurant number of seats: around 200
Offices: 60,950sf

Both 206&207 are Construction Class 3 (Non-Combustible) and C-1 (Noncumbustible).

Regards,

Ivana Masnikosa BArch, OAA
Architect

Kohn Partnership Architects Inc.
116 Spadina Avenue, Suite 501, Toronto, ON, Canada, M5V 2K6
Telephone +1 416-703-6700 **Ext. 2031**
imasnikosa@kohnarchitects.com

From: Brandon Chow <BChow@dsel.ca>
Sent: June 17, 2020 12:23 PM
To: Ivana Masnikosa <imasnikosa@kohnarchitects.com>
Cc: Cormac Murray <cmurray@teeplearch.com>; Sean Lawrence <slawrence@kohnarchitects.com>; tdiamant <tdiamant@teeplearch.com>; Shannon Card <card@csw.ca>
Subject: RE: Block 206 - Ground Floor Coord

Can you provide the following:

- Building gross floor areas
- Office area
- Retail area
- Restaurant # of seats
- Residential unit counts
- Building construction class & occupancy type per ISO guide (attached)

1) Confirm the ISO construction class. Sections 1, 2 and 3 on pages 3 to 8 provides definitions to clarify. Note that ISO refers only to fire-resistive for fire ratings not less than 1-hour.

- *Construction Class 1 (Frame)*
- *Construction Class 2 (Joisted Masonry)*
- *Construction Class 3 (Non-Combustible)*
- *Construction Class 4 (Masonry Non-Combustible)*
- *Construction Class 5 (Modified Fire Resistive)*
- *Construction Class 6 (Fire Resistive)*

2) Confirm the ISO occupancy type. See Chapter 3 (pages 11-13) in the ISO guide.

- *C-1 (Noncombustible)*
- *C-2 (Limited Combustibility)*
- *C-3 (Combustible)*
- *C-4 (Free Burning)*
- *C-5 (Rapid Burning or Flash Burning)*

Let me know if you have any questions.

Thanks,

Brandon Chow
Project Coordinator / Intermediate Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103

Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.532
fax: (613) 836-7183
email: bchow@DSEL.ca

From: Ivana Masnikosa <imasnikosa@kohnarchitects.com>
Sent: June 17, 2020 11:36 AM
To: Brandon Chow <BChow@dsel.ca>
Cc: Cormac Murray <cmurray@teeplearch.com>; Sean Lawrence <slawrence@kohnarchitects.com>; tdiamant <tdiamant@teeplearch.com>; Shannon Card <card@csw.ca>
Subject: RE: Block 206 - Ground Floor Coord

Hi Brandon,

USF for 206 is the same as for 207, and sprinkler system is fully supervised as well.

What site stats do you need, only selected ones - best if you send me the list so that I calculate only those we need.

Regards,

Ivana Masnikosa BArch, OAA
Architect

Kohn Partnership Architects Inc.
116 Spadina Avenue, Suite 501, Toronto, ON, Canada, M5V 2K6
Telephone +1 416-703-6700 **Ext. 2031**
imasnikosa@kohnarchitects.com

From: Brandon Chow <BChow@dsel.ca>
Sent: June 17, 2020 10:57 AM
To: Ivana Masnikosa <imasnikosa@kohnarchitects.com>
Cc: Cormac Murray <cmurray@teeplearch.com>; Sean Lawrence <slawrence@kohnarchitects.com>; tdiamant <tdiamant@teeplearch.com>; Shannon Card <card@csw.ca>
Subject: RE: Block 206 - Ground Floor Coord

Hi Ivana,

Thanks for the Block 207 info.
Can we get the site stats for Block 206 and for Block 207?

Can you also provide the following for Block 206.

- Building USF elevation
- Confirm the sprinkler system will be fully supervised (supervised system including water flow and control valve alarm service)

Brandon Chow
Project Coordinator / Intermediate Designer

APPENDIX B

Water Supply

Windmill
Zibi - Ontario
Proposed Conditions (MSS)

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010

Phase	Block	Type	Unit Rate		No. of Units	Avg Day L/min	Max Day L/min	Peak Hour L/min
1	208	Office	75	L/p/d	287	15.0	22.4	40.4
1	208	Retail	5	L/m^2/d	445	1.5	2.3	4.2
1	205.5A	Res	474.6	L/unit/d	71	23.4	58.5	128.7
1	205.5A	Retail	5	L/m^2/d	1825	6.3	9.5	17.1
1	207	Office	75	L/p/d	385	20.1	30.1	54.2
1	207	Retail	5	L/m^2/d	597	2.1	3.1	5.6
1	206	Res	474.6	L/unit/d	198	65.3	163.1	358.9
1	206	Office	75	L/p/d	395	20.6	30.8	55.5
1	206	Retail	5	L/m^2/d	612	2.1	3.2	5.7
1	204A	Office	75	L/p/d	1049	54.6	136.6	300.5
1	204A	Retail	5	L/m^2/d	1626	5.6	8.5	15.2
2	211	Office	75	L/p/d	839	43.7	109.3	240.4
2	211	Retail	5	L/m^2/d	1301	4.5	6.8	12.2
3	209	Office	75	L/p/d	965	50.3	75.4	135.7
3	209	Retail	5	L/m^2/d	1496	5.2	13.0	28.6
3	210A&B	Office	75	L/p/d	495	25.8	38.7	69.6
3	210A&B	Retail	5	L/m^2/d	767	2.7	4.0	7.2
4	205B	Res	474.6	L/unit/d	67	22.1	55.2	121.5
4	205B	Office	75	L/p/d	163	8.5	12.8	23.0
4	205B	Retail	5	L/m^2/d	253	0.9	1.3	2.4
4	204B	Res	474.6	L/unit/d	115	37.9	94.8	208.5
4	204B	Retail	75	L/p/d	264	13.8	20.7	37.2
4	204B	Office	5	L/m^2/d	410	1.4	2.1	3.8
5	201	Res	474.6	L/unit/d	170	56.0	140.1	308.2
5	201	Office	75	L/p/d	182	9.5	14.2	25.5
5	201	Retail	5	L/m^2/d	281	1.0	1.5	2.6
5	202	Res	474.6	L/unit/d	90	29.7	74.2	163.1
5	202	Office	75	L/p/d	107	5.6	8.4	15.1
5	202	Retail	5	L/m^2/d	166	0.6	0.9	1.6
5	203	Res	474.6	L/unit/d	180	59.3	148.3	326.3
5	203	Retail	75	L/p/d	306	16.0	23.9	43.1
5	203	Retail	5	L/m^2/d	475	1.6	2.5	4.5
6	212	Office	75	L/p/d	1804	94.0	140.9	253.7
6	212	Retail	5	L/m^2/d	2796	9.7	14.6	26.2
7	213	Res	474.6	L/unit/d	200	65.9	164.8	362.5
7	213	Office	75	L/p/d	150	7.8	11.7	21.1
7	213	Retail	5	L/m^2/d	233	0.8	1.2	2.2
8	214	Office	75	L/p/d	587	30.6	45.9	82.6
8	214	Retail	5	L/m^2/d	910	3.2	4.7	8.5
8	215	Office	75	L/p/d	587	30.6	45.9	82.6
8	215	Retail	5	L/m^2/d	910	3.2	7.9	17.4
EO	1	Office	75	L/p/d	12	0.6	0.9	1.7
					Total	**858.9**	**1754.6**	**3624.5**

Notes:
* Development stats per Windmill schedule dated 2016-02-01 and additional information received via email 2016-02-08.
* Office unit rate per Ontario Building Code 8.2.1.3.B.
* Residential Unit rate assuming 65% one bedroom (1.4p/unit), 30% two bedroom (2.1 p/unit), 5% three bedroom (3.0p/unit)
* Special Event area washrooms only per Windmill email 2016-02-08.
* Energy Ottawa maximum employees to work at Chaudiere Office provided by EO via letter dated March 1, 2016

		Max Day PF	Peak Hour PF
Estimated Total Residential Population	1844	2.5	5.5

Windmill
Zibi - Ontario
Block 206

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010

Phase	Block	Type	Unit Rate		No. of Units	Avg Day L/min	Max Day L/min	Peak Hour L/min
1	208	Office	75	L/9.3m^2/d	975	5.46	8.19	14.75
1	208	Retail	2.5	L/m^2/d	736	1.28	1.92	3.45
1	208	Restaurant	125	L/seat/d	8	0.69	1.04	1.88
1	205A	Res	474.6	L/unit/d	71	23.40	114.66	173.16
1	205A	Retail	2.5	L/m^2/d	754	1.31	1.96	3.53
3	207	Office	75	L/9.3m^2/d	6451	36.13	54.19	97.55
3	207	Retail	2.5	L/m^2/d	575	1.00	1.50	2.70
3	207	Restaurant	125	L/seat/d	150	13.02	19.53	35.16
4	206	Res	280.0	L/unit/d	447	86.92	217.29	478.04
4	206	Retail	2.5	L/m^2/d	799	1.39	2.08	3.75
2	211	Office	75	L/9.3m^2/d	14480	81.09	121.64	218.95
2	211	Retail	2.5	L/m^2/d	1082	1.88	2.82	5.07
1	EO	Office	75	L/p/d	12	0.63	0.94	1.69
					Total	**254.20**	**547.76**	**1039.68**

Notes:
* Development stats per Windmill schedule dated 2016-02-01 and additional information received via email 2016-02-08.
* Office unit rate per Ontario Building Code 8.2.1.3.B. Assuming 1 employee per 9.3m^2 of floor space.
* Residential Unit rate assuming 65% one bedroom (1.4p/unit), 30% two bedroom (2.1 p/unit), 5% three bedroom (3.0p/unit)
* Residential Unit rate for Block 206 as per Water Supply Guidelines, unit count per email correspondence dated 2020-06-22.
* Number of Residential units estimated as 850gfa / unit per Windmill development stats dated 2016-02-01.
* Windmill estimated maximum number of employees occupying Albert Island
* Energy Ottawa maximum employees to work at Chaudiere Office provided by EO via letter dated March 1, 2016

		Max Day PF
Estimated Total Residential Population	128	4.9
Estimated Total Residential Population Block 206	447	4.9

Windmill
Zibi - Ontario
Block 206

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

1. Base Requirement

$$F = 220C\sqrt{A}$$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Non-Combustible Construction

C	0.8		*Type of Construction Coefficient per FUS Part II, Section 1*
A	20554.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	25232.5 L/min	
	25000.0 L/min	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Non-Combustible	-25%
Fire Flow	**18750.0 L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%

* Residential Unit rate for Block 206 as per Water Supply Guidelines, unit count per email correspondence dated 2020-06-22.

Reduction	**-9375 L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC	
N	Non-Combustible	20.1m-30m	46	2	92	10%	
S	Non-Combustible	10.1m-20m	35	6	210	15%	
E	Non-Combustible	3.1m-10m	43	6	258	20%	
W	Non-Combustible	10.1m-20m	48	16	768	15%	
		% Increase				**60%**	*value not to exceed 75%*

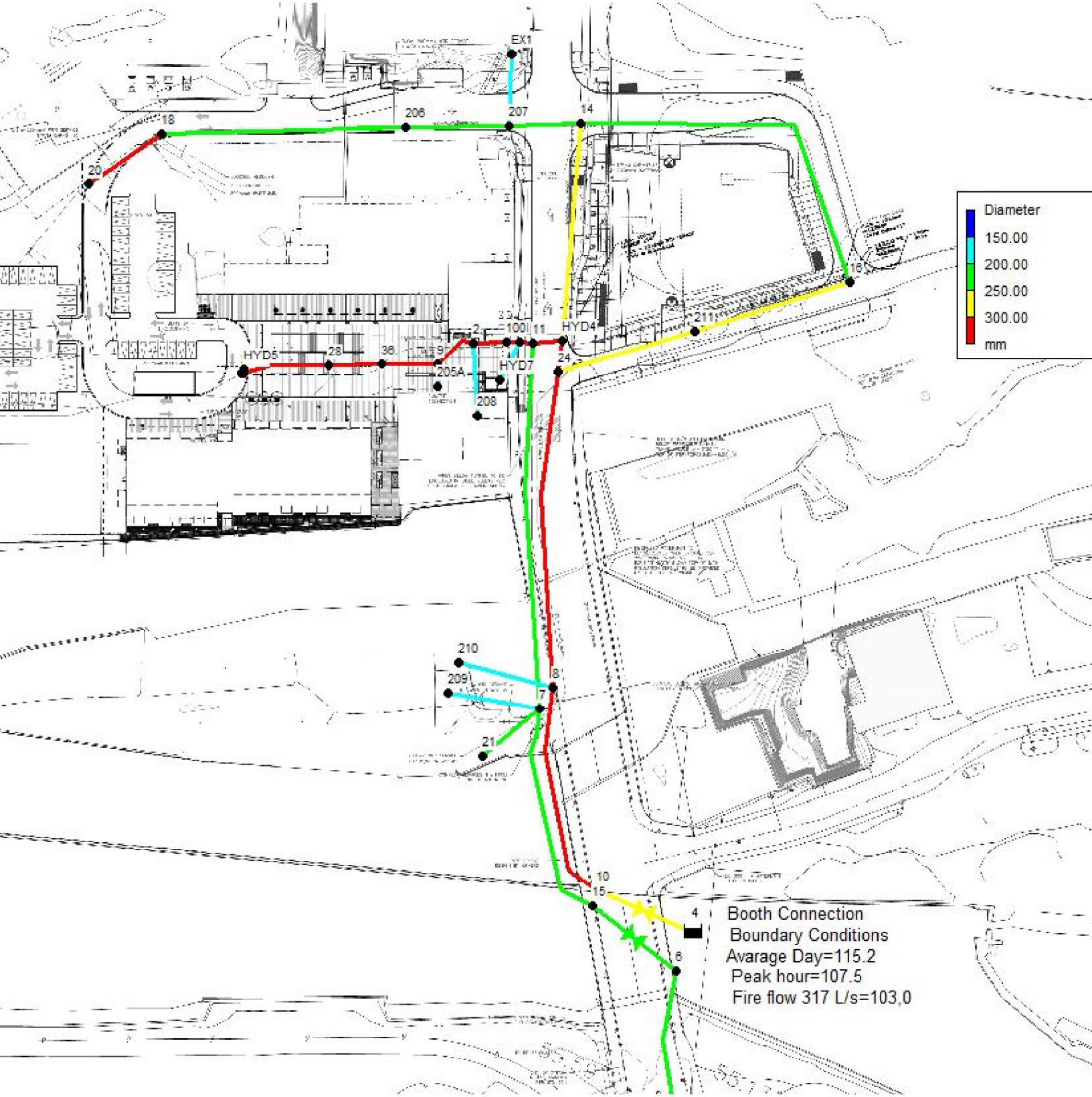
Increase	**11250.0 L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	20625.0 L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section*
	21000.0 L/min	*rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by KPMB Architects
-Calculations based on Fire Underwriters Survey - Part II
- Number of stories for Block 213 estimated based on Master Plan


EX1
18
206
207
14
20
16
211
HYD4
100
11
2
HYD5
28
36
9
205A
HYD7
24
208
210
209
8
7
21
10
15
4
6
Booth Connection
Boundary Conditions
Avarage Day=115.2
Peak hour=107.5
Fire flow 317 L/s=103,0
Diameter
150.00
200.00
250.00
300.00
mm

```
*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                        Version 2.0                                *
*********************************************************************
```

Input File: 2020-07-14_1178_ggg_AVG.net

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm	
1	5	6	270	200	
2	15	7	130	200	
3	10	8	130	300	
4	7	209	15	150	
5	7	11	190	200	
6	8	24	98	300	
7	HYD4	11	17	300	
8	11	3	17	300	
9	HYD7	3	3	150	
10	100	3	39	300	
11	HYD4	14	76	250	
13	14	207	48.45	200	
14	207	EX1	8.57	150	
18	20	18	24.2	300	
19	21	7	1.5	200	
20	8	210	1.5	150	
21	207	HYD6	21.15	200	
22	211	24	8.9	250	
23	24	HYD4	4.2	300	
26	205B	30	1.9	300	
27	30	HYD5	0.65	150	
28	30	28	27.55	300	
29	28	36	16.4	300	
31	36	9	17.8	300	
32	9	2	42.7	300	
33	2	100	9.5	300	
39	9	205A	15	150	
40	2	208	15	150	
17	211	16	75	250	
24	14	16	108	200	
12	206	18	40.27	200	
25	HYD6	206	2	200	
15	4	10	#N/A	250	Valve
16	6	15	#N/A	200	Valve

Node Results:

Node ID	Demand LPM	Head m	Pressure m	Quality
HYD7	0.00	114.57	60.42	0.00
3	0.00	114.57	60.47	0.00
6	0.00	115.19	61.29	0.00
7	0.00	114.57	60.57	0.00
8	0.00	114.57	60.57	0.00
209	0.00	114.57	60.27	0.00
11	0.00	114.57	61.17	0.00
HYD4	0.00	114.57	61.17	0.00

				AVERAGE DAY	
100	0.00	114.57	60.22	0.00	
14	0.00	114.56	63.25	0.00	
207	50.15	114.56	61.17	0.00	
EX1	0.60	114.56	63.16	0.00	
18	0.00	114.56	60.41	0.00	
20	0.00	114.56	60.19	0.00	
21	0.00	114.57	60.57	0.00	
210	0.00	114.57	60.27	0.00	
211	82.97	114.57	61.38	0.00	
24	0.00	114.57	61.17	0.00	
28	0.00	114.57	59.81	0.00	
205B	0.00	114.57	60.53	0.00	
30	0.00	114.57	60.53	0.00	
HYD5	0.00	114.57	60.20	0.00	
9	0.00	114.57	60.42	0.00	
2	0.00	114.57	60.22	0.00	
36	0.00	114.57	59.99	0.00	
205A	24.70	114.57	60.23	0.00	
208	7.40	114.57	60.73	0.00	
10	0.00	114.57	60.57	0.00	
15	0.00	114.57	60.30	0.00	
16	0.00	114.57	63.57	0.00	
206	88.31	114.56	61.71	0.00	
HYD6	0.00	114.56	61.71	0.00	
4	-170.53	115.20	0.00	0.00	Reservoir
5	-83.60	115.20	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
1	83.60	0.04	0.03	Open
2	83.60	0.04	0.03	Open
3	170.53	0.04	0.01	Open
4	0.00	0.00	0.00	Open
5	83.60	0.04	0.02	Open
6	170.53	0.04	0.01	Open
7	-51.50	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
8	32.10	0.01	0.00	Open
9	0.00	0.00	0.00	Open
10	-32.10	0.01	0.00	Open
11	104.40	0.04	0.01	Open
13	139.06	0.07	0.07	Open
14	0.60	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	0.00	0.00	0.00	Open
20	0.00	0.00	0.00	Open
21	88.31	0.05	0.04	Open
22	-117.63	0.04	0.03	Open
23	52.91	0.01	0.00	Open
26	0.00	0.00	0.00	Open
27	0.00	0.00	0.00	Open
28	0.00	0.00	0.00	Open
29	-0.01	0.00	0.00	Open
31	-0.01	0.00	0.00	Open
32	-24.70	0.01	0.00	Open
33	-32.10	0.01	0.00	Open
39	24.70	0.02	0.02	Open
40	7.40	0.01	0.00	Open

				AVERAGE DAY
17	34.66	0.01	0.00	Open
24	-34.66	0.02	0.01	Open
12	0.00	0.00	0.00	Open
25	88.31	0.05	0.07	Open
15	170.53	0.06	0.63	Open Valve
16	83.60	0.04	0.62	Open Valve

```
*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                        Version 2.0                                *
*********************************************************************
```

Input File: 2020-07-09_1178_ggg_ff.net

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm	
1	5	6	270	200	
2	15	7	130	200	
3	10	8	130	300	
4	7	209	15	150	
5	7	11	190	200	
6	8	24	98	300	
7	HYD4	11	17	300	
8	11	HYD7	17	300	
9	hyd	HYD7	3	150	
10	100	HYD7	39	300	
11	HYD4	14	76	250	
13	14	207	48.45	200	
14	207	EX1	8.57	150	
18	20	18	24.2	300	
19	21	7	1.5	200	
20	8	210	1.5	150	
21	207	HYD6	21.15	200	
22	211	24	8.9	250	
23	24	HYD4	4.2	300	
26	205B	30	1.9	300	
27	30	HYD5	0.65	150	
28	30	28	27.55	300	
29	28	36	16.4	300	
31	36	9	17.8	300	
32	9	2	42.7	300	
33	2	100	9.5	300	
39	9	205A	15	150	
40	2	208	15	150	
17	211	16	75	250	
24	14	16	108	200	
12	206	18	40.27	200	
25	HYD6	206	2	200	
15	4	10	#N/A	250	Valve
16	6	15	#N/A	200	Valve

Node Results:

Node ID	Demand LPM	Head m	Pressure m	Quality
hyd	0.00	76.43	22.28	0.00
HYD7	5678.00	76.43	22.33	0.00
6	0.00	94.14	40.24	0.00
7	0.00	84.99	30.99	0.00
8	0.00	84.00	30.00	0.00
209	0.00	84.99	30.69	0.00
11	0.00	77.52	24.12	0.00
HYD4	3966.00	77.94	24.54	0.00

MAX DAY + FIRE FLOW

100	0.00	76.10	21.75	0.00	
14	0.00	77.07	25.76	0.00	
207	75.22	73.11	19.72	0.00	
EX1	0.90	73.11	21.71	0.00	
18	0.00	70.72	16.57	0.00	
20	0.00	70.72	16.35	0.00	
21	0.00	84.99	30.99	0.00	
210	0.00	84.00	29.70	0.00	
211	124.46	78.41	25.22	0.00	
24	0.00	78.48	25.08	0.00	
28	0.00	75.20	20.44	0.00	
205B	0.00	74.94	20.90	0.00	
30	0.00	74.94	20.90	0.00	
HYD5	5678.00	68.91	14.54	0.00	
9	0.00	75.53	21.38	0.00	
2	0.00	75.95	21.60	0.00	
36	0.00	75.37	20.79	0.00	
205A	116.60	75.52	21.18	0.00	
208	11.20	75.95	22.11	0.00	
10	0.00	95.09	41.09	0.00	
15	0.00	91.50	37.23	0.00	
16	0.00	78.19	27.19	0.00	
206	219.37	70.72	17.87	0.00	
HYD6	5678.00	70.72	18.14	0.00	
4	-17001.89	103.00	0.00	0.00	Reservoir
5	-4545.87	107.00	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
1	4545.87	2.41	47.62	Open
2	4545.87	2.41	50.05	Open
3	17001.89	4.01	85.30	Open
4	0.00	0.00	0.00	Open
5	4545.87	2.41	39.30	Open
6	17001.88	4.01	56.31	Open
7	6937.93	1.64	24.19	Open

Link Results: (continued)

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
8	11483.80	2.71	64.35	Open
9	0.00	0.00	0.00	Open
10	-5805.80	1.37	8.48	Open
11	4027.60	1.37	11.43	Open
13	5973.49	3.17	81.60	Open
14	0.90	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	0.00	0.00	0.00	Open
20	0.00	0.00	0.00	Open
21	5897.37	3.13	112.99	Open
22	-2070.35	0.70	8.06	Open
23	14931.54	3.52	130.53	Open
26	0.00	0.00	0.00	Open
27	5678.00	5.36	9265.69	Open
28	-5678.00	1.34	9.71	Open
29	-5678.00	1.34	10.07	Open
31	-5678.00	1.34	8.78	Open
32	-5794.60	1.37	9.88	Open
33	-5805.80	1.37	16.06	Open
39	116.60	0.11	0.29	Open
40	11.20	0.01	0.00	Open

MAX DAY + FIRE FLOW

17	1945.89	0.66	3.02	Open
24	-1945.89	1.03	10.35	Open
12	0.00	0.00	0.00	Open
25	219.37	0.12	0.41	Open
15	17001.89	5.77	7.91	Open Valve
16	4545.87	2.41	2.64	Open Valve

```
*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                        Version 2.0                                *
*********************************************************************
```

Input File: 2020-07-14_1178_ggg_PEAK.net

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm	
1	5	6	270	200	
2	15	7	130	200	
3	10	8	130	300	
4	7	209	15	150	
5	7	11	190	200	
6	8	24	98	300	
7	HYD4	11	17	300	
8	11	3	17	300	
9	HYD7	3	3	150	
10	100	3	39	300	
11	HYD4	14	76	250	
13	14	207	48.45	200	
14	207	EX1	8.57	150	
18	20	18	24.2	300	
19	21	7	1.5	200	
20	8	210	1.5	150	
21	207	HYD6	21.15	200	
22	211	24	8.9	250	
23	24	HYD4	4.2	300	
26	205B	30	1.9	300	
27	30	HYD5	0.65	150	
28	30	28	27.55	300	
29	28	36	16.4	300	
31	36	9	17.8	300	
32	9	2	42.7	300	
33	2	100	9.5	300	
39	9	205A	15	150	
40	2	208	15	150	
17	211	16	75	250	
24	14	16	108	200	
12	206	18	40.27	200	
25	HYD6	206	2	200	
15	4	10	#N/A	250	Valve
16	6	15	#N/A	200	Valve

Node Results:

Node ID	Demand LPM	Head m	Pressure m	Quality
HYD7	0.00	105.97	51.82	0.00
3	0.00	105.97	51.87	0.00
6	0.00	107.45	53.55	0.00
7	0.00	106.00	52.00	0.00
8	0.00	105.99	51.99	0.00
209	0.00	106.00	51.70	0.00
11	0.00	105.97	52.57	0.00
HYD4	0.00	105.97	52.57	0.00

				PEAK HOUR	
100	0.00	105.97	51.62	0.00	
14	0.00	105.95	54.64	0.00	
207	135.41	105.90	52.51	0.00	
EX1	1.70	105.90	54.50	0.00	
18	0.00	105.87	51.72	0.00	
20	0.00	105.87	51.50	0.00	
21	0.00	106.00	52.00	0.00	
210	0.00	105.99	51.69	0.00	
211	224.02	105.97	52.78	0.00	
24	0.00	105.97	52.57	0.00	
28	0.00	105.97	51.21	0.00	
205B	0.00	105.97	51.93	0.00	
30	0.00	105.97	51.93	0.00	
HYD5	0.00	105.97	51.60	0.00	
9	0.00	105.97	51.82	0.00	
2	0.00	105.97	51.62	0.00	
36	0.00	105.97	51.39	0.00	
205A	176.70	105.96	51.62	0.00	
208	20.10	105.97	52.13	0.00	
10	0.00	106.02	52.02	0.00	
15	0.00	106.03	51.76	0.00	
16	0.00	105.96	54.96	0.00	
206	481.79	105.87	53.02	0.00	
HYD6	0.00	105.88	53.03	0.00	
4	-792.69	107.50	0.00	0.00	Reservoir
5	-247.04	107.50	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
1	247.04	0.13	0.20	Open
2	247.04	0.13	0.21	Open
3	792.69	0.19	0.25	Open
4	0.00	0.00	0.00	Open
5	247.03	0.13	0.18	Open
6	792.69	0.19	0.19	Open
7	-50.23	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
8	196.80	0.05	0.02	Open
9	0.00	0.00	0.00	Open
10	-196.80	0.05	0.02	Open
11	455.79	0.15	0.20	Open
13	618.90	0.33	1.14	Open
14	1.70	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	0.00	0.00	0.00	Open
20	0.00	0.00	0.00	Open
21	481.79	0.26	0.94	Open
22	-387.14	0.13	0.31	Open
23	405.56	0.10	0.12	Open
26	0.00	0.00	0.00	Open
27	0.00	0.00	0.00	Open
28	0.00	0.00	0.00	Open
29	0.00	0.00	0.00	Open
31	0.00	0.00	0.00	Open
32	-176.70	0.04	0.01	Open
33	-196.80	0.05	0.02	Open
39	176.70	0.17	0.63	Open
40	20.10	0.02	0.01	Open

				PEAK HOUR
17	163.12	0.06	0.03	Open
24	-163.12	0.09	0.10	Open
12	0.00	0.00	0.00	Open
25	481.79	0.26	1.93	Open
15	792.69	0.27	1.48	Open Valve
16	247.04	0.13	1.42	Open Valve

APPENDIX C

Wastewater Collection

3 Design of the Pumping Station

3.1 Sizing of the Wet Well

The existing wet well is proposed to be used for temporary pumping. The flow of the pumping station (13 L/s) will be accommodated by 1 duty and 1 standby pump, each of which will be able to handle the nominal inflow individually. For conceptual design purposes, a flow rate of 13 L/s was taken. The wet well capacity required to achieve a given pump cycle time can be calculated as follows:

$$V = \frac{T_c \cdot Q}{4}$$

Where:

V = Wet well volume in L;

T_c = Pump Cycle Time in seconds;

Q = Pump discharge rate in L/s.

For a pump cycle time of 5 minutes (i.e. a combined 12 starts per hour) the wet well volume can be calculated as:

$$V = \frac{T_c \cdot Q}{4} = \frac{300s \cdot 13\ L/s}{4} = 975L$$

Based on a 2.4 m diameter round wet well, and an allowance for equipment in the wet well, a live volume depth of 0.23 m is required. Hatch has, in the design allowed for a live wet well depth of 0.5 m, this will provide for less start stop cycles, and provide for somewhat better running times.

It is noted that Hatch has used a reduced cycle time from what Hatch usually uses since this is a temporary pumping station and pump rotation for longevity is not as much of an issue as in permanent pumping stations. For these small flow rates, pumps often have up to 30 allowable starts and stops per hour per pump. As such, the live wet well volume required could be considered conservative. As such the existing wet well is sufficient to have adequate pump cycle times to avoid overloading the pump motors.

3.2 Emergency Storage

DSEL has confirmed the overflow elevation / lowest level at which an overflow occurs at 50.5 m, refer to an email exchange between Hatch and the building consultant for the project, attached in Appendix 4.

The MOECP requires a minimum of 30 minutes of emergency storage for similar pumping stations. Hatch has provided for 30 minutes of storage, based on an overflow invert elevation of 50.0 m in the design of the system. The storage is a combination of the volumes available in MH's 100, 101 as well as 102, along with the pumping station itself. It requires one MH (100) to be upsized to 1800 mm to ensure adequate storage. The storage volume attainable is ~ 24,080 L, or approximately 31 minutes. Full calculations are attached to this report.

3.3 Sizing and Pressure Class of the Forcemain, and System Curve

The PPS is to pump an updated peak sanitary flow = 32.7 L/s . This flow is to be conveyed through twin forcemains. The TPS is to pump a peak WWF of 13 L/s, using the same forcemains. At present, the timeframe for which the temporary PS is to be used, is uncertain.

The MOECP Design Guidelines generally call for a design velocity of > 0.6 m/s for forcemains, with a range of 0.6 m/s to 1.1 m/s as minimum for self-cleansing. The velocity of sewage in the forcemain during normal operation should be in the range of 0.9 m/s to 1.5 m/s, as recommended in section 7.2.5.2 of the "Ottawa Sewer Design Guidelines". The forcemain should have a minimum nominal diameter of 100 mm, as specified in section 7.2.5.1 of the "Ottawa Sewer Design Guidelines".

In principle Hatch prefers to have velocities at the higher end of this spectrum and we often aim to achieve velocities at around 1.25 m/s and, in case of large forcemain diameters, even higher (at ~ 1.5 m/s). In part, this is as a result of larger forcemains being more susceptible to sedimentation issues (and more difficult re-suspending of sediment). However, especially on smaller forcemains (up to ~ 400 mm), maintaining higher velocities can become limiting from a friction perspective. As such, we prefer to have the overall forcemain velocity (in this case) at around 1.25 m/s, more so since there will be a not insignificant number of low points along the main, with an acceptable velocity range of ~ 1.0 m/s to 1.5 m/s at nominal flow.

For a flow of 32.7 L/s this would require a theoretical forcemain diameter range of ~ 166 mm to 204 mm (all ID) with an ideal diameter of 182 mm (ID). The forcemain design was based on PVC 200 mm SDR 26 – ID 201.2 mm.

For the interim PS, this would mean a nominal velocity of 0.41 m/s, which is below the requirements of the MOECP design guidelines, based on a firm flow rate of 13 L/s. While forcemains can operate at that velocity for quite some time, there should be some pre-cautions in the design of these to minimize the potential long term issues, which include:

- Minimizing low / high points along the forcemain route;
- Allowance for swabbing at the PS, and temporary swab catcher at the discharge manhole;
- There may be issues with residence times in the forcemain, at the given length. This could (depending on the discharge location and other flows in the downstream sewer) result in H_2S corrosion downstream of the discharge location.

The static head of this pumping station will range between 13.8 m and 14.3 m during normal operation, based on wet well volume as defined in Section 3.1 above and the forcemain discharge elevation of 60.83 m (pipe obvert). The following friction losses have been calculated for the forcemain, in accordance with City of Ottawa and MOE requirements, for a nominal flow of 13.0 L/s:

- Hazen Williams C (HW-C) = 110: 1.4 m;
- HW-C = 120: 1.2 m;
- HW-C = 130: 1.0 m.

A system curve has been calculated from 0 L/s to 30.0 L/s using the HW-C factors above for the 200 mm forcemain. Minor losses were estimated by allowing for a 'k' value of 15 for fittings and pipework inside the pumping station. This 'k' value results in an additional dynamic head of 0.13 m at a flow rate of 13.0L/s. A graph of the system curve is attached. (Appendix 1: Figure 1). The following lines have been plotted:

- Maximum static head, and friction losses based on a HW-C of 110, along with minor losses;
- Intermediate static head, and friction losses based on a HW-C of 120, along with minor losses;
- Minimum static head, and friction losses based on a HW-C of 130, along with minor losses.

Windmill
Zibi - Ontario
Block 211
(Previous Approved Flows)

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2012

Site Area 1.234 **ha**

	Peak Flow
Extraneous Flow Allowances	0.4

Phase	Block	Type	Unit Rate		No. of Units	Average Flow (L/s)	Peaking Factor (-)	Peak Flow (L/s)
1	208	Office	75	L/p/d	105	0.1	1.5	0.1
1	208	Retail	5	L/m^2/d	736	0.1	1.5	0.1
1	205A	Res	474.6	L/unit/d	71	0.4	3.6	1.4
1	205A	Retail	5	L/m^2/d	754	0.1	1.5	0.1
2	207	Office	75	L/p/d	544	0.5	1.5	0.7
2	207	Retail	5	L/m^2/d	644	0.1	1.5	0.1
2	207	Restaurant	125	L/seat/d	300	0.4	1.5	0.7
3	211	Office	75	L/9.3m^2/d	14480	1.4	2.5	3.4
3	211	Retail	2.5	L/m^2/d	1082	0.0	3.5	0.1
1	EX1	Office	75	L/p/d	12	0.01	1.50	0.02
					Total	**3.0**		**6.8**
					Total Wetweather Flow Estimate			**7.2**

Notes:
* Development stats per Windmill schedule dated 2016-02-01 and additional information received via email 2016-02-08.
* Office unit rate per Ontario Building Code 8.2.1.3.B. assuming 9.3m^2/p
* Residential Unit rate assuming 70% one bedroom (1.4p/unit), 30% two bedroom (2.1 p/unit)
* Retail unit rate per City of Ottawa sewer design guidelines and assumes a 12 hour commercial operation

		P.F.
Estimated Total Residential Population	128	3.6

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2012

Site Area 2 **ha**

Extraneous Flow Allowances **Peak Flow** 0.7

Phase	Block	Type	Unit Rate		No. of Units	Average Flow (L/s)	Peaking Factor (-)	Peak Flow (L/s)
1	208	Office	75	L/9.3m^2/d	2,527	0.2	1.5	0.4
1	205A	Res	280	L/p/d	127	0.4	3.4	1.4
1	205A	Retail	2.8	L/m^2/d	750	0.0	1.5	0.0
2	211	Office	75	L/9.3m^2/d	14,480	1.4	1.5	2.0
2	211	Retail	2.8	L/m^2/d	1,082	0.0	1.5	0.1
3	207	Office	75	L/9.3m^2/d	6,451	0.6	1.5	0.9
3	207	Retail	2.8	L/m^2/d	575	0.0	1.5	0.0
3	207	Restaurant	125	L/seat/d	150	0.2	1.5	0.3
4	206	Res	280	L/p/d	447	1.4	3.4	4.9
4	206	Retail	2.8	L/m^2/d	799	0.0	1.5	0.0
1	EO	Office	75	L/p/d	10	0.01	1.50	0.01
1	ZIBI	Office	75	L/p/d	20	0.02	1.50	0.03
					Total	**4.4**		**10.0**
					Total Wetweather Flow Estimate			**10.7**

Notes:
* Energy Ottawa office - 10 p per Energy Ottawa email dated July 21, 2017.

Development Statistic Summary:

Block 208

Office	2527			

Block 205A

Retail	750			
Residential			p/unit	p
1 Bedroom	33	units	1.4	46
2 Bedroom	37	units	2.1	78
3 Bedroom	1	units	3.1	3

Block 211: 2020-02-05 REV 4, KPMB / Adamson Architect

Retail	1082	m^2
Office	14480	m^2

Block 207

Office	6451	m^2
Retail	575	m^2
Restaurant	582	m^2

Block 206

Standard Units			p/unit	p
1 Bedroom	95	units	1.4	133
2 Bedroom	64	units	2.1	134
Cohabitation Units				
	180	beds	1	180

		P.F.
Estimated Total Residential Population	574	3.4

Retail	799	m^2

SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

LOCATION			AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW* (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
Chaudiere West																											
Block 208			3.00			3.00					0.00		0.00		0.00	0.8	3.00	3.00	0.99	1.79							
Block 205a					121		121	3.6	1.40		0.00		0.00		0.00	0.3	0.00			1.70							
Block 207											0.00		0.00		0.00	1.1	0.00			1.10							
Block 206					447		447	3.4	4.92		0.00		0.00		0.00	1.1	0.00			6.02							
Block 204a											0.00		0.00		0.00	3.0	0.00			3.00							
Block 205b					114		114	3.6	1.32		0.00		0.00		0.00	0.4	0.00			1.72							
Block 204b					196		196	3.5	2.24		0.00		0.00		0.00	0.8	0.00			3.04							
Block 201					289		289	3.5	3.25		0.00		0.00		0.00	0.5	0.00			3.75							
Block 202					153		153	3.6	1.76		0.00		0.00		0.00	0.3	0.00			2.06							
Block 203					306		306	3.5	3.43		0.00		0.00		0.00	0.9	0.00			4.33							
Block 209											0.00		0.00		0.00	2.8	0.00			2.80							
Block 210											0.00		0.00		0.00	1.4	0.00			1.40							
Total to Zaida Eddy Private						3.00	1626									13.4	3.00										
Zaida Eddy Private																											
	102	101				3.00	1626	3.1	16.46		0.00		0.00		0.00	13.4	0.00	3.00	0.99	30.85	18.3	250	0.38	36.66	0.84	0.75	0.84
Block 213			0.28		340	3.28	1966	3.1	19.58		0.00		0.00		0.00	0.4	0.28	3.28									
Block 211	101	100	0.47			3.75	1966	3.1	19.58		0.00		0.00		0.00	17.5	0.47	3.75	1.24	38.32	14.8	250	0.60	46.06	0.83	0.94	1.05
	100	401A				3.75	1966	3.1	19.58		0.00		0.00		0.00	17.5	0.00	3.75	1.24	38.32	75.9	300	0.23	46.38	0.83	0.66	0.73
Block 212			0.55			4.30	1966				0.00		0.00		0.00	5.2	0.55	4.30									
Block 214						4.30	1966				0.00		0.00		0.00	1.7	0.00	4.30		0.00							
Block 215						4.30	1966				0.00		0.00		0.00	1.7	0.00	4.30		0.00							
	401A	402A				4.30	1966	3.1	19.58		0.00		0.00		0.00	26.1	0.00	4.30	1.42	47.10	61.5	300	0.44	64.14	0.73	0.91	0.99
	402A	SAN PS				4.30	1966	3.1	19.58		0.00		0.00		0.00	26.1	0.00	4.30	1.42	47.10	5.8	300	0.35	57.21	0.82	0.81	0.90

* Constant Inflow used for Office/Retail/Restaurant Space, refer to Sanitary Design Sheet prepared for the Master Servicing Study (DSEL Project# 14-717) dated June 2018

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764	l/s/Ha				
Average Daily Flow =	280	l/p/day			Industrial Peak Factor = as per MOE Graph			
Comm/Inst Flow =	28000	L/ha/da	0.3241	l/s/Ha	Extraneous Flow =	0.330	L/s/ha	
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha	Minimum Velocity =	0.600	m/s	
Max Res. Peak Factor =	4.00				Manning's n = (Conc)	0.013	(Pvc)	0.013
Commercial/Inst./Park Peak Factor =	1.50				Townhouse coeff=	2.7		
Institutional =	0.32	l/s/Ha			Single house coeff=	3.4		

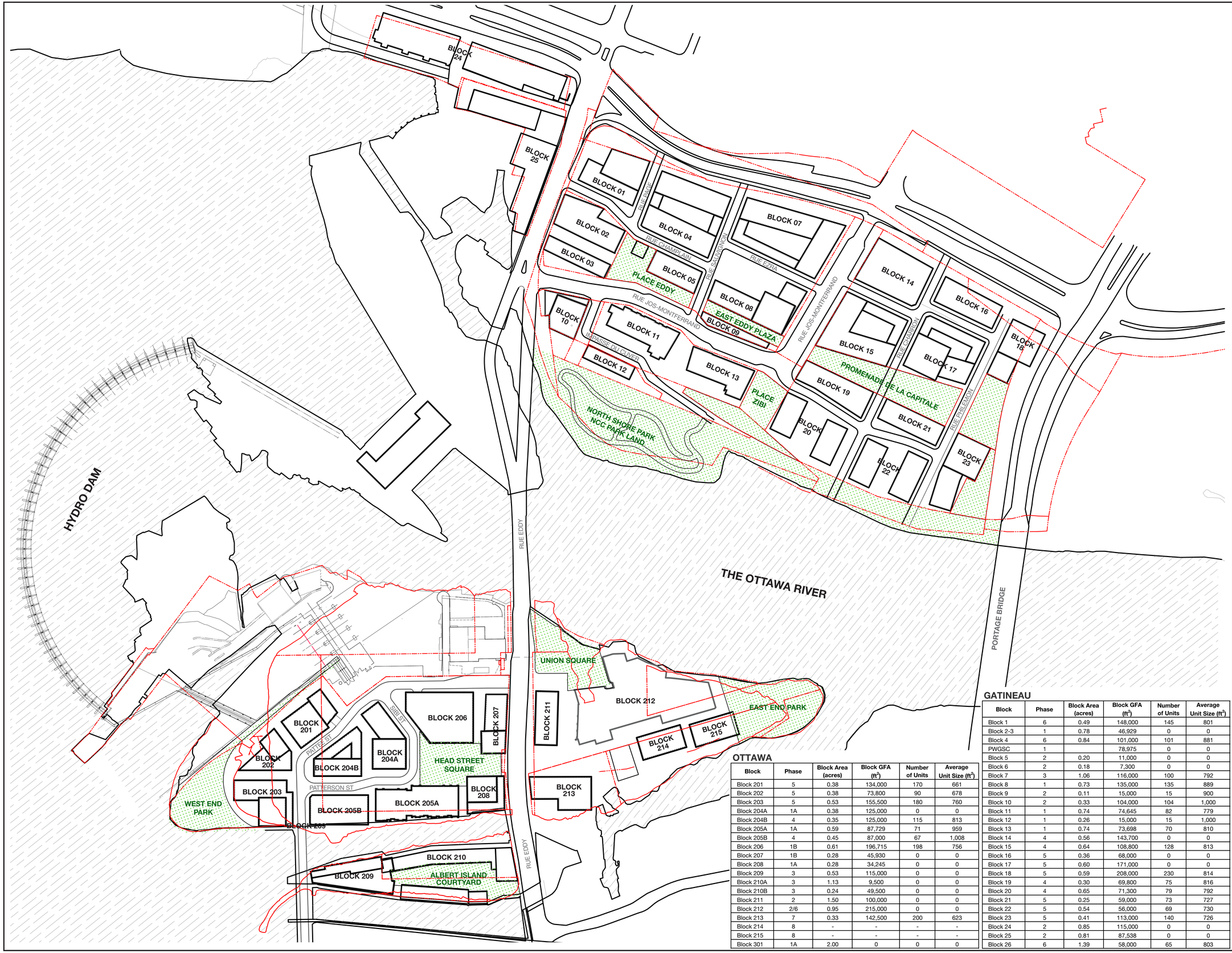
Designed:	PROJECT:		
Checked:	LOCATION: **City of Ottawa**		
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No.	File Ref:	Date: **7/13/2020**	Sheet No. 1 of 1

APPENDIX D

Stormwater Management

										Sewer Data								
Area ID	**Up**	**Down**	**Area**	**C**	**Indiv AxC**	**Acc AxC**	**T_C**	**I**	**Q**	**DIA**	**Slope**	**Length**	**$A_{hydraulic}$**	**R**	**Velocity**	**Qcap**	**Time Flow**	**Q / Q full**
			(ha)	**(-)**			**(min)**	**(mm/hr)**	**(L/s)**	**(mm)**	**(%)**	**(m)**	**(m^2)**	**(m)**	**(m/s)**	**(L/s)**	**(min)**	**(-)**
FUT	STM106	STM105	0.153	0.90	0.14	0.14	10.0	104.2	39.9	450	1.00	21.6	0.159	0.113	1.79	285.1	0.2	0.14
	STM105	STM104	0.000	0.85	0.00	0.14	10.2	103.1	39.5	450	1.10	10.7	0.159	0.113	1.88	299.0	0.1	0.13
104B			0.795	0.85	0.68													
206			0.159	0.90	0.14													
207	STM104	STM103	0.123	0.90	0.11	1.07	10.3	102.7	304.3	450	1.50	99.6	0.159	0.113	2.20	349.2	0.8	0.87
	STM103	STM102	0.000	0.00	0.00	1.07	11.1	98.9	293.3	525	0.60	29.1	0.216	0.131	1.54	333.1	0.3	0.88
	STM102	STM101	0.000	0.00	0.00	1.07	11.4	97.5	289.0	600	0.50	13.6	0.283	0.150	1.54	434.2	0.1	0.67
	STM101	HW100	0.000	0.00	0.00	1.07	11.5	96.8	287.0	600	0.50	21.3	0.283	0.150	1.54	434.2	0.2	0.66

DRAWINGS / FIGURES



NOTES

OTTAWA

Block	Phase	Block Area (acres)	Block GFA (ft^2)	Number of Units	Average Unit Size (ft^2)
Block 201	5	0.38	134,000	170	661
Block 202	5	0.38	73,800	90	678
Block 203	5	0.53	155,500	180	760
Block 204A	1A	0.38	125,000	0	0
Block 204B	4	0.35	125,000	115	813
Block 205A	1A	0.59	87,729	71	959
Block 205B	4	0.45	87,000	67	1,008
Block 206	1B	0.61	196,715	198	756
Block 207	1B	0.28	45,930	0	0
Block 208	1A	0.28	34,245	0	0
Block 209	3	0.53	115,000	0	0
Block 210A	3	1.13	9,500	0	0
Block 210B	3	0.24	49,500	0	0
Block 211	2	1.50	100,000	0	0
Block 212	2/6	0.95	215,000	0	0
Block 213	7	0.33	142,500	200	623
Block 214	8	-	-	-	-
Block 215	8	-	-	-	-
Block 301	1A	2.00	0	0	0

GATINEAU

Block	Phase	Block Area (acres)	Block GFA (ft^2)	Number of Units	Average Unit Size (ft^2)
Block 1	6	0.49	148,000	145	801
Block 2-3	1	0.78	46,929	0	0
Block 4	6	0.84	101,000	101	881
PWGSC	1		78,975	0	0
Block 5	2	0.20	11,000	0	0
Block 6	2	0.18	7,300	0	0
Block 7	3	1.06	116,000	100	792
Block 8	1	0.73	135,000	135	889
Block 9	2	0.11	15,000	15	900
Block 10	2	0.33	104,000	104	1,000
Block 11	1	0.74	74,645	82	779
Block 12	1	0.26	15,000	15	1,000
Block 13	1	0.74	73,698	70	810
Block 14	4	0.56	143,700	0	0
Block 15	4	0.64	108,800	128	813
Block 16	5	0.36	68,000	0	0
Block 17	5	0.60	171,000	0	0
Block 18	5	0.59	208,000	230	814
Block 19	4	0.30	69,800	75	816
Block 20	4	0.65	71,300	79	792
Block 21	5	0.25	59,000	73	727
Block 22	5	0.54	56,000	69	730
Block 23	5	0.41	113,000	140	726
Block 24	2	0.85	115,000	0	0
Block 25	2	0.81	87,538	0	0
Block 26	6	1.39	58,000	65	803

FOTENN PLANNING+DESIGN

ZIBI MASTER PLAN, OTTAWA
WINDMILL DEVELOPMENTS

SITE PLAN

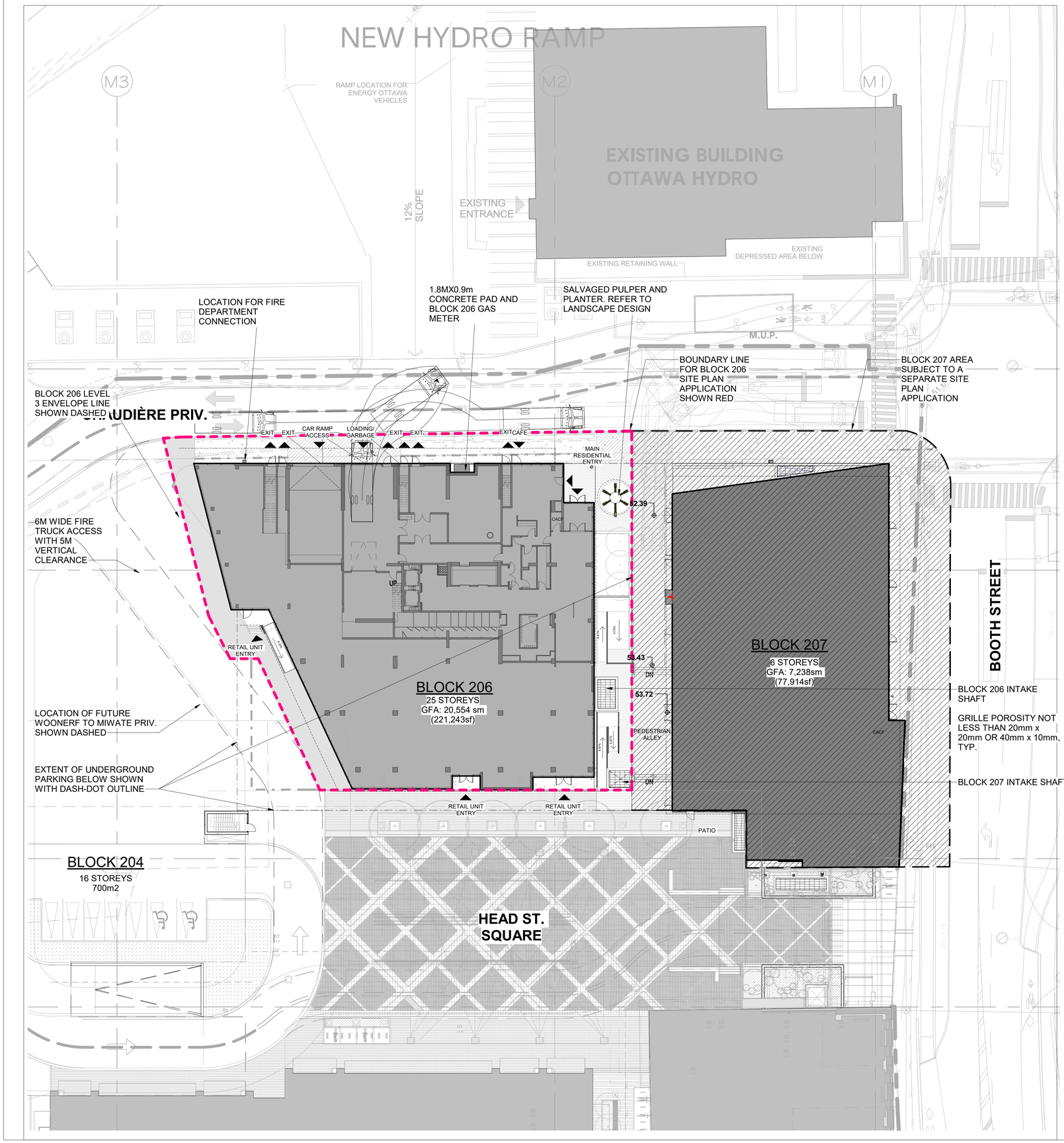
zibi
Windmill | dream

CREATED BY: MB

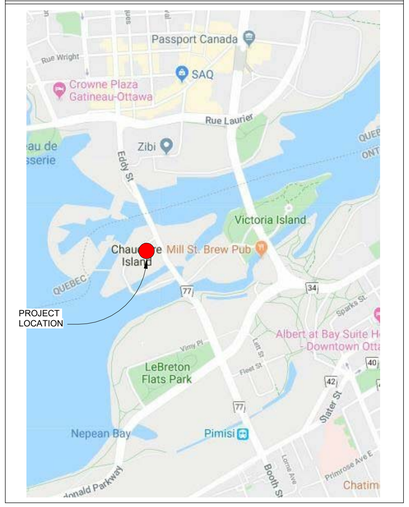
REVIEWED BY: PB

DATE: 13/12/2016

REVISION NO. 01



KEY MAP



SITE STATISTICS

BUILDING & SITE INFORMATION:

LOT AREA	2,189.23 sm (0.54 AC)
LOT FRONTAGE	57.8m
LOT DEPTH	44.3m
PROPOSED GFA	20,554sm(221,243 sf)
DENSITY (FSI)	GFA/LOT AREA = 9.4
COVERAGE:	
BUILDING COVERAGE:	LEVEL 1 AREA/LOT AREA =1599/2189.23 =0.73
PAVING (HARDSCAPING):	PAVING AREA/LOT AREA =376.0/2189.23= 0.17
LANDSCAPING (SOFTSCAPING):	LANDSCAPE AREA/ LOT AREA=36.8/2189.23=0.017
No. OF STOREYS:	25
HEIGHT:	75.07m

GROSS FLOOR AREA	UNITS	AREA(sm)	AREA (sf)
RETAIL:	1	799sm	(8,603sf)
RESIDENTIAL:	204	15,017sm	(161,646sf)
TOTAL GFA:	205	15,816sm	(170,249sf)

AMENITY SPACES (INDOOR/OUTDOOR)

INDOOR AMENITY AREA = 2sm/UNIT	OUTDOOR AMENITY AREA = 2sm/UNIT
INDOOR REQUIRED: 408sm	OUTDOOR REQUIRED: 408sm
INDOOR PROPOSED: 994sm	OUTDOOR PROPOSED: 670sm

GREEN ROOF

AVAILABLE ROOF AREA: 1184sm
GREEN ROOF AREA REQUIRED: 1.4sm/Unit
GREEN ROOF AREA PROPOSED: 588sm (2.9sm/Unit)

PARKING SPACE RATES (BASED ON ZONING BY-LAW 2008-250)

RES. PARKING RATES	COMM. PARKING RATES
MAX 1.5 SPACES/UNIT	MAX 1 SPACES/100sm

RES. VISITORS PARKING RATES
MIN 0.1 SPACES/UNIT, MAX 30, EXCLUDING THE FIRST 12 UNITS

PARKING SPACES:	REQUIRED	PROPOSED
STALL DIMENSION	5.2m x 2.6m	5.2m x 2.6m
DRIVE AISLE WIDTH	6.0m	6.0m
RESIDENTIAL UNITS:	MAX 306 SPACES	54 SPACES
RESIDENTIAL UNITS (VISITOR):	MIN 19 SPACES, MAX 30	19 SPACES
RETAIL:	MAX 8 SPACES	8 SPACES
TOTAL SPACES:		81 SPACES

BICYCLE PARKING SPACE RATES (BASED ON ZONING BY-LAW 2008-250)

RES. DWELLING PARKING RATES	ROOMING RES. PARKING RATES
1.0/ RES UNIT	0.25/ RES UNIT
RETAIL PARKING RATES	
1.0/250sm	

BICYCLE PARKING SPACES:	REQUIRED	PROPOSED
RESIDENTIAL DWELLING:	159	159
ROOMING:	12	12
RETAIL:	3	3
TOTAL SPACES:	174	174

NOTE:
1. ALL SHORT TERM BICYCLE PARKING WILL BE LOCATED AT GRADE

LOADING SPACE RATES (BASED ON ZONING BY-LAW 2008-250)

LOADING SPACES:	REQUIRED	PROPOSED
RESIDENTIAL:	0	1
COMMERCIAL:	0	1

SURVEY INFORMATION

PLAN SURVEY PART OF THE BED OF THE OTTAWA RIVER ADJACENT TO CHAUDIERE ISLAND AND ALBERT ISLAND IN FRONT OF LOT 40 CONCESSION A (BROKEN FRONT) , (PART OF WATER LOT LOCATION CL4467)

REGISTERED PLAN XXXX
CITY OF OTTAWA

PREPARED BY:
SURVEYOR STANTEC GROMATICS LTD.
1331 CLYDE AVENUE, SUITE 400
OTTAWA, ONTARIO, K2C 3G4
T: (613) 722-4420 F: (613) 722-2799

Kohn

Kohn Partnership Architects Inc.
116 Spadina Avenue, Suite 501, Toronto ON M5V 2K6
Tel 416.703.6700 www.kohnarchitects.com

Teeple Architects

5 CAMDEN STREET TORONTO, ONTARIO
416-598-0554-TEL FAX-416-598-1705
INFO@TEEPLEARCH.COM

ISSUE DATES AND DISTRIBUTION LOG

No.	Date	Note
1	TBD	ISSUED FOR SITE PLAN APPROVAL

zibi

dream theia

PRELIMINARY

PROJECT NORTH TRUE NORTH

SEA

Project:
ZIBI ONTARIO BLOCK 206

ZIBI

BOOTH STREET CHAUDIERE ISLAND

OTTAWA ONTARIO

Drawing Title:
SITE PLAN AND SITE STATISTICS

Drawn By:	Checked By:	Project No.
IM	AM	15-122

Date Plotted: 7/6/2020 4:12:35 PM
Scale: As indicated
Drawing No.: A1 01