REPORT
Project: 134437-6.0

DESIGN BRIEF
LILLYTHORNE ZENS 2
LEITRIM DEVELOPMENT AREA

Development Application File No. **D__-__-__-____**

Prepared for Claridge Homes
by IBI GROUP
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1 INTRODUCTION

1.1 Scope

IBI Group has been retained by Claridge Homes to prepare the necessary engineering plans, specifications and documents to support the proposed Site Plan Application for the subject lands in accordance with the policies set out by the Planning and Development Branch of the City of Ottawa. This Brief will present a detailed servicing scheme to support development of the property, and will include sections on water supply, wastewater management, minor and major stormwater management along with erosion and sediment control.

1.2 Subject Property

The subject property, known as Lillythorne Zens 2, is located within Clairdge's Lillythorne subdivision lands. The location of the Lillythorne subdivision within the Leitrim Development Area is shown on Figure 1 and the location of the subject lands within the Lillythorne subdivision is shown on Figure 2.

The proposed area to be developed as the Lillythorne Zens is approximately 1.30 Ha and is bound by Bank Street to the West, Findlay Creek Drive to the South, Kugagami Road to the east and existing commercial to the north.

The current architectural site plan, upon which this report is based, contains eight residential stacked townhouse blocks of various sizes for a total of 96 units along with associated landscaping, parking, vehicle access routes and pedestrian areas. The architectural site plan is shown on Figure 3.

1.3 Previous Studies

As noted above, the subject site is located within the Lillythorne subdivision area and as such the design on which numerous planning and engineering studies have been completed. Besides the Official Plan and zoning, significant to the subject site are the following:

- **Design Brief, Lilythorne, 4747-4755 and 4789 Bank Street, prepared by IBI Group April 2020**
  This approved report (*City File No. D07-16-17-0007*) demonstrates that storm, sanitary and water service allocations for the subject lands were included in the design of the subdivision.

It is the intention of this report to demonstrate that the proposed servicing for the subject lands will be completed in accordance with the approved Lillythorne subdivision report.

1.4 Geotechnical Considerations

One geotechnical report "Geotechnical Investigation, Proposed Residential Development, East of Bank Street and South of Analdea Drive, Ottawa, Ontario" dated November 2013, has been prepared by Golder Associates for the subject lands.

The objectives of the investigation were to prepare a report to:

- Determine the subsoil and groundwater conditions at the site by means of test pits and boreholes and;
- To provide geotechnical recommendations pertaining to design of the proposed development including construction considerations.

The report recommendations were based on the findings and observations from several boreholes and test pits. Among other items, the report recommendations deal with:

- Site grading;
- Foundation design;
- Pavement structure;
- Sewer and Watermain Construction;
- Groundwater Control;
- Grade Raises

The geotechnical investigation report confirmed that the site consists mostly of silt, sand, clayey silt and glacial till on top of limestone bedrock. These conditions will provide a suitable base for construction. No practical restrictions apply to grade raise thickness and service trench seepage barriers are recommended.

2 WATER SUPPLY

2.1 Existing Conditions

The primary source of water for the Leitrim Development Area (LDA) is the Ottawa South Pumping Station (OSPS) which is located approximately 1km north of Leitrim Road adjacent to the future rapid rail transit corridor.

There is an existing 250 mm diameter watermain on Findlay Creek Drive adjacent to the site. During construction of the Lilythorne development a 200 mm diameter watermain stub was installed to service this block.

2.2 Design Criteria

2.2.1 Water Demands

The site consist of eight apartment buildings with 12 units per building for a total of 96 units. A water demand has been calculated using the following data as per table 4.2 of the Ottawa Design Guidelines – Water Distribution.

- Apartment Units 1.8 person per unit
- Residential Average Day Demand 280 l/cap/day

A watermain demand calculation sheet is included in **Appendix A** and the total demands are summarized as follows;

- Average Day 0.56 l/s
- Maximum Day 1.40 l/s
- Peak Hour 3.08 l/s

The watermain demand calculation was forwarded to the city to determine the boundary conditions at the site, copy of the boundary conditions is included in **Appendix B** and summarized below.

	West Findlay Creek Drive Connection	East Findlay Creek Drive Connection
Maximum HGL	154.6	154.6
Peak Hour	144.5	144.5
Max Day + FireFlow (166.7 L/s)	125.0	123.9

2.2.2 System Pressures

The 2010 City of Ottawa Water Distribution Guidelines states that the preferred practice for design of a new distribution system is to have normal operating pressures range between 345 kPa (50 psi) and 552 kPa (80 psi) under maximum daily flow conditions. Other pressure criteria identified in the guidelines are as follows:

Minimum Pressure: Minimum system pressure under peak hour demand conditions shall not be less than 276 kPa (40 psi).

Fire Flow:	During the period of maximum day demand, the system pressure shall not be less than 140 kPa (20 psi) during a fire flow event.
Maximum Pressure:	Maximum pressure at any point in the distribution system shall not exceed 689 kPa (100 psi). In accordance with the Ontario Building/Plumbing Code the maximum pressure should not exceed 552 kPa (80 psi). Pressure reduction controls may be required for buildings where it is not possible/feasible to maintain the system pressure below 552 kPa.

2.2.3 Fire Flow Rate

The fire flow rate for the site is determined by the Fire Underwriters Survey (FUS) method in which the building construction type, type of occupancy, sprinkler system ands separation from adjacent building is considered. A calculation has been conducted for Building D, which has the greatest requirement for fire protection, resulting in a fire flow rate of 10,000 l/min. A copy of the FUS calculations is included in *Appendix A*.

There is a fire route through the site. Fire protection is to be provided by the proposed hydrants on the fire route.

2.2.4 Hydraulic Model

Results of the hydraulic analysis are included in Appendix A with the results highlighted and summarized as follows:

Scenario	Zens 2
Basic Day Pressure (kPa)	585.50 to 593.83
Maximum Day plus Fire Flow Design Fire Flow (l/s)	348.40 to 362.03
Peak Hour Pressure (kPa)	486.52 to 494.86

At all nodes, the basic day pressure is greater than 552 kPa; therefore, pressure reducing valves are required for the residential units. All nodes exceed the required fire flow of 166.7 l/s (10,000 l/min) and the peak hour pressures are above the minimum valve of 275 kPa.

2.3 Proposed Water Plan

The proposed watermain locations and sizes are shown on the site servicing plan Drawing C-001 General Plan of Services. As stated in Section 2.1 the site is serviced by an existing 200 mm diameter stub off of the 250 mm diameter watermain on Findlay Creek Drive. A second connection to the Findlay Creek Drive watermain is to be made at the second entrance in order to provide a loop for the water.

3 WASTEWATER DISPOSAL

3.1 Existing Conditions

The Leitrim Pump Station is the wastewater outlet for all developed lands within the LDA, including the subject property. As noted in section 1.3 above the sanitary sewer design for the subject lands are to be in accordance with the approved Lillythorne subdivision servicing report. The sanitary drainage area plan and sanitary sewer design sheet from the Lillythorne subdivision has been included in **Appendix B**. The subject lands are identified as BLK13201AN on the aforementioned subdivision documents. During construction of the Lillythorne subdivision a 200mm sanitary service stub from the sewer located within Findlay Creek Drive was left to service the subject lands.

3.2 Design Criteria

The sanitary sewers for the subject site will be based on the City of Ottawa design criteria. It should be noted that the sanitary sewer design for this study incorporates the latest City of Ottawa design parameters identified in Technical Bulletin ISTB-2018-01. Some of the key criteria will include the following:

- Demand per capital — 280 litres/person/day
- Peaking factor — Harmon formula where K=0.8
- Infiltration allowance — 0.33 l/s/ha
- Velocities — 0.60 m/s min. to 3.0 m/s max.

3.3 Recommended Wastewater Plan

The on-site sanitary system will consist of a network of 200mm PVC sewers installed at normal depth and slope and will provide a service connections to each vertical stack of units. The sewers have been designed using the criteria noted above in section 3.2 and outlet via the connection to the sanitary sewer within the Findlay Creek Drive right of way. A copy of the sanitary drainage area plan 105202-400 and the sanitary sewer design sheet can be found in **Appendix B.** Please refer to the site servicing plan 134437-C-001 in **Appendix E** for further details.

4 SITE STORMWATER MANAGEMENT

4.1 Objective

The purpose of this evaluation is to prepare the dual drainage design, including the minor and major system, for the proposed site. The design includes the assignment of inlet control devices, on-site storage, and maximum depth of surface ponding. The evaluation takes into consideration the City of Ottawa Sewer Design Guidelines (OSDG) (October 2012), the February 2014 Technical Bulletin ISDTB-2014-01, the September 2016 Technical Bulletin PIEDTB-2016-01 and the June 2018 Technical Bulletin ISTB-2018-04.

4.2 Design Criteria

The stormwater system was designed following the principles of dual drainage, making accommodations for both major and minor flow.

Some of the key criteria include the following:

- Design Storm — 1:2 year return (Ottawa)
- Rational Method Sewer Sizing
- Initial Time of Concentration — 10 minutes
- Runoff Coefficients
  - Landscaped Areas — C = 0.30
  - Asphalt/Concrete — C = 0.90
  - Roof — C = 0.90
- Pipe Velocities — 0.80 m/s to 6.0 m/s
- Minimum Pipe Size — 250 mm diameter (200 mm CB Leads)

4.3 System Concept

The site was included with the stormwater management strategy of the approved Lilythorne at Findlay Creek subdivision as noted in section 1.3. As outlined within the Lilythorne at Findlay Creek Design Brief, the existing downstream storm infrastructure in the adjacent Findlay Creek Drive was design and constructed with capacity for the minor system flows from the subject lands. A copy of the Lilythorne at Findlay Creek storm drainage area plan 105202-500 has been included in **Appendix C** which identifies the subject lands as drainage area MU04. That report provided a summary of the flow allocation for the subject lands. A copy of the summary Table 5.4 is provided within **Appendix C** for reference. The minor system flow allocation for the subject lands is 268l/s per the approved Lilythorne at Findlay Creek Design Brief.

4.3.1 Dual Drainage Design

The dual drainage system proposed for the subject lands will accommodate both major and minor stormwater runoff. Minor flow from the subject site will be conveyed through the storm sewer network and discharge into the existing 600 mmØ trunk storm sewer in Findlay Creek Drive.

The balance of the surface flow not captured by the minor system will be conveyed via the major system. Where possible, storage will be provided in surface sags or low points within the roadway. Once the maximum storage is utilized, the excess flow will cascade to the next downstream street sag. Major flow up to 100-year storm event will be restricted and detained on-site except for 1

uncontrolled area. Emergency overflow will be directed towards Findlay Creek Drive and Kuqagami Road.

4.3.2 Proposed Minor System

Using the criteria identified in Section 4.2, the proposed on-site storm sewers were sized accordingly. A detailed storm sewer design sheet and the associated storm sewer drainage area plan is included in **Appendix C**. The General Plan of Services 134437-C-100, depicting all on-site storm sewers can be found in **Appendix E**.

4.4 Stormwater Management

4.4.1 Quality Control

As noted in the Design Brief for the Lilythorne at Findlay Creek subdivision (City File. No. D07-16-17-0007) the subject lands are tributary to the Expansion of the Findlay Creek Village Stormwater facility. This facility has been designed to provide quality control for the tributary lands as approved by the City of Ottawa, Ministry of Environment, Conservation and Parks.

4.4.2 Water Quantity Control

The subject site will be limited to the minor system release rate of 268 L/s as per the Lilythorne at Findlay Creek Design Brief. This will be achieved through a combination of inlet control devices (ICD's) at inlet locations and surface storage.

Surface flows in excess of the site's allowable release rate will be stored on site in strategic surface storage areas and gradually released into the minor system so as not to exceed the site's allocation.

The maximum surface retention depth located within the developed areas will be limited to 350mm during a 1:100 year event. A copy of the Site Grading Plan 134437-C-200 can be found in **Appendix C.**

Overland flow routes will be provided in the grading to permit emergency overland flow, in excess of the 100 year event, from the site.

At the southeast corner of the site the opportunity to capture and store runoff is limited due to grading constraints and building geometry. This area will discharge to Findlay Creek Drive uncontrolled. These locations are generally located at the perimeter of the site where it is necessary to tie into public boulevards and adjacent properties or in areas where ponding stormwater is undesirable.

4.5 Hydrological Evaluation

The hydrological analysis of the proposed dual drainage system was conducted using DDSWMM. This technique offers a single storm event flow generation and routing. Land use, selected modeling routines, and input parameters are discussed in the following sections. Model files are included on the CD enclosed in **Appendix C**. The main hydrological parameters for the subject site are summarized below.

Storms and Drainage Area Parameters

The main hydrology parameters are summarized below and in **Table 4.1**.

- **Design storms:** The site was evaluated using the following storms:
    - 2 year, 3 hour Chicago storm events with a 10 minute time step (for dual drainage evaluation, specifically to confirm no ponding after the storm event);

  - 100 year 3 hour Chicago storm event with a 10 minute time step (to confirm on-site storage requirements); and
  - 100 year 3 hour Chicago storm event + 20% increase in intensity with a 10 minute time step (for a stress test on major flow conveyance as per the City of Ottawa Sewer Design Guidelines).

- **Infiltration:** The selected infiltration losses are consistent with the City of Ottawa Sewer Design Guidelines. The Horton values are as follows: f_o = 76.2 mm/h, f_c = 13.2 mm/h, k = 0.00115 s^{-1}.

- **Area:** Catchment areas are based on the rational method drainage areas with some minor modifications for modelling purposes.

- **Imperviousness:** Imperviousness for the subject site is based on the rational method runoff coefficients as indicated within Drawing 500.

- **Width:** The catchment width was based on the conveyance route length of the drainage area and multiplied by two. The multiplier of two was only used if the drainage area had runoff contribution from both sides of the drainage area.

- **Slope:** The ground slope was based upon the average slope for both impervious and pervious area. Generally, the slope is approximately 2% (0.02 m/m). This assumes a slope of approximately 1% for impervious or road surfaces and 3% for pervious surfaces (lot grading).

- **Detention storage depth:** Detention storage depths of 1.57 mm and 4.67 mm were used for impervious and pervious areas, respectively.
- **Manning's roughness:** Manning's roughness coefficients of 0.013 and 0.25 were used for impervious and pervious areas, respectively.

- **Baseflow:** No baseflow components were assumed for any of the areas contributing runoff to the minor system.

- **Minor system capture:** The minor system capture is based on the ICD design. ICDs are incorporated into the design to maintain the allowable release rate into the existing downstream storm sewer system to protect the minor system from surcharge during infrequent storm events and to utilize the available on-site storage.

  The main hydrological parameters used in the DDSWWM model are summarized in **Table 4.1**. A CD of the model files is provided in **Appendix C**.

- **Major system storage and routing:** The subject site is comprised of parking areas and drive aisles. Flow is attenuated within low points with potential overflow cascading to the next segment downstream. The total volume at each low point, up to the overflow depth, is the maximum static storage.

  For areas with ponding, cascading overflow from a low point to a downstream segment utilizes the static storage available plus an additional amount of storage equivalent to the depth required for the flow to cascade over the downstream high point. The attenuation in street sags was evaluated to account for static storage and, if overflow occurs, dynamic storage. Within this report it is referred to as double routing.

  DDSWMM does not have a direct way of coding double routing since it does not allow the user to code dynamic storage over the high point. For this analysis, the method employed is

that recommended in the February 2014 City of Ottawa Technical Bulletin (PIEDTB-2016-01). It accounts for overflow from a street segment (regular static storage at a sag) being conveyed to a downstream dummy segment. In other words, a regular low point segment is provided with a downstream dummy segment for further flow attenuation to account for the dynamic ponding during overflow.

There are no drainage area attributes associated with the dummy segment since it is a segment solely for routing. In addition, there is no inflow to the minor system from these dummy segments. The overflow hydrograph from the upstream catchment is routed in the dummy segment to the next "real" downstream segment. The dummy segments have the following specific characteristics:

- Segment Length: Equivalent to the length of the maximum static storage from the street segment contributing to it.
- Road Type: Equivalent to the right-of-way characteristics from the segment contributing to it, but with a longitudinal slope of 0.01% (0.0001 m/m).

The dummy segments for major system routing have been applied to the analysis of the subject site. The segments are referenced as D1, D2, D3, etc. within the DDSWMM modelling file. The drainage area plan presented in **Drawing 500** does not show the dummy segments, but the DDSWMM output file shows the dummy segments immediately following the corresponding major segment which cascades into that dummy segment.

Rear yards were considered independently of street segments and rear yard catch basins were incorporated in the DDSWMM model. Simulations were based on the total interception of runoff by the storm inlets. This was done by specifying a one-to-one relationship between approach flow and capture flow. As per the Technical Bulletin (PIEDTB-2016-01), the effect of flow attenuation due to surface ponding in rear yards has been accounted for by utilizing a constant slope ditch/swale draining to the street. The ditch/swale has a minimum longitudinal slope of 1.5%, a maximum depth of 600mm, and side slopes of 3 horizontal to 1 vertical.

Table 4.1 DDSWMM Hydrological Parameters

DRAINAGE AREA ID	AREA (HA)	D/S SEGMENT ID	IMP RATIO [Tp (h)]	Segment Length (m)	Subcatchment WIDTH (M)	MINOR SYSTEM RESTRICTION (l/s)	AVAILABLE STATIC PONDING (M^3)
CB01	0.07	RYCB1	1.00	21	21	19	8.3
CB02	0.19	CB01	1.00	45	45	63	12.8
CB03	0.04	CB02	1.00	21	42	8	5.0
CB05	0.17	CB02	1.00	43	86	48	11.3
CB06	0.16	CB05	1.00	36	72	32	5
CB07	0.06	OFCDR	1.00	27	54	11	28
CB04	0.29	CB05	0.57	100	100	32	8
MH18*	0.11	OKR	0.64	64	64	13	20.3
MH21*	0.05	OKR	0.64	28	28	6	9
RYCB1**	0.09	OFCDR	0.57	52	52	23	73
RYCB2	0.05	CB07	0.57	44	44	6	N/A
UN2	0.03	OFCDR	0.29	6	12	N/A	N/A

Notes: * Underground storage available

** Dry pond storage available

4.6 Results of the Hydrological Evaluation

The allowable minor system release rate for the 1.31 Ha site is 268 L/s according to the previous Lilythorne at Findlay Creek Design Brief, See Table 5.4 in **Appendix C**. As noted in Section 4.4.2, a portion of the site will be left to discharge to Findlay Creek Drive uncontrolled. As per the detailed DDSWMM model, this uncontrolled area will contribute approximately 7 L/s to Findlay Creek Drive during the 100 year Chicago design storm. A portion of the flows to Findlay Creek Drive (UN2) will be accommodated by the next downstream sag from the overflow locations. Subcatchments UN2 and RYCB01 will be accommodated on Findlay Creek Drive at S13204A of the Lilythorne Design Brief, and the overflow from MH18 and MH21 will be accommodated at the subcatchment S13225A on Kuqagami Road.

Based on the flow allowance for the site, inlet control devices are proposed for the surface drainage. For the 100 year Chicago Storm, the sum of all the minor flow rates is controlled under the maximum allowable flowrate of 268 L/s. Table 4.2 summarizes the ICDs characteristics, refer to **Drawing C-010** for detailed calculations and orifice sizing.

Table 4.2 Summary of ICD

LOCATION	AREA (HA)	RELEASE RATE (L/S)	Head (M)	ICD
CB01	0.07	19	1.65	Standard IPEX MHF 83 mm Diameter
CB02	0.19	63	1.65	Standard IPEX MHF 152 mm Diameter
CB03	0.04	8	1.65	Custom HYDROVEX 100 VHV-1 limited at 8 l/s
CB05	0.17	48	1.65	Custom IPEX MHF 133 mm Diameter
CB06	0.16	32	1.65	Standard IPEX MHF 108 mm Diameter
CB07	0.06	11	1.65	Custom HYDROVEX 100 VHV-1 limited at 11 l/s
CB04	0.29	32	1.65	Standard IPEX MHF 108 mm Diameter
MH18	0.11	13	1.65	Custom HYDROVEX 100 VHV-1 limited at 13 l/s
MH21	0.05	6	1.65	Custom HYDROVEX 75 VHV-1 limited at 6 l/s
RYCB1	0.09	23	1.65	Custom IPEX MHF 92 mm Diameter
RYCB2	0.05	6	1.65	Custom HYDROVEX 75 VHV-1 limited at 6 l/s
UN2	0.03	0	N/A	N/A
TOTAL	**1.31**	**261**	-	

Notes:

The below **Table 4.3** summarizes the minor system capture for each subcatchment on the subject site for the 2 year, 3 hour Chicago storm events. The results demonstrate that there is no ponding on the block where the flow is controlled following the 2 year storm event.

Table 4.3 DDSWMM Hydrological Model Results for 2 Year 3 Hour Chicago

DRAINAGE AREA ID	MINOR SYSTEM RESTRICTION (l/s)	AVAILABLE STATIC STORAGE (m3)	MINOR SYSTEM CAPTURE	TOTAL STORAGE USED (m3)	OVERFLOW (l/s)
CB01	19	8.30	12	0.01	0
CB02	63	12.78	32	0.01	0
CB03	8	5.00	8	0.01	0
CB05	48	11.32	31	0.01	0
CB06	32	5	29	0.01	0
CB07	11	28	11	0.02	0

DRAINAGE AREA ID	MINOR SYSTEM RESTRICTIO N (l/s)	AVAILABLE STATIC STORAGE (m3)	MINOR SYSTEM CAPTURE	TOTAL STORAGE USED (m3)	OVERFLOW (l/s)
CB04	32	8	29	0.01	0
MH18	13	20.30	13	0.02	0
MH21	6	8.93	6	0.01	0
RYCB1	23	73.00	10	0	0
RYCB2	6	N/A	6	N/A	0
UN2	0	N/A	N/A	N/A	2
OKR*	N/A	N/A	N/A	N/A	0
OFCDR**	N/A	N/A	N/A	N/A	2

Notes: * Sum of flows to Kugagami Road (MH18, MH21)
** Sum of flows to Findlay Creek Drive (CB07, RYCB1,UN2)

The **Table 4.4** and **Table 4.5** below, summarize the cascading overflows for each subcatchment on the subject site for the 100 year 3 hour Chicago storm event and the 100 year Chicago storm increased by 20%, respectively. The cascading overflow is the flow exiting a drainage area when maximum minor system inflow and maximum available ponding has been utilized. The overflow is obtained from the respective DDSWMM output file provided in **Appendix C**, CD model files.

Table 4.4 DDSWMM Hydrological Model Results for 100 Year 3 Hour Chicago

DRAINAGE AREA ID	MINOR SYSTEM RESTRICTIO N (l/s)	AVAILABLE STATIC STORAGE (m3)	MINOR SYSTEM CAPTURE	TOTAL STORAGE USED (m3)	OVERFLOW (l/s)
CB01	19	8.3	19	8.3	0.070
CB02	63	12.8	63	12.8	0.071
CB03	8	5.0	8	5.0	0.001
CB05	48	11.3	48	11.3	0.074
CB06	32	4.6	32	4.6	0.034
CB07	11	27.6	11	18.9	0
CB04	32	7.9	32	7.9	0.043
MH18	13	20.3	13	20.2	0
MH21	6	8.9	6	8.9	0
RYCB1	23	73.0	23	68.9	0
RYCB2	6	N/A	6	N/A	0.010
UN2	0	N/A	N/A	N/A	0.007
OKR*	N/A	N/A	N/A	N/A	0
OFCDR**	N/A	N/A	N/A	N/A	0.007

Notes: * Sum of flows to Kugagami Road (MH18, MH21)
** Sum of flows to Findlay Creek Drive (CB07, RYCB1,UN2)

The above results indicate that 7 L/s will flow uncontrolled to Findlay Creek Drive during the 100 year 3 hour Chicago design storm. This flow will be accommodated on the next Findlay Creek Drive downstream sag. The design respects the maximum allowable flow of 268 l/s (261 L/s is captured + 7 L/s uncontrolled) as is demonstrated in the 100 year 3 hour Chicago DDSWMM model provided in Appendix C.

Table 4.5 DDSWMM Hydrological Model Results for 100 Year 3 Hour Chicago +20%

DRAINAGE AREA ID	MINOR SYSTEM RESTRICTION (l/s)	AVAILABLE STATIC STORAGE (m3)	MINOR SYSTEM CAPTURE	TOTAL STORAGE USED (m3)	OVERFLOW (l/s)
CB01	19	8.3	19	8.3	0.134
CB02	63	12.8	63	12.8	0.131
CB03	8	5.0	8	5.0	0.002
CB05	48	11.3	48	11.3	0.119
CB06	32	4.6	32	4.6	0.048
CB07	11	27.6	11	27.6	0
CB04	32	7.9	32	7.9	0.065
MH18	13	20.3	13	20.3	0.018
MH21	6	8.9	6	8.93	0.007
RYCB1	23	73.0	23	73	0.137
RYCB2	6	N/A	6	N/A	0.015
UN2	0	N/A	N/A	N/A	0.009
OKR*	N/A	N/A	N/A	N/A	0.024
OFCDR**	N/A	N/A	N/A	N/A	0.145

Notes: * Sum of flows to Kugagami Road (MH18, MH21)
** Sum of flows to Findlay Creek Drive (CB07, RYCB1,UN2)

The above results indicate that the total major system flow from the site is 169 L/s during the 100 year 3 hour Chicago + 20% sensitivity analysis. Review of the downstream dual drainage system on Findlay Creek Drive and Kugagami Road indicates that this major system cascading flow will be accommodated within the downstream sags with an increase in water level of approximately 1 cm at Findlay Creek Drive and approximately 2 cm at Kuqagami Road. The impact on the downstream system of the total flow that exits the site was reviewed and the ponding doesn't negatively impact the adjacent properties (clearance is maintained). Table 5.8 of last Lilythorne at Findlay Creek submission highlights the affected location and is provided in Appendix C. Supporting information from the Lilythorne at Findlay Creek Design Brief including the Ponding Plan (105202-600) indicating ponding ID 204 on Findlay Creek Drive and ponding IDs 225, 225A on Kugagami Road, as well as the Lilythorne Zens development Velocity x Depth Calculation sheets are included within Appendix C for reference. Therefore, the proposed design will not have a negative impact on the existing downstream system.

The following table summarizes the elevation of dynamic ponding, property line elevation and the garage elevations for the street segments during the 100 year storm event increased by 20%.

Table 4.6 Critical Ponding Locations during the Stress Test and Adjacent Property Elevations

DRAINAGE AREA ID	STATIC PONDING DEPTH (M)	MAX. DEPTH (STATIC + DYNAMIC, WHERE APPLICABLE) (M)	(1) CORRESPONDING ELEVATION (M)	(2) ADJACENT PROPERTY LINE ELEVATION (M)*	DIFFERENCE (2) – (1)	(3) ADJACENT CRITICAL ELEVATION		DIFFERENCE (3) – (1)
						LOCATION	(3) ELEVATION (M)	
CB01	0.15	0.25	94.50	94.60	0.10	Building envelope	94.60	0.10
CB02	0.15	0.25	94.65	94.90	0.25	Building envelope	94.90	0.25
CB03	0.10	0.12	94.57	94.85	0.28	Building envelope	94.85	0.28
CB05	0.15	0.24	94.74	94.85	0.11	Building envelope	94.85	0.11
CB06	0.10	0.17	94.97	95.10	0.13	Building envelope	95.10	0.13
CB07	0.20	0.20	94.70	94.85	0.15	Building envelope	94.85	0.15
CB04	0.15	0.17	95.02	95.15	0.13	Building envelope	95.15	0.13
MH18	0.05	0.15	94.55	94.90	0.35	Building envelope	94.90	0.35
MH21	0.05	0.12	94.42	94.60	0.18	Building envelope	94.60	0.18
RYCB1	0.40	0.61	93.91	94.85	0.94	Building envelope	94.85	0.94
RYCB2	0.00	0.09	94.69	94.90	0.21	Building envelope	94.90	0.21
UN2	0.00	0.07	94.27	94.60	0.33	Building envelope	94.60	0.33

Notes: *Property boundary not available within site, lowest building envelope was used.

From the comparison in **Table 4.6**, during the 100 year storm event increased by 20%, the major system remains below the building opening at all locations.

5 APPROVALS AND PERMIT REQUIREMENTS

5.1 City of Ottawa

The City of Ottawa reviews all development documents including this report and working drawings. Upon completion, the City will approve the local watermains, under Permit No. 008-202, and issue a Commence Work Notification.

5.2 Province of Ontario

It is not anticipated that an Environmental Compliance Approval from the Ministry of Environment, Conservation and Parks (MECP) will be necessary for this site. The Ministry has already issued a Permit To Take Water that covered this block.

5.3 Federal Government

There are no required permits, authorizations or approvals needed expressly for this development from the federal government.

6 SEDIMENT AND EROSION CONTROL PLAN

6.1 General

During construction, existing stream and conveyance systems can be exposed to significant sediment loadings. Although construction is only a temporary situation, it is proposed to possibly introduce a number of mitigative construction techniques to reduce unnecessary construction sediment loadings. These may include:

- Until the local storm sewer is constructed, groundwater in trenches will be pumped into a filter mechanism prior to release to the environment;
- sediment capture filter socks will remain on open surface structures such as maintenance holes and catchbasins until these structures are commissioned and put into use; and
- silt fence on the site perimeter will be installed.

6.2 Trench Dewatering

Any trench dewatering using pumps will be discharged into a filter trap made up of geotextile filters and straw bales similar in design to the OPSD 219.240 Dewatering Trap. These will be constructed in a bowl shape with the fabric forming the bottom and the straw bales forming the sides. Any pumped groundwater will be filtered prior to release to the existing surface runoff. The contractor will inspect and maintain the filters as needed, including sediment removal and disposal and material replacement as needed. It should be noted that that the contractor will be responsible for the design and management of the trap(s).

6.3 Seepage Barriers

In order to further reduce sediment loading to the stormwater management facility, seepage barriers will be installed on any surface water courses at appropriate locations that may become evident during construction. These barriers will be Light Duty Straw Bale Barriers per OPSD 219.100 and Heavy Duty Silt Fence Barriers per OPSD 219.130; locations are shown on the Sediment and Erosion Control Plan included in **Appendix D**. They are typically made of layers of straw bales or geotextile fabric staked in place. All seepage barriers will be inspected and maintained as needed.

6.4 Surface Structure Filters

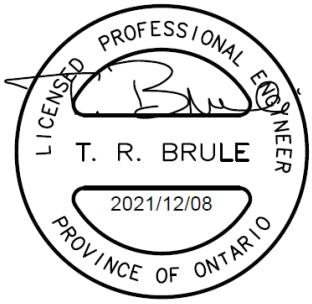
All catchbasins, and to a lesser degree, manholes, convey surface water to sewers. Until streets are asphalted and curbed, all catchbasins and manholes will be constructed with sediment capture inserts or equivalent located between the structure frame and cover. These will stay in place and be maintained during construction and build until it is appropriate to remove same.

7 CONCLUSION

This report has illustrated that the proposed Lillythorne Zens 2 block can be serviced via existing municipal services. The water network will be extended to provide necessary service. All sanitary and storm sewer designs for this development will be completed in conformance with City of Ottawa standards while acknowledging downstream constraints.

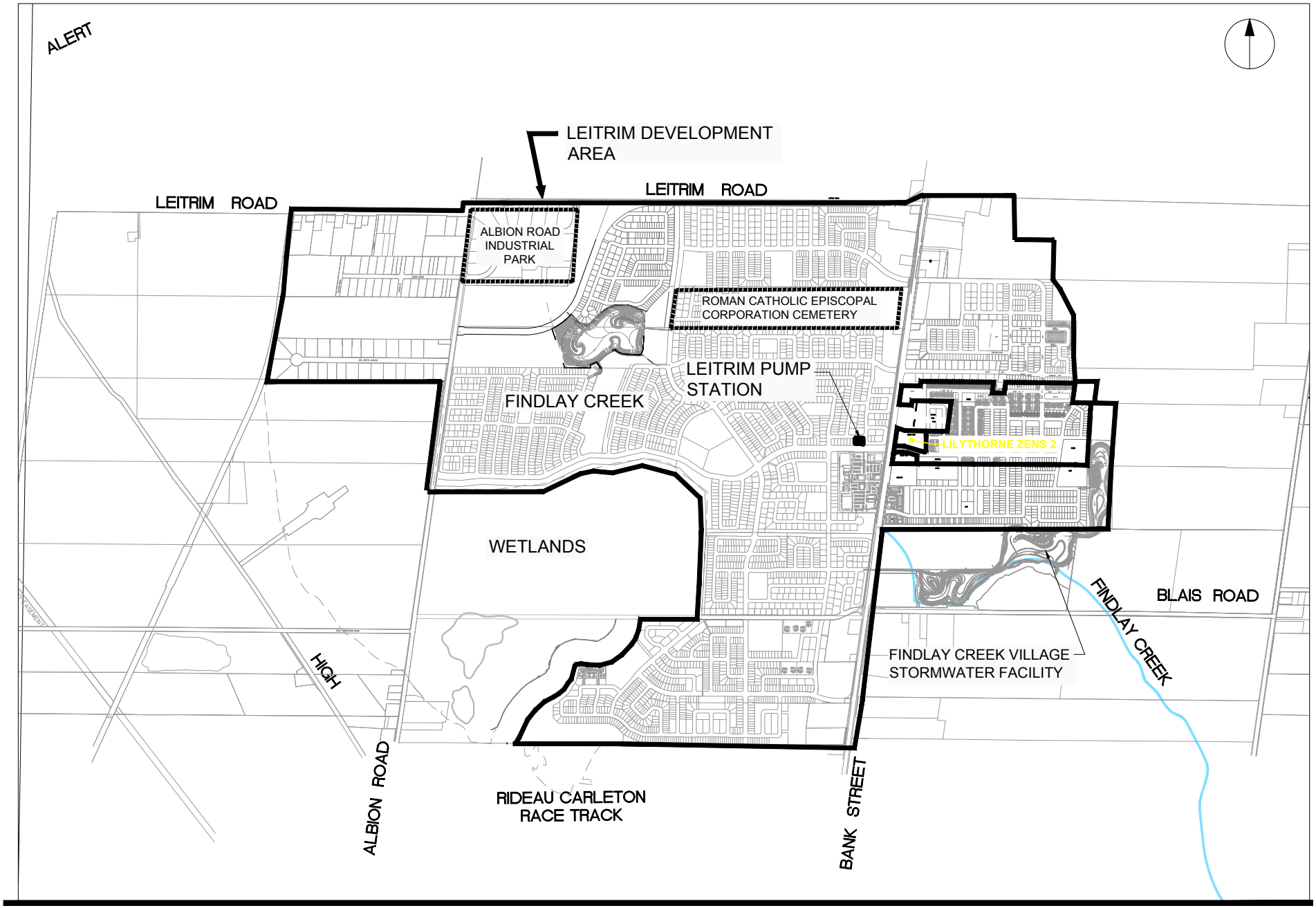
By limiting flow into the minor storm sewer system as per the applicable local stormwater management criteria and allowing for excess surface storage on-site, all stormwater management requirements will be met. Adherence to the Sediment and Erosion Control Plan during construction will minimize harmful impacts on surface water.

Based on the information provided within this report, the plans prepared for the subject development can be serviced to meet City of Ottawa requirements.



Terry Brule, P. Eng.
Associate

Peter Deir P. Eng.
Section 4 Only



J: \134437_Lilythorn\7.0_Production\7.03_Design\04_Civil_Land\Figures\FIGURE 1.dwg Layout Name: FIGURE 1

Scale	Project Title	Drawing Title	Sheet No.
NTS	LILYTHORNE ZENS 2	LOCATION WITHIN LEITRIM DEVELOPMENT AREA	FIGURE 1

LILYTHORNE

LILYTHONE ZENS 2

COWAN'S GROVE

BANK STREET

chemin Kugagami Road

bois Ovation Grove

ruelle Lemon Leaf Lane

voie Rotary Way

plateau Tahoe Heights

promenade Shuttleworth Drive

ruelle Rathburn Lane

chemin Gretsch Road

Future Street

Block 38

ruelle Alvarez Lane

cours Ibanez Walk

voie Odyssey Way

place Wooler Place

terrasse Highgarden Terrace

cote Rosales Ridge

promenade Findlay Creek Drive

placette Trident Mews

avenue Longworth Avenue

ruelle Wabasso Lane

terrasse Pisces Terrace

place Pergola Place

voie Islington Way

LEGEND:

PHASE LIMITS

Sheet No.

Drawing Title

LOCATION WITHIN LILYTHORNE SUBDIVISION

FIGURE 2

Project Title

LILYTHORNE ZENS 2

Scale

N.T.S.

IBI

J:\134437_Lilythorn\7.0_Production\7.03_Design\04_Civil_Land\Figures\FIGURE 3.dwg Layout Name: FIG 3 (2)

PROJECT INFORMATION

CURRENT ZONING	GM
Zoning By-Law 2017-113	
SITE AREA	13,025 sq. m. (140,203) sq. ft.
BUILDING HEIGHT	15.0 m.
AMENITY AREA PER DWELLING UNIT	6.0 sq. m.
LANDSCAPE AREA	46 %
FRONT YARD SETBACK	3.0 M
REAR YARD SETBACK	7.5 M
SIDE YARD SETBACK (BANK ST.)	3.0 M

PROJECT STATISTICS

BUILDING HEIGHT	11.0 M
REQUIRED AMENITY SPACE	
6 SQ. M. PER UNIT=	288 sq. m.
50% COMMUNAL AMENITY AREA =	144 sq. m.
PROVIDED AMENITY SPACE	
PRIVATE BALCONY / PATIOS =	361 sq. m.
COMMUNAL EXTERIOR AREA=	200 sq. m.
TOTAL =	561 sq. m.
SITE COVERAGE	
BUILDING FOOTPRINT = 26.5%	3,450.70 sq. m.
DRIVING SURFACE = 27.7%	3,608.87 sq. m.
LANDSCAPE AREA = 45.8%	5,965.78 sq. m.
TOTAL = 100.0%	13,025.45 sq. m.

CAR PARKING

REQUIRED by ZONING BY-LAW

RESIDENCE	- 1.2 PER UNIT (96 UNITS)	116
VISITOR	- 0.2 PER DWELLING UNIT	20
TOTAL		136
PROVIDED		
RESIDENCE	- 1.2 PER UNIT (96 UNITS)	116
VISITOR	- 0.2 PER DWELLING UNIT	20
TOTAL		136

BICYCLE PARKING

REQUIRED		
RESIDENCE	- 0.5 PER UNIT (96 UNITS)	48
PROVIDED		
EXTERIOR		48

PROJECT DEVELOPER

Claridge Homes
2001 - 201 Gladstone Avenue
Ottawa ON,
Tel.: (613) 233-6930
E-Mail:

LEGAL DESCRIPTION

TOPOGRAPHICAL PLAN OF
BLOCK 165
REGISTERED PLAN 4M-1370
CITY OF OTTAWA
Prepared by Annis, O'Sullivan, Vollebekk Ltd.
Field Work Completed December 12, 2017

SURVEYOR

Annis O'Sullivan Vollebekk Ltd.
Ontario Land Surveyors
14 Concourse Gate, Suite 500,
Nepean, Ontario K2E 7S6
Tel.: (613) 727-0850
Fax: (613) 727-1079
E-Mail: Edl_@sovltd.com

WASTE COLLECTION

GUIDELINES

GARBAGE	- 0.231 CUBIC YARDS / UNIT	23 YARDS^3
RECYCLING (SMP)	- 0.016 CUBIC YARDS / UNIT	2 YARDS^3
RECYCLING (FIBRE)	- 0.052 CUBIC YARDS / UNIT	6 YARDS^3
ORGANICS	- 240L CONTAINER /50 UNITS	2x 240L

	REQUIRED	PROVIDED
GARBAGE	6 STD BINS	6 STD BINS
RECYCLING (SMP)	1 STD BINS	1 STD BINS
RECYCLING (FIBRE)	2 STD BINS	2 STD BINS
ORGANICS	2x 240L BINS	2x 240L BINS
	*STD BINS= (4.0 YARDS^3)	

GROSS BUILDING - AREAS

(CITY OF OTTAWA'S DEFINITION)

PROPOSED BUILDING 'A'	1,290.5 sq. m. (13,889) sq. ft.
PROPOSED BUILDING 'B'	1,220.0 sq. m. (13,130) sq. ft.
PROPOSED BUILDING 'C'	1,220.0 sq. m. (13,130) sq. ft.
PROPOSED BUILDING 'D'	1,220.0 sq. m. (13,130) sq. ft.
PROPOSED BUILDING 'E'	1,220.0 sq. m. (13,130) sq. ft.
PROPOSED BUILDING 'F'	1,220.0 sq. m. (13,130) sq. ft.
PROPOSED BUILDING 'G'	1,290.5 sq. m. (13,889) sq. ft.
PROPOSED BUILDING 'H'	1,290.5 sq. m. (13,889) sq. ft.
TOTAL PROPOSED AREA	9,971.5 sq. m. (107,332) sq. ft.

UNIT STATISTICS

2 BEDROOM UNIT	96

DRAWING NOTES

1. PROPERTY LINE
2. BUILDING SETBACKS
3. REQUIRED AMENITY AREA
4. PARKING SPACE: STANDARD SIZE 2.6 x 5.2 METRES
5. PROPOSED HYDRO TRANSFORMER
6. ASPHALT DRIVING SURFACE
7. DEPRESSED CURB / SIDEWALK TO CITY STANDARDS
8. 1.8m WIDE CONCRETE SIDEWALK: TO CITY STANDARDS
9. BICYCLE PARKING SPACES WITH BOLLARD STYLE RACK
10. PROPOSED HYDRANT
11. EXISTING FIRE HYDRANT
12. DEPRESSED CURB WITH TACTILE WALKING SURFACE INDICATORS AS SHOWN
13. NOT IN USE
14. CONCRETE WALK / PATH
15. EARTH BINS
16. TEMPORARY SNOW STORAGE
17. NOT IN USE
18. EXISTING BELL BOXES
19. NEW 2130 ht. WOOD BOARD FENCE. SEE LANDSCAPE
20. TEMPORARY TREE PROTECTION FENCE. SEE LANDSCAPE
21. GUARD RAIL

1 SP-1 **SITE PLAN** SCALE = 1 : 300

SITE PLAN SYMBOLS

- CONCRETE UNIT PAVERS SURFACE
- SOFT LANDSCAPING
- CONCRETE WALK / PATH
- HEAVY DUTY CONCRETE PAD
- BIKE RACK
- TWO WAY VEHICLE CIRCULATION
- MAIN ENTRANCE
- PROPERTY LINE
- ZONING SETBACKS
- STANDARD PARKING SPACE
- VISITOR PARKING SPACE
- ACCESSIBLE PARKING SPACE
- COMMUNITY MAIL BOXES
- LANDSCAPE RISERS
- SITE UTILITIES (SEE COMPOSITE UTILITY PLAN)
- PROPOSED TREE (SEE LANDSCAPE PLAN)

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT.

ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS.

THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED BY THE ARCHITECT.

DO NOT SCALE DRAWINGS.

NOTATION SYMBOLS:

(00) INDICATES DRAWING NOTES, LISTED ON EACH SHEET.

(00) / 2000 DETAIL NUMBER / TITLE / DETAIL REFERENCE PAGE

No.	DESCRIPTION	DATE
2	ISSUED FOR COORDINATION	2021-04-14
1	ISSUED FOR COORDINATION	2021-03-12

REVISIONS:

ARCHITECT SEAL: ONTARIO ASSOCIATION OF ARCHITECTS RODERICK LAHEY LICENCE 4078 SEAL DATE: STAMP DATE

NORTH ARROW:

CLIENT: CLARIDGE HOMES

ARCHITECT: rla/architecture roderick lahey architect inc. 56 beech street, ottawa, ontario K1S 3J6 t.613.724.9932 f.613.724.1209 rlaarchitecture.ca

PROJECT TITLE: LILYTHORNE BLOCK 240 ZEN OTTAWA ONTARIO

SHEET TITLE: SITE PLAN

DRAWN:	CHECKED:
BIO	CM
SCALE: 1:300	SHEET No. SP-1
PROJECT No. 2105	

PAPER SIZE: A1 | PLOT DATE: Thursday, April 29, 2021 | PLOT SCALE: 1:25.4 | PEN STYLE: RLA.ctb | F:\2021\2105 - Lilythorne Block 240\01 Design Development\01 Site Plan\2105 Zen-Lilythorne Blk240 2021-04-27.dwg #____

Scale	Project Title	Drawing Title	Sheet No.
NTS	LILYTHORNE ZENS 2	ARCHITECTURAL SITE PLAN	FIGURE 3

APPENDIX A

IBI GROUP
333 PRESTON STREET
OTTAWA, ON
K1S 5N4

WATERMAIN DEMAND CALCULATION SHEET

PROJECT : Zens 2
LOCATION : Bank & Findlay Creek
DEVELOPER : Claridge Homes

FILE: 134437.6.04
DATE PRINTED: 08-Dec-21
DESIGN: SEL
PAGE : 1 OF 1

NODE	RESIDENTIAL UNITS SF	RESIDENTIAL UNITS TH	RESIDENTIAL UNITS MD	RESIDENTIAL POP'N	NON-RESIDENTIAL INDTRL (ha.)	NON-RESIDENTIAL INST. (ha.)	NON-RESIDENTIAL COMM. (m^2)	AVERAGE DAILY DEMAND (l/s) Res.	AVERAGE DAILY DEMAND (l/s) Non-res.	AVERAGE DAILY DEMAND (l/s) Total	MAXIMUM DAILY DEMAND (l/s) Res.	MAXIMUM DAILY DEMAND (l/s) Non-res.	MAXIMUM DAILY DEMAND (l/s) Total	MAXIMUM HOURLY Res.	MAXIMUM HOURLY Non-res.	MAXIMUM HOURLY Total	FIRE DEMAND (l/s)
Site			96	173				0.56	0.00	0.56	1.40	0.00	1.40	3.08	0.00	3.08	166.7

ASSUMPTIONS

RESIDENTIAL DENSITIES

Single Family	3.4 persons/unit
Townhouse	2.7 persons/unit
Medium Density	1.8 persons/unit

AVG. DAILY DEMAND

Residential	280 l / cap / day

MAX. DAILY DEMAND

Residential	700 l / cap / day

MAX. HOURLY DEMAND

Residential	1,540 l / cap / day

FIRE FLOW

Residential	10,000 l / min

Fire Flow Requirement from Fire Underwriters Survey

Building 'D' - 3 Storey Residential

Building Floor Area

Floors 1-3	1,320	m^2
Total	1,320	m^2

Fire Flow

$F = 220C\sqrt{A}$

C	1.0		C =	1.5 wood frame
A	1,320	m^2		1.0 ordinary
				0.8 non-combustile
F	7,993	l/min		0.6 fire-resistive
Use	8,000	l/min		

Occupancy Adjustment

		-25%	non-combustile
		-15%	limited combustile
Use	-15%	0%	combustile
		+15%	free burning
Adjustment	-1200 l/min	+25%	rapid burning
Fire flow	6,800 l/min		

Sprinkler Adjustment

		-30%	system conforming to NFPA 13
		-50%	complete automatic system
Use	0%		
Adjustment	0 l/min		

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north	10.2	12	2	24	10%
east	28	17	2	34	7%
south	6	18	3	54	16%
west	10.2	18	3	54	11%
Total					44%

Adjustment 2,992 l/min

Required Fire Flow

Total adjustments	2,992	l/min
Fire flow	9,792	l/min
Use	**10,000**	**l/min**
	166.7	**l/s**

Boundary Conditions
Claridge Zens 2

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	34	0.56
Maximum Daily Demand	84	1.40
Peak Hour	185	3.08
Fire Flow Demand #1	10,000	166.67
Fire Flow Demand #2	15,000	250.00

Location

Results – Existing Conditions

Connection 1 – Findlay Creek Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	154.6	85.9
Peak Hour	144.5	71.5
Max Day plus Fire 1	125.0	43.8
Max Day plus Fire 2	116.5	31.7

Ground Elevation = 94.2 m

Connection 2 – Findlay Creek Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	154.6	86.1
Peak Hour	144.5	71.7
Max Day plus Fire 1	123.9	42.5
Max Day plus Fire 2	114.3	28.7

Ground Elevation = 94.0 m

Results – SUC Zone Reconfiguration

Connection 1 – Findlay Creek Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.0	75.1
Peak Hour	143.6	70.3
Max Day plus Fire 1	137.7	61.8
Max Day plus Fire 2	131.2	52.6

Ground Elevation = 94.2 m

Connection 2 – Findlay Creek Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.0	75.3
Peak Hour	143.6	70.5
Max Day plus Fire 1	136.6	60.6
Max Day plus Fire 2	128.9	49.6

Ground Elevation = 94.0 m

Notes

1. As per the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi.) Pressure control measures to be considered are as follows, in order of preference:
    a. If possible, systems to be designed to residual pressures of 345 to 552 kPa (50 to 80 psi) in all occupied areas outside of the public right-of-way without special pressure control equipment.
    b. Pressure reducing valves to be installed immediately downstream of the isolation valve in the home/ building, located downstream of the meter so it is owner maintained.

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. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

Zens 2 - Average Day - Junction Pressure Graph

Zens 2 - Average Day - Junctions

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J10	0.00	94.20	154.60	591.87
2	☐	J12	0.07	94.60	154.60	587.95
3	☐	J14	0.07	94.60	154.60	587.95
4	☐	J16	0.07	94.85	154.60	585.50
5	☐	J18	0.07	94.70	154.60	586.97
6	☐	J22	0.07	94.70	154.60	586.97
7	☐	J24	0.00	94.60	154.60	587.95
8	☐	J26	0.00	94.80	154.60	585.99
9	☐	J28	0.07	94.55	154.60	588.44
10	☐	J30	0.07	94.55	154.60	588.44
11	☐	J32	0.07	94.60	154.60	587.95
12	☐	J34	0.00	94.00	154.60	593.83

Zens 2 - Max Day + Fire 10000 - Fireflow

		ID	Total Demand (L/s)	Hydrant Available Flow (L/s)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (kPa)	Critical Node Pressure at Fire Demand (kPa)	Critical Pressure for Design Run (kPa)	Hydrant Design Flow (L/s)	Hydrant Pressure at Design Flow (kPa)
1	☐	J24	166.70	348.40	J24	139.96	252.85	139.96	348.40	139.96
2	☐	J26	166.70	362.03	J26	139.96	255.14	139.96	362.03	139.96

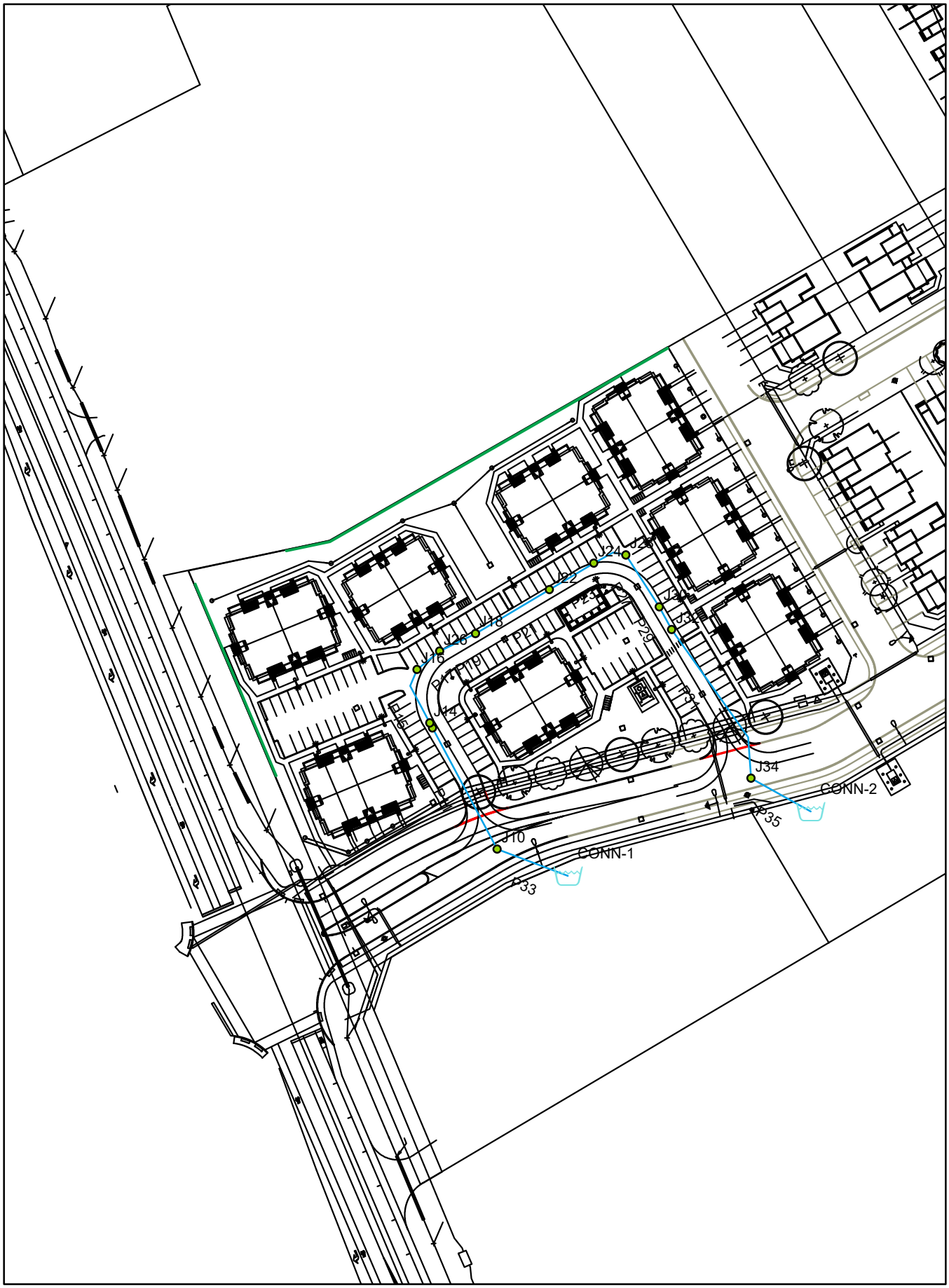
Zens 2 - Max Day + Fire 10000 - Residual Pressure Graph

Zens 2 - Max Day + Fire 15000 - Fireflow

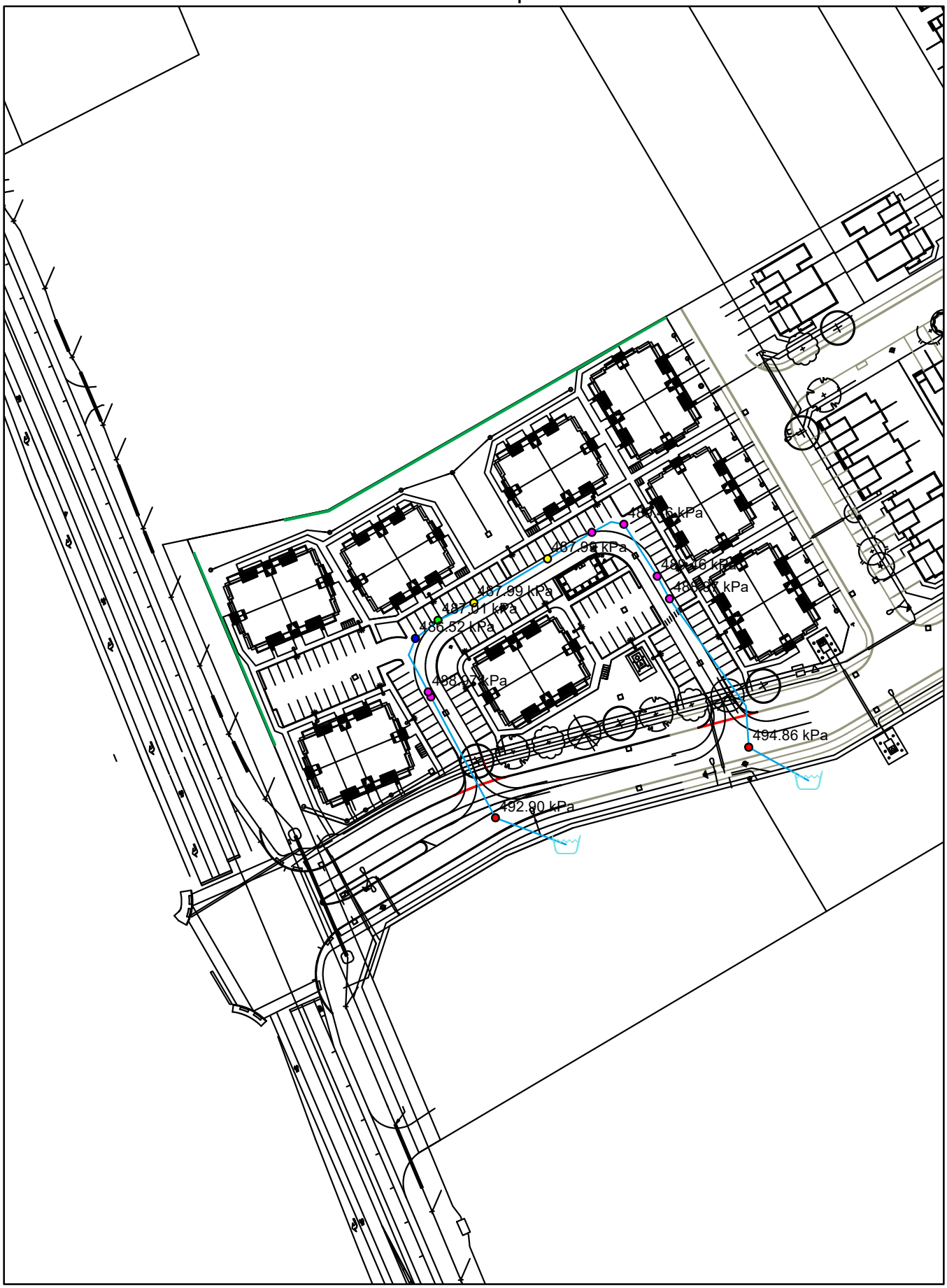
		ID	Total Demand (L/s)	Hydrant Available Flow (L/s)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (kPa)	Critical Node Pressure at Fire Demand (kPa)	Critical Pressure for Design Run (kPa)	Hydrant Design Flow (L/s)	Hydrant Pressure at Design Flow (kPa)
1	☐	J24	250.00	215.26	J24	139.96	120.19	139.96	215.26	139.96
2	☐	J26	250.00	226.01	J26	139.96	127.04	139.96	226.01	139.96

Zens 2 - Max Day + Fire 15000 - Residual Pressure Graph

Zens 2 - Node and Pipe Labelling



Zens 2 - Peak Hour - Junction Pressure Graph



Zens 2 - Peak Hour - Junctions

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J10	0.00	94.20	144.50	492.90
2	☐	J12	0.39	94.60	144.50	488.97
3	☐	J14	0.39	94.60	144.50	488.97
4	☐	J16	0.39	94.85	144.50	486.52
5	☐	J18	0.39	94.70	144.50	487.99
6	☐	J22	0.39	94.70	144.50	487.99
7	☐	J24	0.00	94.60	144.50	488.97
8	☐	J26	0.00	94.80	144.50	487.01
9	☐	J28	0.39	94.55	144.50	489.46
10	☐	J30	0.39	94.55	144.50	489.46
11	☐	J32	0.39	94.60	144.50	488.97
12	☐	J34	0.00	94.00	144.50	494.86

Zens 2 - Peak Hour - Pipes

		ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)	Status	Flow Reversal Count
1	☐	P11	J10	J12	37.00	203.00	110.00	1.65	0.05	0.00	0.03	Open	0
2	☐	P13	J12	J14	1.52	203.00	110.00	1.26	0.04	0.00	0.02	Open	0
3	☐	P15	J14	J16	16.17	203.00	110.00	0.87	0.03	0.00	0.01	Open	0
4	☐	P17	J16	J26	7.83	203.00	110.00	0.48	0.01	0.00	0.00	Open	0
5	☐	P19	J26	J18	10.76	203.00	110.00	0.48	0.01	0.00	0.00	Open	0
6	☐	P21	J18	J22	23.17	203.00	110.00	0.09	0.00	0.00	0.00	Open	0
7	☐	P23	J22	J24	13.95	203.00	110.00	-0.30	0.01	0.00	0.00	Open	0
8	☐	P25	J24	J28	9.41	203.00	110.00	-0.30	0.01	0.00	0.00	Open	0
9	☐	P27	J28	J30	16.65	203.00	110.00	-0.69	0.02	0.00	0.01	Open	0
10	☐	P29	J30	J32	6.95	203.00	110.00	-1.08	0.03	0.00	0.01	Open	0
11	☐	P31	J32	J34	46.66	203.00	110.00	-1.47	0.05	0.00	0.02	Open	0
12	☐	P33	J10	CONN-1	1.00	203.00	110.00	-1.65	0.05	0.00	0.03	Open	0
13	☐	P35	J34	CONN-2	1.00	203.00	110.00	-1.47	0.05	0.00	0.02	Open	0

APPENDIX B

IBI GROUP
400-333 Preston Street
Ottawa, Ontario K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

SANITARY SEWER DESIGN SHEET

Lillythorne Zens2
City of Ottawa
Claridge Homes

LOCATION				RESIDENTIAL										ICI AREAS								INFILTRATION ALLOWANCE			FIXED FLOW (L/s)		TOTAL FLOW	PROPOSED SEWER DESIGN						
				AREA w/ Units (Ha)	UNIT TYPES				AREA w/o Units (Ha)	POPULATION		RES PEAK FACTOR	PEAK FLOW (L/s)	AREA (Ha)						ICI PEAK FACTOR	PEAK FLOW (L/s)	AREA (Ha)		FLOW										
														INSTITUTIONAL		COMMERCIAL		INDUSTRIAL																
STREET	AREA ID	FROM MH	TO MH		SF	SD	TH	APT		IND	CUM			IND	CUM	IND	CUM	IND	CUM			IND	CUM	(L/s)	IND	CUM	(L/s)	CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (full) (m/s)	AVAILABLE CAPACITY L/s	AVAILABLE CAPACITY (%)
Site		MH22A	MH4A				12			32.4	0.0	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.19	50.28	200	0.50	0.746	24.19	100.00%
Site		MH21A	MH20A				6			16.2	16.2	3.71	0.19	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	24.19	30.78	200	0.50	0.746	24.00	99.19%
Site		MH20A	MH18A				3			8.1	24.3	3.69	0.29	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	24.19	28.98	200	0.50	0.746	23.90	98.80%
Site		MH19A	MH18A				3			8.1	32.4	3.68	0.39	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	24.19	28.72	200	0.50	0.746	23.81	98.40%
Site		MH18A	MH16A				12			32.4	64.8	3.63	0.76	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	24.19	27.29	200	0.50	0.746	23.43	96.85%
Site		MH17A	MH16A				9			24.3	89.1	3.61	1.04	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	48.39	30.30	200	2.00	1.492	47.35	97.85%
Site		MH16A	MH04A							0.0	89.1	3.61	1.04	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	24.19	12.06	200	0.50	0.746	23.15	95.70%
Site		MH04A	MH14A				3			8.1	97.2	3.60	1.13	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.13	24.19	35.77	200	0.50	0.746	23.06	95.32%
Site		MH15A	MH14A				12			32.4	129.6	3.57	1.50	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	59.26	29.68	200	3.00	1.828	57.77	97.47%
Site		MH14A	MH02A							0.0	129.6	3.57	1.50	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	24.19	33.27	200	0.50	0.746	22.70	93.80%
Site		MH24A	MH25A				3			8.1	137.7	3.56	1.59	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59	24.19	29.35	200	0.50	0.746	22.61	93.43%
Site		MH25A	MH03A				12			32.4	170.1	3.54	1.95	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95	34.22	39.89	200	1.00	1.055	32.27	94.30%
Site		MH10A	MH11A				6			16.2	186.3	3.53	2.13	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	2.13	24.19	28.91	200	0.50	0.746	22.07	91.20%
Site		MH11A	MH03A				3			8.1	194.4	3.52	2.22	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	2.22	24.19	29.33	200	0.50	0.746	21.98	90.83%
Site		MH03A	MH02A							0.0	194.4	3.52	2.22	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	2.22	24.19	8.69	200	0.50	0.746	21.98	90.83%
Site		MH02A	MH01A				12			32.4	226.8	3.50	2.57	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	2.57	24.19	29.68	200	0.50	0.746	21.62	89.36%
Site		MH01A	MH13201A							0.0	226.8	3.50	2.57	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	2.57	24.67	10.01	200	0.52	0.761	22.10	89.57%

Design Parameters:

Residential			ICI Areas			
SF	3.4	p/p/u	INST	28,000	L/Ha/day	
TH/SD	2.7	p/p/u	COM	28,000	L/Ha/day	
APT	1.8	p/p/u	IND	35,000	L/Ha/day	MOE Chart
Other	60	p/p/Ha		17000	L/Ha/day	

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 280 L/day 200 L/day
3. Infiltration allowance: 0.33 L/s/Ha
4. Residential Peaking Factor:
   Harmon Formula = 1+(14/(4+(P/1000)^0.5))0.8
   where K = 0.8 Correction Factor
5. Commercial and Institutional Peak Factors based on total area, 1.5 if greater than 20%, otherwise 1.0

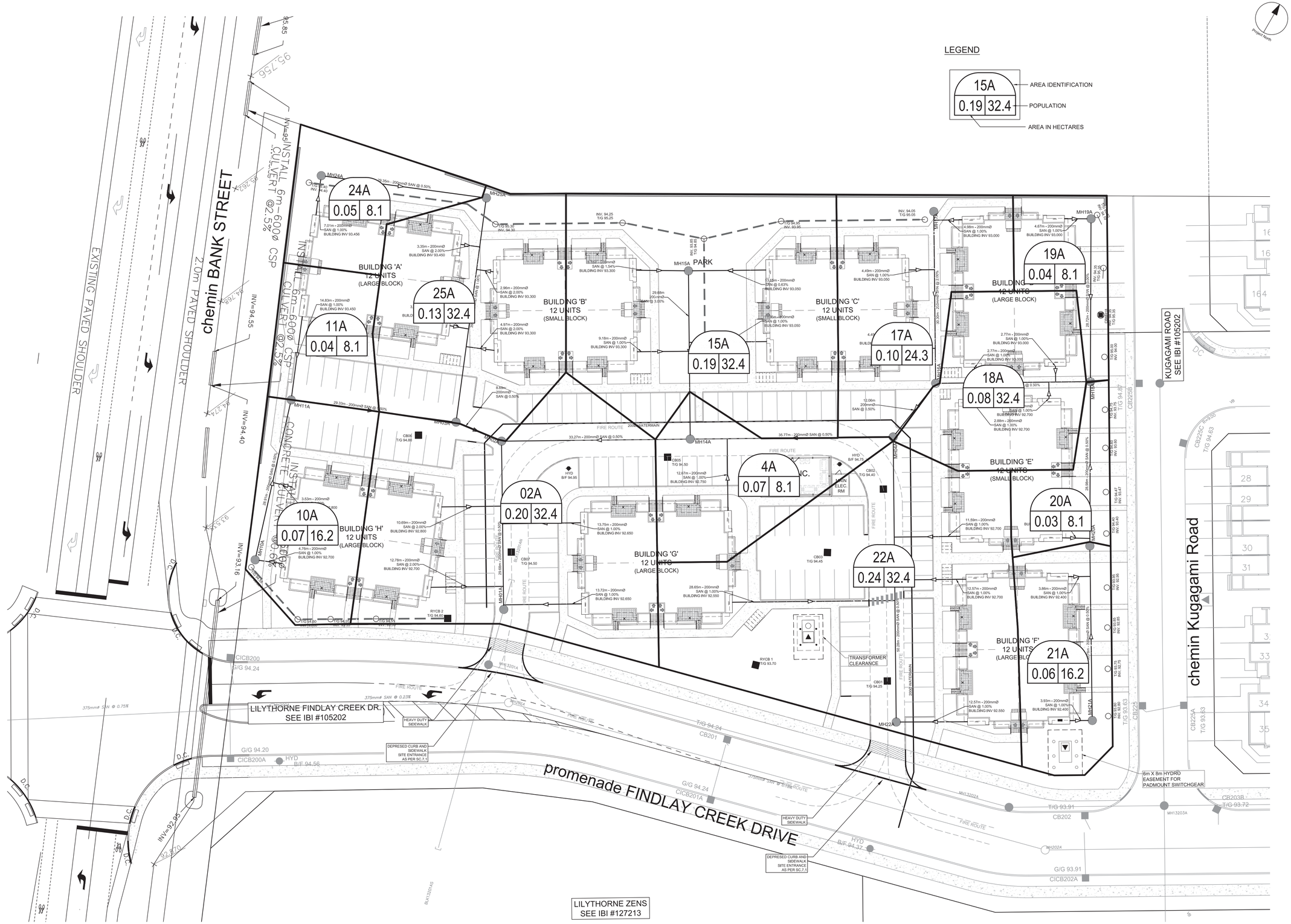
Designed: JEB

Checked: TRB

Dwg. Reference: 134437-C-001

No.	Revision	Date
1.	Issued for SPA	2021-12-08

File Reference: 134437.6.04 **Date:** 2021-12-08 **Sheet No:** 1 of 1



CLIENT
CLARIDGE HOMES

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR COORDINATION	2021.11.03
2	ISSUED FOR COORDINATION #2	2021.11.19
3	ISSUED FOR SPA	2021.12.06

NOT FOR CONSTRUCTION

SEE DRG. 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN


CONSULTANTS

Project Coordinator:
Claridge Homes
Architect:
RLA/ Architecture
Landscape:

Surveyor:

Geotech:
Paterson Group

1:300 0 3 9 15m

SEAL


IBI GROUP
Suite 400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
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ibigroup.com

PROJECT
LILYTHORNE ZENS 2

PROJECT NO: 134437

DRAWN BY:	CHECKED BY:
EH	TRB
PROJECT MGR:	APPROVED BY:
JB	TRB

SHEET TITLE
SANITARY DRAINAGE AREA PLAN

SHEET NUMBER	ISSUE
C-400	1

SCALE CHECK | DATE

CITY PLAN No. XXXXX

CITY FILE No. D07-XX-XX-XXXX

File Location: ..\134437_Lilythorn\7 0_Production\7.03_Design\04_Civil\Sheets\C-400 SANITARY DRAINAGE AREA PLAN.dwg Last Saved: December 9, 2021 by Eric Hennie Plotted: Thursday, December 9, 2021 1:24:16 PM by Eric Hennie

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LEGEND
MH13223A Potential Future Design (for information only)
EXMH138A Existing Infrastructure (for information only)

SANITARY SEWER DESIGN SHEET

Lilythorne at Findlay Creek
CITY OF OTTAWA
Claridge Homes

LOCATION				RESIDENTIAL										ICI AREAS							INFILTRATION ALLOWANCE			FIXED FLOW (L/s)		TOTAL FLOW	PROPOSED SEWER DESIGN						
				AREA	UNIT TYPES				AREA	POPULATION		PEAK	PEAK	AREA (Ha)						PEAK	AREA (Ha)		FLOW				CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE	
STREET	AREA ID	FROM MH	TO MH	w/ Units (Ha)	SF	SD	TH	APT	w/o Units (Ha)	IND	CUM	FACTOR	FLOW (L/s)	INSTITUTIONAL		COMMERCIAL		INDUSTRIAL		FLOW (L/s)	IND	CUM	(L/s)	IND	CUM	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	CAPACITY	
														IND	CUM	IND	CUM	IND	CUM												L/s	(%)
Future Street	*MH13223A*	*MH13223A*	*MH13224A*	*0.46*			*11*			*26.4*	*26.4*	*4.00*	*0.43*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.46*	*0.46*	*0.13*	*0.00*	*0.00*	*0.56*	*57.26*	*88.10*	*200*	*2.80*	*1.766*	*56.70*	*99.03%*
Existing Residential	*MU32*	*BLK132224AE*	*MH13224A*	*0.80*						*104.3*	*104.3*	*4.00*	*1.69*	*0.00*	*0.00*	*2.41*	*2.41*	*0.00*	*0.00*	*2.09*	*3.21*	*3.21*	*0.90*	*0.00*	*0.00*	*4.68*	*57.26*	*13.50*	*200*	*2.80*	*1.766*	*52.58*	*91.83%*
Kugagami Road	*MH13224A*	*MH13224A*	*BLK*	*0.29*			*8*			*19.2*	*149.9*	*4.00*	*2.43*	*0.00*	*0.00*	*0.00*	*2.41*	*0.00*	*0.00*	*2.09*	*0.29*	*3.96*	*1.11*	*0.00*	*0.00*	*5.63*	*57.26*	*31.63*	*200*	*2.80*	*1.766*	*51.63*	*90.17%*
Kugagami Road		BLK	MH13225A											0.00	0.00	0.00	2.41	0.00	0.00	2.09	0.00	3.96	1.11	0.00	0.00	3.20	57.26	33.01	200	2.80	1.766	54.06	94.41%
Kugagami Road	MH13225A	MH13225A	MH13203A	0.30			8			19.2	169.1	4.00	2.74	0.00	0.00	0.00	2.41	0.00	0.00	2.09	0.30	4.26	1.19	0.00	0.00	6.02	57.26	74.50	200	2.80	1.766	51.23	89.48%
Ovation Grove	MH13244A	MH13244A	MH13345A	0.13	1					3.2	3.2	4.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.04	0.00	0.00	0.09	32.46	11.58	200	0.90	1.001	32.37	99.73%
Ovation Grove	MH13345A	MH13345A	MH13246A	0.52	6	6				33.6	36.8	4.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.65	0.18	0.00	0.00	0.78	36.85	54.88	200	1.16	1.136	36.07	97.89%
Ovation Grove	MH13246A	MH13246A	MH13247A	0.73	10	6				46.4	83.2	4.00	1.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73	1.38	0.39	0.00	0.00	1.73	43.28	92.89	200	1.60	1.335	41.55	95.99%
Ovation Grove	MH13247A	MH13247A	MH13248A	0.34	5					16.0	99.2	4.00	1.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	1.72	0.48	0.00	0.00	2.09	48.39	66.72	200	2.00	1.492	46.30	95.68%
Ovation Grove	MH13248A	MH13248A	MH13249A	0.56	11					35.2	134.4	4.00	2.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	2.28	0.64	0.00	0.00	2.82	48.39	70.25	200	2.00	1.492	45.57	94.18%
Ovation Grove	MH13249A	MH13249A	MH13250A	0.12	2					6.4	140.8	4.00	2.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	2.40	0.67	0.00	0.00	2.95	43.28	7.10	200	1.60	1.335	40.33	93.18%
Ovation Grove	MH13250A	MH13250A	MH13260A	0.31			8			19.2	160.0	4.00	2.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	2.71	0.76	0.00	0.00	3.35	43.28	75.16	200	1.60	1.335	39.93	92.26%
Rathburn Lane	MH13259Aa	MH13259A	MH13260A	0.34			9			21.6	21.6	4.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.34	0.10	0.00	0.00	0.45	28.63	77.06	200	0.70	0.883	28.18	98.44%
Rathburn Lane	MH13260A	MH13260A	MH13267A						0.13	0.0	181.6	4.00	2.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	3.18	0.89	0.00	0.00	3.83	42.74	78.85	200	1.56	1.318	38.90	91.03%
Wooler Place	MH13265Ab	MH13265A	MH13267A	0.52			17			40.8	40.8	4.00	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.52	0.15	0.00	0.00	0.81	41.20	69.23	200	1.45	1.271	40.40	98.04%
Wooler Place	MH13267A	MH13267A	MH13269A	0.65	10		3			39.2	261.6	4.00	4.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	4.35	1.22	0.00	0.00	5.46	20.24	115.99	200	0.35	0.624	14.79	73.04%
Wooler Place	MH13269A	MH13269A	MH13208A	0.72	14					44.8	306.4	4.00	4.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72	5.07	1.42	0.00	0.00	6.38	20.24	109.27	200	0.35	0.624	13.86	68.46%
Ibanez Walk	MH13238A	MH13238A	MH13239A	0.67			21			50.4	50.4	4.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.67	0.19	0.00	0.00	1.00	44.22	86.49	200	1.67	1.364	43.21	97.73%
Ibanez Walk	MH13239A	MH13239A	MH13232A	0.62			21			50.4	100.8	4.00	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.62	1.29	0.36	0.00	0.00	1.99	57.87	100.00	200	2.86	1.784	55.87	96.55%
Future Street	*MH13397A*	*MH13223A*	*MH13396A*	*0.29*			*6*			*14.4*	*14.4*	*4.00*	*0.23*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.29*	*0.29*	*0.08*	*0.00*	*0.00*	*0.31*	*40.49*	*70.03*	*200*	*1.40*	*1.248*	*40.17*	*99.22%*
Future Street	*MH13396A*	*MH13396A*	*MH13235A*	*0.24*			*6*			*14.4*	*28.8*	*4.00*	*0.47*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.24*	*0.53*	*0.15*	*0.00*	*0.00*	*0.62*	*44.61*	*11.37*	*200*	*1.70*	*1.376*	*44.00*	*98.62%*
Future Street	*MH13235A*	*MH13235A*	*MH13236A*	*0.32*			*12*			*28.8*	*57.6*	*4.00*	*0.93*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.32*	*0.85*	*0.24*	*0.00*	*0.00*	*1.17*	*43.95*	*43.63*	*200*	*1.65*	*1.355*	*42.78*	*97.33%*
Future Street		*MH13236A*	*BLK*							*0.0*	*57.6*	*4.00*	*0.93*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.85*	*0.24*	*0.00*	*0.00*	*1.17*	*55.70*	*68.15*	*200*	*2.65*	*1.718*	*54.53*	*97.90%*
Block 238	MH13236A	BLK	MH13231A	0.63			22			52.8	110.4	4.00	1.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	1.48	0.41	0.00	0.00	2.20	55.70	31.85	200	2.65	1.718	53.50	96.04%
Alvarez Lane	MH13230A	MH13230A	MH13231A	0.25			6			14.4	14.4	4.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.25	0.07	0.00	0.00	0.30	27.59	39.00	200	0.65	0.851	27.28	98.90%
Alvarez Lane	MH13231A	MH13231A	MH13232A	0.54			19			45.6	170.4	4.00	2.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	2.27	0.64	0.00	0.00	3.40	27.59	78.00	200	0.65	0.851	24.19	87.69%
Alvarez Lane	MH13232A	MH13232A	MH13257A	0.25			6			14.4	285.6	4.00	4.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	3.81	1.07	0.00	0.00	5.69	38.71	77.99	200	1.28	1.194	33.02	85.29%
Rathburn Lane	MH13259Ab	MH13259A	MH13256A	0.89			32			76.8	76.8	4.00	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89	0.89	0.25	0.00	0.00	1.49	35.06	114.91	200	1.05	1.081	33.57	95.74%
Rathburn Lane	MH13256A	MH13256A	MH13257A	0.23			8			19.2	96.0	4.00	1.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	1.12	0.31	0.00	0.00	1.87	34.22	36.49	200	1.00	1.055	32.35	94.54%
Rathburn Lane	MH13257A	MH13257A	MH13206A	0.52			18			43.2	424.8	4.00	6.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	5.45	1.53	0.00	0.00	8.41	19.66	74.50	200	0.33	0.606	11.25	57.22%
Odyssey Way	MH13262A	MH13262A	MH13263A	0.82	17					54.4	54.4	4.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.82	0.82	0.23	0.00	0.00	1.11	27.59	105.70	200	0.65	0.851	26.48	95.97%
Odyssey Way	MH13263A	MH13263A	MH13207A	0.75	16					51.2	105.6	4.00	1.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	1.57	0.44	0.00	0.00	2.15	23.21	109.17	200	0.46	0.716	21.06	90.73%
Shuttleworth Drive	MH13274A	MH13274A	MH13275A	0.62	11					35.2	35.2	4.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.48	0.13	0.00	0.00	0.70	27.59	66.00	200	0.65	0.851	26.88	97.45%
Shuttleworth Drive	MH13275A	MH13275A	MH13209A	0.37	6					19.2	54.4	4.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.85	0.24	0.00	0.00	1.12	20.24	64.70	200	0.35	0.624	19.12	94.47%
Lemon Leaf Lane	MH13265Aa	MH13265A	MH13280A	0.08	1					3.2	3.2	4.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.02	0.00	0.00	0.07	29.63	13.89	200	0.75	0.914	29.56	99.75%
Lemon Leaf Lane	MH13280A	MH13280A	MH13281A	0.41	7					22.4	25.6	4.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.49	0.14	0.00	0.00	0.55	29.63	79.72	200	0.75	0.914	29.08	98.14%
Lemon Leaf Lane	MH13281A	MH13281A	MH13216A	0.45	5	2				20.8	46.4	4.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.94	0.26	0.00	0.00	1.02	22.95	88.10	200	0.45	0.708	21.94	95.58%
Sprinkle Crescent	MH13306A	MH13306A	MH13307A	0.41			17			40.8	40.8	4.00	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.41	0.11	0.00	0.00	0.78	27.59	66.02	200	0.65	0.851	26.81	97.19%
Sprinkle Crescent	MH13307A	MH13307A	MH13216A	0.44			16			38.4	79.2	4.00	1.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.85	0.24	0.00	0.00	1.52	20.24	69.97	200	0.35	0.624	18.72	92.48%
Rotary Way	MH13216A	MH13216A	MH13217A	0.23			5			12.0	137.6	4.00	2.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	2.02	0.57	0.00	0.00	2.80	20.24	45.51	200	0.35	0.624	17.45	86.19%
Sprinkle Crescent	MH13290A	MH13290A	MH13291A	0.20			4			9.6	9.6	4.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.20	0.06	0.00	0.00	0.21	29.63	36.60	200	0.75	0.914	29.42	99.29%
Sprinkle Crescent	MH13291A	MH13291A	MH13217A	0.69			27			64.8	74.4	4.00	1.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.89	0.25	0.00	0.00	1.45	29.63	118.15	200	0.75	0.914	28.18	95.09%
Rotary Way	MH13217A	MH13217A	MH13218A	0.36			7			16.8	228.8	4.00	3.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	3.27	0.92	0.00	0.00	4.62	20.24	88.68	200	0.35	0.624	15.62	77.16%

Design Parameters:

Residential			ICI Areas			
SF	3.2	p/p/u				Peak Factor
TH/SD	2.4	p/p/u	INST	50,000	L/Ha/day	1.5
APT	1.9	p/p/u	COM	50,000	L/Ha/day	1.5
Other	60	p/p/Ha	IND	35,000	L/Ha/day	MOE Chart
MU	130	p/p/Ha		17000	L/Ha/day	

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 350 L/day 300 L/day
3. Infiltration allowance: 0.28 L/s/Ha
4. Residential Peaking Factor:
Harmon Formula = 1+(14/(4+P^0.5))
where P = population in thousands

Designed: KH
Checked: JIM
Dwg. Reference: 105202-400/401

No.	Revision	Date
1	Submission No. 1 for City Review	2018-09-05
2	Submission No. 2 for City Review	2018-10-24
3	Submission No. 3 for City Review	2018-11-28
4	Revised per new legal	2020-02-13
5	Submission to MECP	2020-04-15

File Reference: 105202.5.7.1
Date: 2020-04-15
Sheet No: 1 of 2

IBI GROUP
400-333 Preston Street
Ottawa, Ontario K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
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LEGEND
MH13223A Potential Future Design (for information only)
EXMH138A Existing Infrastructure (for information only)

SANITARY SEWER DESIGN SHEET

Lilythorne at Findlay Creek
CITY OF OTTAWA
Claridge Homes

LOCATION				RESIDENTIAL										ICI AREAS							INFILTRATION ALLOWANCE			FIXED FLOW (L/s)		TOTAL FLOW	PROPOSED SEWER DESIGN						
				AREA	UNIT TYPES				AREA	POPULATION		PEAK	PEAK	AREA (Ha)						PEAK	AREA (Ha)		FLOW				CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE	
STREET	AREA ID	FROM MH	TO MH	w/ Units (Ha)	SF	SD	TH	APT	w/o Units (Ha)	IND	CUM	FACTOR	FLOW (L/s)	INSTITUTIONAL		COMMERCIAL		INDUSTRIAL		FLOW (L/s)	IND	CUM	(L/s)	IND	CUM	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	CAPACITY	
														IND	CUM	IND	CUM	IND	CUM												L/s	(%)
Gretsch Road	MH13272A	MH13272A	MH13273A	0.48			16			38.4	38.4	4.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.48	0.13	0.00	0.00	0.76	27.59	65.77	200	0.65	0.851	26.83	97.26%
Shuttleworth Drive	MH13399A	MH13399A	MH13398A	0.44			14			33.6	33.6	4.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.44	0.12	0.00	0.00	0.67	27.59	36.50	200	0.65	0.851	26.92	97.58%
Shuttleworth Drive	MH13398A	MH13398A	MH13273A	0.35			10			24.0	57.6	4.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.79	0.22	0.00	0.00	1.15	27.59	76.04	200	0.65	0.851	26.43	95.81%
Gretsch Road	MH13273A	MH13273A	MH13218A	0.54			16			38.4	38.4	4.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	1.02	0.29	0.00	0.00	0.91	20.24	87.30	200	0.35	0.624	19.33	95.52%
Gretsch Road	MH13287A	MH13287A	MH13218A	0.87			24			57.6	57.6	4.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.87	0.87	0.24	0.00	0.00	1.18	27.59	107.70	200	0.65	0.851	26.41	95.73%
Rotary Way	MH13218A	MH13218A	MH13219A	0.34	4					12.8	337.6	4.00	5.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	5.50	1.54	0.00	0.00	7.01	20.24	88.76	200	0.35	0.624	13.23	65.37%
Rosales Ridge	MH13285A	MH13285A	MH13219A	0.69	11					35.2	92.8	4.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.69	0.19	0.00	0.00	1.70	37.48	87.77	200	1.20	1.156	35.79	95.47%
Rotary Way	MH13219A	MH13219A	MH13210A	0.35	4					12.8	443.2	4.00	7.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	6.54	1.83	0.00	0.00	9.01	20.24	81.15	200	0.35	0.624	11.23	55.48%
Tahoe Heights	MH13295A	MH13295A	MH13296A	0.25	4					12.8	12.8	4.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.25	0.07	0.00	0.00	0.28	27.59	34.47	200	0.65	0.851	27.31	98.99%
Tahoe Heights	MH13296A	MH13296A	MH13297A	0.16	2					6.4	19.2	4.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.41	0.11	0.00	0.00	0.43	27.59	8.91	200	0.65	0.851	27.16	98.46%
Tahoe Heights	MH13297A	MH13297A	MH13298A	0.29	5					16.0	35.2	4.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.70	0.20	0.00	0.00	0.77	27.59	43.05	200	0.65	0.851	26.82	97.22%
Tahoe Heights	MH13298A	MH13298A	MH13299A	0.53	9					28.8	64.0	4.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	1.23	0.34	0.00	0.00	1.38	27.59	80.00	200	0.65	0.851	26.20	94.99%
Rosales Ridge	MH13299A	MH13299A	MH13300A	0.36	5					16.0	80.0	4.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	1.59	0.45	0.00	0.00	1.74	20.24	81.62	200	0.35	0.624	18.50	91.40%
Rosales Ridge	MH13300A	MH13300A	*EXMH140A*	0.01						0.0	80.0	4.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.60	0.45	0.00	0.00	1.74	20.24	12.52	200	0.35	0.624	18.50	91.38%
DRAFT 2016 UPDATED SERVICEABILITY REPORT																																	
Zone 10 Future			*EXMH138A*	7.86	158		89	72	0.93	856.0	856.0	3.84	13.32	0.52	0.52	1.11	1.11	0.00	0.00	0.28	10.42	10.42	2.92			16.52							
Zone 10 Existing (Modified Peaking Factor)			*EXMH138A*	23.91	79		121		0.82	543.2	543.2	1.90	3.34	1.89	1.89	0.00	0.00	0.00	0.00	1.09	26.62	26.62	7.45			11.89							
Highgarden Terrace	EXMH138A	*EXMH138A*	*EXMH139A*	0.30	3					9.6	1408.8	3.70	21.11	0.00	2.41	0.00	1.11	0.00	0.00	3.06	0.30	37.34	10.46	0.00	0.00	34.62	95.04	*104.24*	375	*0.27*	0.834	60.42	63.57%
Highgarden Terrace	EXMH139A	*EXMH139A*	*EXMH140A*	0.27	3					9.6	1418.4	3.70	21.24	0.00	2.41	0.00	1.11	0.00	0.00	3.06	0.27	37.61	10.53	0.00	0.00	34.83	87.72	*81.23*	375	*0.23*	0.769	52.89	60.30%
Highgarden Terrace	EXMH140A	*EXMH140A*	*EXMH141A*						0.15	0.0	1498.4	3.68	22.34	0.00	2.41	0.00	1.11	0.00	0.00	3.06	0.15	39.36	11.02	0.00	0.00	36.41	91.46	*88.63*	375	*0.25*	0.802	55.04	60.19%
Trident Mews	MH13158A	MH13158A	BLK13158A	0.18			4			9.6	9.6	4.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.18	0.05	0.00	0.00	0.21	28.63	31.26	200	0.70	0.883	28.42	99.28%
Rathburn Lane	MH13162A	MH13162A	BLK13162A	0.18			4			9.6	9.6	4.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.18	0.05	0.00	0.00	0.21	20.24	32.26	200	0.35	0.624	20.04	98.98%
Odyssey Way	MH13167A	MH13167A	BLK13167A	0.18			4			9.6	9.6	4.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.18	0.05	0.00	0.00	0.21	20.24	28.89	200	0.35	0.624	20.04	98.98%
Wooler Place	MH13172A	MH13172A	BLK13172A	0.18	3					9.6	9.6	4.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.18	0.05	0.00	0.00	0.21	20.24	31.00	200	0.35	0.624	20.04	98.98%
COWAN'S GROVE 2017 SANITARY DESIGN SHEET																																	
Highgarden Terrace			*EXMH141A*	24.02					3.87	1574.5	1574.5	3.66	23.37	0.00	0.00	2.11	2.11	0.00	0.00	1.83	30.00	30.00	8.40	0.00	0.00	33.60							
Street 1		*EXMH141A*	*EXMH207A*							0.0	3072.9	3.43	42.74	0.00	2.41	0.00	3.22	0.00	0.00	4.89	0.00	69.36	19.42	0.00	0.00	67.05	87.72	*61.40*	375	*0.23*	0.769	20.67	23.57%
Street 1		*EXMH207A*	*EXMH206A*							0.0	3072.9	3.43	42.74	0.00	2.41	0.00	3.22	0.00	0.00	4.89	0.00	69.36	19.42	0.00	0.00	67.05	91.46	*118.68*	375	*0.25*	0.802	24.41	26.69%
Block 242	BLK13201AN	BLK13201AN	MH13201A	0.34						43.9	43.9	4.00	0.71	0.00	0.00	1.01	1.01	0.00	0.00	0.88	1.35	1.35	0.38	0.00	0.00	1.97	27.59	9.00	200	0.65	0.851	25.62	92.87%
Block 243	BLK13201AS	BLK13201AS	MH13201A	0.16						20.8	20.8	4.00	0.34	0.00	0.00	0.48	0.48	0.00	0.00	0.42	0.64	0.64	0.18	0.00	0.00	0.93	27.59	21.50	200	0.65	0.851	26.65	96.62%
Findlay Creek Drive	MH13201A	MH13201A	MH13202A	0.36						0.0	64.7	4.00	1.05	0.00	0.00	0.00	1.49	0.00	0.00	1.30	0.36	2.35	0.66	0.00	0.00	3.00	28.63	95.12	200	0.70	0.883	25.63	89.52%
Findlay Creek Drive	MH13202A	MH13202A	MH13203A	0.07						0.0	64.7	4.00	1.05	0.00	0.00	0.00	1.49	0.00	0.00	1.30	0.07	2.42	0.68	0.00	0.00	3.02	28.63	27.37	200	0.70	0.883	25.61	89.45%
School Block 244	BLK246	MH13203AS	MH13203A							0.0	0.0	4.00	0.00	2.25	2.25	0.00	0.00	0.00	0.00	1.95	2.25	2.25	0.63	0.00	0.00	2.58	34.22	21.50	200	1.00	1.055	31.63	92.45%
Findlay Creek Drive	MH13203A	MH13203A	MH13204A	0.29	3					9.6	243.4	4.00	3.94	0.00	2.25	0.00	3.90	0.00	0.00	5.34	0.29	9.22	2.58	0.00	0.00	11.86	20.24	78.03	200	0.35	0.624	8.38	41.39%
Findlay Creek Drive	MH13204A	MH13204A	MH13205A	0.43	9					28.8	272.2	4.00	4.41	0.00	2.25	0.00	3.90	0.00	0.00	5.34	0.43	9.65	2.70	0.00	0.00	12.45	20.24	77.97	200	0.35	0.624	7.79	38.49%
Findlay Creek Drive	MH13205A	MH13205A	MH13206A	0.28	4					12.8	285.0	4.00	4.62	0.00	2.25	0.00	3.90	0.00	0.00	5.34	0.28	9.93	2.78	0.00	0.00	12.74	20.24	78.00	200	0.35	0.624	7.51	37.08%
Findlay Creek Drive	MH13206A	MH13206A	MH13207A	0.37	5					16.0	725.8	3.89	11.42	0.00	2.25	0.00	3.90	0.00	0.00	5.34	0.37	15.75	4.41	0.00	0.00	21.17	31.02	78.00	250	0.25	0.612	9.85	31.74%
Findlay Creek Drive	MH13207A	MH13207A	MH13208A	0.34	4					12.8	844.2	3.85	13.15	0.00	2.25	0.00	3.90	0.00	0.00	5.34	0.34	17.66	4.94	0.00	0.00	23.44	31.02	78.00	250	0.25	0.612	7.58	24.45%
Findlay Creek Drive	MH13208A	MH13208A	MH13209A	0.37	4					12.8	1163.4	3.76	17.70	0.00	2.25	0.00	3.90	0.00	0.00	5.34	0.37	23.10	6.47	0.00	0.00	29.51	31.02	78.00	250	0.25	0.612	1.51	4.86%
Findlay Creek Drive	MH13211A	MH13211A	MH13210A	0.66	11					35.2	35.2	4.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.66	0.18	0.00	0.00	0.76	31.73	74.42	200	0.86	0.978	30.98	97.62%
Findlay Creek Drive	MH13210A	MH13210A	MH13209A	0.66	12					38.4	516.8	3.97	8.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	7.86	2.20	0.00	0.00	10.51	20.24	86.29	200	0.35	0.624	9.74	48.10%
Findlay Creek Drive		MH13209A	*EXMH206A*							0.0	1734.6	3.63	25.53	0.00	2.25	0.00	3.90	0.00	0.00	5.34	0.00	31.81	8.91	0.00	0.00	39.77	90.23	11.24	300	0.80	1.237	50.46	55.92%
Findlay Creek Drive		*EXMH206A*	*EXMH205A*							0.0	4807.5	3.26	63.50	0.00	4.66	0.00	7.12	0.00	0.00	10.23	0.00	101.17	28.33	0.00	0.00	102.06	89.61	*121.04*	375	*0.24*	0.786	-12.45	-13.89%

Design Parameters:

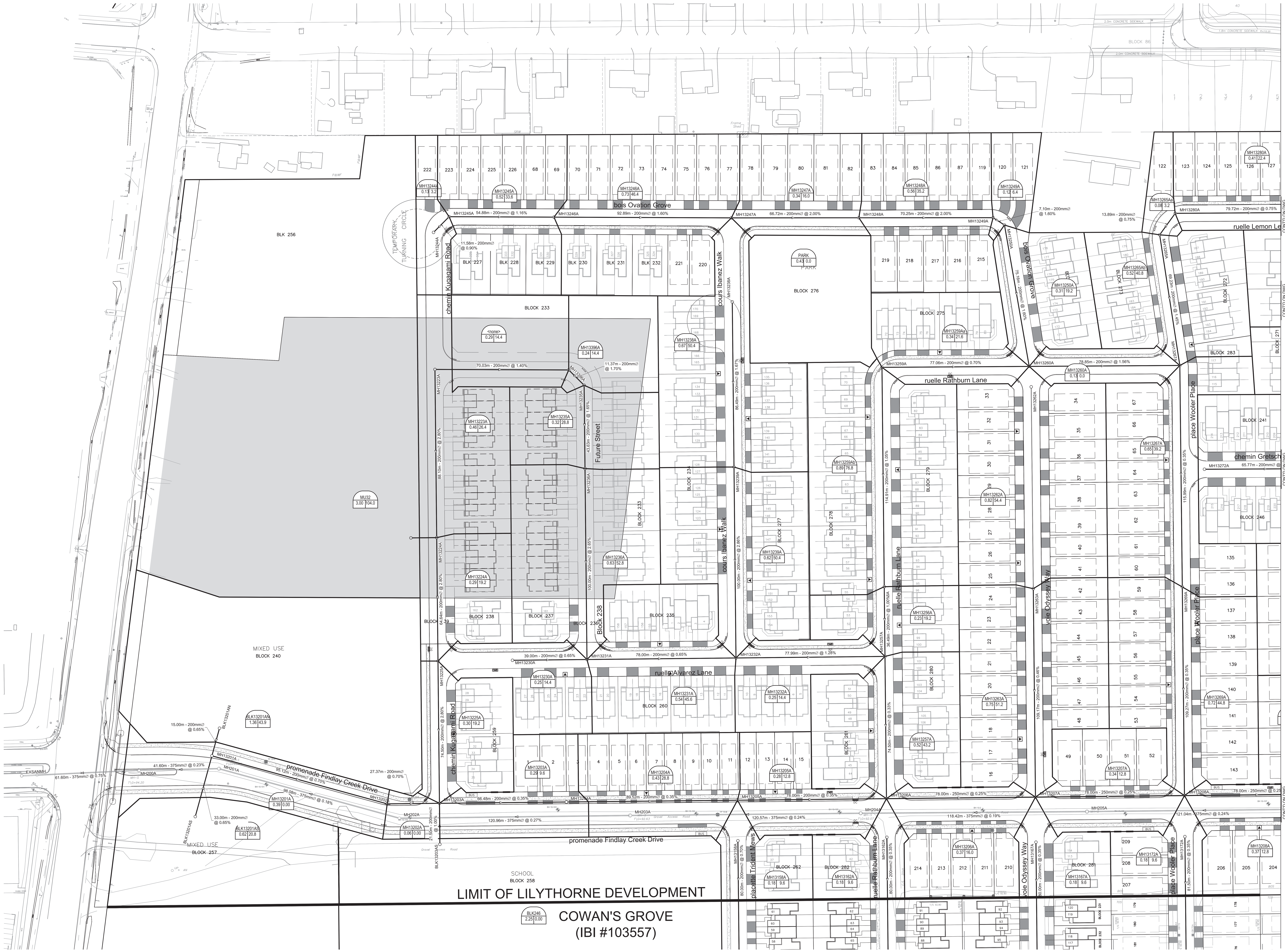
Residential			ICI Areas			
SF	3.2	p/p/u				Peak Factor
TH/SD	2.4	p/p/u	INST	50,000	L/Ha/day	1.5
APT	1.9	p/p/u	COM	50,000	L/Ha/day	1.5
Other	60	p/p/Ha	IND	35,000	L/Ha/day	MOE Chart
MU	130	p/p/Ha		17000	L/Ha/day	

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 350 L/day 300 L/day
3. Infiltration allowance: 0.28 L/s/Ha
4. Residential Peaking Factor:
Harmon Formula = 1+(14/(4+P^0.5))
where P = population in thousands

Designed: KH
Checked: JIM
Dwg. Reference: 105202-400/401

No.	Revision	Date
1	Submission No. 1 for City Review	2018-09-05
2	Submission No. 2 for City Review	2018-10-24
3	Submission No. 3 for City Review	2018-11-28
4	Revised per new legal	2020-02-13
5	Submission to MECP	2020-04-15

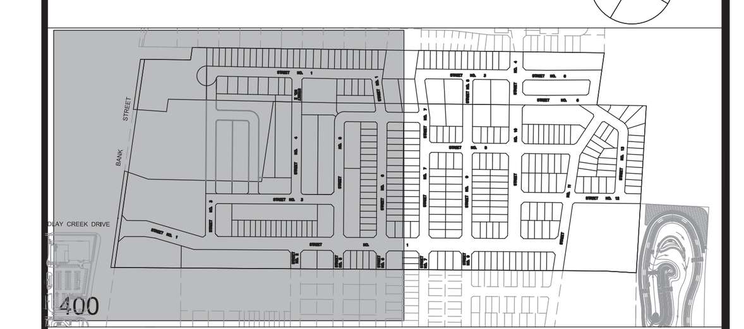
File Reference: 105202.5.7.1
Date: 2020-04-15
Sheet No: 2 of 2



LEGEND :

- AREA NUMBER
- POPULATION
- AREA IN HECTARES
- AREA BOUNDARY

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS



KEY PLAN
NTS

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5			
4	REVISED PER NEW LEGAL 2020:01:15	J.I.M.	2020:02:28
3	SUBMISSION NO. 3 FOR CITY REVIEW	J.I.M.	2018:11:28
2	SUBMISSION NO. 2 FOR CITY REVIEW	J.I.M.	2018:10:24
1	SUBMISSION NO. 1 FOR CITY REVIEW	J.I.M.	2018:09:05

CLARIDGE HOMES
CLARIDGE HOMES (BANK ST.) INC.
2001–210 GLADSTONE AVE
OTTAWA, ON
K2P 0Y6
613–233–6030

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ibigroup.com

Project Title
LILYTHORNE

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
2020/02/28
PROVINCE OF ONTARIO

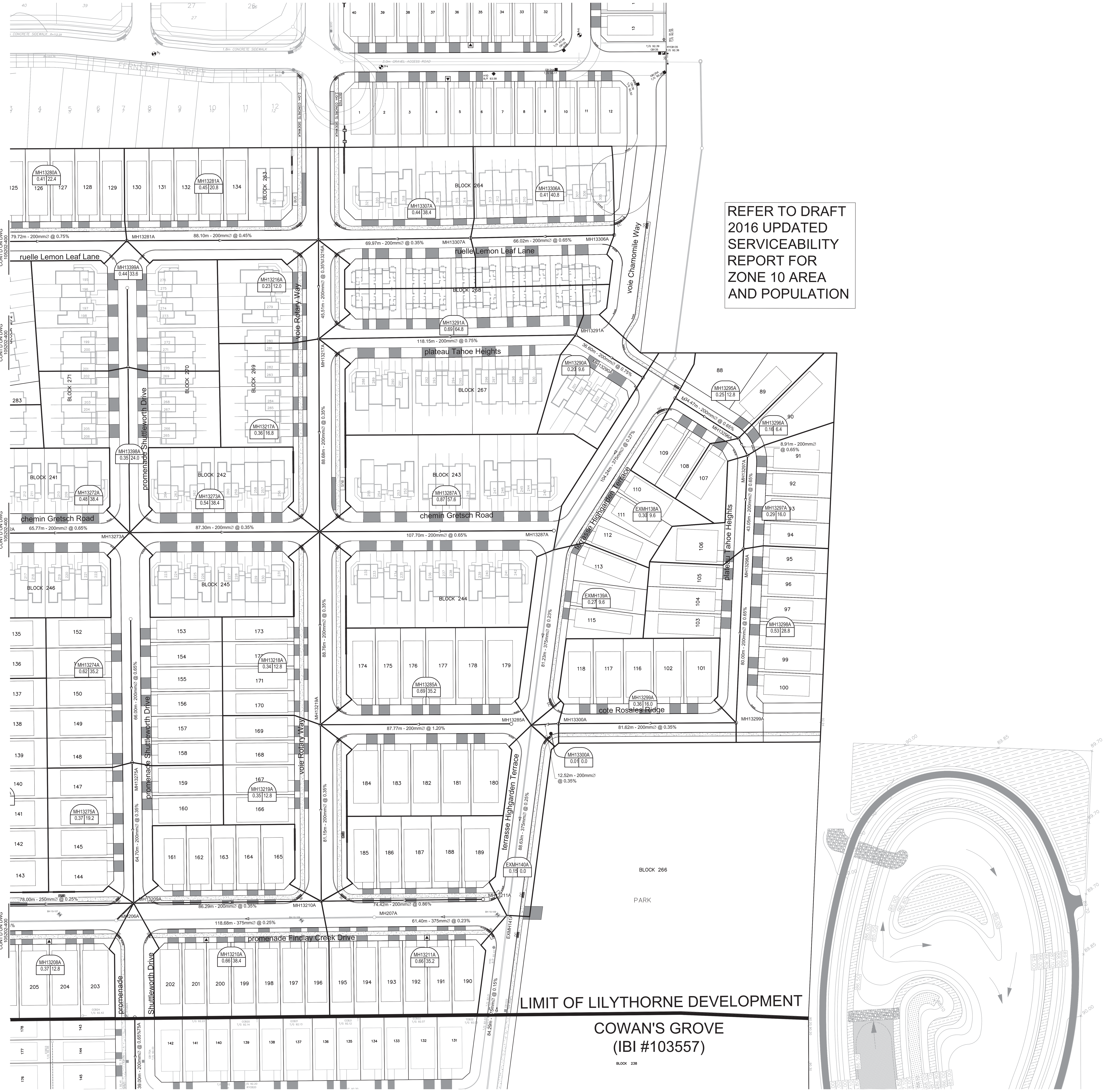
Drawing Title
SANITARY DRAINAGE AREA PLAN

Scale
1:1000

Design	Date
K.H./S.T./M.M.	FEBRUARY 2018
Drawn	**Checked**
D.D./M.M./E.H.	J.I.M.
Project No.	**Drawing No.**
105202	400

D07-16-17-0007

#17777



LEGEND :

- AREA NUMBER
- POPULATION
- AREA IN HECTARES
- AREA BOUNDARY

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN
NTS

No.	REVISIONS	By	Date
14			
13			
12			
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5			
4	REVISED PER NEW LEGAL 2020:01:15	J.I.M.	2020:02:28
3	SUBMISSION NO. 3 FOR CITY REVIEW	J.I.M.	2018:11:28
2	SUBMISSION NO. 2 FOR CITY REVIEW	J.I.M.	2018:10:24
1	SUBMISSION NO. 1 FOR CITY REVIEW	J.I.M.	2018:09:05

CLARIDGE HOMES (BANK ST.) INC.
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K2P 0Y6
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IBI GROUP
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ibigroup.com

Project Title
LILYTHORNE

J. I. MOFFATT
2020/02/28
LICENSED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

Drawing Title
SANITARY DRAINAGE
AREA PLAN

Scale
1:1000

Design	Date
K.H./S.T./M.M.	FEBRUARY 2018
Drawn	**Checked**
D.D./M.M./E.H.	J.I.M.
Project No.	**Drawing No.**
105202	401

D07-16-17-0007

#17777

APPENDIX C

For those areas within Lilythorne at Findlay Creek which will require a separate site stormwater design and analysis, the following table summarizes the assumed inflow rate and minimum on-site storage required for their design.

Table 5.4 Summary of Minimum On-Site Storage and Minor System Inflow Rate for External Development Lands to Lilythorne at Findlay Creek

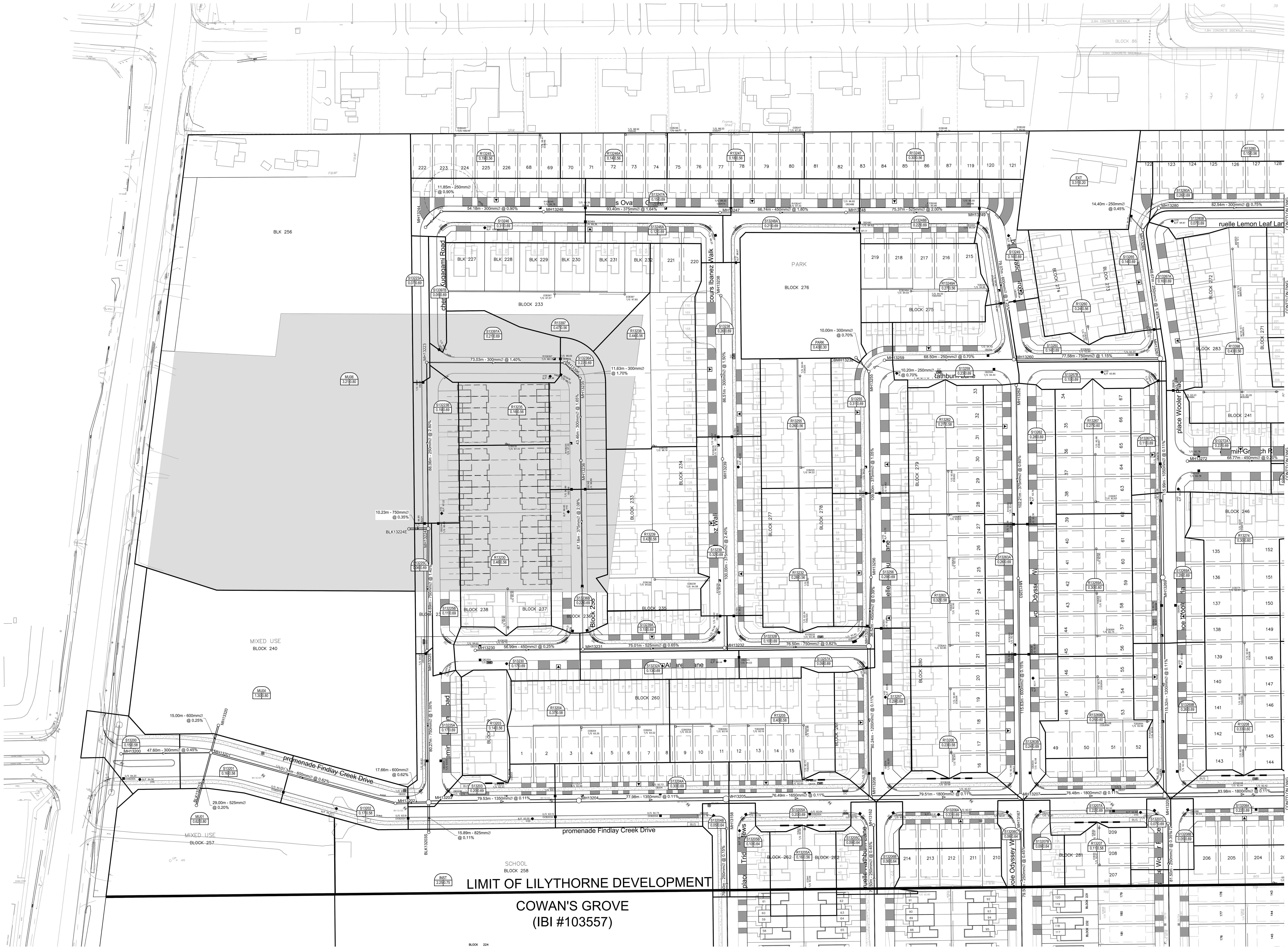
DRAINAGE AREA ID	AREA (HA)	LAND USE	IMP RATIO	MINIMUM ON-SITE STORAGE REQUIRED (CU-M)*	MINOR SYSTEM INFLOW RATE (L/S)
West Section					
BELL	0.31	Park	0.21	0	18
MU06	3.21	Mixed Use/High Density	0.86	375.00	649
MU04	1.32	Mixed Use/High Density	0.86	150.00	268
PARK	0.43	Park	0.14	55.00	20
East Section					
PARK2	Sag	Rear Yard	5	131	59
FPARK2	Continuous	Rear Yard	5	158	87

** The on-site storage noted was used to evaluate Lilythorne at Findlay Creek. As a minimum this on-site storage should be provided.*

The storage available on-site and its maximum depth and the results of the DDSWMM evaluation for the subject site are presented in **Table 5.5**. The ponding plan for the subject site is presented on **Drawings 105202-600 and 105202-601**. The DDSWMM output files are presented in **Appendix E**.

Table 5.5 Summary of On-Site Storage during the Target Minor System Design Storm

DRAINAGE AREA ID	MINOR SYSTEM DESIGN STORM	AVAILABLE STATIC STORAGE (CU-M)	TOTAL STORAGE USED (CU-M)	OVERFLOW (L/S)
West Section				
S13246A	2	0.52	0.0	0.0
S13260	2	0.32	0.0	0.0
S13259	2	13.26	0.0	0.0
S13267B	2	0.07	0.0	0.0
S13267C	2	1.65	0.0	0.0
S13269A	2	4.34	0.0	0.0
S13269B	2	6.17	0.0	0.0
S13272A	2	52.11	0.0	0.0
S13225A	2	6.77	0.0	0.0
S13230	2	4.05	0.0	0.0
S13239A	2	0.37	0.0	0.0
S13232B	2	0.51	0.0	0.0
S13257	2	6.26	0.0	0.0
S13263B	2	6.16	0.0	0.0
S13272B	2	0.56	0.0	0.0



LEGEND :

- AREA NUMBER
- RUN OFF COEFFICIENT
- AREA IN HECTARES
- AREA BOUNDARY

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN
NTS

No.	REVISIONS	By	Date
14			
13			
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5	SUBMISSION TO MECP	J.I.M.	2020:04:15
4	REVISED PER NEW LEGAL 2020:01:15	J.I.M.	2020:02:28
3	SUBMISSION NO. 3 FOR CITY REVIEW	J.I.M.	2018:11:28
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Project Title

LILYTHORNE

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
2020/04/15
PROVINCE OF ONTARIO

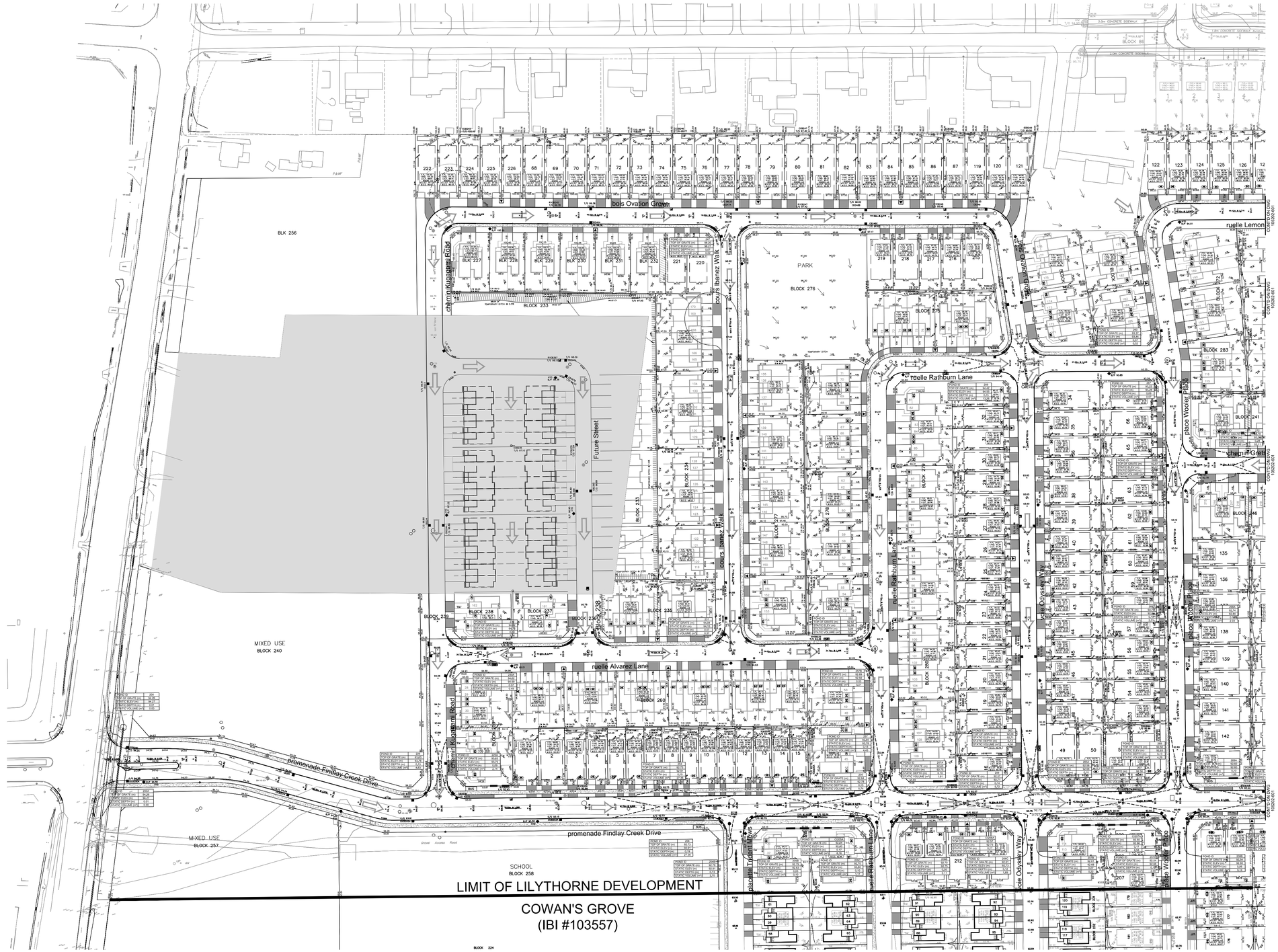
Drawing Title

STORM DRAINAGE AREA PLAN

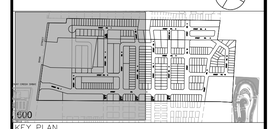
Scale	1:1000
Design: K.H./S.T./M.M.	Date: FEBRUARY 2018
Drawn: D.D./M.M./E.H.	Checked: J.I.M.
Project No.: 105202	Drawing No.: 500

D07-16-17-0007

#17777



SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS



KEY PLAN
NTS

No.	REVISIONS	By	Date
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13			
12			
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5	SUBMISSION TO MECP	J.I.M.	2020:04:15
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Project Title

LILYTHORNE

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
2020/04/15
PROVINCE OF ONTARIO

Drawing Title

PONDING PLAN

Scale: 1:1000

Design	Date
K.H./S.T./M.M.	FEBRUARY 2018
Drawn: D.D./M.M./E.H.	Checked: J.I.M.
Project No.: 105202	Drawing No.: 600

D07-16-17-0007

#17777

Velocity x Depth Calculation - LILYTHORNE AT FINDLAY CREEK - West Section

Iteration equation:

Velocity:

$$v_x = v_{min} + \frac{Q_x - Q_{min}}{Q_{max} - Q_{min}}(v_{max} - v_{min})$$

Depth:

$$d_x = d_{min} + \frac{Q_x - Q_{min}}{Q_{max} - Q_{min}}(d_{max} - d_{min})$$

100 Year 3 Hour Chicago Storm +20%

					SWMHYMO (105202vd.out)					Calculation Sheet: Overflow for Typical Road Ponding Area					SWMHYMO (105202vd.out)			Velocity x Depth	Maximum Static Ponding Depth	Total Dynamic Depth
Area ID (Dummy Segment, if applicable)	Road ROW Section	Longitudinal Slope (%)	Overflow Flowrate		Flowrate (cms)		Velocity (m/s)			Flowrate (cms)		Depth (m)			Depth (m)					
			Qx (l/s)	Qx (cms)	Qmin	Qmax	vmin	vmax	vx	Qmin	Qmax	dmin	dmax	dx	dmin	dmax	dx	(m^2/s)	(m)	(m)
S13246	18m Row, 8.5m asphalt	2.07	**114**	0.114	0.086	0.155	0.966	1.119	**1.028**					**N/A**	0.052	0.064	**0.057**	**0.058**	0.00	0.057
S13247A	18m Row, 8.5m asphalt	2.01	**47**	0.047	0.039	0.084	0.786	0.952	**0.816**					**N/A**	0.039	0.052	**0.041**	**0.034**	0.00	0.041
					0.039	0.084	0.786	0.952	**0.845**	0.0543	0.06531	0.07	0.075	**0.070**	N/A	N/A	**N/A**	**0.059**	0.07	0.140
					0.153	0.249	1.102	1.245	**1.109**					**N/A**	0.064	0.077	**0.065**	**0.072**	0.00	0.065
					0.197	0.297	0.986	1.092	**1.008**					**N/A**	0.077	0.09	**0.080**	**0.080**	0.00	0.080
					0.196	0.296	0.982	1.088	**1.075**					**N/A**	0.077	0.09	**0.088**	**0.095**	0.00	0.088
					0.039	0.083	0.774	0.937	**0.918**					**N/A**	0.039	0.052	**0.051**	**0.046**	0.00	0.051
					0.151	0.245	1.086	1.226	**1.214**	0.2287	0.255	0.12	0.125	**0.122**	N/A	N/A	**N/A**	**0.148**	0.07	0.192
S13259	18m Row, 8.5m asphalt	1.94	**28**	0.028	0.013	0.039	0.589	0.772	**0.695**	0.0222	0.02856	0.05	0.055	**0.055**	N/A	N/A	**N/A**	**0.038**	0.15	0.205
S13267B	18m Row, 8.5m asphalt	0.74								14		0.125	0.13	**0.125**	N/A	N/A	**N/A**	**0.106**	0.06	0.185
S13267A	18m Row, 8.5m asphalt	0.74												**N/A**	0.052	0.064	**0.053**	**0.031**	0.00	0.053
S13267C	18m Row, 8.5m asphalt	0.55								54		0.12	0.125	**0.123**	N/A	N/A	**N/A**	**0.093**	0.10	0.223
S13269A	18m Row, 8.5m asphalt	0.50																		
S13269B	24m Row, 11m asphalt	0.54	**253**	0.253	0.201	0.303	0.705	0.782	**0.744**	0.2395	0.26595	0.125	0.13	**0.128**	N/A	N/A	**N/A**	**0.095**	0.10	0.228
S13272A	18m Row, 8.5m asphalt	0.55	**33**	0.033	0.02	0.044	0.411	0.498	**0.458**	0.0268	0.03383	0.055	0.06	**0.059**	N/A	N/A	**N/A**	**0.027**	0.28	0.339
S13397B	18m Row, 8.5m asphalt	1.46	**19**	0.019	0.019	0.028	0.688	0.762	**0.688**					**N/A**	0.04	0.047	**0.040**	**0.028**	0.00	0.040
S13223A	18m Row, 8.5m asphalt	2.81	**26**	0.026	0.016	0.046	0.709	0.929	**0.782**					**N/A**	0.026	0.039	**0.030**	**0.024**	0.00	0.030
S13223B	18m Row, 8.5m asphalt	2.81	**91**	0.091	0.046	0.1	0.929	1.125	**1.092**					**N/A**	0.039	0.052	**0.050**	**0.054**	0.00	0.050
S13225D	18m Row, 8.5m asphalt	2.81	**624**	0.624	0.444	0.634											**0.102**	**0.182**	0.00	0.102
S13225A	24m Row, 11m asphalt	1.08	**446**	0.446	0.429	0.612											**N/A**	**0.174**	0.13	0.286
S13230	18m Row, 8.5m asphalt	2.81	**84**	0.084	0.046	0.1											**N/A**	**0.088**	0.13	0.212
S13397A	18m Row, 8.5m asphalt	1.40	**85**	0.085	0.071	0.092											**0.072**	**0.071**	0.00	0.072
S13238	18m Row, 8.5m asphalt	1.50	**93**	0.093	0.073	0.132	0.822	0.952	**0.866**					**N/A**	0.052	0.064	**0.056**	**0.049**	0.00	0.056
S13239	18m Row, 8.5m asphalt	2.00	**449**	0.449	0.374	0.535	1.376	1.504	**1.436**					**N/A**	0.09	0.103	**0.096**	**0.138**	0.00	0.096
S13239A	18m Row, 8.5m asphalt	2.00	**196**	0.196	0.153	0.248	1.1	1.242	**1.164**	0.1813	0.20417	0.11	0.115	**0.113**	N/A	N/A	**N/A**	**0.132**	0.06	0.173
S13232A	18m Row, 8.5m asphalt	2.00	**42**	0.042	0.033	0.047	0.892	0.973	**0.944**					**N/A**	0.047	0.054	**0.052**	**0.049**	0.00	0.052
S13232B	18m Row, 8.5m asphalt	0.50	**554**	0.554	0.488	0.66	0.879	0.992	**0.922**	0.5445	0.59044	0.165	0.17	**0.166**	N/A	N/A	**N/A**	**0.153**	0.08	0.246
S13255	18m Row, 8.5m asphalt	1.30	**113**	0.113	0.068	0.123	0.765	0.887	**0.865**					**N/A**	0.052	0.064	**0.062**	**0.053**	0.00	0.062
S13256	18m Row, 8.5m asphalt	0.50	**197**	0.197	0.187	0.267	0.688	0.752	**0.696**					**N/A**	0.09	0.103	**0.092**	**0.064**	0.00	0.092
S13257	18m Row, 8.5m asphalt	0.62	**624**	0.624	0.488	0.66	0.879	0.992	**0.968**	0.5904	0.63807	0.17	0.175	**0.174**	N/A	N/A	**N/A**	**0.168**	0.11	0.284
S13236A	18m Row, 8.5m asphalt	1.50	**154**	0.154	0.132	0.215	0.952	1.078	**0.985**					**N/A**	0.064	0.077	**0.067**	**0.066**	0.00	0.067
S13236B	18m Row, 8.5m asphalt	1.18	**223**	0.223	0.191	0.288	0.954	1.057	**0.988**					**N/A**	0.077	0.09	**0.081**	**0.080**	0.00	0.081
S13262	18m Row, 8.5m asphalt	0.50	**99**	0.099	0.076	0.124	0.55	0.621	**0.584**					**N/A**	0.064	0.077	**0.070**	**0.041**	0.00	0.070
S13263A	18m Row, 8.5m asphalt	0.50	**174**	0.174	0.124	0.187	0.621	0.688	**0.674**					**N/A**	0.077	0.09	**0.087**	**0.059**	0.00	0.087
S13263B	18m Row, 8.5m asphalt	0.55	**147**	0.147	0.125	0.203	0.63	0.712	**0.653**	0.1321	0.15047	0.1	0.105	**0.104**	N/A	N/A	**N/A**	**0.068**	0.10	0.204
S13272B	18m Row, 8.5m asphalt	0.50	**0**	0											N/A	N/A	**N/A**	**0.000**	0.06	0.060
S13200	24m Row, 11m asphalt	0.51	**8**	0.008	0.002	0.01	0.208	0.33	**0.300**	0.0053	0.00804	0.03	0.035	**0.035**	N/A	N/A	**N/A**	**0.010**	0.05	0.085
S13201	24m Row, 11m asphalt	0.51	**224**	0.224	0.195	0.295	0.686	0.76	**0.707**					**N/A**	0.088	0.103	**0.092**	**0.065**	0.00	0.092
S13202	24m Row, 11m asphalt	1.08	**256**	0.256	0.175	0.284	0.883	0.998	**0.968**					**N/A**	0.074	0.088	**0.084**	**0.082**	0.00	0.084
S13203	24m Row, 11m asphalt	0.65	**697**	0.697	0.65	0.861	1.014	1.088	**1.030**					**N/A**	0.133	0.147	**0.136**	**0.140**	0.00	0.136
S13204A	24m Row, 11m asphalt	0.66	**510**	0.51	0.478	0.655	0.945	1.022	**0.959**	0.5035	0.55578	0.165	0.17	**0.166**	N/A	N/A	**N/A**	**0.159**	0.19	0.356
S13204B	24m Row, 11m asphalt	0.66	**473**	0.473	0.465	0.538	1.137	1.169	**1.141**	0.4634	0.5035	0.16	0.165	**0.161**	N/A	N/A	**N/A**	**0.184**	0.13	0.291
S13205A	24m Row, 11m asphalt	0.62	**293**	0.293	0.215	0.325	0.756	0.838	**0.814**	0.2659	0.2941	0.13	0.135	**0.135**	N/A	N/A	**N/A**	**0.110**	0.17	0.305
S13205B	24m Row, 11m asphalt	0.66	**440**	0.44	0.399	0.465	1.097	1.137	**1.122**	0.4254	0.46335	0.155	0.16	**0.157**	N/A	N/A	**N/A**	**0.176**	0.05	0.207
S13205C	24m Row, 11m asphalt	0.62	**269**	0.269	0.215	0.325	0.756	0.838	**0.796**	0.2659	0.2941	0.13	0.135	**0.131**	N/A	N/A	**N/A**	**0.104**	0.10	0.231
S13206A	24m Row, 11m asphalt	0.55	**727**	0.727	0.598	0.792	0.933	1.001	**0.978**	0.7261	0.78731	0.185	0.19	**0.185**	N/A	N/A	**N/A**	**0.181**	0.17	0.355
					0.215	0.325	0.756	0.838	**0.780**	0.2395	0.26595	0.125	0.13	**0.126**	N/A	N/A	**N/A**	**0.099**	0.05	0.176
					0.598	0.792	0.933	1.001	**0.966**	0.6671	0.72606	0.18	0.185	**0.182**	N/A	N/A	**N/A**	**0.176**	0.12	0.302
					0.592	0.785	0.924	0.992	**0.941**	0.6103	0.66706	0.175	0.18	**0.178**	N/A	N/A	**N/A**	**0.167**	0.17	0.348
					0.598	0.792	0.933	1.001	**0.958**	0.6671	0.72606	0.18	0.185	**0.180**	N/A	N/A	**N/A**	**0.172**	0.07	0.250
S13207C	24m Row, 11m asphalt	0.55	**609**	0.609	0.448	0.614	0.886	0.958	**0.956**	0.5558	0.6103	0.17	0.175	**0.175**	N/A	N/A	**N/A**	**0.167**	0.12	0.295
S13208B	24m Row, 11m asphalt	0.54	**586**	0.586	0.433	0.592	0.855	0.924	**0.921**	0.5558	0.6103	0.17	0.175	**0.173**	N/A	N/A	**N/A**	**0.159**	0.06	0.233
S13257A	18m Row, 8.5m asphalt	0.50	**16**	0.016	0.007	0.02	0.299	0.392	**0.363**	0.0157	0.02081	0.045	0.05	**0.045**	N/A	N/A	**N/A**	**0.016**	0.03	0.075
S13202+S13225A	24m Row, 11m asphalt	1.08	**702**	0.702	0.612	0.838	1.209	1.307	**1.248**	0.689	0.75	0.18	0.185	**0.181**	N/A	N/A	**N/A**	**0.226**	0.13	0.311
S13257+S13206B+S13205C	24m Row, 11m asphalt	0.62	**871**	0.871	0.734	0.948	1.104	1.221	**1.179**	0.851	0.917	0.195	0.2	**0.197**	N/A	N/A	**N/A**	**0.232**	0.05	0.247
S13263B+S13207B+S13206C	24m Row, 11m asphalt	0.55	**815**	0.815	0.792	1.022	1.001	1.06	**1.007**	0.787	0.851	0.19	0.195	**0.192**	N/A	N/A	**N/A**	**0.194**	0.12	0.312
S13225D+S13230	18m Row, 8.5m asphalt	2.81	**708**	0.708	0.634	0.868	1.783	1.929	**1.829**	0.679	0.732	0.175	0.18	**0.178**	N/A	N/A	**N/A**	**0.325**	0.13	0.308
S13239+S13239A	18m Row, 8.5m asphalt	2.00	**645**	0.645	0.535	0.732	1.504	1.627	**1.573**	0.629	0.679	0.17	0.175	**0.172**	N/A	N/A	**N/A**	**0.270**	0.06	0.232
S13232B+S13256+S13257A	18m Row, 8.5m asphalt	0.50	**767**	0.767	0.66	0.851	0.992	1.096	**1.050**	0.738	0.791	0.185	0.19	**0.188**	N/A	N/A	**N/A**	**0.197**	0.08	0.268
S13247A+S13246A	18m Row, 8.5m asphalt	2.01	**102**	0.102	0.084	0.152	0.952	1.102	**0.981**	0.091	0.106	0.085	0.09	**0.089**	N/A	N/A	**N/A**	**0.088**	0.07	0.159
S13249+S13259	18m Row, 8.5m asphalt	1.46								0.323	0.13	0.135		**0.133**	N/A	N/A	**N/A**	**0.173**	0.15	0.283
S13267B+S13265+S13267A	18m Row, 8.5m asphalt	0.74								0.417	0.145	0.15		**0.147**	N/A	N/A	**N/A**	**0.140**	0.06	0.207
S13267C+S13272A	18m Row, 8.5m asphalt	0.55								0.269	0.125	0.13		**0.129**	N/A	N/A	**N/A**	**0.100**	0.28	0.409

Major system cascading flow of 8L/s would increase Overflow Flowrate to 0.014cms (contribution from 127213-Zens only)

Major system cascading flow of 256L/s would increase Overflow Flowrate to 0.410cms

Major system cascading flow of 697L/s would increase Overflow Flowrate to 0.880cms

Major system cascading flow of 510L/s would increase Overflow Flowrate to 0.693cms

Major system cascading flow of 702L/s would increase Overflow Flowrate to 0.885cms

Depth would increase by approximately 1cm

Depth would increase by approximately 2cm

Depth would increase by approximately 1cm

Depth would increase by approximately 1cm

Depth would increase by approximately 2cm

Review of the Lilythorne Zen cascading flow to
Velocity x Depth Calculation - LILYTHORNE AT FINDLAY CREEK - West Section

Iteration equation:

Velocity:

$$v_x = v_{min} + \frac{Q_x - Q_{min}}{Q_{max} - Q_{min}} (v_{max} - v_{min})$$

Depth:

$$d_x = d_{min} + \frac{Q_x - Q_{min}}{Q_{max} - Q_{min}} (d_{max} - d_{min})$$

100 Year 3 Hour Chicago Storm +20%																					
					SWMHYMO (105202vd.out)					Calculation Sheet: Overflow for Typical Road Ponding Area					SWMHYMO (105202vd.out)			Velocity x Depth	Maximum Static Ponding Depth	Total Dynamic Depth
Area ID (Dummy Segment, if applicable)	Road ROW Section	Longitudinal Slope (%)	Adjusted Overflow*		Flowrate (cms)		Velocity (m/s)			Flowrate (cms)		Depth (m)			Depth (m)					
			Qx (l/s)	Qx (cms)	Qmin	Qmax	vmin	vmax	vx	Qmin	Qmax	dmin	dmax	dx	dmin	dmax	dx	(m^2/s)	(m)	(m)
S13201	24m Row, 11m asphalt	0.51	**238**	0.238	0.195	0.295	0.686	0.760	**0.718**					**N/A**	0.088	0.103	**0.094**	**0.068**	0.00	0.092
S13202	24m Row, 11m asphalt	1.08	**410**	0.410	0.284	0.429	0.998	1.106	**1.092**					**N/A**	0.088	0.103	**0.101**	**0.110**	0.00	0.101
S13203	24m Row, 11m asphalt	0.65	**880**	0.880	0.861	1.111	1.088	1.152	**1.093**					**N/A**	0.147	0.162	**0.148**	**0.162**	0.00	0.148
S13204A	24m Row, 11m asphalt	0.66	**693**	0.693	0.655	0.867	1.022	1.096	**1.035**	0.667	0.726	0.180	0.185	**0.182**	N/A	N/A	**N/A**	**0.189**	0.19	0.372
S13202+S13225A	24m Row, 11m asphalt	1.08	**885**	0.885	0.838	1.110	1.307	1.402	**1.323**	0.879	0.947	0.195	0.200	**0.195**	N/A	N/A	**N/A**	**0.259**	0.13	0.325

Note: *Adjusted Overflow includes overflow from 127213-Zens where applicable and Zens 2.

It should be noted that major flow from street segment S13138 (italic in the tables above) cascades over the boulevard into the block for the existing SWM facility and the facility expansion, respectively. The product of v x d is provided for information purposes. The cross sections used to evaluate the depth of overflow to the swale to the expansion cell of the Findlay Creek Village Stormwater Facility was provided as part of the Cowan's Grove detail design submission.

Within the subject site under the 100 year Chicago storm event, all street segments have the summation of depth of ponding and depth of cascading flow less than 0.35 m.

For the 100 year storm event increased by 20%, the v x d results are provided for information purposes. As noted previously, the major flow from street segment S13138 (italic in the tables above) cascades over the boulevard into the blocks for the existing SWM facility and facility expansion, respectively. The product of v x d is provided for information purposes.

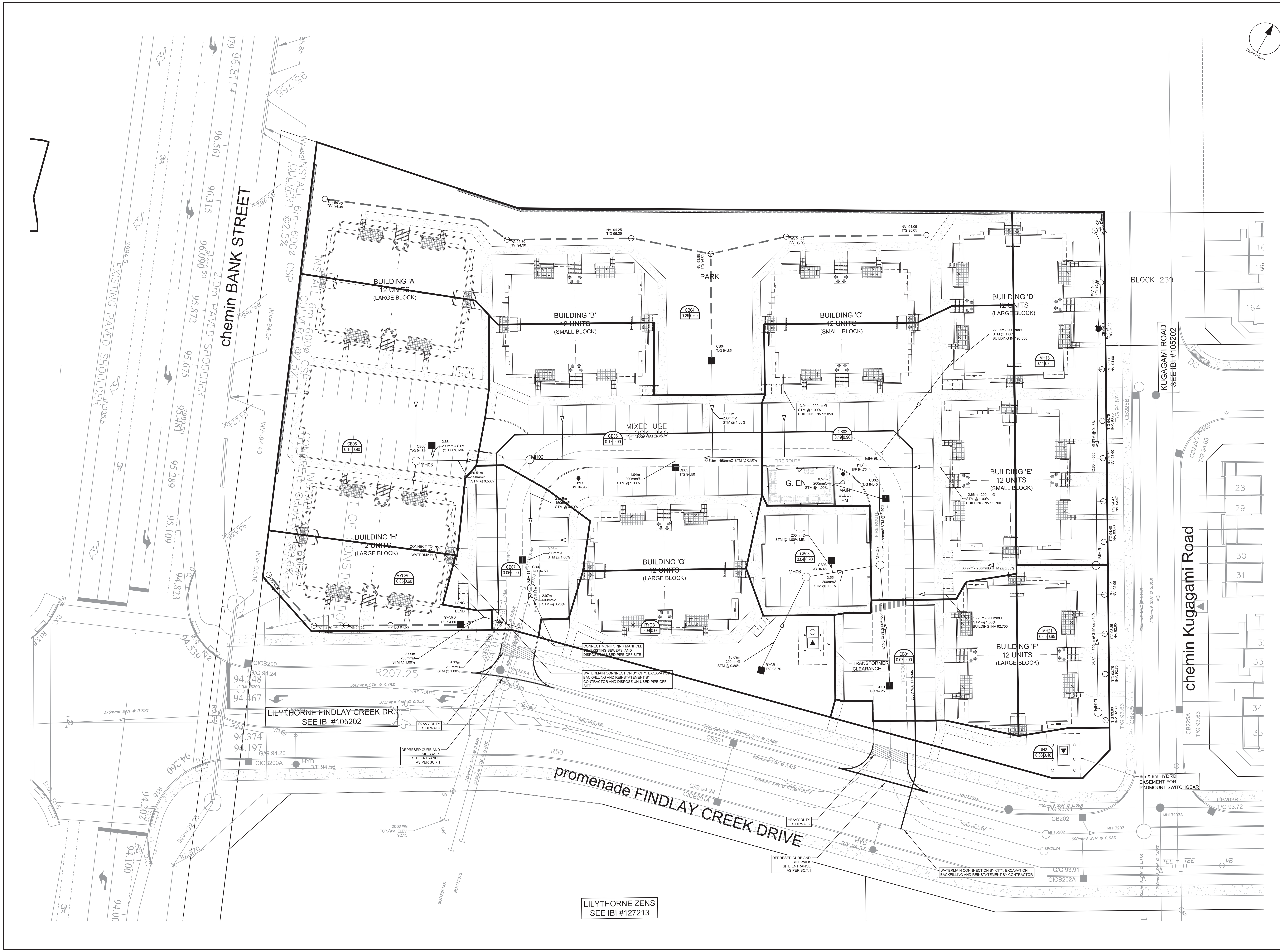
During the 100 year storm event increased by 20%, the summation of depth of ponding and depth of cascading flow is more than 0.35 m at eight (8) locations throughout the subject site. These street segments are noted in **Table 5.7** in bold.

The following table summarizes the elevation dynamic ponding, property line elevation and the garage elevations for the street segments where summation of depth of ponding and depth of cascading flow exceeds 0.35 m during the 100 year storm event increased by 20%.

Table 5.8 Critical Ponding Locations during the Stress Test and Adjacent Property Elevations

DRAINAGE AREA ID	MAX. DEPTH (STATIC + DYNAMIC, WHERE APPLICABLE) (M)	(1) CORRESPONDING ELEVATION (M)	(2) ADJACENT PROPERTY LINE ELEVATION (M)	DIFFERENCE (2) – (1)	(3) ADJACENT CRITICAL ELEVATION		DIFFERENCE (3) – (1)
					LOCATION	(3) ELEVATION (M)	
West Section							
S13204A	0.36	93.09	92.91	-0.18	Garage	93.22	0.13
S13272A	0.41	93.19	93.05	-0.14	Garage	93.25	0.06
S13206A	0.36	92.93	92.85	-0.08	Garage	93.02	0.09
East Section							
S141	0.38	92.39	92.27	-0.12	Back of house	92.57	0.18
S13392	0.39	92.39	92.34	-0.05	Garage	92.50	0.11
S13210A	0.36	92.68	92.6	-0.08	Garage	92.81	0.13
S139	0.34	92.76	92.67	-0.09	Garage	93.00	0.24
Cowan's Grove							
S13137	*0.41*	*92.28*	*92.13*	*-0.15*	*Garage*	*92.45*	*0.17*
S13138	*0.41*	*92.19*	*92.06*	*-0.13*	*Garage*	*92.35*	*0.16*
S13136B	*0.38*	*92.38*	*92.27*	*-0.11*	*Garage*	*92.5*	*0.12*
S142	*0.43*	*92.19*	*92.06*	*-0.13*	*Back of house*	*92.36*	*0.17*

From the comparison in **Table 5.8**, during the 100 year storm event increased by 20%, the major system encroaches the adjacent property line in most cases, but remains below the garage opening.



CLIENT

CLARIDGE HOMES

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ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR COORDINATION	2021:11:03
2	ISSUED FOR COORDINATION #2	2021:11:1?
3	ISSUED FOR SPA	2021:12:08

NOT FOR CONSTRUCTION

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN

SITE

CONSULTANTS

Project Coordinator:
Claridge Homes
Architect:
RLA/ Architecture
Landscape:

Surveyor:

Geotech:
Paterson Group

SEAL

LICENSED PROFESSIONAL ENGINEER
T. R. BRULE
2021/12/08
PROVINCE OF ONTARIO

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PROJECT

LILYTHORNE ZENS 2

PROJECT NO:
134437

DRAWN BY:	CHECKED BY:
EH	TRB
PROJECT MGR:	APPROVED BY:
JB	TRB

SHEET TITLE

STORM DRAINAGE AREA PLAN

SHEET NUMBER: C-500

ISSUE: 1

SCALE CHECK 1 in 10mm

CITY PLAN No. XXXXX

File Location: J:\134437_Lilythorn\7.0_Production\7.03_Design\04_CivilSheets\C-500 STORM DRAINAGE AREA PLAN.dwg Last Saved: December 9, 2021, by James.Battison Plotted: Thursday, December 9, 2021 1:24:43 PM by Eric Henrie

CITY FILE No. D07-XX-XX-XXXX

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ibigroup.com

STORM SEWER DESIGN SHEET

Lillythorne Zens2
City of Ottawa
Claridge Homes

LOCATION				AREA (Ha)										RATIONAL DESIGN FLOW														SEWER DATA									
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.25	C= 0.40	C= 0.50	C= 0.60	C= 0.65	C= 0.69	C= 0.70	C= 0.76	C= 0.90	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (2) (mm/hr)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	2yr PEAK FLOW (L/s)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW IND	FIXED FLOW CUM	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	PIPE SIZE (mm) W	PIPE SIZE (mm) H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (2yr) (L/s)	AVAIL CAP (2yr) (%)
Site	MH21	MH21	MH20						0.05					0.09	0.09	10.00	0.52	10.52	76.81	104.19	122.14	178.56	6.94	9.41	11.04	16.13	0.00	0.00	6.94	248.09	26.52	600			0.15	0.850	241.15	97.20%
Site	MH18	MH18	MH20						0.11					0.20	0.29	10.00	0.84	10.84	76.81	104.19	122.14	178.56	22.21	30.12	35.31	51.62	0.00	0.00	22.21	248.09	42.80	600			0.15	0.850	225.88	91.05%
Site		MH20	MH05											0.00	0.38	10.84	0.75	11.59	73.73	99.96	117.16	171.23	27.98	37.93	44.46	64.98	0.00	0.00	27.98	43.87	38.97	250			0.50	0.866	15.89	36.22%
Site	CB03, RYCB1,	MH06	MH05					0.09					0.04	0.25	0.25	10.00	0.24	10.24	76.81	104.19	122.14	178.56	19.22	26.07	30.56	44.68	0.00	0.00	19.22	30.60	13.55	200			0.80	0.944	11.39	37.21%
Site	CB01, CB02	MH05	MH04										0.26	0.65	1.28	11.59	0.29	11.88	71.20	96.49	113.07	165.23	91.15	123.52	144.74	211.52	0.00	0.00	91.15	129.34	19.68	375			0.50	1.134	38.19	29.53%
Site	CB04, CB05	MH04	MH02					0.29					0.17	0.91	2.19	11.88	0.82	12.70	70.27	95.22	111.57	163.03	153.85	208.45	244.26	356.92	0.00	0.00	153.85	210.32	63.04	450			0.50	1.281	56.47	26.85%
Site	CB06	MH03	MH02										0.16	0.40	0.40	10.00	0.39	10.39	76.81	104.19	122.14	178.56	30.75	41.71	48.90	71.48	0.00	0.00	30.75	43.87	20.51	250			0.50	0.866	13.12	29.91%
Site	CB07	MH02	MH01										0.06	0.15	2.74	12.70	0.30	13.00	67.79	91.81	107.57	157.15	185.73	251.54	294.70	430.55	0.00	0.00	185.73	210.32	23.18	450			0.50	1.281	24.59	11.69%
Site		MH01	*Stub*											0.00	2.74	13.00	0.05	13.05	66.93	90.63	106.17	155.11	183.36	248.29	290.88	424.94	0.00	0.00	183.36	286.47	2.97	600			0.20	0.982	103.10	35.99%
Site	RYCB02	*Stub*	*MH13201*					0.05						0.08	2.82	13.05	0.26	13.31	66.79	90.43	105.94	154.77	188.55	255.30	299.08	436.93	0.00	0.00	188.55	286.47	15.30	600			0.20	0.982	97.92	34.18%
																															600						

Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 732.951 / (TC+6.199)^0.810] 2 YEAR
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

Designed: JEB

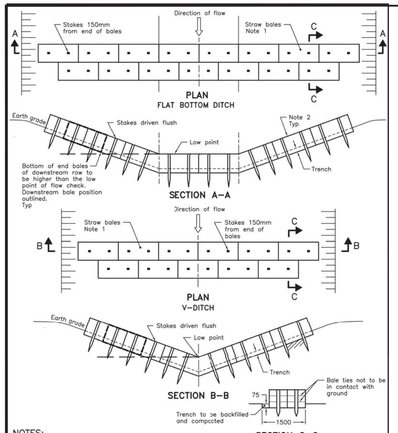
Checked: TRB

Dwg. Reference: 134437-C-500

No.	Revision	Date
1.	Issued for SPA	2021-12-08

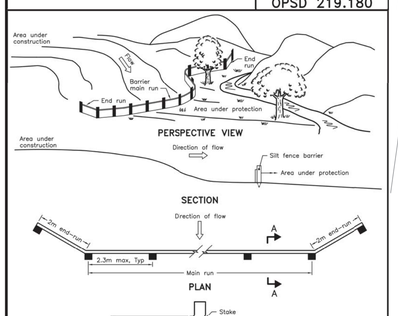
File Reference: 134437.6.04
Date: 2021-12-08
Sheet No: 1 of 1

APPENDIX D



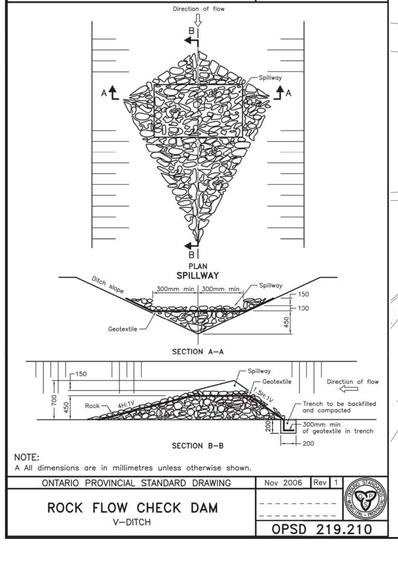
NOTES:
1 Number of bales varies to suit ditch.
2 Straw bales to be butted tightly against adjoining bales and shaped to conform to the sides of the ditch to prevent water flow through barrier.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2006	Rev. 1
STRAW BALE FLOW CHECK DAM		OPSD 219.180



NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2006	Rev. 1
LIGHT–DUTY SILT FENCE BARRIER		OPSD 219.110



NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2006	Rev. 1
ROCK FLOW CHECK DAM V–DITCH		OPSD 219.210

NOTES:

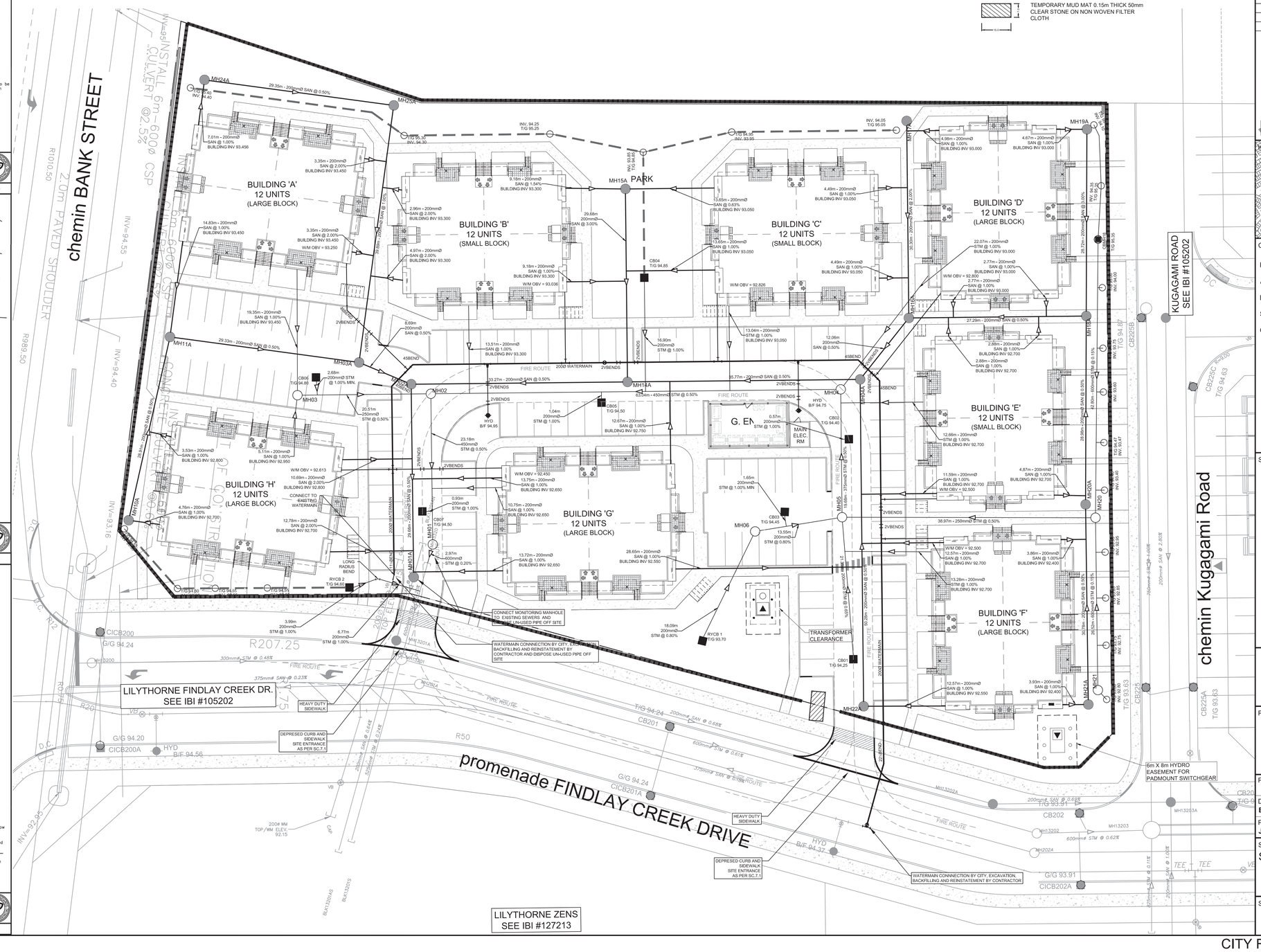
THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY,

1. SILT FENCE TO BE ERECTED PRIOR TO EARTH WORKS BEING COMMENCED. SILT FENCE TO BE MAINTAINED UNTIL VEGETATION IS ESTABLISHED OR UNTIL START OF SUBSEQUENT PHASE.
2. STRAW BALE SEDIMENT TRAPS TO BE CONSTRUCTED IN EXISTING ROAD SIDE DITCHES. TRAPS TO REMAIN AND BE MAINTAINED UNTIL VEGETATION IS ESTABLISHED.
3. SILT SACK TO BE PLACED AND MAINTAINED UNDER COVER OF ALL CATCHBASINS. GEOTEXTILE SILT SACK IN STREET CBs TO REMAIN UNTIL ALL CURBS ARE CONSTRUCTED. GEOTEXTILE FABRIC IN RYCBs TO REMAIN UNTIL VEGETATION IS ESTABLISHED. ALL CATCHBASINS TO BE REGULARLY INSPECTED AND CLEANED, AS NECESSARY, UNTIL SOD AND CURBS ARE CONSTRUCTED.
4. WORKS NOTED ABOVE ARE TO BE INSTALLED, INSPECTED, MAINTAINED AND ULTIMATELY REMOVED BY SERVICING CONTRACTOR.
5. THIS IS A "LIVING DOCUMENT" AND MAY BE MODIFIED IN THE EVENT THE PROPOSED CONTROL MEASURES ARE INSUFFICIENT

NOTES:
1. SEE DRAWING C-010 FOR ADDITIONAL DETAILS AND NOTES.
2. SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR ANNIS, O'SULLIVAN, VOLLEBEKK LTD.

LEGEND :

- LIGHT DUTY SILT FENCE AS PER OPSD-219.110
- SNOW FENCE
- STRAW BALE CHECK DAM AS PER OPSD-219.180
- ROCK CHECK DAM AS PER OPSD-219.210
- CB SILT SACK PLACED UNDER EXISTING CB COVER
- TEMPORARY MUD MAT 0.15m THICK 50mm CLEAR STONE ON NON WOVEN FILTER CLOTH



CLIENT
CLARIDGE HOMES

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ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR COORDINATION	2021.11.03
2	ISSUED FOR COORDINATION #2	2021.11.26
3	ISSUED FOR SPA	2021.12.06

NOT FOR CONSTRUCTION

SEE C00, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN

CONSULTANTS

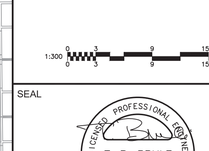
Project Coordinator:
Claridge Homes
Architect:
RLA/ Architecture
Landscape:

Surveyor:

Geotech:
Paterson Group

1:300 0 3 9 15m

SEAL



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PROJECT
LILYTHORNE ZENS 2

PROJECT NO:
134437

DRAWN BY:	CHECKED BY:
EH	TRB
PROJECT MGR:	APPROVED BY:
JB	TRB

SHEET TITLE
SEDIMENT AND EROSION PLAN

SHEET NUMBER
C-900

ISSUE
1

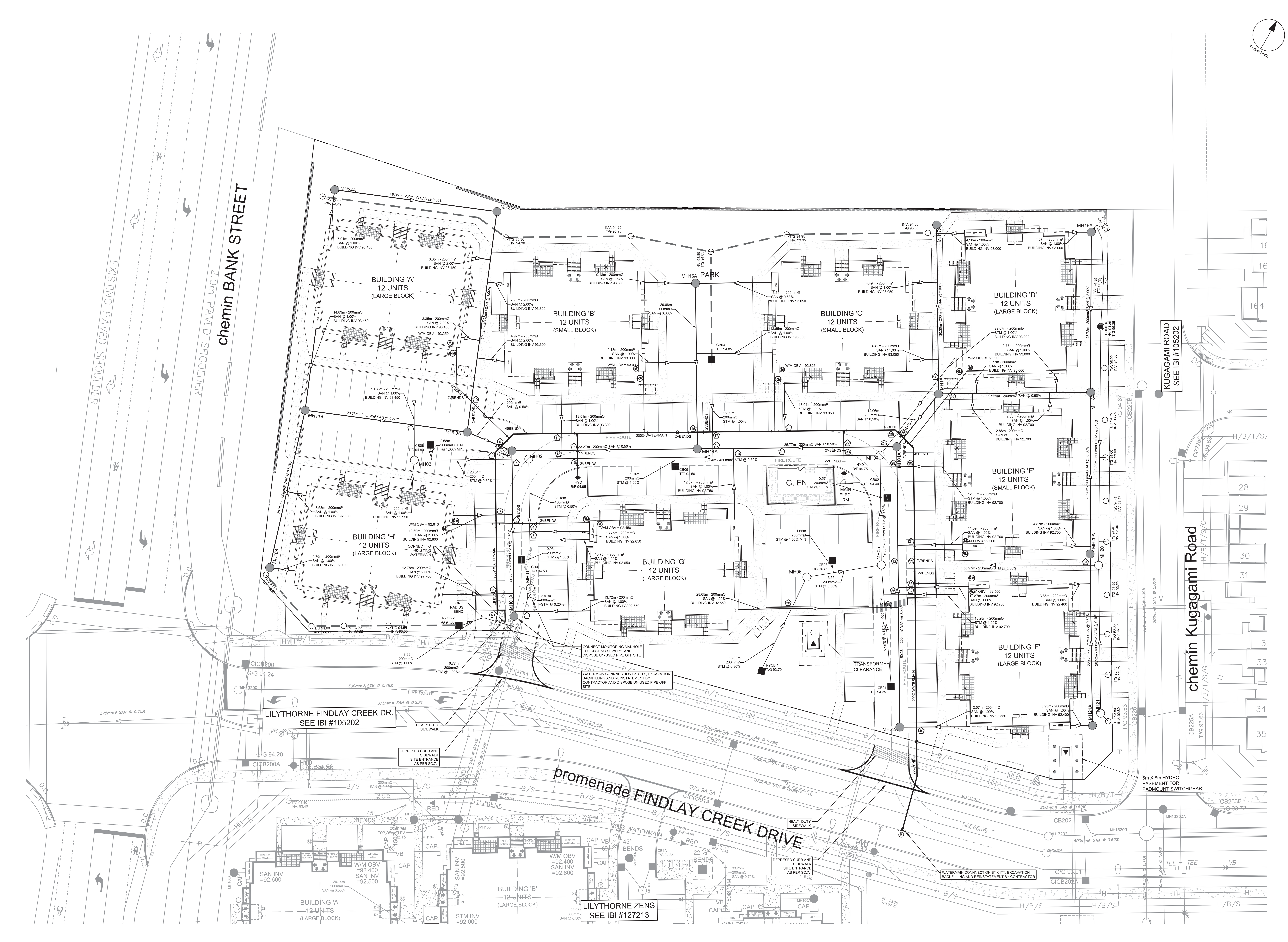
SCALE CHECK

CITY PLAN No. XXXXX

CITY FILE No. D07-XX-XX-XXXX

File Location: J:\134437_Lilythorn\7.0_Production\7.03_Design\04_Civil\Sheets\C-900 SEDIMENT AND EROSION PLAN.dwg Last Saved: December 8, 2021 by James Battison Plotted: Thursday, December 9, 2021 1:25:10 PM by Eric Henrie

APPENDIX E



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CLARIDGE HOMES

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR COORDINATION	2021:11:03
2	ISSUED FOR COORDINATION #2	2021:11:12
3	ISSUED FOR SPA	2021:12:08

NOT FOR CONSTRUCTION

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN

SITE

CONSULTANTS

Project Coordinator:
Claridge Homes
Architect:
RLA/ Architecture
Landscape:

Surveyor:

Geotech:
Paterson Group

1:300

SEAL

LICENSED PROFESSIONAL ENGINEER
T. R. BRULE
2021/12/08
PROVINCE OF ONTARIO

IBI GROUP
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Ottawa ON K1S 5N4 Canada
tel 613 225 1311 / 613 241 3300 fax 613 225 9868
ibigroup.com

PROJECT

LILYTHORNE ZENS 2

PROJECT NO:	
134437	
DRAWN BY: EH	CHECKED BY: TRB
PROJECT MGR: JB	APPROVED BY: TRB

SHEET TITLE

GENERAL PLAN OF SERVICING

SHEET NUMBER	ISSUE
C-001	1

CITY PLAN No. XXXXX

CITY FILE No. D07-XX-XX-XXXX

DRAWING NOTES

1.0 GENERAL

1.1 CONTRACTOR TO VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.

1.2 DO NOT SCALE DRAWINGS.

1.3 CONTRACTOR TO REPORT ALL DISCOVERIES OF ERRORS, OMISSIONS OR DISCREPANCIES TO THE ARCHITECT OR DESIGN ENGINEER AS APPLICABLE.

1.4 USE ONLY THE LATEST REVISED DRAWINGS OR THOSE THAT ARE MARKED "ISSUED FOR CONSTRUCTION".

1.5 ALL CONSTRUCTION SHALL COMPLY WITH CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.

1.6 THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND SPECIFICATIONS.

1.7 FOR LEGAL SURVEY INFORMATION REFER TO REGISTERED PLAN.

1.8 REFER TO SITE PLAN BY RLA ARCHITECTS INC.

1.9 CONTRACTOR TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES AS IDENTIFIED IN THE EROSION AND SEDIMENT CONTROL PLAN TO THE SATISFACTION OF THE CITY OF OTTAWA. PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.), DURING ALL PHASES OF THE SITE PREPARATION AND CONSTRUCTION THE MEASURES ARE TO BE MAINTAINED TO THE SATISFACTION OF THE ENGINEER AND CITY OF OTTAWA IN ACCORDANCE WITH THE BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL. SHOULD ANY ADDITIONAL MEASURES BE REQUIRED TO ADDRESS FIELD CONDITIONS THEY SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER OR THE CITY OF OTTAWA. SUCH ADDITIONAL MEASURES MAY INCLUDE BUT NOT BE LIMITED TO INSTALLATION OF SEDIMENT CAPTURE FILTER SOCKS WITHIN MANHOLES AND CATCHBASINS TO PREVENT SEDIMENT FROM ENTERING THE STRUCTURE AND INSTALLATION AND MAINTENANCE OF A LIGHT DUTY SILT FENCE BARRIER AS REQUIRED.

1.10 ALL IRON WORK ELEVATIONS SHOWN ARE APPROXIMATE AND ARE SUBJECT TO MINOR ADJUSTMENTS AS DETERMINED BY THE ENGINEER.

1.11 ALL CONCRETE CURBS AND SIDEWALKS TO CONFORM TO O.P.S. AND CONSTRUCTED TO CITY STANDARDS. ALL ONSITE CURBS TO BE BARRIER TYPE, WITH DEPRESSIONS AS NOTED.

1.12 ALL CONCRETE SHALL BE "NORMAL PORTLAND CEMENT" IN ACCORDANCE WITH O.P.S.S. 1350 AND SHALL ACHIEVE A MINIMUM STRENGTH OF 30MPa AT 28 DAYS.

1.13 ALL CONSTRUCTION TRAFFIC TO ACCESS SITE FROM FINDLAY CREEK DRIVE.

1.14 FOR GEOTECHNICAL REPORT SEE GEOTECHNICAL INVESTIGATION PROPOSED RESIDENTIAL DEVELOPMENT - KELLAM LANDS, OTTAWA, ON. REPORT No. 12-1121-0286 BY GOLDER ASSOCIATES.

1.15 CONTRACTOR TO PROTECT EXISTING INFRASTRUCTURE AND PROPERTY SUCH AS TREES, PARKING METERS, SIDEWALKS, CURBS, ASPHALT, AND STREET SIGNS FROM DAMAGE DURING CONSTRUCTION. CONTRACTOR TO PAY THE COST TO REINSTATE OR REPLACE ANY DAMAGED INFRASTRUCTURE OR PROPERTY TO THE SATISFACTION OF THE CITY.

1.16 THE POSITION OF POLE LINES, CONDUITS, WATERMAIN, SEWERS, AND OTHER UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES ARE 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 THE CONTRACTOR SHALL INFORM ITSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, SHALL PROTECT ALL UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

1.17 CONTRACTOR TO SUPPLY SUITABLE FILL MATERIAL WHERE REQUIRED TO ROUGH GRADE THE SITE. ALL IMPORTED FILL MATERIAL TO BE CERTIFIED AS ACCEPTABLE BY THE GEOTECHNICAL ENGINEER.

1.18 CONTRACTOR TO HAUL EXCESS MATERIAL OFFSITE AS NECESSARY TO GRADE SITE TO MEET THE PROPOSED GRADES. ALL EXCESS MATERIAL TO BE HAULED OFFSITE AND DISPOSED OF AT AN APPROVED DUMP SITE. SHOULD THE CONTRACTOR ENCOUNTER ANY HAZARDOUS MATERIAL, CONTRACTOR IS TO NOTIFY ENGINEER. ENGINEER TO DETERMINE APPROPRIATE DISPOSAL METHOD/LOCATION.

1.19 FILL MATERIAL WITHIN THE PARKING LOT AND BUILDING PAD AREAS, AND SUPPORTING BUILDING FOUNDATIONS SHALL BE COMPACTED TO 98% STANDARD MODIFIED PROCTOR DENSITY AND TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER.

1.20 ALL COMPACTION METHODS TO BE PERFORMED TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER TO INCLUDE BUT NOT BE LIMITED TO THE THICKNESS OF LIFTS, AND COMPACTION EQUIPMENT USED.

1.21 ALL DISTURBED BOULEVARDS TO BE REINSTATED WITH SOD ON 100mm TOPSOIL.

1.22 UTILITY DUCTS TO BE INSTALLED PRIOR TO ROAD BASE CONSTRUCTION.

1.23 CLAY DIKES TO BE INSTALLED WHERE INDICATED ON THE DRAWINGS OR AS APPROVED AND DIRECTED BY THE GEOTECHNICAL ENGINEER ALL IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.

1.24 BACKWATER VALES, PER CITY STANDARDS S14, S14.1 AND S14.2 RE TO BE INSTALLED FOR ALL STORM AND SANITARY SERVICE CONNECTIONS.

2.0 SANITARY

2.1 ALL SANITARY SEWER MAINS TO BE CSA CERTIFIED, BELL AND SPIGOT TYPE. ONLY FACTORY FITTINGS TO BE USED. SEWER TO BE INSTALLED AS PER OSPD 1005.01. SANITARY SEWER MATERIALS TO BE:
250mmØ AND SMALLER - PVC DR 35

2.2 ALL SANITARY MAINTENANCE HOLES TO BE 1.2m DIAMETER AS PER CITY OF OTTAWA STANDARDS COMPLETE WITH BENCHING, RUNGS, FRAME AND COVER, DROP PIPES AND LANDINGS WHERE NEEDED.

2.3 SANITARY MANHOLE COVERS TO BE CITY OF OTTAWA STD. S25 (MOD. OPSD. 401.020). SANITARY MANHOLE COVER TO BE CLOSED COVER TYPE, AS PER CITY STANDARD S24.

2.4 SANITARY SEWER LEAKAGE TEST AND CCTV INSPECTION SHALL BE COMPLETED AS PER CITY SPECIFICATIONS PRIOR TO INSTALLATION OF BASE COURSE ASPHALT.

2.5 ANY SANITARY SEWER WITH LESS THAN 2.0m COVER REQUIRES THERMAL INSULATION AS PER CITY OF OTTAWA STANDARD W22, OR AS APPROVED BY THE ENGINEER.

2.6 CONNECTION TO THE EXISTING SANITARY SEWER TO BE INCLUDED IN THE COST FOR SANITARY SEWER INSTALLATION. THIS INCLUDES REINSTATEMENT OF ROAD CUTS TO CITY STANDARDS.

3.0 STORM

3.1 ALL STORM SEWERS TO BE CSA CERTIFIED, BELL AND SPIGOT TYPE. ALL STORM SEWERS TO BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS. ONLY FACTORY FITTINGS TO BE USED. STORM SEWER MATERIALS TO BE : 375mmØ AND SMALLER - PVC DR 35
450mmØ AND LARGER - 100-D REINFORCED CONCRETE. UNLESS NOTED OTHERWISE

3.2 ALL STORM MAINTENANCE HOLES TO BE SIZED IN ACCORDANCE WITH THE PLANS AND AS PER CITY OF OTTAWA STANDARDS COMPLETE WITH BENCHING, RUNGS, AND FRAME AND COVER.

3.3 STORM MH COVERS TO BE OPEN TYPE, AS PER CITY STANDARD S24, FRAMES TO BE PER CITY OF OTTAWA STD. S25. CONTRACTOR TO INSTALL FILTER FABRIC UNDER STORM MH COVER UNTIL SODDING IS COMPLETE.

3.4 STORM MAINTENANCE HOLES TO BE OPSD, SIZE AS SPECIFIED, TAPER TOP.

3.5 ALL CATCH BASINS TO BE AS PER OPSD 705.010, FRAME & FISH TYPE GRATE AS PER CITY OF OTTAWA STD. S19.1.

3.6 3m 150mm DIAMETER SOCK-WRAPPED PERFORATED PVC SUBDRAINS TO BE INSTALLED ALL CB'S. TO EXTEND PARALLEL TO CURB IN CBS ADJACENT TO CURB AND IN 4 DIRECTIONS FOR CBS IN CENTER OF PARKING LOT. SUBDRAINS TO DISCHARGE TO CB'S.

3.7 ANY STORM SEWER WITH LESS THAN 2.0m COVER REQUIRES THERMAL INSULATION AS PER CITY OF OTTAWA STANDARD W22, OR AS APPROVED BY THE ENGINEER.

3.8 CONNECTION TO THE EXISTING STORM SEWER TO BE INCLUDED IN THE COST FOR STORM SEWER INSTALLATION. THIS INCLUDES REINSTATEMENT OF ROAD CUT TO CITY STANDARDS.

3.9 CONTRACTOR TO PROVIDE IPEX-TEMPEST MHF ICD'S SHOP DRAWINGS, OR EQUIVALENT, FOR ENGINEERS REVIEW PRIOR TO ORDERING ICD'S.

4.0 WATER

4.1 ALL WATERMAINS TO BE PVC DR 18, WITH MINIMUM COVER OF 2.4m AND INSTALLED PER CITY OF OTTAWA STANDARDS. ALL DOMESTIC WATER SERVICES ARE TO BE 200mmØ.

4.2 THRUST BLOCKS TO BE INSTALLED AT ALL BENDS, TEES, AND CAPS ALL AS PER OPSD 1103.01 AND 1103.02.

4.3 CONTRACTOR TO CONDUCT PRESSURE AND LEAKAGE TESTING OF ALL WATERMAINS AND DISINFECT AND CHLORINATE ALL WATERMAINS TO THE SATISFACTION OF M.O.E. AND THE CITY OF OTTAWA.

4.4 TRACER WIRE TO BE INSTALLED ALONG THE FULL LENGTH OF WATERMAIN AND ATTACHED TO EACH MAIN STOP AS PER CITY OF OTTAWA STANDARDS.

4.5 ALL COMPONENTS OF THE WATER DISTRIBUTION SYSTEM SHALL BE CATHODICALLY PROTECTED AS PER CITY OF OTTAWA STANDARDS.

4.6 ALL VALVES & VALVE BOXES AND CHAMBERS, HYDRANTS, AND HYDRANT VALVES AND ASSEMBLIES SHALL BE INSTALLED AS PER CITY OF OTTAWA STANDARDS.

4.7 ANY WATERMAIN WITH LESS THAN 2.4m COVER REQUIRES THERMAL INSULATION AS PER CITY OF OTTAWA STANDARD W22, OR AS APPROVED BY THE ENGINEER.

4.8 CONTRACTOR IS RESPONSIBLE FOR ACQUIRING THE WATER PERMIT FROM THE CITY OF OTTAWA AND PAYMENT OF ANY FEES ASSOCIATED WITH SECURING THE WATER PERMIT. OWNER IS RESPONSIBLE FOR REIMBURSING THE CONTRACTOR FOR THE ACTUAL COST OF ACQUIRING THE WATER PERMIT.

4.9 CONNECTION TO EXISTING WATERMAIN TO BE INCLUDED IN THE COST FOR THE WATERMAIN INSTALLATION. THIS COST INCLUDES REINSTATEMENT OF ROAD CUTS TO CITY STANDARDS.

4.10 ALL WATERMAIN CROSSINGS TO BE COMPLETED AS PER CITY OF OTTAWA STANDARDS W25 AND W25.2

5.0 PARKING LOT AND WORK IN PUBLIC RIGHTS OF WAY

5.1 CONTRACTOR TO REINSTATE ROAD CUTS PER CITY OF OTTAWA STANDARD R-10.

5.2 THE CONTRACTOR SHALL PREPARE A TRAFFIC MANAGEMENT PLAN FOR REVIEW AND APPROVAL BY THE CITY OF OTTAWA. CONTRACTOR TO MAINTAIN TRAFFIC FLOW DURING THE ENTIRE CONSTRUCTION PERIOD. MAINTENANCE OF ROAD CUTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. PROVISION OF FLAGMEN, DETOURS AS NECESSARY, BARRICADES AND SIGNS TO THE FULL SATISFACTION OF THE ENGINEER AND ROAD AUTHORITY SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

5.3 CONTRACTOR TO PREPARE SUBGRADE, INCLUDING PROOFROLLING, TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER PRIOR TO THE COMMENCEMENT OF PLACEMENT OF GRANULAR B MATERIAL.

5.4 FILL TO BE PLACED AND COMPACTED PER THE GEOTECHNICAL REPORT REQUIREMENTS.

5.5 CONTRACTOR TO SUPPLY, PLACE AND COMPACT GRANULAR B MATERIAL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOETCHNICAL ENGINEER. CONTRACTOR TO PROVIDE ENGINEER WITH SAMPLES OF GRANULAR B MATERIAL FOR TESTING AND CERTIFICATION FROM THE GEOTECHNICAL ENGINEER THAT THE MATERIAL MEETS THE GRADATION REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT.

5.6 GRANULAR A MATERIAL TO BE PLACED ONLY UPON APPROVAL BY THE GEOTECHNICAL ENGINEER OF GRANULAR B PLACEMENT.

5.7 ASPHALT MATERIAL TO BE PLACED ONLY UPON APPROVAL BY THE GEOTECHNICAL ENGINEER OF GRANULAR A PLACEMENT.

5.8 CONTRACTOR TO SUPPLY, PLACE AND COMPACT ASPHALT MATERIAL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER. CONTRACTOR TO PROVIDE ENGINEER WITH SAMPLES OF ASPHALT MATERIAL FOR TESTING AND CERTIFICATION FROM THE GEOTECHNICAL ENGINEER THAT THE MATERIAL MEETS THE REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT.

5.9 CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING LINE AND GRADE IN ACCORDANCE WITH THE PLANS, AND FOR PROVIDING THE ENGINEER WITH VERIFICATION PRIOR TO PLACEMENT.

5.10 DITCHES DISTURBED DURING CULVERT INSTALLATION AND GRADING OPERATIONS ARE TO BE REINSTATED TO THEIR ORIGINAL CONDITION AND FLOWLINE GRADES.

5.11 EXISTING EAST SIDE ROAD DITCH ALONG PALLADIUM DRIVE TO BE REALIGNED AS PER THE GRADING PLAN. ADJACENT AREAS BETWEEN ROAD SIDE DITCH AND PARKING LOT TO BE RE GRADED AS PER THE GRADING PLAN. ALL RE GRADED AREAS IN EXISTING PUBLIC RIGHTS OF WAY AND ANY OTHER DISTURBED AREAS IN EXISTING PUBLIC RIGHTS OF WAY ARE TO BE FINISHED WITH SOD ON 100mm TOPSOIL.

5.12 PAVEMENT STRUCTURE (MATERIAL TYPES AND THICKNESSES) FOR HEAVY DUTY AND LIGHT DUTY AREAS TO BE AS SPECIFIED IN THE GEOTECHNICAL REPORT AND SHOWN ON THE PLANS.

CROSSING SCHEDULE

1	200mmØ SAN 0.542m CLEARANCE OVER 600mmØ STM
2	200mmØ SAN 0.868m CLEARANCE OVER 200mmØ WTR
3	200mmØ SAN 0.389m CLEARANCE OVER 450mmØ STM
4	200mmØ WTR 0.250m CLEARANCE OVER 450mmØ STM
5	200mmØ WTR 0.827m CLEARANCE OVER 200mmØ SAN
6	200mmØ SAN 0.319m CLEARANCE OVER 200mmØ WTR
7	250mmØ STM 1.402m CLEARANCE OVER 200mmØ SAN
8	250mmØ STM 0.318m CLEARANCE OVER 200mmØ WTR
9	200mmØ SAN 0.855m CLEARANCE OVER 200mmØ SAN
10	200mmØ WTR 0.250m CLEARANCE OVER 200mmØ SAN
11	200mmØ STM 1.840m CLEARANCE OVER 200mmØ SAN
12	200mmØ STM 0.770m CLEARANCE OVER 200mmØ WTR
13	200mmØ STM 1.730m CLEARANCE OVER 200mmØ SAN
14	200mmØ WTR 0.790m CLEARANCE OVER 200mmØ SAN
15	200mmØ WTR 0.250m CLEARANCE OVER 450mmØ STM
16	200mmØ WTR 0.250m CLEARANCE OVER 200mmØ SAN
17	200mmØ STM 2.593m CLEARANCE OVER 200mmØ WTR
18	200mmØ STM 3.287m CLEARANCE OVER 200mmØ SAN
19	200mmØ SAN 0.136m CLEARANCE OVER 450mmØ STM
20	200mmØ STM 0.635m CLEARANCE OVER 200mmØ WTR
21	200mmØ STM 1.257m CLEARANCE OVER 200mmØ SAN
22	200mmØ WTR 0.366m CLEARANCE OVER 200mmØ SAN
23	200mmØ WTR 0.250m CLEARANCE OVER 450mmØ STM
24	200mmØ STM 1.042m CLEARANCE OVER 200mmØ SAN
25	200mmØ STM 0.614m CLEARANCE OVER 200mmØ WTR
26	200mmØ WTR 0.250m CLEARANCE OVER 200mmØ SAN
27	200mmØ WTR 0.541m CLEARANCE OVER 200mmØ SAN
28	200mmØ STM 0.403m CLEARANCE OVER 200mmØ SAN
29	200mmØ STM 0.225m CLEARANCE OVER 200mmØ WTR
30	200mmØ STM 0.393m CLEARANCE OVER 200mmØ WTR
31	200mmØ SAN 0.456m CLEARANCE OVER 200mmØ WTR
32	250mmØ STM 0.213m CLEARANCE OVER 200mmØ SAN
33	200mmØ WTR 0.250m CLEARANCE OVER 250mmØ STM
34	250mmØ STM 0.307m CLEARANCE OVER 200mmØ SAN
35	200mmØ SAN 0.371m CLEARANCE OVER 200mmØ WTR
36	200mmØ STM 0.100m CLEARANCE OVER 200mmØ SAN
37	200mmØ STM 0.400m CLEARANCE OVER 200mmØ WTR
38	200mmØ SAN 0.174m CLEARANCE OVER 200mmØ STM
39	200mmØ STM 0.161m CLEARANCE OVER 200mmØ SAN
40	200mmØ SAN 0.417m CLEARANCE OVER 200mmØ WTR

PAVEMENT STRUCTURE **

CAR ONLY PARKING AREAS:

50mm WEAR COURSE - HL-3 OR SUPERPAVE 12.5 ASPHALTIC CONCRETE
150mm BASE - OPSS GRANULARGRANULAR "A" CRUSHED STONE
300mm SUBBASE - OPSS GRANULAR "B" TYPE II
SUBGRADE - IN SITU SOIL, OR OPSS GRANULAR "B" TYPE I OR II
MATERIAL PLACED OVER IN SITU SOIL

HEAVY TRUCK PARKING AREAS AND ACCESS LANES:

40mm WEAR COURSE - HL-3 OR SUPERPAVE 12.5 ASPHALTIC CONCRETE
50mm BINDER COURSE - HL-8 OR SUPERPAVE 19.0 ASPHALTIC CONCRETE
150mm BASE COURSE - OPSS GRANULAR "A" CRUSHED STONE
450mm SUBBASE - OPSS GRANULAR "B" TYPE II
SUBGRADE - IN SITU SOIL, OR OPSS GRANULAR "B" TYPE I OR II
MATERIAL PLACED OVER IN SITU SOIL

** REFER TO GEOTECHNICAL REPORT

CATCH BASIN DATA TABLE

STRUCTURE ID	STRUCTURE	COVER	ELEVATION			OUTLET PIPE		HEAD	FLOW	ICD TYPE
			TOP OF GRATE	INVERT		DIAMETER	TYPE			
				INLET	OUTLET	(mm)				
RYCB1	OPSD 705.010	S19	**93.70**		92.900	200	PVC DR-35	1.65	23.0	Tempest HF
CB01	OPSD 705.010	S19	**94.25**		92.850	200	PVC DR-35	1.65	19.0	Tempest HF
CB02	OPSD 705.010	S19	**94.40**		93.000	200	PVC DR-35	1.65	63.0	Tempest HF
CB03	OPSD 705.010	S19	**94.45**		93.000	200	PVC DR-35	1.65	8.0	Tempest HF
CB04	OPSD 705.010	S19	**94.85**		93.450	200	PVC DR-35	1.65	32.0	Tempest HF
CB05	OPSD 705.010	S19	**94.50**		93.100	200	PVC DR-35	1.65	48.0	Tempest HF
CB06	OPSD 705.010	S19	**94.80**		93.350	200	PVC DR-35	1.65	32.0	Tempest HF
CB07	OPSD 705.010	S19	**94.50**		93.150	200	PVC DR-35	1.65	11.0	Tempest HF
RYCB2	OPSD 705.010	S19	**94.60**		93.050	200	PVC DR-35	1.65	6.0	Tempest HF
MH20	OPSD 701.011	S25 & S24.1	**94.70**		92.375	250	PVC DR-35	1.65	19.0	Tempest HF

Bold font indicates CB's with ICD's

Revision: 2021-12-07

WATERAIN SCHEDULE

A	Station	Description	Finished	Top of	As Built
	0+000.00	11.25° BEND	94.82	92.42	
	0+016.21	SERVICE CROSS	94.69	92.29	
	0+028.99	45° BEND	94.82	92.42	
	0+032.57	SERVICE TEE	94.86	92.46	
	0+033.63	45° BEND	94.88	92.48	
	0+045.12	HYDANT TEE	94.80	92.40	
	0+057.13	SERVICE TEE	94.77	92.37	
	0+063.13	VB	94.73	92.33	
	0+065.02	V-BEND	94.73	92.33	
	0+065.52	V-BEND	94.73	92.36	
	0+067.72	V-BEND	94.73	92.36	
	0+068.22	V-BEND	94.73	92.33	
	0+080.56	SERVICE TEE	94.72	92.32	
	0+092.89	HYDANT TEE	94.66	92.26	
	0+102.14	45° BEND	94.59	92.19	
	0+103.04	V-BEND	94.60	92.20	
	0+103.54	V-BEND	94.61	92.26	
	0+104.94	V-BEND	94.63	92.26	
	0+105.44	V-BEND	94.63	92.23	
	0+105.69	SERVICE TEE	94.64	92.24	
	0+106.74	45° BEND	94.64	92.24	
	0+124.98	SERVICE TEE	94.53	92.13	
	0+126.14	V-BEND	94.55	92.15	
	0+126.64	V-BEND	94.56	93.17	
	0+128.84	V-BEND	94.59	93.17	
	0+129.34	V-BEND	94.60	92.20	
	0+131.06	SERVICE TEE	94.62	92.22	
	0+159.45	VB	94.40	92.00	
	0+165.66	22.5° BEND	94.27	91.87	
B	0+175.75	TVS	94.18	91.78	

Sanitary STRUCTURE TABLE

NAME	RIM ELEV.	INVERT IN	INVERT IN AS-BUILT	INVERT OUT	INVERT OUT AS-BUILT	DESCRIPTION
MH01A	94.69	NW90.978				1200mmØ OPSD-701.010
MH02A	94.83	NE91.186 W91.156		SE91.126		1200mmØ OPSD-701.010
MH03A	94.21	W91.220 N92.700		E91.200		1200mmØ OPSD-701.010
MH04A	94.57	SE91.849 N91.582		SW91.577		1200mmØ OPSD-701.010
MH10A	94.16	E92.652		N92.592		1200mmØ OPSD-701.010
MH11A	94.81	S92.447 N93.302		E91.367		1200mmØ OPSD-701.010
MH14A	93.11	NE91.398 NW91.600		SW91.353		1200mmØ OPSD-701.010
MH15A	94.66	SW93.158 NE92.964		SE92.490		1200mmØ OPSD-701.010
MH16A	93.79	NW92.284 NE91.662		S91.642		1200mmØ OPSD-701.010
MH17A	94.40			SE92.890		1200mmØ OPSD-701.010
MH18A	94.26	NW92.031 SE91.858		SW91.798		1200mmØ OPSD-701.010
MH19A	94.46	SW92.953		SE92.893		1200mmØ OPSD-701.010
MH20A	0.00	SE92.023		NW92.003		1200mmØ OPSD-701.010
MH21A	94.02	SW92.361		NW92.177		1200mmØ OPSD-701.010
MH22A	94.21	NE92.424		NW92.100		1200mmØ OPSD-701.010
MH24A	94.89	S93.386		E93.300		1200mmØ OPSD-701.010
MH25A	94.66	W93.153		S93.099		1200mmØ OPSD-701.010

Storm STRUCTURE TABLE

NAME	RIM ELEV.	INVERT IN	INVERT IN AS-BUILT	INVERT OUT	INVERT OUT AS-BUILT	DESCRIPTION
CBMH18	95.35			SE92.652		1200mmØ OPSD-701.010
MH01	94.60	NW91.564		S91.314		1200mmØ OPSD-701.010
MH02	94.33	SW92.746 NE91.779		SE91.679		1200mmØ OPSD-701.010
MH03	94.76	NW93.257 SE92.899		NE92.849		1200mmØ OPSD-701.010
MH04	94.29	SE92.170 N92.779		SW92.095		1200mmØ OPSD-701.010
MH05	95.41	SE92.612 NE92.393 SW92.443		NW92.268		1200mmØ OPSD-701.010
MH06	94.26	S92.755		NE92.551		1200mmØ OPSD-701.010
MH20	94.70	NW92.588 SE92.588		SW92.588		1200mmØ OPSD-701.010
MH21	94.07			NW92.628		1200mmØ OPSD-701.010

LEGEND:

- EXISTING SANITARY MANHOLE — SANITARY MANHOLE
- EXISTING STORM MANHOLE — STORM MANHOLE
- EXISTING STREET CATCHBASIN — CATCHBASIN c/w TOP OF GRATE
- EXISTING CURB INLET CATCHBASIN — REAR YARD CATCHBASIN c/w GUTTER GRADE
- EXISTING VALVE AND VALVE BOX — VALVE AND VALVE BOX
- EXISTING VALVE AND CHAMBER — VALVE AND CHAMBER
- EXISTING HYDRANT — HYDRANT c/w BOTTOM OF FLANGE ELEVATION
- EXISTING BARRIER CURB — DEPRESSED BARRIER CURB AS PER SC1.1
- EXISTING DEPRESSED BARRIER CURB — BARRIER CURB AS PER SC1.1
- EXISTING CONCRETE SIDEWALK — MOUNTABLE CURB AS PER SC1.3
- 250mmØ SUBDRAIN — PROPOSED CONCRETE SIDEWALK
- SIAMESE CONNECTION (IF REQUIRED) — SANITARY SEWER & FLOW DIRECTION
- METER — STORM SEWER & FLOW DIRECTION
- REMOTE METER — WATERMAIN
- PRV PRESSURE REDUCING VALVE — WATERMAIN REDUCER
- WATERMAIN IDENTIFICATION — VERTICAL BEND LOCATION
- PIPE CROSSING IDENTIFICATION — PROPERTY LINE
- INLET CONTROL DEVICE LOCATION — PROPOSED MAIL BOX
- PROTECTIVE BOLLARD
- HEAVY DUTY ASPHALT / FIRE ROUTE

- EXISTING UTILITIES
- EXISTING DUCT BANK
- SLOPE C/W FLOW DIRECTION
- MAJOR OVERLAND FLOW ROUTE
- PROPOSED SPOT GRADE
- PROPOSED SWALE GRADE
- PROPOSED SWALE HIGH POINT
- LOT CORNER GRADE C/W EXISTING GROUND
- TIE INTO EXISTING GRADE
- EXISTING AOV SURVEY GRADE
- EXISTING IBI SURVEY GRADE
- FULL STATIC PONDING GRADE
- RETAINING WALL
- TOP OF RETAINING WALL
- PROPOSED BOTTOM OF RETAINING WALL
- TERRACING 3:1 MAXIMUM UNLESS NOTED OTHERWISE
- PRELIMINARY ROOF DRAIN LOCATION
- TEST PITS (SEE GEOTECHNICAL REPORT)
- CLAY DYKES PER S8
- USF=92.394 — PROPOSED UNDERSIDE OF FOOTING ELEVATION
- TOF=94.731 — PROPOSED TOP OF FOUNDATION ELEVATION

- PAD MOUNTED TRANSFORMER
- LIGHT FIXTURE
- PRIMARY DUCT BANK
- SECONDARY POWER

CLIENT
CLARIDGE HOMES

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR COORDINATION	2021.11.05
2	ISSUED FOR COORDINATION #2	2021.11.26
3	ISSUED FOR SPA	2021.12.06

NOT FOR CONSTRUCTION

SEE DRG. 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN

CONSULTANTS

Project Coordinator:
Claridge Homes
Architect:
RLA/ Architecture
Landscape:

Surveyor:

Geotech:
Paterson Group

SEAL

LICENSED PROFESSIONAL ENGINEER
T. R. BRULE
2021/12/08
PROVINCE OF ONTARIO

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PROJECT
LILYTHORNE ZENS 2

PROJECT NO: 134437

DRAWN BY:	CHECKED BY:
EH	TRB
PROJECT MGR:	APPROVED BY:
JB	TRB

SHEET TITLE
DETAILS AND NOTES

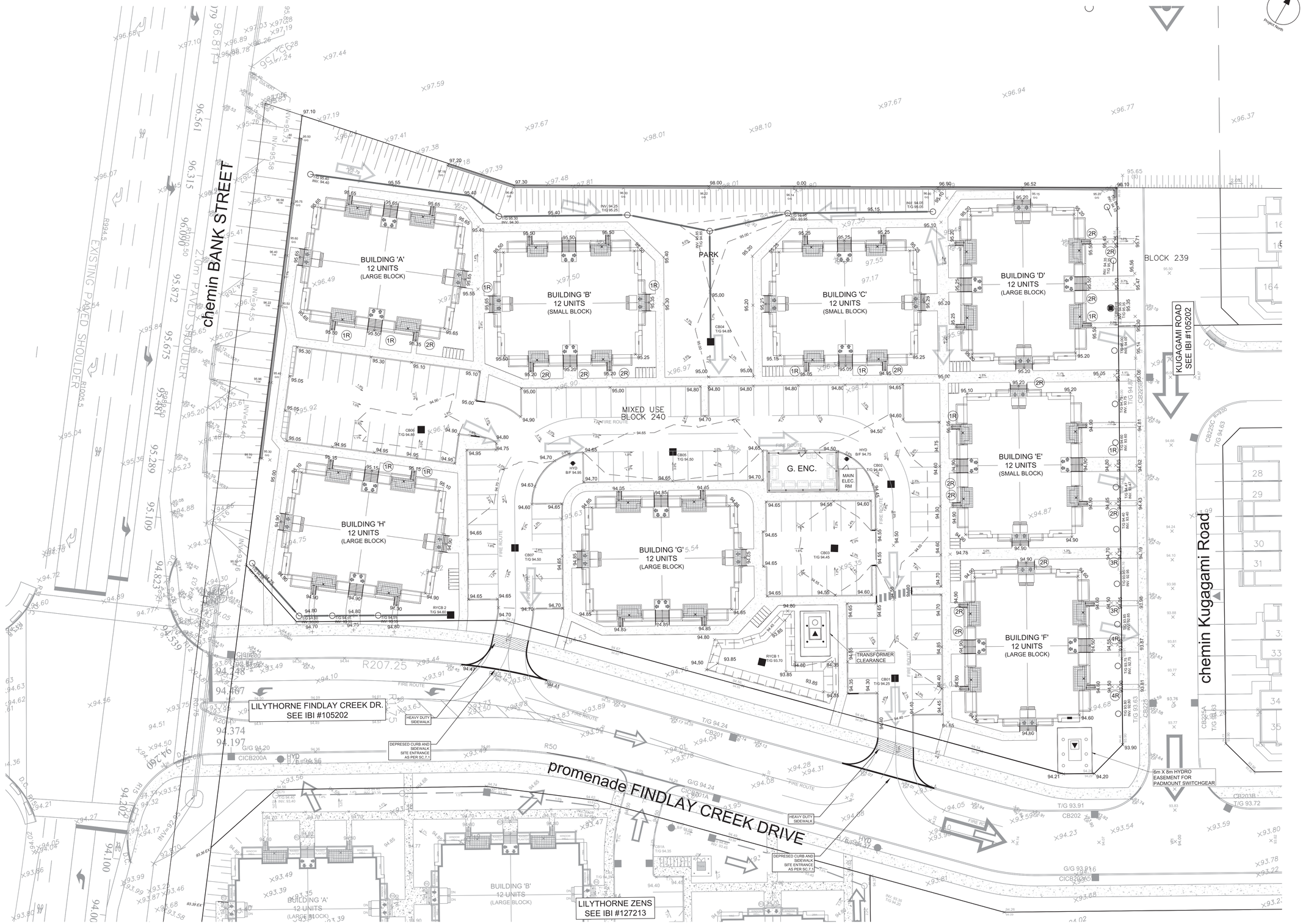
SHEET NUMBER C-010 | ISSUE 1

SCALE CHECK | Drawn

CITY PLAN No. XXXXX

CITY FILE No. D07-XX-XX-XXXX

File Location: J:\134437_Lilythorn\7.0_Production\7.03_Design\04_Civil\Sheets\C-010 DETAILS AND NOTES.dwg Last Saved: December 9, 2021, by James.Battison Plotted: Thursday, December 9, 2021 1:23:04 PM by Eric Henrie



CLIENT

CLARIDGE HOMES

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR COORDINATION	2021.11.03
2	ISSUED FOR COORDINATION #2	2021.11.19
3	ISSUED FOR SPA	2021.12.08

NOT FOR CONSTRUCTION

SEE C00, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN

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1:300 0 3 9 15m

SEAL

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PROJECT

LILYTHORNE ZENS 2

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DRAWN BY: EH	CHECKED BY: TRB
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SHEET TITLE

GRADING PLAN

SHEET NUMBER	ISSUE
C-200	1

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SCALE CHECK

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