REPORT
PROJECT: 135856-6.4.3

DESIGN BRIEF
4624 SPRATT ROAD
CLARIDGE HOMES
RIVERSIDE SOUTH COMMUNITY

Prepared for CLARIDGE HOMES
by IBI GROUP

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List of Appendices

1 INTRODUCTION

1.1 Purpose

The purpose of this Design Brief is to provide stakeholder regulators with the project background together with the design philosophy and criteria incorporated in the site plan design. This report will provide a logical framework to assist reviewers with evaluation of the design of the development.

1.2 Background

The Riverside South Community, formerly known as South Urban Community (SUC), is a part of the former City of Gloucester. The Council of the City of Gloucester adopted the first Official Plan for the community in September 1990. The original concept plan for the community served as the basis for both a Gloucester and a Regional OPA. A Master Drainage Plan (MDP) for the community was formulated in June 1992 based on the preliminary land use plan prepared by J. Bousfields and Associates Ltd. in December 1991.

The South Urban Community became a part of the City of Ottawa through amalgamation in 2001 and the new Official Plan of the City of Ottawa designated the areas as "General Urban Area" and "Employment Area" with some adjustments to the urban boundaries. In 2003, the City of Ottawa initiated a Community Design Plan (CDP) for the Riverside South area. The basis of the CDP is the land use plan for the community, which has evolved over the time and has changed significantly since the original plan prepared in early 1990's.

The South Urban Community River Ridge Master Infrastructure Plan (SUC RR MIP) prepared by Ainley Graham and Associates in 1994 presented a preferred servicing strategy for potable water, sanitary and storm infrastructure in the Riverside South community. The Riverside South Infrastructure Servicing Study Update (ISSU) was issued in 2008 as an update to the SUC RR MIP, to account for modifications to the MDP and CDP since 1994. For reference, a copy of the 2016 Riverside South Community Design Plan – Land Use Plan is included in **Appendix A**.

1.3 Previous Studies

The following report has been referenced prior to completing this assessment:

- **Assessment of Adequacy of Public Services**, Claridge Homes Phase 3 Lands – 4623 Spratt Road, Claridge Homes (Spratt Road) Inc. – Riverside South Community (IBI September 2020).
- **Riverside South Development Corporation (RSDC) Riverside South Community Phase 9 Design Report** (J.L. Richards & Associates Limited, 2012). This report provides details on the proposed water supply, waste water disposal, major and minor storm systems with proposed connections for the subject lands.
- **Riverside South Community Infrastructure Servicing Study Update (RSCISSU)**, Stantec Consulting Ltd., September 30, 2008

1.4 Subject Property

The property covers about 2.4 ha. It is located to the north of the future BRT corridor and west of Spratt Road and east of the RSDC Phase 9 community as shown in **Figure 1.1**. The current draft plan of subdivision for the subject property is included in **Appendix A**.

The proposed development includes 10 stacked townhouses block and a total of 120 units.

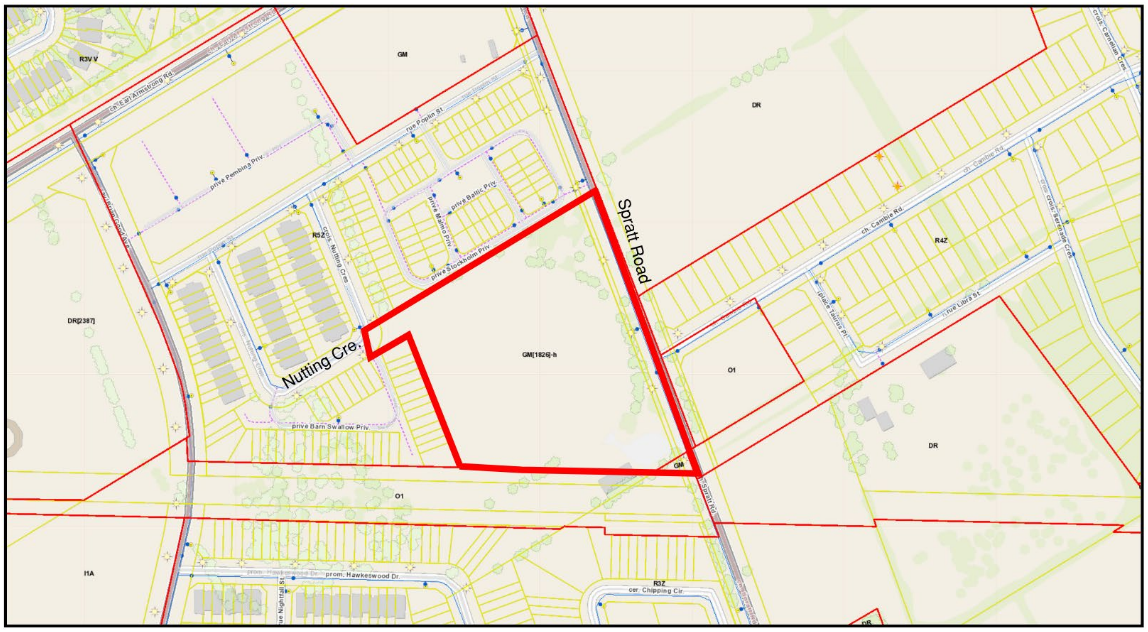

Figure 1.1 Site Location Map

1.5 Existing Infrastructure

Figure 3.1 Water Servicing Plan, **Figure 4.1** Sanitary Servicing Plan and **Figure 5.1** Storm Servicing Plan from **Riverside South Community Phase 9 Design Report** shows the location of existing major municipal infrastructure in the vicinity of the 4624 Spratt development. During construction of the subdivision development, RSDS's Phase 9, servicing stubs for storm and sanitary services were left at the servicing corridor of the subject land along Nutting Crescent in order to service the subject site.

1.6 Pre-Consultation

There was a pre-consultation meeting with the City of Ottawa on September 29, 2020. The meeting notes can be found in **Appendix A**. The following are some of the topics reviewed and discussed:

- Zoning information
- Official plan
- Infrastructure
- Park Requirements
- Noise Study needed
- Traffic Study needed
- Geotechnical Conditions

It should be noted that consultation with the Rideau Valley Conservation Authority will be scheduled forthwith.

1.7 Existing Topography

The property is generally flat throughout the site, with a slightly higher southeast corner. Contours for the site are approximately at the 91 - 92 m elevation. A 3-4m high stockpile of fill exists in the north-central portion of the site.

1.8 Geotechnical Considerations

The following geotechnical investigation report has been prepared by Paterson Group

- Report No. PG5641-1 dated February 23rd, 2021 for the subject property.

Among other items, the reports comments on the following:

- Site Grading
- Foundation Design
- Pavement Design
- Sub-Surface Conditions
- Groundwater Control
- Seismic Design
- Corrosion Potential
- Trees
- Site Services

In general, the subsurface profile encountered topsoil, underlain by sandy silt. Underlying the sandy silt, silty clay to clayed silt and glacial till deposit was encountered.

1.9 Watercourses and Setbacks

There are no identified Municipal Drains or watercourses within proximity to this subject development.

2 WATER SUPPLY

2.1 Existing Conditions

There is an existing 300 mm diameter watermain along Spratt Road and an existing 200mm watermain on Nutting Crescent. **Figure 3.1** included in **Appendix B** shows the location of the proposed watermains for Riverside South Community Phase 9.

2.2 Design Criteria

2.2.1 Water Demands

Water demands have been calculated for the site based on per unit population density and consumption rates taken from Tables 4.1 and 4.2 of the City of Ottawa Design Guidelines – Water Distribution and are summarized as follows:

- Single Family — 3.4 person per unit
- Townhouse and Semi-Detached — 2.7 person per unit
- Average Apartment — 1.8 person per unit
- Residential Average Day Demand — 280 l/cap/day
- Residential Peak Daily Demand — 700 l/cap/day
- Residential Peak Hour Demand — 1, 540 l/cap/day
- ICI Average Day Demand — 28,000 l/gross ha/day
- ICI peak Daily Demand — 42,000 l/gross ha/day
- ICI Peak Hour Demand — 50,400 l/gross ha/day

Residential units in the subject site consists of stacked townhouses. A watermain demand calculation sheet is included in **Appendix B.** The total water demands are summarized as follows:

- Average Day — 0.92 l/s
- Maximum Day — 2.30 l/s
- Peak Hour — 5.05 l/s

2.2.2 System Pressure

The 2010 City of Ottawa Design Guidelines – Water Distribution, Clause 4.2.2 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 in unoccupied areas 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) in occupied areas. 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 Rates

The site consists of 10 stacked townhouse blocks. Fire Underwriters Survey (FUS) calculations have been done for Building B, E and H which are the larger stacked townhouse blocks with the most exposures to adjacent buildings. An additional FUS calculation has been done for Building F, which is a smaller stacked townhouse but has the most exposures to adjacent buildings. The calculations result in a maximum fire flow requirement of 14,000 l/min for Building B and E; a copy of the FUS calculation is included in **Appendix B**.

2.2.4 Boundary Conditions

The City of Ottawa has provided two boundary conditions on Spratt Road and Nutting Crescent for this development. There are pre and post configuration values provided with the pre-configuration values considerably lower than the post SUC Zone. As the re-configuration of the pressure area, scheduled for the end of 2022, is expected to occur while this site is developed. Therefore, the water analysis is carried out for SUC Zone Reconfiguration. A copy of the Boundary Condition is included in **Appendix A** and summarized as follows:

CRITERIA	HYDRAULIC HEAD	
	Spratt Road	Nutting Crescent
Max HGL (Basic Day)	147.3 m	147.3 m
Peak Hour	145.4 m	145.4 m
Max Day + Fire (14,000 l/m)	141.5 m	125.1 m

2.2.5 Hydraulic Model

A computer model for the subject site has been developed using the InfoWater program by Innovyze. The model includes the boundary conditions on Spratt Road and Nutting Crescent for the proposed connections.

2.3 Proposed Water Plan

2.3.1 Hydraulic Analysis

A 200 mm watermain is proposed with the first connection to the existing 300mm watermain at Spratt Road, and extends through the site with a second connection to the 200mm watermain on Nutting Crescent. Refer to the general plan of services **Drawing C-001** for detailed watermain layout for the subject site.

The hydraulic model was run under basic day conditions using the SUC Zone reconfiguration boundary condition to determine the maximum pressure for the site. The minimum pressure for the site is determined in the peak hour analysis using the provided boundary condition. The model was run under the max day plus fire (14,000 L/min) SUC Zone Reconfiguration Boundary condition to determine the design fire flow at the hydrant locations. Results of the analysis for the site are summarized in Section 2.3.2 and the water model schematic and model results are included in **Appendix B**.

2.3.2 Modeling Results

The hydraulic model was run under basic day, maximum day with fire flows and under peak hour conditions. Results of the hydraulic model are included in **Appendix B** and summarized as follows:

Scenario	**SUC Zone Reconfiguration**
Basic Day (Max HGL) Pressure Range	545.03 to 547.68 kPa
Peak Hour (Min HGL) Pressure Range	526.23 to 529.04 kPa
Max Day + 14,000 l/min Fire Flow – Min. Fire Flow	340.43 l/s

A comparison of the results and design criteria is summarized as follows:

Maximum Pressure	All nodes have basic day pressures under 552 kPa under both pressure zone scenarios, therefore pressure reducing control is not required for this development.
Minimum Pressure	All nodes in the model exceed the minimum value of 276 kPa (40 psi).
Fire Flow	Under the future SUC Zone Reconfiguration scenario, all fire nodes exceed the fire flow requirement of 233.33 l/s (14,000 l/min).

3 SANITARY SEWERS

3.1 Existing Conditions

As noted earlier in Section 1.5, sanitary flows from the subject site are routed to RSDC's Phase 9 lands with a sanitary connection to the existing manhole MH31 located at Nutting Crescent. General Plan of Services C-001 included in **Appendix A** shows the existing sanitary stub location.

3.2 RSDC's Phase 9 Design (J.L. Richards, 2012)

Drainage area plan **Figure 4.1** and the sanitary sewer design sheet for the above noted project have been included in **Appendix C** as they demonstrate that the whole of the subject land has been included in the design calculations for the sanitary sewers within RSDC's Phase 9. The subject land is identified as drainage area Claridge Commercial.

3.3 Design Criteria

All on-site sewers have been designed to City of Ottawa and MOE design criteria which include but are not limited to the below listed criteria. A copy of the detailed sanitary tributary area plan 400 and the sanitary sewer design sheets are included in **Appendix C** illustrate the population densities and sewers which provide the necessary outlets.

- Average residential flow = 280 l/c/d
- Peak residential flow factor = (Harmon Formula) x 0.80
- Average commercial flow = 28,000 l/s/ha
- Peak ICI flow factor = 1.5 if ICI area is ≤ 20% total area
  1.0 if ICI area is > 20% total area
- Inflow and Infiltration Rate = 0.33 l/s/ha
- Minimum Full Flow Velocity = 0.60 m/s
- Maximum Full Flow Velocity = 3.0 m/s
- Minimum Pipe Size = 200 mm diameter

In accordance with the City of Ottawa Sewer Design Guidelines Table 4.2, the following density rates are estimated for the subject site:

- Two-bedroom stacked town units = 2.1

3.4 Recommended Sanitary Plan

Detailed sanitary sewer drainage area plan **Drawing C-400** and the Sanitary Design Sheets are included in **Appendix C**. A 200mm diameter sanitary main is proposed to bring the sanitary flows from the site to the existing 200mm stub at Nutting Crescent, with 150mm diameter services to each corner of the stacked townhouse blocks.

According to the RSDC Phase 9 sanitary sewer design sheet, the allocated sanitary flow for the site is 3.47 L/s. The calculated sanitary flow for the proposed site plan is 3.77 L/s. The outlet pipe for the site has a capacity of 19.66 L/s, which can sufficiently accommodate the slightly increased flow. The downstream sewers through RSDC Phase 9 all have a residual capacity that exceeds 0.30 L/s. Therefore, the increase in flow on the existing system is considered negligible, and the subject development will have no negative impacts on downstream infrastructure. A copy of the RSDC sanitary sewer design sheet is included in **Appendix C.**

4 MINOR STORM SEWERS

4.1 Existing Conditions

As noted in Section 1.5, storm flows from the subject site outlet to existing stub at Nutting Crescent. **Figure 5.1** shows the location of the existing storm sewers in this area.

There are no existing municipal drains, watercourses or recognized drainage features on the subject lands as noted in the RSDC Phase 9 design report.

4.2 RSDC's Phase 9 Design (J.L. Richards, 2012)

Drainage area plan **Figure 5.1** and the storm sewer design sheet for this project have been included in **Appendix D** as they demonstrate that the whole of the subject land has been included in the design calculations for the storm sewers within RSDC's Phase 9. The subject land is identified as drainage area Claridge Commercial.

4.3 Minor Storm Sewer Design Criteria

The minor system storm sewers for the subject site are proposed to be sized based on the rational method, applying standards of both the City of Ottawa and MECP. Some of the key criteria for this site include the following:

- Sewer Sizing: Rational Method
- Design Return Period: 1:2 year (local streets/parking lots)
- Initial Time of Concentration 10 minutes
- Manning's: 0.013
- Minimum Velocity: 0.80 m/s
- Maximum Velocity: 3.00 m/s

PIPE DIAMETER (MM)	MINIMUM SLOPE (%)
250	0.43
300	0.34
375	0.25
450	0.20
525	0.16
600	0.13
675	0.11
750 and larger	0.10

4.4 Proposed Minor Storm Plan

As outlined in Section 4.2, the development of RSDC Phase 9 has included the expected stormwater servicing needs of the subject property. The existing 900mm diameter storm sewers constructed downstream of the site were sized to provide the needed capacity for minor storm runoff from the subject site. Minor storm runoff from the subject site will be directed to the existing 750mmØ sewer stub located at the servicing corridor northwest of the site along Nutting Crescent.

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 D**. The general plan of services **Drawing C-001**, depicting all on-site storm sewers can be found in **Appendix A**.

According to **Table 5.3** in RSDC Phase 9 Design Report, the allowable inlet capture rate is identified to be 77 L/s/ha, see **Appendix D**. The total allowable release rate for the subject site is calculated to be 77 L/s/ha X 2.36 ha = 181.72 L/s. Inlet control devices (ICDs) are proposed across the site to maximize the use of available on-site storage and control surcharge of the minor system during infrequent storm events.

The owner of the site will be responsible for regular maintenance of the on-site sewers, catch basins and inlet control devices (ICDs). Maintenance includes but is not limited to the cost of regular cleaning of the structures and ICDs as necessary. The site owner will also be responsible for replacement of damaged or missing catch basin structures, grates or ICDs as needed.

5 STORMWATER MANAGEMENT

5.1 Background

The subject site is located to the north of the future BRT corridor and west of Spratt Road and east of the RSDC Phase 9 community and is tributary to the Pond 1 Stormwater Facility. This facility was designed and constructed in the early 1990s to provide erosion control, along with water quality and quantity control for its tributary area. Therefore, no further requirements in terms of storm runoff quality and quantity control are expected for the subject lands tributary to Pond 1. The stormwater management strategy for the subject site was outlined in the following reports:

- **Riverside South Development Corporation (RSDC) Riverside South Community Phase 9 Design Report** (J.L. Richards & Associates Limited, 2012). This report provides details on the proposed water supply and major and minor storm systems with proposed connections for the subject lands.
- **Riverside South Community Infrastructure Servicing Study Update (RSCISSU)**, Stantec Consulting Ltd., September 30, 2008

Details of the subject site parameters, on-site storage available, and restricted minor system rates will be discussed in **Section 5.4**.

5.2 Objective

The purpose of this evaluation is to prepare the dual drainage design, including the minor and major system, for this development. The design includes the assignment of inlet control devices, maximum depth and velocity of flow on the surface and hydraulic grade line analysis. The evaluation takes into consideration the following City of Ottawa documents:

- Ottawa Sewer Design Guidelines (OSDG) (October 2012)
- February 2014 Technical Bulletin ISDTB-2014-01
- September 2016 Technical Bulletin PIEDTB-2016-01
- March 2018 Technical Bulletin ISTB-2018-01 and
- June 2018 Technical Bulletin ISTB-2018-04.

5.3 Dual Drainage Design

The subject site is designed with dual drainage features, accommodating minor and major system flow. During frequent storm events, the effective runoff of a catchment area is directly released via catchbasin inlets to the network of storm sewers, called the minor system. During less frequent storm events, the balance of the flow (in excess of the minor flow) is accommodated by a system of rear yard swales and street segments, called the major system.

The private drive aisles and parking lots within the subject site features a sawtooth profile. The sawtooth profile facilitates surface storage based on a maximum of 350 mm separation between the low point at the catchbasin and the high overflow point at the downstream end of the segment. The assigned size of the inlet control devices (ICDs) for the subject site was optimized using PCSWMM. ICDs are incorporated into the stormwater management design to protect the minor system from surcharge during infrequent storm events. The ICDs used for the subject site are provided in the CB Table presented on **Drawing C-010**.

The dual drainage system has been evaluated using the fully dynamic PCSWMM model for both the hydrological and hydraulic analysis. The PCSWMM hydrological evaluation offers single storm event flow generation and routing. The major system evaluation is fully dynamic and based on typical road cross sections and road profiles.

The Phase 9 design report notes that the minor system targets for Phase 9 corresponds to peak flows smaller than the 2-year storm runoff and as such, it is expected that some ponding will occur in most areas during the 2-year storm. In order to optimize ponding during 2-year storm, storage within an underground storage system will be provided. Further details of the dual drainage design are discussed in **Section 5.4.1**. Major flow up to 100-year storm event will be restricted and detained on-site. The emergency overflow from the subject site outlet Spratt Road via the proposed entrance, refer to **Drawing C-700**.

At certain locations within the site, the opportunity to store runoff is limited due to grading constraints and building geometry. 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. These “uncontrolled” areas – 0.09 hectares in total, have an average C value of 0.75. The drainage area plans are presented on **Drawings C-500**. Model files are enclosed as part of the digital submission.

5.4 Stormwater Evaluation

5.4.1 Hydrological Evaluation

Land use, selected modeling routines, and input parameters are discussed in the following sections for the subject site only. The main hydrological parameters for the subject site are summarized below.

<u>Storms and Drainage Area Parameters</u>

The main hydrology parameters are summarized below and in **Table 5.1**.

- **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).
- **Area:** The drainage area was divided into sub-drainage areas based on the proposed minor system network of storm sewers and the rational method spreadsheet with some minor modifications for modeling purposes. See **Drawing C-700** for the catchment areas used in the detail evaluation of the subject site.
- **Imperviousness:** The imperviousness values are based on the runoff coefficients, which were determined by obtaining the footprint of the model units intended for the site and placing the maximum footprint on the lots. PCSWMM provides an opportunity to specify direct and indirect routing to a pervious or impervious area. For this evaluation, all drainage areas were assumed to be 100% routed to an outlet.
- **Infiltration:** Infiltration losses were selected to be consistent with the OSDG. The Horton values are as follows: Max. infiltration rate = 76.2 mm/h, Min. infiltration rate = 13.2 mm/h, Decay constant = 4.14 1/hr.
- **Subcatchment 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. This approach is consistent with the OSDG.

- **Slope:** The average surface slope was based upon the average slope for both impervious and pervious area. Based on the surface grading of the subject site an average slope of 1% has been used for subcatchment flow routing.
- **Initial Abstraction (Detention Storage):** Detention storage depths of 1.57 mm and 4.67 mm were used for impervious and pervious areas, respectively. These values are consistent with the OSDG.
- **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 within the PCSWMM model.
- **Major System Storage and Routing:** The subject site is comprised of sawtooth parking areas and drive aisles. For drainage areas with sawtoothing, 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. Ponding plan is presented on **Drawings C-600**. Rear yard segments have a sawtooth pattern with some storage available, which is taken into consideration as part of the analysis.

  For areas with ponding, minor system capture is set to fully utilize storage during the 100 year design storm, while minimizing ponding during the 2 year event. 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.

  For areas with sawtoothing, simulations were based on the constraint that during the 100 year design storm the maximum depth of ponding (including cascading flow where applicable) does not exceed 0.35 m. The surface storages for parking lots were modeled in PCSWMM using stage storage curves. The surface storages for street segments were modeled in PCSWMM using a combination of nodes with inverts corresponding to gutter elevations, and links with corresponding cross-sections. The evaluation was undertaken assuming dynamic flow conditions. It should be noted that the visual interpretation of street links in the model, is based on illustrating street nodes along the center of the road. However, the invert elevations are modified to correspond to the gutter (CB grill) elevations as indicated above.

  Rear yards were considered independently of street segments. Storage volumes in rear yards were accounted for as available on-site storage. Simulations were based on the total interception of runoff by the storm inlets. This was done by specifying a subcatchment outlet in the model at the same node as the rear yard ICD outlet link. Overflow from the rear yards cascades to the next downstream segment and then ultimately to a major system road segment via swales.
- **Minor system capture:** The minor system capture for the subject site is based on 77l/s/ha as per the Phase 9 design report, reference information is provided within **Appendix D**. This will be achieved through a combination of inlet control devices (ICD's) at inlet locations, surface storage where possible and underground storage in oversized storm pipes where required. Surface flows in excess of the site's allowable release rate will be stored on site in strategic surface storage areas or oversized underground pipes and gradually released into the minor system to respect the site's allowable release rate.

For the evaluation of the site in PCSWMM, a rating curve for each ICD has been created. The rating curve was emulating performance of a particular orifice in question to convey the ICD flow to the minor system. The rating curve was based on an average top of grate (T/G) to the center of CB lead height of 1.3 m for the entire site. The ICD size, head and flow are provided on the CB table presented on **Drawing C-010**.

Summary of Modeling Files

For ease of review, the following is a reference list of the computer modeling files provided as part of the digital submission.

PCSWMM

- 135856-4624SprattRd-REV1-2CH.pcz – 2 year 3 hour Chicago
- 135856-4624SprattRd-REV1-100CH.pcz – 100 year 3 hour Chicago
- 135856-4624SprattRd-REV1-120CH.pcz – 100 year 3 hour Chicago increased by 20%

Table 5-1 Hydrological Parameters – Subcatchment Summary Table

DRAINAGE AREA ID	AREA (HA)	DOWNSTREAM SEGMENT ID	RECEIVING MH (SEWER NODE)	IMP RATIO	SUBCATCHMENT WIDTH (M)	AVAILABLE STATIC STORAGE (CU-M)(1)
MH124	0.16	MH100	MH124	87	70	46.12
MH125	0.15	MH101	MH124	87	70	46.12
MH126	0.12	MH102	MH126	87	78	30.21
MH102	0.10	MH101	MH102	87	88	8.11
MH101	0.10	MH100	MH101	87	100	24.85
MH100	0.06	OUT	MH100	87	64	17.93
MH113	0.20	MH102	MH113	79	48	36.54
CBMH9	0.13	MH113	CBMH9	79	64	68.23
CBMH9B	0.10	CBMH9	CBMH9	43	110	19.23
MH110	0.14	MH131	MH110	79	110	62.18
MH127	0.19	MH127B	MH127	79	70	34.55
MH127B	0.15	MH101	MH127	79	58	47.17
MH130	0.05	MH131	MH130	87	42	14.13
MH111	0.12	MH110	MH111	43	96	43.96
MH109B	0.12	MH110	MH109	43	90	33.40
MH100C	0.02	OUT	MH100	43	19	1.84
MH100D	0.05	MH100C	MH100	43	21	4.00

DRAINAGE AREA ID	AREA (HA)	DOWNSTREAM SEGMENT ID	RECEIVING MH (SEWER NODE)	IMP RATIO	SUBCATCHMENT WIDTH (M)	AVAILABLE STATIC STORAGE (CU-M)(1)
MH109	0.30	MH130	MH109	79	27	62.33
UNC1	0.05	OUT	MH110	79	32	n/a
UNC2	0.04	OUT	MH110	79	34	n/a

*(1) The available on-site static storage is based on **Drawings C-600**.*

5.4.2 Results of Hydrological Evaluation

In PCSWMM, the hydraulic grade line (minor system) and major system are simulated simultaneously. The allowable minor system release rate for the 2.36 ha site is 181.72 L/s according to the Phase 9 design report. As noted in **Section 5.3,** a portion of the site will be left to discharge to Spratt Road uncontrolled. As per PCSWMM model, this uncontrolled area will contribute approximately 40.49 L/s to Spratt Road during the 100 year Chicago design storm. As per discussion with City of Ottawa and in order to optimize the 2 year ponding, the allowable release rate remains at 181.72 L/s without a reduction for the uncontrolled areas to Spratt 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 to the maximum allowable flowrate of 181.70 l/s. **Table 5.2** summarizes the ICDs characteristics, refer to **Drawing C-010** for detailed calculations and orifice sizing.

Table 5.2 Summary of ICD

LOCATION	AREA (HA)	RELEASE RATE (L/S)	Head (M)	ICD
MH124	0.16	12	1.65	CUSTOM IPEX MHF
MH125	0.15			
MH126	0.12			
MH102	0.10	8	1.65	CUSTOM IPEX LMF
MH101	0.10	8	1.65	CUSTOM IPEX LMF
MH100	0.06	8	1.65	CUSTOM IPEX LMF
MH113	0.20	10	1.65	CUSTOM IPEX MHF
CBMH9	0.13	17	1.65	IPEX MHF
CBMH9B	0.10	12	1.65	CUSTOM IPEX MHF
MH110	0.14	21	1.65	IPEX MHF
MH127	0.19	10	1.65	CUSTOM IPEX MHF
MH127B	0.15			
MH130	0.05	8	1.65	CUSTOM IPEX LMF
MH111	0.12	6	1.65	IPEX LMF
MH109B	0.12	8	1.65	CUSTOM IPEX LMF
MH100C	0.02	10	1.65	CUSTOM IPEX MHF

LOCATION	AREA (HA)	RELEASE RATE (L/S)	Head (M)	ICD
MH100D	0.05	10	1.65	CUSTOM IPEX MHF
MH109	0.30	25	1.65	IPEX MHF

The below **Table 5.3** summarizes the minor system capture for each subcatchment on the subject site for the 2 year, 3 hour Chicago storm events. As noted in previous sections, the subject was designed with a unit rate that pre-dates the OSDG. The results of the on-site detention analysis show that during the 2 year storm event there is ponding on the subject site. Ponding occurs during the storm event and no ponding remains after the event.

Table 5.1 DDSWMM Hydrological Model Results for 2 Year 3 Hour Chicago

DRAINAGE AREA ID	LOCATION	AVAILABLE STATIC STORAGE (m3)	AVAILABLE STATIC DEPTH (m)	MAXIMUM DEPTH AT LOW POINT (M)	OVERFLOW (l/s)	DURATION (HR:MIN)
MH124	Parking Lot	46.1	0.30	0	0	N/A
MH125	Parking Lot	46.1	0.30	0	0	N/A
MH126	Parking Lot	30.2	0.25	0	0	N/A
MH102	Street	8.1	0.20	0	0	N/A
MH101	Street	24.9	0.30	0	0	N/A
MH100	Street	17.9	0.30	0	0	N/A
MH113	Parking Lot	36.5	0.30	0	0	N/A
CBMH9	Parking Lot	68.2	0.30	0.06	0	1:20
CBMH9B	Landscape Area	19.2	0.30	0.01	0	N/A
MH110	Parking Lot	62.2	0.30	0.04	0	1:10
MH127	Parking Lot	34.6	0.30	0	0	N/A
MH127B	Parking Lot	47.2	0.30	0	0	N/A
MH130	Street	14.1	0.25	0	0	N/A
MH111	Park	44.0	0.30	0.11	0	N/A
MH109B	Landscape Area	33.4	0.30	0.09	0	N/A
MH100C	Landscape Area	1.8	0.18	0	0	N/A
MH100D	Landscape Area	4.0	0.25	0	0	N/A
MH109	Future Block	62.3	0.30	0.15	0	N/A

The **Table 5.4** 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.

Table 5.2 PCSWMM Hydrological Model Results for 100 Year 3 Hour Chicago and 100 Year 3 Hour Chicago +20%

DRAINAGE AREA ID	MINOR SYSTEM CAPTURE (L/S)	AVAILABLE STATIC DEPTH (m)	100 Year 3 Hour Chicago		100 Year 3 Hour Chicago +20%	
			MAXIMUM DEPTH AT LOW POINT (M)	Cascading Depth (m)	MAXIMUM DEPTH AT LOW POINT (M)	Cascading Depth (m)
MH124	12	0.30	0.28	0	0.30	0
MH125		0.30	0.28	0	0.30	0
MH126		0.25	0.22	0	0.25	0
MH102	8	0.20	0.21	0.01	0.22	0.01
MH101	8	0.30	0.23	0	0.31	0
MH100	8	0.30	0.14	0	0.21	0
MH113	10	0.30	0.26	0	0.30	0
CBMH9	17	0.30	0.20	0	0.23	0
CBMH9B	12	0.30	0.29	0	0.30	0
MH110	21	0.30	0.21	0	0.24	0
MH127	10	0.30	0.26	0	0.30	0
MH127B		0.30	0.26	0	0.30	0
MH130	8	0.25	0.25	0	0.26	0.01
MH111	6	0.30	0.27	0	0.30	0
MH109B	8	0.30	0.29	0	0.30	0
MH100C	10	0.18	0.01	0	0.10	0
MH100D	10	0.25	0.21	0	0.28	0.03
MH109	25	0.30	0.31	0.01	0.35	0.05

The above results indicate that there is no major system flow to Spratt Road during the 100 year 3 hour Chicago and 100 year 3 hour Chicago + 20% storm event. As noted in **section 5.4.2**, 40.49 L/s and 49.06 L/s flows uncontrolled to Spratt Road during the 100 year 3 hour Chicago and 100 year 3 hour Chicago + 20% storm event, respectively. The minor flow peak flow remains under 181.72 l/s allocated from the previous Phase 9 design report. Therefore, the proposed design will not have a negative impact on the existing downstream system.

5.4.3 Results of Hydraulic Evaluation

The hydraulic grade line (HGL) was analyzed using PCSWMM for the 100 year 3 hour Chicago storm; the governing storm event for the subdivision. The corresponding stress test (100 year 3 hour Chicago storm + 20% increase in intensity) was also simulated. The HGL elevations are presented in the following **Table 5-5**, along with a comparison of under-side of footing (USF) elevations.

Table 5-5 Storm Hydraulic Grade Line for the subject site for the 100 Year 3 Hour Chicago and 100 Year 3 Hour Chicago increased by 20% Storm Events

PCSWMM MH (SEWER NODE)	USF (M)	STORM HYDRAULIC GRADE LINE			
		100 YEAR 3 HOUR CHICAGO		100 YEAR 3 HOUR CHICAGO + 20%	
		HGL (M)	USF–HGL (EG - HGL) (M)	HGL (M)	USF–HGL (EG - HGL) (M)
4624 Spratt Road (Subject Site)					
MH100	89.59	87.66	1.93	87.66	1.93
MH101	89.64	87.31	2.33	87.31	2.33
MH102	89.64	87.10	2.54	87.10	2.54
MH103	89.64	87.02	2.62	87.03	2.61
MH104	89.64	86.90	2.74	86.91	2.73
CBMH9	89.69	87.73	1.96	87.73	1.96
MH109	89.74	87.75	1.99	87.76	1.98
MH110	89.74	87.67	2.07	87.67	2.07
MH111	89.69	87.54	2.15	87.54	2.15
MH112	89.69	87.49	2.20	87.49	2.20
MH113	89.69	87.41	2.28	87.41	2.28
MH114	89.69	87.34	2.35	87.34	2.35
MH129	89.59	87.58	2.01	87.58	2.01
MH130	89.64	87.93	1.71	87.93	1.71
MH131	89.64	87.78	1.86	87.78	1.86
MH132	89.59	87.45	2.14	87.45	2.14

The HGL results presented in **Table 5-5** indicates that the minimum 0.3 m clearance between the USF and HGL is maintained across the subject site for the 100 year 3 hour Chicago and 100 year 3 hour Chicago increased by 20% storm event.

6 CONVEYANCE CONTROLS

6.1 General

Besides source controls, the development also proposes to use several conveyance control measures to improve runoff quality. These will include:

- flat vegetated swales;
- catchbasin and maintenance hole sumps; and
- pervious rear yard drainage.

6.2 Flat Vegetated Swales

The development will make use of relatively flat vegetated swales where possible to encourage infiltration and runoff treatment.

6.3 Catchbasins

All catchbasins within the development, either rear yard or street, will be constructed with minimum 600 mm deep sumps. These sumps trap pollutants, sand, grit and debris which can be mechanically removed prior to being flushed into the minor pipe system. Both rear yard and street catchbasins will be fabricated to OPSD 705.010 or 705.020. All storm sewer maintenance holes servicing local sewers less than 900 mm diameter shall be constructed with a 300 mm sump as per City standards.

6.4 Pervious Landscaped Area Drainage

Some of the landscaped area swales make use of a filter wrapped perforated drainage pipe constructed below the rear yard swale. This perforated system is designed to provide some ground water recharge and generally reduce both volumetric and pollutant loadings that enter the minor pipe system.

7 SEDIMENT AND EROSION CONTROL PLAN

7.1 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 introduce several mitigative construction techniques to reduce unnecessary construction sediment loadings. These will include:

- Until the local storm sewer and storm pond are constructed, groundwater in trenches will be pumped into a filter mechanism prior to release to the environment. After construction of the storm water facility, any construction dewatering will be routed to the nearest storm sewer.
- bulkhead barriers will be installed at the nearest downstream manhole in each sewer which connects to an existing downstream sewer.
- Should the storm and sanitary sewer connections be made in advance of the final ICD installations within the development, temporary ICD's shall be placed in the last manhole prior to connection to existing sewers. The temporary ICD shall be sized to the design flow rate with a 2.0m head.
- seepage barriers will be constructed in any temporary drainage ditches.
- 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.

7.2 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.

For pumping rates between 50,000 to 400,000 liters per day, registration on the Environmental and Sector Registry (EASR) is required.

7.3 Bulkhead Barriers

Although the storm sewers eventually outlet into a sediment forebay, a ½ diameter bulkhead will be constructed over the lower half of the outletting sewers to reduce sediment loadings during construction. These bulkheads will trap any sediment laden flows, thus preventing any construction-related contamination into existing sewers. The bulkheads will be inspected and maintained including periodic sediment removal as needed.

7.4 Seepage Barriers

In order to further reduce sediment loading to the stormwater management facility and existing watercourses, 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 F. 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.

7.5 Surface Structure Filters

All catchbasins, and to a lesser degree, manholes, convey surface water to sewers. Until streets are asphalted and curbed where required, all manholes will be constructed with sediment capture filter socks 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.

8 ROADS AND NOISE ATTENUATION

Vehicular access to 4624 Spratt Road is provided by two private entrances from Spratt Road. All private drive aisles are 6.7m width asphalt. The roads have been designed (by others) to accommodate public garbage collection routes and fire truck movements.

All public spaces within the private development are barrier free and accessible. There are no accessible units within the development, as each unit is serviced by stairs.

There are 144 residence parking spaces and 24 visitor parking spaces provided for this development. There are no accessible parking spaces provided.

There are 60 bicycle parking spaces provided throughout the development.

There are 4 solid waste collection and recycling areas placed at strategic locations throughout the development.

An environmental noise attenuation study has been provided for this development. The study has been prepared by IBI Group.

9 SOILS

Paterson Group Inc. was retained to prepare a geotechnical investigation for the proposed residential development for 4624 Spratt Road. 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 geotechnical report PG5641-1 was prepared by Paterson Group in February 2021. The report contains recommendations which include but are not limited to the following:

- The maximum permissible grade raise is 3.0m
- In areas where finished grade exceeds grade raise limits, geotechnical reviews are required
- Fill placed below the foundations to meet OPSS Granular 'A' or Granular 'B' Type II placed in 200 mm lifts compacted to 98% SPMDD.
- Fill for roads to be suitable native material in 300mm lifts compared to 95% SPMDD

Pavement Structure – Car Parking Areas:

LOCAL ROAD	THICKNESS
Asphaltic Concrete	50mm
OPSS Granular A Base	150mm
OPSS Granular B Type II Subbase	300mm

Pavement Structure – Local Roadways:

LOCAL ROAD	THICKNESS
Asphaltic Concrete	90mm
OPSS Granular A Base	150mm
OPSS Granular B Type II Subbase	450mm

- Pipe bedding and cover: The pipe bedding for sewer and water pipes placed on a relatively dry, undisturbed subgrade surface should consist of at least 150 mm of OPSS Granular A material. Where the bedding is located within the firm grey silty clay, the thickness of the bedding material should be increased to a minimum of 300 mm. The cover material, which should consist of OPSS Granular A, should extend from the spring line of the pipe to 300 mm above the obvert of the pipe. The material should be placed in 300 mm thick lifts and compacted to a minimum of 95% of its SPMDD.

In general, the grading plan for 4624 Spratt Road adheres to the grade raise constraints noted above. A copy of the grading plans is included in **Appendix D**.

10 CONCLUSION

This report has illustrated that watermains and storm and sanitary sewers can be extended to service the subject lands in accordance with the approved adjacent developments, the ISSU and the deviation report. The water, wastewater, and stormwater systems required to develop 4624 Spratt Road are designed in accordance with MECP and City of Ottawa's current level of service requirements.

The use of lot level controls, conveyance controls and end of pipe controls outlined in the report will result in effective treatment of surface stormwater runoff from the site. Adherence to the proposed sediment and erosion control plan during construction will minimize harmful impacts on surface water.

An ECA from the MECP is not required for this development.

Regulatory review and permits from the Rideau Valley Conservation are not required for this development.

Final detail design will be subject to governmental approval prior to construction, including but not limited to the following:

- Block 203 Commence Work Order: City of Ottawa
- Block 203 Watermain Approval: City of Ottawa

Report prepared by:

Demetrius Yannoulopoulos, P. Eng.
Director – Office Lead

Mahsa Ghasri, M.SC., EIT.
Water Resources

Ryan Magladry, C.E.T
Project Manager

Amy Zhuang, P.Eng.
Project Engineer

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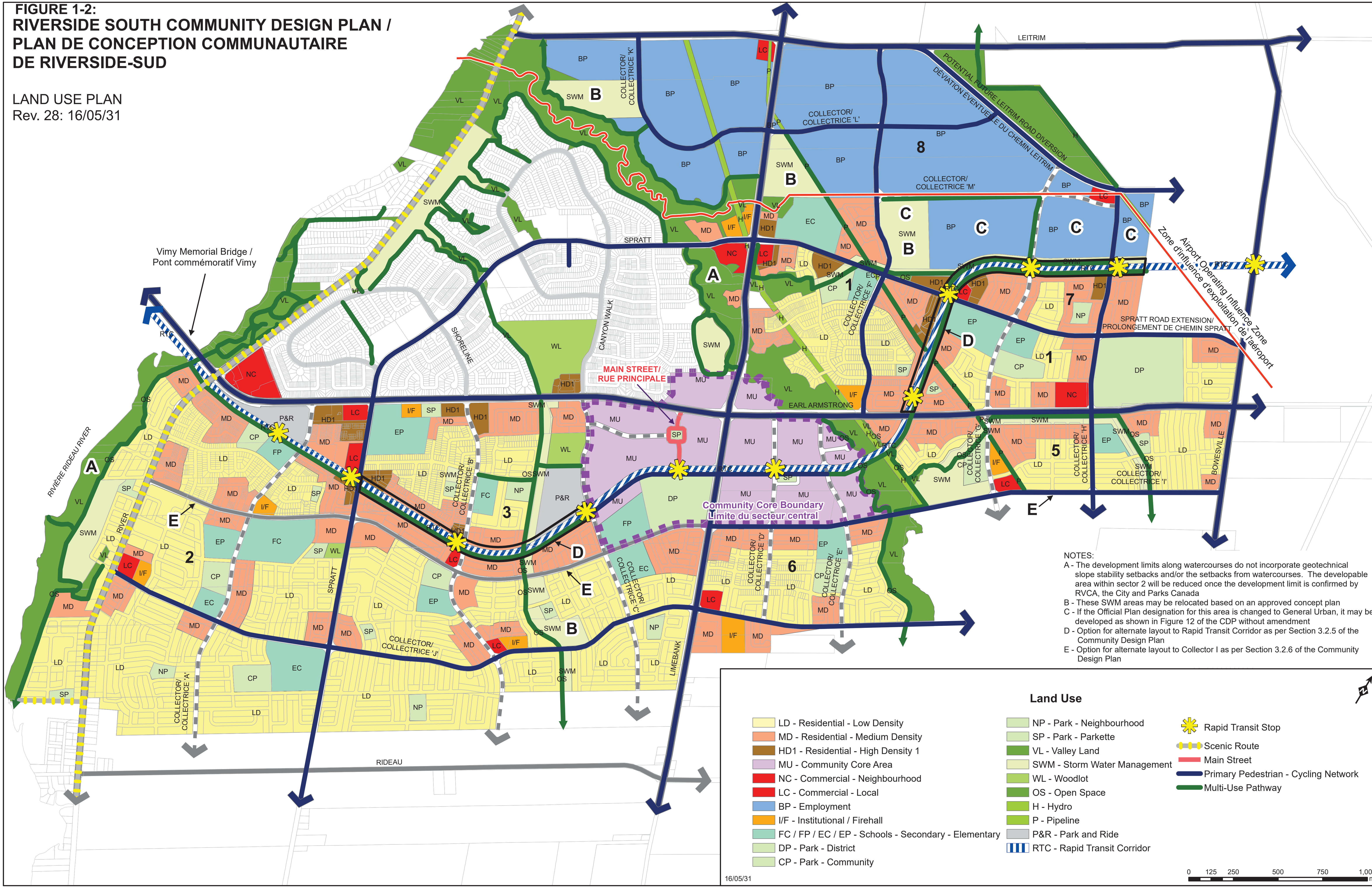
APPENDIX A

- RSDC Land Use Plan
- RSDC Phase 9 - Plan of Subdivision Northeast
- Site Plan
- Notes of Pre
- General Plan of Services

FIGURE 1-2:

RIVERSIDE SOUTH COMMUNITY DESIGN PLAN / PLAN DE CONCEPTION COMMUNAUTAIRE DE RIVERSIDE-SUD

LAND USE PLAN
Rev. 28: 16/05/31



NOTES:

A - The development limits along watercourses do not incorporate geotechnical slope stability setbacks and/or the setbacks from watercourses. The developable area within sector 2 will be reduced once the development limit is confirmed by RVCA, the City and Parks Canada

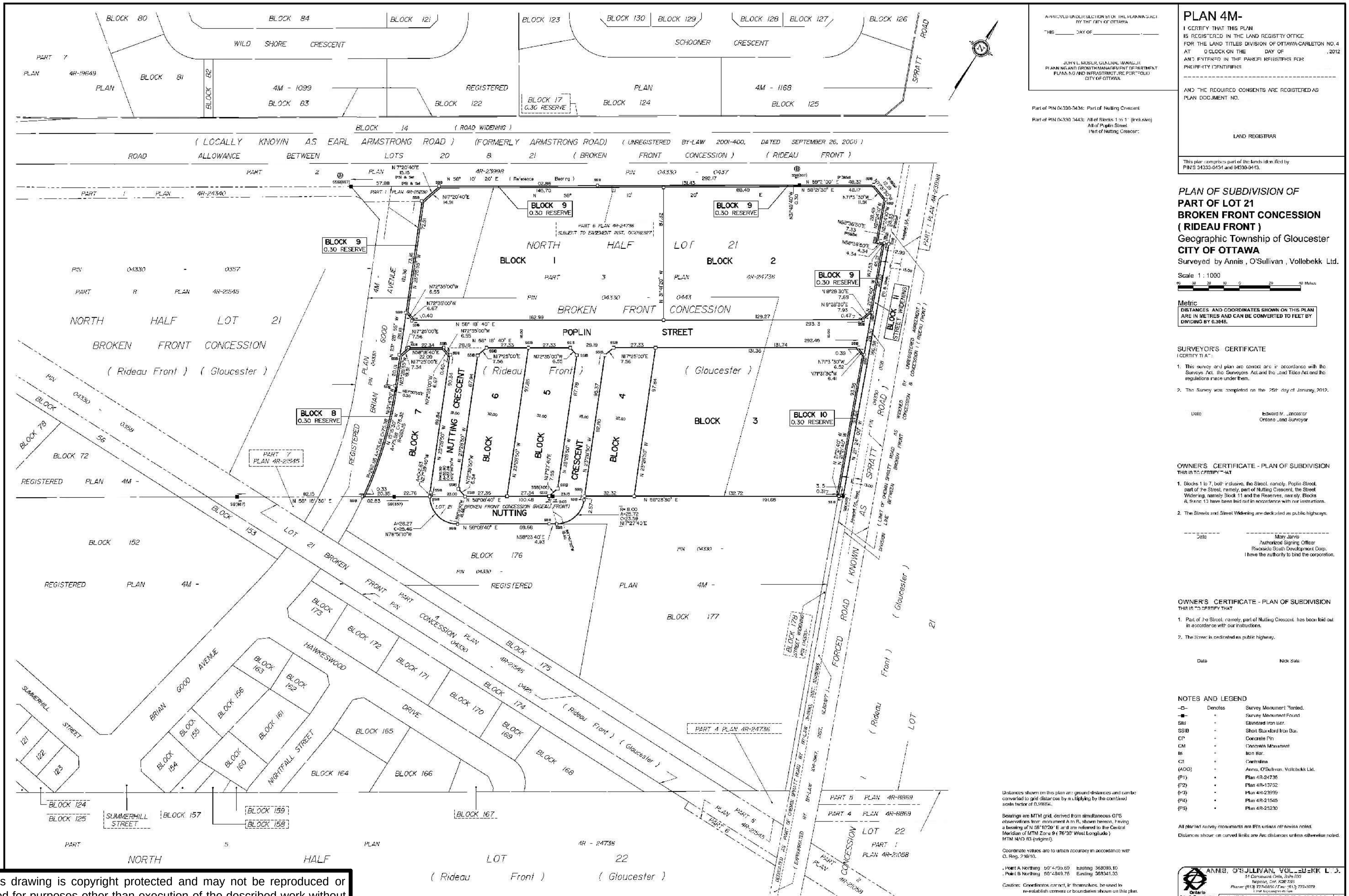
B - These SWM areas may be relocated based on an approved concept plan

C - If the Official Plan designation for this area is changed to General Urban, it may be developed as shown in Figure 12 of the CDP without amendment

D - Option for alternate layout to Rapid Transit Corridor as per Section 3.2.5 of the Community Design Plan

E - Option for alternate layout to Collector I as per Section 3.2.6 of the Community Design Plan

I:\AA_Staff\Sarah\DonMorse\RiversideSouthCDP_Update_2015\RiversideSouthCDP_LandUse2015_enRev28.mxd



PROJECT:	DRAWING:		DRAWING NO.:
RIVERSIDE SOUTH PHASE 9 CITY OF OTTAWA	COPY OF PLAN OF SUBDIVISION NORTHEAST	DESIGN: OTHER	FIGURE 1.2b
		DRAWN: OTHER	JLR NO:
		CHECKED: J.L.P.	21464-09
		PLOTTED: Oct16,2012	

File Location: V:\21464-09.LD\21464-09 P Fig1_2.dwg

1 SP-1 SITE PLAN
SCALE = 1 : 400

DRAWING NOTES

1. PROPERTY LINE
2. BUILDING SETBACKS
3. HARD SURFACE WALK
4. PARKING SPACE: STANDARD SIZE 2.6 x 5.2 METRES
5. VISITOR PARKING SPACE
6. ASPHALT DRIVING SURFACE
7. BICYCLE PARKING SPACES (DESIGN DETAILS PROVIDED ON PLAN L.1)
8. PROPOSED FIRE HYDRANT
9. EXISTING FIRE HYDRANT
10. EXISTING CONCRETE SIDEWALK WITH STREET CURB
11. PRIVATE PATIOS ABOVE / BELOW GRADE
12. GARBAGE ENCLOSURE
13. COMMUNITY MAIL BOX
14. UTILITY CLOSETS
15. PROPOSED HYDRO TRANSFORMER
16. 1.8 METRE CONCRETE SIDEWALK WITH STREET CURB
17. EXISTING ROGERS VAULT
18. EXISTING HYDRO TRANSFORMER
19. GUARD RAIL

SITE PLAN SYMBOLS

- CONCRETE UNIT PAVERS SURFACE
- SOFT LANDSCAPING
- CONCRETE WALK / PATH
- 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)

PROJECT DEVELOPER

Claridge Homes
2001 - 201 Gladstone Avenue
Ottawa ON,
Tel.: (613) 233-6030
E-Mail:

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@aovltd.com

LEGAL DESCRIPTION

PLAN OF SUBDIVISION OF
PART OF LOT 21 AND
BROKEN FRONT CONCESSION (RIDEAU FRONT)
Geographic Township of Gloucester
REGISTERED PLAN 4M-1470
CITY OF OTTAWA
SURVEYED BY ANNIS O'SULLIVAN VOLLEBEKK LTD.

PROJECT INFORMATION

ZONING Zoning By-Law 2008-250	GM
USE	PLANNED UNIT DEVELOPMENT
SITE AREA	23,888.7 sq. m. (257,135) sq. ft.
MAX. BUILDING HEIGHT	18.0 m.
FRONT YARD SETBACK	3.0 M
INTERIOR SIDE YARD SETBACK (RES. BUILDING ≥ 11M)	3.0 M
INTERIOR SIDE YARD SETBACK (NON-RES. BUILDING ABUTTING RES. ZONE)	5.0 M
REAR YARD SETBACK (ABUTTING RES. ZONE)	7.5 M
REAR YARD SETBACK (RESIDENTIAL BUILDING)	7.5 M
AMENITY AREA PER DWELLING UNIT	6.0 sq. m.
COMMUNAL AMENITY AREA	50%
WIDTH OF LANDSCAPE AREA (ABUTTING A STREET)	3.0 M
WIDTH OF LANDSCAPE AREA (ABUTTING RES. ZONE)	3.0 M
WIDTH OF LANDSCAPE AREA AROUND PARKING	1.5 M

PROJECT STATISTICS

PLANNING UNIT DEVELOPMENT
COMPRISED OF STACKED TOWNHOUSES

BUILDING HEIGHT 11.0 M

AMENITY SPACE (720 sq. m. req.)

PRIVATE BALCONY / PATIO =	1092 sq. m.
EXTERIOR AT GRADE =	_ sq. m.
PARK =	540 sq. m.
TOTAL =	_ sq. m.

SITE COVERAGE (residential only)

BUILDING FOOTPRINT =	21.1%	4,387 sq. m.
DRIVING SURFACE =	26.3%	5,458 sq. m.
LANDSCAPE AREA =	52.6%	10,913 sq. m.
TOTAL =	100.0%	20,758 sq. m.

GROSS BUILDING - AREAS
(CITY OF OTTAWA'S DEFINITION)

PROPOSED BUILDING 'A'	1,290.5 sq. m. (13,890) sq. ft.
PROPOSED BUILDING 'B'	1,290.5 sq. m. (13,890) sq. ft.
PROPOSED BUILDING 'C'	1,290.5 sq. m. (13,890) sq. ft.
PROPOSED BUILDING 'D'	1,290.5 sq. m. (13,890) sq. ft.
PROPOSED BUILDING 'E'	1,290.5 sq. m. (13,890) sq. ft.
PROPOSED BUILDING 'F'	1,220.0 sq. m. (13,130) sq. ft.
PROPOSED BUILDING 'G'	1,220.0 sq. m. (13,130) sq. ft.
PROPOSED BUILDING 'H'	1,290.5 sq. m. (13,890) sq. ft.
PROPOSED BUILDING 'J'	1,290.5 sq. m. (13,890) sq. ft.
PROPOSED BUILDING 'K'	1,220.0 sq. m. (13,130) sq. ft.
TOTAL PROPOSED AREA	12,693.5 sq. m. (136,620) sq. ft.

UNIT STATISTICS

PROPOSED 2 BEDROOM UNIT	120
TOTAL	120

CAR PARKING

REQUIRED by ZONING BY-LAW

RESIDENCE	- 1.2 PER UNIT (120 UNITS)	144
VISITOR	- 0.2 PER DWELLING UNIT	24
TOTAL		168

PROVIDED

RESIDENCE	- 1.2 PER UNIT (72 UNITS)	144
VISITOR	- 0.2 PER DWELLING UNIT	24
TOTAL		168

BICYCLE PARKING

REQUIRED

RESIDENCE	- 0.5 PER UNIT (120 UNITS)	60

PROVIDED

EXTERIOR	60

SNOW STORAGE

NO SNOW STORAGE IS PROVIDED ON SITE. TO BE MANAGED UNDER SEPARATE CONTRACT

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 (circle) INDICATES DRAWING NOTES, LISTED ON EACH SHEET.
- 00 (diamond) INDICATES ASSEMBLIE TYPE; REFER TO TYPICAL ASSEMBLIES SCHEDUAL.
- 00 (hexagon) INDICATES WINDOW TYPE; REFER TO WINDOW ELEVATIONS AND DETAILS ON A900 SERIES.
- 000 (oval) INDICATES DOOR TYPE; REFER TO DOOR SCHEDULE AND DETAILS ON A900 SERIES.
- DETAIL NUMBER / 00 / A000 / TITLE / SCALE / DETAIL REFERENCE PAGE

No.	DESCRIPTION	DATE
2	ISSUED FOR CONSULTANT REVIEW	OCT 15 2021
1	ISSUED FOR PRELIMINARY REVIEW	FEB 26 2021

REVISIONS:

ARCHITECT SEAL: ONTARIO ASSOCIATION OF ARCHITECTS RODERICK I. LAHEY LICENCE 4375
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: SPRATT ROAD
OTTAWA ONTARIO

SHEET TITLE: SITE PLAN

DRAWN: CM	CHECKED: RV
SCALE: 1:400	SHEET No. SP-1
PROJECT No. 1721	

Vincent Denomme <vincent.denomme@claridgehomes.com>

4624 Spratt Road, follow-up to preconsultation

Tse, Wendy <Wendy.Tse@ottawa.ca> Thu, Oct 8, 2020 at 1:30 PM
To: Vincent Denomme <vincent.denomme@claridgehomes.com>, Jim Burghout <jim.burghout@claridgehomes.com>
Cc: "Sevigny, John" <John.Sevigny@ottawa.ca>, "Walker, Burl" <Burl.Walker@ottawa.ca>, "Siitam, Taavi" <Taavi.Siitam@ottawa.ca>, "Paudel, Neeti" <neeti.paudel@ottawa.ca>

Good afternoon Vincent and Jim,

Thank you for meeting with staff on September 29, 2020 to discuss the proposed development at 4624 Spratt Road. Our understanding is the proposed development will consist of 144 residential units over 12 buildings accessed by a private road.

The applications required are the following:

Site plan: complex (manager approval), $35,487.53+initial engineering design review and inspection (dependent on value of works) +RVCA fee of $1015 (Ward 22)

Lifting of Holding symbol: $7611.99

A 10% reduction in the fees is applicable if the applications are submitted together.

It is our understanding that the Plan of Condominium application will be submitted at a later date.

The following is a summary of comments:

Infrastructure

- Please see attached

Parks

- The subject lands are described as Block 177 on Plan 4M-1470 except Part 1 on Plan 4R-29198. The area of Block 177 is 23,838 sq. m as described in the application form. The applicant is proposing to develop the block with 144 walk-up apartments.

  Parks condition 11(a) in the subdivision agreement for application #D07-16-06-0033 indicates that Block 177 was excluded from the parkland dedication calculations for the subdivision application.

11. **Parks**

(a) The Owner covenants and agrees that the parkland dedication excluding Block 177 is 1.12 hectares. The Owner shall convey to the City a park block, Block 151, being 0.516 hectares in area and shall pay cash-in-lieu of parkland on 0.604 hectares in the amount of $289,009.93 as referenced in Schedule "B" herein. A parkland appraisal fee of $1,000.00 plus HST of $130.00 as referenced in Schedule "B" herein shall also be paid by the Owner. The cash-in-lieu of parkland and appraisal fee are payable to the City upon execution of this Agreement. Pursuant to By-law No. 2009-95, as amended, 100% of the said cash-in-lieu of parkland funds collected shall be earmarked for a future district park in Ward 22.

- The parkland dedication requirements will be determined in accordance with the City's Parkland Dedication By-law. The rate for residential development at a density of 18 dwelling units per net hectare or more is 1 hectare per 300 dwelling units. The parkland dedication requirement is 4,800 sq. m. In the event there is a change in the number of dwelling units, the parkland dedication requirement may also change.

- The proposed development will result in an under dedication of 4,800 sq. m of parkland. The under dedication of parkland within this development shall be offset by the over dedication of parkland in other subdivisions within the Riverside South CDP area. Prior to registration of the site plan agreement, the Owner shall submit to the City proof from the landowners' trustee that the Owner is party to the cost sharing agreement and has paid its share of any costs pursuant to the landowners' agreement, or the Owner shall submit other suitable documentation from the landowners' trustee demonstrating that the Owner is participating in the landowners' agreement, to the satisfaction of the General Manager, Recreation, Cultural and Facility Services Department.

Transportation

- Follow Traffic Impact Assessment Guidelines
  - TIA will be required.
  - Start this process as soon as possible.
  - Applicant advised that their application will not be deemed complete until the submission of the draft step 1-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable).
  - Request base mapping asap if RMA is required. Contact Engineering Services (https://ottawa.ca/en/city-hall/planning-and-development/engineering-services)
- Noise Impact Studies required for the following:
  - Road (The proposed BRT corridor south of the development should be considered).
- On site plan:
  - Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.
  - Turning templates will be required for all accesses showing the largest vehicle to access the site; required for internal movements and at all access (entering and exiting and going in both directions).
  - Show all curb radii measurements; ensure that all curb radii are reduced as much as possible
  - Show lane/aisle widths.
  - Sidewalk is to be continuous across access as per City Specification 7.1.
- The City recommends development on private property be in accordance with the Accessibility Design Standards (AODA legislation). As the site proposed is residential, it is suggested that the design conforms to the Site Plan Checklist, which summarizes AODA requirements (attached).
- The south east corner (fronting Spratt Road) is currently rural. Ensure this section is urbanized to match the existing conditions.
- It is recommended that the concept plan / development plan for the corner of the BRT address this facility (not turn its back to it) and also show ped / cycling connections to/from the station onto the site. Note also that a MUP is planned for along the south side of the BRT corridor in this part of the community.
- ROW protection on Spratt Road is 26m.

Planning

- Given the direction of the current CDP and proposed SP, it is reasonable that new development at this site should have, at minimum, one unit, closest to the future transit station be made suitable for commercial purposes, and subject to the Residential Neighbourhood Commercial Suffix, Section 141 of the Zoning By-law. The goal is to support transit use, make pedestrian activity more convenient and enjoyable, and create a vibrant public realm through the design of the site. A convenience store, or a coffee shop, are examples of the types of uses that would support these objectives. This site should take advantage of the site's proximity to the future BRT
- Consider the materiality and design of the buildings, particularly as it will be highly visible from Stockholm, Spratt and the future BRT. Facades facing the public realm should be designed to be attractive.
- Investigate opportunity to provide buildings fronting on Stockholm Private. Perhaps this would include products like back-to-back townhouses, or similar to those on Nutting Crescent or Stockholm Private, with garages built into them to reduce surface parking.
- Consider connecting a street through from Nutting Crescent. An off-set grid pattern would further mitigate the desire for vehicles to travel quickly through the development. Cut through traffic will likely not be an issue.
- Improve pedestrian connections from surrounding areas; from Nutting as well as Stockholm. The street connections are there already (via Malmo and Gothenburg), and should be used.
- Consider a more urban grid pattern, to build in speed management at the on-set rather than retrofitting and will aid in achieving higher shares of active transportation, not only within this development but also as residents in the general area are able to move through this site to neighbourhood facilities
- Consider the street presence along Spratt, minimize gaps between buildings a much as possible, also examine the internal configuration of the parking and how it might be configured so that the development can create a more continuous built form, rather than large intermittent parking lots, that break up the community character by creating individual "pods".
- Consideration to be given to landscaping particularly with the existing residential development and along Stockholm. To the greatest extent possible, retain any existing trees and landscaping.
- Snow storage and solid waste collection areas to be indicated on plans.
- Within a parking lot, consider clusters of parking broken up with some landscaping (for example, rather than having 10 parking spaces in a row, break up into two sections of 5 each with landscaping section in between). This will soften the parking lot and the appropriate placement of trees will decrease the heat island effect.
- Please advise if you require a copy of the Barrhaven-Riverside South Rapid Transit Environmental Project Report, prepared by MRC, dated October 2013

Submission requirements

- Site servicing plan
- Grade control and Drainage plan
- Plan and Profile drawings
- TIA
- SWM report
- Site servicing study
- Geotechnical study
- Erosion and sediment control plan
- Site plan, including phasing, if applicable
- Landscape plan
- Tree Conservation Report
- Survey plan
- Building elevations
- Architectural Building elevations
- Planning rationale, to include a Design brief
- Site lighting certificate, if available, if not, will be required prior to site plan approval

- Phase 1 ESA and Phase 2 if recommended by Phase 1

Note:

- All reports should follow the City's Guides for Preparing Studies and plans – these guides can be found at standard for https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#standards-policies-and-guidelines

The signed pdf versions of all reports and plans are required. To assist in our posting of the documents, please also complete the attached files checklist or name the documents in accordance with the list.

If you haven't already reached out to the office of Councillor Meehan to provide a heads-up, it is suggested this be done prior to the submission of the application.

Please let me know if there are any questions.

Regards,

Wendy

Wendy Tse, MCIP, RPP, LEED GA

Planner / Urbaniste

Development Review /Examen des demandes d'aménagement

Planning, Infrastructure and Economic Development Department/

Services de la planification, de l'infrastructure et du développement économique

City of Ottawa/ Ville d'Ottawa

110, avenue Laurier Avenue West / Ouest, 4th Floor / 4ième étage

Ottawa, ON   K1P 1J1

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Mail Code: 01-14

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3 attachments

files checklist.docx
18K

4624 Spratt Road, infrastructure.pdf
636K

AODA Checklist.docx
251K

135856 - SAN STRUCTURE TABLE						
NAME	RIM ELEV.	INVERT IN	INVERT IN AS-BUILT	INVERT OUT	INVERT OUT AS-BUILT	DESCRIPTION
MH100A	91.43			SW88.788		1200mmØ OPSD-701.010
MH101A	91.47	NE88.708 NW88.748		SW88.688		1200mmØ OPSD-701.010
MH102A	91.42	SE88.684 NE88.644		SW88.624		1200mmØ OPSD-701.010
MH103A	91.51	NE88.500 NW88.540		SW88.480		1200mmØ OPSD-701.010
MH104A	91.55	NE88.393 SE88.433		SW88.373		1200mmØ OPSD-701.010
MH105A	91.58	NE88.278		NW88.218		1200mmØ OPSD-701.010
MH106A	91.54	SE88.100		SW88.040		1200mmØ OPSD-701.010
MH110A	91.65	S88.836		W88.776		1200mmØ OPSD-701.010
MH111A	91.50	E88.662 S88.702		W88.642		1200mmØ OPSD-701.010
MH112A	91.60	E88.598		W88.568		1200mmØ OPSD-701.010
MH113A	91.61	E88.534		N88.504		1200mmØ OPSD-701.010
MH114A	91.56	S88.461 W88.701		N88.641		1200mmØ OPSD-701.010
MH115A	91.49	S88.482		NW88.462		1200mmØ OPSD-701.010
MH120A	91.73	S88.897		N88.877		1200mmØ OPSD-701.010
MH121A	91.82			N88.964		1200mmØ OPSD-701.010
MH123A	91.86			N88.810		1200mmØ OPSD-701.010
MH130A	91.55			W89.155		1200mmØ OPSD-701.010
MH131A	91.59	E89.049		N88.989		1200mmØ OPSD-701.010
MH132A	91.35	S88.848 E88.888		N88.828		1200mmØ OPSD-701.010
MH133A	91.44	S88.733		NW88.713		1200mmØ OPSD-701.010
MH140A	91.83			W89.004		1200mmØ OPSD-701.010
MH150A	91.64	S88.894 N88.894		E88.834		1200mmØ OPSD-701.010
MH151A	91.60			N88.996		1200mmØ OPSD-701.010
MH152A	91.68			S89.016		1200mmØ OPSD-701.010
MH160A	91.88			SW89.024		1200mmØ OPSD-701.010
MH170A	91.53	NE88.933		SE88.873		1200mmØ OPSD-701.010
MH180A	91.47			SE88.658		1200mmØ OPSD-701.010

MANHOLE FRAME AND COVERS PER CITY STD S25 AND S24

135856 - STM STRUCTURE TABLE						
NAME	RIM ELEV.	INVERT IN	INVERT IN AS-BUILT	INVERT OUT	INVERT OUT AS-BUILT	DESCRIPTION
CB3	91.25			W89.850		600mmx600mm OPSD-705.010
CBMH9	91.35			E87.563		1200mmØ OPSD-701.010
MH100	91.32			SW87.502		1200mmØ OPSD-701.010
MH101	91.41	NE87.348 SE87.313		SW87.103		1200mmØ OPSD-701.010
MH102	91.52	NE86.999 SE87.039		SW86.754		1500mmØ OPSD-701.011
MH103	91.61	NE86.728		NW86.668		1500mmØ OPSD-701.011
MH104	91.51	SE86.634 NE86.894		SW86.574		1500mmØ OPSD-701.011
MH109	91.69			NW87.600		1200mmØ OPSD-701.010
MH110	91.65	SE87.587		W87.452		1200mmØ OPSD-701.010
MH111	91.58	E87.356		W87.326		1200mmØ OPSD-701.010
MH112	91.63	E87.306		N87.276		1200mmØ OPSD-701.010
MH113	91.58	S87.239 W87.429		N87.144		1200mmØ OPSD-701.010
MH114	91.59	S87.090 E87.120		NW87.060		1200mmØ OPSD-701.010
MH124	91.75	E89.564		SW89.150		1200mmØ OPSD-701.010
MH125	91.78	NE89.042		SW86.943		1200mmØ OPSD-701.010
MH126	91.48	NE86.931		SW86.901		1200mmØ OPSD-701.010
MH127	91.55			N87.959		1200mmØ OPSD-701.010
MH128	91.52	S87.889		W87.529		1200mmØ OPSD-701.010
MH129	91.48	S87.481 E87.521		N87.461		1200mmØ OPSD-701.010
MH130	91.48			W87.844		1200mmØ OPSD-701.010
MH131	91.61	E87.759		N87.699		1200mmØ OPSD-701.010
MH132	91.44	S87.429		NW87.324		1200mmØ OPSD-701.010
MH133	91.52			N87.755		1200mmØ OPSD-701.010
MH134	91.47	S87.692		W87.132		1200mmØ OPSD-701.010
MH453	88.20					1200mmØ OPSD-701.010

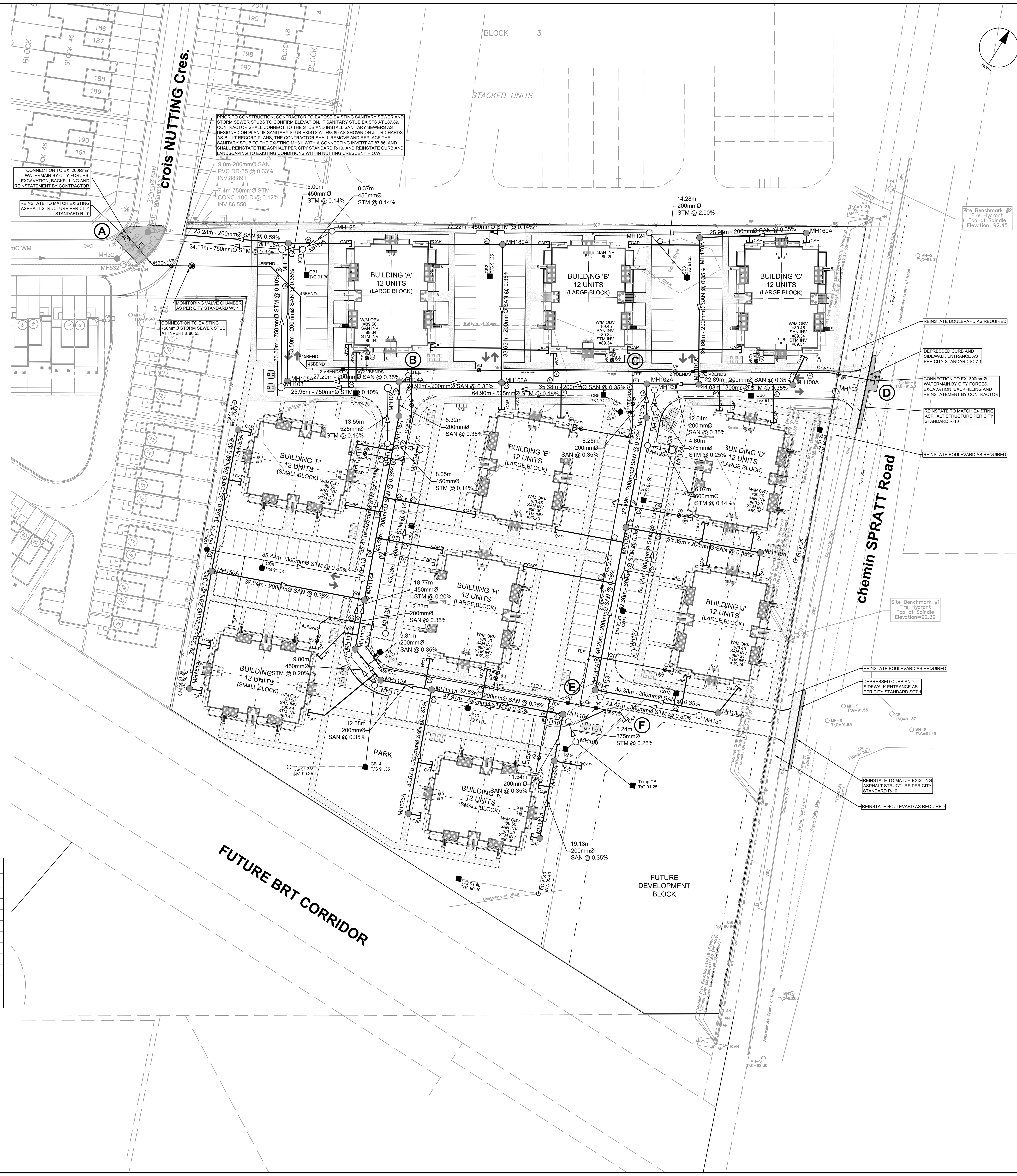
MANHOLE FRAME AND COVERS PER CITY STD S25 AND S24.1

WATERMAIN SCHEDULE					
	Station	Description	Finished Grade	Top of Waterain	As Built Waterain
A	0+000.00	TEE	±91.4	±88.96	
	0+002.32			88.917	
	0+010.02	45° BEND	91.483	89.083	
	0+014.46	VB	91.572	89.172	
	0+019.41	V&VC	91.670	89.270	
	0+038.68	45° BEND	91.634	89.234	
	0+048.89	45° BEND	91.362	88.962	
	0+064.79	45° BEND	91.547	89.147	
	0+067.29	45° BEND	91.520	89.120	
	0+075.79	22½° VBEND	91.545	89.028	
	0+076.29	22½° VBEND	91.547	88.821	
	0+080.28	22½° VBEND	91.561	88.827	
	0+080.82	22½° VBEND	91.563	89.046	
B	0+092.78	TEE	91.575	89.175	
	0+109.14	VB	91.518	89.118	
	0+114.63		91.518	89.263	
	0+120.00		91.511	89.111	
	0+127.21	STM SERV BLK B	91.500	88.758	
	0+132.00		91.493	89.093	
	0+141.51	WM SERV TEE	91.490	89.090	
C	0+146.62	TEE	91.495	89.095	
	0+156.96	VB	91.517	89.117	
	0+160.90	22½° VBEND	91.517	89.117	
	0+161.75	22½° VBEND	91.517	89.471	
	0+163.49	22½° VBEND	91.509	89.471	
	0+164.40	22½° VBEND	91.497	89.097	
	0+176.57	HYD TEE	91.358	88.958	
	0+186.62	SAN SERV BLK C	91.503	88.700	
	0+190.50	STM SERV BLK C	91.548	88.700	
	0+194.45	11¼° BEND	91.444	88.700	
	0+196.69	VB	91.379	88.700	
	0+204.86			88.850	
D	0+205.61	TEE	±91.169	±88.85	
B	0+000.00	TEE	91.575	89.175	
	0+008.69	VB	91.465	89.065	
	0+011.25	11¼° BEND	91.472	89.072	
	0+019.00		91.548	89.091	
	0+022.35	WM SERV TEE	91.499	89.099	
	0+032.00	SAN SERV BLK E	91.447	88.674	
	0+037.25		91.413	89.013	
	0+042.00	SAN SERV BLK H	91.453	88.750	
	0+045.35	STM SERV BLK H	91.497	88.750	
	0+063.13	WM SERV TEE	91.549	89.149	
	0+068.89	45° BEND	91.582	89.182	
	0+071.29	HYDRANT TEE	91.602	89.202	
	0+074.54	45° BEND	91.659	89.259	
	0+085.90	SAN SERV BLK H	91.620	88.784	
	0+100.08	SAN SERV BLK H	91.593	88.830	
	0+102.46	WM SERV TEE	91.599	89.199	
	0+116.37	WM SERV TEE	91.640	89.240	
	0+120.86	VB	91.658	89.258	
E	0+123.86	TEE	91.661	89.261	
	0+127.80	VB	91.665	89.265	
	0+133.89	45° BEND	91.762	89.362	
F	0+136.26	CAP	91.691	89.291	
E	0+000.00	TEE	91.661	89.261	
	0+012.27	WM SERV TEE	91.503	89.103	
	0+028.90	VBEND	91.386	88.986	
	0+029.50	VBEND	91.394	88.780	
	0+031.80	VBEND	91.438	88.780	
	0+032.40	VBEND	91.453	89.043	
	0+040.90	VBEND	91.459	89.004	
	0+039.98	VBEND	91.454	88.709	
	0+041.82	VBEND	91.433	88.709	
	0+042.23	VBEND	91.409	88.984	
	0+049.82	WM SERV TEE	91.351	88.933	
	0+066.18	WM SERV TEE	91.496	89.096	
	0+069.35	11¼° BEND	91.439	89.039	
	0+072.54	HYDRANT TEE	91.373	88.974	
	0+074.52	VBEND	91.334	88.934	
	0+078.28	7° DEFLECTION	91.339	89.333	
	0+080.58	7° DEFLECTION	91.406	89.333	
C	0+082.47	TEE	91.495	89.095	

PIPE INTERFERENCE TABLE			
Crossing No.	PIPE 1	PIPE 2	Clearance
1	WM Bottom 88.759	Nutting SAN Top 87.393	1.366
2	WM Bottom 88.717	Nutting STM Top 88.096	0.621
3	STM Bottom 89.298	WM Top 88.773	0.525
4	WM Bottom 88.300	STM Top 88.036	0.264
5	WM Bottom 88.954	STM Top 87.708	1.246
6	SAN Bottom 89.248	WM Top 88.702	0.546
7	STM Bottom 89.325	WM Top 88.817	0.508
8	SAN Bottom 89.343	WM Top 88.821	0.522
9	WM Bottom 89.097	STM Top 87.974	1.123
10	WM Bottom 89.243	SAN Top 88.969	0.274
11	WM Bottom 89.107	SAN Top 88.818	0.289
12	SAN Bottom 89.188	WM Top 88.650	0.538
13	SAN Bottom 88.955	WM Top 88.453	0.502
14	WM Bottom 89.245	SAN Top 88.965	0.280
15	STM Bottom 89.293	WM Top 88.700	0.593
16	SAN Bottom 89.284	WM Top 88.700	0.585
17	SAN Bottom 89.341	WM Top 88.841	0.500
18	SAN Bottom 89.299	WM Top 88.784	0.515
19	SAN Bottom 89.250	WM Top 88.743	0.507
20	STM Bottom 89.263	WM Top 88.743	0.520
21	SAN Bottom 89.188	WM Top 88.678	0.510
22	WM Bottom 88.865	STM Top 87.660	1.205
23	WM Bottom 88.892	STM Top 87.622	1.270
24	WM Bottom 88.911	SAN Top 88.610	0.302
25	WM Bottom 88.906	STM Top 87.499	1.407
26	WM Bottom 88.849	SAN Top 88.341	0.508

PIPE INTERFERENCE TABLE			
Crossing No.	PIPE 1	PIPE 2	Clearance
27	SAN Bottom 89.330	STM Top 87.799	1.531
28	SAN Bottom 89.255	STM Top 87.855	1.400
29	SAN Bottom 89.286	STM Top 88.257	1.029
30	STM Bottom 89.299	STM Top 88.262	1.037
31	STM Bottom 89.233	SAN Top 88.805	0.428
32	STM Bottom 89.851	SAN Top 89.323	0.528
33	WM Bottom 89.254	STM Top 88.606	0.649
34	WM Bottom 89.304	STM Top 87.904	1.399
35	WM Bottom 89.316	SAN Top 89.015	0.300
36	STM Bottom 89.267	SAN Top 88.750	0.517
37	STM Bottom 89.635	SAN Top 89.370	0.265
38	STM Bottom 89.689	SAN Top 88.350	1.339
39	SAN Bottom 88.240	STM Top 87.468	0.772
40	STM Bottom 89.295	SAN Top 88.536	0.759
41	STM Bottom 89.250	STM Top 88.627	0.623
42	SAN Bottom 89.336	STM Top 87.657	1.679
43	SAN Bottom 89.316	STM Top 87.680	1.636
44	SAN Bottom 88.501	STM Top 87.655	0.845
45	SAN Bottom 89.224	STM Top 88.243	0.981
46	SAN Bottom 88.908	STM Top 88.613	0.295
47	SAN Bottom 88.099	STM Top 87.429	0.670
48	SAN Bottom 89.230	STM Top 87.773	1.457
49	SAN Bottom 89.208	STM Top 87.819	1.389
50	SAN Bottom 89.313	STM Top 87.731	1.582
51	WM Bottom 89.083	STM Top 87.710	1.373
52	WM Bottom 89.031	SAN Top 88.725	0.307

PIPE INTERFERENCE TABLE			
Crossing No.	PIPE 1	PIPE 2	Clearance
53	WM Bottom 89.080	STM Top 87.793	1.286
54	WM Bottom 89.048	SAN Top 88.687	0.361
55	SAN Bottom 89.313	STM Top 87.707	1.606
56	SAN Bottom 88.905	STM Top 87.926	0.979
57	SAN Bottom 88.887	STM Top 87.923	0.964
58	SAN Bottom 89.048	STM Top 88.064	0.984
59	SAN Bottom 88.700	STM Top 87.782	0.918
60	SAN Bottom 88.702	STM Top 87.917	0.785
61	SAN Bottom 88.835	STM Top 87.982	0.854
62	SAN Bottom 88.683	STM Top 87.714	0.969
63	SAN Bottom 88.432	STM Top 87.617	0.815



NOT FOR CONSTRUCTION

CLIENT

CLARIDGE HOMES

210 Gladstone Ave. Ottawa, On K0P 0Y6

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR CITY REVIEW	2021-12-15

CONSULTANTS

SEAL

D. Yannoulopoulos 2021-12-15

W. ZHUANG 100231427 2021-12-15

IBI GROUP
Suite 400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 / 613 241 3300 fax 613 225 9868
ibigroup.com

PROJECT

ZENS - 4624 SPRATT

PROJECT NO: 135856	
DRAWN BY: D.D./S.G.	CHECKED BY: A.Z.
PROJECT MGR: R.M.	APPROVED BY: ----

SHEET TITLE

GENERAL PLAN OF SERVICES

SHEET NUMBER C-001

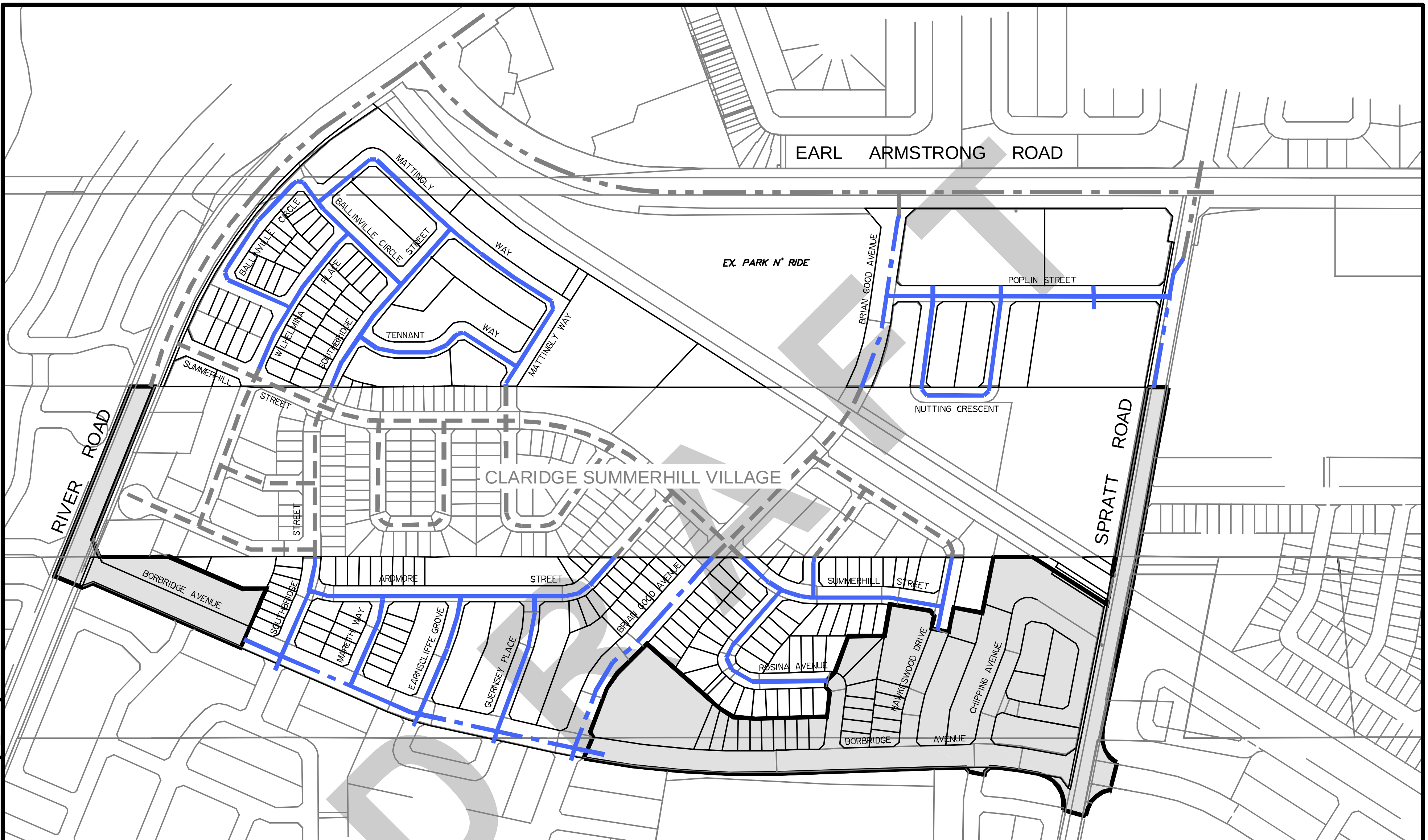
ISSUE 1

CITY FILE No. D07-xx-xx-xxxx

CITY PLAN No. xxxxx

APPENDIX B

- City of Ottawa Boundary Conditions
- Watermain Demand Calculation Sheet
- FUS Fire Flow Requirement Calculation
- Modeling Output Files



Existing 300mmØ Watermain

Existing 400mmØ Watermain

Proposed Watermain Summerhill Village

Proposed 200mmØ Watermain

Proposed 300mmØ Watermain

Proposed 400mmØ Watermain

Future Phase 9

J.L.Richards
ENGINEERS·ARCHITECTS·PLANNERS

J.L. Richards
& Associates Limited
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
Fax: 613 728 6012

PROJECT:
RIVERSIDE SOUTH
PHASE 9
CITY OF OTTAWA

DRAWING:
WATER SERVICING
PLAN

DESIGN:	J.L.P.
DRAWN:	T.B.
CHECKED:	J.L.P.
PLOTTED:	Oct09,2012

DRAWING NO.:
FIGURE 3.1

JLR NO:
21464-09

File Location: V:\21464-09.LD\21464-09 P Fig3_1.dwg

Boundary Conditions
4624 Spratt Road

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	63	1.05
Maximum Daily Demand	158	2.63
Peak Hour	347	5.78
Fire Flow Demand #1	14,000	233.33

Location

Results – Existing Conditions

Connection 1 – Spratt Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.8	55.8
Peak Hour	125.0	47.6
Max Day plus Fire 1	123.1	44.8

Ground Elevation = 91.5 m

Connection 2 – Nutting Cres.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.8	56.5
Peak Hour	125.0	48.3
Max Day plus Fire 1	106.7	22.2

Ground Elevation = 91.1 m

Results – SUC Zone Reconfiguration

Connection 1 – Spratt Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.3	79.3
Peak Hour	145.4	76.6
Max Day plus Fire 1	141.5	71.0

Ground Elevation = 91.5 m

Connection 2 – Nutting Cres.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.3	80.0
Peak Hour	145.4	77.3
Max Day plus Fire 1	125.1	48.4

Ground Elevation = 91.1 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.

WATERMAIN DEMAND CALCULATION SHEET

IBI GROUP
333 PRESTON STREET
OTTAWA, ONTARIO
K1S 5N4

PROJECT : **4624 Spratt Road**
CLIENT : **Claridge Homes**

FILE: 135856-6.4.4
DATE PRINTED: 23-Nov-21
DESIGN: WZ

NODE	RESIDENTIAL				NON-RESIDENTIAL (ICI)			AVERAGE DAILY DEMAND (l/s)			MAXIMUM DAILY DEMAND (l/s)			MAXIMUM HOURLY DEMAND (l/s)			FIRE DEMAND (l/min)
	SINGLE FAMILY UNITS	TOWNHOUSE / BACK TO BACK UNITS	MEDIUM DENSITY UNITS	POPULATION	INDUST. (ha)	COMM. (ha)	INSTIT. (ha)	RESIDENTIAL	ICI	TOTAL	RESIDENTIAL	ICI	TOTAL	RESIDENTIAL	ICI	TOTAL	
Block 'A'		12		25.20				0.08		0.08	0.20		0.20	0.45		0.45	14,000
Block 'B'		12		25.20				0.08		0.08	0.20		0.20	0.45		0.45	14,000
Block 'C'		12		25.20				0.08		0.08	0.20		0.20	0.45		0.45	14,000
Block 'D'		12		25.20				0.08		0.08	0.20		0.20	0.45		0.45	14,000
Block 'E'		12		25.20				0.08		0.08	0.20		0.20	0.45		0.45	14,000
Block 'F'		12		25.20				0.08		0.08	0.20		0.20	0.45		0.45	14,000
Block 'G'		12		25.20				0.08		0.08	0.20		0.20	0.45		0.45	14,000
Block 'H'		12		25.20				0.08		0.08	0.20		0.20	0.45		0.45	14,000
Block 'J'		12		25.20				0.08		0.08	0.20		0.20	0.45		0.45	14,000
Block 'K'		12		25.20				0.08		0.08	0.20		0.20	0.45		0.45	14,000
Commercial Block				31.34				0.10		0.10	0.25		0.25	0.56		0.56	14,000
Total		**120**		**283.34**				**0.92**		**0.92**	**2.30**		**2.30**	**5.05**		**5.05**	

POPULATION DENSITY

Single Family 3.4 persons/unit
Semi Detached & Townhouse 2.7 persons/unit
2 Bedroom Unit 2.1 persons/unit
Medium Density 1.8 persons/unit

WATER DEMAND RATES

Residential 280 l/cap/day

PEAKING FACTORS

Maximum Daily Residential 2.5 x avg. day
Maximum Hourly Residential 2.2 x max. day

FIRE DEMANDS

Single Family 10,000 l/min (166.7 l/s)
Semi Detached & Townhouse 10,000 l/min (166.7 l/s)
Medium Density 15,000 l/min (250 l/s)

4624 Spratt Road - Fire Flow Requirement from Fire Underwriters Survey

Building Floor Area Block 'B'

Floor area	445.4	m^2
Storey	3	
Area	1,336.2	m^2

$F = 220C\sqrt{A}$

C	1.5		C =	1.5	wood frame
A	1,336	m^2		1.0	ordinary
				0.8	non-combustile
F	12,063	l/min		0.6	fire-resistive
use	12,000	l/min			

Occupancy Adjustment

			-25%	non-combustile
			-15%	limited combustile
Use	-15%		0%	combustile
			+15%	free burning
Adjustment	-1800	l/min	+25%	rapid burning
Fire flow	10,200	l/min		

Sprinkler Adjustment

Use	0%	
Adjustment	0	l/min

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north	22.0	18	2	36	7%
east	29.0	25	3	76	8%
south	18.2	25	3	76	13%
west	30.0	18	3	54	7%
Total					35%

Adjustment	3,570	l/min
Total adjustments	3,570	l/min
Fire flow	13,770	l/min
Use	**14,000**	**l/min**
	233.3	**l/s**

* Exposure charges from Techinical Bulletin ISTB 2018-02 Table G5

4624 Spratt Road - Fire Flow Requirement from Fire Underwriters Survey

Building Floor Area Block 'E'

Floor area	445.4	m^2
Storey	3	
Area	1,336.2	m^2

$F = 220C\sqrt{A}$

C	1.5		C =	1.5	wood frame
A	1,336	m^2		1.0	ordinary
				0.8	non-combustile
F	12,063	l/min		0.6	fire-resistive
use	12,000	l/min			

Occupancy Adjustment

			-25%	non-combustile
			-15%	limited combustile
Use	-15%		0%	combustile
			+15%	free burning
Adjustment	-1800	l/min	+25%	rapid burning
Fire flow	10,200	l/min		

Sprinkler Adjustment

Use 0%

Adjustment 0 l/min

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall Length	Stories	L*H Factor	Exposure Charge *
north	18.2	18	3	54	11%
east	33.5	25	3	75	5%
south	10.6	18	3	54	16%
west	33.2	18	3	54	5%
Total					37%

Adjustment	3,774	l/min
Total adjustments	3,774	l/min
Fire flow	13,974	l/min
Use	**14,000**	**l/min**
	233.3	**l/s**

* Exposure charges from Techinical Bulletin ISTB 2018-02 Table G5

4624 Spratt Road - Fire Flow Requirement from Fire Underwriters Survey

Building Floor Area Block 'F'

Floor area	422.9	m^2
Storey	3	
Area	1,268.7	m^2

$F = 220C\sqrt{A}$

C	1.5		C =	1.5	wood frame
A	1,269	m^2		1.0	ordinary
				0.8	non-combustile
F	11,754	l/min		0.6	fire-resistive
use	12,000	l/min			

Occupancy Adjustment

			-25%	non-combustile
			-15%	limited combustile
Use	-15%		0%	combustile
			+15%	free burning
Adjustment	-1800	l/min	+25%	rapid burning
Fire flow	10,200	l/min		

Sprinkler Adjustment

Use	0%	
Adjustment	0	l/min

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north	22.3	18	3	54	11%
east	33.2	25	3	75	5%
south	34.7	25	3	75	5%
west	16.0	18	2	36	11%
Total					32%

Adjustment	3,264	l/min
Total adjustments	3,264	l/min
Fire flow	13,464	l/min
Use	**13,000**	**l/min**
	216.7	**l/s**

* Exposure charges from Techinical Bulletin ISTB 2018-02 Table G5

4624 Spratt Road - Fire Flow Requirement from Fire Underwriters Survey

Building Floor Area Block 'H'

Floor area	445.4	m^2
Storey	3	
Area	1,336.2	m^2

F = 220C√A

C	1.5		C =	1.5	wood frame
A	1,336	m^2		1.0	ordinary
				0.8	non-combustile
F	12,063	l/min		0.6	fire-resistive
use	12,000	l/min			

Occupancy Adjustment

			-25%	non-combustile
			-15%	limited combustile
Use	-15%		0%	combustile
			+15%	free burning
Adjustment	-1800	l/min	+25%	rapid burning
Fire flow	10,200	l/min		

Sprinkler Adjustment

Use	0%	
Adjustment	0	l/min

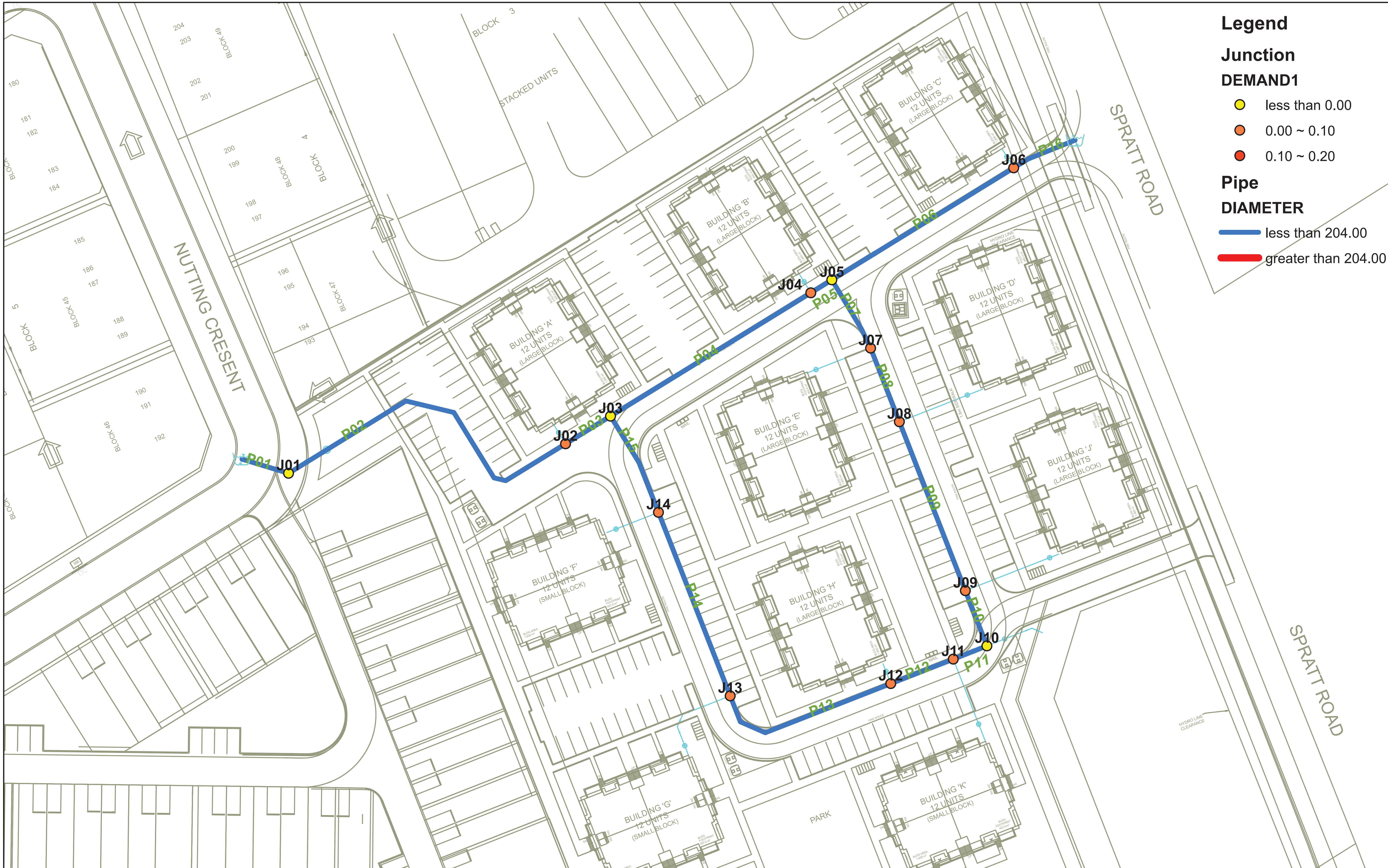
Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall Length	Stories	L*H Factor	Exposure Charge *
north	10.6	18	3	54	11%
east	42.0	25	3	75	5%
south	24.4	25	3	75	8%
west	28.3	18	3	54	7%
Total					31%

Adjustment	3,162	l/min
Total adjustments	3,162	l/min
Fire flow	13,362	l/min
Use	**13,000**	**l/min**
	216.7	**l/s**

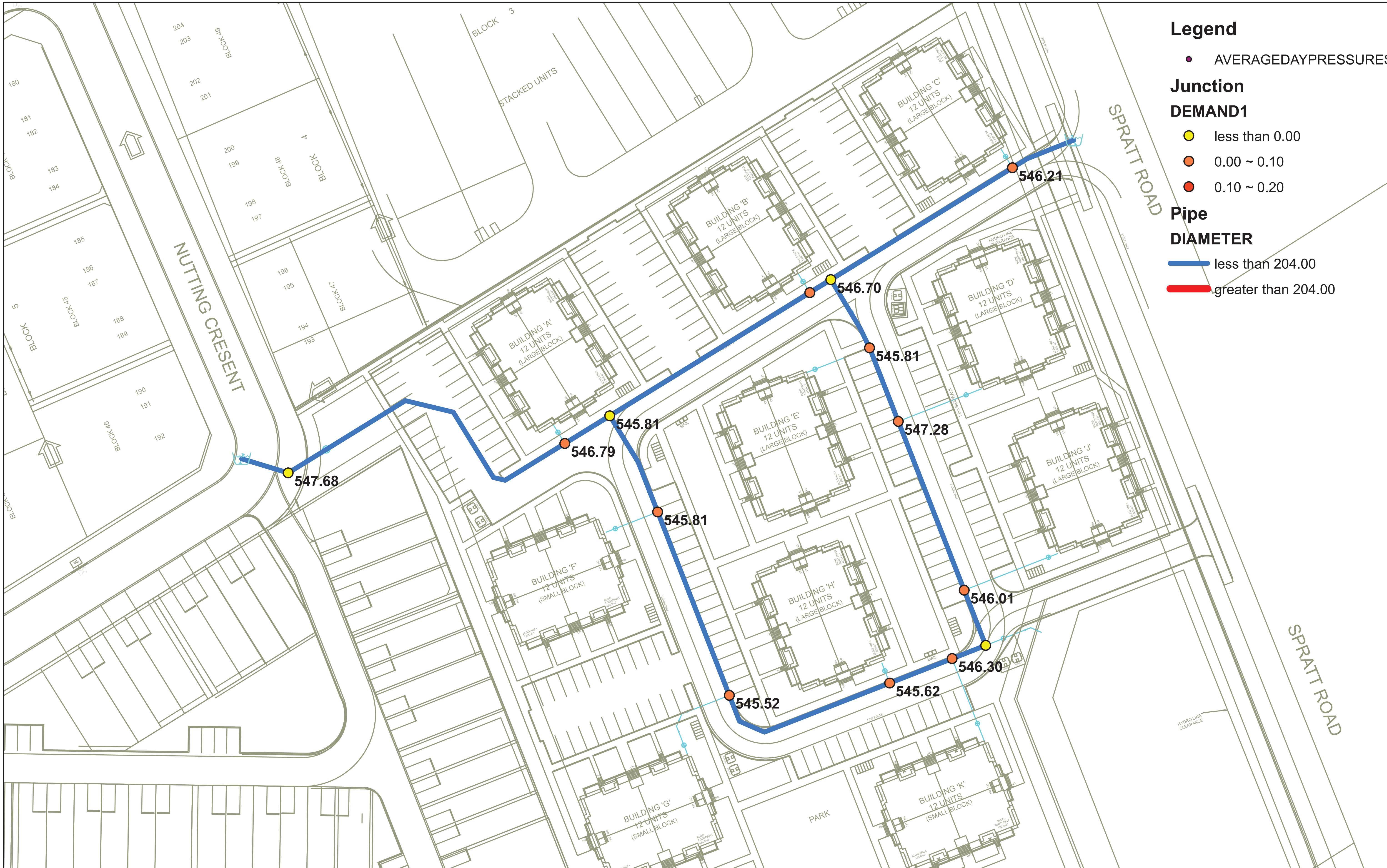
* Exposure charges from Techinical Bulletin ISTB 2018-02 Table G5

Junctions and Pipes Layout



Date: 2021-11-22

Average Day Pressures (kPa)

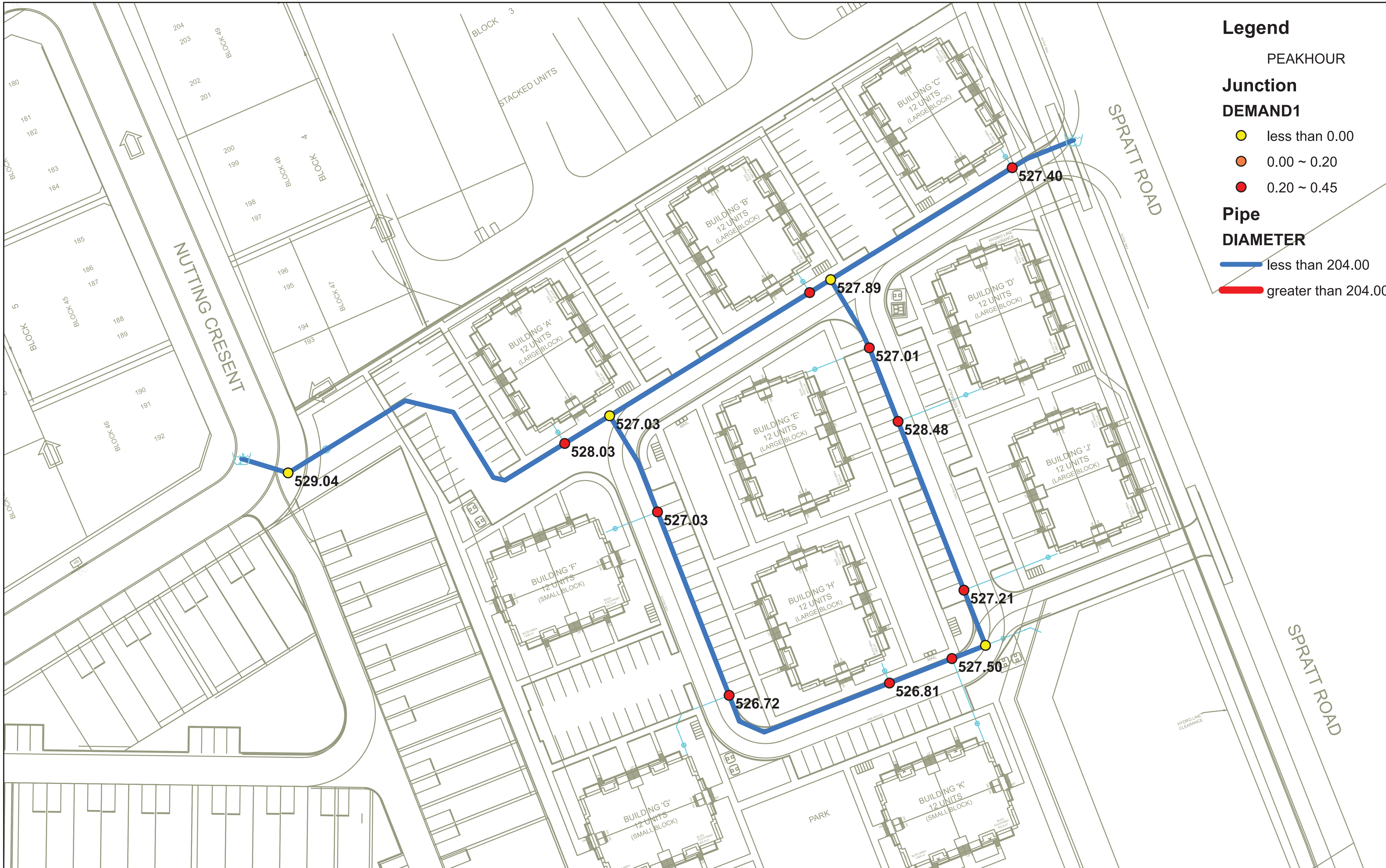


Date: 2021-11-22

Average Day Pressures

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J01	0.00	91.41	147.30	547.68
2	☐	J02	0.08	91.50	147.30	546.79
3	☐	J03	0.00	91.60	147.30	545.81
4	☐	J04	0.08	91.50	147.30	546.79
5	☐	J05	0.00	91.51	147.30	546.70
6	☐	J06	0.08	91.56	147.30	546.21
7	☐	J07	0.08	91.60	147.30	545.81
8	☐	J08	0.08	91.45	147.30	547.28
9	☐	J09	0.08	91.58	147.30	546.01
10	☐	J10	0.00	91.68	147.30	545.03
11	☐	J11	0.08	91.55	147.30	546.30
12	☐	J12	0.08	91.62	147.30	545.62
13	☐	J13	0.08	91.63	147.30	545.52
14	☐	J14	0.08	91.60	147.30	545.81

Peak Hour Pressures (kPa)

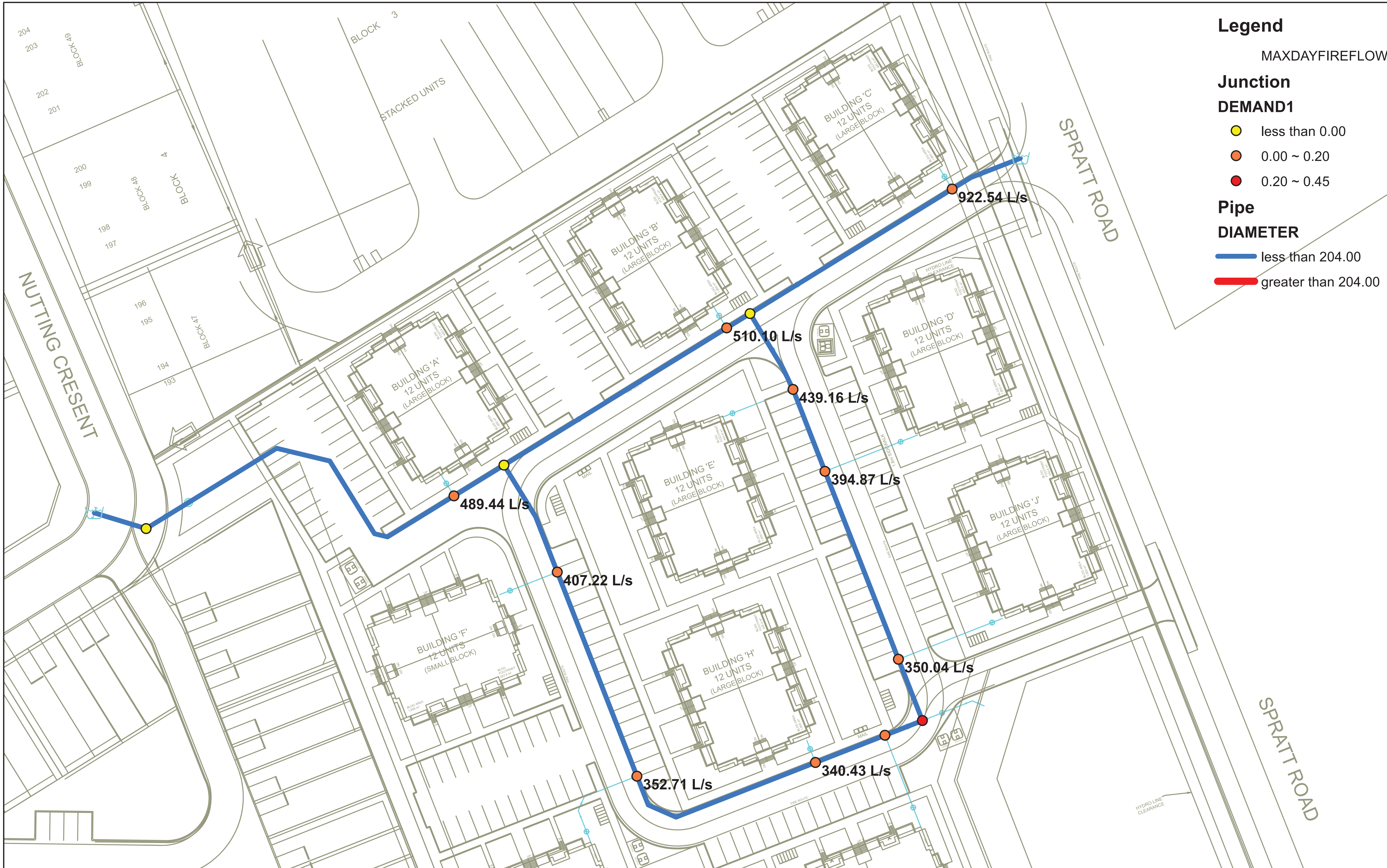


Date: 2021-11-22

Peak Hour Pressures

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J01	0.00	91.41	145.40	529.04
2	☐	J02	0.45	91.50	145.38	528.03
3	☐	J03	0.00	91.60	145.38	527.03
4	☐	J04	0.45	91.50	145.38	527.99
5	☐	J05	0.00	91.51	145.38	527.89
6	☐	J06	0.45	91.56	145.38	527.40
7	☐	J07	0.45	91.60	145.38	527.01
8	☐	J08	0.45	91.45	145.38	528.48
9	☐	J09	0.45	91.58	145.38	527.21
10	☐	J10	0.00	91.68	145.38	526.23
11	☐	J11	0.45	91.55	145.38	527.50
12	☐	J12	0.45	91.62	145.38	526.81
13	☐	J13	0.45	91.63	145.38	526.72
14	☐	J14	0.45	91.60	145.38	527.03

Max Day + Fireflow 233.33 L/s



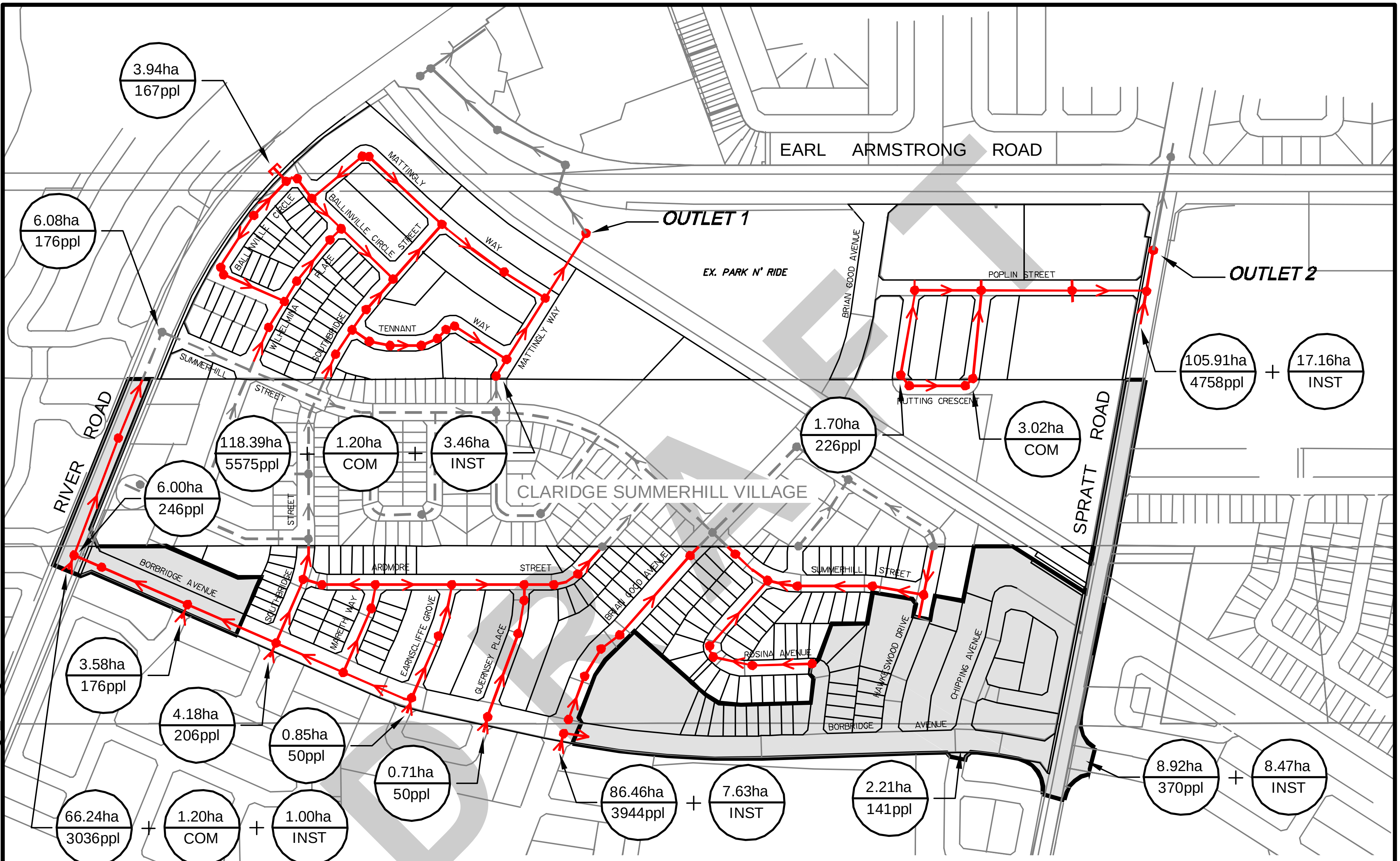
Date: 2021-11-23

Max Day + Fireflow 233.33 L/s

		ID	Static Demand (L/s)	Static Pressure (kPa)	Static Head (m)	Fire-Flow Demand (L/s)	Residual Pressure (kPa)	Hydrant Available Flow (L/s)	Hydrant Pressure at Available Flow (kPa)
1	☐	J02	0.20	402.67	132.59	233.33	317.97	489.44	139.96
2	☐	J04	0.20	433.85	135.77	233.33	326.33	510.10	139.96
3	☐	J06	0.20	476.40	140.18	233.33	416.56	922.54	139.97
4	☐	J07	0.20	433.18	135.81	233.33	304.17	439.16	139.96
5	☐	J08	0.20	432.72	135.61	233.33	289.26	394.87	139.96
6	☐	J09	0.20	427.06	135.16	233.33	266.25	350.04	139.96
7	☐	J11	0.20	425.07	134.93	233.33	261.80	342.46	139.96
8	☐	J12	0.20	422.80	134.77	233.33	260.22	340.43	139.96
9	☐	J13	0.20	418.28	134.31	233.33	268.11	352.71	139.96
10	☐	J14	0.20	414.02	133.85	233.33	294.95	407.22	139.96

APPENDIX C

- RSDC Phase 9 Figure 4.1 Sanitary Servicing Plan
- RSDC Phase 9 Sanitary Drainage Plan
- RSDC Phase 9 Sanitary Sewer Design Sheet
- Sanitary Drainage Area Plan Drawing 400
- Sanitary Sewer Design Sheet



Existing Sanitary Sewer

Proposed Sanitary Sewer

Proposed Sanitary Sewer Summerhill Village by Claridge Homes

Future Phase 9

J.L.Richards
ENGINEERS·ARCHITECTS·PLANNERS

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& Associates Limited
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
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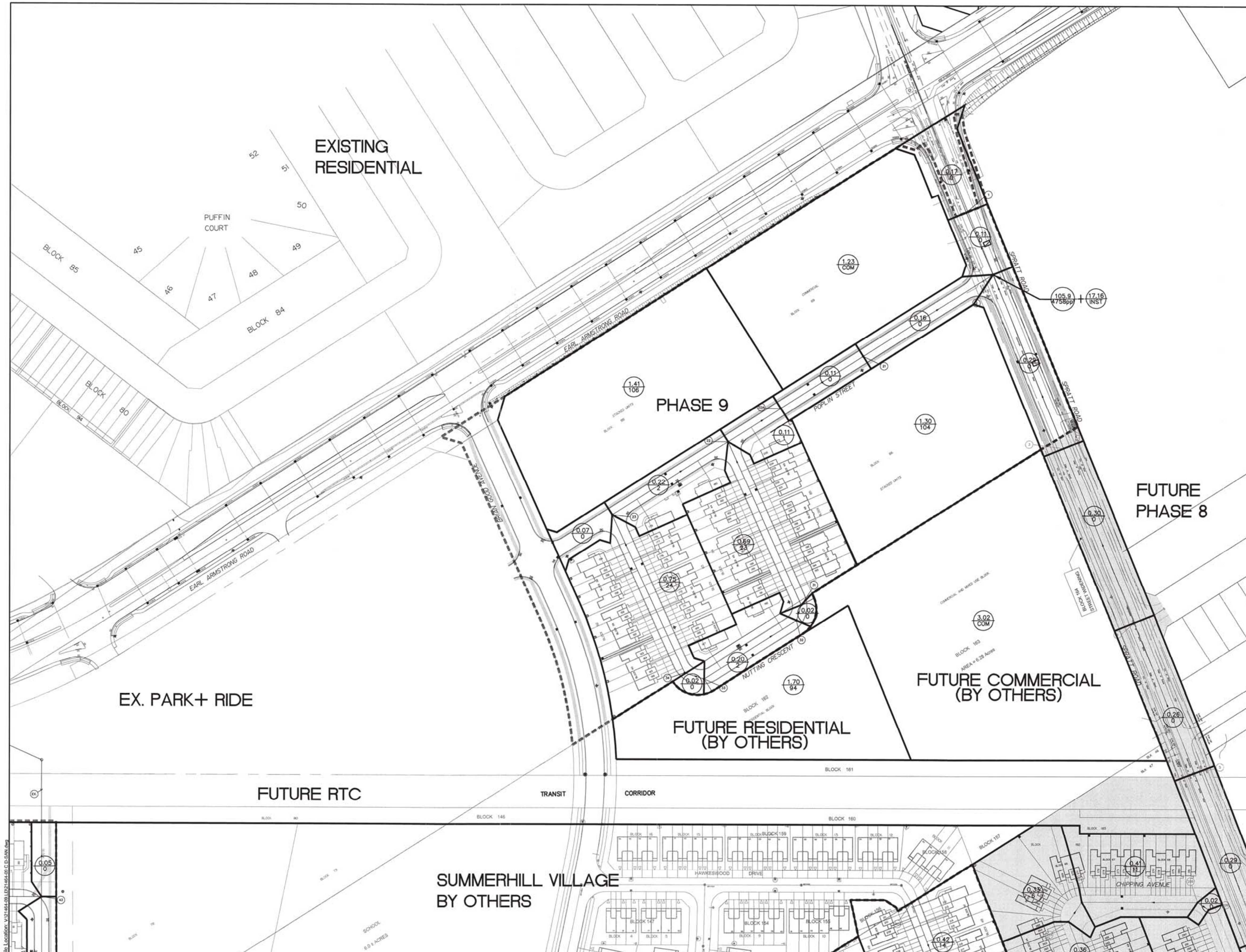
PROJECT: RIVERSIDE SOUTH PHASE 9 CITY OF OTTAWA	DRAWING: SANITARY SERVICING PLAN	DESIGN: G.D.	DRAWING NO.: FIGURE 4.1
		DRAWN: T.B.	
		CHECKED: J.L.P.	JLR NO: 21464-09
		PLOTTED: Oct09,2012	

File Location: V:\21464-09.LD\21464-09 P Fig4_1.dwg



LEGEND

- PROPOSED ELBOW CATCHBASIN
- PROPOSED TEE CATCHBASIN
- CATCH BASIN
- HYDRANT
- SANITARY SEWER & MANHOLE
- LOT NUMBER
- DRAINAGE BOUNDARY
- AREA IN HECTARES / NUMBER OF UNITS
- PHASING LIMIT

NO.	ISSUE	DATE
9	ISSUED FOR MYLARS	AUG. 23, 2012
8	REVISED STORM SEWER ON SPRATT ROAD AND STUBS ON POPIN STREET	JUNE 27, 2012
7	ISSUED FOR CONSTRUCTION	MAY 30, 2012
6	REVISED PER CITY COMMENTS & LEGAL	MAY 18, 2012
5	REVISED PER CITY COMMENTS / TENDER	MAR. 05, 2012
4	REVISED PER CITY COMMENTS	DEC. 09, 2011
3	REVISED PER CITY COMMENTS	SEPT. 06, 2011
2	REVISED PER CITY COMMENTS & LEGAL	APR. 28, 2011
1	SUBMITTED TO CITY FOR REVIEW	OCT. 13, 2010

SCALE: 1:1000

RIVERSIDE SOUTH DEVELOPMENT CORPORATION (RSDC)

J.L.Richards
ENGINEERS·ARCHITECTS·PLANNERS
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864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
Fax: 613 728 6012

PROFESSIONAL STAMP: J.L. PARISSA, 100058079, 2012-08-23, PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT: RIVERSIDE SOUTH PHASE 9

CITY OF OTTAWA

DRAWING: SANITARY DRAINAGE PLAN

DESIGN: G.D.
DRAWN: T.S.
CHECKED: J.P.
PLOTTED: Aug 23, 2012

DRAWING NO.: D2-SAN
JLR NO: 21464-09

Printed on 10/3/2012 at 4:58 PM

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

CITY OF OTTAWA
RIVERSIDE SOUTH DEVELOPMENT CORPORATION
RIVERSIDE SOUTH PHASE 9

SANITARY SEWER CALCULATION SHEET

DESIGN PARAMETERS

Population Density (Singles)	=	3.2	pers/unit	Commercial	=	50,000	L/d/ha	(Peaking Factor = 1.5)
Population Density (Stacks, Towns)	=	2.4	pers/unit	Institutional	=	50,000	L/d/ha	(Peaking Factor = 1.5)
Population Density (Mixed)	=	1.9	pers/unit	Light Industrial	=	35,000	L/d/ha	(Peaking Factor = Per MOE Graph)
Per Capita Flow (Residential)	=	350	L/cap/d	Infiltration (Residential)	=	0.28	L/s/ha	
				Manning's Coefficient, n	=	0.013		

LEGEND

DENOTES FUTURE OR EXISTING SEWERS, AND EXTERNAL FLOWS

BY:	PROJECT:				
G.C. Dumencu, EIT	Riverside South Development Corporation Riverside South Phase 9				
CHECKED: J.L. Párraga, P.Eng.	LOCATION: City of Ottawa				
JLR NO.: 21464-09	DATE: Oct-11	REVISED: Apr-11 Aug-11	REVISED: Dec-11 Feb-12	REVISED: May-12 Jun-12	REVISED: Sep-12 FINAL

STREET	PHASE	MH NUMBER		RESIDENTIAL										COMMERCIAL			INSTITUTIONAL				ICI	INFILTRATION			Peak	Qd/Qcap	SEWER DATA						UPSTREAM					DOWNSTREAM					REMARKS	CAPACITY OK?
				NUMBER OF UNITS						CUMULATIVE		Peaking	Pop.		Cum.	Comm.		Cum.	Peaking	Institut.	Peak ICI	Total	Cum.	Infiltration	Design																			
		FROM	TO	Singles	Towns	Stacks	Total Units	Pop. (people)	Area (ha)	Pop. (people)	Area (ha)	Factor	Flow (L/s)	Area (ha)	Area (L/s)	Flow (L/s)	Area (ha)	Area (L/s)	Factor	Flow (L/s)	Flow (L/s)	Area (ha)	Area (ha)	Flow (L/s)	Flow (L/s)		Dia. (mm)	Slope (%)	Q full (L/s)	V full (m/s)	V partial (m/s)	Length (m)	Prop. Centreline	Obvert Drop	Obvert	Invert	Cover	Prop. Centreline	Obvert Drop	Obvert	Invert	Cover		
Southeast Quadrant																																												
FUTURE (STANTEC 2c & 2d)	FUT	STUB	150							3,944	86.46	3.34	53.34				7.63	7.63		6.62	6.62	7.63	94.09	26.35	86.31	0.56	525	0.12	155.42	0.70	0.72	20.62	91.00		88.235	87.710	2.77	91.00		88.210	87.685	2.79	Stantec OBV 88.21	Y
BORBRIDGE AVE	FUT 9	150	214						0.15	3,944	86.61	3.34	53.34				1.06	8.69		7.54	7.54	1.21	95.30	26.68	87.57	0.56	525	0.12	155.42	0.70	0.73	63.48	91.00		88.210	87.685	2.79	90.85		88.134	87.609	2.72		Y
BORBRIDGE AVE	FUT 9	214	213	2			2	6	0.41	3,950	87.02	3.34	53.42					8.69		7.54	7.54	0.41	95.71	26.80	87.76	0.56	525	0.12	155.42	0.70	0.73	113.90	90.85		88.134	87.609	2.72	91.52		87.997	87.472	3.52		Y
BORBRIDGE AVE	FUT 9	213	160	8			8	26	0.70	3,976	87.72	3.34	53.73					8.69		7.54	7.54	0.70	96.41	26.99	88.26	0.57	525	0.12	155.42	0.70	0.72	114.99	91.52		87.997	87.472	3.52	92.40		87.859	87.334	4.54		Y
ROSINA AVENUE	FUT 9	163 (E)	162	1			1	3	0.13	3	0.13	4.00	0.05									0.13	0.13	0.04	0.09	0.00	200	1.17	37.01	1.14	0.18	9.18	92.30		89.000	88.800	3.30	92.40		88.893	88.693	3.51		Y
ROSINA AVENUE	FUT 9	162	161	1			1	3	0.13	6	0.26	4.00	0.10									0.13	0.26	0.07	0.18	0.00	200	1.17	37.01	1.14	0.27	9.18	92.40		88.893	88.693	3.51	92.35		88.785	88.585	3.56		Y
ROSINA AVENUE	FUT 9	161	160	5			5	16	0.38	22	0.64	4.00	0.36									0.38	0.64	0.18	0.54	0.01	200	1.17	37.01	1.14	0.42	79.17	92.35		88.785	88.585	3.56	92.40		87.859	87.659	4.54		Y
BORBRIDGE AVE	FUT 9	160	190						0.22	3,998	88.58	3.33	53.99					8.69		7.54	7.54	0.22	97.27	27.24	88.77	0.57	525	0.12	155.42	0.70	0.72	85.95	92.40		87.859	87.334	4.54	92.50		87.756	87.230	4.74		Y
HAWKESWOOD DRIVE	FUT 9	180 (S)	193		4		4	10	0.14	10	0.14	4.00	0.16									0.14	0.14	0.04	0.19	0.01	200	0.65	27.59	0.85	0.25	30.67	92.10		88.554	88.353	3.55	91.88		88.354	88.154	3.53		Y
HAWKESWOOD DRIVE	FUT 9	193	193A	1	12		13	32	0.89	42	1.03	4.00	0.67									0.89	1.03	0.29	0.96	0.04	200	0.40	21.64	0.67	0.35	19.51	91.88		88.354	88.154	3.53	91.93		88.276	88.076	3.65		Y
HAWKESWOOD DRIVE	FUT 9	193A	192							42	1.03	4.00	0.67										1.03	0.29	0.96	0.04	200	0.40	21.64	0.67	0.35	59.06	91.93		88.276	88.076	3.65	92.52		88.039	87.839	4.48		Y
HAWKESWOOD DRIVE	FUT 9	192	191	1	2		3	8	0.13	50	1.16	4.00	0.80									0.13	1.16	0.32	1.13	0.05	200	0.40	21.64	0.67	0.38	16.50	92.52		88.039	87.839	4.48	92.39		87.973	87.773	4.42		Y
HAWKESWOOD DRIVE	FUT 9	191	190	3	4		7	19	0.35	69	1.51	4.00	1.11									0.35	1.51	0.42	1.54	0.07	200	0.40	21.64	0.67	0.40	54.60	92.39		87.973	87.773	4.42	92.50		87.756	87.555	4.74		Y
BORBRIDGE AVE	FUT 9	190	212						0.20	4,067	90.29	3.33	54.81					8.69		7.54	7.54	0.20	98.98	27.71	90.07	0.58	525	0.12	155.42	0.70	0.73	84.27	92.50		87.756	87.230	4.74	92.60		87.655	87.130	4.95		Y
CHIPPING AVENUE	FUT 9	205 (W)	204		11		11	26	0.41	26	0.41	4.00	0.43									0.41	0.41	0.11	0.54	0.03	200	0.33	19.66	0.61	0.27	70.71	92.88		89.524	89.324	3.36	92.64		89.290	89.090	3.35		Y
CHIPPING AVENUE	FUT 9	204	203		6		6	14	0.33	41	0.74	4.00	0.66									0.33	0.74	0.21	0.87	0.04	200	0.33	19.66	0.61	0.32	14.50	92.64		89.290	89.090	3.35	92.70		89.242	89.042	3.46		Y
CHIPPING AVENUE	FUT 9	203	202		12		12	29	0.36	70	1.10	4.00	1.13									0.36	1.10	0.31	1.44	0.07	200	0.33	19.66	0.61	0.37	47.30	92.70		89.242	89.042	3.46	92.58		89.086	88.886	3.49		Y
CHIPPING AVENUE	FUT 9	202	201		12		12	29	0.40	98	1.50	4.00	1.59									0.40	1.50	0.42	2.01	0.10	200	0.33	19.66	0.61	0.41	58.85	92.58		89.086	88.886	3.49	92.70		88.892	88.692	3.81		Y
CHIPPING AVENUE	FUT 9	205 (E)	206						0.02		0.02	4.00										0.02	0.02	0.01	0.01	0.00	200	0.33	19.66	0.61	0.02	8.04	92.88		89.488	89.288	3.39	92.86		89.461	89.261	3.40		Y
CHIPPING AVENUE	FUT 9	206	207		9		9	22	0.35	22	0.37	4.00	0.35									0.35	0.37	0.10	0.45	0.02	200	0.33	19.66	0.61	0.25	76.26	92.86		89.461	89.261	3.40	92.77		89.210	89.010	3.56		Y
CHIPPING AVENUE	FUT 9	207	208		1		1	2	0.08	24	0.45	4.00	0.39									0.08	0.45	0.13	0.51	0.03	200	0.33	19.66	0.61	0.25	10.84	92.77		89.210	89.010	3.56	92.75		89.174	88.974	3.58		Y
CHIPPING AVENUE	FUT 9	208	209		14		14	34	0.44	58	0.89	4.00	0.93									0.44	0.89	0.25	1.18	0.06	200	0.33	19.66	0.61	0.36	62.33	92.75		89.174	88.974	3.58	92.47		88.968	88.768	3.50		Y
CHIPPING AVENUE	FUT 9	209	201		1		1	2	0.05	60	0.94	4.00	0.97									0.05	0.94	0.26	1.23	0.06	200	0.33	19.66	0.61	0.38	23.07	92.47		88.968	88.768	3.50	92.70		88.892	88.692	3.81		Y
CHIPPING AVENUE	FUT 9	201	200		3		3	7	0.10	166	2.54	4.00	2.68									0.10	2.54	0.71	3.39	0.17	200	0.33	19.66	0.61	0.45	17.53	92.70		88.892	88.692	3.81	92.36		88.834	88.634	3.53		Y
CHIPPING AVENUE	FUT 9	200	212		6		6	14	0.25	180	2.78	4.00	2.92									0.25	2.78	0.78	3.70	0.10	200	1.24	38.13	1.18	0.76	46.65	92.36		88.834	88.634	3.53	92.60	0.600	88.255	88.055	4.35		Y
FUTURE DEVELOPMENT	FUT	STUB	212		59		59	141	2.21	141	2.21	4.00	2.28									2.21	2.21	0.62	2.90	0.15	200	0.33	19.66	0.61	0.46	20.78	92.68		87.723	87.523	4.96	92.60		87.655	87.455	4.95		Y
BORBRIDGE AVE	FUT 9	212	211						0.03	4,388	95.31	3.30	58.61					8.69		7.54	7.54	0.03	104.00	29.12	95.27	0.61	525	0.12	155.42	0.70	0.73	20.11	92.60		87.655	87.130	4.95	92.47		87.631	87.106	4.84		Y
BORBRIDGE AVE	FUT 9	211	7						0.27	4,388	95.58	3.30	58.61					8.69		7.54	7.54	0.27	104.27	29.20	95.35	0.61	525	0.12	155.42	0.70	0.73	97.77	92.47		87.631	87.106	4.84	93.00		87.513	86.988	5.49	Stantec OBV 87.51	Y
SPRATT ROAD (STANTEC 3a)	FUT	STUB	7							370	8.92	4.00	6.00				8.47	8.47		7.35	7.35	8.47	17.39	4.87	18.22	0.12	525	0.12	155.42	0.70	0.48	20.96	93.00		87.539	87.014	5.46	93.00		87.513	86.988	5.49		Y
SPRATT ROAD	FUT	7	2						1.41	4,758	105.91	3.26	62.93					17.16		14.90	14.90	1.41	123.07	34.46	112.28	0.72	525	0.12	155.42	0.70	0.74	549.08	93.00		87.513	86.988	5.49	91.35		86.855	86.330	4.50		Y
Northeast Quadrant (Flow East to Spratt Road via Poplin Street)																																												
NUTTING CRESCENT	9	33 (W)	34						0.02		0.02	4.00										0.02	0.02	0.01	0.01	0.00	200	2.00	48.39	1.49		12.36	91.35		88.629	88.429	2.72	91.35		88.382	88.182	2.97		Y
NUTTING CRESCENT	9	34	23		24		24	58	0.75	58	0.77	4.00	0.93									0.75	0.77	0.22	1.15	0.05	200	0.40	21.64	0.67	0.39	106.50	91.35		88.382	88.182	2.97	91.10		87.956	87.756	3.14		Y
POPLIN STREET	9	23	22		2		2	5	0.29	62	1.06	4.00	1.01									0.29	1.06	0.30	1.31	0.06	200	0.40	21.64	0.67	0.40	83.73	91.10		87.956	87.756	3.14	91.20		87.621	87.421	3.58		Y
CLARIDGE RESIDENTIAL	FUT IBI	STUB	33 (E)			94	94	226	1.70	226	1.70	4.00	3.66									1.70	1.70	0.48	4.13	0.21	200	0.33	19.66	0.61	0.49	9.00	91.35		88.562	88.362	2.79	91.35		88.533	88.333	2.82		Y
NUTTING CRESCENT	9	33 (E)	32		2		2	5	0.20	231	1.90	4.00	3.74									0.20	1.90	0.53	4.27	0.15	200	0.65	27.59	0.85	0.63	66.94	91.35		88.533	88.333	2.82	91.37		88.098	87.898	3.27		Y
NUTTING CRESCENT	9	32	31						0.02	231	1.92	4.00	3.74									0.02	1.92	0.54	4.27	0.20	200	0.40	21.64	0.67	0.53	9.86	91.37		88.098	87.898	3.27	91.37		88.058	87.858	3.31		Y
CLARIDGE COMMERCIAL	FUT IBI	STUB	31									4.00		3.02	3.02	2.62					2.62	3.02	3.02	0.85	3.47	0.18	200	0.33	19.66	0.61	0.46	9.01	91.37		88.088	87.888	3.28	91.37		88.058	87.859	3.31		Y
NUTTING CRESCENT	9	31	22		23		23	55	0.69	286	2.61	4.00	4.63		3.02	2.62					2.62	0.69	5.63	1.58	8.83	0.41	200	0.40	21.64	0.67	0.64	109.38	91.37		88.058	87.858	3.31	91.20		87.621	87.421	3.58		Y
POPLIN STREET	9	22	22A		1		1	2	0.11	351	3.78	4.00	5.68		3.02	2.62					2.62	0.11	6.80	1.90	10.21	0.47	200	0.40	21.64	0.67	0.66	38.16	91.20		87.621	87.421	3.58	91.00		87.468	87.268	3.53		Y
FUTURE STACKS	FUT 9	STUB (N)	22A			106	106	254	1.41	254	1.41	4.00	4.12									1.41	1.41	0.39	4.52	0.23	200	0.33	19.66	0.61	0.51	9.00	91.10		87.911	87.712	3.19	91.00	0.413	87.881	87.681	3.12	INV to INV drop = 0.413 m < 0.6 m (no drop pipe req'd)	Y
POPLIN STREET	9	22A	21						0.11	605	5.30	3.93	9.63		3.02	2.62					2.62	0.11	8.32	2.33	14.58	0.67	200	0.40	21.64	0.67	0.71	59.61	91.00		87.468	87.268	3.53	91.09		87.230	87.030	3.86		Y
FUTURE STACKS	FUT 9	STUB (S)	21			104	104	250	1.30	250	1.30	4.00	4.04									1.30	1.30	0.36	4.41	0.22	200	0.33	19.66	0.61	0.49	9.00	91.27		87.259	87.059	4.01	91.09		87.230	87.030	3.86		Y
FUTURE COMMERCIAL	FUT 9	STUB (N)	21									4.00		1.23	1.23	1.07					1.07	1.23	1.23	0.34	1.41	0.07	200	0.33	19.66	0.61	0.36	9.00	91.27		87.259	87.059	4.01	91.09		87.230	87.030	3.86		Y
POPLIN STREET	9	21	2						0.16	855	6.76	3.84	13.30		4.25	3.69					3.69	0.16	11.01	3.08	20.08	0.31	300	0.40	63.80	0.87	0.79	93.77	91.09		87.230	86.930	3.86	91.35		86.855	86.555	4.50		Y
SPRATT ROAD	9	2	1 (AECOM STUB)						0.28	5,613	112.95	3.20	72.71		4.25	3.69		17.16		14.90	18.59	0.28	134.36	37.62	128.92	0.83	525	0.12	155.42	0.70	0.78	41.25	91.35		86.855	86.330	4.50	91.08	1.130	86.805	86.280	4.27	Ex. Aecom Stub INV 85.15	Y
SPRATT ROAD	9	1 (AECOM STUB)	EX. (STANTEC 111)						1.38	5,613	114.33	3.20	72.71		4.25	3.69		17.16		14.90	18.59	1.38	135.74	38.01	129.31	0.83	525	0.12	155.42	0.70	0.78		91.08		AECOM STUB INV.	85.150								
									STANTEC POP.	6,216												STANTEC AREA	146.27	FLOW	137.40																			

CLIENT

CLARIDGE HOMES

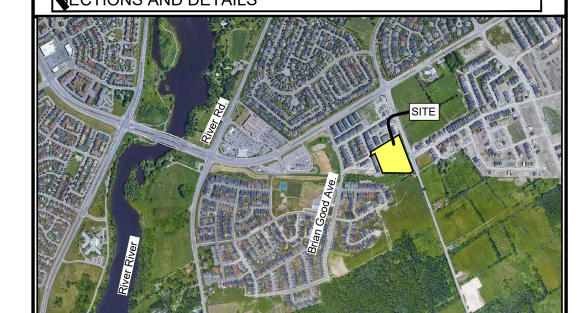
210 Gladstone Ave. Ottawa, On K0P 0Y6

ISSUES

No.	DESCRIPTION	DATE
####	ISSUED FOR CITY REVIEW	2021-12-15

NOT FOR CONSTRUCTION

C-410, FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS



CONSULTANTS

SEAL

LICENSED PROFESSIONAL ENGINEER — D. G. Yannoulopoulos — 2021-12-15 — PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER — W. ZHUANG — 100231427 — 2021-12-15 — PROVINCE OF ONTARIO

IBI GROUP
Suite 400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 / 613 241 3300 fax 613 225 9868
ibigroup.com

PROJECT

ZENS - 4624 SPRATT

PROJECT NO: 135856

DRAWN BY:	CHECKED BY:
D.D./S.G.	A.Z.
PROJECT MGR:	APPROVED BY:
R.M.	----

SHEET TITLE

SANITARY DRAINAGE AREA PLAN

SHEET NUMBER	ISSUE
C-400	1

CITY FILE No. D07-xx-xx-xxxx

CITY PLAN No. xxxxx

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

Spratt Road Zens
City of Ottawa
Claridge Homes

LOCATION: STREET	LOCATION: AREA ID	LOCATION: FROM MH	LOCATION: TO MH	RESIDENTIAL: AREA w/ Units (Ha)	UNIT TYPES: SF	UNIT TYPES: SD	UNIT TYPES: TH	UNIT TYPES: APT	AREA w/o Units (Ha)	POPULATION: IND	POPULATION: CUM	RES PEAK FACTOR	PEAK FLOW (L/s)	ICI AREAS: AREA (Ha) INSTITUTIONAL IND	INSTITUTIONAL CUM	COMMERCIAL IND	COMMERCIAL CUM	INDUSTRIAL IND	INDUSTRIAL CUM	ICI PEAK FACTOR	PEAK FLOW (L/s)	INFILTRATION ALLOWANCE: AREA (Ha) IND	AREA (Ha) CUM	FLOW (L/s)	FIXED FLOW (L/s): IND	FIXED FLOW (L/s): CUM	TOTAL FLOW (L/s)	PROPOSED SEWER DESIGN: CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (full) (m/s)	AVAILABLE CAPACITY L/s	AVAILABLE CAPACITY (%)
Nutting Crescent	MH130A	MH130A	MH131A	0.04				3		6.3	6.3	3.75	0.08	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.04	0.04	0.01	0.00	0.00	0.09	11.23	30.38	150	0.50	0.616	11.14	99.20%
	MH131A	MH131A	MH132A	0.12				3		6.3	12.6	3.72	0.15	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.12	0.16	0.05	0.00	0.00	0.20	20.24	40.25	200	0.35	0.624	20.04	98.99%
	MH140A	MH140A	MH132A	0.15				12		25.2	25.2	3.69	0.30	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.15	0.15	0.05	0.00	0.00	0.35	20.24	33.33	200	0.35	0.624	19.89	98.27%
	MH132A	MH132A	MH133A	0.09				6		12.6	50.4	3.65	0.60	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.09	0.40	0.13	0.00	0.00	0.73	20.24	27.19	200	0.35	0.624	19.51	96.40%
	MH133A	MH133A	MH102A	0.04				0		0.0	50.4	3.65	0.60	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.04	0.44	0.15	0.00	0.00	0.74	20.24	8.25	200	0.35	0.624	19.50	96.34%
	MH160A	MH160A	MH170A	0.06				6		12.6	12.6	3.72	0.15	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.06	0.06	0.02	0.00	0.00	0.17	20.24	25.98	200	0.35	0.624	20.07	99.15%
	MH170A	MH170A	MH101A	0.04				3		6.3	18.9	3.71	0.23	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.04	0.10	0.03	0.00	0.00	0.26	20.24	35.66	200	0.35	0.624	19.98	98.72%
	MH100A	MH100A	MH101A	0.12				12		25.2	25.2	3.69	0.30	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.12	0.12	0.04	0.00	0.00	0.34	20.24	22.89	200	0.35	0.624	19.90	98.31%
	MH101A	MH101A	MH102A	0.05				0		0.0	44.1	3.66	0.52	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.05	0.27	0.09	0.00	0.00	0.61	20.24	12.64	200	0.35	0.624	19.63	96.98%
	MH102A	MH102A	MH103A	0.03				0		0.0	94.5	3.60	1.10	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.03	0.74	0.24	0.00	0.00	1.35	20.24	35.38	200	0.35	0.624	18.90	93.35%
	MH180A	MH180A	MH103A	0.07				6		12.6	12.6	3.72	0.15	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.07	0.07	0.02	0.00	0.00	0.18	20.24	33.65	200	0.35	0.624	20.07	99.13%
	MH103A	MH103A	MH104A	0.14				12		25.2	132.3	3.57	1.53	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.14	0.95	0.31	0.00	0.00	1.84	20.24	24.91	200	0.35	0.624	18.40	90.90%
	MH121A	MH121A	MH120A	0.06				3		6.3	6.3	3.75	0.08	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.06	0.06	0.02	0.00	0.00	0.10	20.24	19.13	200	0.35	0.624	20.15	99.52%
	MH120A	MH120A	MH110A	0.03				3		6.3	12.6	3.72	0.15	0.00	0.00	0.36	0.36	0.00	0.00	1.50	0.18	0.39	0.45	0.15	0.00	0.00	0.48	20.24	11.54	200	0.35	0.624	19.77	97.65%
	MH110A	MH110A	MH111A					0		0.0	12.6	3.72	0.15	0.00	0.00	0.00	0.36	0.00	0.00	1.50	0.18	0.00	0.45	0.15	0.00	0.00	0.48	20.24	32.53	200	0.35	0.624	19.77	97.65%
	MH123A	MH123A	MH111A	0.06				6		12.6	12.6	3.72	0.15	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.06	0.06	0.02	0.00	0.00	0.17	20.24	30.67	200	0.35	0.624	20.07	99.15%
	MH111A	MH111A	MH112A	0.06				3		6.3	31.5	3.68	0.38	0.00	0.00	0.00	0.36	0.00	0.00	1.50	0.18	0.06	0.57	0.19	0.00	0.00	0.74	20.24	12.58	200	0.35	0.624	19.50	96.35%
	MH112A	MH112A	MH113A	0.13				3		6.3	37.8	3.67	0.45	0.00	0.00	0.00	0.36	0.00	0.00	1.50	0.18	0.13	0.70	0.23	0.00	0.00	0.86	20.24	9.81	200	0.35	0.624	19.39	95.77%
	MH113A	MH113A	MH114A	0.05				3		6.3	44.1	3.66	0.52	0.00	0.00	0.00	0.36	0.00	0.00	1.50	0.18	0.05	0.75	0.25	0.00	0.00	0.95	20.24	12.23	200	0.35	0.624	19.30	95.33%
	MH151A	MH151A	MH150A	0.07				6		12.6	12.6	3.72	0.15	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.07	0.07	0.02	0.00	0.00	0.18	20.24	29.12	200	0.35	0.624	20.07	99.13%
	MH152A	MH152A	MH150A	0.08				6		12.6	12.6	3.72	0.15	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.08	0.08	0.03	0.00	0.00	0.18	20.24	34.99	200	0.35	0.624	20.06	99.12%
	MH150A	MH150A	MH114A	0.07				0		0.0	25.2	3.69	0.30	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.07	0.22	0.07	0.00	0.00	0.37	20.24	37.84	200	0.35	0.624	19.87	98.15%
	MH114A	MH114A	MH115A	0.03				3		6.3	75.6	3.62	0.89	0.00	0.00	0.00	0.36	0.00	0.00	1.50	0.18	0.03	1.00	0.33	0.00	0.00	1.39	20.24	45.54	200	0.35	0.624	18.85	93.12%
	MH115A	MH115A	MH104A	0.17				12		25.2	100.8	3.59	1.17	0.00	0.00	0.00	0.36	0.00	0.00	1.50	0.18	0.17	1.17	0.39	0.00	0.00	1.74	20.24	8.32	200	0.35	0.624	18.51	91.43%
	MH104A	MH104A	MH105A	0.11				3		6.3	239.4	3.49	2.71	0.00	0.00	0.00	0.36	0.00	0.00	1.00	0.12	0.11	2.23	0.74	0.00	0.00	3.56	20.24	27.20	200	0.35	0.624	16.68	82.39%
	MH105A	MH105A	MH106A	0.07				3		6.3	245.7	3.49	2.78	0.00	0.00	0.00	0.36	0.00	0.00	1.00	0.12	0.07	2.30	0.76	0.00	0.00	3.66	20.24	33.59	200	0.35	0.624	16.59	81.94%
	MH106A	MH106A	*EX MH31*	0.14				3		6.3	252.0	3.49	2.85	0.00	0.00	0.00	0.36	0.00	0.00	1.00	0.12	0.14	2.44	0.81	0.00	0.00	3.77	20.24	25.28	200	0.35	0.624	16.47	81.37%
				2.08				120		252.0	TRUE					0.36						2.44								200				

Design Parameters:

Residential			ICI Areas			
SF	3.4	p/p/u				
TH/SD	2.7	p/p/u	INST	28,000	L/Ha/day	
APT	2.1	p/p/u	COM	28,000	L/Ha/day	
Other	60	p/p/Ha	IND	35,000	L/Ha/day	MOE Chart
				17000	L/Ha/day	

*** All units will be 2-bedrooms stacked townhouses**

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: W.Z. & R.M.

Checked: D.G.Y.

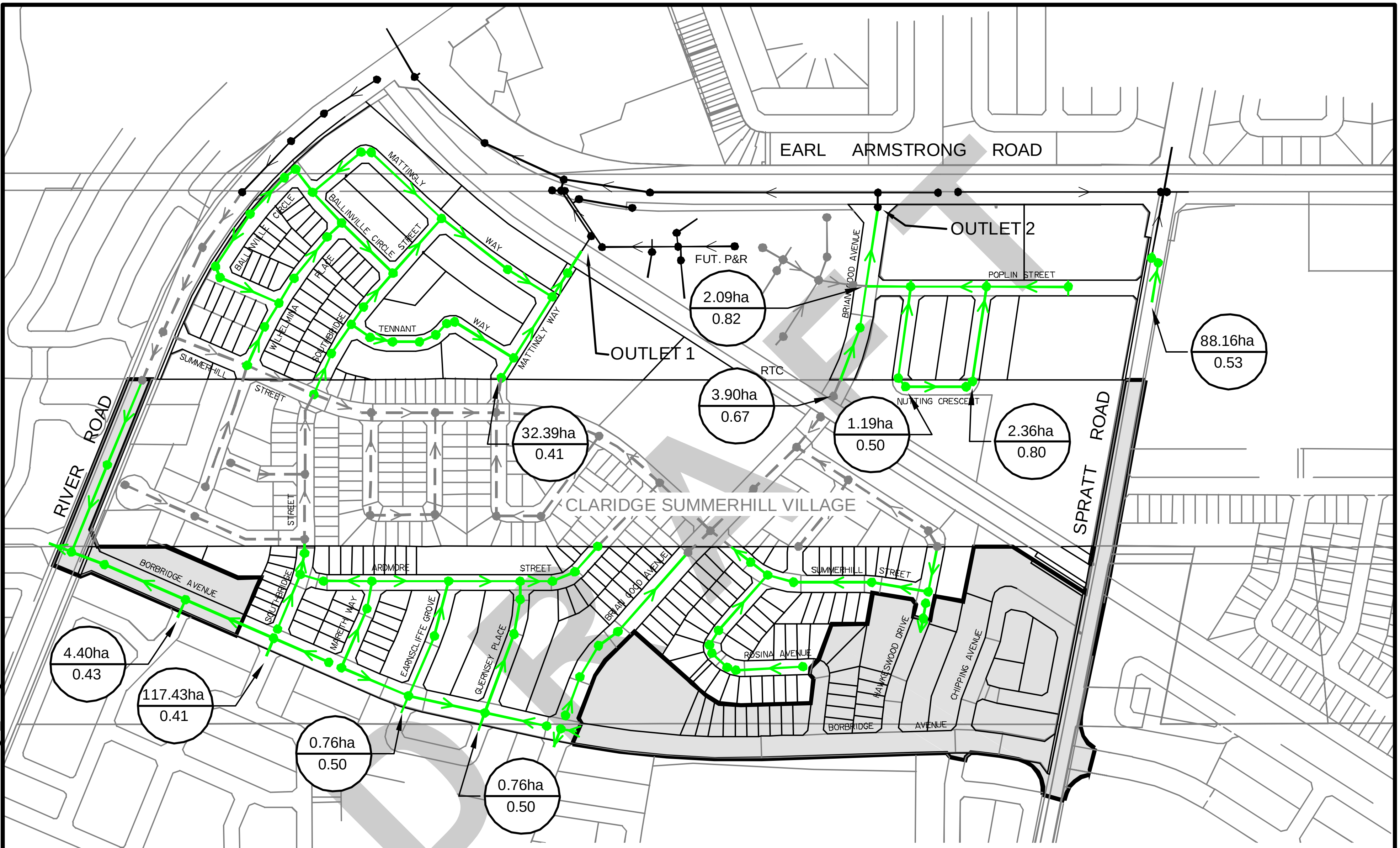
Dwg. Reference: 135856-400

No.	Revision	Date
1.	Servicing Brief - Submission No. 1	2021-12-14

File Reference:	Date:	Sheet No:
135856-6.04.04	2021-12-14	1 of 1

APPENDIX D

- RSDC Phase 9 Figure 5.1 Storm Servicing Plan
- RSDC Phase 9 Storm Drainage Plan
- RSDC Phase 9 Storm Sewer Design Sheet
- RSDC Phase 9 - Figure 5.2 Storm Drainage Plan
- RSDC Phase 9 - Table 5.3 Allowable Inlet Capture Rate
- Storm Sewer Design Sheet
- Storm Drainage Area Plan Drawing 500
- Ponding Plan 600



Proposed Storm Sewer
Proposed Storm Sewer Summerhill Village by Claridge Homes
Proposed Storm Sewer by Others
Existing Storm Sewer
Future Phase 9

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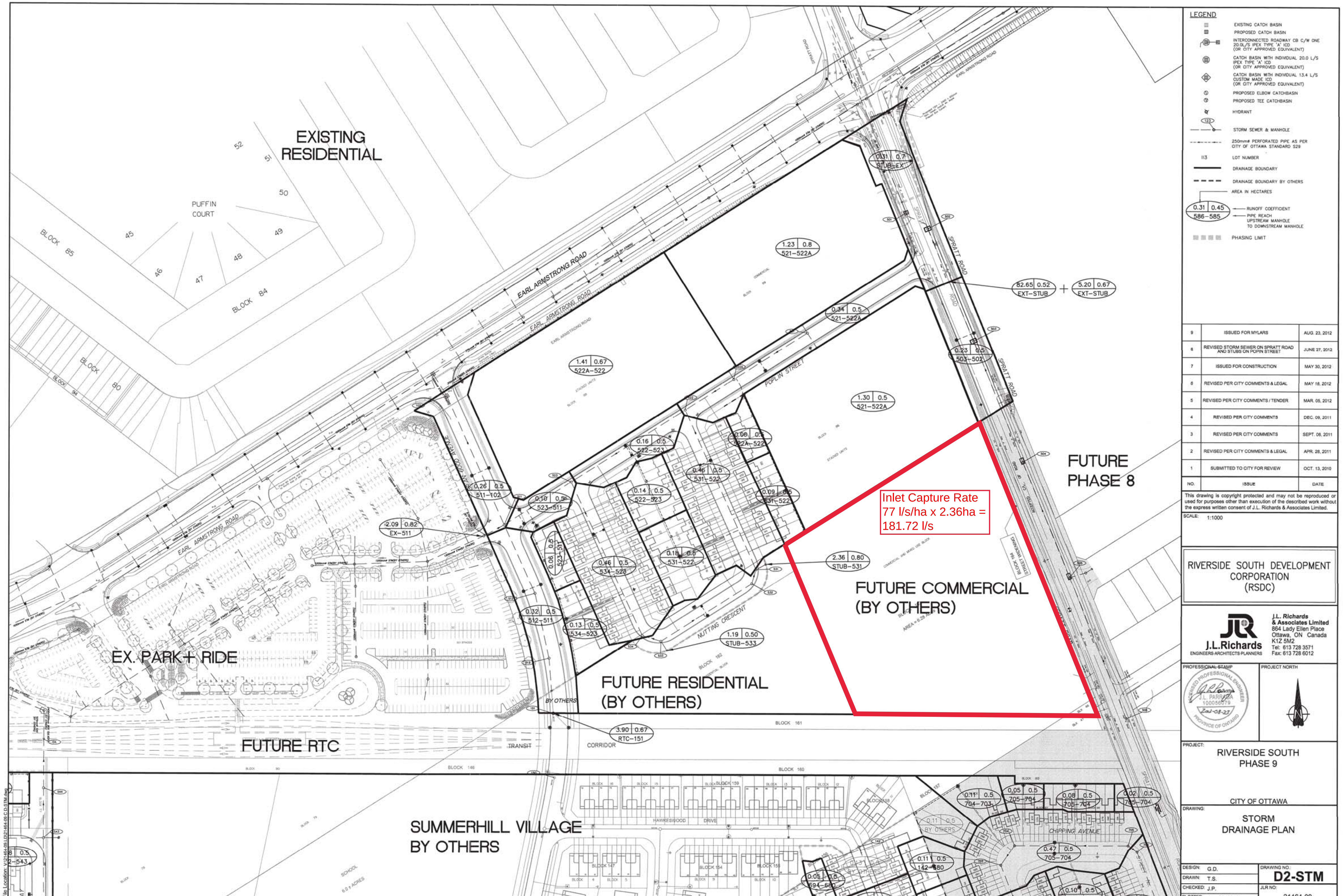
PROJECT:	RIVERSIDE SOUTH PHASE 9, CITY OF OTTAWA
DRAWING:	STORM SERVICING PLAN
DESIGN:	G.D.
DRAWN:	K.T.K.
CHECKED:	J.L.P.
PLOTTED:	Oct09,2012
DRAWING NO.:	FIGURE 5.1
JLR NO:	21464-09

File Location: V:\21464-09.LD\21464-09 P Fig5_1.dwg



LEGEND
EXISTING CATCH BASIN
PROPOSED CATCH BASIN
INTERCONNECTED ROADWAY CB C/W ONE 20.0L/S IPEX TYPE "A" ICD (OR CITY APPROVED EQUIVALENT)
CATCH BASIN WITH INDIVIDUAL 20.0 L/S IPEX TYPE "A" ICD (OR CITY APPROVED EQUIVALENT)
CATCH BASIN WITH INDIVIDUAL 13.4 L/S CUSTOM MADE ICD (OR CITY APPROVED EQUIVALENT)
PROPOSED ELBOW CATCHBASIN
PROPOSED TEE CATCHBASIN
HYDRANT
STORM SEWER & MANHOLE
250mmø PERFORATED PIPE AS PER CITY OF OTTAWA STANDARD S29
LOT NUMBER
DRAINAGE BOUNDARY
DRAINAGE BOUNDARY BY OTHERS
AREA IN HECTARES
RUNOFF COEFFICIENT
PIPE REACH UPSTREAM MANHOLE TO DOWNSTREAM MANHOLE
PHASING LIMIT
EXISTING RESIDENTIAL
PUFFIN COURT
BLOCK 85
BLOCK 84
EARL ARMSTRONG ROAD
SPRATT ROAD
POPLIN STREET
NUTTING CRESCENT
FUTURE PHASE 8
Inlet Capture Rate
77 l/s/ha x 2.36ha =
181.72 l/s
FUTURE COMMERCIAL
(BY OTHERS)
FUTURE RESIDENTIAL
(BY OTHERS)
EX. PARK+ RIDE
FUTURE RTC
TRANSIT CORRIDOR
SUMMERHILL VILLAGE
BY OTHERS
HAWKESWOOD DRIVE
CHIPPING AVENUE
1.23 0.8 521–522A
1.41 0.67 522A–522
1.30 0.5 521–522A
0.34 0.5 521–522A
0.23 0.5 503–502
0.31 0.7 STUB–EX
82.65 0.52 EXT–STUB
5.20 0.67 EXT–STUB
2.36 0.80 STUB–531
1.19 0.50 STUB–533
3.90 0.67 RTC–151
2.09 0.82 EX–511
0.26 0.5 511–102
0.32 0.5 512–511
9 ISSUED FOR MYLARS AUG. 23, 2012
8 REVISED STORM SEWER ON SPRATT ROAD AND STUBS ON POPIN STREET JUNE 27, 2012
7 ISSUED FOR CONSTRUCTION MAY 30, 2012
6 REVISED PER CITY COMMENTS & LEGAL MAY 18, 2012
5 REVISED PER CITY COMMENTS / TENDER MAR. 05, 2012
4 REVISED PER CITY COMMENTS DEC. 09, 2011
3 REVISED PER CITY COMMENTS SEPT. 08, 2011
2 REVISED PER CITY COMMENTS & LEGAL APR. 28, 2011
1 SUBMITTED TO CITY FOR REVIEW OCT. 13, 2010
NO. ISSUE DATE
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PROFESSIONAL STAMP
PROJECT NORTH
PROJECT:
RIVERSIDE SOUTH PHASE 9
CITY OF OTTAWA
DRAWING:
STORM DRAINAGE PLAN
DESIGN: G.D.
DRAWN: T.S.
CHECKED: J.P.
PLOTTED: Aug 23, 2012
DRAWING NO.: D2-STM
JLR NO: 21464-09

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STORM SEWER DESIGN SHEET

Spratt Road Zens
City of Ottawa
Claridge Homes

LOCATION				AREA (Ha)										RATIONAL DESIGN FLOW				
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.25	C= 0.30	C= 0.50	C= 0.57	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)
Nutting Cresent	MH100, MH100C,D	MH100	MH101				0.07						0.06	0.25	0.25	10.00	0.90	10.90
	MH130	MH130	MH131										0.05	0.13	0.13	10.00	0.50	10.50
	MH131	MH131	MH132									0.34		0.72	0.84	10.50	1.48	11.98
		MH132	MH101											0.00	0.84	11.98	0.10	12.08
	MH101	MH101	MH102										0.10	0.25	1.34	12.08	1.33	13.40
	MH109, MH109B	MH109	MH110				0.12					0.30		0.80	0.80	10.00	0.11	10.11
	MH110	MH110	MH111										0.14	0.35	1.15	10.11	0.99	11.10
	MH111	MH111	MH112			0.12								0.10	1.25	11.10	0.20	11.30
		MH112	MH113											0.00	1.25	11.30	0.39	11.68
	CBMH9. CBMH9B	CBMH9	MH113				0.10					0.13		0.41	0.41	10.00	0.78	10.78
	MH113	MH113	MH114									0.20		0.42	2.09	11.68	0.80	12.48
		MH114	MH102											0.00	2.09	12.48	0.18	12.66
	MH102	MH102	MH103										0.10	0.25	3.68	13.40	0.51	13.91
	MH103	MH103	MH104										0.42	1.05	4.73	13.91	0.63	14.55
		MH104	*EX Stub*											0.00	4.73	14.55	0.46	15.00
						0.12	0.29					0.97	0.87	4.73	TRUE			

FROM	TO	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)	SEWER DATA CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (2yr) (L/s)	AVAIL CAP (2yr) (%)
MH100	MH101	76.81	104.19	122.14	178.56	19.00	25.78	30.22	44.18	0.00	0.00	19.00	59.68	44.03	300			0.35	0.818	40.68	68.16%
MH130	MH131	76.81	104.19	122.14	178.56	9.61	13.03	15.28	22.34	0.00	0.00	9.61	59.68	24.42	300			0.35	0.818	50.07	83.90%
MH131	MH132	74.95	101.64	119.13	174.13	63.21	85.72	100.48	146.87	0.00	0.00	63.21	91.46	71.39	375			0.25	0.802	28.24	30.88%
MH132	MH101	69.95	94.78	111.05	162.27	59.00	79.94	93.67	136.87	0.00	0.00	59.00	91.46	4.60	375			0.25	0.802	32.45	35.49%
MH101	MH102	69.66	94.37	110.58	161.57	93.41	126.56	148.29	216.68	0.00	0.00	93.41	179.46	64.02	525			0.16	0.803	86.05	47.95%
MH109	MH110	76.81	104.19	122.14	178.56	61.49	83.42	97.79	142.96	0.00	0.00	61.49	91.46	5.24	375			0.25	0.802	29.96	32.76%
MH110	MH111	76.39	103.62	121.47	177.57	87.92	119.26	139.80	204.37	0.00	0.00	87.92	133.02	47.97	450			0.20	0.810	45.10	33.90%
MH111	MH112	72.84	98.74	115.72	169.13	91.12	123.52	144.77	211.58	0.00	0.00	91.12	133.02	9.80	450			0.20	0.810	41.89	31.50%
MH112	MH113	72.16	97.81	114.62	167.51	90.27	122.36	143.39	209.56	0.00	0.00	90.27	133.02	18.77	450			0.20	0.810	42.75	32.14%
CBMH9	MH113	76.81	104.19	122.14	178.56	31.77	43.10	50.53	73.86	0.00	0.00	31.77	59.68	38.44	300			0.35	0.818	27.91	46.77%
MH113	MH114	70.89	96.07	112.57	164.51	147.97	200.52	234.97	343.36	0.00	0.00	147.97	179.46	38.39	525			0.16	0.803	31.49	17.55%
MH114	MH102	68.43	92.69	108.60	158.67	142.84	193.47	226.68	331.19	0.00	0.00	142.84	179.46	8.65	525			0.16	0.803	36.62	20.41%
MH102	MH103	65.81	89.09	104.36	152.45	242.07	327.72	383.90	560.79	0.00	0.00	242.07	402.33	26.84	750			0.12	0.882	160.25	39.83%
MH103	MH104	64.46	87.24	102.19	149.26	304.85	412.61	483.29	705.90	0.00	0.00	304.85	402.33	33.60	750			0.12	0.882	97.47	24.23%
MH104	*EX Stub*	62.86	85.05	99.61	145.47	297.28	402.23	471.08	687.98	0.00	0.00	297.28	402.33	24.13	750			0.12	0.882	105.05	26.11%
															750						

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

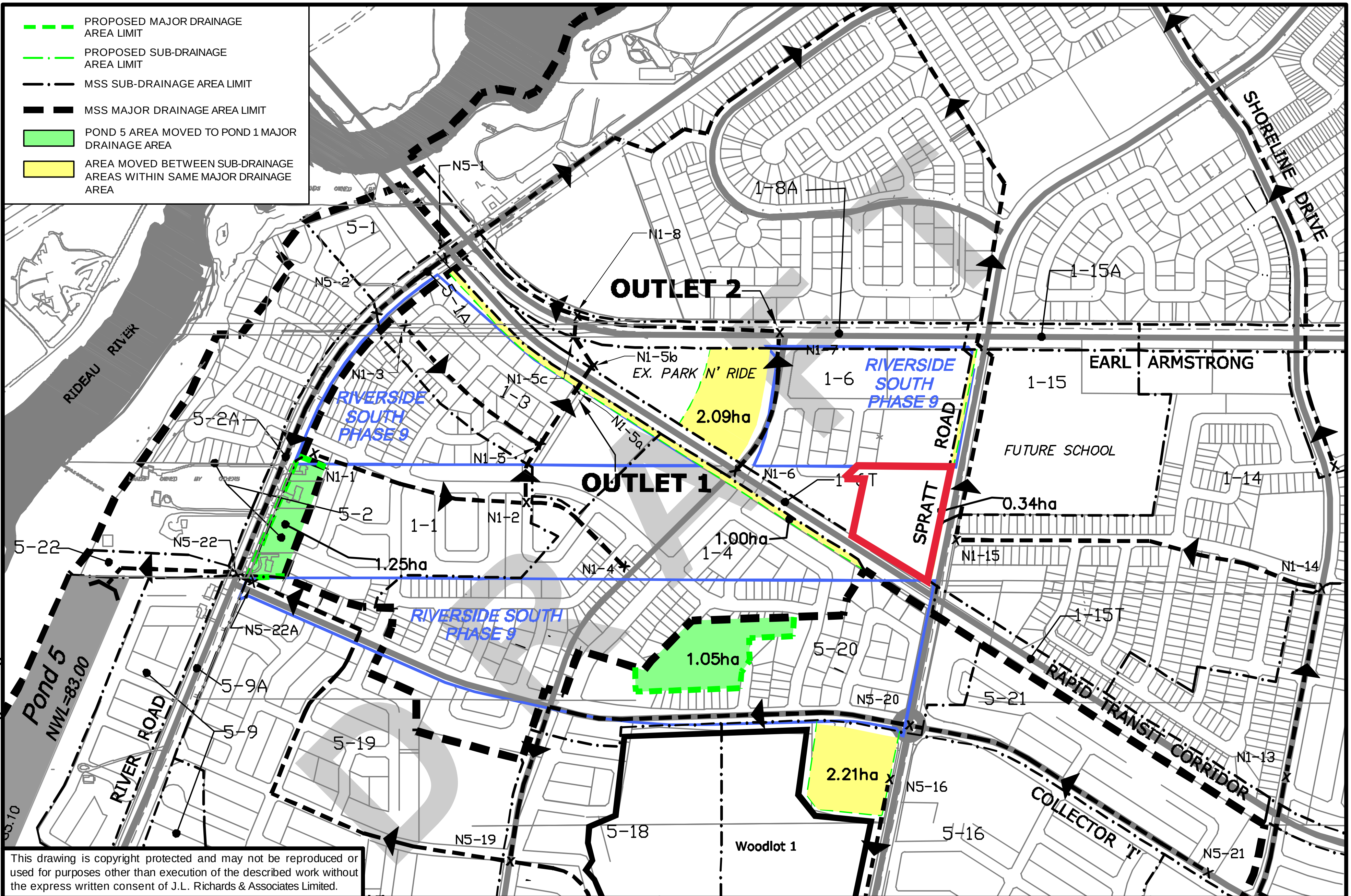
Designed: W.Z. & R.M.

Checked: D.G.Y.

Dwg. Reference: 135856-500

No.	Revision	Date
1.	Servicing Brief - Submission No. 1	2021-11-29

File Reference:	Date:	Sheet No:
135856.6.04.04	2021-11-29	1 of 1



File Location: V:\21464-09\LD\21464-09 P Fig5 2.dwg

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PROJECT:	RIVERSIDE SOUTH PHASE 9 CITY OF OTTAWA
DRAWING:	STORM DRAINAGE PLAN
DESIGN:	OTHER
DRAWN:	T.B.
CHECKED:	J.L.P.
PLOTTED:	Oct05,2011
DRAWING NO.:	FIGURE 5.2
JLR NO:	21464-09

Table 5.2: Storm Runoff Coefficients

Land Use Description	Runoff Coefficient, C
Residential - Low Density	0.40
Residential - Medium Density	0.50
Residential - High Density	0.60
Core Area	0.80
Commercial Area	0.80
Employment Lands	0.70
Schools	0.40
Institutional (other than school)	0.60
Collector Road/Transitway ROW	0.67
Parkland/Open Space/Hydro/Pipeline Corridor	0.20

Table 5.3: Allowable Inlet Capture Rates

Subcatchment Area ID	Inlet Capture Rate	Subcatchment Area ID	Inlet Capture Rate
1-1	68 L/s/ha	5-1	100 L/s/ha
1-3	57 L/s/ha	5-1A	221 L/s/ha
1-4	83 L/s/ha	5-2	62 L/s/ha
1-6	77 L/s/ha	5-2A	179 L/s/ha
1-6T	151 L/s/ha	5-19	58 L/s/ha
1-15	136 L/s/ha	5-20	77 L/s/ha

5.3.3 Major System

The RSCISSU provides specific design guidelines with regard to on-site storage requirements (refer to Appendix 'F'). On this basis, the provision of 50 m^3/ha of road sag storage is required for all subcatchment areas (i.e., subcatchment areas 1-1 to 1-6, inclusive) that are tributary to the noted outlets in order to meet the RSCISSU requirements. A discussion of major overland flow for RSDC Phase 9 and Claridge Homes Summerhill Village lands is provided in Section 5.5, with detailed calculations included in Appendix 'G'.

CLIENT

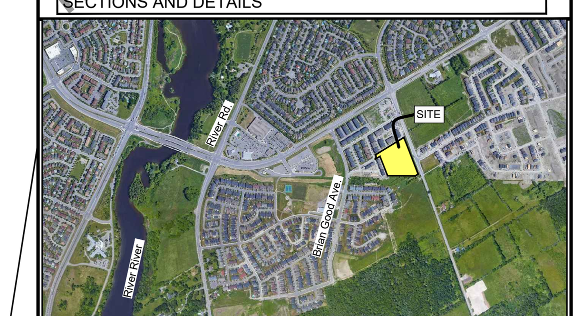
CLARIDGE HOMES

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR CITY REVIEW	2021-12-15

NOT FOR CONSTRUCTION

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



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PROJECT

ZENS - 4624 SPRATT

PROJECT NO: 135856	
DRAWN BY: D.D./S.G.	CHECKED BY: A.Z.
PROJECT MGR: R.M.	APPROVED BY: ----

SHEET TITLE

STORM DRAINAGE AREA PLAN

SHEET NUMBER	ISSUE
C-500	1

CITY PLAN No. xxxxx

CITY FILE No. D07-xx-xx-xxxx

SCALE CHECK 1 in 10mm

File Location: J:\135856_4624_Spratt_\7.0_Production\7.03_Design\04_Civil\Sheets\C-500 STORM DRAINAGE AREA PLAN.dwg Last Saved: December 15, 2021, by ddore Plotted: Wednesday, December 15, 2021 4:28:50 PM by Denis Dore

CLIENT

CLARIDGE HOMES

210 Gladstone Ave. Ottawa, On K0P 0Y6

ISSUES

No.	DESCRIPTION	DATE
####	ISSUED FOR CITY REVIEW	2021-12-15

NOT FOR CONSTRUCTION

SEE C-010, FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

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PROJECT

ZENS - 4624 SPRATT

PROJECT NO:
135856

DRAWN BY:	CHECKED BY:
D.D./S.G.	A.Z.
PROJECT MGR:	APPROVED BY:
R.M.	----

SHEET TITLE

PONDING PLAN

SHEET NUMBER	ISSUE
C-600	1

CITY FILE No. D07-xx-xx-xxxx

CITY PLAN No. xxxxx

File Location: J:\135856_4624_Spratt_\7.0_Production\7.03_Design\04_Civil\Sheets\C-600 PONDING PLAN.dwg Last Saved: December 15, 2021, by ddore Plotted: Wednesday, December 15, 2021 4:29:09 PM by Denis Dore

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STORM SEWER DESIGN SHEET

Spratt Road Zens
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= 0.30	C= 0.50	C= 0.57	C= 0.65	C= 0.69	C= 0.70	C= 0.75	C= 0.81	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) (%)
Nutting Cresent	MH100, MH100C,D	MH100	MH101				0.07						0.06	0.23	0.23	10.00	0.90	10.90	76.81	104.19	122.14	178.56	17.85	24.22	28.39	41.50	0.00	0.00	17.85	59.68	44.03	300			0.35	0.818	41.83	70.09%
	MH130	MH130	MH131										0.05	0.11	0.11	10.00	0.50	10.50	76.81	104.19	122.14	178.56	8.65	11.73	13.75	20.10	0.00	0.00	8.65	59.68	24.42	300			0.35	0.818	51.04	85.51%
		MH131	MH129											0.00	0.11	10.50	1.27	11.77	74.95	101.64	119.13	174.13	8.44	11.44	13.41	19.61	0.00	0.00	8.44	59.68	62.36	300			0.35	0.818	51.24	85.86%
	MH127, MH127B	MH127	MH128									0.34		0.71	0.71	10.00	1.02	11.02	76.81	104.19	122.14	178.56	54.45	73.86	86.59	126.58	0.00	0.00	54.45	239.68	50.14	600			0.14	0.821	185.23	77.28%
		MH128	MH129											0.00	0.71	11.02	0.12	11.14	73.11	99.11	116.15	169.76	51.83	70.26	82.34	120.34	0.00	0.00	51.83	239.68	6.07	600			0.14	0.821	187.85	78.38%
		MH129	MH132											0.00	0.82	11.77	0.18	11.95	70.62	95.70	112.14	163.86	58.02	78.61	92.12	134.61	0.00	0.00	58.02	59.68	9.03	300			0.35	0.818	1.67	2.79%
		MH132	MH101											0.00	0.82	11.95	0.10	12.05	70.04	94.90	111.20	162.49	57.54	77.96	91.35	133.48	0.00	0.00	57.54	91.46	4.60	375			0.25	0.802	33.92	37.09%
	MH101	MH101	MH102										0.10	0.23	1.28	12.05	1.35	13.39	69.75	94.49	110.72	161.78	89.21	120.86	141.62	206.93	0.00	0.00	89.21	179.46	64.90	525			0.16	0.803	90.25	50.29%
	MH109	Temp CB	MH109									0.30		0.63	0.63	10.00	0.15	10.15	76.81	104.19	122.14	178.56	48.04	65.17	76.40	111.69	0.00	0.00	48.04	59.26	16.22	200			3.00	1.828	11.22	18.94%
	MH109B	MH109	MH110				0.12							0.17	0.79	10.15	0.11	10.26	76.24	103.42	121.23	177.22	60.41	81.94	96.05	140.41	0.00	0.00	60.41	91.46	5.24	375			0.25	0.802	31.05	33.95%
	MH110	MH110	MH111									0.14		0.29	1.08	10.26	0.99	11.24	75.83	102.86	120.57	176.24	82.22	111.52	130.72	191.08	0.00	0.00	82.22	133.02	47.97	450			0.20	0.810	50.80	38.19%
	MH111	MH111	MH112				0.12							0.17	1.25	11.24	0.20	11.45	72.34	98.05	114.91	167.94	90.50	122.66	143.75	210.09	0.00	0.00	90.50	133.02	9.80	450			0.20	0.810	42.52	31.97%
		MH112	MH113											0.00	1.25	11.45	0.39	11.83	71.67	97.13	113.83	166.35	89.66	121.51	142.40	208.10	0.00	0.00	89.66	133.02	18.77	450			0.20	0.810	43.36	32.60%
	CBMH9. CBMH9B	CBMH9	MH113				0.10					0.13		0.41	0.41	10.00	0.78	10.78	76.81	104.19	122.14	178.56	31.49	42.72	50.08	73.22	0.00	0.00	31.49	59.68	38.44	300			0.35	0.818	28.19	47.23%
	MH113	CB7	Main									0.20		0.42	0.42	10.00	0.02	10.02	76.81	104.19	122.14	178.56	32.03	43.45	50.93	74.46	0.00	0.00	32.03	48.39	1.40	200			2.00	1.492	16.36	33.81%
		MH133	MH134											0.00	0.42	10.02	1.12	11.13	76.74	104.11	122.04	178.42	32.00	43.41	50.89	74.40	0.00	0.00	32.00	111.29	45.48	450			0.14	0.678	79.29	71.24%
		MH134	MH114											0.00	0.42	11.13	0.20	11.33	72.71	98.56	115.51	168.82	30.32	41.10	48.17	70.40	0.00	0.00	30.32	111.29	8.05	450			0.14	0.678	80.97	72.76%
		MH113	MH114											0.00	1.66	11.83	0.69	12.52	70.42	95.42	111.81	163.39	116.98	158.50	185.73	271.40	0.00	0.00	116.98	179.46	33.41	525			0.16	0.803	62.49	34.82%
		MH114	MH102											0.00	2.08	12.52	0.28	12.81	68.30	92.51	108.39	158.36	141.94	192.25	225.24	329.08	0.00	0.00	141.94	179.46	13.55	525			0.16	0.803	37.53	20.91%
	MH102	MH102	MH103										0.10	0.23	3.58	13.39	0.54	13.93	65.84	89.13	104.41	152.52	235.84	319.29	374.02	546.36	0.00	0.00	235.84	367.27	25.96	750			0.10	0.805	131.43	35.78%
		MH103	MH104											0.00	3.58	13.93	0.70	14.63	64.41	87.17	102.11	149.14	230.73	312.29	365.78	534.26	0.00	0.00	230.73	367.27	33.60	750			0.10	0.805	136.54	37.18%
	MH124	MH124	MH125										0.16	0.36	0.36	10.00	1.90	11.90	76.81	104.19	122.14	178.56	27.67	37.54	44.01	64.33	0.00	0.00	27.67	111.29	77.22	450			0.14	0.678	83.62	75.14%
	MH125	MH125	MH126										0.15	0.34	0.70	11.90	0.21	12.10	70.21	95.13	111.47	162.89	49.01	66.41	77.81	113.70	0.00	0.00	49.01	111.29	8.37	450			0.14	0.678	62.28	55.96%
	MH126	MH126	MH104										0.12	0.27	0.97	12.10	0.12	12.23	69.57	94.25	110.44	161.37	67.36	91.26	106.93	156.25	0.00	0.00	67.36	111.29	5.00	450			0.14	0.678	43.93	39.47%
		MH104	*EX Stub*											0.00	4.55	14.63	0.50	15.13	62.66	84.78	99.29	145.01	285.14	385.80	451.83	659.86	0.00	0.00	285.14	367.27	24.13	750			0.10	0.805	82.13	22.36%
							0.41					1.11	0.74	4.55	TRUE																	750						

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: W.Z. & R.M.

Checked: D.G.Y.

Dwg. Reference: 135856-500

No.	Revision	Date
1.	Servicing Brief - Submission No. 1	2021-12-14

File Reference:	Date:	Sheet No:
135856.6.04.04	2021-12-14	1 of 1

APPENDIX E

- PCSWMM Storm Drainage Area Plan 700
- Stormwater Modeling Files

CLIENT

CLARIDGE HOMES

210 Gladstone Ave. Ottawa, On K0P 0Y6

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR CITY REVIEW	2021-12-14

NOT FOR CONSTRUCTION

KEY PLAN

CONSULTANTS

LEGEND:

- DRAINAGE AREAS
- AREA ID (S588)
- IMPERVIOUS VALUE (71)
- AREA (ha) (0.20)
- MAJOR FLOW

1:500 — 0 5 15 25m

SEAL

LICENSED PROFESSIONAL ENGINEER
P. SPAL
2021/12/14
PROVINCE OF ONTARIO

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PROJECT
ZENS - 4624 SPRATT ROAD

PROJECT NO: 135856	
DRAWN BY: J.S.F.	CHECKED BY: P.S.
PROJECT MGR: M.G.	APPROVED BY:

SHEET TITLE
PCSWMM DRAINAGE AREA PLAN

SHEET NUMBER	ISSUE
C-700	1

CITY FILE No. D07-xx-xx-xxxx

CITY PLAN No. xxxxx

APPENDIX F

- Grading Plan Drawing 200
- Erosion and Sedimentation Control Plan Drawing 900
- Geotechnical Report by Paterson Group

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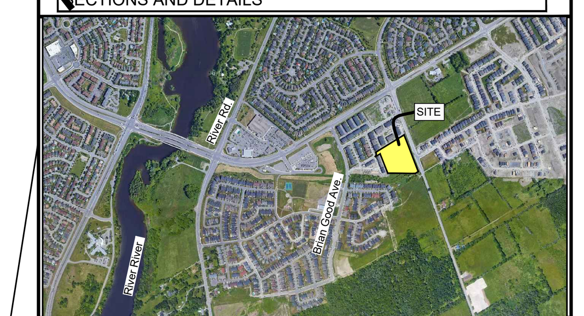
ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR CITY REVIEW	2021-12-15

NOT FOR CONSTRUCTION

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



CONSULTANTS

1:500 0 5 15 25m

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LICENSED PROFESSIONAL ENGINEER D. G. YANNOULOPOULOS 2021-12-15 PROVINCE OF ONTARIO

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PROJECT

ZENS - 4624 SPRATT

PROJECT NO:
135856

DRAWN BY:	CHECKED BY:
D.D./S.G.	**A.Z.**
PROJECT MGR:	APPROVED BY:
R.M.	**----**

SHEET TITLE

GRADING PLAN

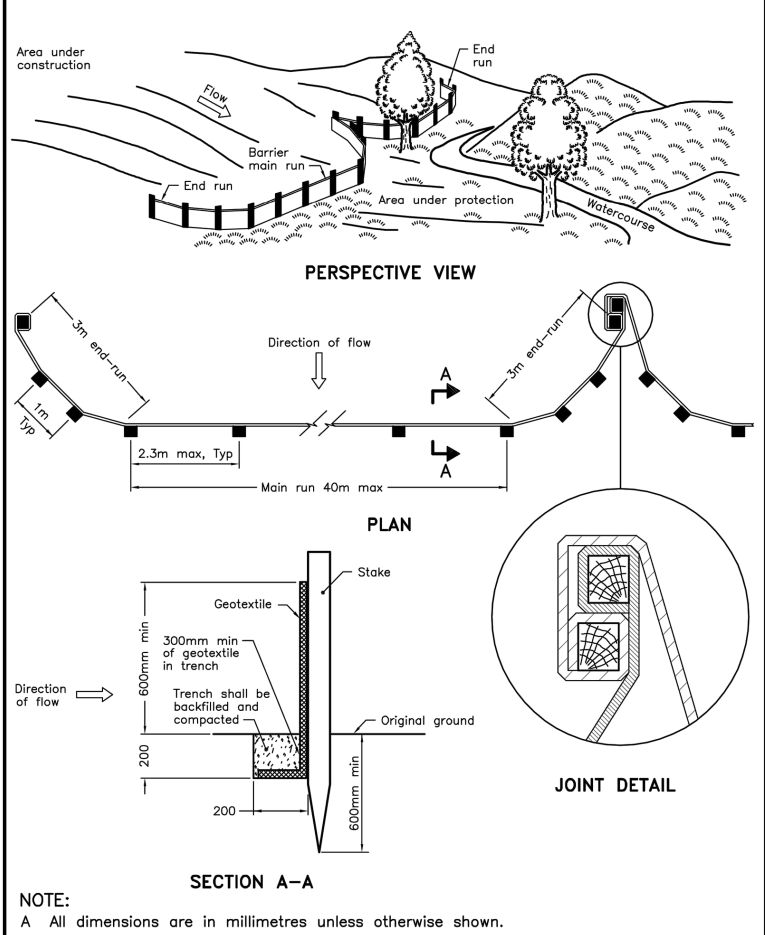
SHEET NUMBER: C-200 | ISSUE: 1

CITY PLAN No. xxxxx

CITY FILE No. D07-XX-XX-XXXX

SCALE CHECK 1 in 10mm

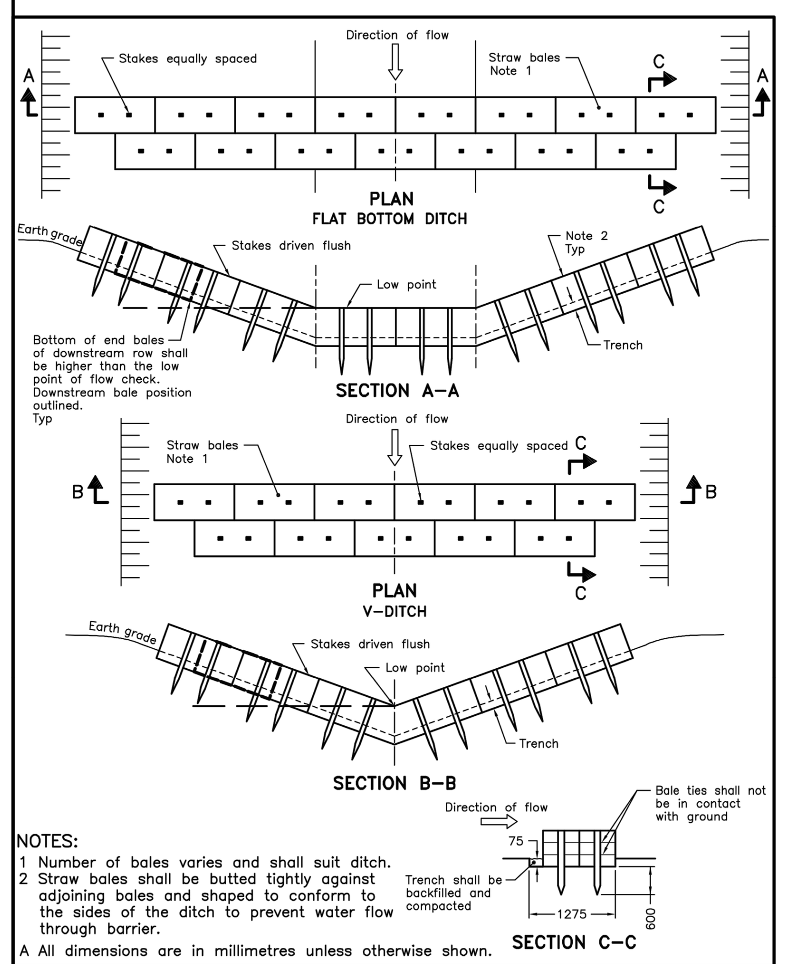
File Location: J:\135856_4624_Spratt_\7.0_Production\7.03_Design\04_Civil\Sheets\C-200 GRADING PLAN.dwg Last Saved: December 15, 2021, by ddore Plotted: Wednesday, December 15, 2021 4:28:13 PM by Denis Dore



ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2015 | Rev 2

LIGHT–DUTY SILT FENCE BARRIER

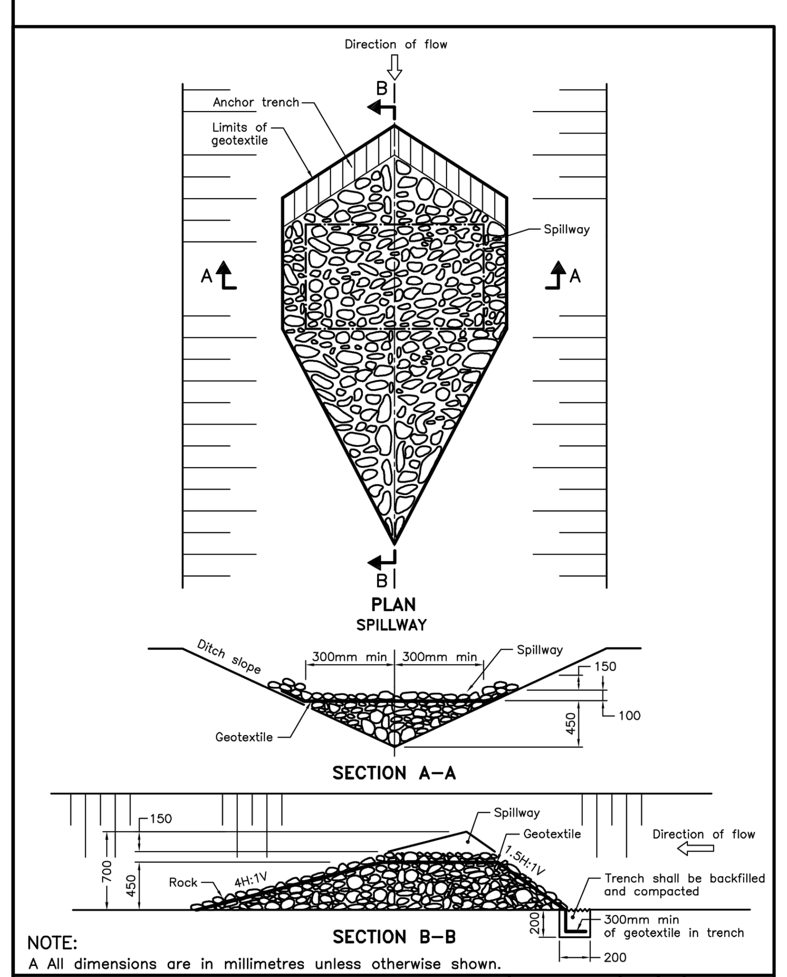
OPSD 219.110



ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2015 | Rev 2

STRAW BALE FLOW CHECK DAM

OPSD 219.180



ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2015 | Rev 2

TEMPORARY ROCK FLOW CHECK DAM V–DITCH

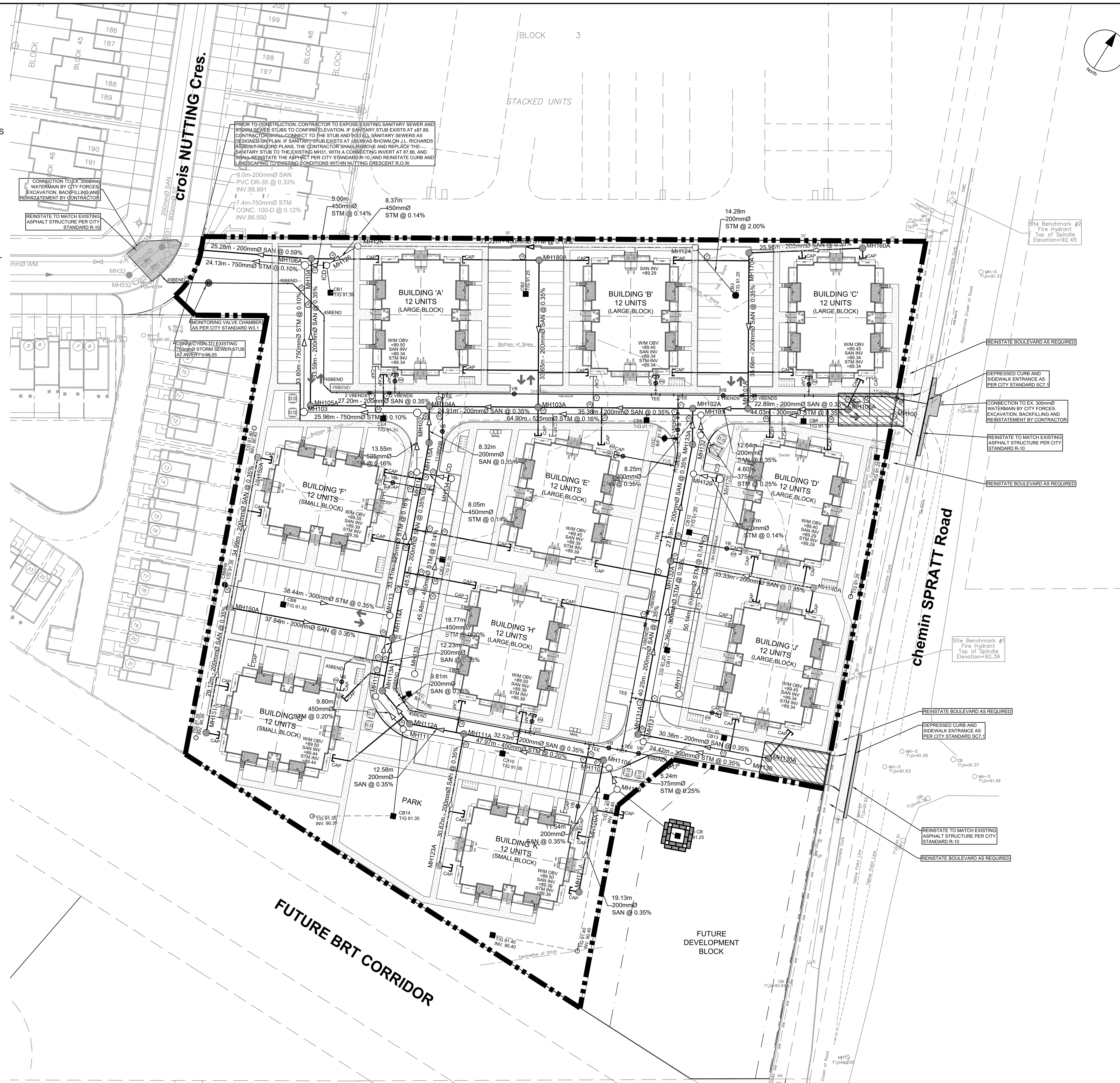
OPSD 219.210

NOTES:

1. 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.
2. 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.
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
6. SEE DRAWING C-010 FOR ADDITIONAL DETAILS AND NOTES.

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
- SILT SACK PLACED UNDER EXISTING CB COVER
- TEMPORARY MUD MAT 0.15m THICK 50mm CLEAR STONE ON NON WOVEN FILTER CLOTH (15.0 × 7.5)



SEE C-010, FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

CLIENT

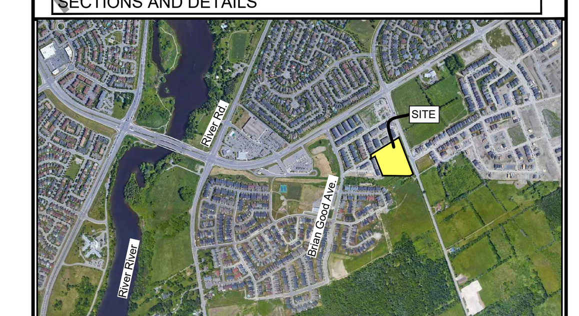
CLARIDGE HOMES

210 Gladstone Ave. Ottawa, On K0P 0Y6

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR CITY REVIEW	2021-12-15

NOT FOR CONSTRUCTION



CONSULTANTS

1:500 0 5 15 25m

SEAL

LICENSED PROFESSIONAL ENGINEER — D. G. Yannoulopoulos — 2021-12-15 — PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER — W. ZHUANG — 100231427 — 2021-12-15 — PROVINCE OF ONTARIO

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PROJECT

ZENS - 4624 SPRATT

PROJECT NO: 135856	
DRAWN BY: D.D./S.G.	CHECKED BY: A.Z.
PROJECT MGR: R.M.	APPROVED BY: ----

SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN

SHEET NUMBER	ISSUE
C-900	1

CITY FILE No. D07-xx-xx-xxxx

CITY PLAN No. xxxxx

patersongroup

Geotechnical Engineering

Environmental Engineering

Hydrogeology

Geological Engineering

Materials Testing

Building Science

Archaeological Services

Geotechnical Investigation

Proposed Residential Development
4624 Spratt Road
Ottawa, Ontario

Prepared For

Claridge Homes

February 23, 2021

Report: PG5641-1

Paterson Group Inc.
Consulting Engineers
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Table of Contents

Appendices

1.0 Introduction

Paterson Group (Paterson) was commissioned by Claridge Homes to conduct a geotechnical investigation for the proposed residential development to be located at 4624 Spratt Road in the City of Ottawa (refer to Figure 1 - Key Plan presented in Appendix 2).

The objectives of the geotechnical investigation were to:

- ❑ determine the subsoil and groundwater conditions at this site by means of boreholes.

- ❑ provide geotechnical recommendations for the design of the proposed development based on the results of the boreholes. These recommendations include permissible grade raises, long term settlements and other construction considerations which may affect its design.

The following report has been prepared specifically and solely for the aforementioned project which is described herein. The report contains our findings and includes geotechnical recommendations pertaining to the design and construction of the proposed development as understood at the time of this report.

2.0 Proposed Development

Based on the available conceptual plans, the proposed development at the subject site will consist of a series of townhouse blocks, each with a partial basement level. Asphalt-paved access lanes and parking areas with landscaped margins are also proposed as part of the development. Further, it is anticipated that the proposed development will be municipally serviced.

3.0 Method of Investigation

3.1 Field Investigation

This field program for the current geotechnical investigation was carried out on January 14 and 15, 2021. During that time, a total of 6 boreholes were advanced to a maximum depth of 6.2 m below existing ground surface. The boreholes were distributed in a manner to provide general coverage of the subject site taking into consideration site features, underground utilities and existing test holes completed during the previous investigation. The location of the test holes are presented on Drawing PG5641-1 - Test Hole Location Plan included in Appendix 2.

The boreholes were advanced using a track-mounted auger drill rig operated by a two person crew. The test hole procedure consisted of augering to the required depths at the selected locations and sampling the overburden soils. All fieldwork was conducted under the full-time supervision of Paterson personnel under the direction of a senior engineer from the geotechnical division.

Sampling and In Situ Testing

Soil samples from the boreholes were collected using a 50 mm diameter split-spoon sampler. All soil samples were visually inspected and initially classified on site. The auger and split-spoon samples were placed in sealed plastic bags. All samples were transported to the our laboratory for examination and classification. The depths at which the auger and split-spoon were recovered from the test holes are shown as AU and SS, respectively, on the Soil Profile and Test Data sheets presented in Appendix 1.

The Standard Penetration Test (SPT) was conducted in conjunction with the recovery of the split-spoon samples. The SPT results are recorded as “N” values on the Soil Profile and Test Data sheets. The “N” value is the number of blows required to drive the split-spoon sampler 300 mm into the soil after a 150 mm initial penetration using a 63.5 kg hammer falling from a height of 760 mm.

Undrained shear strength testing was conducted in cohesive soils using a field vane apparatus.

The thickness of the overburden was evaluated by dynamic cone penetration testing (DCPT) completed at BH 3-21. The DCPT consists of driving a steel drill rod, equipped with a 50 mm diameter cone at the tip, using a 63.5 kg hammer falling from a height of 760 mm. The number of blows required to drive the cone into the soil is recorded for each 300 mm increment.

The subsurface conditions observed at the test hole locations were recorded in detail in the field. Our findings are presented in the Soil Profile and Test Data sheets in Appendix 1.

Groundwater Monitoring

Flexible standpipes were installed in all boreholes to permit monitoring of the groundwater levels subsequent to the completion of the sampling program.

3.2 Field Survey

The test hole locations and ground surface elevation at each test hole location were recovered in the field by Paterson personnel and referenced to a geodetic datum. The test hole locations and ground surface elevation at each test hole location are presented on Drawing PG5641-1 - Test Hole Location Plan in Appendix 2.

3.3 Laboratory Testing

The soil samples recovered from the subject site were examined in our laboratory to review the results of the field logging. Additional soil review was carried out in accordance with the City of Ottawa Tree Planting in Sensitive Marine Clay Soils (2017 Guidelines) and included additional laboratory testing, consisting of 4 Atterberg Limits tests, 2 grain size distribution tests, and 1 shrinkage limit test. The results are summarized in Section 4.0 and are further discussed in Subsection 6.8.

All samples will be stored in the laboratory for a period of one month after issuance of this report. They will then be discarded unless we are otherwise directed.

3.4 Analytical Testing

One (1) soil sample was submitted to assess the corrosion potential for exposed ferrous metals and the potential of sulphate attacks against subsurface concrete structures. The sample was analyzed to determine the concentration of sulphate and chloride, the resistivity and the pH of the sample. The results are discussed in Subsection 6.7 and shown in Appendix 1.

4.0 Observations

4.1 Surface Conditions

The subject site is vacant, and generally has a grassed surface with some trees around the perimeter. An existing fill pile with an approximate height of 3 to 4 m was also observed in the north-central portion of the site. The site is bordered by Spratt Road to the east, Stockholm Private Road to the north, residential properties to the west, and vacant land to the south. The existing ground surface across the site is relatively level at approximate geodetic elevation 91 m.

4.2 Subsurface Profile

Overburden

Generally, the soil conditions encountered at the test hole locations consist of a topsoil layer and/or fill which is underlain by a loose to compact, brown sandy silt.

A stiff to firm, grey silty clay to clayey silt was generally encountered underlying the sandy silt at approximate depths of 2.1 to 3.7 m below the existing ground surface.

A glacial till deposit was generally encountered underlying the silty clay to clayey silt, and was observed to consist of a compact to dense, grey silty sand to sandy silt with gravel cobbles and boulders. The boreholes were generally terminated in the glacial till deposit at approximate depths of 5.9 to 6.2 m below the existing ground surface.

Practical refusal to the DCPT was encountered in BH 3-21 at a depth of 11.8 m.

Reference should be made to the Soil Profile and Test Data sheets in Appendix 1 for specific details of the soil profiles encountered at each test hole location.

Bedrock

Based on available geological mapping, the bedrock at the subject site consists of interbedded sandstone and dolomite of the March formation with a drift thickness of 10 to 15 m.

Laboratory Testing

Atterberg limits testing, as well as associated moisture content testing, was completed on the recovered silty clay to clayey silt samples at selected locations throughout the subject site.

The results of the Atterberg limits tests are presented in Table 1 and on the Atterberg Limits Results sheet in Appendix 1. The tested silty clay samples classify as inorganic clays of low plasticity (CL) in accordance with the Unified Soil Classification System.

Table 1 - Atterberg Limits Results

Sample	Depth (m)	LL (%)	PL (%)	PI (%)	w (%)	Classification
BH 1-21	3.8	35	17	18	33	CL
BH 2-21	3.8	39	20	19	36	CL
BH 5-21	2.3	40	20	20	43	CL
BH 6-21	2.3	32	18	14	30	CL

Notes: LL: Liquid Limit; PL: Plastic Limit; PI: Plasticity Index; w: water content;
CL: Inorganic Clay of Low Plasticity

The results of the shrinkage limit test indicate a shrinkage limit of 14% and a shrinkage ratio of 1.92.

Grain size distribution (sieve and hydrometer analysis) was also completed on 2 selected soil samples. The results of the grain size analysis are summarized in Table 2 below and presented on the Grain Size Distribution Results sheets in Appendix 1.

Table 2 - Summary of Grain Size Distribution Analysis

Test Hole	Sample	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
BH 2-21	SS5	0.0	13.2	53.8	33.0
BH 5-21	SS4	0.0	14.6	54.9	30.5

4.3 Groundwater

Groundwater level readings were recorded on January 22, 2021 within the piezometers which were installed within the open boreholes during the course of the field investigation. The groundwater level readings are presented in Table 3 below and on the Soil Profile and Test Data sheets in Appendix 1.

Table 3 - Summary of Groundwater Level Readings

Borehole Number	Ground Elevation (m)	Groundwater Levels (m)		Recording Date
		Depth	Elevation	
BH 1-21	91.42	Blocked	-	January 22, 2021
BH 2-21	91.33	1.95	89.38	January 22, 2021
BH 3-21	91.45	3.70	87.75	January 22, 2021
BH 4-21	91.24	1.45	89.79	January 22, 2021
BH 5-21	91.27	2.45	88.82	January 22, 2021
BH 6-21	91.36	2.36	89.00	January 22, 2021

It should be noted that surficial water from rain events can become trapped within a monitoring well installed in low permeability soils. Long-term groundwater levels can also be estimated based on the observed colour, moisture levels and consistency of the recovered soil samples. Based on these observations, the long-term groundwater level is expected between an approximate 3 to 4 m depth. However, it should be noted that groundwater levels are subject to seasonal fluctuations, and therefore, the groundwater levels could vary at the time of construction.

5.0 Discussion

5.1 Geotechnical Assessment

From a geotechnical perspective, the subject site is considered suitable for the proposed development. It is recommended that the proposed buildings be founded on conventional spread footings bearing on the undisturbed, compact sandy silt, firm to stiff silty clay, or compact glacial till.

Due to the presence of a silty clay to clayey silt deposit, a permissible grade raise restriction is required for the subject site.

The above and other considerations are further discussed in the following sections.

5.2 Site Grading and Preparation

Stripping Depth

Topsoil and deleterious fill, such as those containing organic materials, should be stripped from under any buildings, paved areas, pipe bedding and other settlement sensitive structures.

Fill Placement

Fill used for grading beneath the proposed residential buildings should consist, unless otherwise specified, of clean imported granular fill, such as Ontario Provincial Standard Specifications (OPSS) Granular A or Granular B Type II. The fill should be placed in maximum 300 mm thick lifts and compacted using suitable compaction equipment for the lift thickness. Fill placed beneath the building areas should be compacted to at least 98% of the standard Proctor maximum dry density (SPMDD).

Non-specified existing fill along with site-excavated soil can be used as general landscaping fill where settlement of the ground surface is of minor concern. These materials should be spread in thin lifts and at least compacted by the tracks of the spreading equipment to minimize voids. If excavated brown silty clay, free of organics and deleterious materials, is to be used to build up the subgrade level for areas to be paved, it is recommended that the material be placed under dry conditions and in above freezing temperatures, and compacted in thin lifts using suitable compaction equipment for the lift thickness by making several passes which are observed and approved by the geotechnical consultant.

Non-specified existing fill and site-excavated soils are not suitable for use as backfill against foundation walls unless a composite drainage blanket connected to a perimeter drainage system is provided.

5.3 Foundation Design

Bearing Resistance Values

Strip footings, up to 2 m wide, and pad footings, up to 5 m wide, placed on an undisturbed, compact sandy silt, firm to stiff silty clay, or compact glacial till bearing surface can be designed using a bearing resistance value at serviceability limit states (SLS) of **100 kPa** and a factored bearing resistance value at ultimate limit states (ULS) of **190 kPa**.

An undisturbed soil bearing surface consists of a surface from which all topsoil and deleterious materials, such as loose, frozen or disturbed soil, whether in situ or not, have been removed, in the dry, prior to the placement of concrete for footings.

Footings designed using the above-noted bearing resistance value at SLS will be subjected to potential post-construction total and differential settlements of 25 and 20 mm, respectively.

Lateral Support

The bearing medium under footing-supported structures is required to be provided with adequate lateral support with respect to excavations and different foundation levels. Adequate lateral support is provided to the in-situ bearing medium soils above the groundwater table when a plane extending down and out from the bottom edge of the footing at a minimum of 1.5H:1V passes only through in situ soil of the same or higher capacity as the bearing medium soil.

Permissible Grade Raise

Due to the presence of the silty clay deposit, a permissible grade raise restriction of **3 m** is recommended for grading at the subject site.

If higher than permissible grade raises are required, preloading with or without a surcharge, lightweight fill, and/or other measures should be investigated to reduce the risks of unacceptable long-term post construction total and differential settlements.

5.4 Design for Earthquakes

The site class for seismic site response can be taken as **Class C** for the foundations considered at the subject site. The soils underlying the subject site are not susceptible to liquefaction. Reference should be made to the latest revision of the Ontario Building Code 2012 for a full discussion of the earthquake design requirements.

5.5 Basement Slab

With the removal of all topsoil and deleterious fill from within the footprint of the proposed buildings, the native soil surface will be considered an acceptable subgrade on which to commence backfilling for floor slab construction.

Any soft areas should be removed and backfilled with appropriate backfill material prior to placing any fill. OPSS Granular B Type II, with a maximum particle size of 50 mm, are recommended for backfilling below the floor slab.

It is also recommended that the upper 200 mm of sub-floor fill consists of 19 mm clear crushed stone.

5.6 Pavement Structure

Car only parking areas and heavy truck traffic and access lanes are anticipated at this site. The proposed pavement structures are shown in Tables 4 and 5.

Table 4 - Recommended Pavement Structure - Car Parking Areas

Thickness (mm)	Material Description
50	**Wear Course -** Superpave 12.5 Asphaltic Concrete
150	**BASE** - OPSS Granular A Crushed Stone
300	**SUBBASE** - OPSS Granular B Type II
SUBGRADE - Either fill, in situ soil or OPSS Granular B Type I or II material placed over in situ soil	

Table 5 - Recommended Pavement Structure - Local Roadways	
Thickness (mm)	**Material Description**
40	**Wear Course -** Superpave 12.5 Asphaltic Concrete
50	**Binder Course -** Superpave 19.0 Asphaltic Concrete
150	**BASE** - OPSS Granular A Crushed Stone
450	**SUBBASE** - OPSS Granular B Type II
SUBGRADE - Either fill, in situ soil or OPSS Granular B Type I or II material placed over in situ soil	

If soft spots develop in the subgrade during compaction or due to construction traffic, the affected areas should be excavated and replaced with OPSS Granular B Type II material. Weak subgrade conditions may be experienced over service trench fill materials, which will require the use of a woven geotextile liner, such as Terratrack 200 or equivalent.

The pavement granular base and subbase should be placed in maximum 300 mm thick lifts and compacted to a minimum of 99% of the material's SPMDD using suitable vibratory equipment. Minimum Performance Graded (PG) 58-34 asphalt cement should be used for this project.

Pavement Structure Drainage

Satisfactory performance of the pavement structure is largely dependent on keeping the contact zone between the subgrade material and the base stone in a dry condition. Failure to provide adequate drainage under conditions of heavy wheel loading can result in the fine subgrade soil being pumped into the voids in the stone subbase, thereby reducing load carrying capacity.

Due to the low permeability of the subgrade materials consideration should be given to installing subdrains during the pavement construction as per City of Ottawa standards. The subdrain inverts should be approximately 300 mm below subgrade level. The subgrade surface should be crowned to promote water flow to the drainage lines and all subdrains should be provided with a positive outlet to the storm sewer.

6.0 Design and Construction Precautions

6.1 Foundation Drainage and Backfill

A perimeter foundation drainage system is recommended for each proposed structure. The system should consist of a 150 mm diameter, geotextile-wrapped, perforated and corrugated plastic pipe which is surrounded on all sides by 150 mm of 10 mm clear crushed stone and placed at the footing level around the exterior perimeter of the structure. The pipe should have a positive outlet, such as a gravity connection to the storm sewer or sump pit.

Backfill against the exterior sides of the foundation walls should consist of free-draining, non frost susceptible granular materials. The site materials will be frost susceptible and, as such, are not recommended for re-use as backfill unless a composite drainage system (such as Delta Drain 6000) connected to a drainage system is provided. A drainage geocomposite, such as Delta Drain 6000 or equivalent, connected to the perimeter foundation drainage system with a positive outlet to the storm sewer is also recommended.

6.2 Protection Against Frost Action

Perimeter footings of heated structures are required to be insulated against the deleterious effect of frost action. A minimum 1.5 m thick soil cover, or an equivalent combination of soil cover and foundation insulation, should be provided in this regard.

A minimum of 2.1 m thick soil cover, or an equivalent combination of soil cover and foundation insulation, should be provided for other exterior unheated footings such as isolated exterior piers.

6.3 Excavation Side Slopes

The side slopes of excavations in the soil and fill overburden materials should either be cut back at acceptable slopes or should be retained by shoring systems from the start of the excavation until the structure is backfilled. It is anticipated that sufficient room will be available for the greater part of the excavations to be undertaken by open-cut methods (i.e. unsupported excavations).

The excavation side slopes above the groundwater level extending to a maximum depth of 3 m should be cut back at 1H:1V or flatter. The flatter slope is required for excavation below groundwater level. The subsoil at this site is considered to be mainly a Type 2 and 3 soil according to the Occupational Health and Safety Act and Regulations for Construction Projects.

Excavated soil should not be stockpiled directly at the top of excavations and heavy equipment should be kept away from the excavation sides.

Slopes in excess of 3 m in height should be periodically inspected by the geotechnical consultant in order to detect if the slopes are exhibiting signs of distress.

It is recommended that a trench box be used at all times to protect personnel working in trenches with steep or vertical sides. It is expected that services will be installed by “cut and cover” methods and excavations will not be left open for extended periods of time.

6.4 Pipe Bedding and Backfill

Bedding and backfill materials should be in accordance with the most recent Material Specifications and Standard Detail Drawings from the Department of Public Works and Services, Infrastructure Services Branch of the City of Ottawa.

The pipe bedding for sewer and water pipes placed on a relatively dry, undisturbed subgrade surface should consist of at least 150 mm of OPSS Granular A material. Where the bedding is located within the firm grey silty clay, the thickness of the bedding material should be increased to a minimum of 300 mm. The material should be placed in maximum 300 mm thick lifts and compacted to a minimum of 95% of its SPMDD. The bedding material should extend at least to the spring line of the pipe.

The cover material, which should consist of OPSS Granular A, should extend from the spring line of the pipe to 300 mm above the obvert of the pipe. The material should be placed in 300 mm thick lifts and compacted to a minimum of 95% of its SPMDD.

Generally, it should be possible to re-use the moist (not wet) brown silty clay above the cover material if the excavation and filling operations are carried out in dry weather conditions. Wet silty clay material will be difficult to re-use, as the high water contents make compacting impractical without an extensive drying period.

Where hard surface areas are considered above the trench backfill, the trench backfill material within the frost zone (about 1.8 m below finished grade) should match the soils exposed at the trench walls to minimize differential frost heaving. The trench backfill should be placed in maximum 300 mm thick loose lifts and compacted to a minimum of 95% of the material's SPMDD.

To reduce long-term lowering of the groundwater at this site, clay seals should be provided within the service trenches excavated through the silty clay deposit. The seals should be at least 1.5 m long (in the trench direction) and should extend from trench wall to trench wall. The seals should extend from the frost line and fully penetrate the bedding, subbedding and cover material. The barriers should consist of relatively dry and compactable brown silty clay placed in maximum 225 mm thick loose layers and compacted to a minimum of 95% of the SPMDD. The clay seals should be placed at the site boundaries and at strategic locations at no more than 60 m intervals in the service trenches excavated through the silty clay deposit.

6.5 Groundwater Control

It is anticipated that groundwater infiltration into the excavations should be controllable using open sumps. The contractor should be prepared to direct water away from all bearing surfaces and subgrades, regardless of the source, to prevent disturbance to the founding medium.

A temporary Ministry of Environment, Conservation and Parks (MECP) permit to take water (PTTW) may be required if more than 400,000 L/day of ground and/or surface water are to be pumped during the construction phase. At least 4 to 5 months should be allowed for completion of the application and issuance of the permit by the MECP.

For typical ground or surface water volumes, being pumped during the construction phase, between 50,000 to 400,000 L/day, it is required to register on the Environmental Activity and Sector Registry (EASR). A minimum of two to four weeks should be allotted for completion of the EASR registration and the Water Taking and Discharge Plan to be prepared by a Qualified Person as stipulated under O.Reg. 63/16. If a project qualifies for a PTTW based upon anticipated conditions, an EASR will not be allowed as a temporary dewatering measure while awaiting the MOECC review of the PTTW application.

6.6 Winter Construction

Precautions should be taken if winter construction is considered for this project. The subsurface conditions at this site mostly consist of frost susceptible materials. In presence of water and freezing conditions ice could form within the soil mass. Heaving and settlement upon thawing could occur.

In the event of construction during below zero temperatures, the founding stratum should be protected from freezing temperatures by the use of straw, propane heaters, tarpaulins or other suitable means. In this regard, the base of the excavations should be insulated from sub-zero temperatures immediately upon exposure and until such time as heat is adequately supplied to the building and the footings are protected with sufficient soil cover to prevent freezing at founding level.

The trench excavations should be constructed in a manner that will avoid the introduction of frozen materials into the trenches. As well, pavement construction is difficult during winter. The subgrade consists of frost susceptible soils which will experience total and differential frost heaving as the work takes place. In addition, the introduction of frost, snow or ice into the pavement materials, which is difficult to avoid, could adversely affect the performance of the pavement structure. Additional information could be provided, if required.

6.7 Corrosion Potential and Sulphate

The results of the analytical testing show that the sulphate content is less than 0.1%. This result is indicative that Type 10 Portland cement (Type GU, or normal cement) would be appropriate for this site. The chloride content and the pH of the sample indicate that they are not significant factors in creating a corrosive environment for exposed ferrous metals at this site, whereas the resistivity is indicative of a to slightly to moderately aggressive corrosive environment.

6.8 Landscaping Considerations

Tree Planting Setbacks

In accordance with the City of Ottawa Tree Planting in Sensitive Marine Clay Soils (2017 Guidelines), Paterson completed a soils review of the site to determine applicable tree planting setbacks.

Based on our Atterberg Limits tests results completed within the general area of the site, the modified plasticity limit does not exceed 40%. The following tree planting setbacks are therefore recommended for this site. Large trees (mature height over 14 m) can be planted within these provided a tree to foundation setback equal to the full mature height of the tree can be provided (e.g. in a park or other green space). The tree planting setback limit is **4.5 m** for small (mature tree height up to 7.5m) and medium size trees (mature tree height 7.5 m to 14 m) provided that the following conditions are met:

- ❑ The underside of footing (USF) is 2.1 m or greater below the lowest finished grade must be satisfied for footings within 10 m from the tree, as measured from the centre of the tree trunk and verified by means of the Grading Plan as indicated procedural changes below.

- ❑ A small tree must be provided with a minimum of 25 m^3 of available soil volume while a medium tree must be provided with a minimum of 30 m^3 of available soil volume, as determined by the Landscape Architect. The developer is to ensure that the soil is generally un-compacted when backfilling in street tree planting locations.

- ❑ The tree species must be small (mature tree height up to 7.5 m) to medium size (mature tree height 7.5 m to 14 m) as confirmed by the Landscape Architect.

- ❑ The foundation walls are to be reinforced at least nominally (minimum of two upper and two lower 15M bars in the foundation wall). Grading surround the tree must promote drainage to the tree root zone (in such a manner as not to be detrimental to the tree), as noted on the subdivision Grading Plan.

- ❑ Grading surrounding the tree must promote drainage to the tree root zone (in such a manner as not to be detrimental to the tree), as noted on the subdivision Grading Plan.

Aboveground Swimming Pools

The in-situ soils are considered to be acceptable for in-ground swimming pools. Above ground swimming pools must be placed at least 5 m away from the residence foundation and neighbouring foundations. Otherwise, pool construction is considered routine, and can be constructed in accordance with the manufacturer's recommendations.

Aboveground Hot Tubs

Additional grading around hot tubs should not exceed permissible grade raises. Otherwise, hot tub construction is considered routine, and can be constructed in accordance with the manufacturer's specifications.

Decks and Building Additions

Additional grading around proposed decks or additions should not exceed permissible grade raises. Otherwise, standard construction practices are considered acceptable.

7.0 Recommendations

It is recommended that the following be completed once the master plan and site development are determined:

- ❑ Review detailed grading plan(s) from a geotechnical perspective.
- ❑ Observation of all bearing surfaces prior to the placement of concrete.
- ❑ Periodic observation of the condition of unsupported excavation side slopes in excess of 3 m in height, if applicable.
- ❑ Observation of all subgrades prior to placing backfilling materials.
- ❑ Field density tests to ensure that the specified level of compaction has been achieved.
- ❑ Sampling and testing of the bituminous concrete including mix design reviews.

A report confirming that these works have been conducted in general accordance with Paterson's recommendations could be issued upon request, following the completion of a satisfactory material testing and observation program by the geotechnical consultant.

8.0 Statement of Limitations

The recommendations made in this report are in accordance with Paterson's present understanding of the project. We request that we be permitted to review the grading plan once available and to review our recommendations when the drawings and specifications are complete.

A geotechnical investigation of this nature is a limited sampling of a site. Should any conditions at the site be encountered which differ from those at the test locations, Paterson requests to be notified immediately in order to permit reassessment of the recommendations.

The client should be aware that any information pertaining to soils and the test hole log are furnished as a matter of general information only. Test hole descriptions or logs are not to be interpreted as descriptive of conditions at locations other than those of the test holes.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than Claridge Homes or their agent(s) is not authorized without review by this firm for the applicability of our recommendations to the altered use of the report.

Paterson Group Inc.

LICENSED PROFESSIONAL ENGINEER
Feb. 23, 2021
S. S. DENNIS
100519516
PROVINCE OF ONTARIO

Scott S. Dennis, P.Eng..

David J. Gilbert, P.Eng.

Report Distribution:

- ❏ Claridge Homes (e-mail copy)
- ❏ Paterson Group (1 copy)

APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

ATTERBERG LIMIT RESULTS

GRAIN SIZE DISTRIBUTION RESULTS

ANALYTICAL TESTING RESULTS

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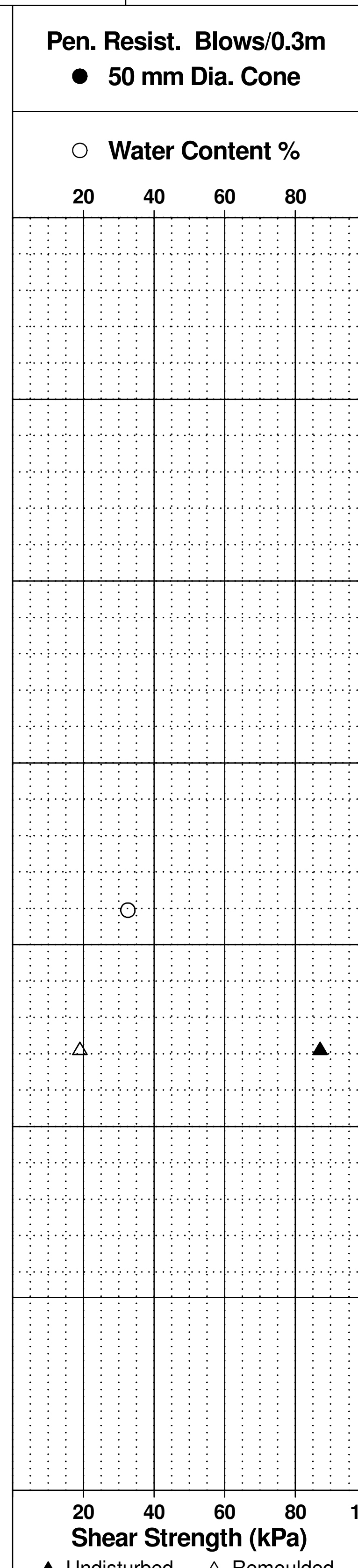
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - 4624 Spratt Road
Ottawa, Ontario

DATUM Geodetic	**FILE NO.** PG5641
REMARKS	
BORINGS BY CME 75 Power Auger — **DATE** 2021 January 15	**HOLE NO.** BH 1-21

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	91.42
FILL: Crushed stone with brown silty sand		AU	1				
0.76							
Brown **SANDY SILT** some clay		SS	2	58	10	1	90.42
		SS	3	100	2	2	89.42
		SS	4	100	2	3	88.42
		SS	5	100	2		
3.66							
Stiff grey **SILTY CLAY**, trace sand		SS	6	100	W	4	87.42
						5	86.42
5.33							
GLACIAL TILL: Compact grey, silty sand some clay, gravel, cobbles and boulders		SS	7	100	23		
5.94							
End of Borehole							
(Standpipe Blocked - Jan 22, 2021)							



Piezometer Construction

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - 4624 Spratt Road
Ottawa, Ontario

DATUM Geodetic

REMARKS

BORINGS BY CME 75 Power Auger

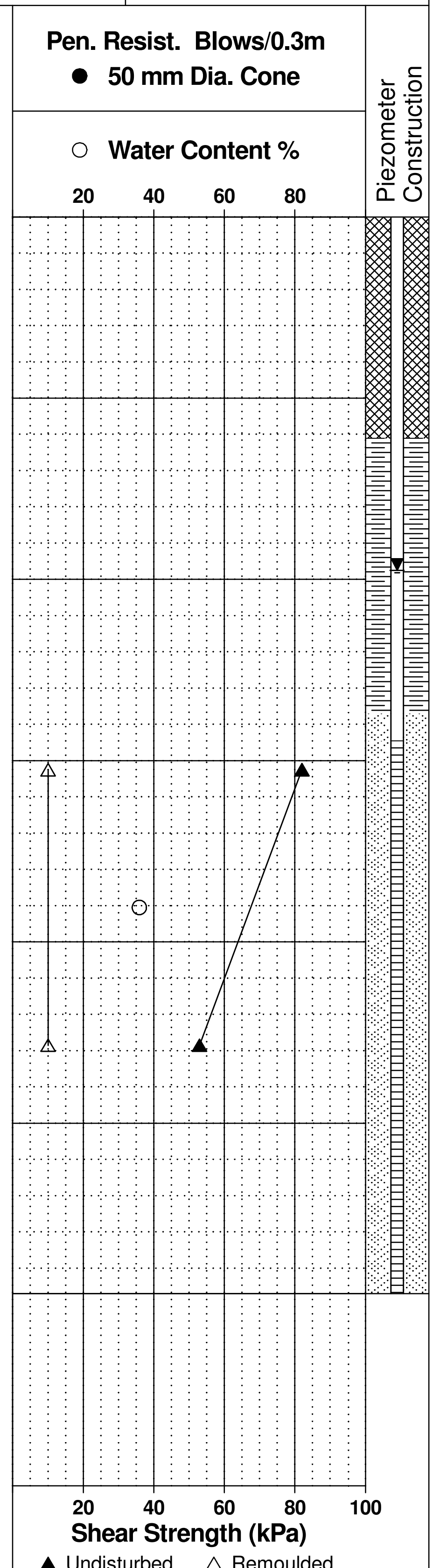
DATE 2021 January 15

FILE NO. PG5641

HOLE NO. BH 2-21

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	% RECOVERY	N VALUE or RQD
GROUND SURFACE					
TOPSOIL (to 0.30)		AU	1		
Brown **SANDY SILT** some clay (0.30 to 3.05)		SS	2	50	9
		SS	3	67	5
		SS	4	100	2
Stiff grey **CLAYEY SILT** some sand (3.05 to 5.94)		SS	5	100	W
		SS	6	100	W
End of Borehole (5.94)					
(GWL @ 1.95 m depth - Jan 22, 2021)					

DEPTH (m)	ELEV. (m)
0	91.33
1	90.33
2	89.33
3	88.33
4	87.33
5	86.33



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - 4624 Spratt Road
Ottawa, Ontario

DATUM Geodetic

REMARKS

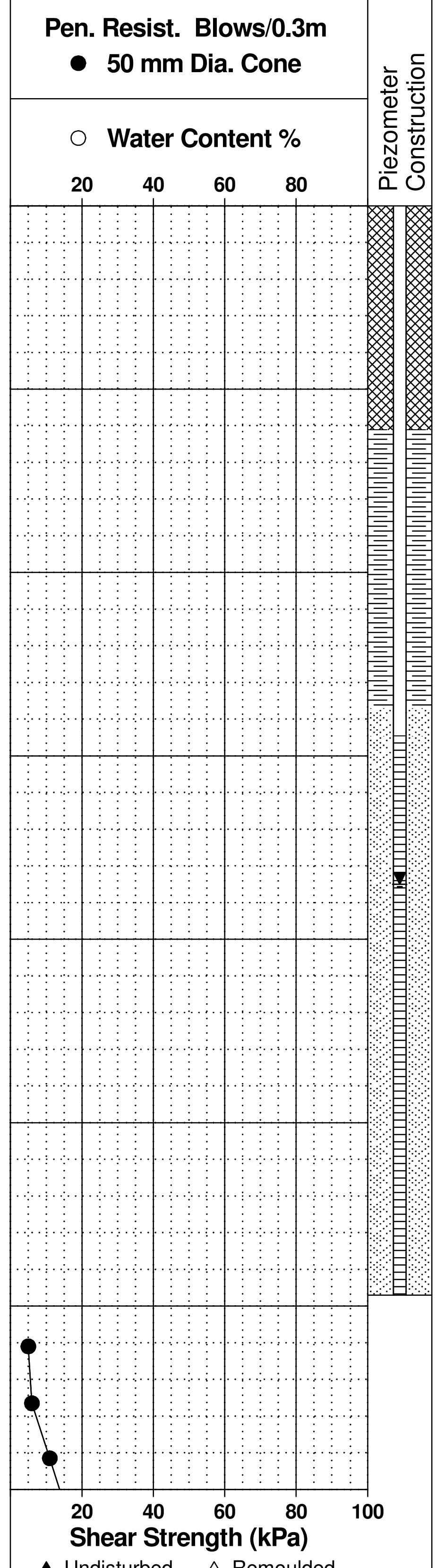
BORINGS BY CME 75 Power Auger

DATE 2021 January 14

FILE NO. PG5641

HOLE NO. BH 3-21

SOIL DESCRIPTION	SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE					0	91.45
TOPSOIL (to 0.30)	AU	1				
Brown **SANDY SILT** some clay	SS	2	100	4	1	90.45
	SS	3	100	2	2	89.45
2.44						
GLACIAL TILL: Compact to dense brown silty sand some clay with cobbles and boulders	SS	4	50	55		
	SS	5	58	35	3	88.45
- Grey by 3.78 m depth	SS	6	42	15	4	87.45
	SS	7	33	14	5	86.45
	SS	8	8	14		
6.22					6	85.45
Dynamic Cone Penetration Test commenced at 6.22 m depth.					7	84.45



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - 4624 Spratt Road
Ottawa, Ontario

DATUM Geodetic

REMARKS

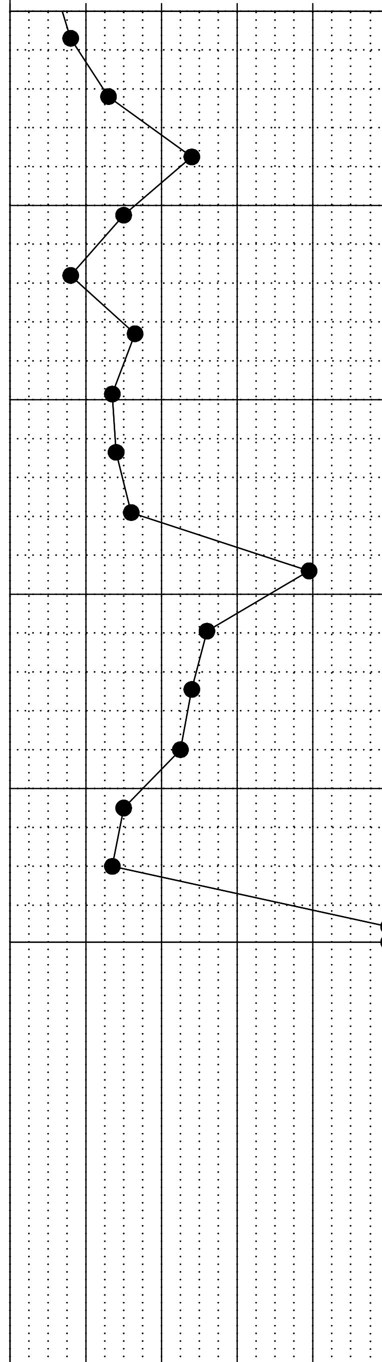
BORINGS BY CME 75 Power Auger

DATE 2021 January 14

FILE NO. PG5641

HOLE NO. BH 3-21

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	% RECOVERY	N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE								20 40 60 80	
						7	84.45		
						8	83.45		
Inferred **GLACIAL TILL**						9	82.45		
						10	81.45		
						11	80.45		
11.79									
End of Borehole Practical DCPT refusal at 11.79m depth (GWL @ 3.70 m - Jan 22, 2021)									



20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - 4624 Spratt Road
Ottawa, Ontario

DATUM Geodetic

REMARKS

BORINGS BY CME 75 Power Auger

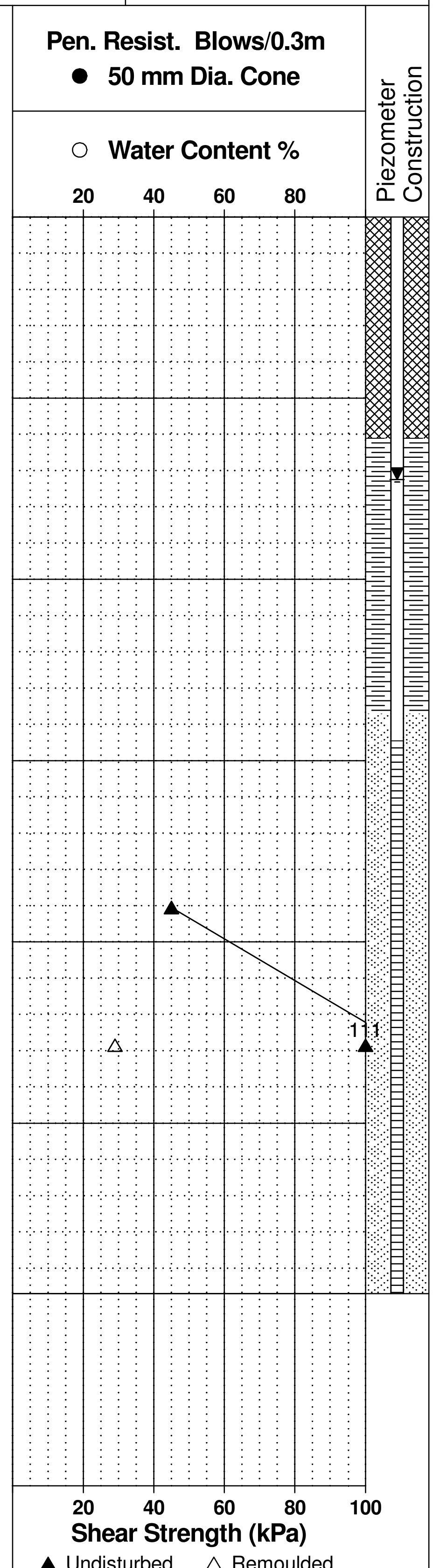
DATE 2021 January 15

FILE NO. PG5641

HOLE NO. BH 4-21

SOIL DESCRIPTION	SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE					0	91.24
TOPSOIL (to 0.30)	AU	1				
Brown **SANDY SILT** some clay	SS	2	83	5	1	90.24
	SS	3	100	4	2	89.24
	SS	4	100	3		
(to 3.05)					3	88.24
Firm to stiff grey **SILTY CLAY**, trace sand	SS	5	67	W		
					4	87.24
					5	86.24
(to 5.64)						
GLACIAL TILL: Compact to dense grey silty sand, some clay, gravel, cobbles and boulders (to 5.94)	SS	6	100	12		
End of Borehole						

(GWL @ 1.45 m - Jan 22, 2021)



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - 4624 Spratt Road
Ottawa, Ontario

DATUM Geodetic

REMARKS

BORINGS BY CME 75 Power Auger

DATE 2021 January 14

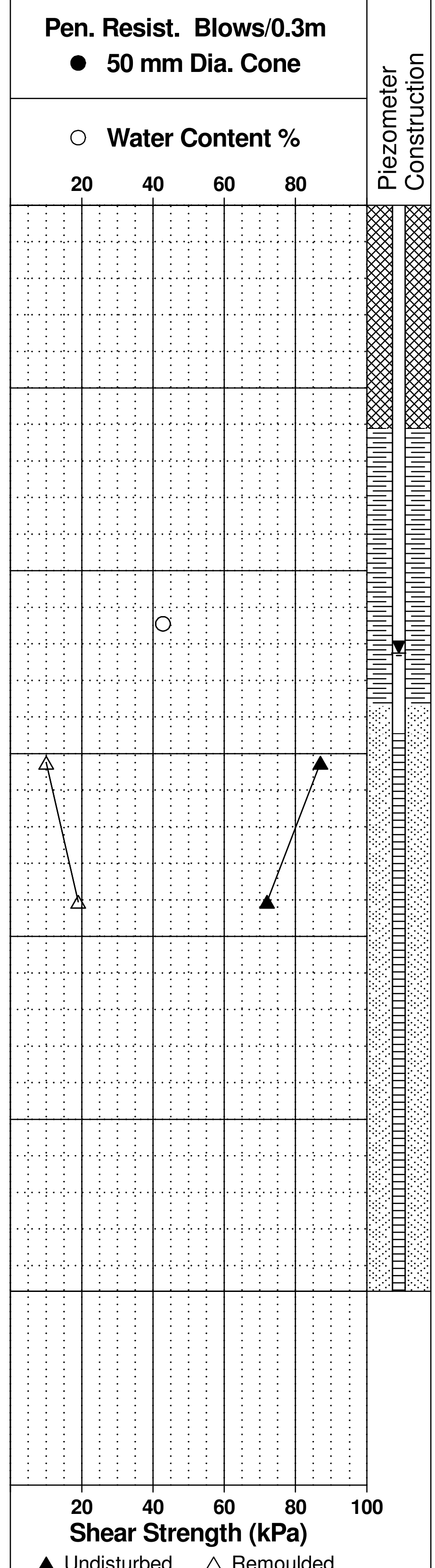
FILE NO. PG5641

HOLE NO. BH 5-21

SOIL DESCRIPTION	Depth to base (m)	SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD
GROUND SURFACE					
TOPSOIL	0.30	AU	1		
Brown **SANDY SILT** , some clay	2.13	SS	2	100	4
		SS	3	100	2
Stiff brown **CLAY EY SILT**, some sand	4.57	SS	4	100	W
GLACIAL TILL: Grey sandy silt, some clay, trace gravel, cobbles and boulders	5.94	SS	5	100	6
		SS	6	100	2
End of Borehole					

(GWL @ 2.45 m depth - Jan 22, 2021)

DEPTH (m)	ELEV. (m)
0	91.27
1	90.27
2	89.27
3	88.27
4	87.27
5	86.27



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - 4624 Spratt Road
Ottawa, Ontario

DATUM Geodetic

REMARKS

BORINGS BY CME 75 Power Auger

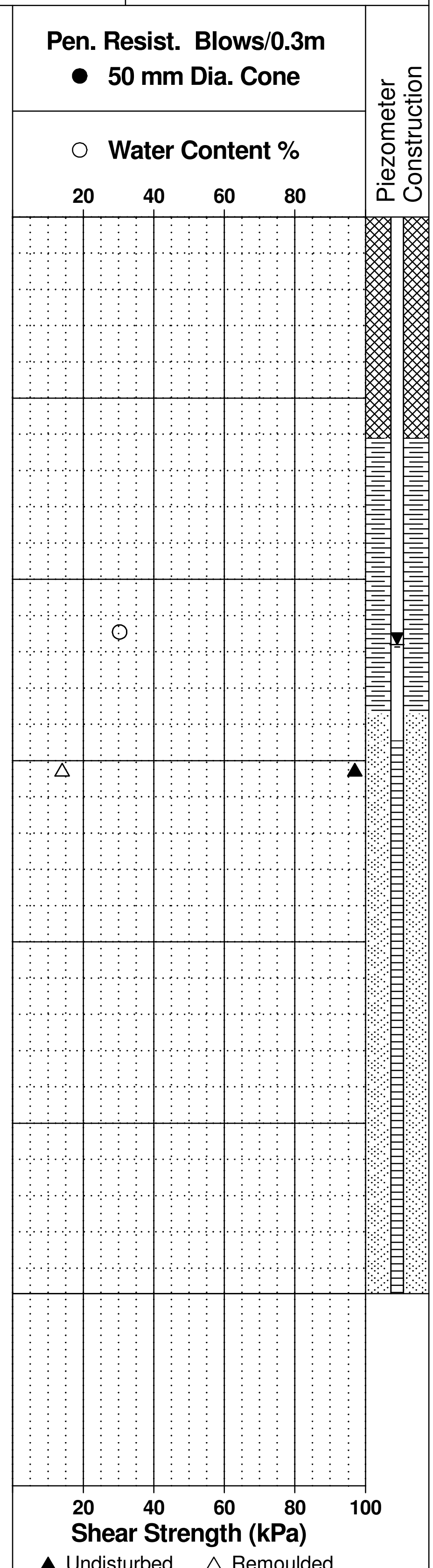
DATE 2021 January 14

FILE NO. PG5641

HOLE NO. BH 6-21

SOIL DESCRIPTION	SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE					0	91.36
TOPSOIL (to 0.30)	AU	1				
Brown **SANDY SILT** some clay	SS	2	100	4	1	90.36
	SS	3	100	2	2	89.36
(to 2.29) Stiff grey **SILTY CLAY** some sand	SS	4	100	2	3	88.36
(to 3.91) **GLACIAL TILL:** Dense grey silty sand some gravel, cobbles and boulders	SS	5	58	39	4	87.36
	SS	6	33	42	5	86.36
	SS	7	75	40		
(5.94) End of Borehole						

(GWL @ 2.36 m - Jan 22, 2021)



SYMBOLS AND TERMS

SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the strength of cohesionless soils is the relative density, usually inferred from the results of the Standard Penetration Test (SPT) ‘N’ value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm.

Relative Density	‘N’ Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

Consistency	Undrained Shear Strength (kPa)	‘N’ Value
Very Soft	<12	<2
Soft	12-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their “sensitivity”. The sensitivity is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

Terminology used for describing soil strata based upon texture, or the proportion of individual particle sizes present is provided on the Textural Soil Classification Chart at the end of this information package.

ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NXL size core. However, it can be used on smaller core sizes, such as BX, if the bulk of the fractures caused by drilling stresses (called “mechanical breaks”) are easily distinguishable from the normal in situ fractures.

RQD %	ROCK QUALITY
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube
PS	-	Piston sample
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

MC%	-	Natural moisture content or water content of sample, %
LL	-	Liquid Limit, % (water content above which soil behaves as a liquid)
PL	-	Plastic limit, % (water content above which soil behaves plastically)
PI	-	Plasticity index, % (difference between LL and PL)
Dxx	-	Grain size which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Cc	-	Concavity coefficient = $(D30)^2 / (D10 \times D60)$
Cu	-	Uniformity coefficient = D60 / D10

Cc and Cu are used to assess the grading of sands and gravels:
Well-graded gravels have: 1 < Cc < 3 and Cu > 4
Well-graded sands have: 1 < Cc < 3 and Cu > 6
Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.
Cc and Cu are not applicable for the description of soils with more than 10% silt and clay (more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

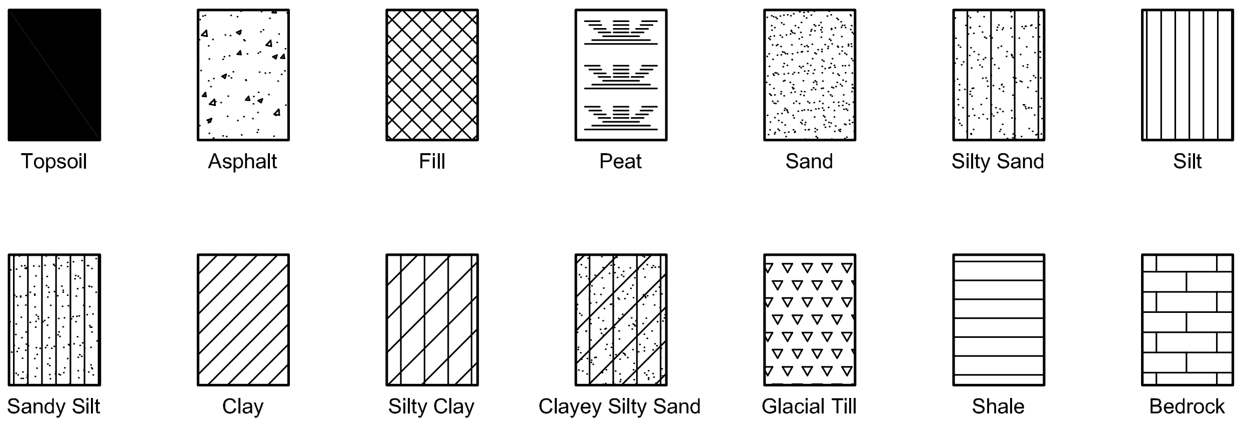
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void Ratio		Initial sample void ratio = volume of voids / volume of solids
Wo	-	Initial water content (at start of consolidation test)

PERMEABILITY TEST

k	-	Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.

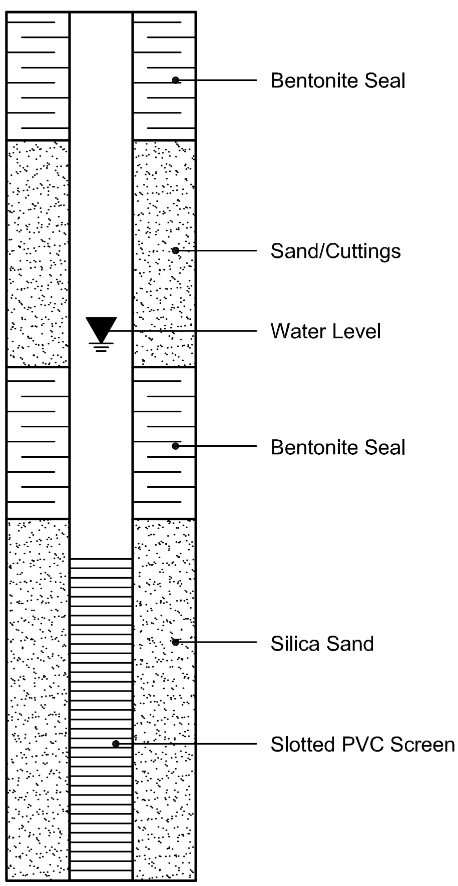
SYMBOLS AND TERMS (continued)

STRATA PLOT

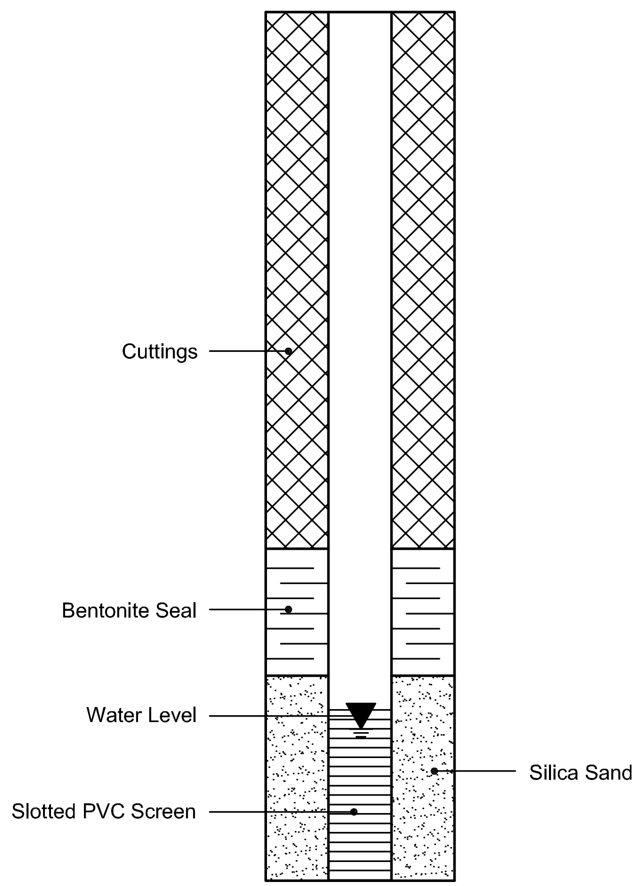


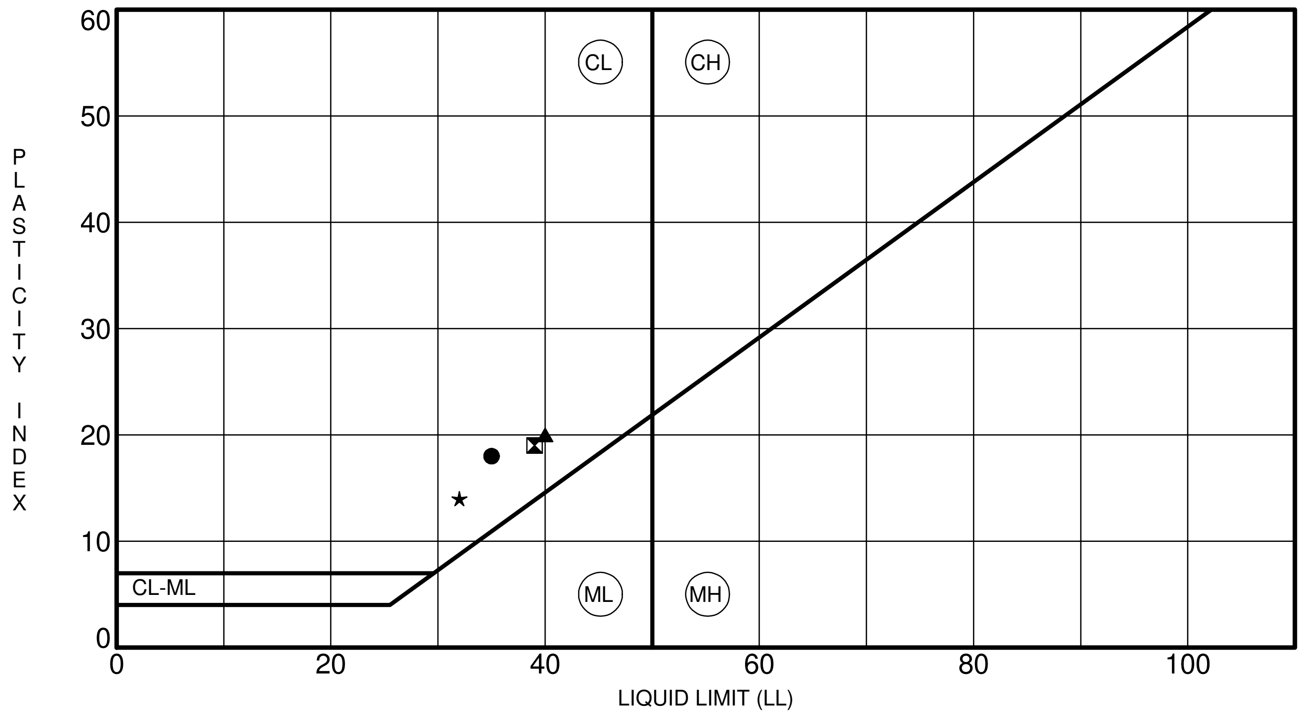
MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION





	Specimen Identification	LL	PL	PI	Fines	Classification
●	**BH 1-21 SS6**	**35**	**17**	**18**		**CL = Inorganic Clays of Low Plasticity**
⧗	**BH 2-21 SS5**	**39**	**20**	**19**		**CL = Inorganic Clays of Low Plasticity**
▲	**BH 5-21 SS4**	**40**	**20**	**20**		**CL = Inorganic Clays of Low Plasticity**
★	**BH 6-21 SS4**	**32**	**18**	**14**		**CL = Inorganic Clays of Low Plasticity**

CLIENT	**Claridge Homes**	FILE NO.	**PG5641**
PROJECT	**Geotechnical Investigation - Proposed Residential Development - 4624 Spratt Road**	DATE	**14 Jan 21**

patersongroup **Consulting Engineers**

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

ATTERBERG LIMITS' RESULTS

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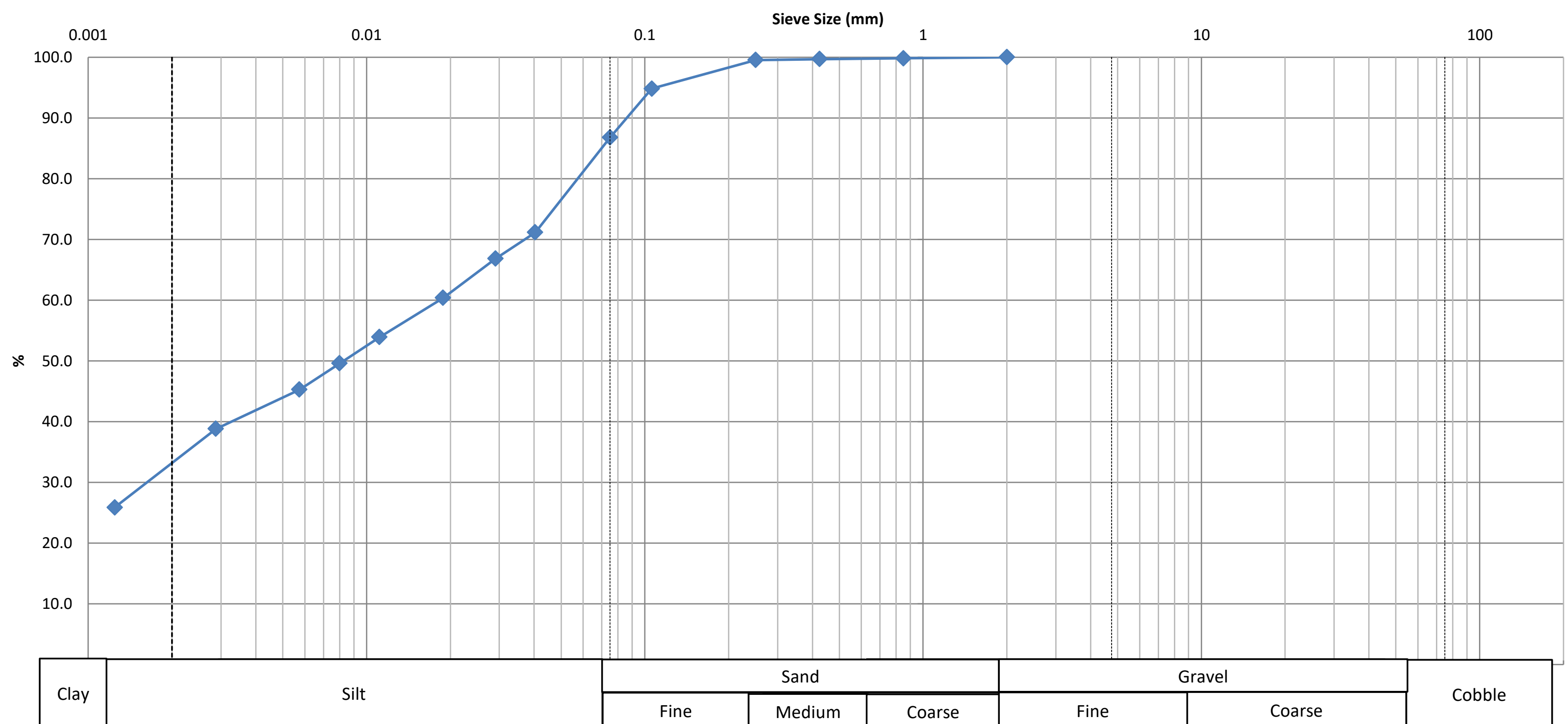
SIEVE ANALYSIS
ASTM C136

CLIENT:	Claridge Homes	DEPTH:	12' 6" - 14' 6"	FILE NO:	PG5641
CONTRACT NO.:		BH OR TP No.:	BH2-21 SS5	LAB NO:	23384
PROJECT:	4624 Spratt			DATE RECEIVED:	21-Jan-21
				DATE TESTED:	26-Jan-21
DATE SAMPLED:	15-Jan-21			DATE REPORTED:	29-Jan-21
SAMPLED BY:	Zach			TESTED BY:	C.S.



Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
						37.4					
	D100	D60	D30	D10	Gravel (%)	Sand (%)		Silt (%)		Clay (%)	
					0.0	13.2		53.8		33.0	

Comments:

REVIEWED BY:	Curtis Beadow	Joe Fosyth, P. Eng.

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HYDROMETER
LS-702 ASTM-422

CLIENT:	Claridge Homes	DEPTH:	12' 6" - 14' 6"	FILE NO.:	PG5641
PROJECT:	4624 Spratt	BH OR TP No.:	BH2-21 SS5	DATE SAMPLED	15-Jan-21
LAB No. :	23384	TESTED BY:	C.S.	DATE RECEIVE	21-Jan-21
SAMPLED BY:	Zach	DATE REPT'D:	29-Jan-21	DATE TESTED:	26-Jan-21

SAMPLE INFORMATION

SAMPLE MASS	SPECIFIC GRAVITY
112.9	2.700

INITIAL WEIGHT	50.00	**HYGROSCOPIC MOISTURE**		
WEIGHT CORRECTED	45.87	TARE WEIGHT	50.00	ACTUAL WEIGHT
WT. AFTER WASH BACK SIEVE	6.86	AIR DRY	150.00	100.00
SOLUTION CONCENTRATION	40 g/L	OVEN DRY	141.73	91.73
		CORRECTED	0.917	

GRAIN SIZE ANALYSIS

SIEVE DIAMETER (mm)	WEIGHT RETAINED (g)	PERCENT RETAINED	PERCENT PASSING
26.5			
19			
13.2			
9.5			
4.75			
2.0	**0.0**	0.0	**100.0**
Pan	**112.9**		
0.850	**0.09**	0.2	**99.8**
0.425	**0.16**	0.3	**99.7**
0.250	**0.24**	0.5	**99.5**
0.106	**2.59**	5.2	**94.8**
0.075	**6.62**	13.2	**86.8**
Pan	**6.86**		
SIEVE CHECK 0.0	MAX = 0.3%		

HYDROMETER DATA

ELAPSED	TIME (24 hours)	Hs	Hc	Temp. (°C)	DIAMETER	(P)	TOTAL PERCENT PASSING
1	9:09	39.0	6.0	23.0	0.0404	71.1	**71.1**
2	9:10	37.0	6.0	23.0	0.0291	66.8	**66.8**
5	9:13	34.0	6.0	23.0	0.0188	60.4	**60.4**
15	9:23	31.0	6.0	23.0	0.0111	53.9	**53.9**
30	9:38	29.0	6.0	23.0	0.0080	49.6	**49.6**
60	10:08	27.0	6.0	23.0	0.0057	45.3	**45.3**
250	1:18	24.0	6.0	23.0	0.0029	38.8	**38.8**
1440	9:08	18.0	6.0	23.0	0.0012	25.9	**25.9**

COMMENTS:

Moisture = 37.41%

REVIEWED BY:	**C. Beadow**	**Joe Forsyth, P. Eng.**

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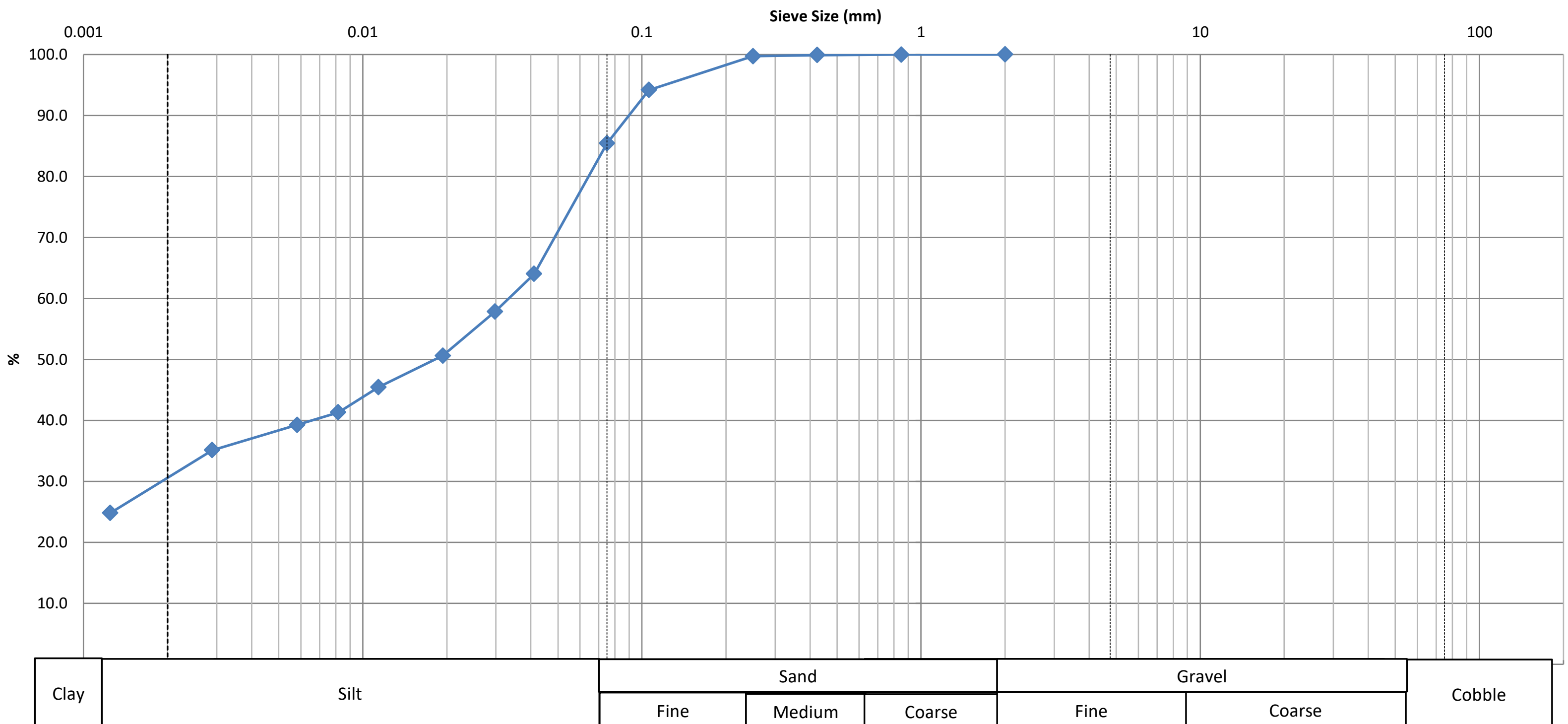
SIEVE ANALYSIS
ASTM C136

CLIENT:	Claridge Homes	DEPTH:	7' 6" - 9' 6"	FILE NO:	PG5641
CONTRACT NO.:		BH OR TP No.:	BH5-21 SS4	LAB NO:	23385
PROJECT:	4624 Spratt			DATE RECEIVED:	21-Jan-21
				DATE TESTED:	26-Jan-21
DATE SAMPLED:	15-Jan-21			DATE REPORTED:	29-Jan-21
SAMPLED BY:	Zach			TESTED BY:	C.S.



Identification	Soil Classification				MC(%)	LL	PL	PI	Cc	Cu
					36.2					
	D100	D60	D30	D10	Gravel (%)	Sand (%)	Silt (%)	Clay (%)		
					0.0	14.6	54.9	30.5		

Comments:

REVIEWED BY:	**Curtis Beadow**	**Joe Fosyth, P. Eng.**

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HYDROMETER
LS-702 ASTM-422

CLIENT:	Claridge Homes	DEPTH:	7' 6" - 9' 6"	FILE NO.:	PG5641
PROJECT:	4624 Spratt	BH OR TP No.:	BH5-21 SS4	DATE SAMPLED	15-Jan-21
LAB No. :	23385	TESTED BY:	C.S.	DATE RECEIVE	21-Jan-21
SAMPLED BY:	Zach	DATE REPT'D:	29-Jan-21	DATE TESTED:	26-Jan-21

SAMPLE INFORMATION

SAMPLE MASS	SPECIFIC GRAVITY
113.1	2.700

		HYGROSCOPIC MOISTURE		
INITIAL WEIGHT	50.00			
WEIGHT CORRECTED	47.87	TARE WEIGHT	50.00	ACTUAL WEIGHT
WT. AFTER WASH BACK SIEVE	7.58	AIR DRY	150.00	100.00
SOLUTION CONCENTRATION	40 g/L	OVEN DRY	145.74	95.74
		CORRECTED	0.957	

GRAIN SIZE ANALYSIS

SIEVE DIAMETER (mm)		WEIGHT RETAINED (g)	PERCENT RETAINED	PERCENT PASSING
26.5				
19				
13.2				
9.5				
4.75				
2.0		**0.0**	0.0	**100.0**
Pan		**113.1**		
0.850		**0.01**	0.0	**100.0**
0.425		**0.05**	0.1	**99.9**
0.250		**0.14**	0.3	**99.7**
0.106		**2.92**	5.8	**94.2**
0.075		**7.29**	14.6	**85.4**
Pan		**7.58**		
SIEVE CHECK	0.0	MAX = 0.3%		

HYDROMETER DATA

ELAPSED	TIME (24 hours)	Hs	Hc	Temp. (°C)	DIAMETER	(P)	TOTAL PERCENT PASSING
1	9:22	37.0	6.0	23.0	0.0411	64.0	**64.0**
2	9:23	34.0	6.0	23.0	0.0298	57.8	**57.8**
5	9:26	30.5	6.0	23.0	0.0194	50.6	**50.6**
15	9:36	28.0	6.0	23.0	0.0114	45.4	**45.4**
30	9:51	26.0	6.0	23.0	0.0082	41.3	**41.3**
60	10:21	25.0	6.0	23.0	0.0058	39.2	**39.2**
250	1:31	23.0	6.0	23.0	0.0029	35.1	**35.1**
1440	9:21	18.0	6.0	23.0	0.0012	24.8	**24.8**

COMMENTS:

Moisture = 36.16%

REVIEWED BY:	C. Beadow	Joe Forsyth, P. Eng.

PARACEL LABORATORIES LTD.

Order #: 2104185

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 31683

Report Date: 22-Jan-2021

Order Date: 19-Jan-2021

Project Description: PG5641

	Client ID:	BH4-21-SS3	-	-	-
	Sample Date:	15-Jan-21 17:00	-	-	-
	Sample ID:	2104185-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	75.4	-	-	-
General Inorganics					
pH	0.05 pH Units	7.10	-	-	-
Resistivity	0.10 Ohm.m	102	-	-	-
Anions					
Chloride	5 ug/g dry	<5	-	-	-
Sulphate	5 ug/g dry	18	-	-	-

APPENDIX 2

FIGURE 1 - KEY PLAN

DRAWING PG5641-1 - TEST HOLE LOCATION PLAN

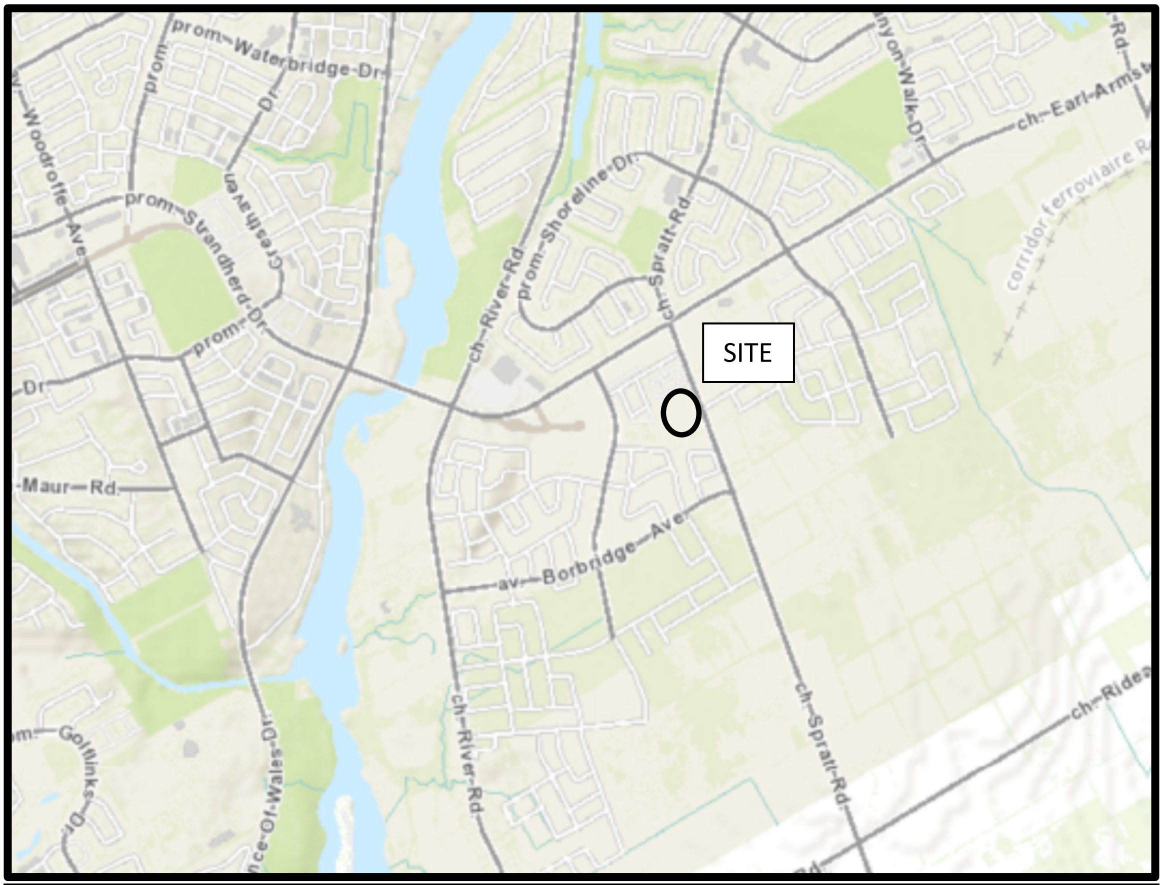

FIGURE 1

KEY PLAN

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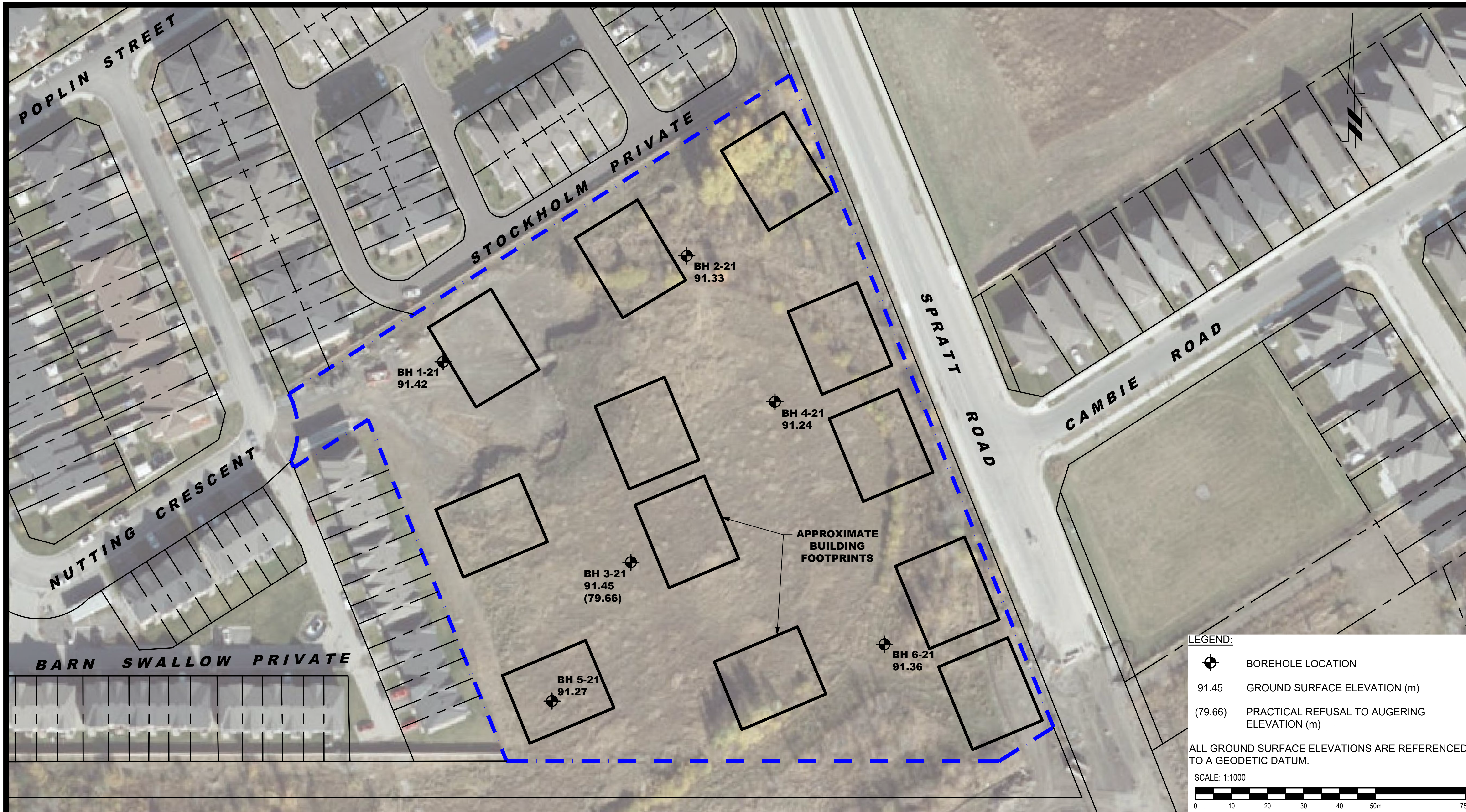

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NO.	REVISIONS	DATE	INITIAL

CLARIDGE HOMES

GEOTECHNICAL INVESTIGATION - PROPOSED RESIDENTIAL DEVELOPMENT
4624 SPRATT ROAD

OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:1000	Date: 02/2021
Drawn by: NFRV	Report No.: PG5641-1
Checked by: SD	Dwg. No.: PG5641-1
Approved by: DJG	Revision No.:

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