REPORT
PROJECT: 126715-6.4.3

DESIGN BRIEF
CRT Ph 1 Blk 324
FERNBANK COMMUNITY

Prepared for: Claridge Homes
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1 INTRODUCTION

1.1 Background

In 2009, the City of Ottawa completed the Fernbank Community Design Plan (FCDP). The FCDP covers approximately 675 gross hectares of land between the established communities of Stittsville, Kanata West and Kanata South.

In conjunction with preparation of the Community Design Plan, several Class Environmental Assessment Studies/Master Plans were also prepared. Two of those were the Master Servicing Study (MSS) for water and sanitary and an Environmental Management Plan (EMP) for the natural environment and stormwater management. Those reports identify planning level solutions for on-site storm drainage, wastewater collection and water supply and distribution to the community.

1.2 Objective

IBI Group Professional Services Inc. (IBI Group) has been retained by Claridge Homes to provide engineering and consulting services for the Block 324 with CRT Phase 1 Lands in the Fernbank Community, the site location is illustrated in Figure 1.1 in Appendix A. IBI Group has completed the Detail Design for CRT Lands Phases 1 and 2, with Phase 1 now in service and Phase 2 works now under construction. This report will provide a logical framework to assist reviewers with evaluation of the design of Block 324 within Phase 1 of the development.

This report will provide a recommended servicing plan for the major municipal infrastructure needed to support development of the subject lands. This report will demonstrate how the proposed municipal servicing is in conformance with the previously approved subdivision design. Any deviation from the approved subdivision design will be identified with rationalization for the change.

This report was prepared in accordance with the Servicing Study Guidelines for Development Applications in the City of Ottawa. **Appendix A** contains a checklist of those guidelines.

1.3 Subject Property

The current Site Plan as prepared Architects DCA for the subject property, is in **Appendix A**. The property covers a total area of approximately 1.8 ha and is bounded by Robert Grant Ave to the east, Putney Cres to the west, the Hydro corridor to the north, future residential block to the south.

The proposed land use for the subject phase, which is in general conformance with the FCDP, will include back to back townhouse units on private services and roads.

1.4 Phasing

All site plan works will be completed in one phase.

1.5 Previous Studies

The Fernbank Community development process included a number of background studies that are pertinent to the subject site. Three integrated Class Environmental Assessment Studies/Master Plans were prepared in support of the FCDP which include:

- Transportation Master Plan;
- Environmental Management Plan (EMP);
- Master Servicing Study (MSS).

In 2011, IBI Group completed a Conceptual Site Servicing Plan for the CRT Lands. That report was designed to assist the City in preparation of draft conditions for development of the subject property.

In January 2012, Novatech Engineering Consultants Ltd. completed the Fernbank Community Sanitary Trunk Sewer Design Report of the Fernbank Trunk Sewer. That sewer was identified in the 2009 MSS report. The 2012 report built upon previous design elements and included some changes to the proposed sewer design originally identified in the 2009 document. It is the latter report that will provide the design framework for the sanitary sewer design for the subject site.

Subsequent development applications under the Planning Act will be supported by these studies/plans. IBI Group completed the detail design in July 2017 for Phase 1 and September 2020 for Phase 2 of the CRT Lands.

The subject property will follow closely the recommendations of those reports. With respect to the provision of water supply, wastewater disposal and treatment of stormwater runoff, the recommendations of the above noted reports provided development criteria on which the subject property will develop. Any deviations from the previous report criteria will be identified in later sections of this report.

1.6 Pre-Consultation

A preconsultation meeting was held with the City planning and Engineering staff along with the owner, a copy of the meeting notes is included in **Appendix A**.

1.7 Geotechnical Considerations

A Geotechnical Investigative Report entitled “Geotechnical Investigation Proposed Residential Development Westwood-Block 324, 5725 Fernbank Road, Ottawa, Ontario”, number PG2236-3, and dated February 3, 2021, was prepared by Paterson Group Inc. The scope of this report also included investigation on the subject lands. The objectives of the investigation include:

- Determination of the subsoil and groundwater conditions;
- Provision of preliminary geotechnical recommendations pertaining to the design and development of the subject site including construction considerations.

Among other items, the report commented on the following:

- Site grading;
- Foundation design;
- Pavement structure;
- Infrastructure construction;
- Groundwater control;
- Tree planting.

Among other considerations, the report confirmed that there are no grade raise limitations for the the subject site, and provided recommended Pavement Structure for car park areas and local roads as noted below:

Recommended Pavement Structure – Car only parking

50mm Wear Course – HL-3 or Superpave 12.5 Asphaltic Concrete

150mm BASE – OPSS Granular A Crushed Stone

300mm SUBBASE – OPSS Granular B Type II.

Recommended Pavement Structure – Local Residential Roadways

40 Wear Course – HL-3 or Superpave 12.5 Asphaltic Concrete

50 Wear Course – HL-8 or Superpave 19 Asphaltic Concrete

150 BASE – OPSS Granular A Crushed Stone

400 SUBBASE – OPSS Granular B Type II

2 WATER SUPPLY

2.1 Existing Condition

As part of Phase 1 of the CRT subdivision, a 200mm diameter watermain was constructed within Putney Crescent adjacent to Block 324.

2.2 Design Criteria

2.2.1 Water Demands

Per unit population density and consumption rates are taken from **Tables 4.1** and **4.2** at the 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 350 l/cap/day
- Residential Peak Daily Demand 875 l/cap/day
- Residential Peak Hour Demand 1,925 l/cap/day

A water demand calculation sheet is included in **Appendix B** and the total water demands are summarized as follows:

- Average Day 1.23 l/s
- Maximum Day 3.06 l/s
- Peak Hour 6.74 l/s

2.2.2 System Pressure

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

Minimum Pressure	Minimum system pressure under peak hour demand conditions shall not be less than 276 kPa (40 psi).
Fire Flow	During the period of maximum day demand, the system pressure shall not be less than 140 kPa (20 psi) during a fire flow event.

Maximum Pressure	Maximum pressure at any point in the distribution system 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

Block 324 consist of back to back townhouses with the majority having 12 units and are 3 stories above ground. A Fire Underwriters Survey (FUS) calculation for a 12 unit 3 storey wood frame construction building results in a fire flow of 20,000 l/min (333 l/s) which is not practical to supply. In order to reduce the fire flow the building can be broken up into smaller fire units by installing 2 hour rated firewalls. Firewalls are proposed to be installed to separate the building into 4 unit segments. A FUS calculation is included in **Appendix B** which calculates a fire flow for the 4 units on the east end of the 12 unit townhouse block between Streets 4 and 5 adjacent to Putney Crescent. The 4 units has external exposures in three directions and an exposure to the 2 hour firewall as shown in the calculation. The resulting fire flow demand is 11,000 l/min (183.3 l/s) which represents the highest fire flow for the Block 324 site and is used in the water model.

2.2.4 Boundary Conditions

As part of the CRT Phase 1 design the City of Ottawa has provided hydraulic boundary conditions at two locations along the Trans Canada Trail 400 mm watermain. Separate boundary conditions have been given for the max day plus fire scenario for a 204 l/s and 262 l/s fire flow. As the fire demand for Block 324 is 183.3 l/s per Section 2.2.3 the 204 l/s boundary condition is used in the fire analysis. A copy of the boundary condition is included in **Appendix B** and summarized as follows:

	CONNECTION 1	CONNECTION 2
Max HGL (Basic Day)	161.1 m	161.4 m
Peak Hour	154.7 m	154.8 m
Max Day + Fire (204 l/s Fire Flow)	152.8 m	153.0 m
Max Day + Fire (262 l/s Fire Flow)	150.6 m	150.9 m

2.2.5 Hydraulic Model

Block 324 has been added to the water model for CRT Phase 1, the model is developed with the Infowater 12.4 program that was converted from the previous CRT Phase 1 H_2O Map water program. Boundary conditions from Section 2.2.4 have been incorporated into the model. In Block 324 the fire flows are evaluated at the proposed hydrant locations represented by Nodes B50 to B60. A schematic of the water model for Block 524 and the overall CRT Phase 1 water model are included in Appendix B.

2.3 Proposed Water Plan

2.3.1 Modeling Results

The hydraulic model was run under basic day, maximum day with fire flows and under peak hour conditions for Block 324. Water pipes are sized to provide sufficient pressure and to deliver the required fire flows.

Results of the hydraulic model are included in **Appendix B** and are summarized below and the l Plans 126715-001, 010, and 011 provided in appendix A provide details on the proposed watermain layout, notes, and road sections respectively.

Scenario

Basic Day (Max HGL) Pressure Range	519.4 to 542.9 kPa
Peak Hour Pressure Range	450.4 to 475.9 kPa
Max Day + 204 l/s Fire Design Flow Range	234.3 l/s to 298.1 l/s

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

Maximum Pressure:	All notes have basic day pressures under 552 kPa, 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:	All hydrant nodes exceed the 183.3 l/s required fire flow.

3 WASTEWATER DISPOSAL

3.1 Existing Conditions

The Fernbank Trunk sewer was extended as part of CRT Lands Phase 1 development. The main trunk sewer for the subject lands was previously constructed in block 328 and 336 and Putney Crescent with servicing stubs designed for this site, it should be noted that it appears from as built records these stubs were not constructed.

The CRT Phase 1 sewer design included an allocation into MH209A for the subject site and surrounds lands. The design of Phase 1 was completed based on the previous Ottawa Sewer Design Guidelines, for which a demand of 350L/Day/cap and infiltration allowance of 0.28l/s/Ha was used. The Phase 1 design had estimated an area allocation of 11.57 Ha and a total population allowance of 512.6 yielding a total peak flow to MH209A of 11.55L/s under the design criteria at the time.

3.2 Block 324 Design Criteria

The sanitary sewers for the subject site will be based on the recommendations of the 2009 MSS, the updated design guidelines the City of Ottawa and the requirements of provincial Ministry of the Environment. Some of the key criteria will include the following:

Average Day Residential Flow	280 l/cap/day
Residential Peaking Factor	Harmon Formula: (min. -2.0, max, -4.0)
Infiltration Rate	0.33 l/s/ha
Townhouse Unit Population Density	2.5 ppu
Velocities	Min 0.6 m/s Max 3.0 m/s

Table 3-1 Minimum Allowable Slopes

DIAMETER (MM)	SLOPE (%)
200	0.320
250	0.240
300	0.816
375	0.140
450	0.111
525 and larger	0.100

Where practical and where there are less than 10 residential connections, the first lengths of sanitary sewers are designed as 200 mm diameter pipes with a minimum slope of 0.65%.

The proposed site plan has a tributary area of 1.87Ha, and a population contribution of 280 to MH 209A. The total peak flow to MH209A from Phase 1 including the subject parcel is 11.89 L/s, which is very similar to the original design of 11.55l/s, hence no negative impact on downstream sewers is anticipated, a copy of the original design sheet and the updated design sheet is included in **Appendix C**.

3.3 Local Extraneous Flows

All sanitary sewers will be constructed to City of Ottawa standards, including testing prior to being put into service. There are no unusual local conditions within the subject site that are expected to contribute extraneous flows higher than those noted in the City's guidelines. No external lands will drain through this site.

3.4 Sewer Calculations

Detailed sanitary sewer design sheets, using recommendations from the MSS, and criteria of the City of Ottawa and the provincial Ministry of Environment, and Sanitary Drainage Area Plans Drawings 126715-400 are provided in **Appendix C**. they demonstrate the sewers have been designed to meet governmental requirements.

4 SITE STORMWATER MANAGEMENT

4.1 Background

The subject site is part of the larger development referred to as Fernbank Community Development. The stormwater management strategy was outlined in the following reports:

- *Conceptual site servicing plan stormwater management plan and erosion and sediment control plan CRT lands Fernbank community (IBI Group, August 2011)*
- *Design brief CRT Lands – Phase 1* Fernbank Community Development *(IBI Group, July 2017)*

The subject site is part of the drainage area that ultimately discharges to the Pond 6 SWM Facility. The trunk storm sewer to the pond and the pond itself were previously constructed.

4.2 Objective

The purpose of this report section is to present the dual drainage design, including the minor and major system, for block 324 in CRT Ph 1 in the Fernbank Community. The design includes the sizing of inlet control devices, maximum depth of surface ponding. The stormwater system concept is discussed in subsequent sections and has been developed based on the October 2012 City of Ottawa Sewer Design Guidelines and February 2014 City of Ottawa Technical Bulletin ISDTB-2014-01.

4.3 Design Criteria

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

Some of the key criteria include the following:

- Design Storm 1:2 year return (Ottawa)
- Rational Method Sewer Sizing
- Initial Time of Concentration 10 minutes
- Runoff Coefficients
  - Landscaped Areas C = 0.2
  - Landscaped Area with Pathway C = 0.5
  - Building and Roof Area C = 0.9
  - Parking Area and Driveway C = 0.9
- Pipe Velocities 0.80 m/s to 3.0 m/s
- Minimum Pipe Size 250 mm diameter (200 mm CB Leads)
- Minimal Allowable Slopes

DIAMETER (MM)	SLOPE (%)
250	0.432
300	0.340
375	0.250
450	0.195
525	0.160
600	0.132
750 and larger	0.100

4.4 System Concept

According to the CRT Phase 1 report prepared by IBI Group, the development of the downstream stormwater system included the expected stormwater servicing needs of the subject property. The existing storm sewers constructed adjacent to the site were oversized to provide the needed

capacity for minor storm runoff from the subject site. Minor storm runoff from the subject site will connect to the existing 975 mmØ sewer in block 316. See **Appendix D** for CRT Ph 1 sewer design sheet, and tributary area plan, where the service stub for the site was allocated 493.82 l/s during. However, this included 112.87 l/s for 0.56 Ha of the adjacent parcel, as noted on the Storm Tributary plan and storm sewer design sheets, therefor the allocation for this block is 380.95 l/s

4.4.1 Dual Drainage Design

The dual drainage system proposed for the subject site will accommodate both major and minor stormwater runoff. Minor flow from the subject site will be conveyed through the storm sewer network and discharge into the existing 975 mmØ sewer in Block 316.

The surface flow not captured by the minor system during rainfalls more than the 1:100yr event will be conveyed via the major system. Storage will be provided in subsurface storage facility (Stormtech units) sized to accommodate the 1:100yr rainfall events, to this end no ponding during the 1:2 year event will occur. If the maximum storage is utilized or if the inlet is blocked, the excess flow will cascade to the next downstream sag. Major flow up to 100-year storm event will be restricted and detained on-site, except a small area fronting Putney Cres and a small area abutting the existing dry pond in block 316. Emergency overflow will be directed towards aforementioned dry pond.

4.4.2 Proposed Minor System

Using the criteria identified in Section 4.2, the proposed on-site storm sewers were sized accordingly. A detailed storm sewer design sheet and the associated storm sewer drainage area plan is included in **Appendix D**. The general plan of services, depicting all on-site storm sewers can be found in **Appendix A**.

The owner of the site will be responsible for regular maintenance of the on-site sewers, catch basins, storage chambers and inlet control devices (ICDs). Maintenance includes but is not limited to the cost of regular cleaning of the storage chambers, storm sewer 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.

4.5 Stormwater Management

4.5.1 Water Quality Control

The subject site is part of the larger Fernbank development where an end of pipe quality control Storm Water Management facility has been constructed and is operational. This site was identified to be developed with a runoff coefficient of 0.8, the actual runoff coefficient is approximately 0.77 therefore no negative impact is anticipated on the downstream Pond 6 SWM facility.

4.5.2 Water Quantity Control

As noted in section 4.4 above, the downstream sewer design limits the subject site to a maximum minor system release rate of 380.95 l/s into the existing 975 mm Dia storm sewer system. Surface flows in excess of the site's allowable release rate will be stored in strategic subsurface storage facilities and gradually released into the minor system to respect the site's allowable release rate. Due to the proposed sloped roofs no roof top storage is used, and the relatively flat site grading severely limits available surface storage. The proposed underground storage system is StrormTech (or approved equal), it has been sized to accommodate the design volume in excess of the 1:100yr event. Therefore, very limited surface storage is being utilized to meet the site demands and there will no active surface ponding during the 2 yr storm event. However, should an inlet be blocked or during extreme events a minimum 300mm freeboard is provided between

an overflow elevation and building envelope or opening. Overland flow routes are provided to permit emergency overland flow away from buildings and out to the adjacent dry pond. A copy of Stormtech info sheet for the model DC780 and SC4500 is included in **Appendix D**.

The DDSWMM model was used to evaluate the on-site stormwater management. In addition to the piped minor system a small section of boulevard flows uncontrolled to the existing storm sewer system, corresponding the allowable release rate has been reduced to 357.95l/s to account for this area. The design proposes a total release rate from the ICD's of 332.13l/s there no negative impact on the down stream sewer is anticipated. All ICD's for the site will be custom IPEX Tempest ICD's sized to meet the below flow rates under the identified Head.

4.6 Hydrological Evaluation

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

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

- **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);
    - 5 year, 3 hour Chicago storm events with a 10 minute time step (for dual drainage evaluation);
    - 100 year 3 hour Chicago storm event with a 10 minute time step (to confirm on-site storage requirements); and
    - 100 year 3 hour Chicago storm event + 20% increase in intensity with a 10 minute time step (for a stress test on major flow conveyance as per the City of Ottawa Sewer Design Guidelines).
- **Infiltration:** The selected infiltration losses are consistent with the City of Ottawa Sewer Design Guidelines. The Horton values are as follows: f_o = 76.2 mm/h, f_c = 13.2 mm/h, k = 0.00115 s^{-1}.
- **Area:** Catchment areas are based on the rational method drainage areas with some minor modifications for modelling purposes.
- **Imperviousness:** Imperviousness for the subject site is based on the rational method runoff coefficients as indicated within Drawing 500.
- **Width:** The catchment width was based on the conveyance route length of the drainage area and multiplied by two. The multiplier of two was only used if the drainage area had runoff contribution from both sides of the drainage area.
- **Slope:** The ground slope was based upon the average slope for both impervious and pervious area. Generally, the slope is approximately 2% (0.02 m/m). This assumes a slope of approximately 1% for impervious or road surfaces and 3% for pervious surfaces (lot grading).
- **Detention storage depth:** Detention storage depths of 1.57 mm and 4.67 mm were used for impervious and pervious areas, respectively.

- **Manning's roughness:** Manning's roughness coefficients of 0.013 and 0.25 were used for impervious and pervious areas, respectively.

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

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

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

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

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

  DDSWMM does not have a direct way of coding double routing since it does not allow the user to code dynamic storage over the high point. For this analysis, the method employed is that recommended in the February 2014 City of Ottawa Technical Bulletin (PIEDTB-2016-01). It accounts for overflow from a street segment (regular static storage at a sag) being conveyed to a downstream dummy segment. In other words, a regular low point segment is provided with a downstream dummy segment for further flow attenuation to account for the dynamic ponding during overflow.

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

    - Segment Length: Equivalent to the length of the maximum static storage from the street segment contributing to it.

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

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

  Rear yards were considered independently of street segments and rear yard catch basins were incorporated in the DDSWMM model. Simulations were based on the total interception of runoff by the storm inlets. This was done by specifying a one-to-one relationship between

approach flow and capture flow. As per the Technical Bulletin (PIEDTB-2016-01), the effect of flow attenuation due to surface ponding in rear yards has been accounted for by utilizing a constant slope ditch/swale draining to the street. The ditch/swale has a minimum longitudinal slope of 1.5%, a maximum depth of 600mm, and side slopes of 3 horizontal to 1 vertical.

Table 4.1 DDSWMM Hydrological Parameters

DRAINAGE AREA ID	AREA (HA)	D/S SEGMENT ID	IMP RATIO [Tp (h)]	Segment Length (m)	Subcatchment WIDTH (M)	MINOR SYSTEM RESTRICTION (l/s)	AVAILABLE STATIC PONDING (M^3)	AVAILABLE UNDERGROUND STORAGE (M^3)
MH112	0.47	OUTW1	0.81	104	208	172	0.61	0.00
MH116	0.54	OUTW2	0.83	101	202	48	1.77	145.10
MH120	0.22	OUTW3	0.59	70	70	44	0.44	12.65
MH121	0.27	OUTW4	0.84	93	93	43	0.88	45.50
MH123	0.13	OUTW5	0.87	56	56	48	0.8	0.00
EXTERNAL AREAS								
EXT1	0.08	OUTW6	0.59	10	20	0.0	0.0	0.0
RES2B	0.56	OUT	0.86	63	126	112.87	0.0	0.0

4.7 Results of the Hydrological Evaluation

The allowable minor system release rate for the 2.27 ha site is 493.82 L/s according to the previous CRT Phase 1 Design Brief. The uncontrolled flow from the small section of boulevard, is also contributing to the allowable release rate and is therefore included in the current pro-rated calculation.

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 468 l/s. In addition, flow from the stress test are contained on site, in the storage areas designed for this purpose and located in the downstream subcatchments (116, 120, 121). Table 4.2 summarizes the ICDs characteristics, refer to **Drawing 010** for detailed calculations and orifice sizing.

Table 4.2 Summary of ICDs

Drainage ID	Location	RELEASE RATE (l/s)	HEAD	ICD
MH112	CB112A	67	1.65	Custom IPEX Tempest limited at 67 l/s
	CB112B	67	1.65	Custom IPEX Tempest limited at 67 l/s
	CB110A	19	1.65	Standard IPEX MHF 83 mm Diameter
	CB112C	19	1.65	Standard IPEX MHF 83 mm Diameter
MH116	MH116	48	1.65	Custom IPEX Tempest limited at 48 l/s
MH120	MH203	44	1.65	Standard IPEX MHF 127 mm Diameter
MH121	MH122	43	1.65	Custom IPEX Tempest limited at 43 l/s
MH123	CBMH123	29	1.65	Custom IPEX Tempest limited at 29 l/s
	CB124A	19	1.65	Standard IPEX MHF 83 mm Diameter

The below **Table 4.3** summarizes the minor system capture for each subcatchment on the subject site for the 2 year, 3 hour Chicago storm events. The DDSWMM results for drainage area MH116 demonstrate that there will be 20.25m^3 underground storage utilized during the 2 year event.

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

DRAINAGE AREA ID	AVAILABLE STATIC STORAGE (m3)	AVAILABLE UNDERGROUND STORAGE (M3)	MINOR SYSTEM CAPTURE	TOTAL STORAGE USED (m3)	OVERFLOW (l/s)
MH112	0.61	0	70	0	0
MH116	1.77	158	48	20.25	0
MH120	0.44	12.65	24	0	0
MH121	0.88	45.50	40	0	0
MH123	0.8	0	20	0	0
EXTERNAL AREAS					
EXT1	0	0	0	N/A	0
RES2B	0	0	81	N/A	0

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

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

DRAINAGE AREA ID	MINOR SYSTEM RESTRICTION (l/s)	AVAILABLE STATIC STORAGE (m3)	AVAILABLE UNDERGROUND STORAGE (M3)	TOTAL STORAGE USED (m3)	OVERFLOW (l/s)
MH112	172	0.61	0	0.27	0
MH116	48	1.77	158.00	145.10	0
MH120	44	0.44	12.65	13.09	0
MH121	43	0.88	45.50	46.38	0
MH123	48	0.8	0	0.16	0
RES2B	112.87	0	0	N/A	N/A

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

DRAINAGE AREA ID	MINOR SYSTEM RESTRICTION (l/s)	AVAILABLE STATIC STORAGE (m3)	AVAILABLE UNDERGROUND STORAGE (M3)	TOTAL STORAGE USED (m3)	OVERFLOW (l/s)
MH112	172	0.74	0	0.61	39
MH116	48	1.77	158.00	158.00	113
MH120	44	0.44	12.65	13.09	21
MH121	43	0.8	45.50	46.38	39
MH123	48	0.88	0	0.16	13
RES2B	112.87	0	0	N/A	N/A

The above results indicate that there is no major system flow from the site during the 100 year 3 hour Chicago analysis. Supporting information, the Velocity x Depth Calculation sheets are included within **Appendix D** for reference. Therefore, the proposed design will not have a negative impact on the existing downstream system.

All the total depths of flow and ponding during the 100 year storm event increased by 20%, the major system remains at or below 0.20m and therefore below the building openings at all locations, see the Velocity x Depth Calculation sheets provided in **Appendix D**.

4.8 Hydraulic Grade Line Analysis

As part of the Phase 1 design the storm HGL was established at various points, at MH 209 the HGL was established at 100.97, the invert of the storm sewer at MH 109 which connect to MH 209 is 100.89, since the sewers are sized to accommodate the 5 yr design event, and ICD's limit flow into the sewers to the 5yr even the HGL within the site is deemed to follow the obvert of the sewer.

5 CONVEYANCE CONTROLS

5.1 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 swale drainage.

5.2 Flat Vegetated Swales

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

5.3 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.

5.4 Pervious Swale Drainage

Some of the landscaped swales make use of a filter wrapped perforated drainage pipe constructed below the 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. Typically, a 250 mm diameter perforated pipe wrapped in filter sock is constructed in a crushed clear stone surround at an invert elevation of approximately 0.8 m below grade. These pipes are in turn directly connected to rear yard catchbasins structures with solid grates located within the street, at regular intervals as per City Standards.

6 SEDIMENT AND EROSION CONTROL PLAN

6.1 General

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

- groundwater in trench will be pumped into a filter mechanism prior to release to the environment;
- bulkhead barriers will be installed at the nearest downstream manhole in each sewer which connects to an existing downstream sewer;
- seepage barriers will be constructed in any temporary drainage ditches; and
- silt sacks will remain on open surface structure such as manholes and catchbasins until these structures are commissioned and put into use.

6.2 Trench Dewatering

During construction of municipal services, 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.

6.3 Bulkhead Barriers

At the first manhole constructed immediately upstream of an existing sewer, a ½ diameter bulkhead will be constructed over the lower half of the outletting sewer. This bulkhead will trap any sediment carrying flows, thus preventing any construction –related contamination of existing sewers. The bulkheads will be inspected and maintained including periodic sediment removal as needed.

6.4 Seepage Barriers

These barriers will consist of both the Light Duty Straw Bale Barrier as per OPSD 219.100 or the Light Duty Silt Fence Barrier as per OPSD 219.110 and will be installed in accordance with the sediment and erosion control drawing. The barriers are typically made of layers of straw bales or geotextile fabric staked in place. All seepage barriers will be inspected and maintained as needed.

6.5 Surface Structure Filters

All catchbasins, and to a lesser degree manholes, convey surface water to sewers. However, until the surrounding surface has been completed these structures will be covered to prevent sediment from entering the minor storm sewer system. Until rearyards are sodded or until streets are asphalted and curbed, all catchbasins and manholes will be equipped with geotextile filter socks. These will stay in place and be maintained during construction and build until it is appropriate to remove them.

6.6 Stockpile Management

During construction of any development similar to that being proposed both imported and native soils are stockpiled. Mitigative measures and proper management to prevent these materials entering the sewer systems is needed.

During construction of the deeper municipal services, water, sewers and service connections, imported granular bedding materials are temporarily stockpiled on site. These materials are however quickly used up and generally before any catchbasins are installed. Street catchbasins are installed at the time of roadway construction and rearyard catchbasins are usually installed after base course asphalt is placed.

Contamination of the environment as a result of stockpiling of imported construction materials is generally not a concern since these materials are quickly used and the mitigative measures stated previously, especially the use of filter fabric in catchbasins and manholes help to manage these concerns.

The roadway granular materials are not stockpiled on site. They are immediately placed in the roadway and have little opportunity of contamination. Lot grading sometimes generates stockpiles of native materials. However, this is only a temporary event since the materials are quickly moved off site.

The construction of this development will involve a rock blasting and breaking, at this time no crushing operation is anticipated. Given the existing topography, and the relatively flat requirement for back to back town on a private road network a fill operation is require in the northern section of the site as noted on the grading plan which is in **Appendix E**. As part of this operation, materials will be manipulated onsite, and provided the sediment and erosion control measures are in place, are generally inconsequential to the surrounding environment.

A copy of the Erosion and Sedimentation Control Plan is included in **Appendix E**.

7 ROADS AND NOISE ATTENUATION

Vehicular access to the site is provided by five road connections to Putney Cresc. The proposed plan identifies all roads within the site as private and are either 6m or 7m wide.

A public walkway block was established as part of the plan of subdivision immediately south of the site, this walkway is to be constructed by the subdivision developers after this site plan has been constructed.

An Environmental Noise Impact Assessment was prepared by IBI Group, dated January, 2021. Since the site consists of all back to back units with no rear yards or amenity space noise barriers are not required for this site. Various units will require noise clauses or upgraded building components.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

This report and the accompanying working drawings demonstrate that the proposed development meets the requirements of the stakeholder regulators, including the City of Ottawa, provincial MOECP. With minor exceptions, the proposed development is in general conformance with the 2009 Master Servicing Report and current City of Ottawa design standards.

Downstream sanitary sewers were designed with the proposed development area included. There is a reliable water supply available adjacent to the proposed development.

8.2 Recommendations

Water, wastewater and stormwater systems required to develop the site are designed in accordance with MOECP 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.

It is recommended that the regulators review this submission with an aim of providing the requisite approvals to permit the owners to proceed to the development stage of the subject site.

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

- Commence Work Notification: City of Ottawa
- ECA (sewers): MOECP
- Commence Work Notification (utilities): City of Ottawa

Report prepared and electronically sealed on July 16, 2021 by:

Demetrius Yannoulopoulos, P. Eng.
Director

Mahsa Ghasri, E.I.T
Water Resources

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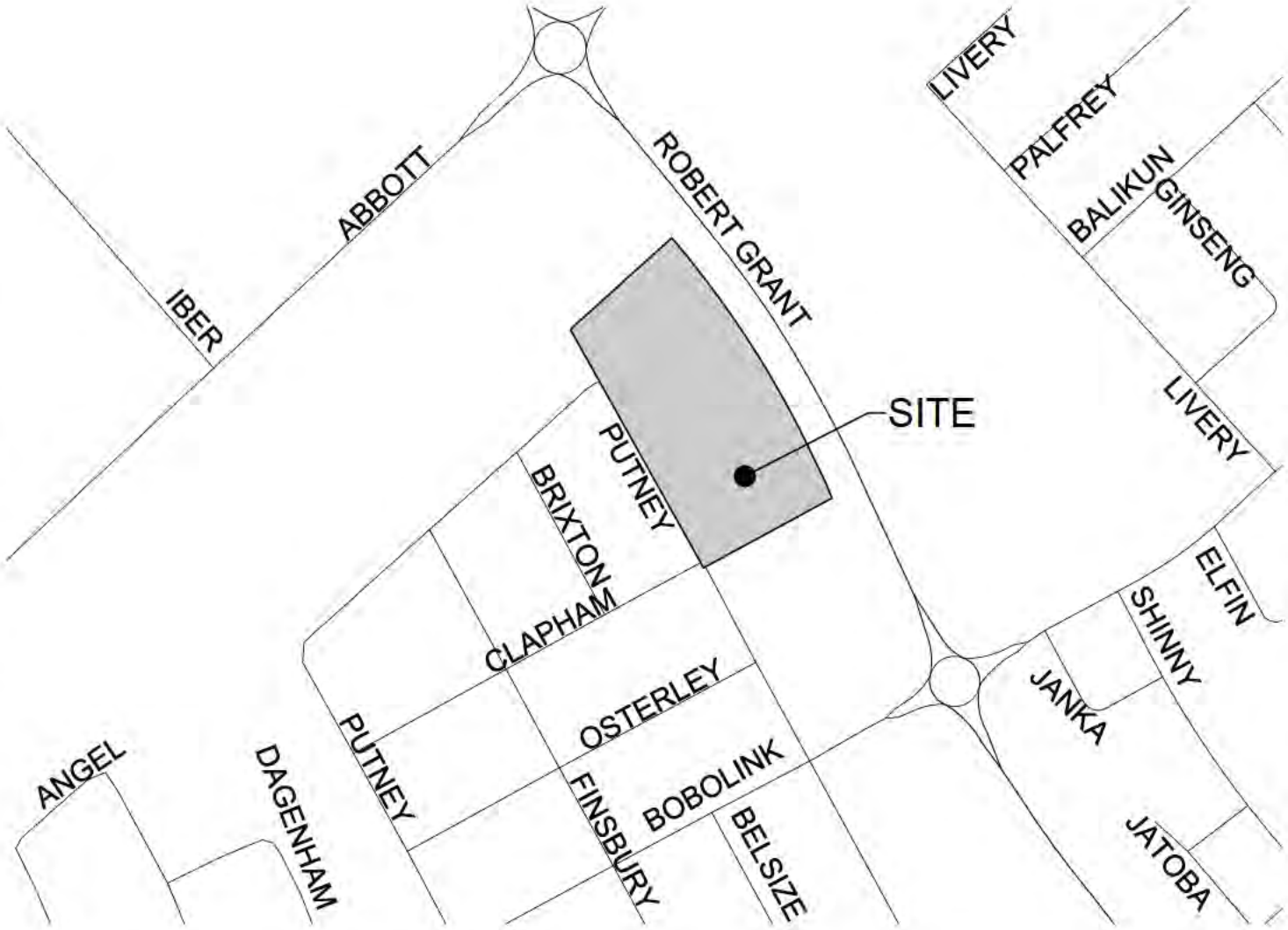
APPENDIX A

Figure 1.1 Location Plan
Development Servicing Study Checklist
Architects DCA Site Plan
Pre-consult meeting notes



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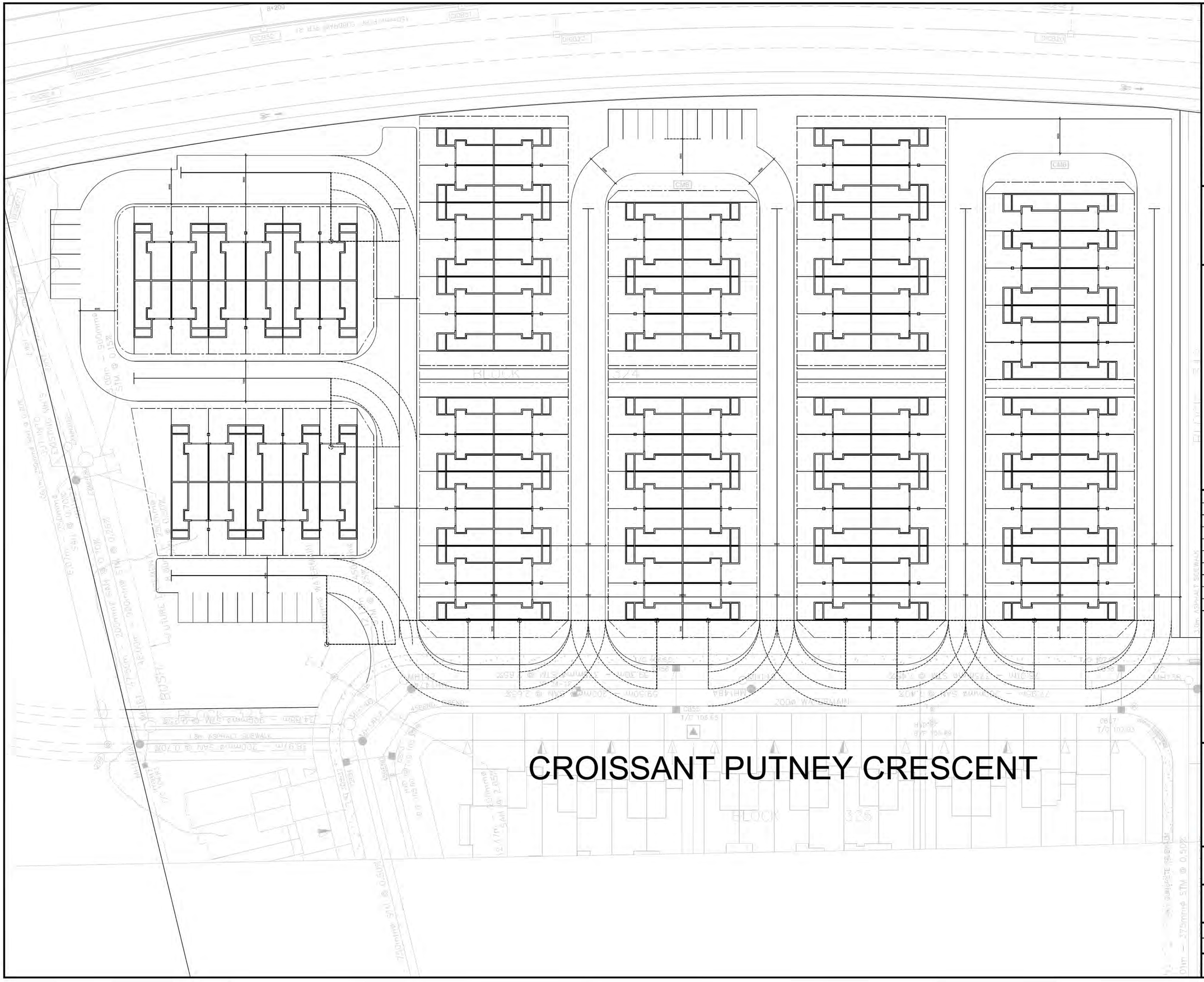
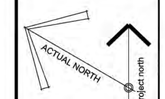
IBI

Project Title	Drawing Title	Sheet No.
CRT BLOCK 324	SITE LOCATION PLAN	FIGURE 1



GENERAL NOTES

1. DO NOT SCALE DRAWINGS; ONLY FIGURED DIMENSIONS ARE TO BE USED. WHERE DOUBT EXISTS; FILE REQUEST FOR INTERPRETATION AND REQUEST CLARITY.
2. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO VERIFY DIMENSIONS ON SITE; REPORT DISCREPANCIES TO THE ARCHITECT PROMPTLY.
3. GENERAL CONTRACTOR TO TAKE INTO ACCOUNT CONSTRUCTION TOLERANCE; GENERAL CONTRACTOR TO COORDINATE THE WORK OF DIFFERENT TRADES TO COMPLY WITH DESIGN INTENT.
4. ALL WORK DESCRIBED IN THESE DRAWINGS AND SPECIFICATIONS ARE TO COMPLY WITH THE CURRENT EDITION OF THE ONTARIO BUILDING CODE (2012) OR NATIONAL BUILDING CODE (2010) INCLUDING MOST RECENT AMENDMENTS.
5. DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY AND ARE TO BE READ TOGETHER.



ISSUE RECORD:

NO.	DESCRIPTION	DATE
01	FOR CLIENT REVIEW	2020/06/19
02	FOR CLIENT REVIEW	2020/07/13
03	FOR CLIENT REVIEW	2020/07/23
04	FOR CLIENT REVIEW	2020/11/03
05	FOR CLIENT REVIEW	2020/11/12

CLIENT

CLARIDGE HOMES INC.
210 GLADSTONE AVE. OTTAWA ON.
TEL: 613-233-6030

CLARIDGE HOMES

DCA
A GROUP OF ARCHITECTS
201-1339 WELLINGTON ST. WEST OTTAWA ON K1Y 3B8
WWW.ARCHITECTSDCA.COM 613.725.2294

PROJECT TITLE
CLARIDGE HOMES
WESTWOOD

DRAWING TITLE
SITE PLAN
BLOCK 324

DATE	DRAWN	JOB NO.	DRAWING NO.
JUNE 2020	CA	3272	A100
SCALE 1:300	REVIEWED TD		

ARCHITECTURAL

From: Rygus, Kathy <Kathy.Rygus@ottawa.ca>
Sent: Friday, May 22, 2020 2:54 PM
To: Vincent Denomme <vincent.denomme@claridgehomes.com>
Cc: Surprenant, Eric <Eric.Surprenant@ottawa.ca>; Giampa, Mike <Mike.Giampa@ottawa.ca>; Wang, Randolph <Randolph.Wang@ottawa.ca>
Subject: Preconsultation Putney Crescent - Comments

Hi Vincent,
Attached are the comments regarding your site plan concept for Block 324 on Putney Crescent in CRT's Westwood subdivision. Sorry for our delay in providing this.

Planning & Urban Design (see 2 attached PDF's)

- Alternative site plans should be explored because we are not convinced that the circulated plan is best option for the site.
- The repetitive pattern of the buildings and streets may be concerning.
- There are a number of practical questions which are noted on the attached map.
- A Design Brief is required for the site plan. The Terms Of Reference for the Design Brief are outlined on the attached checklist with boxes for required information checked.

Transportation

- Please submit a TIA screening form for this site. If the expected traffic generation was captured through a subdivision traffic study, the TIA requirement may be waived.
- Five accesses on a crescent for 112 units is excessive and may not meet the Private Approach bylaw for access spacing. The number of intersections with Putney Crescent should be reduced and the access on the curve eliminated.

Engineering

- Comments attached as separate PDF

The application type would be 'Complex Site Plan Control application (Manager Approval, Public Consultation) with a fee of $35,487.53 together with Conservation Authority review fee of $1015.00 and deposit for Engineering Design Review and Inspection Fees (based on value of works). These preconsultation comments are valid for a period of one year. Please let me know if you have any questions.

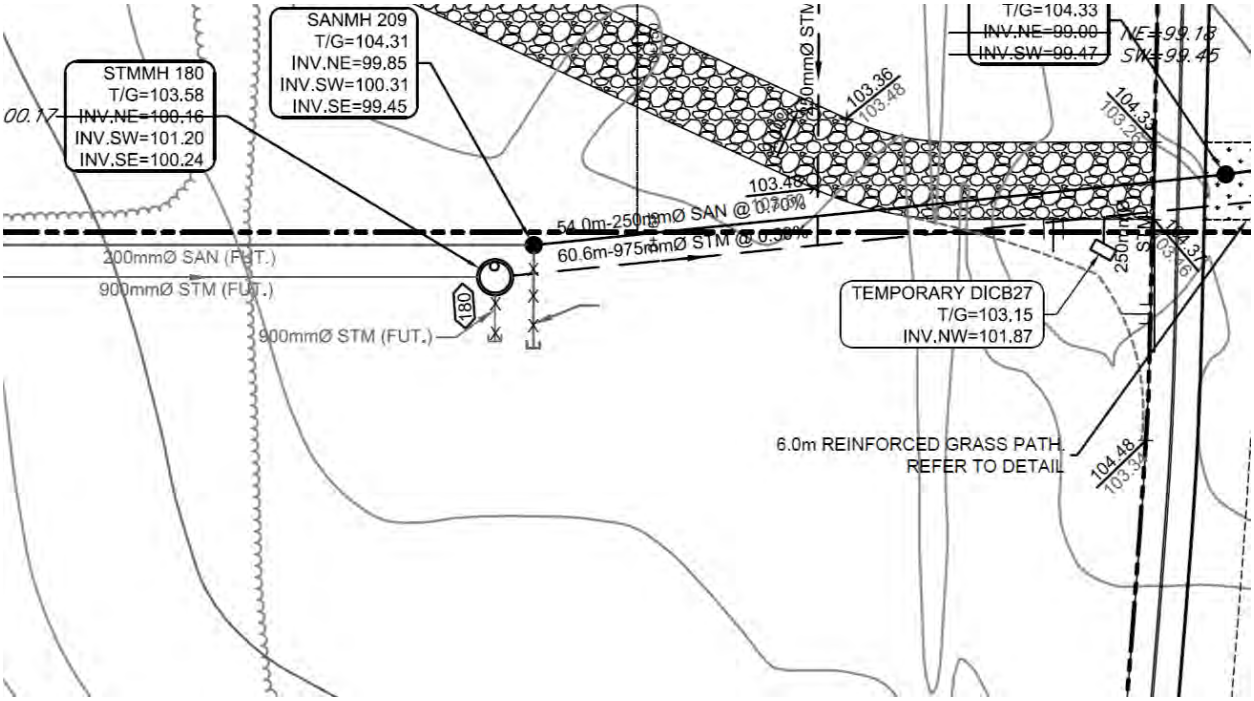
Kathy Rygus
Planner/ Urbaniste
Development Review West / Services d'examen demandes d'aménagements Ouest
Planning, Infrastructure and Economic Development Department
City of Ottawa | Ville d'Ottawa

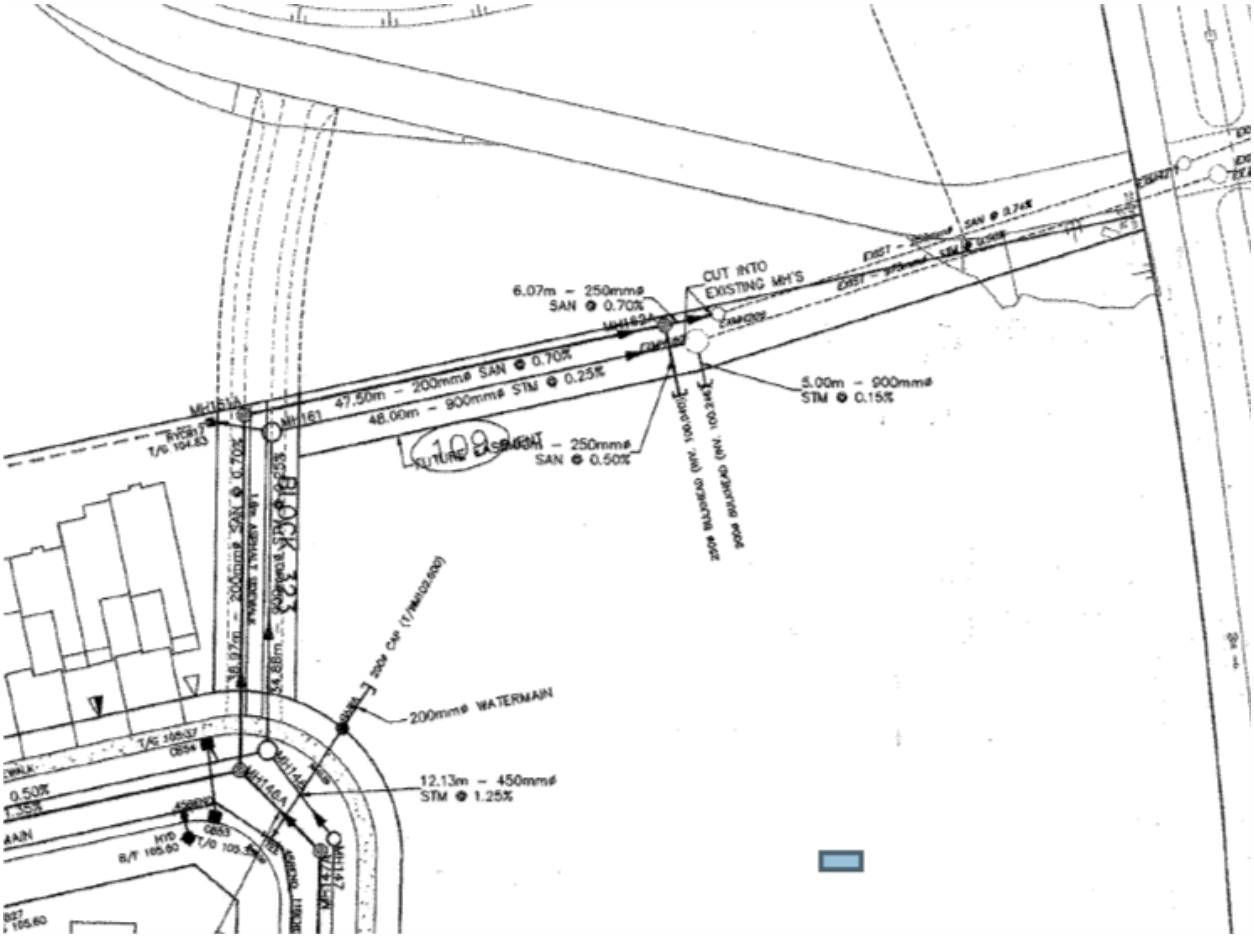
613-580-2424, Ext/poste 28318
Kathy.rygus@ottawa.ca

'

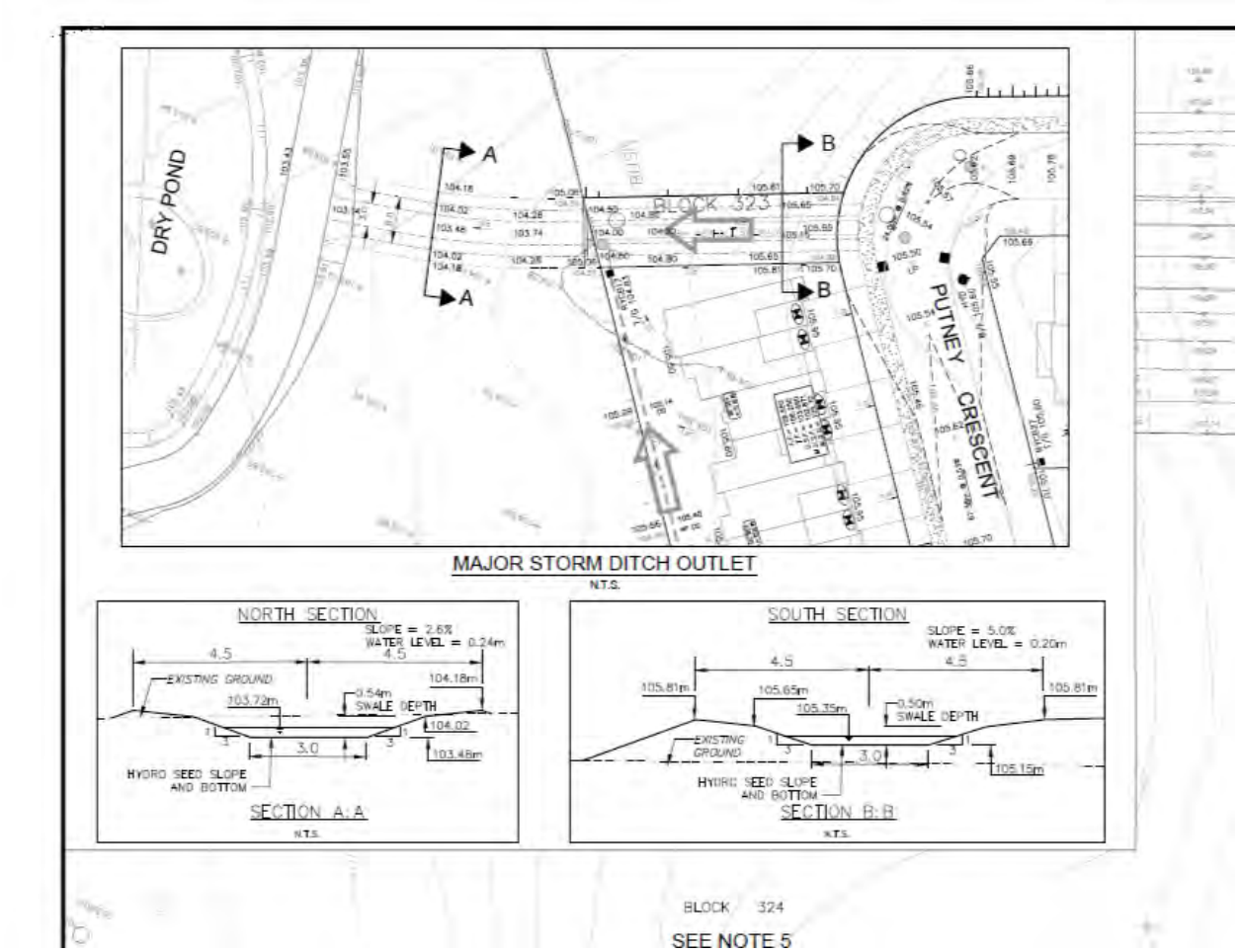
SERVICING: Preconsultation Notes Block 324, Plan 4M-1619 (Putney Crescent)

From a servicing standpoint, sanitary and storm servicing was to be North of site however from the as-built drawings it would seem that the service laterals were not dropped for the site. An easement for the sewers will be required along North edge of site. It will be the owner's responsibility to make connections.

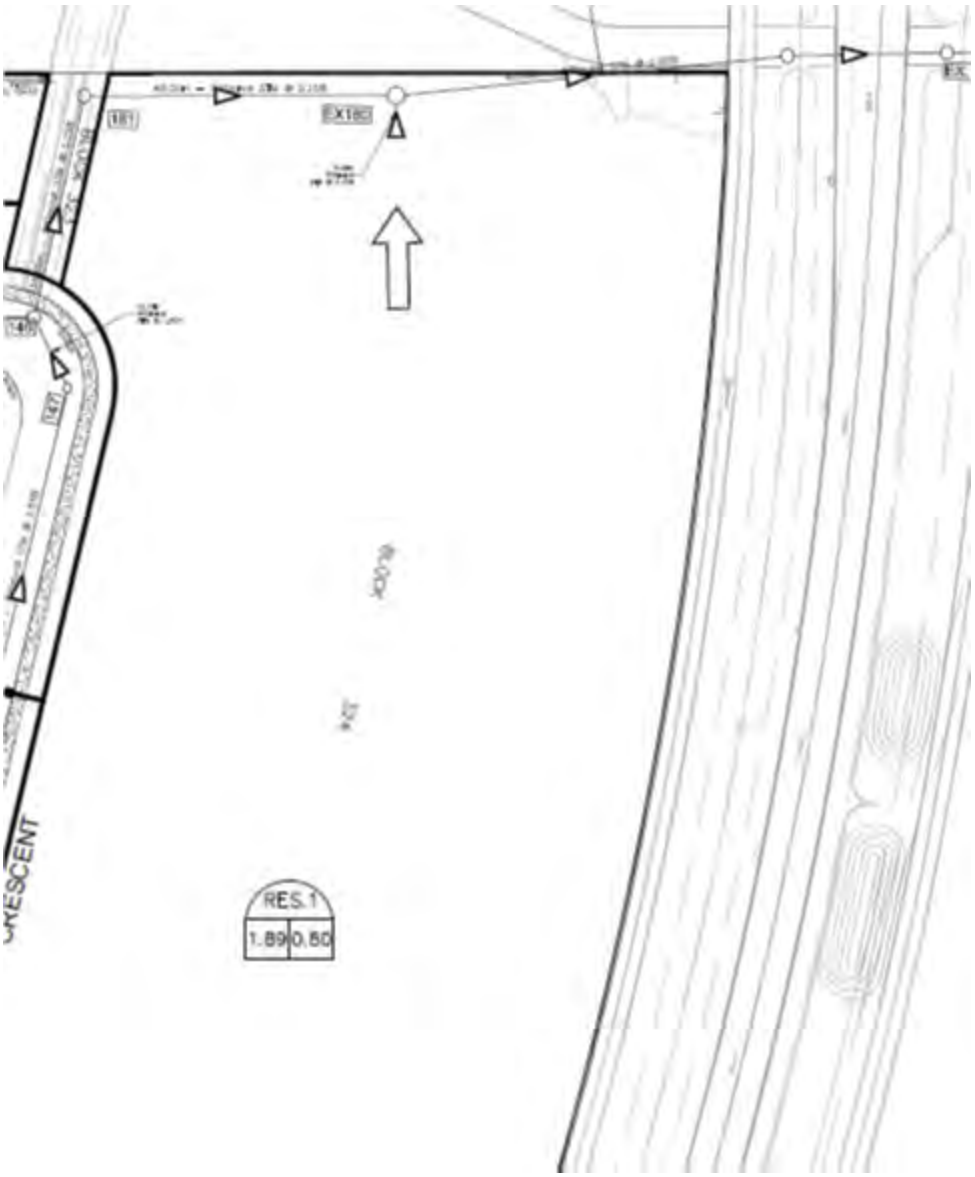




Water service connection is from Putney. A perimeter W3 chamber will be required at property line and consultant will need to ensure proper hydrant coverage for the site and adequate FUS calculations for meeting fireflow requirements.



It will be important to coordinate grading tie in with Block 323 since this block conveys major overland flows. Site assigned runoff coefficient is as per CRT development Storm Drainage Area plan, which is 0.8 as indicated below.



List of required reports and plans is attached.

Fire Route will need to be circulated to emergency services to be adopted through by-law.

APPENDIX B

Water Demand Calculation
F.U.S. Calculation
Boundary Conditions
Hydraulic Model Output
126715-001 General Plan of Services
126715-010 Details
126715-011 Road Sections

Boundary Conditions at CRT Lands

Information Provided:

Date provided: 16 Nov 2016

Criteria	Demand (L/s)
Average Demand	16.9
Maximum Daily Demand	36.9
Peak Hourly Demand	77.8
Fire Flow Demand	167
Fire Flow Demand	225
Maximum Daily + Fire Flow Demand	204 & 262

Location:

Results

Connection1:

Criteria	Head (m)	Pressure (psi)
Max HGL	161.1	75.8
PKHR	154.7	66.7
MXDY + Fire Flow (204 L/s)	152.8	64
MXDY + Fire Flow (262 L/s)	150.6	60.9

Connection2:

Criteria	Head (m)	Pressure (psi)
Max HGL	161.4	85.4
PKHR	154.8	76.0
MXDY + Fire Flow (204 L/s)	153	73.4
MXDY + Fire Flow (262 L/s)	150.9	70.5

Considerations

1. According to the City of Ottawa Water Design Guidelines as well as the Ontario Building Code, the maximum pressure at any point within a distribution system shall not exceed 80 psi in occupied areas. Measures should be taken to try to reduce the residual pressure below 80 psi without the use of special pressure control equipment. In circumstances where the residual pressure cannot be reduced below 80 psi without the use of pressure control equipment, a pressure reducing valve (**PRV**) should be installed at site.

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 : CRT Phase 1 - Block 324
CLIENT : Claridge Homes

FILE 126715
DATE PRINTED 17-Jan-21
DESIGN LE
PAGE 1 OF 1

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	TOWN HOUSE UNITS	MEDIUM DENSITY (ha)	POPULATION	INDUST. (ha)	COMM. (ha)	INSTIT. (ha)	RESIDENTIAL	ICI	TOTAL	RESIDENTIAL	ICI	TOTAL	RESIDENTIAL	ICI	TOTAL	
B01		4		10.80				0.04		0.04	0.11		0.11	0.24		0.24	
B02		7		18.90				0.08		0.08	0.19		0.19	0.42		0.42	
B03		6		16.20				0.07		0.07	0.16		0.16	0.36		0.36	
B04		6		16.20				0.07		0.07	0.16		0.16	0.36		0.36	
B06		6		16.20				0.07		0.07	0.16		0.16	0.36		0.36	
B07		6		16.20				0.07		0.07	0.16		0.16	0.36		0.36	
B08		3		8.10				0.03		0.03	0.08		0.08	0.18		0.18	
B09		9		24.30				0.10		0.10	0.25		0.25	0.54		0.54	
B10		6		16.20				0.07		0.07	0.16		0.16	0.36		0.36	
B11		5		13.50				0.05		0.05	0.14		0.14	0.30		0.30	
B12		4		10.80				0.04		0.04	0.11		0.11	0.24		0.24	
B50		6		16.20				0.07		0.07	0.16		0.16	0.36		0.36	11,000
B52		12		32.40				0.13		0.13	0.33		0.33	0.72		0.72	11,000
B54		12		32.40				0.13		0.13	0.33		0.33	0.72		0.72	11,000
B56		12		32.40				0.13		0.13	0.33		0.33	0.72		0.72	11,000
B58																	11,000
B60		8		21.60				0.09		0.09	0.22		0.22	0.48		0.48	11,000
Total		**112**		**302**				1.23		**1.23**	3.06		**3.06**	6.74		**6.74**	

POPULATION DENSITY

Single Family	3.4	persons/unit
Semi Detached & Townhouse	2.7	persons/unit
Medium Density	1.8	persons/unit

WATER DEMAND RATES

Residential	350	l/cap/day
Commercial Shopping Center	2,500	L/(1000m2)/day

PEAKING FACTORS

Maximum Daily		
Residential	2.5	x avg. day
Commercial	1.5	x avg. day
Maximum Hourly		
Residential	2.2	x avg. day
Commercial	1.8	x avg. day

FIRE DEMANDS

Single Family	10,000 l/min (166.7 l/s)
Semi Detached & Townhouse	11,000 l/min (183.3 l/s)

Fire Flow Requirement from Fire Underwriters Survey

12 Unit Block With Firewall - 4 Unit Fire Areas

Building Floor Area

floor area (4 units)	218.0	m^2
stories	3	
Area	654.0	m^2

$F = 220C\sqrt{A}$

C	1.5	C =	1.5 wood frame
A	654 m^2		1.0 ordinary
			0.8 non-combustible
F	8,439 l/min		0.6 fire-resistive
use	8,000 l/min		

Occupancy Adjustment

Use	-15%	
Adjustment	-1200	l/min
Fire flow	6,800	l/min

-25% non-combustible
-15% limited combustible
0% combustible
+15% free burning
+25% rapid burning

Sprinkler Adjustment

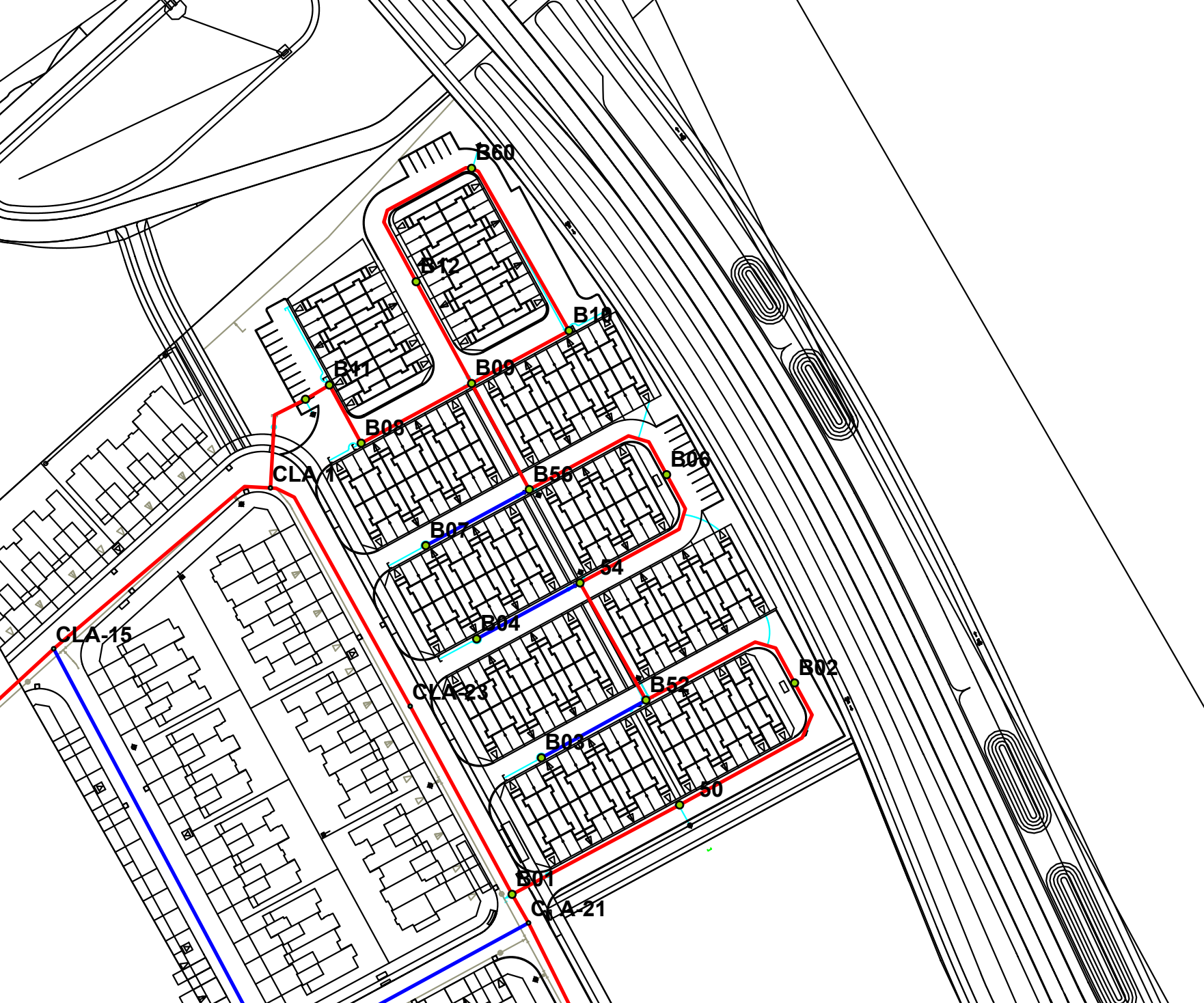
Use	0%	
Adjustment	0	l/min

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north	13.0	39.0	3	117	15%
east	8.0	20.0	3	60	19%
south	13.0	39.0	3	117	15%
west	2 hour rated firewall				10%
Total					59%

Adjustment	4,012	l/min
Total adjustments	4,012	l/min
Fire flow	10,812	l/min
Use	**11,000**	**l/min**
	183.3	**l/s**

* Exposure charges from Technical Bulletin ISTB 2018-02 Appendix H (ISO Method)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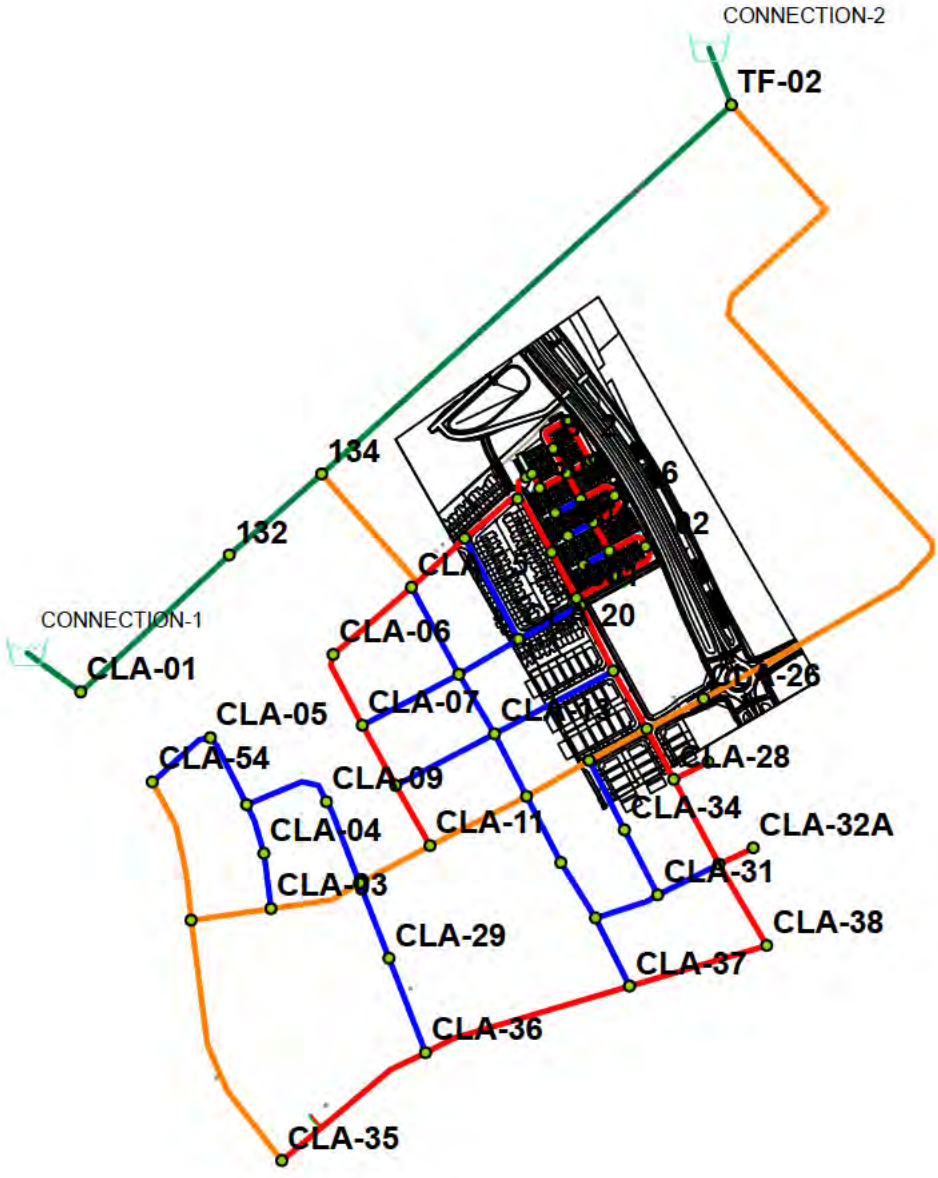
B02
B03
50
B01
CLA-21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TF-02
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132
CONNECTION-1
CLA-01
CLA-06
CLA-05
CLA-07
CLA-54
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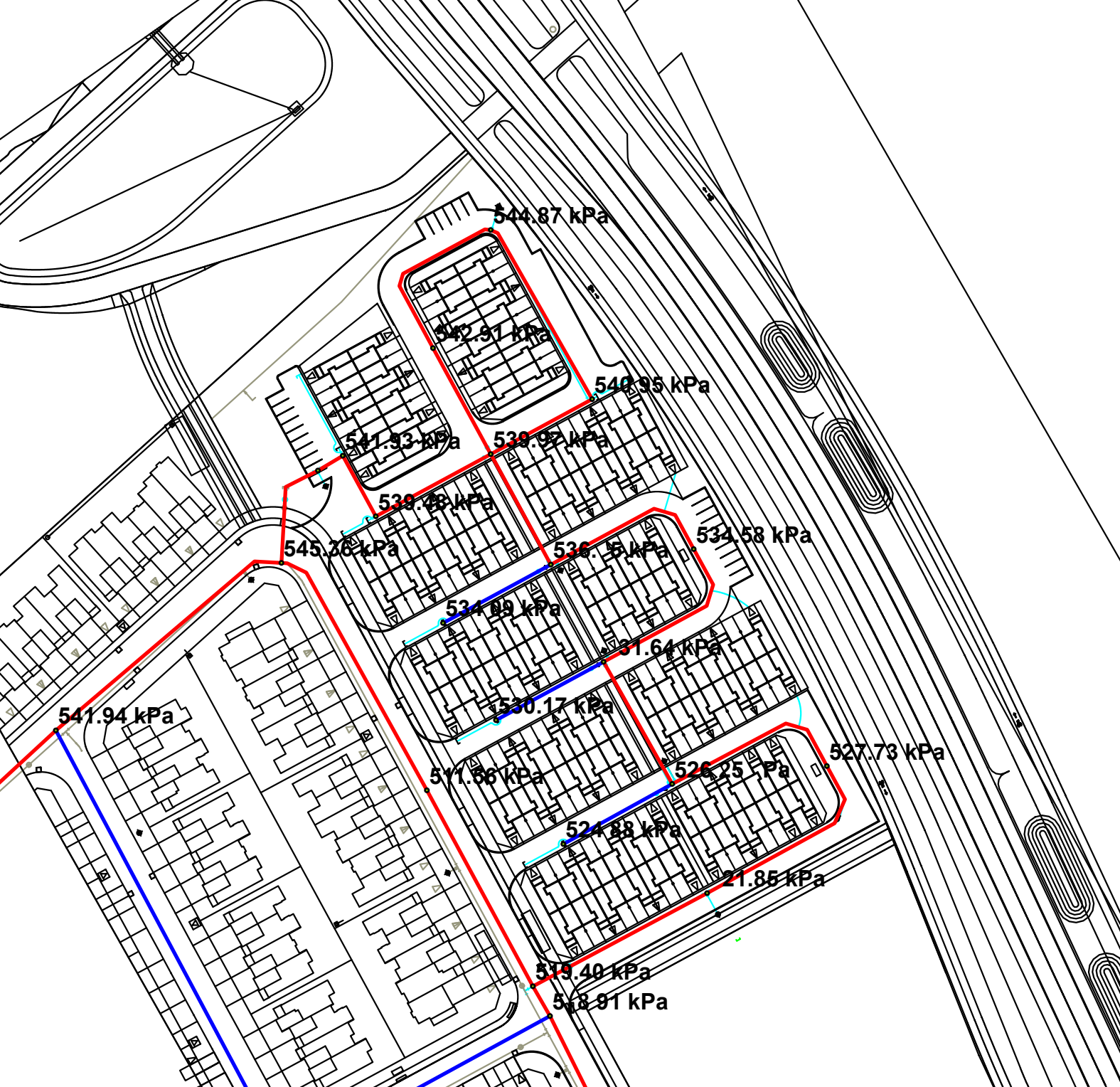
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534.09 kPa
531.64 kPa
541.94 kPa
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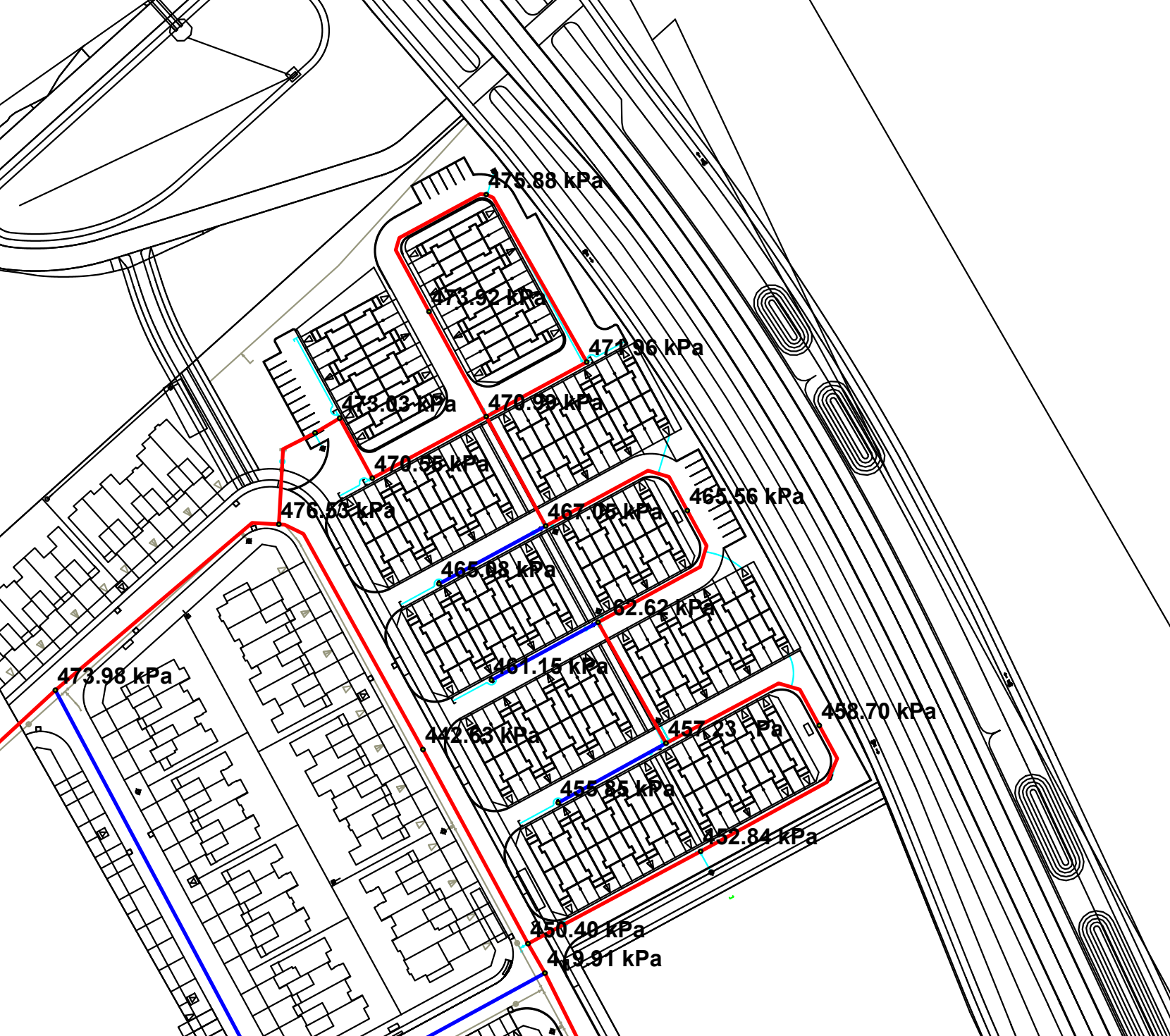
519.40 kPa
518.91 kPa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465.08 kPa
462.62 kPa
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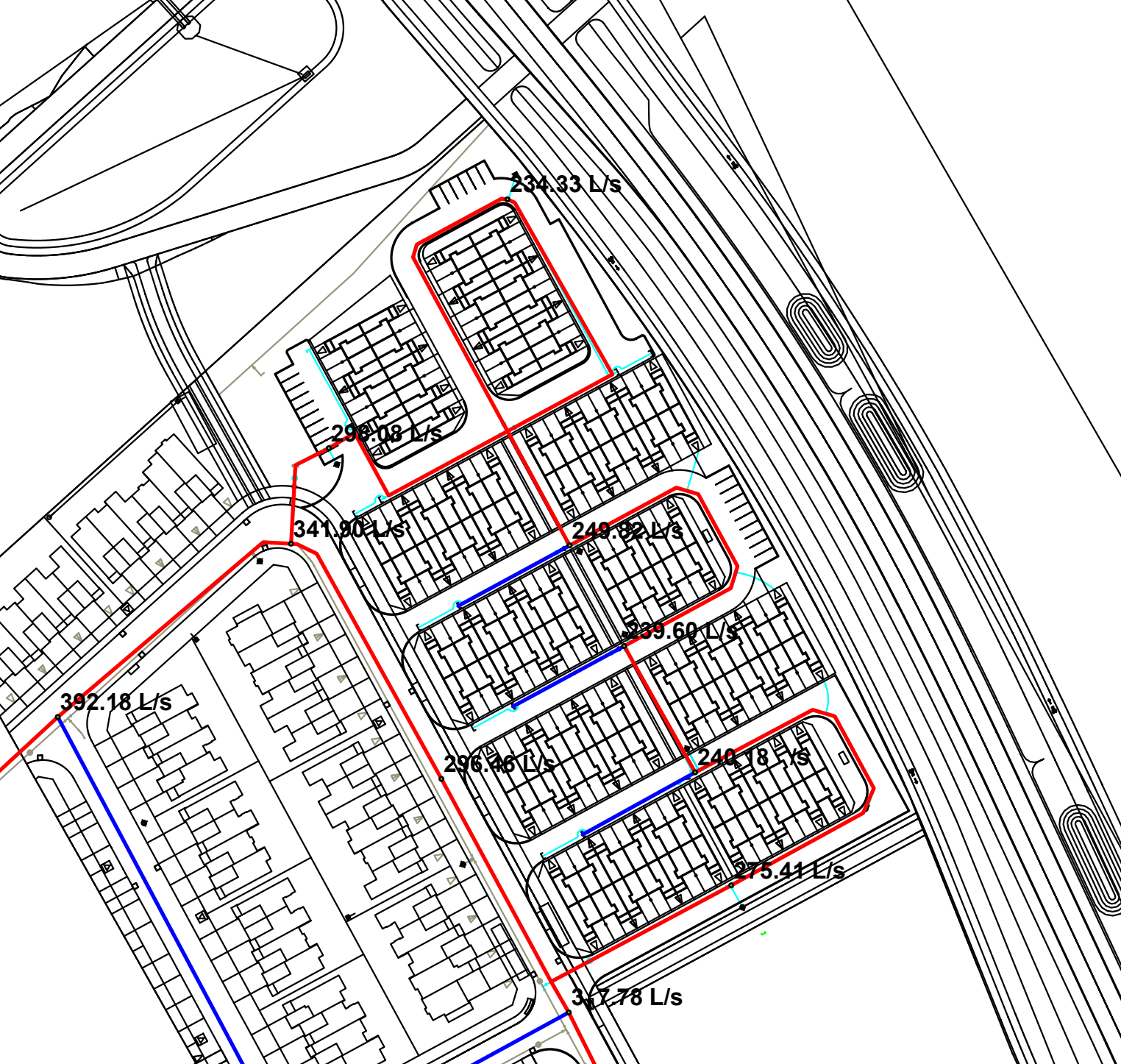
450.40 kPa
449.91 kPa


234.33 L/s
290.08 L/s
341.90 L/s
249.82 L/s
239.60 L/s
392.18 L/s
296.46 L/s
240.18 L/s
275.41 L/s
347.78 L/s

Basic Day (Max HGL) - Junction Report

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	132	0.00	107.60	161.17	524.90
2	☐	134	0.00	107.60	161.21	525.29
3	☐	B01	0.04	108.20	161.20	519.40
4	☐	B02	0.08	107.35	161.20	527.73
5	☐	B03	0.07	107.64	161.20	524.88
6	☐	B04	0.07	107.10	161.20	530.17
7	☐	B06	0.07	106.65	161.20	534.58
8	☐	B07	0.07	106.70	161.20	534.09
9	☐	B08	0.03	106.15	161.20	539.48
10	☐	B09	0.10	106.10	161.20	539.97
11	☐	B10	0.07	106.00	161.20	540.95
12	☐	B11	0.05	105.90	161.20	541.93
13	☐	B12	0.04	105.80	161.20	542.91
14	☐	B50	0.07	107.95	161.20	521.85
15	☐	B52	0.13	107.50	161.20	526.25
16	☐	B54	0.13	106.95	161.20	531.64
17	☐	B56	0.13	106.50	161.20	536.05
18	☐	B58	0.00	106.00	161.20	540.95
19	☐	B60	0.09	105.60	161.20	544.87
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23	☐	CLA-04	0.12	107.70	161.20	524.27
24	☐	CLA-05	0.11	108.10	161.20	520.35
25	☐	CLA-06	0.19	107.00	161.20	531.16
26	☐	CLA-07	0.19	108.55	161.20	515.97
27	☐	CLA-08	0.23	108.30	161.20	518.42
28	☐	CLA-09	0.12	108.10	161.20	520.36
29	☐	CLA-10	0.23	108.05	161.20	520.85
30	☐	CLA-11	0.22	108.15	161.20	519.89
31	☐	CLA-12	0.15	108.35	161.21	517.95
32	☐	CLA-13	0.28	109.20	161.21	509.61
33	☐	CLA-14	0.31	109.20	161.20	509.60
34	☐	CLA-15	0.33	105.90	161.20	541.94
35	☐	CLA-16	0.69	105.55	161.20	545.36
36	☐	CLA-20	0.26	108.50	161.20	516.46
37	☐	CLA-21	0.14	108.25	161.20	518.91
38	☐	CLA-22	0.19	109.10	161.21	510.61
39	☐	CLA-23	0.10	109.00	161.20	511.56
40	☐	CLA-24	0.18	108.75	161.21	514.06
41	☐	CLA-25	0.08	108.80	161.21	513.60
42	☐	CLA-26	0.44	109.00	161.22	511.76
43	☐	CLA-27	0.12	108.00	161.20	521.33
44	☐	CLA-28	0.25	108.60	161.21	515.50
45	☐	CLA-28A	0.28	108.60	161.21	515.50
46	☐	CLA-29	0.10	107.50	161.20	526.21
47	☐	CLA-30	0.14	107.95	161.20	521.80
48	☐	CLA-31	0.17	108.05	161.20	520.82
49	☐	CLA-32	0.21	108.15	161.20	519.84
50	☐	CLA-32A	0.28	108.15	161.20	519.84

Peak Hour - Junction Report

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	132	0.00	107.60	154.69	461.46
2	☐	134	0.00	107.60	154.69	461.41
3	☐	B01	0.24	108.20	154.16	450.40
4	☐	B02	0.42	107.35	154.16	458.70
5	☐	B03	0.36	107.64	154.16	455.85
6	☐	B04	0.36	107.10	154.16	461.15
7	☐	B06	0.36	106.65	154.16	465.56
8	☐	B07	0.36	106.70	154.16	465.08
9	☐	B08	0.18	106.15	154.17	470.55
10	☐	B09	0.54	106.10	154.16	470.99
11	☐	B10	0.36	106.00	154.16	471.96
12	☐	B11	0.30	105.90	154.17	473.03
13	☐	B12	0.24	105.80	154.16	473.92
14	☐	B50	0.36	107.95	154.16	452.84
15	☐	B52	0.72	107.50	154.16	457.23
16	☐	B54	0.72	106.95	154.16	462.62
17	☐	B56	0.72	106.50	154.16	467.05
18	☐	B58	0.00	106.00	154.17	472.07
19	☐	B60	0.48	105.60	154.16	475.88
20	☐	CLA-01	0.00	107.60	154.70	461.54
21	☐	CLA-02	1.14	107.70	154.07	454.37
22	☐	CLA-03	1.06	107.80	154.07	453.45
23	☐	CLA-04	0.68	107.70	154.07	454.39
24	☐	CLA-05	0.61	108.10	154.07	450.45
25	☐	CLA-06	1.02	107.00	154.31	463.61
26	☐	CLA-07	1.05	108.55	154.22	447.50
27	☐	CLA-08	1.29	108.30	154.15	449.32
28	☐	CLA-09	0.68	108.10	154.07	450.51
29	☐	CLA-10	1.29	108.05	154.08	451.11
30	☐	CLA-11	1.21	108.15	154.11	450.34
31	☐	CLA-12	0.83	108.35	154.12	448.48
32	☐	CLA-13	1.52	109.20	154.15	440.49
33	☐	CLA-14	1.68	109.20	154.22	441.12
34	☐	CLA-15	1.80	105.90	154.27	473.98
35	☐	CLA-16	3.79	105.55	154.18	476.53
36	☐	CLA-20	1.44	108.50	154.21	447.89
37	☐	CLA-21	0.78	108.25	154.16	449.91
38	☐	CLA-22	1.06	109.10	154.15	441.46
39	☐	CLA-23	0.54	109.00	154.17	442.63
40	☐	CLA-24	0.98	108.75	154.13	444.64
41	☐	CLA-25	0.45	108.80	154.14	444.32
42	☐	CLA-26	2.43	109.00	154.18	442.73
43	☐	CLA-27	0.68	108.00	154.07	451.45
44	☐	CLA-28	1.36	108.60	154.08	445.68
45	☐	CLA-28A	1.52	108.60	154.08	445.67
46	☐	CLA-29	0.53	107.50	154.05	456.12
47	☐	CLA-30	0.76	107.95	154.03	451.55
48	☐	CLA-31	0.91	108.05	154.03	450.58
49	☐	CLA-32	1.14	108.15	154.02	449.51
50	☐	CLA-32A	1.52	108.15	154.02	449.50

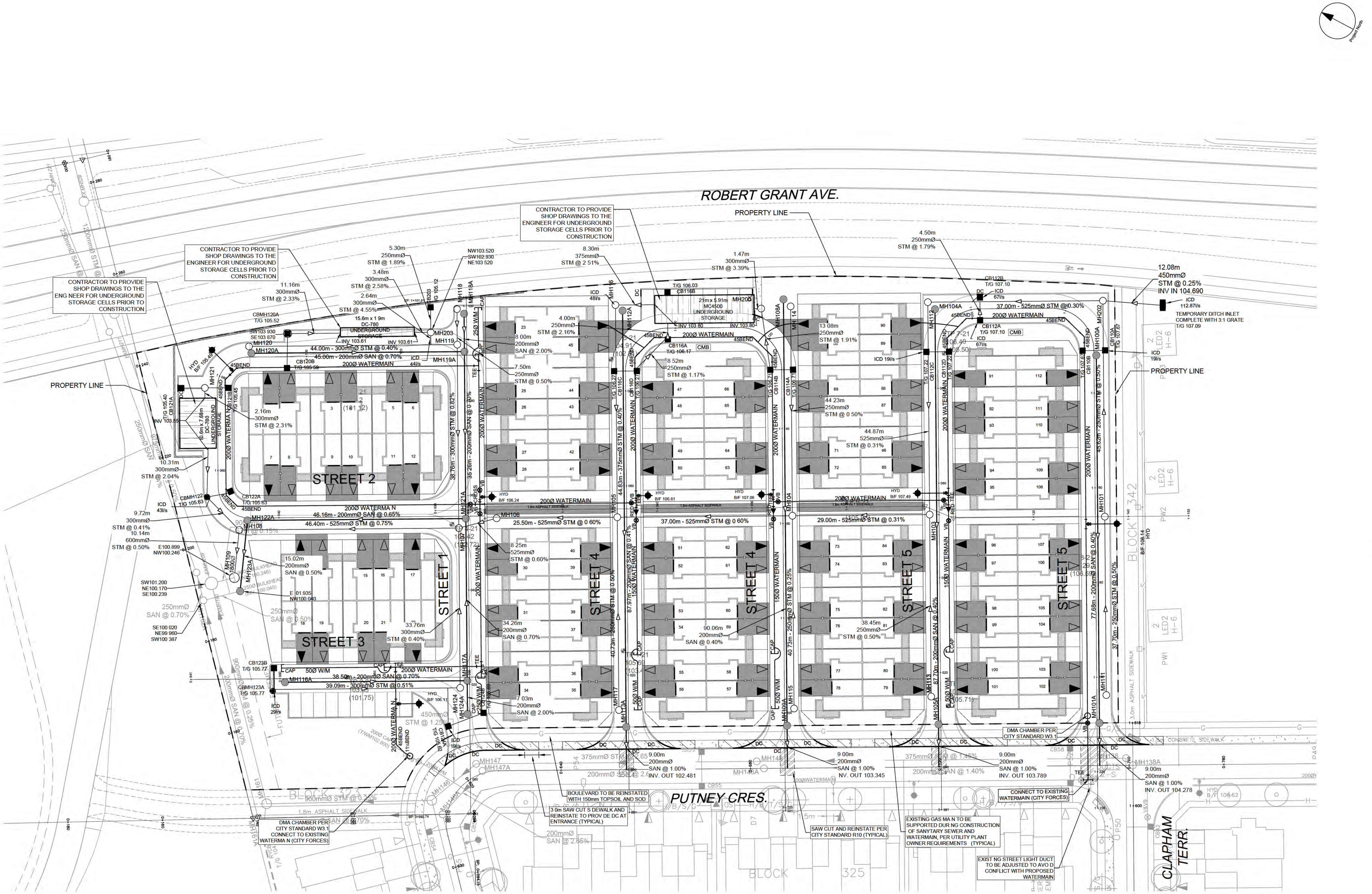
Max Day + Fire (204 l/s) - Fireflow Design Report

		ID	Total Demand (L/s)	Available Flow at Hydrant (L/s)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)
1	☐	B50	183.46	275.41	B50	139.96	122.23	275.41	139.96	140.01
2	☐	B52	183.63	240.18	B52	139.96	121.78	240.18	139.96	139.98
3	☐	B54	183.63	239.60	B54	139.96	121.23	239.60	139.96	139.98
4	☐	B56	183.63	249.82	B56	139.96	120.78	249.82	139.96	139.99
5	☐	B58	183.30	298.08	B58	139.96	120.28	298.08	139.96	139.96
6	☐	B60	183.52	234.33	B60	139.96	119.88	234.33	139.96	139.98
7	☐	CLA-02	167.19	310.45	CLA-54	138.83	122.07	309.79	139.96	141.10
8	☐	CLA-03	167.15	325.34	CLA-03	139.96	122.08	325.35	139.96	139.96
9	☐	CLA-04	166.98	190.58	CLA-04	139.96	121.98	190.58	139.96	139.97
10	☐	CLA-05	166.95	171.50	CLA-05	139.96	122.38	171.50	139.96	139.96
11	☐	CLA-06	167.13	347.90	CLA-06	139.96	121.28	347.90	139.96	139.96
12	☐	CLA-07	167.15	352.62	CLA-07	139.96	122.83	352.62	139.96	139.96
13	☐	CLA-08	167.26	358.68	CLA-08	139.96	122.58	358.68	139.96	139.96
14	☐	CLA-09	166.98	166.01	CLA-09	139.96	122.38	166.01	139.96	139.96
15	☐	CLA-10	167.26	352.00	CLA-09	139.83	122.37	351.91	139.96	140.10
16	☐	CLA-11	167.22	388.47	CLA-11	139.96	122.43	388.47	139.96	139.96
17	☐	CLA-12	167.05	406.86	CLA-12	139.96	122.63	406.86	139.96	139.96
18	☐	CLA-13	167.36	303.12	CLA-13	139.96	123.48	303.12	139.96	139.96
19	☐	CLA-14	167.44	320.82	CLA-14	139.96	123.48	320.82	139.96	139.96
20	☐	CLA-15	167.49	392.18	CLA-15	139.96	120.18	392.18	139.96	139.96
21	☐	CLA-16	168.39	341.90	CLA-16	139.96	119.83	341.90	139.96	139.96
22	☐	CLA-20	167.33	264.94	CLA-20	139.96	122.78	264.94	139.96	140.00
23	☐	CLA-21	167.03	347.78	CLA-21	139.96	122.53	347.78	139.96	139.96
24	☐	CLA-22	167.15	360.57	CLA-22	139.96	123.38	360.57	139.96	139.96
25	☐	CLA-23	166.92	296.46	CLA-23	139.96	123.28	296.46	139.96	139.96
26	☐	CLA-24	167.12	412.19	CLA-24	139.96	123.03	412.19	139.96	139.96
27	☐	CLA-25	166.88	429.86	CLA-25	139.96	123.08	429.86	139.96	139.96
28	☐	CLA-26	167.77	425.55	CLA-26	139.96	123.28	425.56	139.96	139.96
29	☐	CLA-27	166.98	195.02	CLA-27	139.96	122.28	195.02	139.96	139.97
30	☐	CLA-28	167.29	299.70	CLA-28	139.96	122.88	299.70	139.96	139.96
31	☐	CLA-29	166.91	176.88	CLA-29	139.96	121.78	176.88	139.96	139.96
32	☐	CLA-30	167.01	225.16	CLA-30	139.96	122.23	225.16	139.96	140.00
33	☐	CLA-31	167.08	226.83	CLA-31	139.96	122.33	226.83	139.96	140.00
34	☐	CLA-32	167.19	269.10	CLA-32	139.96	122.43	269.10	139.96	139.96
35	☐	CLA-33	167.08	191.53	CLA-33	139.96	122.28	191.53	139.96	139.97
36	☐	CLA-34	167.22	187.92	CLA-34	139.96	122.28	187.92	139.96	139.96
37	☐	CLA-35	166.84	275.39	CLA-35	139.96	121.68	275.39	139.96	139.96
38	☐	CLA-36	227.95	251.04	CLA-36	139.96	121.73	251.04	139.96	139.97
39	☐	CLA-37	225.55	246.99	CLA-37	139.96	122.13	246.99	139.96	139.97
40	☐	CLA-38	230.94	236.84	CLA-38	139.96	122.58	236.84	139.96	139.96
41	☐	CLA-54	167.05	273.98	CLA-54	139.96	122.18	273.98	139.96	139.96
42	☐	CLA-55	167.49	658.31	CLA-55	139.96	120.88	658.32	139.96	139.96

Peak Hour - Pipe Report

		ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)	Status	Flow Reversal Count
36	☐	31	CLA-14	CLA-20	77.44	155.00	100.00	1.64	0.09	0.01	0.13	Open	0
37	☐	33	CLA-20	CLA-21	79.13	155.00	100.00	3.58	0.19	0.04	0.55	Open	0
38	☐	35	CLA-14	CLA-13	77.51	155.00	100.00	4.51	0.24	0.07	0.84	Open	0
39	☐	37	CLA-08	CLA-13	124.48	155.00	100.00	0.46	0.02	0.00	0.01	Open	0
40	☐	39	CLA-11	CLA-12	121.20	297.00	120.00	-8.31	0.12	0.01	0.08	Open	0
41	☐	41	CLA-12	CLA-13	78.38	155.00	100.00	-3.19	0.17	0.03	0.44	Open	0
42	☐	43	CLA-12	CLA-24	80.77	297.00	120.00	-9.95	0.14	0.01	0.11	Open	0
43	☐	45	CLA-24	CLA-25	73.62	297.00	120.00	-15.09	0.22	0.02	0.24	Open	0
44	☐	47	CLA-25	CLA-22	75.05	204.00	110.00	-3.30	0.10	0.01	0.10	Open	0
45	☐	49	CLA-22	CLA-13	150.36	155.00	100.00	-0.27	0.01	0.00	0.00	Open	0
46	☐	51	CLA-21	CLA-22	82.10	204.00	110.00	4.09	0.13	0.01	0.15	Open	0
47	☐	53	CLA-30	CLA-33	72.99	155.00	100.00	-3.09	0.16	0.03	0.42	Open	0
48	☐	55	CLA-30	CLA-31	74.77	155.00	100.00	-0.50	0.03	0.00	0.01	Open	0
49	☐	57	CLA-31	CLA-34	81.48	155.00	100.00	-2.95	0.16	0.03	0.38	Open	0
50	☐	59	CLA-31	CLA-32	76.20	155.00	100.00	1.54	0.08	0.01	0.12	Open	0
51	☐	61	CLA-25	CLA-28	64.06	204.00	110.00	11.00	0.34	0.06	0.96	Open	0
52	☐	63	CLA-32	CLA-38	105.48	204.00	110.00	7.00	0.21	0.04	0.42	Open	0
53	☐	67	CLA-30	CLA-37	85.27	155.00	100.00	2.83	0.15	0.03	0.35	Open	0
54	☐	69	CLA-37	CLA-38	159.94	204.00	110.00	3.81	0.12	0.02	0.13	Open	0
55	☐	71	CLA-37	CLA-36	240.46	204.00	110.00	-2.19	0.07	0.01	0.05	Open	0
56	☐	73	CLA-36	CLA-29	113.49	155.00	100.00	-2.61	0.14	0.03	0.30	Open	0
57	☐	75	CLA-02	CLA-35	296.18	297.00	120.00	5.44	0.08	0.01	0.04	Open	0
58	☐	77	CLA-35	CLA-36	202.13	204.00	110.00	5.06	0.15	0.05	0.23	Open	0
59	☐	P11	B01	CLA-23	58.42	204.00	110.00	-3.34	0.10	0.01	0.11	Open	0
60	☐	P13	B01	B50	51.80	204.00	110.00	1.81	0.06	0.00	0.03	Open	0
61	☐	P15	B50	B02	54.83	204.00	110.00	1.45	0.04	0.00	0.02	Open	0
62	☐	P17	B52	B02	50.42	204.00	110.00	-1.03	0.03	0.00	0.01	Open	0
63	☐	P19	B52	B03	32.61	155.00	100.00	0.36	0.02	0.00	0.01	Open	0
64	☐	P21	B52	B54	36.75	204.00	110.00	-0.05	0.00	0.00	0.00	Open	0
65	☐	P23	B54	B04	32.09	155.00	100.00	0.36	0.02	0.00	0.01	Open	0
66	☐	P25	B06	B54	47.17	204.00	110.00	1.13	0.03	0.00	0.01	Open	0
67	☐	P27	B06	B56	46.76	204.00	110.00	-1.49	0.05	0.00	0.02	Open	0
68	☐	P29	B56	B07	32.09	155.00	100.00	0.36	0.02	0.00	0.01	Open	0
69	☐	P31	B56	B09	33.00	204.00	110.00	-2.57	0.08	0.00	0.07	Open	0
70	☐	P33	B10	B09	30.26	204.00	110.00	-0.57	0.02	0.00	0.00	Open	0

		ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)	Status	Flow Reversal Count
71	☐	P35	B09	B08	34.26	204.00	110.00	-4.19	0.13	0.01	0.16	Open	0
72	☐	P37	B08	B11	18.13	204.00	110.00	-4.37	0.13	0.00	0.17	Open	0
73	☐	P39	B11	B58	7.56	204.00	110.00	-4.67	0.14	0.00	0.20	Open	0
74	☐	P41	B58	CLA-16	29.50	204.00	110.00	-4.67	0.14	0.01	0.20	Open	0
75	☐	P43	B09	B12	31.63	204.00	110.00	0.51	0.02	0.00	0.00	Open	0
76	☐	P45	B12	B60	47.91	204.00	110.00	0.27	0.01	0.00	0.00	Open	0
77	☐	P47	B10	B60	52.09	204.00	110.00	0.21	0.01	0.00	0.00	Open	0



NOT FOR CONSTRUCTION

1:400 — 0 4 12 20m

CLIENT

CLARIDGE HOMES

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ISSUES

No.	DESCRIPTION	DATE
1	ISSUED TO CITY FOR REVIEW	2021:01:22
2	REVISED PER CITY COMMENTS	2021:07:16

-SEE 010 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS
-SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR AOV.

KEY PLAN

SITE

CONSULTANTS

SEAL

LICENSED PROFESSIONAL ENGINEER
D. G. Yannoulopoulos
2021/07/16
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

CRT

BLOCK 324

PROJECT NO:
126715

DRAWN BY:	CHECKED BY:
D.D. E.H.	DGY
PROJECT MGR:	APPROVED BY:
DGY	DGY

SHEET TITLE

GENERAL PLAN OF SERVICES

SHEET NUMBER	ISSUE
001	1

File Location: J:\126715_CRT_Block324\7.0_Production\7.03_Design\04_Civil\Sheets\001 GENERAL PLAN OF SERVICES.dwg Last Saved: July 12, 2021, by Ehenrie Plotted: Friday, July 16, 2021 2:57:04 PM by Eric Henrie

CITY FILE No. D07-12-21-0022 CITY PLAN No. 18416

UTILITY LEGEND

- TRANSFORMER
- TRANSFORMER C/W CONCRETE W NGS
- HYDRO SWITCHGEAR
- HMH — HYDRO MANHOLE
- BELL PEDESTAL
- GLB — BELL GRADE LEVEL BOX (l=600mm, w=1200mm, d=750mm) C/W 1 5 x 3 0m easement
- FC — BELL F BER CABINET (l=1200mm, w=750mm, d=500mm)
- CSP — BELL CENTRAL SPLITT NG POINTS (l=1175mm, w=1200mm, d=500mm)
- ROGERS PEDESTAL
- ROGERS VAULT (l=1000mm, w=1000mm, d=1200mm) C/W 1m x 2m easement
- P30 — STREET LIGHT
- STREET LIGHT DISCONNECT
- STREET LIGHT GROUND NG
- H/B/T/G/S — JO NT UTILITY TRENCH
- H — HYDRO CABLE AND DUCTS
- B — BELL CABLE
- BB — BELL DUCTS
- T — ROGERS CABLE
- TT — ROGERS DUCTS
- C — GAS
- S — STREET LIGHT CABLE
- UT LITY DROP LOCATIONS
- 10-DUCTS / 6-H / 4-T — CONCRETE ENCASED DUCT BANK C/W NUMBER OF DUCTS
- CMB — COMMUNITY MAILBOX
- PROPOSED TREE LOCATION
- ROOT MANAGEMENT BARRIER

SEDIMENT EROSION LEGEND

- HEAVY DUTY SILT FENCE
- SNOW FENCE
- STRAW BALE CHECK DAM
- STRAW BALE CHECK DAM WITH FILTER CLOTH
- ROCK CHECK DAM
- SEDIMENT SACK PLACED UNDER EXIST NG CB COVER
- TEMPORARY MUD MAT 0.15m THICK 50mm CLEAR STONE ON NON WOVEN FILTER CLOTH

GRADING LEGEND

- PROPOSED SWALE C/W FLOW DIRECTION
- 5.0% — PROPOSED DITCH C/W FLOW DIRECTION AND SLOPE
- 1.0% — SLOPE C/W FLOW DIRECTION
- MAJOR OVERLAND FLOW ROUTE
- 104.62 — PROPOSED SPOT GRADE
- x104.40 TC — PROPOSED SWALE GRADE
- x104.50 GWP — PROPOSED SWALE HIGH PO NT GRADE
- 104.80 103.80 — LOT CORNER GRADE C/W EXIST NG GRADE
- 86.45 EX — TIE INTO EXISTING GRADE
- 96.79 — FULL STATIC PONDING GRADE
- 95.50 / 93.50 — RETA N NG WALL C/W TOP OF WALL AND GRASS GRADE
- TERRAC NG 3:1 MAX MUM UNLESS NOTED OTHERWISE
- PRESSURE REDUCING VALVE
- F NISHED FLOOR ELEVATION
- TOP OF FOUNDATION ELEVATION
- UNDERSIDE OF FOOTING ELEVATION
- MIN MUM UNDERSIDE OF FOOTING (Based on the higher of the sewer obverts, or hydraulic grade line)
- M N MUM GARAGE GRADE

(F.F.EL. 96.32, T.FND. 95.96, U.S.F. 95.56, M.U.E.F. 95.56, M.G.S.)

- 28 — TOTAL NUMBER OF RISERS
- M N MUM GRASS GRADE
- WU — WALKUP UNIT
- WO — WALKOUT UNIT
- NS — NON-STANDARD FOUNDATION (Frost cover not provided for standard unit)
- BS — BACKSPLIT UNIT (1.5m frost cover on footings)
- NOISE FENCE LOCATION
- NOISE FENCE GATE

ROADWAY STRUCTURE:

CAR PARKING AREAS (500mm)

50mm - SUPERPAVE 12.5 ASPHALTIC CONCRETE
150mm - OPSS GRANULAR "A" CRUSHED STONE
300mm - OPSS GRANULAR "B" TYPE II

DRIVE ISLES (640mm)

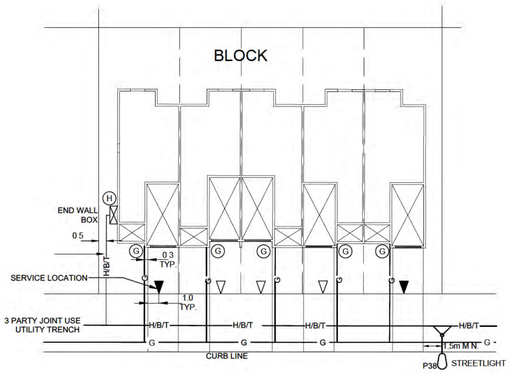
40mm - SUPERPAVE 12.5 ASPHALTIC CONCRETE
50mm - SUPERPAVE 19.0 ASPHALTIC CONCRETE
150mm - OPSS GRANULAR "A" CRUSHED STONE
400mm - OPSS GRANULAR "B" TYPE II

SERVICING LEGEND

- MH118A — SANITARY MANHOLE
- 200mmø SAN — SANITARY SEWER
- MH109 / MH118 — STORM MANHOLE
- 825mmø STM — STORM SEWER - LESS THAN 900Ø
- 900mmø STM — STORM SEWER - 900Ø AND GREATER
- 200Ø WATERMAIN — WATERMAIN
- CB100, T/G 104.10 — STREET CATCHBASIN C/W TOP OF GRATE
- CICB101, G/G 104.25 — CURB INLET CATCHBAS N C/W GUTTER GRADE
- DCB100, T/G 104.10 — DOUBLE CATCHBAS N C/W TOP OF GRATE
- DCICB101, G/G 104.25 — DITCH INLET CATCHBASIN C/W GUTTER GRADE
- CBMH100, T/G 103.59 — CATCHBAS N MANHOLE C/W TOP OF GRATE
- CBMH101, T/G 103.59 — DITCH INLET MANHOLE C/W TOP OF GRATE
- CB100, T/G 104.10 — ICD LOCATION
- RYCB, T/G 104.35 — REAR YARD CATCHBASIN IN ROAD CONNECTING STRUCTURE C/W SOLID GRATE
- T/G 104.35, INV 103.35 — REAR YARD "TEE" CATCHBASIN (300Ø) C/W TOP OF GRATE AND INVERT OUT
- T/G 104.50, INV 103.50 — REAR YARD "END" CATCHBASIN (300Ø) C/W TOP OF GRATE AND INVERT OUT
- T/G 104.35, INV 103.35 — REAR YARD "CUSTOM ANGLED " CATCHBASIN (450Ø) C/W TOP OF GRATE AND INVERT OUT
- T/G 104.35, INV 103.35 — REAR YARD "THREE WAY" CATCHBASIN (450Ø) C/W TOP OF GRATE AND INVERT OUT
- PERFORATED REAR YARD SUBDRA N
- 300mmØ CSP — CSP CULVERT C/W DIAMETER
- V&VB — VALVE AND VALVE BOX
- V&VC — VALVE AND VALVE CHAMBER
- HYD, 104.35 — FIRE HYDRANT C/W BOTTOM OF FLANGE ELEVATION
- 200Ø WM — RED — 150Ø WM — WATERMAIN REDUCER
- 7 VBENDS — VERTICAL BEND LOCATION
- SANITARY AND WATER SERVICE LOCATION
- SANITARY, STORM AND WATER SERVICE LOCATION
- BH 12, 102.00 — INFERRED BEDROCK (SEE GEOTECHNICAL REPORT)
- HGL, 101.79 — 100 YEAR STORM HYDRAULIC GRADE L NE AT MANHOLE
- S/T HGL, 101.79 — STRESS TEST STORM HYDRAULIC GRADE LINE AT MANHOLE
- 108, 102.40 — UNDERSIDE OF FOOTING ELEVATION (WITH LOT #)
- CLAY SEAL IN SEWER / WATERMAIN TRENCH

GENERAL LEGEND

- L MIT OF CONSTRUCTION
- PHASING LINE
- BARR ER CURB
- MOUNTABLE CURB
- DEPRESSED BARRIER CURB
- CONCRETE SIDEWALK
- TACTILE WALKING SURFACE NDICATOR
- ASPHALT SIDEWALK / PATHWAY
- BUS STOP CONCRETE / ASPHALT



3 PARTY TYPICAL SERVICE LOCATIONS FOR TOWNHOUSE BLOCKS

N.T.S.
REFER TO CITY OF OTTAWA DETAIL R21 FOR MINIMUM OFFSETS
(* REFER TO LANDSCAPE PLAN AND ROAD CROSS-SECTION FOR FINAL TREE LOCATION)

DRAWING NOTES

1.0 GENERAL

1.1 CONTRACTOR TO VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.

1.2 DO NOT SCALE DRAWINGS.

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

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

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

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

1.7 FOR LEGAL SURVEY INFORMATION REFER TO REGISTERED PLAN FROM AOV.

1.8 REFER TO SITE PLAN BY DCA ARCHITECTS.

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

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

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

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

1.13 ALL CONSTRUCTION TRAFFIC TO ACCESS SITE FROM PUTNEY CRES.

1.14 FOR GEOTECHNICAL REPORT SEE GEOTECHNICAL INVESTIGATION BY PATERSON GROUP.

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

1.16 THE POSITION OF POLE LINES, CONDUITS, WATERMAIN, SEWERS, AND OTHER UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK THE CONTRACTOR SHALL INFORM ITSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, SHALL PROTECT ALL UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

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

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

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

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

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

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

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

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

2.0 SANITARY

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

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

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

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

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

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

2.7 ALL SANITARY CONNECTION TO INCLUDE BACKWATER VALVE TYPE 1 PER CITY STANDARD S14.1

3.0 STORM

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

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

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

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

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

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

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

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

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

3.10 ALL STORM CONNECTION TO INCLUDE FOUNDATION BACKWATER VALVE TYPE 1 PER CITY STANDARD S14.1

3.11 LANDSCAPE SUBDRAIN AND APPURTENANCES TO BE INSTALLED PER CITY OF OTTAWA STANDARDS INCLUDING BUT NOT LIMITED TO S29, S30, S31

4.0 WATER

4.1 ALL WATERMAINS 100mmØ OR GREATER TO BE PVC DR 18, LESS THAN 100mm Ø TO BE COPPER OR APPROVED EQUAL WITH MINIMUM COVER OF 2.4m AND INSTALLED PER CITY OF OTTAWA STANDARDS. ALL DOMESTIC WATER SERVICES ARE TO BE 25mmØ

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

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

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

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

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

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

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

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

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

5.0 PARKING LOT AND WORK IN PUBLIC RIGHTS OF WAY

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

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

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

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

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

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

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

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

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

5.10 DITCHES AND CULVERTS DISTURBED DURING ARE TO BE REINSTATED TO THEIR ORIGINAL CONDITION AND FLOWLINE GRADES.

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

CATCHBASIN/CATCHBASIN MANHOLE/DITCH INLET DATA

STRUCTURE ID	STORM AREA ID	STRUCTURE	FRAME & COVER	ELEVATION			OUTLET PIPE			ICD	
				TOP OF GRATE	INVERT		DIAMETER	TYPE	HEAD	FLOW	TYPE
					INLET	OUTLET	(mm)		(m)	(L/s)	
CB110A	MH112	OPSD 705.010	S19.1	107.67	106.05	105.95	250	PVC DR35	1.65	19	STANDARD IPEX MHF 83MM DIA.
CB110B	MH112	OPSD 705.010	S19.1	107.67		106.17	200	PVC DR35			
CB112A	MH112	OPSD 705.010	S19.1	107.10		105.30	200	PVC DR35	1.65	67	CUSTOM IPEX TEMPEST
CB112B	MH112	OPSD 705.010	S19.1	107.10		105.30	200	PVC DR35	1.65	67	CUSTOM IPEX TEMPEST
CB112C	MH112	OPSD 705.010	S19.1	107.22		105.72	200	PVC DR35	1.65	19	STANDARD IPEX MHF 83MM DIA.
CB112D	MH112	OPSD 705.010	S19.1	107.22	105.60	105.50	200	PVC DR35			
CB114A	MH116	OPSD 705.010	S19.1	106.71		105.21	200	PVC DR35			
CB114B	MH116	OPSD 705.010	S19.1	106.71	105.09	104.99	250	PVC DR35			
CB116A	MH116	OPSD 705.010	S19.1	106.17	104.45	103.40	250	PVC DR35			
CB116B	MH116	OPSD 705.010	S19.1	106.03		103.40	200	PVC DR35			
CB116C	MH116	OPSD 705.010	S19.1	106.27		104.77	200	PVC DR35			
CB116D	MH116	OPSD 705.010	S19.1	106.27	104.65	104.55	250	PVC DR35			
CB120B	MH121	OPSD 705.010	S19.1	105.59		104.09	200	PVC DR35			
CB121A	MH121	OPSD 705.010	S19.1	105.40		103.90	200	PVC DR35			
CB121B	MH121	OPSD 705.010	S19.1	105.45		103.95	200	PVC DR35			
CB122A	MH121	OPSD 705.010	S19.1	105.63		102.95	200	PVC DR35			
CBMH123A	MH123	OPSD 705.010	S28.1	105.77	104.14	102.90	300	PVC DR35	1.65	29	CUSTOM IPEX TEMPEST
CB123B	MH123	OPSD 705.010	S19.1	105.77		104.24	200	PVC DR35			
CB124A	MH123	OPSD 705.010	S19.1	105.62	104.05	103.95	250	PVC DR35	1.65	19	STANDARD IPEX MHF 83MM DIA.
CB124B	MH123	OPSD 705.010	S19.1	105.69		104.20	200	PVC DR35			
CB203	MH120	OPSD 705.010	S19.1	105.12		103.62	250	PVC DR35			
CBMH120A	MH120	OPSD 701.010	S28.1	105.52	103.93	103.30	300	PVC DR35			
CBMH122	MH121	OPSD 701.010		105.63	NE102.91 SE102.90	102.75	300	PVC DR35			
DI	EXT	OPSD 705.040	OPSD 403.010	107.09		104.690	450	CONC. CL 100-D			

CLIENT

CLARIDGE HOMES

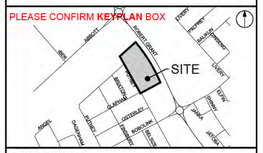
IBI Group Professional Services (Canada) Inc.
is a member of the IBI Group of companies

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED TO CITY FOR REVIEW	2021.01.22
2	REVISED PER CITY COMMENTS	2021.05.10

:SEE 010 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS
:SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR/ AOV.

PLEASE CONFIRM KEYPLAN BOX



CONSULTANTS

NOT FOR CONSTRUCTION

SEAL

LICENSED PROFESSIONAL ENGINEER
L.D. 45. Yannoulopoulos
2021/01/22
PROVINCE OF ONTARIO

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400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
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PROJECT

CRT

BLOCK 324

PROJECT NO: 126715	
DRAWN BY: D.D. E.H.	CHECKED BY: DGY
PROJECT MGR: DGY	APPROVED BY: DGY

SHEET TITLE

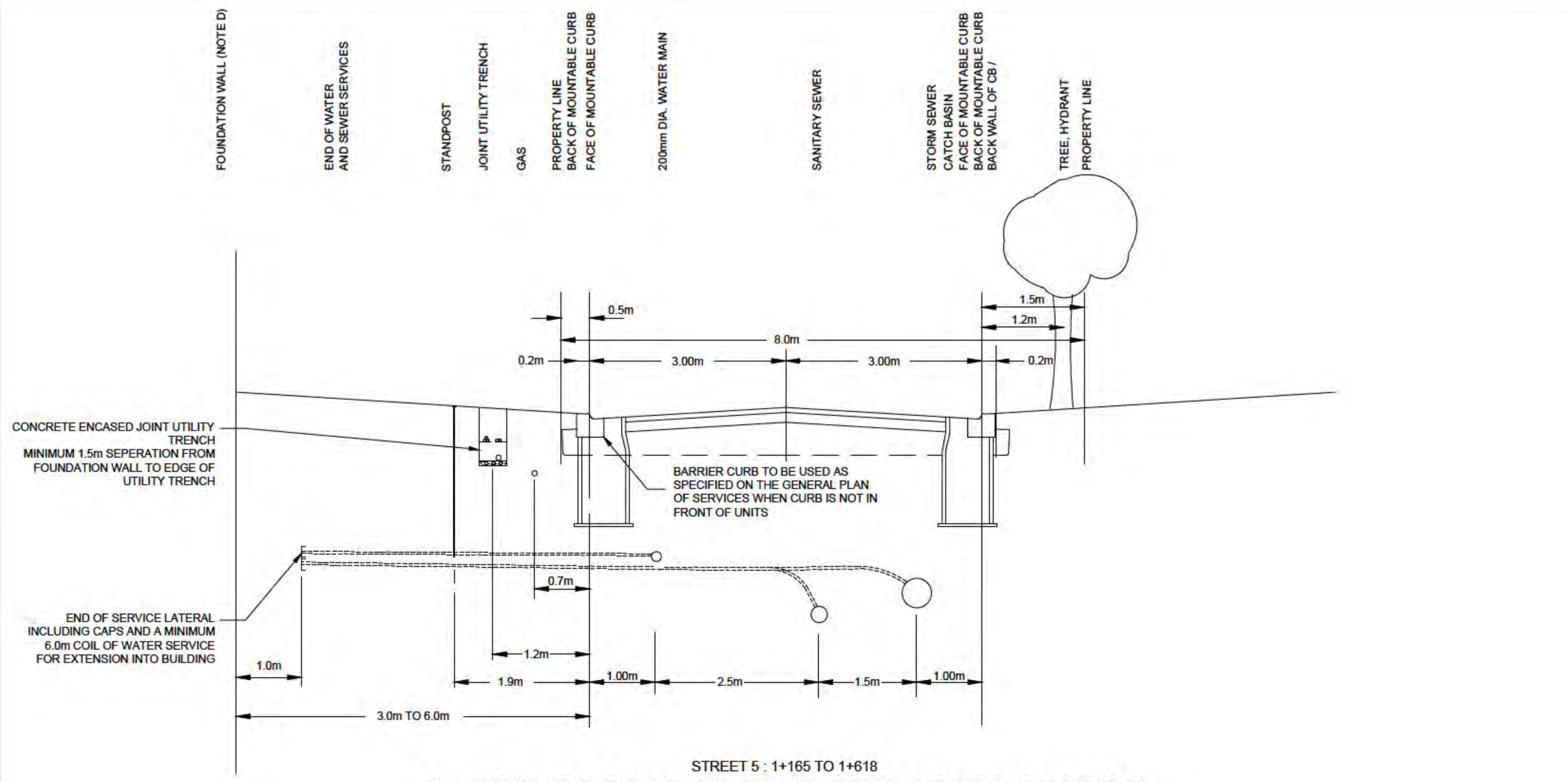
GENERAL NOTES, LEGEND AND CB DATA TABLE

SHEET NUMBER	ISSUE
010	1

SCALE CHECK 10mm 1 in

File Location: J:\126715_CRT_Block32\47.0_Production\7.03_Design\04_Civil\Sheets\010 NOTES-LEGEND-CB DATA.dwg Last Saved: July 16, 2021 by Ehemie Plotted: Friday, July 16, 2021 3:08:48 PM by Eric Hemie

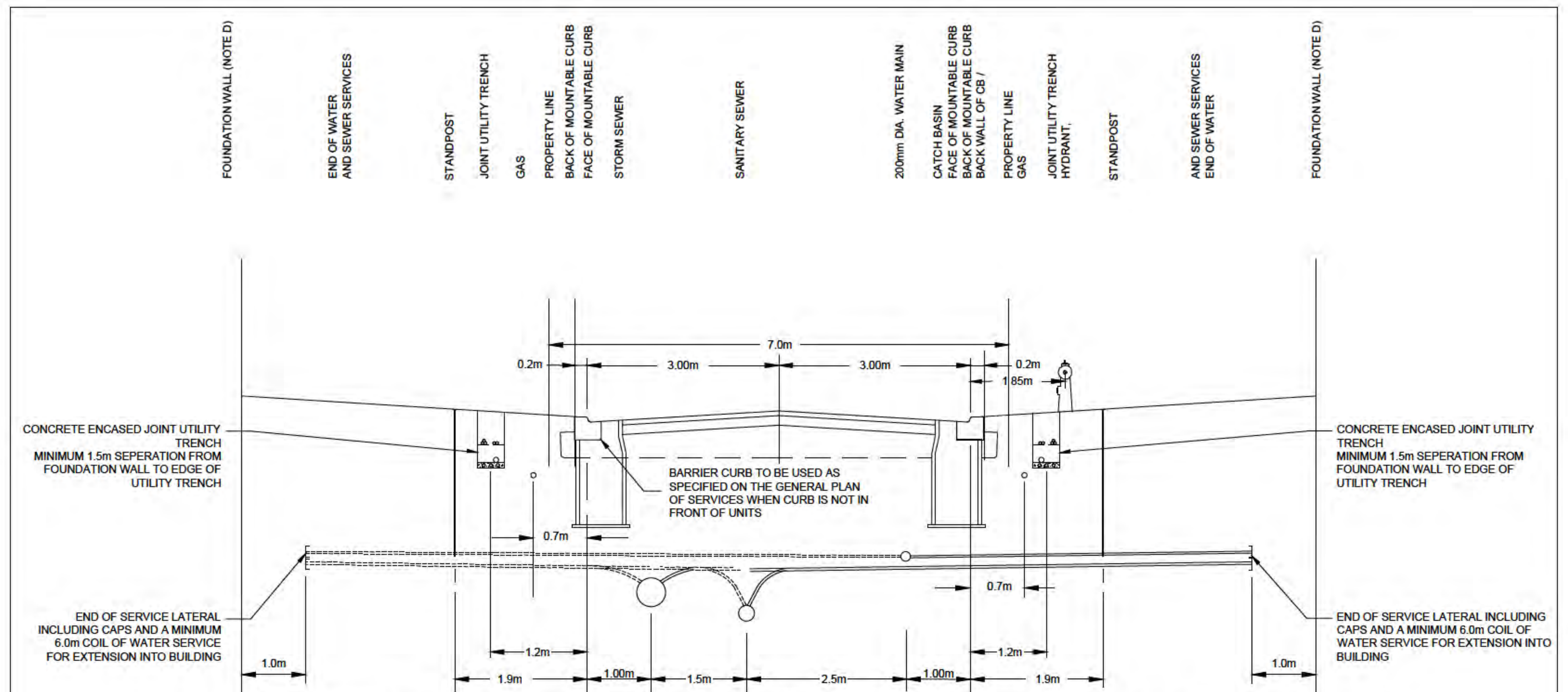
CITY FILE No. D07-12-21-0022 CITY PLAN No. 18416



STREET 5 : 1+165 TO 1+618

8m PRIVATE ROAD 6m PAVEMENT CROSS SECTION

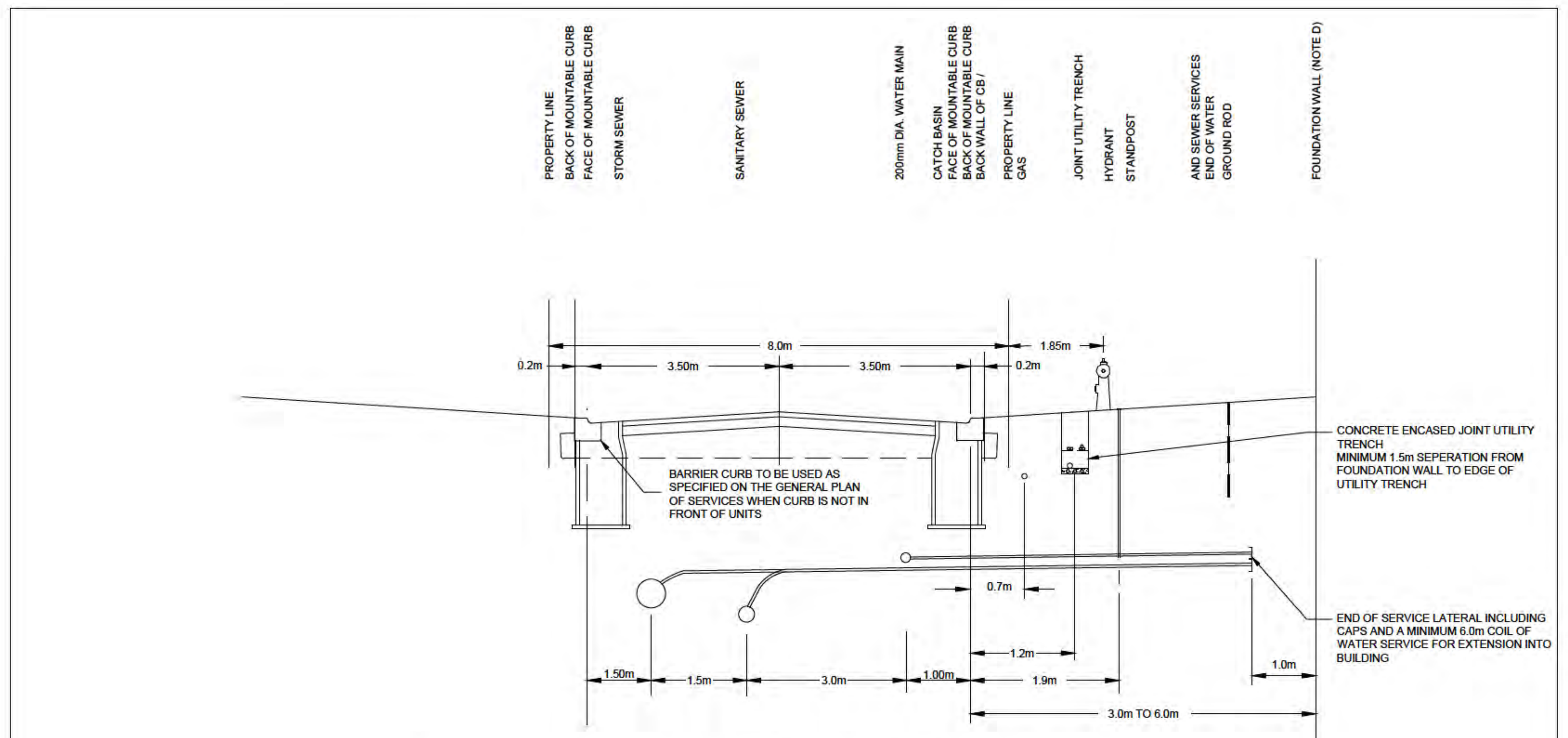
N.T.S



STREET 2 1+046 TO 1+126
STREET 3
STREET 4 1+012 TO 1+085, 1+127 TO 1+200
STREET 5 1+012 TO 1+087

7m PRIVATE ROAD 6m PAVEMENT CROSS SECTION

N.T.S



STREET 1

8m PRIVATE ROAD 7m PAVEMENT CROSS SECTION

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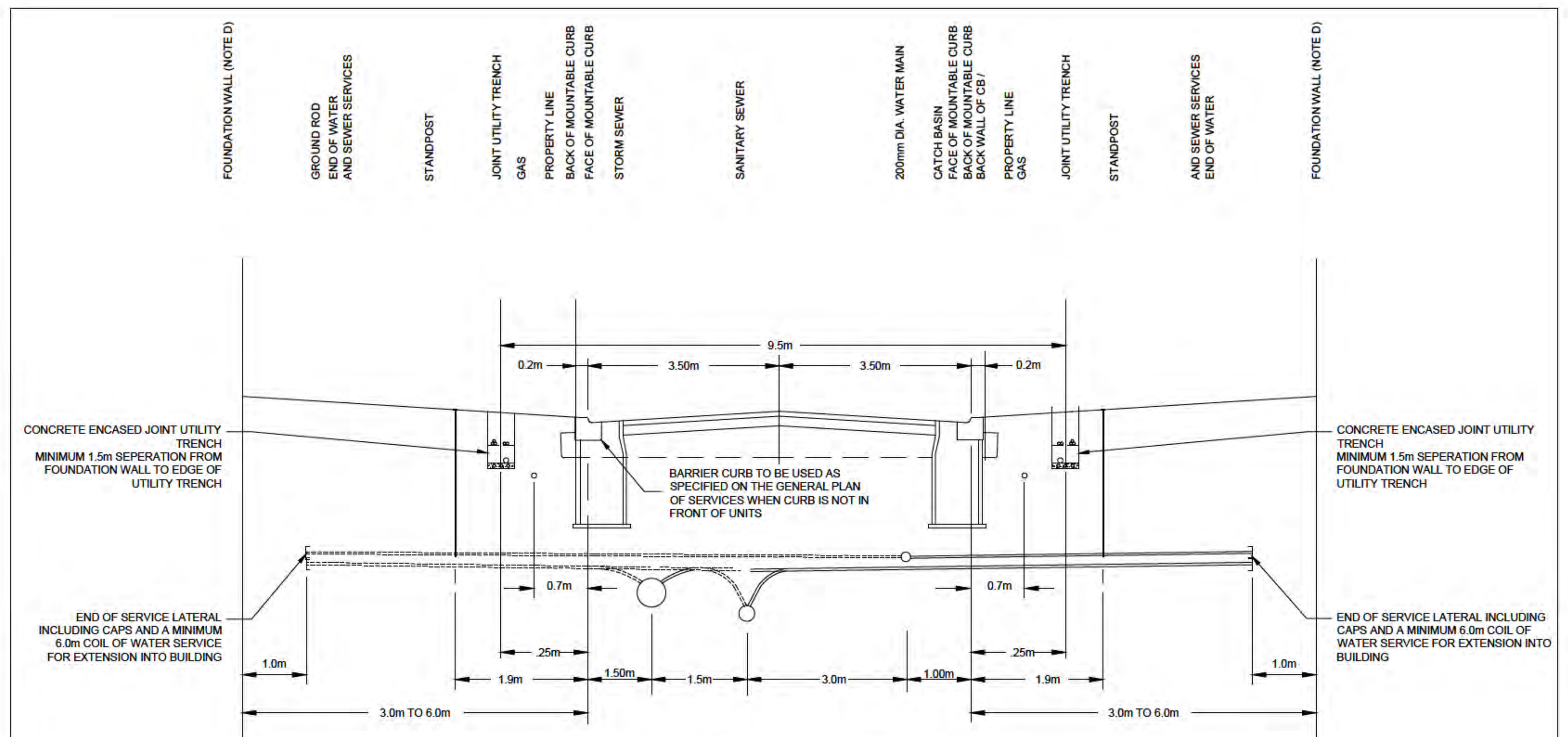

STREET 2 0+998 TO 1+046

9.5m PRIVATE ROAD 7m PAVEMENT CROSS SECTION

N.T.S

CLIENT

CLARIDGE HOMES

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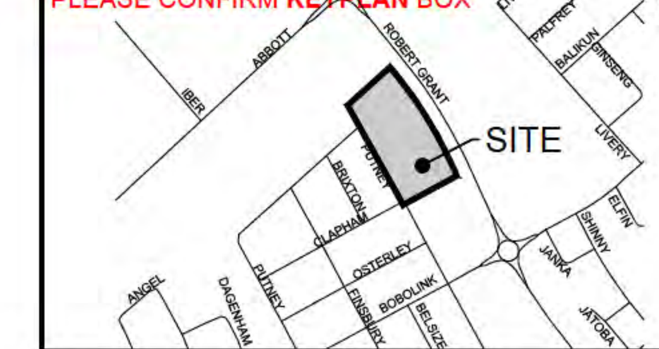
ISSUES

No.	DESCRIPTION	DATE
1	ISSUED TO CITY FOR REVIEW	2021:01:22
2	REVISED PER CITY COMMENTS	2021:07:16

-SEE 010 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS
-SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR AOV.

PLEASE CONFIRM KEYPLAN BOX



CONSULTANTS

NOT FOR CONSTRUCTION

SEAL

LICENSED PROFESSIONAL ENGINEER
D. G. Yannoulopoulos
2021/07/16
PROVINCE OF ONTARIO

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Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

PROJECT

CRT

BLOCK 324

PROJECT NO:
126715

DRAWN BY:	CHECKED BY:
D.D. E.H.	DGY
PROJECT MGR:	APPROVED BY:
DGY	DGY

SHEET TITLE

STREET SECTIONS

SHEET NUMBER: 011

ISSUE: 1

CITY FILE No. D07-12-21-0022 CITY PLAN No. 18416

APPENDIX C

CRT Lands Phase 1 Sanitary Sewer Design Sheet (original)
CRT Lands Phase 1 Sanitary Sewer Design Sheet (updated criteria)
Blk 324 Sanitary Sewer Design Sheet
126715-400 Sanitary Drainage Area Plan

IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

SANITARY SEWER DESIGN SHEET

PROJECT: CRT DEVELOPMENT
LOCATION: CITY OF OTTAWA
CLIENT: CRT DEVELOPMENT INC.

LOCATION				RESIDENTIAL									ICI AREAS							INFILTRATION ALLOWANCE			TOTAL FLOW	PROPOSED SEWER DESIGN						
				UNIT TYPES				AREA	POPULATION		PEAK FACTOR	PEAK FLOW	AREA (Ha)						PEAK FLOW	AREA (Ha)		FLOW		CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH	SF	SD	TH	APT	(Ha)	IND	CUM		(L/s)	INSTITUTIONAL		COMMERCIAL		INDUSTRIAL		(L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
													IND	CUM	IND	CUM	IND	CUM												
PUTNEY CRESCENT	141A	141A	142A			1		0.06	2.5	2.5	4.00	0.04		0.00		0.00		0.00	0.00	0.06	0.06	0.02	0.06	24.19	9.07	200	0.50	0.746	24.14	99.76
PUTNEY CRESCENT	142A	142A	143A			11		0.35	27.5	30.0	4.00	0.49		0.00		0.00		0.00	0.00	0.35	0.41	0.11	0.60	47.16	55.56	200	1.90	1.454	46.56	98.73
PUTNEY CRESCENT	143A	143A	144A			17		0.49	42.5	72.5	4.00	1.17		0.00		0.00		0.00	0.00	0.49	0.90	0.25	1.43	41.91	64.86	200	1.50	1.292	40.48	96.60
FINSBURY AVENUE	136AA	136A	144A			21		0.65	52.5	52.5	4.00	0.85		0.00		0.00		0.00	0.00	0.65	0.65	0.18	1.03	53.56	110.44	200	2.45	1.652	52.52	98.07
PUTNEY CRESCENT	144A	144A	145A			10		0.36	25.0	150.0	4.00	2.43		0.00		0.00		0.00	0.00	0.36	1.91	0.53	2.97	32.46	80.25	200	0.90	1.001	29.50	90.86
CLAPHAM TERRACE	136AB	136A	137A			10		0.37	25.0	25.0	4.00	0.41		0.00		0.00		0.00	0.00	0.37	0.37	0.10	0.51	24.19	78.00	200	0.50	0.746	23.69	97.90
BRIXTON WAY	137AA	137A	160A			12		0.35	30.0	55.0	4.00	0.89		0.00		0.00		0.00	0.00	0.35	0.72	0.20	1.09	41.91	50.77	200	1.50	1.292	40.81	97.39
BRIXTON WAY	160A	160A	145A			18		0.54	45.0	100.0	4.00	1.62		0.00		0.00		0.00	0.00	0.54	1.26	0.35	1.97	52.45	78.53	200	2.35	1.617	50.48	96.24
PUTNEY CRESCENT	145A	145A	146A			11		0.34	27.5	277.5	4.00	4.50		0.00		0.00		0.00	0.00	0.34	3.51	0.98	5.48	39.76	70.87	200	1.35	1.226	34.28	86.22
CLAPHAM WAY	137AB	137A	138A			9		0.38	22.5	22.5	4.00	0.36		0.00		0.00		0.00	0.00	0.38	0.38	0.11	0.47	37.48	78.00	200	1.20	1.156	37.01	98.74
PUTNEY CRESCENT	138A	138A	148A			10		0.35	25.0	47.5	4.00	0.77		0.00		0.00		0.00	0.00	0.35	0.73	0.20	0.97	40.49	77.95	200	1.40	1.248	39.51	97.59
PUTNEY CRESCENT	148A	148A	147A			7		0.26	17.5	65.0	4.00	1.05		0.00		0.00		0.00	0.00	0.26	0.99	0.28	1.33	55.70	59.50	200	2.65	1.718	54.37	97.61
PUTNEY CRESCENT	147A	147A	146A			0		0.03	0.0	65.0	4.00	1.05		0.00		0.00		0.00	0.00	0.03	1.02	0.29	1.34	55.70	12.47	200	2.65	1.718	54.36	97.60
BLOCK 323	146A	146A	161A			0		0.03	0.0	342.5	4.00	5.55		0.00		0.00		0.00	0.00	0.03	4.56	1.28	6.83	28.63	38.97	200	0.70	0.883	21.80	76.15
BLOCK 316	HYD. 2	161A	*Ex.209*			0		5.12	0.0	342.5	4.00	5.55		0.00		0.00		0.00	0.00	5.12	9.68	2.71	8.26	28.63	53.67	200	0.70	0.883	20.37	71.15
BLOCK 324	RES.1	BULKHEAD	*Ex.209*					1.89	170.1	170.1	4.00	2.76		0.00		0.00		0.00	0.00	1.89	1.89	0.53	3.29	43.87	8.00	250	0.50	0.866	40.58	92.51
				Refer to ECA No. 9079-9LNNZC dated July 9, 2014 for description of existing sewers.																											

Design Parameters:

Residential

SF	3.3	p/p/u
TH/SD	2.5	p/p/u
APT	1.8	p/p/u
Low	60	p/p/Ha
Med	75	p/p/Ha
High	90	p/p/Ha

ICI Areas

			Peak Factor
INST	50,000	L/Ha/day	1.5
COM	50,000	L/Ha/day	1.5
IND	35,000	L/Ha/day	MOE Chart

Notes:

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

Designed: J.I.M.

Checked: P.K.

Dwg. Reference: 27970 - 501, 501A, 501B

No.	Revision	Date
1.	Submission No. 1 to City of Ottawa	2013-08-29
2.	Submission No. 2 to City of Ottawa	2014-01-22
3.	Submission No. 3 to City of Ottawa	2014-08-22
4.	Submission No. 4 to City of Ottawa	2015-06-15
5.	Submission No. 5 to City of Ottawa	2016-11-10
6.	Submission for MOE Approval	2017-02-10
7.	Resubmission for MOE Approval	2017-07-14

File Reference:	Date:	Sheet No:
27970.5.7.1	2017-07-14	1 of 4

IBI GROUP
IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

SANITARY SEWER DESIGN SHEET

PROJECT: CRT DEVELOPMENT
LOCATION: CITY OF OTTAWA
CLIENT: CRT DEVELOPMENT INC.

LOCATION				RESIDENTIAL									ICI AREAS							INFILTRATION ALLOWANCE			TOTAL FLOW	PROPOSED SEWER DESIGN						
				UNIT TYPES				AREA	POPULATION		PEAK FACTOR	PEAK FLOW	AREA (Ha)						PEAK FLOW	AREA (Ha)		FLOW		CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH	SF	SD	TH	APT	(Ha)	IND	CUM		(L/s)	INSTITUTIONAL		COMMERCIAL		INDUSTRIAL		(L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
													IND	CUM	IND	CUM	IND	CUM												
CLAPHAM TERRACE	136AC	136A	135A			11		0.41	27.5	27.5	4.00	0.45		0.00		0.00		0.00	0.00	0.41	0.41	0.11	0.56	27.59	65.31	200	0.65	0.851	27.03	97.97
CLAPHAM TERRACE	135A	135A	134A			9		0.31	22.5	50.0	4.00	0.81		0.00		0.00		0.00	0.00	0.31	0.72	0.20	1.01	27.59	57.36	200	0.65	0.851	26.57	96.33
PUTNEY CRESCENT	141A	141A	134A			9		0.34	22.5	22.5	4.00	0.36		0.00		0.00		0.00	0.00	0.34	0.34	0.10	0.46	32.46	75.02	200	0.90	1.001	32.00	98.58
PUTNEY CRESCENT	134A	134A	140A	6				0.34	19.8	92.3	4.00	1.50		0.00		0.00		0.00	0.00	0.34	1.40	0.39	1.89	32.46	78.00	200	0.90	1.001	30.57	94.18
OSTERLEY WAY	153A	153A	152A	8				0.51	26.4	26.4	4.00	0.43		0.00		0.00		0.00	0.00	0.51	0.51	0.14	0.57	29.63	49.25	200	0.75	0.914	29.06	98.07
OSTERLEY WAY	152A	152A	151A	17				0.78	56.1	82.5	4.00	1.34		0.00		0.00		0.00	0.00	0.78	1.29	0.36	1.70	29.63	95.75	200	0.75	0.914	27.93	94.27
OSTERLEY WAY	151A	151A	150A	10				0.47	33.0	115.5	4.00	1.87		0.00		0.00		0.00	0.00	0.47	1.76	0.49	2.36	29.63	59.68	200	0.75	0.914	27.27	92.02
OSTERLEY WAY	150A	150A	140A	9				0.42	29.7	145.2	4.00	2.35		0.00		0.00		0.00	0.00	0.42	2.18	0.61	2.96	29.63	62.98	200	0.75	0.914	26.67	90.00
PUTNEY CRESCENT	140A	140A	124A	3				0.24	9.9	247.4	4.00	4.01		0.00		0.00		0.00	0.00	0.24	3.82	1.07	5.08	32.46	78.00	200	0.90	1.001	27.38	84.36
BLOCK 343	RES.2	BLKHD	129A					1.21	108.9	108.9	4.00	1.76		0.00		0.00		0.00	0.00	1.21	1.21	0.34	2.10	20.24	19.00	200	0.35	0.624	18.14	89.61
BOBOLINK RIDGE	129A	129A	128A	0				0.09	0.0	108.9	4.00	1.76		0.00		0.00		0.00	0.00	0.09	1.30	0.36	2.13	31.02	45.00	250	0.25	0.612	28.89	93.14
BOBOLINK RIDGE	128AA	128A	127A	6				0.41	19.8	128.7	4.00	2.09		0.00		0.00		0.00	0.00	0.41	1.71	0.48	2.56	31.02	78.00	250	0.25	0.612	28.46	91.73
BOBOLINK RIDGE	127AA	127A	126A	10				0.53	33.0	161.7	4.00	2.62		0.00		0.00		0.00	0.00	0.53	2.24	0.63	3.25	31.02	78.00	250	0.25	0.612	27.77	89.53
BOBOLINK RIDGE	126A	126A	125A	5				0.33	16.5	178.2	4.00	2.89		0.00		0.00		0.00	0.00	0.33	2.57	0.72	3.61	31.02	47.81	250	0.25	0.612	27.41	88.37
BOBOLINK RIDGE	125A	125A	124A	12				0.56	39.6	217.8	4.00	3.53		0.00		0.00		0.00	0.00	0.56	3.13	0.88	4.41	31.02	74.85	250	0.25	0.612	26.61	85.80
BOBOLINK RIDGE	124A	124A	123A	11				0.61	36.3	501.5	3.97	8.07		0.00		0.00		0.00	0.00	0.61	7.56	2.12	10.19	31.02	88.85	250	0.25	0.612	20.83	67.15
DAGENHAM STREET	PARK1, 131A	131A	130A	7				1.70	23.1	23.1	4.00	0.37		0.00		0.00		0.00	0.00	1.70	1.70	0.48	0.85	34.22	43.00	200	1.00	1.055	33.37	97.51
DAGENHAM STREET	130A	130A	123A	8				0.46	26.4	49.5	4.00	0.80		0.00		0.00		0.00	0.00	0.46	2.16	0.60	1.41	34.22	87.11	200	1.00	1.055	32.81	95.89
BOBOLINK RIDGE	123A	123A	122A	2				0.14	6.6	557.6	3.95	8.92		0.00		0.00		0.00	0.00	0.14	9.86	2.76	11.68	31.02	25.98	250	0.25	0.612	19.34	62.34
BOBOLINK RIDGE	122A	122A	121A	5				0.26	16.5	574.1	3.94	9.17		0.00		0.00		0.00	0.00	0.26	10.12	2.83	12.00	31.02	36.36	250	0.25	0.612	19.02	61.31
BOBOLINK RIDGE	121A	121A	120A	6				0.30	19.8	593.9	3.93	9.47		0.00		0.00		0.00	0.00	0.30	10.42	2.92	12.38	31.02	40.43	250	0.25	0.612	18.64	60.08
ANGEL HEIGHTS	111A	111A	112A	1				0.08	3.3	3.3	4.00	0.05		0.00		0.00		0.00	0.00	0.08	0.08	0.02	0.08	28.63	12.92	200	0.70	0.883	28.55	99.73
ANGEL HEIGHTS	112A	112A	113A	13				0.77	42.9	46.2	4.00	0.75		0.00		0.00		0.00	0.00	0.77	0.85	0.24	0.99	28.63	95.21	200	0.70	0.883	27.64	96.55
ANGEL HEIGHTS	113A	113A	114A	6				0.29	19.8	66.0	4.00	1.07		0.00		0.00		0.00	0.00	0.29	1.14	0.32	1.39	28.63	38.92	200	0.70	0.883	27.24	95.15
ANGEL HEIGHTS	114A	114A	120A	6				0.35	19.8	85.8	4.00	1.39		0.00		0.00		0.00	0.00	0.35	1.49	0.42	1.81	28.63	70.46	200	0.70	0.883	26.82	93.69
BOBOLINK RIDGE	120A	120A	105A	11				0.62	36.3	716.0	3.89	11.28		0.00		0.00		0.00	0.00	0.62	12.53	3.51	14.79	36.70	90.60	250	0.35	0.724	21.91	59.71

Design Parameters:

Residential			ICI Areas		
					Peak Factor
SF	3.3	p/p/u			
TH/SD	2.5	p/p/u	INST	50,000 L/Ha/day	1.5
APT	1.8	p/p/u	COM	50,000 L/Ha/day	1.5
Low	60	p/p/Ha	IND	35,000 L/Ha/day	MOE Chart
Med	75	p/p/Ha			
High	90	p/p/Ha			

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

Designed: J.I.M.
Checked: P.K.
Dwg. Reference: 27970 - 501, 501A, 501B

No.	Revision	Date
1.	Submission No. 1 to City of Ottawa	2013-08-29
2.	Submission No. 2 to City of Ottawa	2014-01-22
3.	Submission No. 3 to City of Ottawa	2014-08-22
4.	Submission No. 4 to City of Ottawa	2015-06-15
5.	Submission No. 5 to City of Ottawa	2016-11-10
6.	Submission for MOE Approval	2017-02-10
7.	Resubmission for MOE Approval	2017-07-14

File Reference: 27970.5.7.1
Date: 2017-07-14
Sheet No: 2 of 4

IBI GROUP
IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

SANITARY SEWER DESIGN SHEET

PROJECT: CRT DEVELOPMENT
LOCATION: CITY OF OTTAWA
CLIENT: CRT DEVELOPMENT INC.

LOCATION				RESIDENTIAL									ICI AREAS							INFILTRATION ALLOWANCE			TOTAL FLOW	PROPOSED SEWER DESIGN						
				UNIT TYPES				AREA	POPULATION		PEAK FACTOR	PEAK FLOW	AREA (Ha)						PEAK FLOW	AREA (Ha)		FLOW		CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH	SF	SD	TH	APT	(Ha)	IND	CUM		(L/s)	INSTITUTIONAL		COMMERCIAL		INDUSTRIAL		(L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
													IND	CUM	IND	CUM	IND	CUM												
EMBANKMENT STREET	128AB	128A	188A	16				0.74	52.8	52.8	4.00	0.86		0.00		0.00		0.00	0.00	0.74	0.74	0.21	1.06	27.59	98.00	200	0.65	0.851	26.52	96.15
EMBANKMENT STREET	188A	188A	189A	11				0.52	36.3	89.1	4.00	1.44		0.00		0.00		0.00	0.00	0.52	1.26	0.35	1.80	27.59	74.80	200	0.65	0.851	25.79	93.49
BLOCK 344	RES.3	192A	189A					1.52	136.8	136.8	4.00	2.22		0.00		0.00		0.00	0.00	1.52	1.52	0.43	2.64	20.24	40.00	200	0.35	0.624	17.60	86.95
EMBANKMENT STREET	189A	189A	190A	14				0.69	46.2	272.1	4.00	4.41		0.00		0.00		0.00	0.00	0.69	3.47	0.97	5.38	20.24	92.53	200	0.35	0.624	14.86	73.42
EMBANKMENT STREET		190A	176A	0				0.00	0.0	272.1	4.00	4.41		0.00		0.00		0.00	0.00	0.00	3.47	0.97	5.38	20.24	10.78	200	0.35	0.624	14.86	73.42
BLOCK 345	INST.2	BULKHEAD	176A	0				0.00	0.0	0.0	4.00	0.00	6.53	6.53		0.00		0.00	5.67	6.53	6.53	1.83	7.50	20.24	21.00	200	0.35	0.624	12.75	62.97
COPE DRIVE	176A	176A	175A	3				0.63	9.9	282.0	4.00	4.57		6.53		0.00		0.00	5.67	0.63	10.63	2.98	13.21	20.24	76.03	200	0.35	0.624	7.03	34.72
COPE DRIVE	175A	175A	174A	5				0.46	16.5	298.5	4.00	4.84		6.53		0.00		0.00	5.67	0.46	11.09	3.11	13.61	20.24	84.94	200	0.35	0.624	6.63	32.76
BELSIZE WAY	127AB	127A	185A	11				0.53	36.3	36.3	4.00	0.59		0.00		0.00		0.00	0.00	0.53	0.53	0.15	0.74	27.59	88.50	200	0.65	0.851	26.85	97.33
BELSIZE WAY	185A	185A	186A	13				0.59	42.9	79.2	4.00	1.28		0.00		0.00		0.00	0.00	0.59	1.12	0.31	1.60	27.59	83.61	200	0.65	0.851	25.99	94.21
PINNER ROAD	191A	191A	186A	3				0.24	9.9	9.9	4.00	0.16		0.00		0.00		0.00	0.00	0.24	0.24	0.07	0.23	27.59	43.00	200	0.65	0.851	27.36	99.17
PINNER ROAD	186A	186A	187A	5				0.35	16.5	105.6	4.00	1.71		0.00		0.00		0.00	0.00	0.35	1.71	0.48	2.19	20.24	70.39	200	0.35	0.624	18.05	89.18
PINNER ROAD		187A	183A	0				0.00	0.0	105.6	4.00	1.71		0.00		0.00		0.00	0.00	0.00	1.71	0.48	2.19	20.24	9.00	200	0.35	0.624	18.05	89.18
FINSBURY AVENUE	182A	182A	183A	16				0.97	52.8	52.8	4.00	0.86		0.00		0.00		0.00	0.00	0.97	0.97	0.27	1.13	32.46	117.13	200	0.90	1.001	31.33	96.53
FINSBURY AVENUE	183A	183A	184A	4				0.33	13.2	171.6	4.00	2.78		0.00		0.00		0.00	0.00	0.33	3.01	0.84	3.62	20.24	65.71	200	0.35	0.624	16.62	82.10
FINSBURY AVENUE		184A	174A	0				0.00	0.0	171.6	4.00	2.78		0.00		0.00		0.00	0.00	0.00	3.01	0.84	3.62	20.24	17.89	200	0.35	0.624	16.62	82.10
COPE DRIVE	174A	174A	173A	7				0.47	23.1	493.2	3.98	7.95		6.53		0.00		0.00	5.67	0.47	14.57	4.08	17.69	31.02	82.90	250	0.25	0.612	13.33	42.96
COPE DRIVE	173A	173A	172A	6				0.41	19.8	513.0	3.97	8.25		6.53		0.00		0.00	5.67	0.41	14.98	4.19	18.11	31.02	76.02	250	0.25	0.612	12.91	41.62
BLOCK 313	INST.1	BULKHEAD	172A	0				0.00	0.0	0.0	4.00	0.00	2.88	2.88		0.00		0.00	2.50	2.88	2.88	0.81	3.31	20.24	16.00	200	0.35	0.624	16.94	83.67
COPE DRIVE	172A	172A	171B	3				0.23	9.9	522.9	3.96	8.40		9.41		0.00		0.00	8.17	0.23	18.09	5.07	21.63	31.02	36.96	250	0.25	0.612	9.39	30.27
COPE DRIVE	171B	171B	171A	2				0.22	6.6	529.5	3.96	8.50		9.41		0.00		0.00	8.17	0.22	18.31	5.13	21.79	31.02	41.21	250	0.25	0.612	9.23	29.75
DAGENHAM STREET	180A	180A	181A	7				0.50	23.1	23.1	4.00	0.37		0.00		0.00		0.00	0.00	0.50	0.50	0.14	0.51	20.24	90.00	200	0.35	0.624	19.73	97.46
DAGENHAM STREET	181A	181A	171A	0				0.11	0.0	23.1	4.00	0.37		0.00		0.00		0.00	0.00	0.11	0.61	0.17	0.55	20.24	67.50	200	0.35	0.624	19.70	97.31
COPE DRIVE	171A	171A	170B	1				0.17	3.3	555.9	3.95	8.90		9.41		0.00		0.00	8.17	0.17	19.09	5.35	22.41	45.12	37.91	300	0.20	0.618	22.71	50.33
COPE DRIVE	170B	170B	170A	3				0.25	9.9	565.8	3.95	9.04		9.41		0.00		0.00	8.17	0.25	19.34	5.42	22.63	45.12	43.98	300	0.20	0.618	22.49	49.84
BLOCK 312	RES.3A	BULKHEAD	sewer	0				3.26	195.6	195.6	4.00	3.17		0.00		0.00		0.00	0.00	3.26	3.26	0.91	4.08	20.24	16.22	200	0.35	0.624	16.16	79.83
COPE DRIVE	170A	170A	110A	6				0.62	19.8	781.2	3.87	12.24		9.41		0.00		0.00	8.17	0.62	23.22	6.50	26.91	45.12	120.00	300	0.20	0.618	18.21	40.36
GOLDHAWK DRIVE	306A	SOUTH	303A	31				1.83	102.3	102.3	4.00	1.66		0.00		0.00		0.00	0.00	1.83	1.83	0.51	2.17							
STREET NO. 26	304A	WEST	303A	14				0.69	46.2	46.2	4.00	0.75		0.00		0.00		0.00	0.00	0.69	0.69	0.19	0.94							
GOLDHAWK DRIVE	303A	303A	302A	10				0.62	33.0	181.5	4.00	2.94		0.00		0.00		0.00	0.00	0.62	3.14	0.88	3.82	20.24	94.58	200	0.35	0.624	16.42	81.13
Future Street	RES.5, 5A, Park3	EAST	302A					23.97	1421.4	1421.4	3.70	21.28		0.00		0.00		0.00	0.00	23.97	23.97	6.71	28.00							
GOLDHAWK DRIVE	302A	302A	301A	10				0.56	33.0	1635.9	3.65	24.20		0.00		0.00		0.00	0.00	0.56	27.67	7.75	31.95	50.44	70.68	300	0.25	0.691	18.49	36.66
GOLDHAWK DRIVE	301A	301A	207A	6				0.37	19.8	1655.7	3.65	24.47		0.00		0.00		0.00	0.00	0.37	28.04	7.85	32.32	50.44	70.00	300	0.25	0.691	18.12	35.93
STREET NO. 2	RES.4	EAST	207A					13.88	832.8	832.8	3.85	12.99		0.00		0.00		0.00	0.00	13.88	13.88	3.89	16.87							
GOLDHAWK DRIVE	207A	207A	206A	17				0.86	56.1	2544.6	3.50	36.10		0.00		0.00		0.00	0.00	0.86	42.78	11.98	48.08	70.84	107.19	375	0.15	0.621	22.76	32.13
GOLDHAWK DRIVE	206A	206A	205A	12				0.69	39.6	2584.2	3.50	36.60		0.00		0.00		0.00	0.00	0.69	43.47	12.17	48.78	70.84	106.61	375	0.15	0.621	22.07	31.15
GOLDHAWK DRIVE	205A	205A	110A	5				0.44	16.5	2600.7	3.49	36.81		0.00		0.00		0.00	0.00	0.44	43.91	12.29	49.11	70.84	100.61	375	0.15	0.621	21.73	30.68

Design Parameters:

Residential

SF	3.3	p/p/u
TH/SD	2.5	p/p/u
APT	1.8	p/p/u
Low	60	p/p/Ha
Med	75	p/p/Ha
High	90	p/p/Ha

ICI Areas

			Peak Factor
INST	50,000	L/Ha/day	1.5
COM	50,000	L/Ha/day	1.5
IND	35,000	L/Ha/day	MOE Chart

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

Designed: J.I.M.

Checked: P.K.

Dwg. Reference: 27970 - 501, 501A, 501B

No.	Revision	Date
1.	Submission No. 1 to City of Ottawa	2013-08-29
2.	Submission No. 2 to City of Ottawa	2014-01-22
3.	Submission No. 3 to City of Ottawa	2014-08-22
4.	Submission No. 4 to City of Ottawa	2015-06-15
5.	Submission No. 5 to City of Ottawa	2016-11-10
6.	Submission for MOE Approval	2017-02-10
7.	Resubmission for MOE Approval	2017-07-14

File Reference: 27970.5.7.1
Date: 2017-07-14
Sheet No: 3 of 4

IBI GROUP
IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

SANITARY SEWER DESIGN SHEET

PROJECT: CRT DEVELOPMENT
LOCATION: CITY OF OTTAWA
CLIENT: CRT DEVELOPMENT INC.

LOCATION				RESIDENTIAL									ICI AREAS							INFILTRATION ALLOWANCE			TOTAL	PROPOSED SEWER DESIGN						
				UNIT TYPES				AREA	POPULATION		PEAK	PEAK	AREA (Ha)						PEAK	AREA (Ha)		FLOW	FLOW	CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH	SF	SD	TH	APT	(Ha)	IND	CUM	FACTOR	FLOW (L/s)	INSTITUTIONAL IND	INSTITUTIONAL CUM	COMMERCIAL IND	COMMERCIAL CUM	INDUSTRIAL IND	INDUSTRIAL CUM	FLOW (L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
																							0.00							
	LSPS	Allowance						0.00	0.0	0.0													108.00							
	STITTSVILLE 6 PS		110A					0.00	0.0	0.0				0.00		0.00		0.00	0.00				84.00							
Future Street	INST.3	BLKHD	110A					0.00	0.0	0.0			2.47	2.47		0.00		0.00	2.14											
	PARK4	BLKHD	110A					0.83	0.0	0.0				0.00		0.00		0.00	0.00											
	PARK5	BLKHD	110A					1.04	0.0	0.0				0.00		0.00		0.00	0.00											
	RES.9	BLKHD	110A					34.81	2610.8	2610.8				0.00		0.00		0.00	0.00											
	RES.7	BLKHD	110A					4.24	318.0	318.0				0.00		0.00		0.00	0.00											
	RES.13	BLKHD	110A					2.22	133.2	133.2				0.00		0.00		0.00	0.00											
	RES.12	BLKHD	110A					43.89	2633.4	2633.4				0.00		0.00		0.00	0.00											
	INST.4	BLKHD	110A					0.00	0.0	0.0			2.44	2.44		0.00		0.00	2.12											
	COMM.	BLKHD	110A					0.00	0.0	0.0				0.00	0.63	0.63		0.00	0.55											
	HYD.4	BLKHD	110A					3.06	0.0	0.0				0.00		0.00		0.00	0.00											
	RES.8	BLKHD	110A					2.30	172.5	172.5				0.00		0.00		0.00	0.00											
	HYD.5	BLKHD	110A					5.20	0.0	0.0				0.00		0.00		0.00	0.00											
Future Street	RES.11	BLKHD	110A					6.91	414.6	414.6				0.00		0.00		0.00	0.00											
	PARK6	BLKHD	110A					1.19	0.0	0.0				0.00		0.00		0.00	0.00											
	RES.10	BLKHD	110A					1.92	115.2	115.2				0.00		0.00		0.00	0.00											
	HYD.3	BLKHD	110A					6.31	0.0	0.0				0.00		0.00		0.00	0.00											
TOTAL		BLKHD	110A					113.92		6397.7	3.14	81.49		4.91		0.63		0.00	4.81	119.46	119.46	33.45	311.74	320.28	24.02	600	0.25	1.097	8.54	2.67
GOLDHAWK DRIVE		**110A**	**109A**					**0.00**	**0.0**	**9779.6**	**2.96**	**117.43**		**14.32**		**0.63**		**0.00**	**12.98**	**0.00**	**186.59**	**52.25**	**374.66**	**378.96**	**61.28**	**600**	**0.35**	**1.298**	**4.30**	**1.14**
GOLDHAWK DRIVE	**110A**	**1101A**	**1092A**	**1**				**0.18**	**3.3**	**3.3**	**4.00**	**0.05**								**0.18**	**0.18**	**0.05**	**0.10**	**28.63**	**61.28**	**200**	**0.70**	**0.883**	**28.52**	**99.64**
GOLDHAWK DRIVE		**109A**	**108A**					**0.00**	**0.0**	**9782.9**	**2.96**	**117.47**		**14.32**		**0.63**		**0.00**	**12.98**	**0.00**	**186.77**	**52.30**	**374.74**	**378.96**	**57.50**	**600**	**0.35**	**1.298**	**4.22**	**1.11**
GOLDHAWK DRIVE	**109A**	**1091A**	**1082A**	5				**0.32**	**16.5**	**16.5**	**4.00**	**0.27**								**0.32**	**0.32**	**0.09**	**0.36**	**28.63**	**57.50**	**200**	**0.70**	**0.883**	**28.27**	**98.75**
GOLDHAWK DRIVE		**108A**	**107A**					**0.00**	**0.0**	**9799.4**	**2.96**	**117.64**		**14.32**		**0.63**		**0.00**	**12.98**	**0.00**	**187.09**	**52.39**	**375.00**	**378.96**	**53.32**	**600**	**0.35**	**1.298**	**3.96**	**1.05**
GOLDHAWK DRIVE	**108A**	**1081A**	**1072A**	**4**				**0.30**	**13.2**	**13.2**	**4.00**	**0.21**							**0.00**	**0.30**	**0.30**	**0.08**	**0.30**	**28.63**	**53.32**	**200**	**0.70**	**0.883**	**28.33**	**98.96**
GOLDHAWK DRIVE		**107A**	**106A**					**0.00**	**0.0**	**9812.6**	**2.96**	**117.77**		**14.32**		**0.63**		**0.00**	**12.98**	**0.00**	**187.39**	**52.47**	**375.22**	**378.96**	**62.94**	**600**	**0.35**	**1.298**	**3.74**	**0.99**
GOLDHAWK DRIVE	**107A**	**1071A**	**1062A**	**7**				**0.31**	**23.1**	**23.1**	**4.00**	**0.37**		**0.00**		**0.00**		**0.00**	**0.00**	**0.31**	**0.31**	**0.09**	**0.46**	**28.63**	**62.94**	**200**	**0.70**	**0.883**	**28.17**	**98.39**
GOLDHAWK DRIVE		**106A**	**105A**					**0.00**	**0.0**	**9835.7**	**2.96**	**118.01**		**14.32**		**0.63**		**0.00**	**12.98**	**0.00**	**187.70**	**52.56**	**375.54**	**378.96**	**60.09**	**600**	**0.35**	**1.298**	**3.42**	**0.90**
GOLDHAWK DRIVE	**106A**	**1061A**	**1052A**	**2**				**0.24**	**6.6**	**6.6**	**4.00**	**0.11**		**0.00**		**0.00**		**0.00**	**0.00**	**0.24**	**0.24**	**0.07**	**0.17**	**28.63**	**60.09**	**200**	**0.70**	**0.883**	**28.45**	**99.39**
		105A	**104A**					**0.00**	**0.0**	**10558.3**	**2.93**	**125.37**		**14.32**		**0.63**		**0.00**	**12.98**	**0.00**	**200.47**	**56.13**	**386.48**	**389.64**	**72.85**	**600**	**0.37**	**1.335**	**3.16**	**0.81**
GOLDHAWK DRIVE	**105A**	**1051A**	**1042A**	**7**				**0.45**	**23.1**	**23.1**	**4.00**	**0.37**								**0.45**	**0.45**	**0.13**	**0.50**	**27.59**	**72.85**	**200**	**0.65**	**0.851**	**27.09**	**98.19**
GOLDHAWK DRIVE		**104A**	**103A**					**0.00**	**0.0**	**10581.4**	**2.93**	**125.60**		**14.32**		**0.63**		**0.00**	**12.98**	**0.00**	**200.92**	**56.26**	**386.84**	**389.64**	**48.77**	**600**	**0.37**	**1.335**	**2.80**	**0.72**
GOLDHAWK DRIVE	**104A**	**1041A**	**1032A**	**9**				**0.47**	**29.7**	**29.7**	**4.00**	**0.48**							**0.00**	**0.47**	**0.47**	**0.13**	**0.61**	**27.59**	**48.77**	**200**	**0.65**	**0.851**	**26.97**	**97.78**
GOLDHAWK DRIVE		**103A**	**102A**					**0.00**	**0.0**	**10611.1**	**2.93**	**125.90**		**14.32**		**0.63**		**0.00**	**12.98**	**0.00**	**201.39**	**56.39**	**387.27**	**389.64**	**45.00**	**600**	**0.37**	**1.335**	**2.37**	**0.61**
GOLDHAWK DRIVE	**103A, HYD1**	**1031A**	**1021A**	**6**				**2.01**	**19.8**	**19.8**	**4.00**	**0.32**							**0.00**	**2.01**	**2.01**	**0.56**	**0.88**	**27.59**	**45.00**	**200**	**0.65**	**0.851**	**26.70**	**96.80**
GOLDHAWK DRIVE	**102A**	**102A**	***FT-24 (EX)***					**0.12**	**0.0**	**10630.9**	**2.93**	**126.10**		**14.32**		**0.63**		**0.00**	**12.98**	**0.12**	**203.52**	**56.99**	**388.07**	**389.64**	**102.59**	**600**	**0.37**	**1.335**	**1.57**	**0.40**
HYDRO EASEMENT		***FT-24 (EX)***	***FT-23 (EX)***					**0.00**	**0.0**	**10650.7**	**2.93**	**126.30**		**14.32**		**0.63**		**0.00**	**12.98**	**0.00**	**205.53**	**57.55**	**388.83**	**400.03**	**107.50**	**600**	**0.39**	**1.371**	**11.20**	**2.80**

Design Parameters:

Residential			ICI Areas			
SF	3.3	p/p/u				Peak Factor
TH/SD	2.5	p/p/u	INST	50,000	L/Ha/day	1.5
APT	1.8	p/p/u	COM	50,000	L/Ha/day	1.5
Low	60	p/p/Ha	IND	35,000	L/Ha/day	MOE Chart
Med	75	p/p/Ha				
High	90	p/p/Ha				

Notes:

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

Designed: J.I.M.

Checked: P.K.

Dwg. Reference: 27970 - 501, 501A, 501B

No.	Revision	Date
1.	Submission No. 1 to City of Ottawa	2013-08-29
2.	Submission No. 2 to City of Ottawa	2014-01-22
3.	Submission No. 3 to City of Ottawa	2014-08-22
4.	Submission No. 4 to City of Ottawa	2015-06-15
5.	Submission No. 5 to City of Ottawa	2016-11-10
6.	Submission for MOE Approval	2017-02-10
7.	Resubmission for MOE Approval	2017-07-14

File Reference:	Date:	Sheet No:
27970.5.7.1	2017-07-14	4 of 4

REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH

Signed _____

Date _____ 2017

Plan Number _____

LEGEND :

145A / 0.34 27.5 — AREA ID # / POPULATION / AREA IN HECTARES

FUTURE MINOR FLOW DIRECTION

NOTES:

1. THIS ALLOWANCE IS FOR OPA66 EXPANSION AREAS 6a, 6b AND 6c.

2. AN ALLOWANCE OF 100l/s HAS BEEN MADE FOR FLOWS TRIBUTARY TO THE LAIRD STREET PUMP STATION.

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7	RESUBMISSION FOR MOE APPROVAL	JIM	17:07:14
6	SUBMISSION FOR MOE APPROVAL	JIM	17:02:10
5	SUBMISSION #5 FOR CITY REVIEW	JIM	16:11:10
4	SUBMISSION #4 FOR CITY REVIEW	JIM	15:06:15
3	SUBMISSION #3 FOR CITY REVIEW	JIM	14:08:22
2	SUBMISSION #2 FOR CITY REVIEW	JIM	14:01:22
1	SUBMISSION #1 FOR CITY REVIEW	JIM	13:08:29

CRT DEVELOPMENT INC.

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

Project Title

CRT LANDS
FERNBANK COMMUNITY
PHASE 1

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
2017/07/14
PROVINCE OF ONTARIO

Drawing Title

SANITARY DRAINAGE
AREA PLAN

Scale
1:1250

Design	Date
J.I.M.	OCTOBER '12
Drawn	Checked
M.M.	P.K.
Project No.	Drawing No.
27970	501A

D07-16-11-0003

#17366

IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

SANITARY SEWER DESIGN SHEET

PROJECT: CRT DEVELOPMENT
LOCATION: CITY OF OTTAWA
CLIENT: CRT DEVELOPMENT INC.

LOCATION				RESIDENTIAL									ICI AREAS							INFILTRATION ALLOWANCE			TOTAL	PROPOSED SEWER DESIGN						
				UNIT TYPES				AREA	POPULATION		PEAK	PEAK	AREA (Ha)						PEAK	AREA (Ha)		FLOW	FLOW	CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
													INSTITUTIONAL		COMMERCIAL		INDUSTRIAL		FLOW								(full)		
STREET	AREA ID	FROM MH	TO MH	SF	SD	TH	APT	(Ha)	IND	CUM	FACTOR	FLOW (L/s)	IND	CUM	IND	CUM	IND	CUM	(L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(m/s)	L/s	(%)
PUTNEY CRESCENT	141A	141A	142A			1		0.06	2.5	2.5	4.00	0.03		0.00		0.00		0.00	0.00	0.06	0.06	0.02	0.05	24.19	9.07	200	0.50	0.746	24.14	99.78
PUTNEY CRESCENT	142A	142A	143A			11		0.35	27.5	30.0	4.00	0.39		0.00		0.00		0.00	0.00	0.35	0.41	0.14	0.52	47.16	55.56	200	1.90	1.454	46.64	98.89
PUTNEY CRESCENT	143A	143A	144A			17		0.49	42.5	72.5	4.00	0.94		0.00		0.00		0.00	0.00	0.49	0.90	0.30	1.24	41.91	64.86	200	1.50	1.292	40.67	97.05
FINSBURY AVENUE	136AA	136A	144A			21		0.65	52.5	52.5	4.00	0.68		0.00		0.00		0.00	0.00	0.65	0.65	0.21	0.90	53.56	110.44	200	2.45	1.652	52.66	98.33
PUTNEY CRESCENT	144A	144A	145A			10		0.36	25.0	150.0	4.00	1.94		0.00		0.00		0.00	0.00	0.36	1.91	0.63	2.57	32.46	80.25	200	0.90	1.001	29.89	92.07
CLAPHAM TERRACE	136AB	136A	137A			10		0.37	25.0	25.0	4.00	0.32		0.00		0.00		0.00	0.00	0.37	0.37	0.12	0.45	24.19	78.00	200	0.50	0.746	23.75	98.16
BRIXTON WAY	137AA	137A	160A			12		0.35	30.0	55.0	4.00	0.71		0.00		0.00		0.00	0.00	0.35	0.72	0.24	0.95	41.91	50.77	200	1.50	1.292	40.96	97.73
BRIXTON WAY	160A	160A	145A			18		0.54	45.0	100.0	4.00	1.30		0.00		0.00		0.00	0.00	0.54	1.26	0.42	1.71	52.45	78.53	200	2.35	1.617	50.74	96.74
PUTNEY CRESCENT	145A	145A	146A			11		0.34	27.5	277.5	4.00	3.60		0.00		0.00		0.00	0.00	0.34	3.51	1.16	4.76	39.76	70.87	200	1.35	1.226	35.00	88.04
CLAPHAM WAY	137AB	137A	138A			9		0.38	22.5	22.5	4.00	0.29		0.00		0.00		0.00	0.00	0.38	0.38	0.13	0.42	37.48	78.00	200	1.20	1.156	37.07	98.89
PUTNEY CRESCENT	138A	138A	148A			10		1.19	165.0	187.5	4.00	2.43		0.00		0.00		0.00	0.00	1.19	1.57	0.52	2.95	40.49	77.95	200	1.40	1.248	37.54	92.72
PUTNEY CRESCENT	148A	148A	147A			7		0.56	72.5	260.0	4.00	3.37		0.00		0.00		0.00	0.00	0.56	2.13	0.70	4.07	55.70	59.50	200	2.65	1.718	51.63	92.69
PUTNEY CRESCENT	147A	147A	146A			0		0.03	0.0	260.0	4.00	3.37		0.00		0.00		0.00	0.00	0.03	2.16	0.71	4.08	55.70	12.47	200	2.65	1.718	51.62	92.67
BLOCK 323	146A	146A	161A			0		0.03	0.0	537.5	3.96	6.89		0.00		0.00		0.00	0.00	0.03	5.70	1.88	8.78	28.63	38.97	200	0.70	0.883	19.85	69.35
BLOCK 316	HYD. 2	161A	*Ex.209*			0		5.12	0.0	537.5	3.96	6.89		0.00		0.00		0.00	0.00	5.12	10.82	3.57	10.46	28.63	53.67	200	0.70	0.883	18.16	63.45
BLOCK 324	RES.1	123A	*Ex.209*					0.71	85.0	85.0	4.00	1.10		0.00		0.00		0.00	0.00	0.71	0.71	0.23	1.34	43.87	8.00	250	0.50	0.866	42.53	96.95
Refer to ECA No. 9079-9LNNZC dated July 9, 2014 for description of existing sewers.																														

Design Parameters:

Residential			ICI Areas			
						Peak Factor
SF	3.3	p/p/u				
TH/SD	2.5	p/p/u	INST	25 000	L/Ha/day	1.5
APT	1.8	p/p/u	COM	25 000	L/Ha/day	1.5
Low	60	p/p/Ha	IND	35 000	L/Ha/day	MOE Chart
Med	75	p/p/Ha				
High	90	p/p/Ha				

Notes:

1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 280 L/day
3. Infiltration allowance: 0.33 L/s/Ha
4. Residential Peaking Factor:
   Harmon Formula = 1 (14/(4 P^0.5))
   where P = population in thousands

Designed: J.I.M.

Checked: P.K.

Dwg. Reference: 27970 - 501 501A 501B

No.	Revision	Date
1.	Submission No. 1 to City of Ottawa	2013-08-29
2.	Submission No. 2 to City of Ottawa	2014-01-22
3.	Submission No. 3 to City of Ottawa	2014-08-22
4.	Submission No. 4 to City of Ottawa	2015-06-15
5.	Submission No. 5 to City of Ottawa	2016-11-10
6.	Submission for MOE Approval	2017-02-10
7.	Resubmission for MOE Approval	2017-07-14

File Reference: 27970.5.7.1
Date: 2017-07-14
Sheet No: 1 of 4

IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

SANITARY SEWER DESIGN SHEET

PROJECT: CRT DEVELOPMENT
LOCATION: CITY OF OTTAWA
CLIENT: CRT DEVELOPMENT INC.

LOCATION				RESIDENTIAL								ICI AREAS							INFILTRATION ALLOWANCE			TOTAL	PROPOSED SEWER DESIGN						
				UNIT TYPES				AREA	POPULATION		PEAK	PEAK	AREA (Ha)						PEAK	AREA (Ha)		FLOW	FLOW	CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
													INSTITUTIONAL		COMMERCIAL		INDUSTRIAL												
STREET	AREA ID	FROM MH	TO MH	SF	SD	TH	APT	(Ha)	IND	CUM	FACTOR	FLOW (L/s)	IND	CUM	IND	CUM	IND	CUM	FLOW (L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
CLAPHAM TERRACE	136AC	136A	135A			11		0.41	27.5	27.5	4.00	0.36		0.00		0.00		0.00	0.00	0.41	0.41	0.14	0.49	27.59	65.31	200	0.65	0.851	27.09	98.22
CLAPHAM TERRACE	135A	135A	134A			9		0.31	22.5	50.0	4.00	0.65		0.00		0.00		0.00	0.00	0.31	0.72	0.24	0.89	27.59	57.36	200	0.65	0.851	26.70	96.79
PUTNEY CRESCENT	141A	141A	134A			9		0.34	22.5	22.5	4.00	0.29		0.00		0.00		0.00	0.00	0.34	0.34	0.11	0.40	32.46	75.02	200	0.90	1.001	32.06	98.76
PUTNEY CRESCENT	134A	134A	140A	6				0.34	19.8	92.3	4.00	1.20		0.00		0.00		0.00	0.00	0.34	1.40	0.46	1.66	32.46	78.00	200	0.90	1.001	30.80	94.89
OSTERLEY WAY	153A	153A	152A	8				0.51	26.4	26.4	4.00	0.34		0.00		0.00		0.00	0.00	0.51	0.51	0.17	0.51	29.63	49.25	200	0.75	0.914	29.12	98.28
OSTERLEY WAY	152A	152A	151A	17				0.78	56.1	82.5	4.00	1.07		0.00		0.00		0.00	0.00	0.78	1.29	0.43	1.50	29.63	95.75	200	0.75	0.914	28.14	94.95
OSTERLEY WAY	151A	151A	150A	10				0.47	33.0	115.5	4.00	1.50		0.00		0.00		0.00	0.00	0.47	1.76	0.58	2.08	29.63	59.68	200	0.75	0.914	27.55	92.99
OSTERLEY WAY	150A	150A	140A	9				0.42	29.7	145.2	4.00	1.88		0.00		0.00		0.00	0.00	0.42	2.18	0.72	2.60	29.63	62.98	200	0.75	0.914	27.03	91.22
PUTNEY CRESCENT	140A	140A	124A	3				0.24	9.9	247.4	4.00	3.21		0.00		0.00		0.00	0.00	0.24	3.82	1.26	4.47	32.46	78.00	200	0.90	1.001	27.99	86.24
BLOCK 343	RES.2	BLKHD	129A					1.21	108.9	108.9	4.00	1.41		0.00		0.00		0.00	0.00	1.21	1.21	0.40	1.81	20.24	19.00	200	0.35	0.624	18.43	91.05
BOBOLINK RIDGE	129A	129A	128A	0				0.09	0.0	108.9	4.00	1.41		0.00		0.00		0.00	0.00	0.09	1.30	0.43	1.84	31.02	45.00	250	0.25	0.612	29.18	94.07
BOBOLINK RIDGE	128AA	128A	127A	6				0.41	19.8	128.7	4.00	1.67		0.00		0.00		0.00	0.00	0.41	1.71	0.56	2.23	31.02	78.00	250	0.25	0.612	28.79	92.80
BOBOLINK RIDGE	127AA	127A	126A	10				0.53	33.0	161.7	4.00	2.10		0.00		0.00		0.00	0.00	0.53	2.24	0.74	2.84	31.02	78.00	250	0.25	0.612	28.18	90.86
BOBOLINK RIDGE	126A	126A	125A	5				0.33	16.5	178.2	4.00	2.31		0.00		0.00		0.00	0.00	0.33	2.57	0.85	3.16	31.02	47.81	250	0.25	0.612	27.86	89.82
BOBOLINK RIDGE	125A	125A	124A	12				0.56	39.6	217.8	4.00	2.82		0.00		0.00		0.00	0.00	0.56	3.13	1.03	3.86	31.02	74.85	250	0.25	0.612	27.16	87.57
BOBOLINK RIDGE	124A	124A	123A	11				0.61	36.3	501.5	3.97	6.46		0.00		0.00		0.00	0.00	0.61	7.56	2.49	8.95	31.02	88.85	250	0.25	0.612	22.07	71.14
DAGENHAM STREET	PARK1, 131A	131A	130A	7				1.70	23.1	23.1	4.00	0.30		0.00		0.00		0.00	0.00	1.70	1.70	0.56	0.86	34.22	43.00	200	1.00	1.055	33.36	97.49
DAGENHAM STREET	130A	130A	123A	8				0.46	26.4	49.5	4.00	0.64		0.00		0.00		0.00	0.00	0.46	2.16	0.71	1.35	34.22	87.11	200	1.00	1.055	32.86	96.04
BOBOLINK RIDGE	123A	123A	122A	2				0.14	6.6	557.6	3.95	7.14		0.00		0.00		0.00	0.00	0.14	9.86	3.25	10.39	31.02	25.98	250	0.25	0.612	20.63	66.50
BOBOLINK RIDGE	122A	122A	121A	5				0.26	16.5	574.1	3.94	7.34		0.00		0.00		0.00	0.00	0.26	10.12	3.34	10.67	31.02	36.36	250	0.25	0.612	20.34	65.59
BOBOLINK RIDGE	121A	121A	120A	6				0.30	19.8	593.9	3.93	7.57		0.00		0.00		0.00	0.00	0.30	10.42	3.44	11.01	31.02	40.43	250	0.25	0.612	20.01	64.50
ANGEL HEIGHTS	111A	111A	112A	1				0.08	3.3	3.3	4.00	0.04		0.00		0.00		0.00	0.00	0.08	0.08	0.03	0.07	28.63	12.92	200	0.70	0.883	28.56	99.76
ANGEL HEIGHTS	112A	112A	113A	13				0.77	42.9	46.2	4.00	0.60		0.00		0.00		0.00	0.00	0.77	0.85	0.28	0.88	28.63	95.21	200	0.70	0.883	27.75	96.93
ANGEL HEIGHTS	113A	113A	114A	6				0.29	19.8	66.0	4.00	0.86		0.00		0.00		0.00	0.00	0.29	1.14	0.38	1.23	28.63	38.92	200	0.70	0.883	27.40	95.70
ANGEL HEIGHTS	114A	114A	120A	6				0.35	19.8	85.8	4.00	1.11		0.00		0.00		0.00	0.00	0.35	1.49	0.49	1.60	28.63	70.46	200	0.70	0.883	27.02	94.40
BOBOLINK RIDGE	120A	120A	105A	11				0.62	36.3	716.0	3.89	9.02		0.00		0.00		0.00	0.00	0.62	12.53	4.13	13.16	36.70	90.60	250	0.35	0.724	23.54	64.15

Design Parameters:

Residential			ICI Areas			
						Peak Factor
SF	3.3	p/p/u				
TH/SD	2.5	p/p/u	INST	25 000	L/Ha/day	1.5
APT	1.8	p/p/u	COM	25 000	L/Ha/day	1.5
Low	60	p/p/Ha	IND	35 000	L/Ha/day	MOE Chart
Med	75	p/p/Ha				
High	90	p/p/Ha				

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 280 L/day
3. Infiltration allowance: 0.33 L/s/Ha
4. Residential Peaking Factor:
   Harmon Formula = 1 (14/(4 P^0.5))
   where P = population in thousands

Designed: J.I.M.
Checked: P.K.
Dwg. Reference: 27970 - 501 501A 501B

No.	Revision	Date
1.	Submission No. 1 to City of Ottawa	2013-08-29
2.	Submission No. 2 to City of Ottawa	2014-01-22
3.	Submission No. 3 to City of Ottawa	2014-08-22
4.	Submission No. 4 to City of Ottawa	2015-06-15
5.	Submission No. 5 to City of Ottawa	2016-11-10
6.	Submission for MOE Approval	2017-02-10
7.	Resubmission for MOE Approval	2017-07-14

File Reference: 27970.5.7.1
Date: 2017-07-14
Sheet No: 2 of 4

IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

SANITARY SEWER DESIGN SHEET

PROJECT: CRT DEVELOPMENT
LOCATION: CITY OF OTTAWA
CLIENT: CRT DEVELOPMENT INC.

LOCATION				RESIDENTIAL									ICI AREAS							INFILTRATION ALLOWANCE			TOTAL	PROPOSED SEWER DESIGN						
				UNIT TYPES				AREA	POPULATION		PEAK	PEAK	AREA (Ha)						PEAK	AREA (Ha)		FLOW	FLOW	CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
													INSTITUTIONAL		COMMERCIAL		INDUSTRIAL		FLOW										
STREET	AREA ID	FROM MH	TO MH	SF	SD	TH	APT	(Ha)	IND	CUM	FACTOR	FLOW (L/s)	IND	CUM	IND	CUM	IND	CUM	(L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
EMBANKMENT STREET	128AB	128A	188A	16				0.74	52.8	52.8	4.00	0.68		0.00		0.00		0.00	0.00	0.74	0.74	0.24	0.93	27.59	98.00	200	0.65	0.851	26.66	96.63
EMBANKMENT STREET	188A	188A	189A	11				0.52	36.3	89.1	4.00	1.16		0.00		0.00		0.00	0.00	0.52	1.26	0.42	1.57	27.59	74.80	200	0.65	0.851	26.02	94.31
BLOCK 344	RES.3	192A	189A					1.52	136.8	136.8	4.00	1.77		0.00		0.00		0.00	0.00	1.52	1.52	0.50	2.27	20.24	40.00	200	0.35	0.624	17.97	88.76
EMBANKMENT STREET	189A	189A	190A	14				0.69	46.2	272.1	4.00	3.53		0.00		0.00		0.00	0.00	0.69	3.47	1.15	4.67	20.24	92.53	200	0.35	0.624	15.57	76.92
EMBANKMENT STREET		190A	176A	0				0.00	0.0	272.1	4.00	3.53		0.00		0.00		0.00	0.00	0.00	3.47	1.15	4.67	20.24	10.78	200	0.35	0.624	15.57	76.92
BLOCK 345	INST.2	BULKHEAD	176A	0				0.00	0.0	0.0	4.00	0.00	6.53	6.53		0.00		0.00	2.83	6.53	6.53	2.15	4.99	20.24	21.00	200	0.35	0.624	15.25	75.35
COPE DRIVE	176A	176A	175A	3				0.63	9.9	282.0	4.00	3.66		6.53		0.00		0.00	2.83	0.63	10.63	3.51	10.00	20.24	76.03	200	0.35	0.624	10.25	50.61
COPE DRIVE	175A	175A	174A	5				0.46	16.5	298.5	4.00	3.87		6.53		0.00		0.00	2.83	0.46	11.09	3.66	10.36	20.24	84.94	200	0.35	0.624	9.88	48.80
BELSIZE WAY	127AB	127A	185A	11				0.53	36.3	36.3	4.00	0.47		0.00		0.00		0.00	0.00	0.53	0.53	0.17	0.65	27.59	88.50	200	0.65	0.851	26.94	97.66
BELSIZE WAY	185A	185A	186A	13				0.59	42.9	79.2	4.00	1.03		0.00		0.00		0.00	0.00	0.59	1.12	0.37	1.40	27.59	83.61	200	0.65	0.851	26.19	94.94
PINNER ROAD	191A	191A	186A	3				0.24	9.9	9.9	4.00	0.13		0.00		0.00		0.00	0.00	0.24	0.24	0.08	0.21	27.59	43.00	200	0.65	0.851	27.38	99.25
PINNER ROAD	186A	186A	187A	5				0.35	16.5	105.6	4.00	1.37		0.00		0.00		0.00	0.00	0.35	1.71	0.56	1.93	20.24	70.39	200	0.35	0.624	18.31	90.45
PINNER ROAD		187A	183A	0				0.00	0.0	105.6	4.00	1.37		0.00		0.00		0.00	0.00	0.00	1.71	0.56	1.93	20.24	9.00	200	0.35	0.624	18.31	90.45
FINSBURY AVENUE	182A	182A	183A	16				0.97	52.8	52.8	4.00	0.68		0.00		0.00		0.00	0.00	0.97	0.97	0.32	1.00	32.46	117.13	200	0.90	1.001	31.46	96.91
FINSBURY AVENUE	183A	183A	184A	4				0.33	13.2	171.6	4.00	2.22		0.00		0.00		0.00	0.00	0.33	3.01	0.99	3.22	20.24	65.71	200	0.35	0.624	17.03	84.10
FINSBURY AVENUE		184A	174A	0				0.00	0.0	171.6	4.00	2.22		0.00		0.00		0.00	0.00	0.00	3.01	0.99	3.22	20.24	17.89	200	0.35	0.624	17.03	84.10
COPE DRIVE	174A	174A	173A	7				0.47	23.1	493.2	3.98	6.36		6.53		0.00		0.00	2.83	0.47	14.57	4.81	14.00	31.02	82.90	250	0.25	0.612	17.02	54.87
COPE DRIVE	173A	173A	172A	6				0.41	19.8	513.0	3.97	6.60		6.53		0.00		0.00	2.83	0.41	14.98	4.94	14.38	31.02	76.02	250	0.25	0.612	16.64	53.66
BLOCK 313	INST.1	BULKHEAD	172A	0				0.00	0.0	0.0	4.00	0.00	2.88	2.88		0.00		0.00	1.25	2.88	2.88	0.95	2.20	20.24	16.00	200	0.35	0.624	18.04	89.13
COPE DRIVE	172A	172A	171B	3				0.23	9.9	522.9	3.96	6.72		9.41		0.00		0.00	4.08	0.23	18.09	5.97	16.77	31.02	36.96	250	0.25	0.612	14.25	45.93
COPE DRIVE	171B	171B	171A	2				0.22	6.6	529.5	3.96	6.80		9.41		0.00		0.00	4.08	0.22	18.31	6.04	16.92	31.02	41.21	250	0.25	0.612	14.10	45.44
DAGENHAM STREET	180A	180A	181A	7				0.50	23.1	23.1	4.00	0.30		0.00		0.00		0.00	0.00	0.50	0.50	0.17	0.46	20.24	90.00	200	0.35	0.624	19.78	97.71
DAGENHAM STREET	181A	181A	171A	0				0.11	0.0	23.1	4.00	0.30		0.00		0.00		0.00	0.00	0.11	0.61	0.20	0.50	20.24	67.50	200	0.35	0.624	19.74	97.53
COPE DRIVE	171A	171A	170B	1				0.17	3.3	555.9	3.95	7.12		9.41		0.00		0.00	4.08	0.17	19.09	6.30	17.50	45.12	37.91	300	0.20	0.618	27.62	61.21
COPE DRIVE	170B	170B	170A	3				0.25	9.9	565.8	3.95	7.24		9.41		0.00		0.00	4.08	0.25	19.34	6.38	17.70	45.12	43.98	300	0.20	0.618	27.41	60.76
BLOCK 312	RES.3A	BULKHEAD	sewer	0				3.26	195.6	195.6	4.00	2.54		0.00		0.00		0.00	0.00	3.26	3.26	1.08	3.61	20.24	16.22	200	0.35	0.624	16.63	82.16
COPE DRIVE	170A	170A	110A	6				0.62	19.8	781.2	3.87	9.79		9.41		0.00		0.00	4.08	0.62	23.22	7.66	21.54	45.12	120.00	300	0.20	0.618	23.58	52.27
GOLDHAWK DRIVE	306A	SOUTH	303A	31				1.83	102.3	102.3	4.00	1.33		0.00		0.00		0.00	0.00	1.83	1.83	0.60	1.93							
STREET NO. 26	304A	WEST	303A	14				0.69	46.2	46.2	4.00	0.60		0.00		0.00		0.00	0.00	0.69	0.69	0.23	0.83							
GOLDHAWK DRIVE	303A	303A	302A	10				0.62	33.0	181.5	4.00	2.35		0.00		0.00		0.00	0.00	0.62	3.14	1.04	3.39	20.24	94.58	200	0.35	0.624	16.85	83.26
Future Street	RES.5, 5A, Park3	EAST	302A					23.97	1421.4	1421.4	3.70	17.03		0.00		0.00		0.00	0.00	23.97	23.97	7.91	24.94							
GOLDHAWK DRIVE	302A	302A	301A	10				0.56	33.0	1635.9	3.65	19.36		0.00		0.00		0.00	0.00	0.56	27.67	9.13	28.49	50.44	70.68	300	0.25	0.691	21.95	43.51
GOLDHAWK DRIVE	301A	301A	207A	6				0.37	19.8	1655.7	3.65	19.57		0.00		0.00		0.00	0.00	0.37	28.04	9.25	28.83	50.44	70.00	300	0.25	0.691	21.61	42.85
STREET NO. 2	RES.4	EAST	207A					13.88	832.8	832.8	3.85	10.39		0.00		0.00		0.00	0.00	13.88	13.88	4.58	14.97							
GOLDHAWK DRIVE	207A	207A	206A	17				0.86	56.1	2544.6	3.50	28.88		0.00		0.00		0.00	0.00	0.86	42.78	14.12	43.00	70.84	107.19	375	0.15	0.621	27.84	39.30
GOLDHAWK DRIVE	206A	206A	205A	12				0.69	39.6	2584.2	3.50	29.28		0.00		0.00		0.00	0.00	0.69	43.47	14.35	43.63	70.84	106.61	375	0.15	0.621	27.21	38.41
GOLDHAWK DRIVE	205A	205A	110A	5				0.44	16.5	2600.7	3.49	29.45		0.00		0.00		0.00	0.00	0.44	43.91	14.49	43.94	70.84	100.61	375	0.15	0.621	26.90	37.97

Design Parameters:

Residential

SF	3.3	p/p/u
TH/SD	2.5	p/p/u
APT	1.8	p/p/u
Low	60	p/p/Ha
Med	75	p/p/Ha
High	90	p/p/Ha

ICI Areas

			Peak Factor
INST	25 000	L/Ha/day	1.5
COM	25 000	L/Ha/day	1.5
IND	35 000	L/Ha/day	MOE Chart

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 280 L/day
3. Infiltration allowance: 0.33 L/s/Ha
4. Residential Peaking Factor:
   Harmon Formula = 1 (14/(4 P^0.5))
   where P = population in thousands

Designed: J.I.M.
Checked: P.K.
Dwg. Reference: 27970 - 501 501A 501B

No.	Revision	Date
1.	Submission No. 1 to City of Ottawa	2013-08-29
2.	Submission No. 2 to City of Ottawa	2014-01-22
3.	Submission No. 3 to City of Ottawa	2014-08-22
4.	Submission No. 4 to City of Ottawa	2015-06-15
5.	Submission No. 5 to City of Ottawa	2016-11-10
6.	Submission for MOE Approval	2017-02-10
7.	Resubmission for MOE Approval	2017-07-14

File Reference: 27970.5.7.1
Date: 2017-07-14
Sheet No: 3 of 4

IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

SANITARY SEWER DESIGN SHEET

PROJECT: CRT DEVELOPMENT
LOCATION: CITY OF OTTAWA
CLIENT: CRT DEVELOPMENT INC.

LOCATION				RESIDENTIAL								ICI AREAS							INFILTRATION ALLOWANCE			TOTAL	PROPOSED SEWER DESIGN						
				UNIT TYPES				AREA	POPULATION		PEAK	PEAK	AREA (Ha)						PEAK	AREA (Ha)		FLOW	FLOW	CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
													INSTITUTIONAL		COMMERCIAL		INDUSTRIAL												
STREET	AREA ID	FROM MH	TO MH	SF	SD	TH	APT	(Ha)	IND	CUM	FACTOR	FLOW (L/s)	IND	CUM	IND	CUM	IND	CUM	FLOW (L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
																							0.00							
	LSPS	Allowance						0.00	0.0	0.0													108.00							
	STITTSVILLE 6 PS		110A					0.00	0.0	0.0				0.00		0.00		0.00	0.00				84.00							
Future Street	INST.3	BLKHD	110A					0.00	0.0	0.0			2.47	2.47		0.00		0.00	1.07											
	PARK4	BLKHD	110A					0.83	0.0	0.0				0.00		0.00		0.00	0.00											
	PARK5	BLKHD	110A					1.04	0.0	0.0				0.00		0.00		0.00	0.00											
	RES.9	BLKHD	110A					34.81	2610.8	2610.8				0.00		0.00		0.00	0.00											
	RES.7	BLKHD	110A					4.24	318.0	318.0				0.00		0.00		0.00	0.00											
	RES.13	BLKHD	110A					2.22	133.2	133.2				0.00		0.00		0.00	0.00											
	RES.12	BLKHD	110A					43.89	2633.4	2633.4				0.00		0.00		0.00	0.00											
	INST.4	BLKHD	110A					0.00	0.0	0.0			2.44	2.44		0.00		0.00	1.06											
	COMM.	BLKHD	110A					0.00	0.0	0.0				0.00	0.63	0.63		0.00	0.27											
	HYD.4	BLKHD	110A					3.06	0.0	0.0				0.00		0.00		0.00	0.00											
	RES.8	BLKHD	110A					2.30	172.5	172.5				0.00		0.00		0.00	0.00											
	HYD.5	BLKHD	110A					5.20	0.0	0.0				0.00		0.00		0.00	0.00											
Future Street	RES.11	BLKHD	110A					6.91	414.6	414.6				0.00		0.00		0.00	0.00											
	PARK6	BLKHD	110A					1.19	0.0	0.0				0.00		0.00		0.00	0.00											
	RES.10	BLKHD	110A					1.92	115.2	115.2				0.00		0.00		0.00	0.00											
	HYD.3	BLKHD	110A					6.31	0.0	0.0				0.00		0.00		0.00	0.00											
TOTAL		**BLKHD**	**110A**					**113.92**		**6397.7**	**3.14**	**65.19**		**4.91**		**0.63**		**0.00**	**2.40**	**119.46**	**119.46**	**39.42**	**299.01**	**320.28**	**24.02**	**600**	**0.25**	**1.097**	**21.27**	**6.64**
GOLDHAWK DRIVE		**110A**	**109A**					**0.00**	**0.0**	**9779.6**	**2.96**	**93.95**		**14.32**		**0.63**		**0.00**	**6.49**	**0.00**	**186.59**	**61.57**	**354.01**	**378.96**	**61.28**	**600**	**0.35**	**1.298**	**24.95**	**6.58**
GOLDHAWK DRIVE	**110A**	**1101A**	**1092A**	**1**				**0.18**	**3.3**	**3.3**	**4.00**	**0.04**								**0.18**	**0.18**	**0.06**	**0.10**	**28.63**	**61.28**	**200**	**0.70**	**0.883**	**28.53**	**99.64**
GOLDHAWK DRIVE		**109A**	**108A**					**0.00**	**0.0**	**9782.9**	**2.96**	**93.97**		**14.32**		**0.63**		**0.00**	**6.49**	**0.00**	**186.77**	**61.63**	**354.10**	**378.96**	**57.50**	**600**	**0.35**	**1.298**	**24.86**	**6.56**
GOLDHAWK DRIVE	**109A**	**1091A**	**1082A**	5				**0.32**	**16.5**	**16.5**	**4.00**	**0.21**								**0.32**	**0.32**	**0.11**	**0.32**	**28.63**	**57.50**	**200**	**0.70**	**0.883**	**28.31**	**98.88**
GOLDHAWK DRIVE		**108A**	**107A**					**0.00**	**0.0**	**9799.4**	**2.96**	**94.11**		**14.32**		**0.63**		**0.00**	**6.49**	**0.00**	**187.09**	**61.74**	**354.34**	**378.96**	**53.32**	**600**	**0.35**	**1.298**	**24.62**	**6.50**
GOLDHAWK DRIVE	**108A**	**1081A**	**1072A**	**4**				**0.30**	**13.2**	**13.2**	**4.00**	**0.17**								**0.30**	**0.30**	**0.10**	**0.27**	**28.63**	**53.32**	**200**	**0.70**	**0.883**	**28.36**	**99.06**
GOLDHAWK DRIVE		**107A**	**106A**					**0.00**	**0.0**	**9812.6**	**2.96**	**94.22**		**14.32**		**0.63**		**0.00**	**6.49**	**0.00**	**187.39**	**61.84**	**354.55**	**378.96**	**62.94**	**600**	**0.35**	**1.298**	**24.41**	**6.44**
GOLDHAWK DRIVE	**107A**	**1071A**	**1062A**	**7**				**0.31**	**23.1**	**23.1**	**4.00**	**0.30**		**0.00**		**0.00**		**0.00**	**0.00**	**0.31**	**0.31**	**0.10**	**0.40**	**28.63**	**62.94**	**200**	**0.70**	**0.883**	**28.23**	**98.60**
GOLDHAWK DRIVE		**106A**	**105A**					**0.00**	**0.0**	**9835.7**	**2.96**	**94.41**		**14.32**		**0.63**		**0.00**	**6.49**	**0.00**	**187.70**	**61.94**	**354.84**	**378.96**	**60.09**	**600**	**0.35**	**1.298**	**24.12**	**6.37**
GOLDHAWK DRIVE	**106A**	**1061A**	**1052A**	**2**				**0.24**	**6.6**	**6.6**	**4.00**	**0.09**		**0.00**		**0.00**		**0.00**	**0.00**	**0.24**	**0.24**	**0.08**	**0.16**	**28.63**	**60.09**	**200**	**0.70**	**0.883**	**28.46**	**99.42**
		105A	**104A**					**0.00**	**0.0**	**10558.3**	**2.93**	**100.30**		**14.32**		**0.63**		**0.00**	**6.49**	**0.00**	**200.47**	**66.16**	**364.94**	**389.64**	**72.85**	**600**	**0.37**	**1.335**	**24.70**	**6.34**
GOLDHAWK DRIVE	**105A**	**1051A**	**1042A**	**7**				**0.45**	**23.1**	**23.1**	**4.00**	**0.30**								**0.45**	**0.45**	**0.15**	**0.45**	**27.59**	**72.85**	**200**	**0.65**	**0.851**	**27.14**	**98.38**
GOLDHAWK DRIVE		**104A**	**103A**					**0.00**	**0.0**	**10581.4**	**2.93**	**100.48**		**14.32**		**0.63**		**0.00**	**6.49**	**0.00**	**200.92**	**66.30**	**365.28**	**389.64**	**48.77**	**600**	**0.37**	**1.335**	**24.36**	**6.25**
GOLDHAWK DRIVE	**104A**	**1041A**	**1032A**	**9**				**0.47**	**29.7**	**29.7**	**4.00**	**0.39**								**0.47**	**0.47**	**0.16**	**0.54**	**27.59**	**48.77**	**200**	**0.65**	**0.851**	**27.05**	**98.04**
GOLDHAWK DRIVE		**103A**	**102A**					**0.00**	**0.0**	**10611.1**	**2.93**	**100.72**		**14.32**		**0.63**		**0.00**	**6.49**	**0.00**	**201.39**	**66.46**	**365.67**	**389.64**	**45.00**	**600**	**0.37**	**1.335**	**23.97**	**6.15**
GOLDHAWK DRIVE	**103A, HYD1**	**1031A**	**1021A**	**6**				**2.01**	**19.8**	**19.8**	**4.00**	**0.26**								**0.00**	**2.01**	**0.66**	**0.92**	**27.59**	**45.00**	**200**	**0.65**	**0.851**	**26.67**	**96.67**
GOLDHAWK DRIVE	**102A**	**102A**	***FT-24 (EX)***					**0.12**	**0.0**	**10630.9**	**2.93**	**100.88**		**14.32**		**0.63**		**0.00**	**6.49**	**0.12**	**203.52**	**67.16**	**366.53**	**389.64**	**102.59**	**600**	**0.37**	**1.335**	**23.10**	**5.93**
HYDRO EASEMENT		***FT-24 (EX)***	***FT-23 (EX)***					**0.00**	**0.0**	**10650.7**	**2.93**	**101.04**		**14.32**		**0.63**		**0.00**	**6.49**	**0.00**	**205.53**	**67.82**	**367.36**	**400.03**	**107.50**	**600**	**0.39**	**1.371**	**32.67**	**8.17**

Design Parameters:

Residential			ICI Areas			
SF	3.3	p/p/u				Peak Factor
TH/SD	2.5	p/p/u	INST	25 000	L/Ha/day	1.5
APT	1.8	p/p/u	COM	25 000	L/Ha/day	1.5
Low	60	p/p/Ha	IND	35 000	L/Ha/day	MOE Chart
Med	75	p/p/Ha				
High	90	p/p/Ha				

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 280 L/day
3. Infiltration allowance: 0.33 L/s/Ha
4. Residential Peaking Factor:
   Harmon Formula = 1 (14/(4 P^0.5))
   where P = population in thousands

Designed: J.I.M.

Checked: P.K.

Dwg. Reference: 27970 - 501 501A 501B

No.	Revision	Date
1.	Submission No. 1 to City of Ottawa	2013-08-29
2.	Submission No. 2 to City of Ottawa	2014-01-22
3.	Submission No. 3 to City of Ottawa	2014-08-22
4.	Submission No. 4 to City of Ottawa	2015-06-15
5.	Submission No. 5 to City of Ottawa	2016-11-10
6.	Submission for MOE Approval	2017-02-10
7.	Resubmission for MOE Approval	2017-07-14

File Reference: 27970.5.7.1
Date: 2017-07-14
Sheet No: 4 of 4

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

BLK 32 PH 1 CRT
CITY OF OTTAWA
CLAR DGE HOMES

LOCATION				RESIDENTIAL										ICI AREAS								INFILTRATION ALLOWANCE			FIXED FLOW (L/s)		TOTAL FLOW	PROPOSED SEWER DESIGN						
				AREA	UNIT TYPES				AREA	POPULATION		RES	PEAK	AREA (Ha)						ICI	PEAK	AREA (Ha)		FLOW				CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH	w/ Units (Ha)	SF	SD	TH	APT	w/o Units (Ha)	IND	CUM	PEAK FACTOR	FLOW (L/s)	INSTITUTIONAL IND	INSTITUTIONAL CUM	COMMERCIAL IND	COMMERCIAL CUM	INDUSTRIAL IND	INDUSTRIAL CUM	PEAK FACTOR	FLOW (L/s)	IND	CUM	(L/s)	IND	CUM	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
OUTLET TO PUTNEY Cresc.																																		
	100A	100A	101A	0.22			11			29.7	29.7	3.68	0.35	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.22	0.22	0.07	0.00	0.00	0.43	21.64	77.68	200	0.40	0.667	21.21	98.03%
		101A	EXIST	0.00						0.0	29.7	3.68	0.35	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.22	0.07	0.00	0.00	0.43	34.22	9.00	200	1.00	1.055	33.79	98.75%
	104A	104A	105A	0.31			23			62.1	62.1	3.64	0.73	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.31	0.31	0.10	0.00	0.00	0.83	21.64	87.70	200	0.40	0.667	20.81	96.15%
		105A	EXIST							0.0	62.1	3.64	0.73	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.31	0.10	0.00	0.00	0.83	34.22	9.00	200	1.00	1.055	33.38	97.56%
	108A	108A	109A	0.31			22			59.4	59.4	3.64	0.70	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.31	0.31	0.10	0.00	0.00	0.80	21.64	90.06	200	0.40	0.667	20.84	96.29%
		109A	EXIST							0.0	59.4	3.64	0.70	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.31	0.10	0.00	0.00	0.80	34.22	9.00	200	1.00	1.055	33.41	97.65%
	112A	112A	113A	0.31			22			59.4	59.4	3.64	0.70	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.31	0.31	0.10	0.00	0.00	0.80	21.91	87.97	200	0.41	0.676	21.11	96.34%
		113A	EXIST							0.0	59.4	3.64	0.70	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.31	0.10	0.00	0.00	0.80	34.22	9.00	200	1.00	1.055	33.41	97.65%
OUTLET TO EASEMENT																																		
	118A	118A	119A	0.02			1			2.7	2.7	3.76	0.03	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.02	0.02	0.01	0.00	0.00	0.04	48.39	8.00	200	2.00	1.492	48.35	99.92%
	120A	120A	119A	0.16			6			16.2	16.2	3.71	0.19	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.16	0.16	0.05	0.00	0.00	0.25	28.63	45.00	200	0.70	0.883	28.38	99.13%
	119A	119A	121A	0.06			5			13.5	32.4	3.68	0.39	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.06	0.24	0.08	0.00	0.00	0.47	28.63	35.26	200	0.70	0.883	28.16	98.37%
	124A	124A	117A	0.02			1			2.7	2.7	3.76	0.03	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.02	0.02	0.01	0.00	0.00	0.04	48.39	7.03	200	2.00	1.492	48.35	99.92%
	116A	116A	117A	0.19			5			13.5	13.5	3.72	0.16	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.19	0.19	0.06	0.00	0.00	0.23	28.63	38.50	200	0.70	0.883	28.40	99.21%
	117A	117A	121A	0.06			5			13.5	29.7	3.68	0.35	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.06	0.27	0.09	0.00	0.00	0.44	28.63	34.26	200	0.70	0.883	28.18	98.45%
	121A	121A	122A	0.21			11			29.7	91.8	3.60	1.07	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.21	0.72	0.24	0.00	0.00	1.31	27.59	46.16	200	0.65	0.851	26.28	95.25%
		122A	123A							0.0	91.8	3.60	1.07	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.72	0.24	0.00	0.00	1.31	24.19	15.02	200	0.50	0.746	22.89	94.59%
		123A	EXIST							*0.0*	*91.8*	*3.60*	*1.07*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*1.00*	*0.00*	*0.00*	*0.72*	*0.24*	*0.00*	*0.00*	*1.31*	*43.87*	*7.50*	*250*	*0.50*	*0.866*	*42.56*	*97.02%*

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	1.8	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	

Notes:
1. Mannings coefficient (n) 0.013
2. Demand (per capita) 280 L/day 200 L/day
3. Inf ltration 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

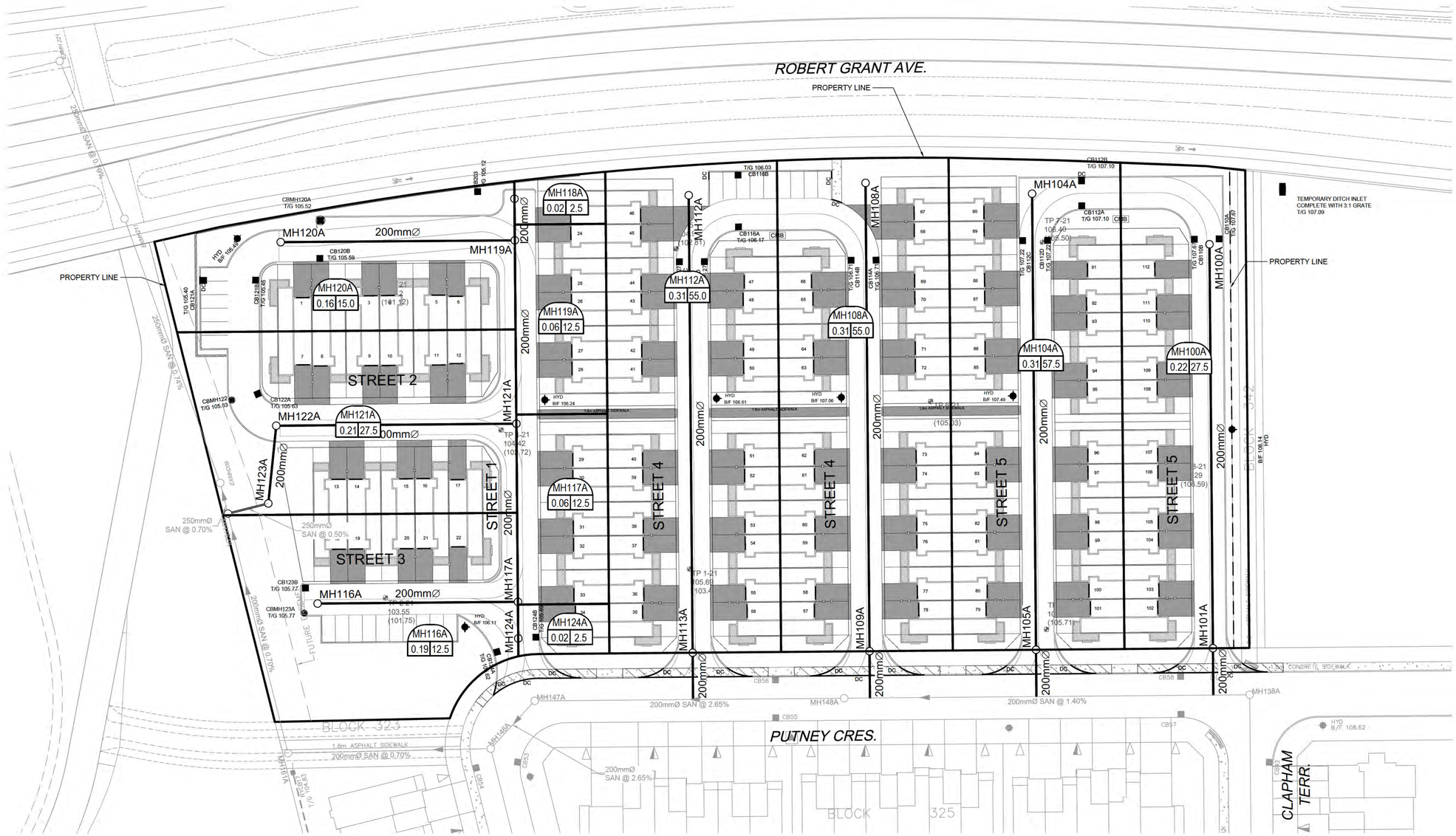
Designed: R.M,

Checked: D.G.Y.

Dwg. Reference: 126715-400

No.	Revision	Date
1.	Servicing Brief - Submission No. 1	2021-01-18
2.	Servicing Brief - Submission No. 2	2021-01-18

File Reference: 125600.6.4.4.
Date: 2021-01-18
Sheet No: 1 of 1



CLIENT

CLARIDGE HOMES

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED TO CITY FOR REVIEW	2021.01.22
2	REVISED PER CITY COMMENTS	2021.07.16

- SEE 010 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS
- SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR/ AOV

KEY PLAN

CONSULTANTS

NOT FOR CONSTRUCTION

1:400 0 4 12 20m

SEAL

LICENSED PROFESSIONAL ENGINEER
L.D. (Dan) Yannoulopoulos
2021/07/16
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

CRT

BLOCK 324

PROJECT NO: 126715	
DRAWN BY: **D.D. E.H.**	CHECKED BY: **DGY**
PROJECT MGR: **DGY**	APPROVED BY: **DGY**

SHEET TITLE

SANITARY DRAINAGE AREA PLAN

SHEET NUMBER	ISSUE
400	1

SCALE CHECK 1 in 10mm

File Location: z:\126715_CRT_Block324\7.0_Production\7.03_Design\04_Civil\Sheets\400 SANITARY DRAINAGE AREA PLAN.dwg Last Saved: June 16, 2021, by Ehemie Plotted: Friday, July 16, 2021 3:01:19 PM by Eric Hemie

CITY FILE No. D07-12-21-0022 CITY PLAN No. 18416

APPENDIX D

CRT Lands Phase 1 Storm Drainage Area Plan
CRT Lands Phase 1 Storm Sewer Design Sheet
Storm Sewer Design Sheet
126715-500 Storm Drainage Area Plan
DC 780 Stormtech info sheet
SC 4500 Stormtech info sheet
Storage calculations

REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH

Signed _____

Date _____ 2017

Plan Number _____

LEGEND :

S145 — AREA ID #
0.34|0.75 — RUN OFF COEFFICIENT
AREA IN HECTARES

FUTURE MINOR FLOW DIRECTION

NOTES:

1. THIS ALLOWANCE IS FOR OPA66 EXPANSION AREAS 6a, 6b AND 6c.

2. AN ALLOWANCE OF 100l/s HAS BEEN MADE FOR FLOWS TRIBUTARY TO THE LAIRD STREET PUMP STATION.

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8	RESUBMISSION FOR MOE APPROVAL	JIM	17: 07: 14
7	SUBMISSION FOR MOE APPROVAL	JIM	17: 02: 10
6	SUBMISSION #5 FOR CITY REVIEW	JIM	16: 11: 10
5	SUBMISSION #4 FOR CITY REVIEW	JIM	15: 06: 15
4	SUBMISSION #3 FOR CITY REVIEW	JIM	14: 08: 22
3	SUBMISSION #2 FOR CITY REVIEW	JIM	14: 01: 22
2	REVISIONS AS PER RELOCATION OF FOUNDER AVENUE	JIM	13: 12: 12
1	SUBMISSION #1 FOR CITY REVIEW	JIM	13: 08: 29

CRT DEVELOPMENT INC.

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

Project Title

CRT LANDS
FERNBANK COMMUNITY
PHASE 1

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
2017/07/14
PROVINCE OF ONTARIO

Drawing Title

STORM DRAINAGE
AREA PLAN

Scale
1:1250

Design	Date
J.I.M.	OCTOBER '12
Drawn	Checked
M.M.	P.K.
Project No.	Drawing No.
27970	500A

D07-16-11-0003

#17366

J:\27970-FernbankPhase1&2 Drawings\Sitecivil\Layouts\500A.dwg Layout Name: 500A STORM DRAINAGE Plot Style: AIA STANDARD--HALF.CTB Plot Scale: 1:50.8 Plotted At: 7/13/2017 1:29 PM Last Saved By: mmina Last Saved At: Jul. 11, 17

IBI GROUP
IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

STORM SEWER DESIGN SHEET

PROJECT: CRT DEVELOPMENT
LOCATION: CITY OF OTTAWA
CLIENT: CRT DEVELOPMENT INC.

LOCATION				AREA (Ha)										RATIONAL DESIGN FLOW											SEWER DATA								
STREET	AREA ID	FROM MH	TO MH	C= 0.20	C= 0.55	C= 0.65	C= 0.66	C= 0.75	C= 0.80	C= 0.90	C=	C=	C=	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr) (L/s)	(%)
PUTNEY CRESCENT	---	141	142					0.00						0.00	0.00	10.00	0.12	10.12	104.19	122.14	178.56	0.00				0.00	62.04	8.84	250			1.00	1.224	62.04	100.00%
PUTNEY CRESCENT	R142A, B	142	143		0.33									0.50	0.50	10.12	0.48	10.60	103.56	121.40	177.47	52.25				52.25	139.06	54.71	300			1.90	1.906	86.80	62.42%
PUTNEY CRESCENT	S143	143	144					0.32						0.67	1.17	10.60	0.68	11.28	101.13	118.54	173.26	118.50				118.50	266.03	65.86	450			0.80	1.620	147.53	55.45%
FINSBURY AVENUE	S136B, E, R136A	136	144		0.27			0.44						1.33	1.33	10.00	0.87	10.87	104.19	122.14	178.56	138.60				138.60	154.65	110.07	300			2.35	2.119	16.05	10.38%
PUTNEY CRESCENT	S144, R144A, B, C	144	145		0.57			0.25						1.39	3.89	11.28	0.74	12.02	97.90	114.73	167.68	381.31				381.31	401.29	80.25	525			0.80	1.796	19.98	4.98%
CLAPHAM TERRACE	S136C, D, R136B	136	137		0.23			0.18						0.73	0.73	10.00	0.94	10.94	104.19	122.14	178.56	75.75				75.75	100.88	77.99	300			1.00	1.383	25.14	24.92%
BRIXTON WAY	R137A	137	160		0.11									0.17	0.90	10.94	0.42	11.36	99.48	116.59	170.40	89.05				89.05	224.02	50.00	375			1.50	1.965	134.97	60.25%
BRIXTON WAY	S160A, B	160	145					0.43						0.90	1.79	11.36	0.54	11.90	97.50	114.26	166.98	174.69				174.69	280.40	78.98	375			2.35	2.459	105.71	37.70%
PUTNEY CRESCENT	S145A, B, R145	145	146		0.30			0.55						1.61	7.29	12.02	0.70	12.72	94.61	110.85	161.98	689.86				689.86	821.24	75.47	750			0.50	1.801	131.38	16.00%
CLAPHAM TERRACE	S137A, B, R137B	137	138		0.30			0.27						1.02	1.02	10.00	1.19	11.19	104.19	122.14	178.56	106.45				106.45	129.34	81.01	375			0.50	1.134	22.89	17.70%
PUTNEY CRESCENT	S138, R138	138	148		0.14			0.15						0.53	1.55	11.19	0.67	11.86	98.30	115.20	168.37	152.21				152.21	220.25	78.01	375			1.45	1.932	68.04	30.89%
PUTNEY CRESCENT	S148	148	147					0.22						0.46	2.01	11.86	0.38	12.24	95.28	111.65	163.15	191.25				191.25	297.76	59.30	375			2.65	2.612	106.51	35.77%
PUTNEY CRESCENT	---	147	146					0.00						0.00	2.01	12.24	0.10	12.34	93.68	109.76	160.37	188.02				188.02	332.54	12.13	450			1.25	2.026	144.52	43.46%
BLOCK 324		146	161											0.00	9.30	12.72	0.40	13.12	91.73	107.47	157.01	853.01				853.01	944.29	34.88	900			0.25	1.438	91.28	9.67%
BLOCK 324	R146	161	*Ex. 180*		0.14									0.21	9.51	13.12	0.56	13.68	90.15	105.61	154.28	857.65				857.65	944.29	48.00	900			0.25	1.438	86.65	9.18%
BLOCK 324	RES.1, RES. 2B	BULKHEAD	*Ex. 180*						2.45					5.45	5.45	13.00	0.07	13.07	90.63	106.17	155.11	493.82				493.82	731.45	5.00	900			0.15	1.114	237.62	32.49%
														Refer to ECA No. 9079-9LNNZC dated July 9, 2014 for description of existing sewers.																				

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 = 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: J.I.M.
Checked: P.K.
Dwg. Reference: 27970 - 500, 500A, 500B

No.	Revision	Date
1.	Submission No. 1 to City of Ottawa	2013-08-29
2.	Submission No. 2 to City of Ottawa	2014-01-22
3.	Submission No. 3 to City of Ottawa	2014-08-22
4.	Submission No. 4 to City of Ottawa	2015-06-15
5.	Submission No. 5 to City of Ottawa	2016-11-10
6.	Submission for MOE Approval	2017-02-10
7.	Resubmission for MOE Approval	2017-07-14

File Reference: 27970.5.7.1
Date: 2017-07-14
Sheet No: 1 of 3

IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

STORM SEWER DESIGN SHEET

PROJECT: CRT DEVELOPMENT
LOCATION: CITY OF OTTAWA
CLIENT: CRT DEVELOPMENT INC.

LOCATION				AREA (Ha)										RATIONAL DESIGN FLOW											SEWER DATA								
STREET	AREA ID	FROM MH	TO MH	C= 0.20	C= 0.55	C= 0.65	C= 0.66	C= 0.75	C= 0.80	C= 0.90	C=	C=	C=	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr) (L/s)	(%)
CLAPHAM TERRACE	S136A	136	135					0.17						0.35	0.35	10.00	1.03	11.03	104.19	122.14	178.56	36.93				36.93	50.02	61.00	250			0.65	0.987	13.09	26.16%
CLAPHAM TERRACE	S135A, B	135	134					0.26						0.54	0.90	11.03	1.08	12.11	99.05	116.08	169.66	88.80				88.80	108.21	61.66	375			0.35	0.949	19.41	17.94%
PUTNEY CRESCENT	---	141	134		0.00									0.00	0.00	10.00	1.31	11.31	104.19	122.14	178.56	0.00				0.00	108.21	74.74	375			0.35	0.949	108.21	100.00%
PUTNEY CRESCENT	S134A, B, C, R134	134	140		0.21			0.39						1.13	2.03	12.11	1.10	13.21	94.22	110.39	161.31	191.34				191.34	265.43	78.10	525			0.35	1.188	74.09	27.91%
OSTERLEY WAY	S153	153	152					0.12						0.25	0.25	10.00	1.04	11.04	104.19	122.14	178.56	26.07				26.07	43.87	53.80	250			0.50	0.866	17.80	40.57%
OSTERLEY WAY	S152A, B	152	151					0.40						0.83	1.08	11.04	1.82	12.85	99.02	116.05	169.61	107.36				107.36	148.72	98.72	450			0.25	0.906	41.36	27.81%
OSTERLEY WAY	S151A, R151A	151	150		0.18			0.10						0.48	1.57	12.85	0.96	13.81	91.21	106.85	156.10	143.00				143.00	170.86	59.71	450			0.33	1.041	27.86	16.30%
OSTERLEY WAY	S150A, B	150	140					0.32						0.67	2.24	13.81	0.91	14.72	87.62	102.63	149.90	195.83				195.83	257.73	63.00	525			0.33	1.153	61.90	24.02%
PUTNEY CRESCENT	S140, R140	140	124		0.21			0.25						0.84	5.11	14.72	0.91	15.63	84.48	98.93	144.48	431.53				431.53	636.13	76.57	750			0.30	1.395	204.60	32.16%
PUTNEY CRESCENT	S149A, B, S129C	149	128					0.22						0.46	0.46	10.00	0.61	10.61	104.19	122.14	178.56	47.79				47.79	62.04	45.00	250			1.00	1.224	14.25	22.96%
BLOCK 343	RES.2A	BULKHEAD	129						0.65					1.45	1.45	13.00	0.27	13.27	90.63	106.17	155.11	131.01				131.01	303.78	13.50	675			0.12	0.822	172.76	56.87%
BOBOLINK RIDGE		129	128					0.00						0.00	1.45	13.00	0.91	13.91	90.63	106.17	155.11	131.01				131.01	303.78	45.00	675			0.12	0.822	172.76	56.87%
BOBOLINK RIDGE	S128A, R128A	128	127		0.14			0.18						0.59	2.49	13.91	1.57	15.49	87.25	102.19	149.26	217.56				217.56	473.55	81.00	825			0.10	0.858	255.99	54.06%
BOBOLINK RIDGE	S127A, R127A	127	126		0.19			0.17						0.64	3.14	15.49	1.51	17.00	82.02	96.05	140.25	257.44				257.44	473.55	78.00	825			0.10	0.858	216.11	45.64%
FINSBURY AVENUE	S151B, C, R151B	151	126		0.20			0.25						0.83	0.83	10.00	0.79	10.79	104.19	122.14	178.56	86.17				86.17	117.21	76.50	300			1.35	1.606	31.04	26.48%
BOBOLINK RIDGE	---	126	125					0.00						0.00	3.97	17.00	0.81	17.81	77.61	90.86	132.63	307.77				307.77	597.22	44.30	900			0.10	0.909	289.46	48.47%
BOBOLINK RIDGE	S125, R125A, B	125	124		0.35			0.39						1.35	5.31	17.81	1.39	19.20	75.45	88.32	128.91	400.95				400.95	739.33	80.07	975			0.10	0.959	338.38	45.77%
BOBOLINK RIDGE	S124, R124A, B	124	123		0.32			0.26						1.03	11.45	19.20	1.23	20.44	72.05	84.32	123.05	825.24				825.24	1,760.81	88.10	1350			0.10	1.192	935.57	53.13%
DAGENHAM STREET	R131	131	130		0.20									0.31	0.31	10.00	0.84	10.84	104.19	122.14	178.56	31.86				31.86	59.68	41.39	300			0.35	0.818	27.82	46.61%
DAGENHAM STREET	S130, R130A, B	130	123		0.33			0.36						1.26	1.56	10.84	1.75	12.59	99.94	117.13	171.20	156.00				156.00	179.46	84.37	525			0.16	0.803	23.46	13.07%
BOBOLINK RIDGE	---	123	122		0.00									0.00	13.01	20.44	0.30	20.74	69.31	81.11	118.33	902.05				902.05	1,760.81	21.46	1350			0.10	1.192	858.77	48.77%
BOBOLINK RIDGE	S122, R122	122	121		0.17			0.31						0.91	13.92	20.74	0.39	21.13	68.68	80.36	117.24	956.05				956.05	3,040.59	39.49	1500			0.17	1.667	2084.54	68.56%
BOBOLINK RIDGE	R121	121	120		0.13									0.20	14.12	21.13	0.37	21.50	67.86	79.41	115.84	958.22				958.22	3,040.59	36.84	1500			0.17	1.667	2082.37	68.49%
ANGEL HEIGHTS	---	111	112		0.00									0.00	0.00	10.00	0.27	10.27	104.19	122.14	178.56	0.00				0.00	42.08	13.58	250			0.46	0.830	42.08	100.00%
ANGEL HEIGHTS	S112, R112A, B	112	113		0.20			0.27						0.87	0.87	10.27	1.68	11.95	102.77	120.47	176.10	89.29				89.29	139.51	85.60	450			0.22	0.850	50.22	36.00%
DAGENHAM STREET	PARK1	DICB	132	1.27										0.71	0.71	12.00	0.29	12.29	94.70	110.96	162.13	66.87				66.87	100.88	23.70	300			1.00	1.383	34.02	33.72%
DAGENHAM STREET	S132	132	113					0.24						0.50	1.21	12.29	0.55	12.83	93.49	109.54	160.05	112.80				112.80	210.32	42.00	450			0.50	1.281	97.52	46.37%
ANGEL HEIGHTS	S113	113	114					0.30						0.63	1.49	12.83	0.85	13.68	91.29	106.94	156.24	136.40				136.40	248.09	43.13	600			0.15	0.850	111.69	45.02%
ANGEL HEIGHTS	S114, R114	114	120		0.50			0.24						1.26	2.76	13.68	1.43	15.11	88.09	103.18	150.72	243.05				243.05	367.27	69.17	750			0.10	0.805	124.22	33.82%
BOBOLINK RIDGE	S120	120	105					0.28						0.58	17.46	21.50	0.96	22.45	67.13	78.54	114.57	1,172.18				1,172.18	3,040.59	95.64	1500			0.17	1.667	1868.41	61.45%
ANGEL HEIGHTS	S101	101	102					0.20						0.42	0.42	10.00	0.52	10.52	104.19	122.14	178.56	43.45				43.45	129.34	35.48	375			0.50	1.134	85.89	66.41%
GOLDHAWK DRIVE	R102	102	103		0.21									0.32	0.74	10.52	0.83	11.35	101.52	118.99	173.93	74.93				74.93	126.19	38.36	450			0.18	0.769	51.26	40.62%
GOLDHAWK DRIVE	S103, R103A, B	103	104		0.50			0.34						1.47	2.21	11.35	1.01	12.36	97.55	114.32	167.07	215.73				215.73	303.78	49.62	675			0.12	0.822	88.05	28.98%
GOLDHAWK DRIVE	S104, R104A, B, C	104	105		0.59			0.30						1.53	3.74	12.36	1.35	13.71	93.19	109.19	159.53	348.45				348.45	473.55	69.59	825			0.10	0.858	125.10	26.42%
GOLDHAWK DRIVE	S105A, S105B, R105	105	107		0.13	0.90								1.83	23.03	22.45	1.31	23.77	65.29	76.38	111.40	1,503.33				1,503.33	5,720.16	126.10	2100			0.10	1.600	4216.82	73.72%
GOLDHAWK DRIVE	S107	107	109			0.61								1.10	24.13	23.77	1.17	24.94	62.94	73.62	107.36	1,518.58				1,518.58	5,720.16	112.64	2100			0.10	1.600	4201.58	73.45%
GOLDHAWK DRIVE	S109	109	110			0.52								0.94	25.07	24.94	0.67	25.62	60.99	71.33	104.01	1,528.92				1,528.92	5,720.16	64.64	2100			0.10	1.600	4191.24	73.27%

Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
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[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: J.I.M.
Checked: P.K.
Dwg. Reference: 27970 - 500, 500A, 500B

No.	Revision	Date
1.	Submission No. 1 to City of Ottawa	2013-08-29
2.	Submission No. 2 to City of Ottawa	2014-01-22
3.	Submission No. 3 to City of Ottawa	2014-08-22
4.	Submission No. 4 to City of Ottawa	2015-06-15
5.	Submission No. 5 to City of Ottawa	2016-11-10
6.	Submission for MOE Approval	2017-02-10
7.	Resubmission for MOE Approval	2017-07-14

File Reference: 27970.5.7.1
Date: 2017-07-14
Sheet No: 2 of 3

IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

STORM SEWER DESIGN SHEET

PROJECT: CRT DEVELOPMENT
LOCATION: CITY OF OTTAWA
CLIENT: CRT DEVELOPMENT INC.

LOCATION				AREA (Ha)										RATIONAL DESIGN FLOW											SEWER DATA									
STREET	AREA ID	FROM MH	TO MH	C= 0.20	C= 0.55	C= 0.65	C= 0.66	C= 0.75	C= 0.80	C= 0.90	C=	C=	C=	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr) (L/s)	(%)
EMBANKMENT STREET	S128B, R128B	128	188		0.09			0.31						0.78	0.78	10.00	1.76	11.76	104.19	122.14	178.56	81.68				81.68	108.21	100.00	375			0.35	0.949	26.53	24.52%
EMBANKMENT STREET	S188, R188A, B	188	189		0.19			0.30						0.92	1.70	11.76	0.97	12.72	95.75	112.20	163.96	162.77				162.77	210.32	74.32	450			0.50	1.281	47.54	22.61%
BLOCK 344	RES.3	BULKHEAD	189						1.58					3.51	3.51	*13.95*	0.66	14.61	87.11	102.03	149.03	306.10				306.10	402.33	35.00	750			0.12	0.882	96.23	23.92%
EMBANKMENT STREET	S189, R189	189	190		0.09			0.28						0.72	5.94	14.61	1.69	16.30	84.83	99.35	145.10	503.52				503.52	739.33	97.00	975			0.10	0.959	235.81	31.89%
EMBANKMENT STREET	S190	190	176					0.05						0.10	6.04	16.30	0.20	16.50	79.59	93.19	136.05	480.69				480.69	739.33	11.54	975			0.10	0.959	258.64	34.98%
COPE DRIVE	S177, R177	177	176		0.08			0.14						0.41	0.41	10.00	1.17	11.17	104.19	122.14	178.56	43.16				43.16	59.68	57.46	300			0.35	0.818	16.52	27.69%
BLOCK 345 (SCHOOL)	INST.2	BULKHEAD	176						6.57					14.61	14.61	12.00	0.15	12.15	94.70	110.96	162.13	1,383.66				1,383.66	1,575.26	12.00	1200			0.15	1.349	191.60	12.16%
COPE DRIVE	S176	176	175					0.14						0.29	21.36	16.50	1.05	17.55	79.01	92.51	135.05	1,687.52				1,687.52	2,332.02	80.65	1500			0.10	1.278	644.51	27.64%
COPE DRIVE	S175, R175	175	174		0.36			0.42						1.43	22.78	17.55	1.12	18.67	76.14	89.13	130.09	1,734.64				1,734.64	2,332.02	86.28	1500			0.10	1.278	597.38	25.62%
FINSBURY AVENUE	S182A,B, R182A,B,C	182	183		0.58			0.58						2.10	2.10	10.00	1.57	11.57	104.19	122.14	178.56	218.40				218.40	283.76	119.30	525			0.40	1.270	65.35	23.03%
PINNER ROAD	S191, R191A	191	186		0.19			0.60						1.54	1.54	10.00	0.55	10.55	104.19	122.14	178.56	160.61				160.61	378.96	43.00	600			0.35	1.298	218.35	57.62%
BELSIZE WAY	S127B, R127B, C	127	185		0.41			0.26						1.17	1.17	10.00	1.31	11.31	104.19	122.14	178.56	121.80				121.80	188.11	90.00	450			0.40	1.146	66.31	35.25%
BELSIZE WAY	---	185	186											0.00	1.17	11.31	1.29	12.60	97.75	114.56	167.42	114.27				114.27	175.96	82.92	450			0.35	1.072	61.69	35.06%
PINNER ROAD	S186, R186	186	187		0.23			0.23						0.83	3.54	12.60	1.38	13.97	92.21	108.04	157.85	326.60				326.60	473.55	70.83	825			0.10	0.858	146.95	31.03%
PINNER ROAD	---	187	183					0.00						0.00	3.54	13.97	0.19	14.17	87.03	101.93	148.88	308.22				308.22	473.55	10.00	825			0.10	0.858	165.33	34.91%
FINSBURY AVENUE	S183, R183	183	184		0.22			0.24						0.84	6.47	14.17	1.14	15.30	86.34	101.13	147.71	559.05				559.05	900.87	68.70	1050			0.10	1.008	341.82	37.94%
FINSBURY AVENUE	---	184	174					0.00						0.00	6.47	15.30	0.32	15.62	82.59	96.71	141.22	534.72				534.72	900.87	19.07	1050			0.10	1.008	366.15	40.64%
COPE DRIVE	S174, R174	174	173		0.12			0.25						0.70	29.96	18.67	0.94	19.61	73.30	85.80	125.21	2,196.41				2,196.41	3,792.13	81.44	1800			0.10	1.444	1595.72	42.08%
COPE DRIVE	S173	173	172					0.29						0.60	30.57	19.61	0.84	20.46	71.11	83.22	121.43	2,173.69				2,173.69	3,792.13	73.01	1800			0.10	1.444	1618.44	42.68%
BLOCK 313 (SCHOOL)	INST.1	BULKHEAD	172						2.88					6.41	6.41	12.00	0.25	12.25	94.70	110.96	162.13	606.54				606.54	755.43	17.02	900			0.16	1.150	148.90	19.71%
COPE DRIVE	S172	172	171					0.23						0.48	37.45	20.46	0.93	21.39	69.27	81.05	118.25	2,594.13				2,594.13	3,792.13	80.84	1800			0.10	1.444	1198.00	31.59%
DAGENHAM STREET	S180A,B, R180A	180	181		0.09			0.37						0.91	0.91	10.00	1.42	11.42	104.19	122.14	178.56	94.72				94.72	245.74	94.00	525			0.30	1.100	151.02	61.46%
DAGENHAM STREET	S181, R181	181	171		0.09			0.14						0.43	1.34	11.42	1.23	12.66	97.23	113.94	166.51	130.14				130.14	286.47	72.50	600			0.20	0.982	156.32	54.57%
COPE DRIVE	S171	171	170					0.26						0.54	39.33	21.39	0.94	22.33	67.34	78.79	114.94	2,648.73				2,648.73	3,792.13	81.06	1800			0.10	1.444	1143.40	30.15%
BLOCK 312	RES.3A	CBMH549	sewer				3.26							5.98	5.98	12.00	0.22	12.22	94.70	110.96	162.13	566.42				566.42	844.60	16.74	900			0.20	1.286	278.18	32.94%
COPE DRIVE	S170A,B	170	110					0.33						0.69	46.00	22.33	1.33	23.66	65.53	76.66	111.82	3,014.45				3,014.45	4,694.42	121.89	1950			0.10	1.523	1679.97	35.79%
GOLDHAWK DRIVE	S110B	110	205			0.47								0.85	71.92	25.62	0.83	26.45	59.93	70.09	102.19	4,310.29				4,310.29	11,180.46	94.32	2700			0.10	1.892	6870.17	61.45%
														0.00																					
GOLDHAWK DRIVE	INST.3	BULKHEAD	205						2.47					5.49	5.49	12.00	0.17	12.17	94.70	110.96	162.13	520.19				520.19	620.09	17.00	675			0.50	1.679	99.90	16.11%
GOLDHAWK DRIVE	205A, 205B	205	206			1.46								2.64	80.05	26.45	0.94	27.39	58.68	68.62	100.04	4,697.53				4,697.53	11,180.46	107.00	2700			0.10	1.892	6482.93	57.98%
GOLDHAWK DRIVE	S206	206	207			0.84								1.52	81.57	27.39	0.90	28.29	57.33	67.04	97.72	4,676.48				4,676.48	11,726.17	107.16	2700			0.11	1.984	7049.69	60.12%
														0.00																					
STREET NO. 2	RES. 4, 6 & 7		207			22.96			1.89					45.69	45.69	10.00	0.83	10.83	104.19	122.14	178.56	4,760.80				4,760.80	5,720.16	80.00	2100			0.10	1.600	959.36	16.77%
STREET NO. 2	S305	305	CULVERT			0.03								0.05	0.05												13,335.43	22.00	1500			3.27	7.311	13335.43	100.00%
STREET NO. 26	S304	304	CULVERT			0.03								0.05	0.05												12,579.97	22.00	1500			2.91	6.896	12579.97	100.00%
FUTURE STREET	S304B	304	303			0.69								1.25	1.25												5,720.16	98.94	2100			0.10	1.600	5720.16	100.00%
GOLDHAWK DRIVE	S303, S306	303	302			3.19								5.76	7.01												5,720.16	94.58	2100			0.10	1.600	5720.16	100.00%
GOLDHAWK DRIVE	S302,Park3,Res 5	302	301	1.36		10.06								18.93	25.95												5,720.16	70.65	2100			0.10	1.600	5720.16	100.00%
GOLDHAWK DRIVE	S301	301	207			0.49								0.89	26.83												5,720.16	70.00	2100			0.10	1.600	5720.16	100.00%
STREET NO. 25	---	207	300											0.00	154.09												2,332.02	93.73	1500			0.10	1.278	2332.02	100.00%
POND		300	HEADWALL	9.21		52.74								100.42	254.51												3,006.86	75.63	1650			0.10	1.362	3006.86	100.00%

These pipes are sized by stormwater modeling (See Design Brief-Fernbank Pond 5 Stormwater Management Facility Report)

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 = 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: J.I.M.
Checked: P.K.
Dwg. Reference: 27970 - 500, 500A, 500B

No.	Revision	Date
1.	Submission No. 1 to City of Ottawa	2013-08-29
2.	Submission No. 2 to City of Ottawa	2014-01-22
3.	Submission No. 3 to City of Ottawa	2014-08-22
4.	Submission No. 4 to City of Ottawa	2015-06-15
5.	Submission No. 5 to City of Ottawa	2016-11-10
6.	Submission for MOE Approval	2017-02-10
7.	Resubmission for MOE Approval	2017-07-14

File Reference: 27970.5.7.1
Date: 2017-07-14
Sheet No: 3 of 3

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

STORM SEWER DESIGN SHEET

CRT Blk 324
City of Ottawa
Claridge Homes

LOCATION				AREA (Ha)							RATIONAL DESIGN FLOW												SEWER DATA								
STREET	AREA ID	FROM	TO	C 0.61	C 0.77	C 0.78	C 0.79	C 0.80	C 0.81	C 0.90	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (2) (mm/hr)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	2yr PEAK FLOW (L/s	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (2yr) (L/s)	(%)
OUTLET TO EASEMENT																																		
	ext	Temp DI	202					0.56			1.25	1.25	11.00	0.22	11.22	73.17	99.19	116.25	169.91	91.13	123.54	144.78	211.61	0.00	91.13	148.72	12.08	450			0.25	0.906	57.59	38.73%
		111	101								0.00	0.00	10.00	0.73	10.73	76.81	104.19	122.14	178.56	0.00	0.00	0.00	0.00	0.00	0.00	43.87	37.70	250			0.50	0.866	43.87	100.00%
		101	202		0.18						0.39	0.39	10.73	0.88	11.60	74.13	100.51	117.80	172.19	28.56	38.73	45.39	66.34	0.00	28.56	43.87	45.62	250			0.50	0.866	15.31	34.89%
	MH112	202	112		0.06						0.13	1.76	11.60	0.56	12.16	71.15	96.42	112.99	165.12	125.17	169.62	198.77	290.47	0.00	125.17	245.74	37.00	525			0.30	1.100	120.57	49.07%
		112	103		0.23						0.49	2.25	12.16	0.67	12.83	69.39	94.00	110.14	160.93	156.22	211.64	247.97	362.33	0.00	156.22	249.80	44.87	525			0.31	1.118	93.58	37.46%
		113	103								0.00	0.00	10.00	0.74	10.74	76.81	104.19	122.14	178.56	0.00	0.00	0.00	0.00	0.00	0.00	43.87	38.45	250			0.50	0.866	43.87	100.00%
		103	104								0.00	2.25	12.83	0.43	13.27	67.40	91.28	106.94	156.23	151.76	205.52	240.77	351.75	0.00	151.76	249.80	29.00	525			0.31	1.118	98.04	39.25%
		114	104								0.00	0.00	10.00	0.85	10.85	76.81	104.19	122.14	178.56	0.00	0.00	0.00	0.00	0.00	0.00	43.87	44.23	250			0.50	0.866	43.87	100.00%
		115	104								0.00	0.00	10.00	0.78	10.78	76.81	104.19	122.14	178.56	0.00	0.00	0.00	0.00	0.00	0.00	43.87	40.73	250			0.50	0.866	43.87	100.00%
		104	105								0.00	2.25	13.27	0.40	13.66	66.19	89.61	104.98	153.35	149.02	201.76	236.35	345.27	0.00	149.02	347.53	37.00	525			0.60	1.555	198.51	57.12%
	MH116	ce l	116			0.54					1.17	1.17	10.00	0.05	10.05	76.81	104.19	122.14	178.56	89.93	122.00	143.02	209.08	0.00	89.93	289.79	8.30	375			2.51	2.542	199.85	68.97%
		116	105								0.00	1.17	10.05	0.74	10.79	76.60	103.91	121.80	178.06	89.69	121.67	142.62	208.50	0.00	89.69	115.68	44.83	375			0.40	1.015	25.99	22.47%
		117	105								0.00	0.00	10.00	0.78	10.78	76.81	104.19	122.14	178.56	0.00	0.00	0.00	0.00	0.00	0.00	43.87	40.73	250			0.50	0.866	43.87	100.00%
		105	106								0.00	3.42	13.66	0.27	13.94	65.12	88.14	103.25	150.81	222.85	301.66	353.35	516.14	0.00	222.85	347.53	25.50	525			0.60	1.555	124.67	35.87%
		106	107								0.00	3.42	13.94	0.09	14.02	64.40	87.16	102.09	149.11	220.40	298.30	349.40	510.34	0.00	220.40	347.53	8.25	525			0.60	1.555	127.13	36.58%
	123	123	124						0.13		0.29	0.29	10.00	0.66	10.66	76.81	104.19	122.14	178.56	22.48	30.50	35.76	52.27	0.00	22.48	72.04	39.09	300			0.51	0.987	49.56	68.79%
		124	107								0.00	0.29	10.66	0.64	11.30	74.36	100.83	118.18	172.74	21.77	29.52	34.60	50.57	0.00	21.77	63.80	33.76	300			0.40	0.874	42.04	65.88%
	120	120	119	0.22							0.37	0.37	10.00	0.84	10.84	76.81	104.19	122.14	178.56	28.65	38.87	45.57	66.62	0.00	28.65	63.80	44.00	300			0.40	0.874	35.15	55.09%
		118	119								0.00	0.00	10.00	0.14	10.14	76.81	104.19	122.14	178.56	0.00	0.00	0.00	0.00	0.00	0.00	43.87	7.50	250			0.50	0.866	43.87	100.00%
		119	107								0.00	0.37	10.84	0.52	11.35	73.73	99.96	117.16	171.24	27.51	37.29	43.71	63.89	0.00	27.51	91.35	38.76	300			0.82	1.252	63.85	69.89%
		107	108								0.00	4.09	14.02	0.44	14.47	64.17	86.85	101.72	148.58	262.35	355.06	415.87	607.41	0.00	262.35	388.55	46.40	525			0.75	1.739	126.20	32.48%
	121	122	108				0.27				0.59	0.59	10.00	0.19	10.19	76.81	104.19	122.14	178.56	45.54	61.78	72.43	105.88	0.00	45.54	63.80	9.94	300			0.40	0.874	18.26	28.62%
		108	109								0.00	4.68	14.47	0.11	14.58	63.05	85.31	99.92	145.92	295.15	399.37	467.73	683.11	0.00	295.15	452.94	10.14	600			0.50	1.552	157.79	34.84%
		109	*EX*								*0.00*	*4.68*	*14.58*	*0.08*	*14.66*	*62.78*	*84.95*	*99.49*	*145.29*	*293.90*	*397.65*	*465.72*	*680.14*	*0.00*	*293.90*	*731.45*	*5.20*	*900*			*0.15*	*1.114*	*437.55*	*59.82%*
				0.22	0.47	0.54	0.27	0.56	0.13	0.00	4.68																							
											2.19	Total A																						
											0 77	Avg_C																						

Definitions:

Q 2.78CiA, where
Q Peak Flow in Litres per Second (L/s)
A Area in Hectares (Ha)
i Rainfall intensity in m illimeters 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)

Designed: RM

Checked: DY

Dwg. Reference: 126715-500

No.	Revision	Date
1.	Servicing Brief - Submission No. 1	2021-01-18
2.	Servicing Brief - Submission No. 2	2021-07-16

File Reference: 126715.6.4.4
Date: 2021-01-18
Sheet No: 1 of 1

MH121
0.27 0.79
AREA IDENTIFICATION
COEFFICIENT
AREA IN HECTARES

Project North

ROBERT GRANT AVE.

PROPERTY LINE

CBMH120A T/G 105.52

15.6m x 1.9m DC-780 UNDERGROUND STORAGE

MH120 CB120B T/G 105.59

MH121 0.27 0.79

10.6m x 7.8m DC-780 UNDERGROUND STORAGE

CB120A T/G 105.45

T/G 105.40 CB120A

CBMH122 T/G 105.63

CB122A T/G 105.63

STREET 2

MH108

MH109

STREET 1

STREET 3

<none> 0.13 0.81

CB123B T/G 105.72

CBMH123A T/G 105.77

MH124

CB124B T/G 105.58

HYD B/F 106.11

450mmØ STM @ 0.25%

FUTURE

BLOCK 323

900mmØ STM @ 0.25%

1.8m ASPHALT SIDEWALK

MH147

MH146

MH145

CB53

CB54

MH120 0.22 0.61

MH116 0.54 0.78

EXT1 0.08 0.61

MH106

MH105

MH104

MH103

MH102

MH117

MH115

MH114

MH113

MH112

MH111

MH101

STREET 4

STREET 5

CB116A T/G 106.17 CMB

CB116B T/G 106.03

2.1m x 5.91m MC4500 UNDERGROUND STORAGE

CB116C T/G 106.27

CB116D T/G 106.27

CB114A T/G 106.11

CB114B T/G 106.71

CB112A T/G 107.22

CB112B T/G 107.10

CB112C T/G 107.22

CB112D T/G 107.22

MH202 0.06 0.77

CB110A T/G 107.07

CB110B T/G 107.67

CB110C T/G 107.67

CB110D T/G 107.67

TEMPORARY DITCH INLET COMPLETE WITH 3:1 GRATE T/G 107.09

PROPERTY LINE

0.56Ha EXT C=0.8

RES.2B 0.56 0.80

HYD B/F 106.14

HYD B/F 106.24

HYD B/F 106.61

HYD B/F 107.06

HYD B/F 107.49

HYD B/F 108.62

525mmØ

450mmØ

375mmØ

300mmØ

250mmØ

600mmØ

375mmØ STM @ 2.65%

375mmØ STM @ 1.45%

CB56

CB58

MH148

MH138

CB55

CB57

CB52

PUTNEY CRES.

CLAPHAM TERR.

BLOCK 325

108

107

CONCRETE SIDEWALK

DC

CMB

CLIENT

CLARIDGE HOMES

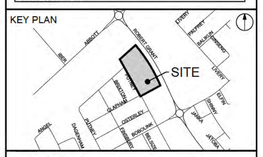
COPYRIGHT

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED TO CITY FOR REVIEW	2021.01.22
2	REVISED PER CITY COMMENTS	2021.07.16

SEE 010 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS
SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR/ AOV

KEY PLAN



CONSULTANTS

NOT FOR CONSTRUCTION

1:400 0 4 12 20m

SEAL

LICENSED PROFESSIONAL ENGINEER
D. G. Yannoulopoulos
2021/07/16
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
CRT
BLOCK 324

PROJECT NO: 126715

DRAWN BY:	CHECKED BY:
D.D. E.H.	DGY
PROJECT MGR:	APPROVED BY:
DGY	DGY

SHEET TITLE
STORM DRAINAGE AREA PLAN

SHEET NUMBER 500

ISSUE 1

SCALE CHECK 1 in

File Location: J:\126715_CRT_Block324\7.0_Production\7.03_Design\04_Civil\Sheets\500 STORM DRAINAGEAREA PLAN.dwg Last Saved: June 16, 2021, by Ehemie Plotted: Friday, July 16, 2021 3:01:38 PM by Eric Hemie

CITY FILE No. D07-12-21-0022 CITY PLAN No. 18416

LEGEND :

EMERGENCY OVERLAND FLOW ROUTE

Project North

ROBERT GRANT AVE.

PROPERTY LINE

BOTTOM OF WALL TO MATCH EXISTING SIDEWALK

POND ID	120A
TOP OF GRATE (m)	105.52
STATIC ELEV (m)	105.59
STATIC DEPTH (m)	0.07
STATIC VOLUME (m³)	0.44

POND ID	116B
TOP OF GRATE (m)	106.03
STATIC ELEV (m)	106.13
STATIC DEPTH (m)	0.10
STATIC VOLUME (m³)	1.12

POND ID	112B
TOP OF GRATE (m)	107.10
STATIC ELEV (m)	107.15
STATIC DEPTH (m)	0.05
STATIC VOLUME (m³)	0.18

POND ID	120A
TOP OF GRATE (m)	105.40
STATIC ELEV (m)	105.45
STATIC DEPTH (m)	0.05
STATIC VOLUME (m³)	0.40

EXISTING GRADE AT PROPERTY LINE

POND ID	121B
TOP OF GRATE (m)	105.45
STATIC ELEV (m)	105.54
STATIC DEPTH (m)	0.09
STATIC VOLUME (m³)	0.40

POND ID	116A
TOP OF GRATE (m)	106.17
STATIC ELEV (m)	106.26
STATIC DEPTH (m)	0.09
STATIC VOLUME (m³)	0.65

POND ID	112A
TOP OF GRATE (m)	107.10
STATIC ELEV (m)	107.19
STATIC DEPTH (m)	0.09
STATIC VOLUME (m³)	0.56

POND ID	123B
TOP OF GRATE (m)	105.77
STATIC ELEV (m)	105.82
STATIC DEPTH (m)	0.08
STATIC VOLUME (m³)	0.34

POND ID	123A
TOP OF GRATE (m)	105.77
STATIC ELEV (m)	105.82
STATIC DEPTH (m)	0.08
STATIC VOLUME (m³)	0.54

STREET 1 STREET 2 STREET 3 STREET 4 STREET 5

PROPERTY LINE

PUTNEY CRES.

CLAPHAM TERR.

BLOCK 325

BLOCK 342

CONCRETE SIDEWALK

1.8m ASPHALT SIDEWALK

8m ASPHALT SIDEWALK

CLIENT

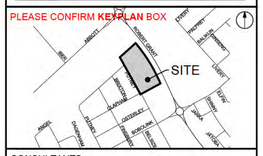
CLARIDGE HOMES

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED TO CITY FOR REVIEW	2021.01.22
2	REVISED PER CITY COMMENTS	2021.07.16

- SEE 010 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS
- SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR/ AOV

PLEASE CONFIRM KEYPLAN BOX



CONSULTANTS

NOT FOR CONSTRUCTION

1:400 0 4 12 20m

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CRT

BLOCK 324

PROJECT NO: 126715	
DRAWN BY: D.D. E.H.	CHECKED BY: DGY
PROJECT MGR: DGY	APPROVED BY: DGY

SHEET TITLE

PONDING PLAN

SHEET NUMBER	ISSUE
600	1

SCALE CHECK 1 in

File Location: J:\126715_CRT_Block324\7.0\3_Production\7.0\3_Design\04_Civil\Sheets\600 PONDING PLAN.dwg Last Saved: June 16, 2021 by bhennie Plotted: Friday, July 16, 2021 3:02:09 PM by Eric Hennie

CITY FILE No. D07-12-21-0022 CITY PLAN No. 18416

MC-4500 CHAMBER

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. StormTech chambers can also be used in conjunction with Green Infrastructure, thus enhancing the performance and extending the service life of these practices.

STORMTECH MC-4500 CHAMBER
(not to scale)

Nominal Chamber Specifications

Size (L x W x H)
52" x 100" x 60"
1321 mm x 2540 mm x 1524 mm

Chamber Storage
106.5 ft³ (3.01 m³)

Min. Installed Storage*
162.6 ft³ (4.60 m³)

Weight
Nominal 125 lbs (56.7 kg)

Shipping
7 chambers/pallet
5 end caps/pallet
11 pallets/truck

*Assumes a minimum of 12" (300 mm) of stone above, 9" (230 mm) of stone below chambers, 9" (230 mm) of stone between chambers/end caps and 40% stone porosity.

STORMTECH MC-4500 END CAP
(not to scale)

Nominal End Cap Specifications

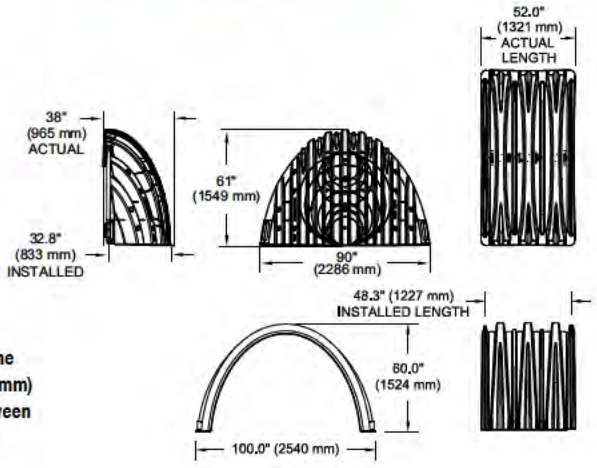
Size (L x W x H)
38" x 90" x 61"
965 mm x 2286 mm x 1549 mm

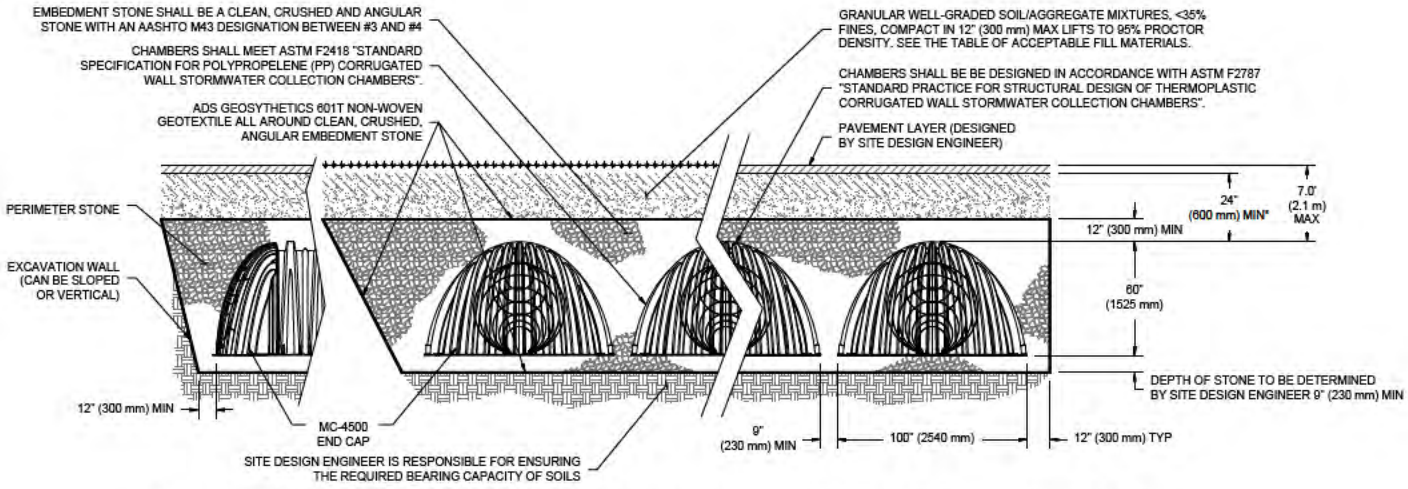
End Cap Storage
39.5 ft³ (1.12 m³)

Min. Installed Storage*
115.3 ft³ (3.26 m³)

Weight
Nominal 90.0 lbs (40.8 kg)

*Assumes a minimum of 12" (300 mm) of stone above, 9" (230 mm) of stone below, 12" (300 mm) of stone perimeter, 9" (230 mm) of stone between chambers/end caps and 40% stone porosity.





*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 30" (750 mm).

MC-4500 CHAMBER SPECIFICATIONS

STORAGE VOLUME PER CHAMBER FT^3 (M^3)

	Bare Chamber Storage ft^3 (m^3)	Chamber and Stone Foundation Depth in. (mm)			
		9" (230 mm)	12" (300 mm)	15" (375 mm)	18" (450 mm)
MC-4500 Chamber	106.5 (3.01)	162.6 (4.60)	166.3 (4.71)	169.9 (4.81)	173.6 (4.91)
MC-4500 End Cap	39.5 (1.12)	115.3 (3.26)	118.6 (3.36)	121.9 (3.45)	125.2 (3.54)

Note: Assumes 9" (230 mm) row spacing, 40% stone porosity, 12" (300 mm) stone above and includes the bare chamber/end cap volume. End cap volume assumes 12" (300 mm) stone perimeter in front of end cap.

AMOUNT OF STONE PER CHAMBER

ENGLISH TONS (yds^3)	Stone Foundation Depth			
	9"	12"	15"	18"
MC-4500 Chamber	7.4 (5.2)	7.8 (5.5)	8.3 (5.9)	8.8 (6.2)
MC-4500 End Cap	9.8 (7.0)	10.2 (7.3)	10.6 (7.6)	11.1 (7.9)
METRIC KILOGRAMS (m^3)	230 mm	300 mm	375 mm	450 mm
MC-4500 Chamber	6713 (4.0)	7076 (4.2)	7529 (4.5)	7983 (4.7)
MC-4500 End Cap	8890 (5.3)	9253 (5.5)	9616 (5.8)	10069 (6.0)

Note: Assumes 12" (300 mm) of stone above and 9" (230 mm) row spacing and 12" (300 mm) of perimeter stone in front of end caps.

VOLUME EXCAVATION PER CHAMBER YD^3 (M^3)

	Stone Foundation Depth			
	9" (230 mm)	12" (300 mm)	15" (375mm)	18" (450 mm)
MC-4500 Chamber	10.5 (8.0)	10.8 (8.3)	11.2 (8.5)	11.5 (8.8)
MC-4500 End Cap	9.7 (7.4)	10.0 (7.6)	10.3 (7.9)	10.6 (8.1)

Note: Assumes 9" (230 mm) of separation between chamber rows, 12" (300 mm) of perimeter in front of the end caps, and 24" (600 mm) of cover. The volume of excavation will vary as depth of cover increases.

Working on a project?
Visit us at www.stormtech.com
and utilize the StormTech Design Tool

For more information on the StormTech MC-4500 Chamber and other ADS products, please contact our Customer Service Representatives at 1-800-821-6710

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1-800-821-6710 www.ads-pipe.com

STORMTECH DC-780 CHAMBER

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. StormTech chambers can also be used in conjunction with Green Infrastructure, thus enhancing the performance and extending the service life of these practices.

- 12' (3.6 m) Deep Cover Applications
- Designed in accordance with ASTM F 2787 and produced to meet the ASTM 2418 product standard.
- AASHTO safety factors provided for AASHTO Design Truck (H20 and deep cover conditions.)

STORMTECH DC-780 CHAMBER
(not to scale)

Nominal Chamber Specifications

Size (L x W x H)
85.4" x 51.0" x 30.0"
2,170 mm x 1,295 mm x 762 mm

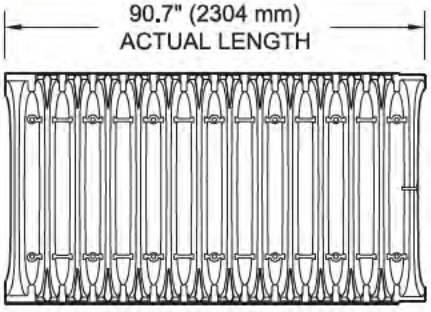
Chamber Storage
46.2 ft³ (1.30 m³)

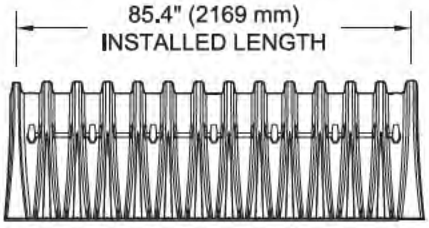
Min. Installed Storage*
78.4 ft³ (2.20 m³)

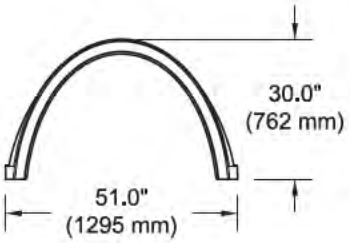
Weight
80.0 lbs (36.3 kg)

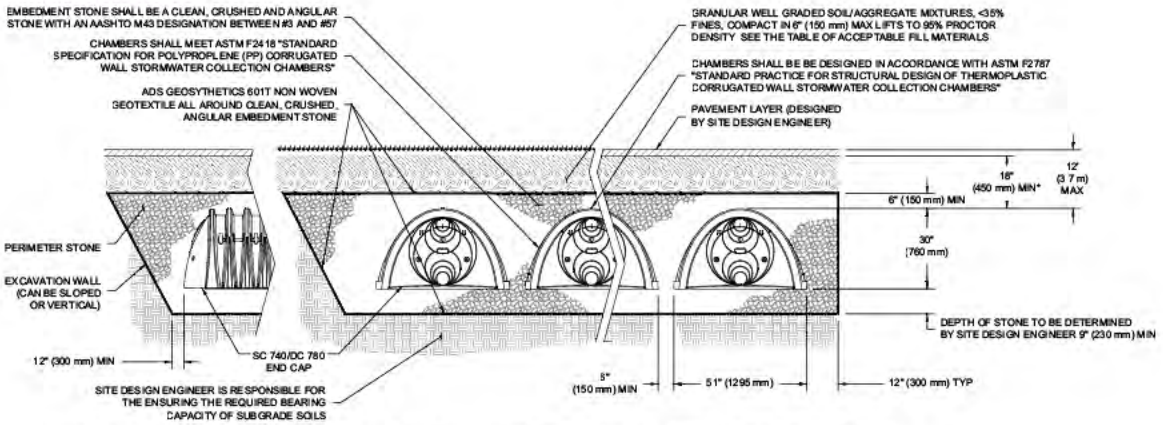
Shipping
24 chambers/pallet
60 end caps/pallet
12 pallets/truck

*Assumes 9" (230 mm) stone below, 6" (150 mm) row spacing and 40% stone porosity.









*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 24" (600 mm)

DC-780 CUMULATIVE STORAGE VOLUMES PER CHAMBER

Assumes 40% Stone Porosity. Calculations are Based Upon a 9" (230 mm) Stone Base Under Chambers.

Depth of Water in System Inches (mm)	Cumulative Chamber Storage ft³ (m³)	Total System Cumulative Storage ft³ (m³)
45 (1,143)	46.27 (1.310)	78.47 (2.222)
44 (1,118)	46.27 (1.310)	77.34 (2.190)
43 (1,092)	Stone 46.27 (1.310)	76.21 (2.158)
42 (1,067)	Cover 46.27 (1.310)	75.09 (2.126)
41 (1,041)	46.27 (1.310)	73.96 (2.094)
40 (1,016)	46.27 (1.310)	72.83 (2.062)
39 (991)	46.27 (1.310)	71.71 (2.030)
38 (965)	46.21 (1.309)	70.54 (1.998)
37 (940)	46.04 (1.304)	69.32 (1.963)
36 (914)	45.76 (1.296)	68.02 (1.926)
35 (889)	45.15 (1.278)	66.53 (1.884)
34 (864)	44.34 (1.255)	64.91 (1.838)
33 (838)	43.38 (1.228)	63.21 (1.790)
32 (813)	42.29 (1.198)	61.43 (1.740)
31 (787)	41.11 (1.164)	59.59 (1.688)
30 (762)	39.83 (1.128)	57.70 (1.634)
29 (737)	38.47 (1.089)	55.76 (1.579)
28 (711)	37.01 (1.048)	53.76 (1.522)
27 (686)	35.49 (1.005)	51.72 (1.464)
26 (660)	33.90 (0.960)	49.63 (1.405)
25 (635)	32.24 (0.913)	47.52 (1.346)
24 (610)	30.54 (0.865)	45.36 (1.285)
23 (584)	28.77 (0.815)	43.18 (1.223)
22 (559)	26.96 (0.763)	40.97 (1.160)
21 (533)	25.10 (0.711)	38.72 (1.096)
20 (508)	23.19 (0.657)	36.45 (1.032)
19 (483)	21.25 (0.602)	34.16 (0.967)
18 (457)	19.26 (0.545)	31.84 (0.902)
17 (432)	17.24 (0.488)	29.50 (0.835)
16 (406)	15.19 (0.430)	27.14 (0.769)
15 (381)	13.10 (0.371)	24.76 (0.701)
14 (356)	10.98 (0.311)	22.36 (0.633)
13 (330)	8.83 (0.250)	19.95 (0.565)
12 (305)	6.66 (0.189)	17.52 (0.496)
11 (279)	4.46 (0.126)	15.07 (0.427)
10 (254)	2.24 (0.064)	12.61 (0.357)

Depth of Water in System Inches (mm)	Cumulative Chamber Storage ft³ (m³)	Total System Cumulative Storage ft³ (m³)
9 (229)	0 (0)	10.14 (0.287)
8 (203)	0 (0)	9.01 (0.255)
7 (178)	0 (0)	7.89 (0.223)
6 (152)	Stone Foundation 0 (0)	6.76 (0.191)
5 (127)	0 (0)	5.63 (0.160)
4 (102)	0 (0)	4.51 (0.128)
3 (76)	0 (0)	3.38 (0.096)
2 (51)	0 (0)	2.25 (0.064)
1 (25)	0 (0)	1.13 (0.032)

Note: Add 1.13 ft³ (0.032 m³) of Storage for Each Additional Inch (25 mm) of Stone Foundation.

STORAGE VOLUME PER CHAMBER FT³ (M³)

	Bare Chamber Storage ft³ (m³)	Chamber and Stone Foundation Depth in. (mm)		
		9" (230 mm)	12" (300 mm)	18" (450 mm)
DC-780 Chamber	78.4 (2.2)	78.4 (2.2)	81.8 (2.3)	88.6 (2.5)

Note: Assumes 40% porosity for the stone, the bare chamber volume, 6" (150 mm) of stone above, and 6" (150 mm) row spacing.

AMOUNT OF STONE PER CHAMBER

ENGLISH TONS (yds3)	Stone Foundation Depth		
	9"	12"	18"
DC-780 Chamber	4.2 (3.0)	4.7 (3.3)	5.6 (3.9)
METRIC KILOGRAMS (m³)	230 mm	300 mm	450 mm
DC-780 Chamber	3,810 (2.3)	4,264 (2.5)	5,080 (3.0)

Note: Assumes 9" (150 mm) of stone above, and between chambers.

VOLUME EXCAVATION PER CHAMBER YD³ (M³)

	Stone Foundation Depth		
	9" (230 mm)	12" (300 mm)	18" (450 mm)
DC-780 Chamber	5.9 (4.5)	6.3 (4.8)	6.9 (5.3)

Note: Assumes 6" (150 mm) separation between chamber rows and 18" (450 mm) of cover. The volume of excavation will vary as depth of cover increases.

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PROJECT	BLK 324
DATE	2021-07-16
FILE	126715-6.4
REV #	2
DESIGNED BY	R M.
CHECKED BY	D.G.Y.

STORMWATER MANAGEMENT

	storage cm/m	storage/end cap	length of end cap
DC 780	1 014	0	
MC 4500	3.748	3.26	0.83

Cell 116 twin 21m 4500 units			
21	72.48632	6.52	79.00632
21	72.48632	6.52	79.00632
	144.97264	13.04	158.01264
required storage 100yr			145.10

Cell 120 15m 780 unit			
15	15 21	0	15.21
required storage 100yr			13.09

Cell 121 5@10m 780 units			
10	10.14		10.14
10	10.14		10.14
10	10.14		10.14
10	10.14		10.14
10	10.14		10.14
	50.7	0	50.7
required storage 100yr			46.38

Cell	req 100yr storage CM	provided storage CM
MH116	145.10	158.01
MH120	13.09	15.21
MH121	46.38	50.70
total	204 57	223.92

Velocity x Depth Calculation - CRT - Block 324

Iteration equation

Veloc ty

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

Depth

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

100 Year 3 Hour Chicago Storm

					SWMHYMO (126715vd.out)					Calculation Sheet: Overflow for Typical Road Ponding Area					SWMHYMO (126715vd.out)			Velocity x Depth	Maximum Static Ponding Depth	Total Depth (Static + Dynamic)
Area ID (Dummy Segment, if applicable)	Road ROW Section	Longitudinal Slope (%)	Overflow Flowrate		Flowrate (cms)		Velocity (m/s)			Flowrate (cms)		Depth (m)			Depth (m)					
			Qx (l/s)	Qx (cms)	Qmin	Qmax	vmin	vmax	vx	Qmin	Qmax	dmin	dmax	dx	dmin	dmax	dx	(m^2/s)	(m)	(m)
MH112	7	1.50	0	0.000	0.000	0.001	0.000	0.166	0.000					N/A	0.000	0.005	0.000	0.000	0.09	0.09
MH116	7	2.20	0	0.000	0.000	0.001	0.000	0.166	0.000					N/A	0.000	0.005	0.000	0.000	0.10	0.10
MH120	8	1.70	0	0.000	0.000	0.001	0.000	0.166	0.000					N/A	0.000	0.005	0.000	0.000	0.07	0.07
MH121	8	0.50	0	0.000	0.000	0.001	0.000	0.166	0.000					N/A	0.000	0.005	0.000	0.000	0.09	0.09
MH123	7	0.50	0	0.000	0.000	0.001	0.000	0.166	0.000					N/A	0.000	0.005	0.000	0.000	0.08	0.08
			0	0.000					#DIV/0!					#DIV/0!			N/A	#DIV/0!		#VALUE!
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Velocity x Depth Calculation   CRT   Block 324

Iteration equation

Velocity

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

Depth

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

100 Year 3 Hour Chicago Storm + 20%																				
					SWMHYMO (126715vd.out)					Calculation Sheet: Overflow for Typical Road Ponding Area					SWMHYMO (126715vd.out)			Velocity x Depth	Maximum Static Ponding Depth	Total Depth (Static Dynamic)
Area ID (Dummy Segment, if applicable)	Road ROW Section	Longitudinal Slope (%)	Overflow Flowrate		Flowrate (cms)		Velocity (m/s)			Flowrate (cms)		Depth (m)			Depth (m)					
			Qx (l/s)	Qx (cms)	Qmin	Qmax	vmin	vmax	vx	Qmin	Qmax	dmin	dmax	dx	dmin	dmax	dx	(m^2/s)	(m)	(m)
MH112	7	1.50	**39**	0.039	0.031	0.040	0.489	0.534	**0.529**					**N/A**	0.032	0.037	**0.036**	**0.019**	0.09	0.13
MH116	7	2.20	**113**	0.113	0.111	0.130	0.721	0.753	**0.724**					**N/A**	0.063	0.068	**0.064**	**0.046**	0.10	0.16
MH120	8	1.70	**21**	0.021	0.015	0.022	0.387	0.441	**0.433**					**N/A**	0.021	0.026	**0.025**	**0.011**	0.07	0.10
MH121	8	0.50	**39**	0.039	0.031	0.040	0.489	0.534	**0.529**					**N/A**	0.032	0.037	**0.036**	**0.019**	0.09	0.13
MH123	7	0.50	**13**	0.013	0.009	0.015	0.327	0.387	**0.367**					**N/A**	0.016	0.021	**0.019**	**0.007**	0.08	0.10
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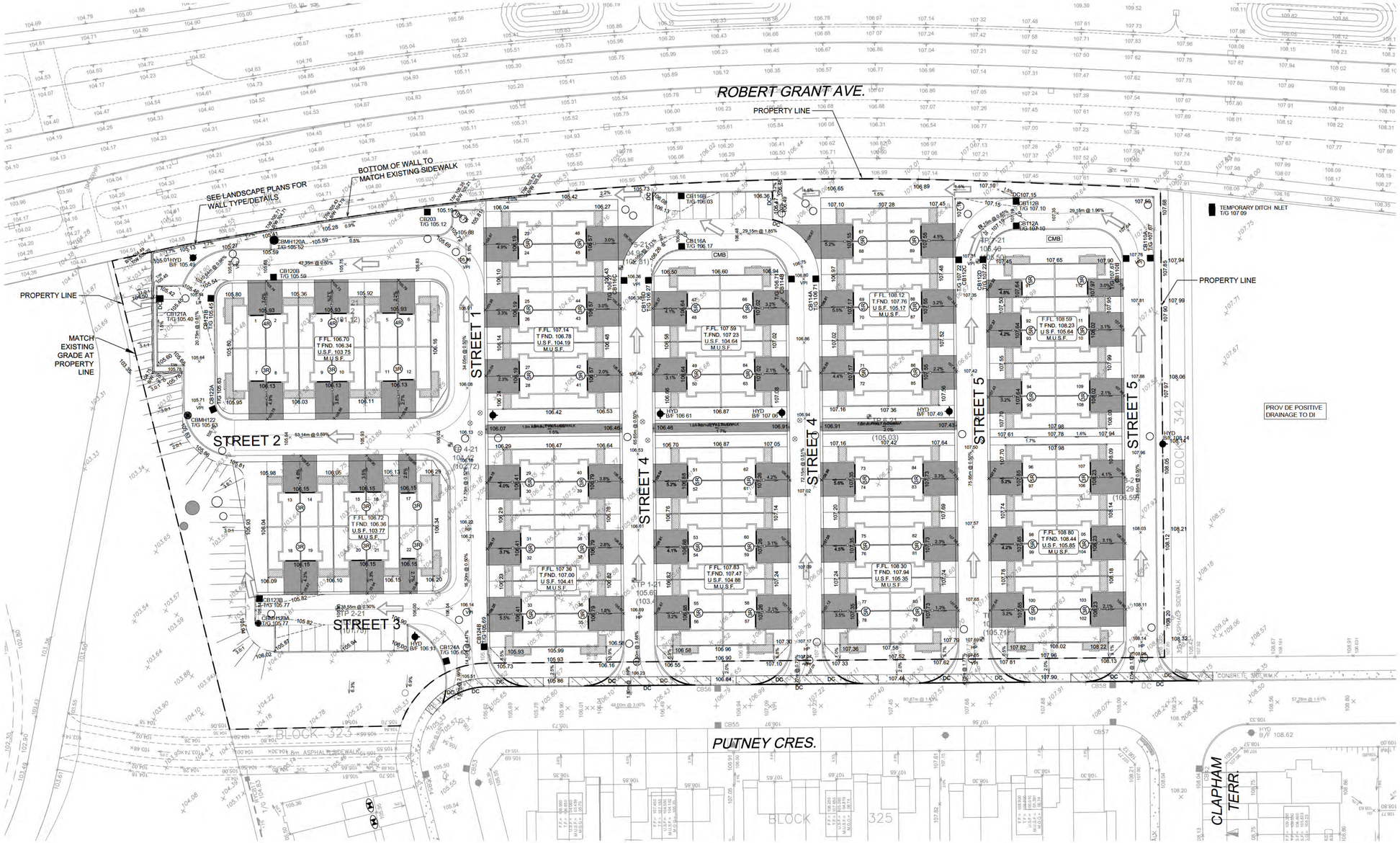
APPENDIX E

126715-200 Grading Plan
126715-900 Erosion and Sediment Control Plan



CLIENT

CLARIDGE HOMES

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED TO CITY FOR REVIEW	2021.01.22
2	REVISED PER CITY COMMENTS	2021.07.16

SEE 010 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS
SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR/ AOV

CONSULTANTS

NOT FOR CONSTRUCTION

1:400 (0, 4, 12, 20m; 1, 12, 20m)

SEAL

LICENSED PROFESSIONAL ENGINEER
D. dE. Yannoulopoulos
2021/07/16
PROVINCE OF ONTARIO

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

PROJECT

CRT

BLOCK 324

PROJECT NO: 126715	
DRAWN BY: **D.D. E.H.**	CHECKED BY: **DGY**
PROJECT MGR: **DGY**	APPROVED BY: **DGY**

SHEET TITLE

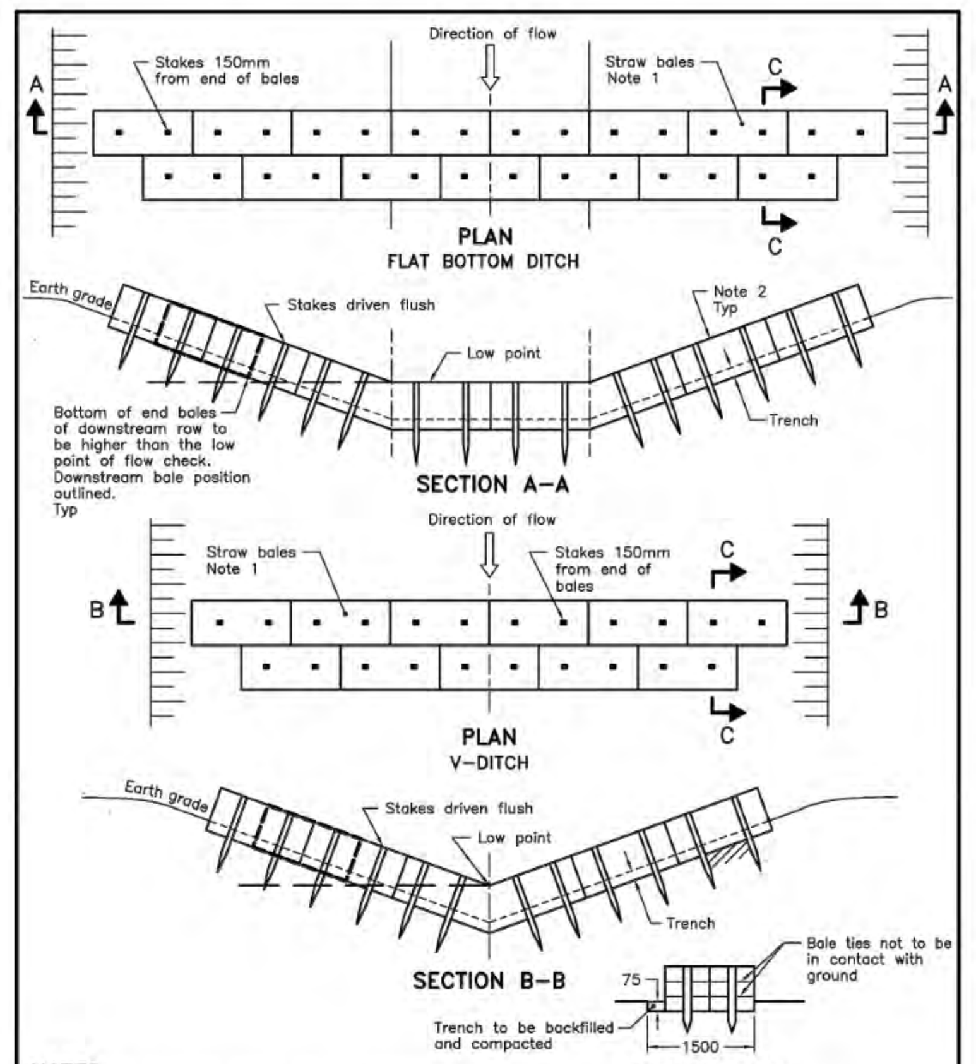
GRADING PLAN

SHEET NUMBER	ISSUE
200	1

SCALE CHECK 1 in

File Location: J:\126715_CRT_Block324\7.0_Production\7.05_Design\04_Civil\Sheets\200 GRADING PLAN.dwg Last Saved: June 22, 2021 by Ehennie Plotted: Friday, July 16, 2021 3:00:48 PM by Eric Hennie

CITY FILE No. D07-12-21-0022 CITY PLAN No. 18416

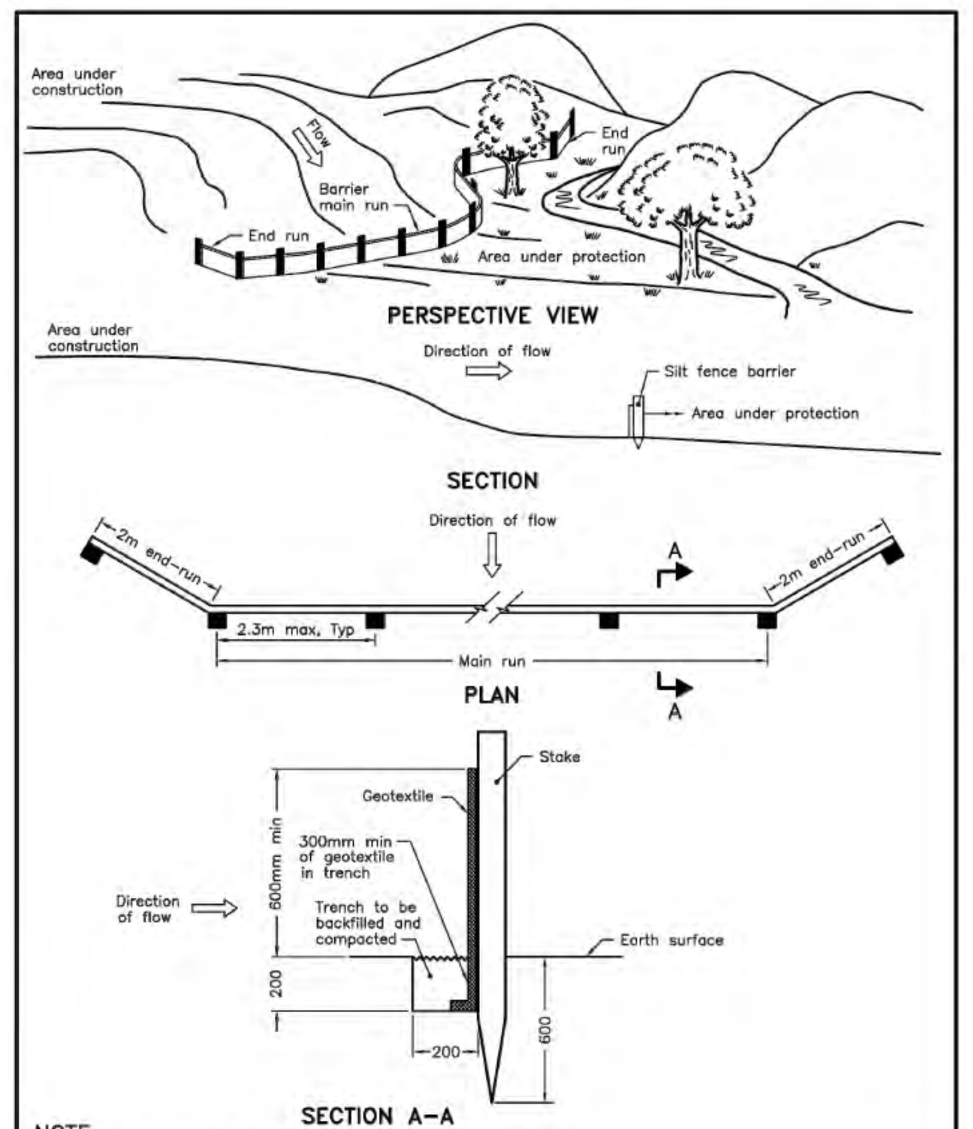


NOTES:
1 Number of bales varies to suit ditch.
2 Straw bales to be butted tightly against adjoining bales and shaped to conform to the sides of the ditch to prevent water flow through barrier.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2006 | Rev 1

STRAW BALE FLOW CHECK DAM

OPSD 219.180

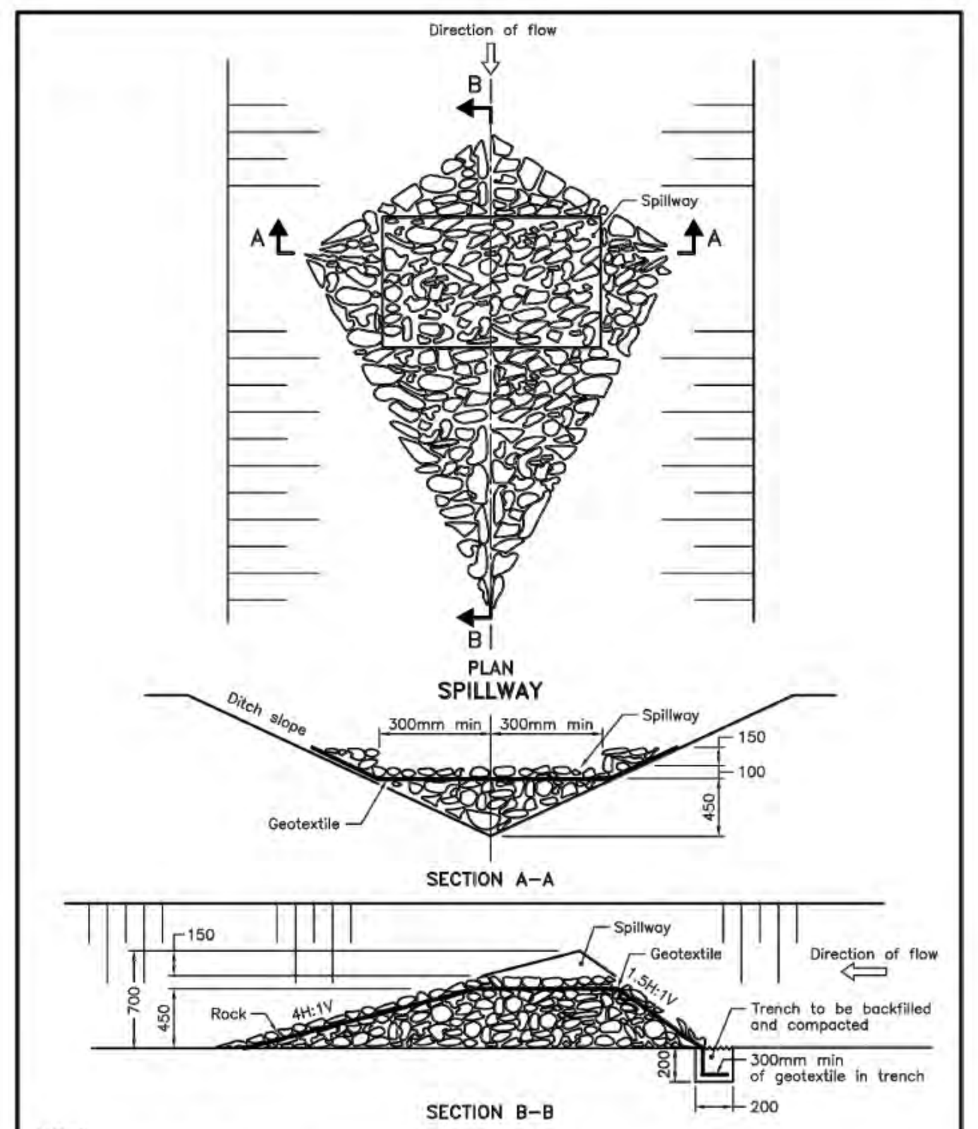


NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2006 | Rev 1

LIGHT–DUTY SILT FENCE BARRIER

OPSD 219.110



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

ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2006 | Rev 1

ROCK FLOW CHECK DAM
V–DITCH

OPSD 219.210

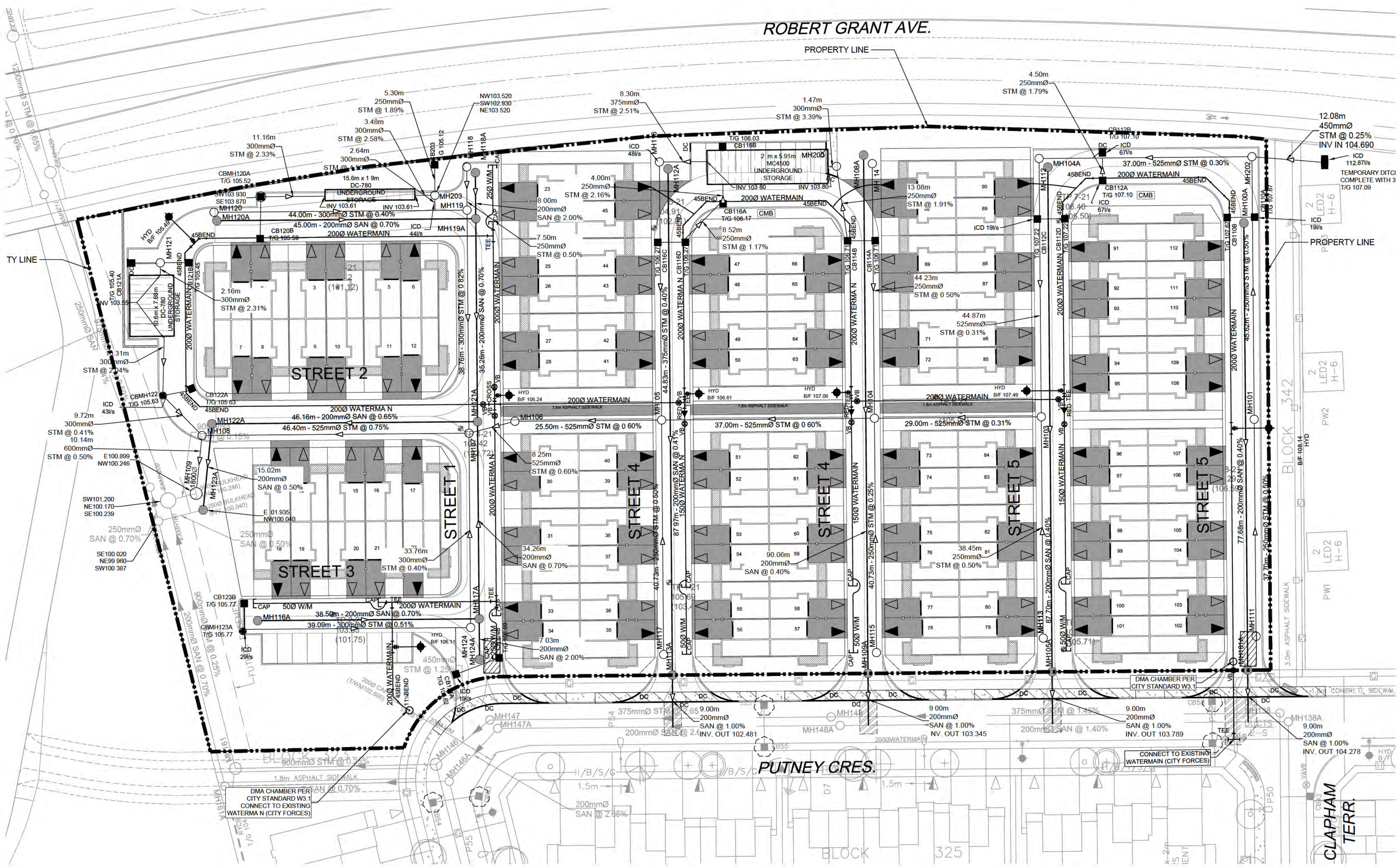
NOTES:

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

1. SILT FENCE TO BE ERECTED PRIOR TO EARTH WORKS BEING COMMENCED. SILT FENCE TO BE MAINTAINED UNTIL VEGETATION IS ESTABLISHED OR UNTIL START OF SUBSEQUENT PHASE.
2. STRAW BALE SEDIMENT TRAPS TO BE CONSTRUCTED IN EXISTING ROAD SIDE DITCHES. TRAPS TO REMAIN AND BE MAINTAINED UNTIL VEGETATION IS ESTABLISHED.
3. SILT SACK TO BE PLACED AND MAINTAINED UNDER COVER OF ALL CATCHBASINS. GEOTEXTILE SILT SACK IN STREET CBs TO REMAIN UNTIL ALL CURBS ARE CONSTRUCTED. GEOTEXTILE FABRIC IN RYCBs TO REMAIN UNTIL VEGETATION IS ESTABLISHED. ALL CATCHBASINS TO BE REGULARLY INSPECTED AND CLEANED, AS NECESSARY, UNTIL SOD AND CURBS ARE CONSTRUCTED.
4. CONTRACTOR TO PROVIDE DETAILS ON LOCATION(S) AND DESIGN OF DEWATERING TRAP(S) PRIOR TO COMMENCING WORK. CONTRACTOR ALSO RESPONSIBLE FOR MAINTAINING TRAP(S) AND ADJUSTING SIZE(S) IF DEEMED REQUIRED BY THE ENGINEER DURING CONSTRUCTION.
5. CONTRACTOR TO PROTECT EXISTING CATCHBASINS WITH FILTER CLOTH UNDER THE COVERS TO TRAP SEDIMENTATION. REFER TO IDENTIFIED STRUCTURES.
6. WORKS NOTED ABOVE ARE TO BE INSTALLED, INSPECTED, MAINTAINED AND ULTIMATELY REMOVED BY SERVICING CONTRACTOR.
7. THIS IS A "LIVING DOCUMENT" AND MAY BE MODIFIED IN THE EVENT THE PROPOSED CONTROL MEASURES ARE INSUFFICIENT

LEGEND:

- LIGHT DUTY SILT FENCE AS PER OPSD-219.110
- SNOW FENCE
- STRAW BALE CHECK DAM AS PER OPSD-219.180
- ROCK CHECK DAM AS PER OPSD-219.210
- CB — SILT SACK PLACED UNDER EXISTING CB COVER
- TEMPORARY MUD MAT 0.15m THICK 50mm CLEAR STONE ON NON WOVEN FILTER CLOTH (7.0 × 15.0)



CLIENT

CLARIDGE HOMES

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ISSUES

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-SEE 010 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS
-SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR AOV.

KEY PLAN

CONSULTANTS

NOT FOR CONSTRUCTION

1:400

SEAL

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

CRT

BLOCK 324

PROJECT NO: 126715	
DRAWN BY: D.D. E.H.	CHECKED BY: DGY
PROJECT MGR: DGY	APPROVED BY: DGY

SHEET TITLE

EROSION AND SEDIMENTATION CONTROL PLAN

SHEET NUMBER 900 | ISSUE 1

CITY FILE No. D07-12-21-0022 CITY PLAN No. 18416