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**G5168**

**JANUARY 2018**

**GEOHYDROLOGY ASSESSMENT  
1637 – 1645 BATHURST STREET  
TORONTO, ONTARIO**

**DISTRIBUTION:**

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## 1.0 INTRODUCTION

Starlight Investments (the Client) intends to redevelop the property located at 1637 – 1645 Bathurst Street, Toronto, Ontario, (hereafter referred to as ‘the Site’). McClymont & Rak Engineers Inc. (MCR) were retained to conduct a Geohydrology Assessment for the Site to evaluate the requirements for temporary and permanent dewatering for the proposed redevelopment.

### 1.1 SCOPE OF WORK

The objectives of the Geohydrology Assessment are to determine the following:

- Hydrogeological conditions of the Site, including the groundwater and phreatic surface, subsurface elevations and flow patterns and the interaction with the design and construction of the proposed development.
- Reviewing the available background information for the Site obtained from MCR’s files, City of Toronto, and architectural drawings.
- Estimate the potential temporary dewatering flow rates during construction and assessment of potential impacts on the surrounding environment.
- Estimate the long term flow rates from the Private Water Drainage System (PWDS) of the proposed building.
- Assess the permitting requirements for both dewatering and discharge with the Ministry of Environment and Climate Change (MOECC) and the City of Toronto – Toronto Water (the City), respectively.
- Summarize the findings in a Geohydrology Assessment Report.

### 1.2 SITE DESCRIPTION

The subject property is located at the municipal address 1637 – 1645 Bathurst Street, in a predominantly residential area of the City of Toronto, Ontario. The site is rectangular in shape with a total area of approximately 4,200 m<sup>2</sup>.

The Site is bounded by residential buildings to the north, east, and south and Bathurst Street to the west. The Site is occupied by five 3-storey apartment

buildings, a paved entrance from Bathurst Street to the west side of the buildings and a paved driveway along the east side.

The ground surface on the west side of the buildings is landscaped, covered with grass and some trees and bushes. There are board fences on the south and east sides, and wire fence on the north side.

The paved surfaces are even, while landscaped parts are made with irregular slopes and flatter areas. Terrain slopes towards the north and east with the maximum difference in borehole elevations of 2.6 m. There is a retaining wall along Bathurst Street extending from the entrance driveway all the way to the south end of the property.

The legal description of the Site is: Lots 4 to 10 Inclusive, Plan M-347, City of Toronto. A Site Survey Plan is enclosed in Appendix A.

### **1.3 PROPOSED DEVELOPMENT**

The Site is proposed for residential redevelopment consisting of a four [4] storey building with one and a half [1.5] levels of below grade parking (Appendix B). It is understood that the finished floor elevation (FFE) at ground will be at approximately 174.0 meters above sea level (masl). The P1 lower FFE will be at an approximate elevation of 167.09 masl.

Presently, it is assumed that the proposed building can be supported on conventional spread/strip footings. The size of the shoring plan layout was assumed to cover approximately 108 m by 28 m.

A conventional sub-floor Private Water Drainage System (PWDS) with perimeter weeping tile below the P1 Level slab will be required. A soldier pile and lagging wall shoring system will be sufficient for the Site except where adjacent structures exist, where a caisson wall will be utilized.

### **1.4 PROPERTY OWNERSHIP**

The Site is commissioned by Starlight Investments, and the owner is represented

by Ms. Ashley Burke, with the following contact information:

Starlight Investments  
1400 – 3280 Bloor Street West, Centre Tower  
Toronto, Ontario  
M8X 2X3

Ms. Ashley Burke  
Development Manager  
T (416) 234 – 8444  
E-mail: [aburke@starlightinvest.com](mailto:aburke@starlightinvest.com)

## **1.5 REVIEW OF PREVIOUS REPORTS**

The following geo-environmental reports were provided for review prior to initiating the investigation:

- MCR report titled, *Geotechnical Report, Proposed Residential Development, 1637 – 1645 Bathurst Street, Toronto, Ontario*, prepared for Starlight Investments, dated August 2017.

## 2.0 HYDROGEOLOGICAL CONDITIONS

### 2.1 PHYSICAL SETTING

The Site is located in the north-central portion of the City of Toronto and is situated in a predominantly residential area. There are no areas of natural significance within 250 m. There are no water bodies or areas of natural significance within 30 m of the Site boundaries. The nearest surface water body is the Don River, at approximately 5.0 km east of the Site.

The Site is located at an average geodetic elevation of approximately 170 masl and the topography across the Site is generally flat with a gentle slope towards the south.

The Site is bounded by the following properties/features:

<b>North</b>	Residential Buildings
<b>South</b>	Residential Buildings
<b>East</b>	Residential Buildings
<b>West</b>	Bathurst Street

### 2.2 TOPOGRAPHY

According to the topographic map, Map 30 M/11, 9<sup>th</sup> Edition published by Government of Canada; Natural Resources Canada; Earth Sciences Sector; Canada Centre for Mapping and Earth Observation, on July 19, 2013, the ground surface at the Site is relatively flat with the surrounding area sloping gently to the south towards Lake Ontario.

### 2.3 REGIONAL GEOLOGY AND HYDROGEOLOGY

According to the geological map entitled "Quaternary Geology of Ontario, Southern Sheet" Map 2556, published by the Ontario Ministry of Development and Mines, dated 1991, the overburden in the study area consists of predominantly silt to silty clay matrix, high in matrix carbonate content and clast poor. The groundwater typically tends to flow towards south, towards Lake Ontario.

According to Ontario Ministry of Development and Mines, Map No. 2544, “Bedrock Geology of Ontario, Southern Sheet, 1991”, the bedrock typically consists of Upper Ordovician shale, limestone, dolostone and siltstone. Groundwater tends to flow towards south, towards Lake Ontario.

## **2.4 LOCAL GEOLOGY AND HYDROGEOLOGY**

On a local scale, geological conditions and hydrogeology are similar to the ones at a regional scale. Locally, near surface groundwater flow may be influenced by underground structures (e.g., service trenches, catch basins, and building foundations or surface watercourses). No surface water features are present onsite and there are no Provincially Significant Wetlands in the vicinity of the Site.



### **3.0 SCOPE OF INVESTIGATION**

#### **3.1 OVERVIEW OF SITE INVESTIGATION**

- The field investigation included the advancement of three boreholes (BH1 to BH3) by MCR from June to August 2017 (Figure 1). Borehole logs are presented in Appendix C.
- Groundwater levels were recorded from all available monitoring wells over various dates and the data is presented in Table 1.
- Groundwater samples were collected from BH1 for chemical analysis of the City of Toronto Sewers By-Law criteria.

#### **3.2 MONITORING WELL INSTALLATION**

All monitoring wells by MCR were installed with a 50 mm diameter schedule 40 PVC pipe and a 3.05 m long slotted well screen. Well screens were surrounded by a silica sand pack to at least 0.6 m above the top of screen with a bentonite seal extending from above the sand pack to within 0.5 m of the ground surface. All monitoring wells were completed with a flush mounted cover at ground surface.

#### **3.3 ELEVATION SURVEYING**

The elevations for all MCR boreholes were surveyed and referenced to a metric and geodetic system. Borehole elevations are shown on the borehole logs in Appendix C.

#### **3.4 GROUNDWATER SAMPLING**

All groundwater sampling activities were conducted in accordance with Ontario Regulation (O.Reg.)153/04, as amended to O.Reg.511/09, July 2011. All monitoring wells were developed prior to sampling activities using a Waterra Hydrolift II (HL-1217) inertial lift pump by purging at least three well volumes or until the monitoring well was purged dry. Groundwater samples were obtained at least 24 hours' post-development under static conditions.

### 3.5 GROUNDWATER ANALYSIS

All groundwater samples were submitted to ALS Laboratory Group (ALS) of Richmond Hill, Ontario, certified by the Canadian Association for Laboratory Accreditation (CALA), for chemical analysis. The Certificates of Analysis received are included in Appendix D. The contact information for the laboratory used is included below.

#### **ALS Laboratory Group**

95 West Beaver Creek Road  
Richmond Hill, ON L4B 1H2

Groundwater samples were submitted for bulk chemical analysis for the criteria provided in the *Toronto Municipal Code, Chapter 681, Sewers By-law*. The results of chemical analysis were compared to the criteria provided in *Table 1 – Limits for Sanitary and Combined Sewers Discharge* and *Table 2 – Limits for Storm Sewer Discharge*. These guidelines establish the maximum allowable concentrations of specific analytical parameters for water discharged into either the municipal sanitary and/or storm sewer system respectively.

## 4.0 INVESTIGATION RESULTS

### 4.1 GEOLOGY

Ground surface elevations at boreholes ranged from 171.95 (BH 2) to 174.55 masl (BH 3). Based on the investigation, the geologic formations beneath the Site are illustrated in the borehole logs (Appendix C) and include the following (from surface to depth):

**Asphalt/Granular Fill:** An asphalt layer, about 75 mm in thickness was present at the ground surface of borehole 1.

**Miscellaneous Fill:** Fill, consisting of silty sand and clayey silt with some sand and gravel, was detected below the asphalt layer in borehole 1 and at the surface of boreholes 2 and 3. The fill extended to depths ranging from 0.75 to 1.50 m. The brown, moist, stiff/compact, fill also contained traces of organics, rootlets and construction debris such as brick pieces.

**Due to the nature of fill and for the purpose of offsite disposal, the type/quality and extent of the existing fill should be explored by further test pit investigation.**

**Sandy Silt Till:** Compact to very dense sandy silt to sandy silt till deposit was encountered below the fill and extended to the maximum depth of investigation in all boreholes. The brown to grey, moist to wet deposit contained layers of hard, moist to wet clayey silt to clayey silt till. They clayey silt to clayey silt till was very dense and contained wet silty sand and trances of clay and gravel.

**It should be noted that the till/sand soil is an unsorted sediment; therefore, boulders and cobbles are anticipated.**

**Groundwater:** Upon completion of drilling, groundwater was observed at depths of 11.30 and 11.00 m in boreholes 2 and 3, respectively. Borehole 1 remained dry.

On July 21/2017, groundwater was measured at a depth of 6.23 m in borehole 1.

The results are summarized on the Record of Borehole Sheets in Appendix C and Table 1.

## **4.2 GROUNDWATER LEVEL MONITORING**

Groundwater levels were monitored by MCR in BH1 to BH2 during 2017. All groundwater measurement data is presented in the enclosed Table 1. It should be noted that groundwater levels are subject to seasonal fluctuations. Consequently, definitive information on the long-term groundwater levels could not be obtained during this investigation.

The interpreted groundwater flow direction is based on the 2017 round of water table elevation measurements, since this event provided water table elevations from the majority of the monitoring wells. Confidence in the groundwater flow direction could be increased with additional rounds of water table elevation measurements. The interpreted local direction of hydraulic movement across the Site is inferred to be in a south-westerly direction, towards Lake Ontario.

## **4.3 GROUNDWATER QUALITY**

Groundwater samples collected in August 2017 from BH1 were analyzed for the City of Toronto Sewers By-Law criteria. The results of chemical analysis (Table 2) indicate that the sample complies with both the *Table 1 Limits for Sanitary & Combined Sewers Discharge* and the *Table 2 Limits for Storm Sewer Discharge* for all parameters analyzed.

## **4.4 GROUNDWATER DISCHARGE ASSESSMENT**

Presently, the groundwater sample collected onsite can be discharged to the City sanitary and combined sewer system or storm sewer system with no additional filtration or treatment.

## 5.0 REVIEW AND EVALUATION

### 5.1 TEMPORARY DEWATERING ASSESSMENT

The excavation for the proposed one and half underground parking structure will extend into competent native silty clay/sandy silt till. In order to protect the sides/bottom of the excavation from being disturbed by excess groundwater pressure, i.e. to prevent quick sand/dilating silt conditions, the groundwater table must be lowered to at least 2.0 m below the bottom of the footing excavation. Positive dewatering such as eductors will be required for the proposed excavation. Onsite soils might be subject to localized piping during dewatering. Creation of piping channels may result in substantial increase in the volume of both temporary dewatering and permanent drainage.

For the proposed two underground levels, groundwater is required to be drawn down a minimum of 2 m below the underside of the footing, at an elevation of approximately 163.59 masl. The average ground water level recorded in the monitoring wells is at an elevation of 167.27 masl, representing an approximate 3.68 m hydrostatic head requiring dewatering.

Theoretically, the groundwater drawdown for a single well pumping can be described as:

$$Q = -2\pi rKh \frac{dh}{dr} \quad (1)$$

And further we have:

$$h^2 = -\frac{Q}{\pi K} \ln(r / r_w) + h_w^2 \quad (2)$$

Where:

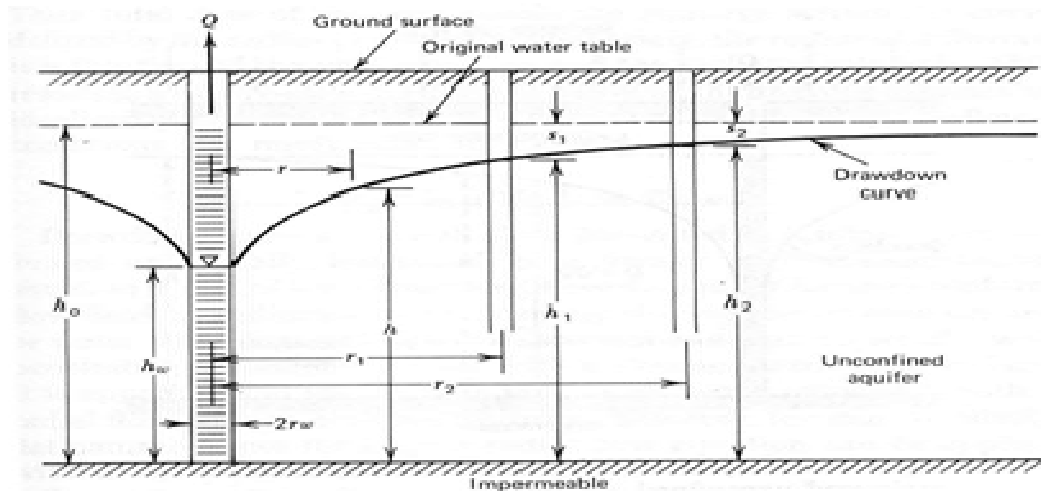
$h$  [m] is the height of the water table above an impervious base

$Q$  [ $m^3/day$ ] is the rate of pumping discharge

$K$  [m/day] is hydraulic conductivity

$R$  [m] is the radius from the centre of well location

$r_w$  [m] is the radius of pumping well (see Schematic A below).



Schematic A: Radial flow to an unconfined aquifer (Todd 1980)

### 5.1.1 Numerical Analysis

The abovementioned Site parameters were used to calculate the estimated steady state discharge rate for temporary construction dewatering. Groundwater monitoring data is presented in Table 3. The calculations for temporary dewatering rates are shown in Table 4.

From the observed soil types and based on soil sample descriptions (*Todd, 1980; Mays, 2001; and Craig, 2004*), the average hydraulic conductivity ( $K$ ) of the aquifer was estimated at 0.5 m/day.

The estimated steady state discharge rate for temporary construction dewatering was calculated to be approximately 108 m<sup>3</sup>/day (19 USG/min). It should be noted that the initial drawdown pumping rate and accumulation from rainfall will be higher and this should be confirmed by the dewatering contractor.

## 5.2 PERMANENT FOUNDATION DRAIN FLOW RATES

For the proposed redevelopment, it is preliminarily assumed that the ground floor's FFE will be at approximately 174.0 masl. The P1 lowest slab's finished floor will be at an approximate elevation of 167.09 masl.

A conventional sub-floor Private Water Drainage System (PWDS) with

perimeter/under floor weeping tile is proposed below the P1 level slab. The invert of the PWDS is assumed to be at an approximate elevation of 166.59 masl.

It is also recommended that all under floor drainage pipes must have geotextile filter sleeve to prevent long term silting. To further minimize siltation, all drainage pipe connections must be solid PVC elbows and Ts, no “butt” end connections should be permitted. The perforated pipes should slope to a sump at a minimum 1% slope. Perimeter drainage pipes, with a positive gravity outlet, should be solid PVC with a minimum of 0.5% slope. In addition, silt traps must be provided at convenient/accessible locations.

### **5.2.1 Numerical Analysis**

The abovementioned Site parameters were used to calculate the estimated steady state discharge rate for the PWDS. Groundwater monitoring data is presented in Table 3. The calculations for permanent drainage flow rates are shown in Table 5.

From the observed soil types and based on soil sample descriptions (*Todd, 1980; Mays, 2001; and Craig, 2004*), the average hydraulic conductivity (K) of the aquifer was estimated at 0.5 m/day.

The estimated steady state discharge rate for the PWDS was calculated at approximately 29 m<sup>3</sup>/day (5 USG/min). This result is preliminary and should be confirmed during the construction phase, based on the observed condition of the encountered bedrock after advanced drawdown and excavation of overburden.

## **5.3 MOECC PERMIT TO TAKE WATER REQUIREMENT**

The Permit to Take Water (PTTW) requirements for construction site dewatering have been updated to the current O.Reg.63/16 amendment to Environmental Protection Act. In accordance with the updated regulation, construction site dewatering will require a complete PTTW application when water takings greater than 400,000 L/day are predicted. Groundwater taking between 50,000 L/day and 400,000 L/day will require a limited PTTW via an online application process through the Environmental Activity and Sector Registry (EASR). Groundwater

taking from a proposed building structure by means of a PWDS will require a PTTW when water taking is greater than 50,000 L/day. The complete permit application process for PTTW takes approximately twelve weeks to review and is required prior to applying for the discharge permits.

The anticipated temporary dewatering discharge rate was calculated at approximately 108 m<sup>3</sup>/day. Therefore, a limited PTTW application will be required to be applied for with the MOECC.

The flow rate from the PWDS was calculated at approximately 29 m<sup>3</sup>/day. Therefore, a PTTW application for the PWDS will not be required for the proposed building.

#### **5.4 TORONTO WATER DISCHARGE PERMIT REQUIREMENTS**

The City of Toronto – Toronto Water requires that any private water to be discharged into the City sewer system must have a permit or agreement in place in order to discharge; this applies to all water not purchased from the City water supply. For temporary dewatering during the construction phase, this includes all groundwater and storm water that is collected or encountered during site excavation. For the PWDS, this includes all groundwater that is constantly pumped as a result of the drainage system elevation located below the groundwater table elevation or through storm water infiltration.

Recently, Toronto Water has indicated that PWDS systems may only be permitted through recirculation via an infiltration gallery and discharge to sewers may be prohibited. Otherwise, a fully waterproofed substructure may be required in the event that infiltration is not feasible. The Client must obtain permission and confirm discharge approval from Toronto Water directly.

The groundwater quality sample collected in 2017 indicated that the water onsite could be discharged into the City sanitary and combined sewer system or storm sewer system without additional filtration/treatment required. A short-term temporary discharge permit must be applied for construction dewatering with Toronto Water.



According to Toronto Water, groundwater discharge is to cease when weather forecasts predict storm events of 35 mm of rain or more, for both the temporary and permanent systems. For temporary discharge, dewatering contractors must include provisions for storing discharge water for the duration of the storm event.

## **5.5 ENVIRONMENTAL PROTECTION**

The Site is located within the Lake Ontario drainage basin and the lake is approximately 7.5 km south of the Site. There are no surface water features and no areas of natural significance or provincially significant wetlands in the vicinity of the Site. The Site is located in the City of Toronto urban environment which obtains its municipal water supply from Lake Ontario. Therefore, there are no potable groundwater users within the vicinity of the Site.

The proposed redevelopment plan will remove all the overburden to a depth of approximately 7.5 mbgs, from the interior Site area shown on the Site plan. Temporary groundwater dewatering will lower the groundwater table to below the underground parking foundations levels. The extracted water will be discharged into the sanitary sewer or into the storm sewer. Updated groundwater monitoring will be conducted by the dewatering contractor prior to and during construction activities to ensure that no additional adverse groundwater impacts are identified throughout the project's construction.

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

McClymont & Rak Engineers Inc. were retained to conduct a Geohydrology Assessment for the Site in relation to the proposed redevelopment. The Site is occupied by five 3-storey apartment buildings, a paved entrance from Bathurst Street to the west side of the buildings and a paved driveway along the east side.

The Site is proposed for residential redevelopment consisting of a four [4] storey building with one and a half [1.5] levels of below grade parking (Appendix B). It is understood that the finished floor elevation (FFE) at ground will be at approximately 174.0 meters above sea level (masl). The P1 lower FFE will be at an approximate elevation of 167.09 masl.

Presently, it is assumed that the proposed building can be supported on conventional spread/strip footings. The size of the shoring plan layout was assumed to cover approximately 108 m by 28 m.

A conventional sub-floor Private Water Drainage System (PWDS) with perimeter weeping tile below the P1 Level slab will be required. A soldier pile and lagging wall shoring system will be sufficient for the Site except where adjacent structures exist, where a caisson wall will be utilized.

The excavation for the proposed one and half underground parking structure will extend into competent native silty clay/sandy silt till. In order to protect the sides/bottom of the excavation from being disturbed by excess groundwater pressure, i.e. to prevent quick sand/dilating silt conditions, the groundwater table must be lowered to at least 2.0 m below the bottom of the footing excavation. Positive dewatering such as eductors will be required for the proposed excavation. Onsite soils might be subject to localized piping during dewatering. Creation of piping channels may result in substantial increase in the volume of both temporary dewatering and permanent drainage.

For the proposed two underground levels, groundwater is required to be drawn down a minimum of 2 m below the underside of the footing, at an elevation of approximately 163.59 masl. The average ground water level recorded in the monitoring wells is at an elevation of 167.27 masl, representing an approximate 3.68

m hydrostatic head requiring dewatering.

The steady state discharge rate for temporary construction dewatering was estimated at approximately 108 m<sup>3</sup>/day (19 USG/min). Therefore, based on the amended O.Reg. 63/16 to the Environmental Protection Act, a limited PTTW application will be required from the MOECC and a temporary discharge permit will be required from the Toronto Water. It should be noted that the initial drawdown pumping rate and accumulation from rainfall will be higher and this should be confirmed by the dewatering contractor.

For the proposed redevelopment, it is preliminarily assumed that the ground floor's FFE will be at approximately 174.0 masl. The P1 lowest slab's finished floor will be at an approximate elevation of 167.09 masl.

A conventional sub-floor Private Water Drainage System (PWDS) with perimeter/under floor weeping tile is proposed below the P1 level slab. The invert of the PWDS is assumed to be at an approximate elevation of 166.59 masl.

The estimated steady state discharge rate for the PWDS was calculated at approximately 29 m<sup>3</sup>/day (5 USG/min). Therefore, a PTTW will not be required from the MOECC for the PWDS. However, it is recommended that the situation be re-assessed based on the actual geologic/hydrogeological conditions encountered and the final drainage design details. A permanent drainage discharge permit will be required from Toronto Water since the drainage will be installed below the long-term groundwater elevation.

However, Toronto Water has recently indicated that the PWDS systems may only be permitted through recirculation via an infiltration gallery and discharge to sewers may be prohibited. Otherwise, a fully waterproofed substructure may be required in the event that infiltration is not feasible. The Client must obtain permission and confirm discharge approval from Toronto Water directly.

Presently, the groundwater sample collected onsite can be discharged to the City sanitary and combined sewer system or storm sewer system with no additional filtration or treatment.

The application process, where a PTTW is required, can take at least three months for a review by the MOECC and is required to be approved prior to applying for discharge permits. It is recommended that applications to Toronto Water for discharge permits be applied for at least three months prior to the required start dates. Applications are to be supported by drawings and calculations provided by the mechanical and the site servicing consultant and coordination is required amongst all disciplines.

## 7.0 REFERENCES

1. Ontario Ministry of the Environment. *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*. April 15, 2011.
2. Ministry of Northern Development and Mines. *Quaternary Geology of Toronto and Southern Ontario - Southern, Sheet Map 2504*, 1980.
3. Ministry of Northern Development and Mines. *Bedrock Geology of Ontario-Southern Sheet*, 1991.
4. D.K. Todd, *Groundwater Hydrology*, 2<sup>nd</sup> Edition, John Wiley & Sons, New York, 1980.
5. L.W. Mays, *Water Resources Engineering*, 1<sup>st</sup> Edition, John Wiley & Sons, New York, 2001.
6. MCR report titled, *Geotechnical Report, Proposed Residential Development, 1637 – 1645 Bathurst Street, Toronto, Ontario*, prepared for Starlight Investments, dated August 2017.

## 8.0 STATEMENT OF LIMITATIONS

McClymont & Rak Engineers, Inc. (MCR) conducted the work associated with this report in accordance with the scope of services, time and budget limitations imposed for this work. The work has been conducted according to reasonable and generally accepted local standards for an environmental consultant at the time of the work. No other warranty or representation, expressed or implied, is included or intended in this report.

The work was designed to provide an overall assessment of the environmental conditions at the Site. The conclusions presented in this report are based on the information obtained during the investigation. The work is intended to reduce the client's risk with respect to environmental impairment. No work can completely eliminate the possibility of further environmental impairment on the Site.

It should be noted that subsurface conditions might vary at locations and depths other than those locations where borings, surveys or explorations were made by MCR. Other contaminants, not tested for in this work, may also potentially be present on the Site. Even with exhaustive investigation, it is not possible to warranty the Site will be free of contaminants. Should conditions, not observed during the work, become apparent, MCR should be immediately notified to assess the situation and conduct additional work, where required. The findings of this report are based on conditions as they were observed at the time of the work.

No assurance is made regarding changes in conditions subsequent to the time of the work. Remediation cost estimates is based on the available information. The estimated costs for remediation only represent the costs for the clean-up of known contaminants that have been identified during the work. Additional costs may be incurred as a result of other contaminants or areas of contamination identified by subsequent work.

Regulatory statutes are subject to interpretation. These statutes and their interpretation may change over time, thus these issues should be reviewed with appropriate legal counsel.

MCR relied on information provided by others in this report. MCR cannot guarantee the accuracy, completeness and reliability of the information provided by others, although MCR staff attempted to seek clarification on information provided and verifies authenticity, where practical.

The report and its attachments were prepared for and made available for the sole use of the client. MCR will not be responsible for any use or interpretation of the information contained in this report by any other party without the prior expressed written consent of MCR.

## 9.0 CLOSURE

In accordance with your request and authorization, McClymont and Rak Engineers Inc. completed this Geohydrology Assessment Report. This report presented the methodology, findings and conclusions of the investigation. The Statement of Limitations for all work performed as part of this investigation is included.

We trust that the information provided in this report is sufficient for your present requirements. Should you have any further questions, please do not hesitate to contact our office. Thank you for retaining McClymont & Rak Engineers, Inc. for this project.

Respectfully,  
McCLYMONT & RAK ENGINEERS INC.



**Prepared By:**

Richard Sukhu, B.Eng.      Julie Wang, Ph.D., P.Eng.



**Reviewed By:**

Lad Rak, P.Eng., M.Eng., QP<sub>ESA</sub>

**Date of Issue: January 5, 2018**

## FIGURES

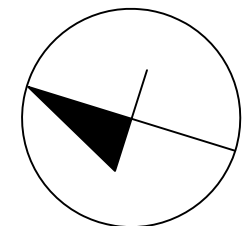


BATHURST STREET



BOREHOLE BY McCLYMONT & RAK  
ENGINEERS INC., JULY/AUGUST 2017

GROUNDWATER MONITORING WELL  
BY McClymont & Rak Engineers  
Inc., July/August 2017



Scale N/A	Project No. G5168
Date AUGUST 2017	Drawing No. 1

## TABLES

**McCLYMONT AND RAK ENGINEERS INC.**  
**GEO-ENVIRONMENTAL CONSULTANTS**

**TABLE 1**  
**CONSTRUCTION DETAILS AND ELEVATION OF MONITORING WELLS**

MONITORING WELL ID	GROUND SURFACE ELEVATION (masl)	WATER LEVEL (mbgs)	GROUNDWATER ELEVATION (masl)	DATE OF MEASUREMENT (mm/dd/yyyy)	DEPTH OF WELL (mbgs)	DEPTH OF BENTONITE (mbgs)	LENGTH OF SCREEN (m)	INSIDE DIAMETER OF PIPE (mm)	TOP OF MONITORING WELL
BH 1	173.50	DRY	-	7/6/2017	12.20	8.50	3.05	50	FLUSH MOUNT
		6.23	167.27	7/21/2017					
BH 2	171.95	11.28	160.67	8/14/2017	12.20	8.50	3.05	50	FLUSH MOUNT
<b>Min</b>	171.95	6.23	160.67	-	12.20	-	-	-	-
<b>Max</b>	173.50	11.28	167.27	-	12.20	-	-	-	-
<b>Average</b>	172.73	8.76	163.97	-	12.20	-	-	-	-

**NOTE:**

*mbgs - meters below ground surface*

*masl - meters above sea level*

*N/A - Not Applicable*

*NF - Not Found*

**McCLYMONT AND RAK ENGINEERS INC.**  
**GEO-ENVIRONMENTAL CONSULTANTS**

**TABLE 2**  
**GROUNDWATER ANALYTICAL RESULTS - CITY OF TORONTO SEWERS BY-LAW DISCHARGE CRITERIA**

**MCR JOB#:** GE5168

**SITE ADDRESS:** 1637 - 1645 Bathurst Street, Toronto, ON

PARAMETER	UNITS	LIMITS FOR STORM SEWER DISCHARGE	LIMITS FOR SANITARY & COMBINED SEWERS DISCHARGE	BH 1
				28-Aug-17
pH	pH Units	6.0 - 9.5	6.0 - 11.5	7.95
Total Suspended Solids	mg/L	15	350	8.8
Fluoride (F-)	mg/L	-	10	<0.20
Total Kjeldahl Nitrogen (TKN)	mg/L	-	100	<0.15
Total Phosphorus (P)	mg/L	0.4	10	0.0211
Total Cyanide (CN)	mg/L	0.02	2	<0.0020
Escherichia Coli	CFU/100mL	200	-	0
Total Aluminum (Al)	mg/L	-	50	0.144
Total Antimony (Sb)	mg/L	-	5	0.00028
Total Arsenic (As)	mg/L	0.02	1	0.00246
Total Cadmium (Cd)	mg/L	0.008	0.7	<0.000010
Total Chromium (Cr)	mg/L	0.08	4	0.00077
Total Cobalt (Co)	mg/L	-	5	<0.00010
Total Copper (Cu)	mg/L	0.04	2	<0.0010
Total Lead (Pb)	mg/L	0.12	1	0.00021
Total Manganese (Mn)	mg/L	0.05	5	0.0167
Total Mercury (Hg)	mg/L	0.0004	0.01	<0.000010
Total Molybdenum (Mo)	mg/L	-	5	0.00433
Total Nickel (Ni)	mg/L	0.08	2	0.00058
Total Selenium (Se)	mg/L	0.02	1	0.000173
Total Silver (Ag)	mg/L	0.12	5	<0.000050
Total Tin (Sn)	mg/L	-	5	0.00087
Total Titanium (Ti)	mg/L	-	5	0.00227
Total Zinc (Zn)	mg/L	0.04	2	0.0104
Chromium (VI)	mg/L	0.04	2	<0.0010
Biological Oxygen Demand	mg/L	15	300	<2.0
Total Oil & Grease (Animal/Vegetable)	mg/L	-	150	<2.0
Total Oil & Grease Mineral/Synthetic	mg/L	-	15	<1.0
Phenols-4AAP	mg/L	0.008	1	0.0045
Benzene	µg/L	2	10	<0.50
Chloroform	µg/L	2	40	<1.0
1,2-Dichlorobenzene	µg/L	5.6	50	<0.50
1,4-Dichlorobenzene	µg/L	6.8	80	<0.50
cis-1,2-Dichloroethylene	µg/L	5.6	4000	<0.50
Dichloromethane (Methylene Chloride)	µg/L	5.2	2000	<2.0
trans-1,3-Dichloropropene	µg/L	5.6	140	<0.50
Ethylbenzene	µg/L	2	160	<0.50
1,1,2,2-Tetrachloroethane	µg/L	17	1400	<0.50
Tetrachloroethylene	µg/L	4.4	1000	<0.50
Toluene	µg/L	2	16	<0.50
Trichloroethylene	µg/L	7.6	400	<0.50
Xylene (Total)	µg/L	4.4	1400	<1.1
Total PAHs (18 PAHs)	µg/L	2	5	<1.7
Bis(2-ethylhexyl)phthalate	µg/L	8.8	12	<2.0
3,3'-Dichlorobenzidine	µg/L	0.8	2	<0.40
Di-n-butylphthalate	µg/L	15	80	<1.0
Pentachlorophenol	µg/L	2	5	<0.50
Total PCBs	µg/L	0.4	1	<0.040
Nonylphenol	µg/L	1	20	<1.0
Total Nonylphenol Ethoxylates	µg/L	10	200	<2.0

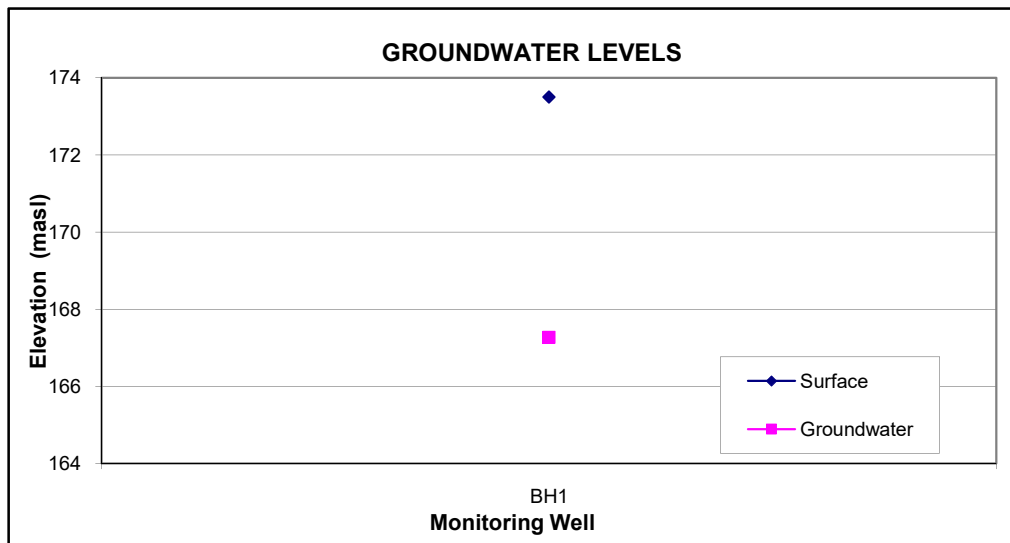
<b>BOLD</b>	Exceeds Criteria - Table 1 Sanitary and Combined Sewer
<b>BOLD</b>	Non-Detect Exceeds Criteria - Table 1 Sanitary and Combined Sewer
<b>BOLD</b>	Exceeds Criteria - Table 2 Storm Sewer Criteria
<b>BOLD</b>	Non-Detect Exceeds Criteria - Table 2 Storm Sewer Criteria

<b>MCR</b>	<b>McCLYMONT &amp; RAK ENGINEERS, INC.</b>	<b>GROUNDWATER</b>
	<b>GEO-ENVIRONMENTAL CONSULTANTS</b>	

**Project:** Proposed Residential Development  
**Location:** 1637 - 1645 Bathurst Street, Toronto, ON  
**Date:** October-17  
**Project #:** G5168

**TABLE 3**  
**GROUNDWATER MONITORING DATA**

Borehole Number	Surface Elevation	Water Level Depth	Elevation	Monitoring Date	NOTES
	(masl)			(mm/dd/yyyy)	
BH1	173.50	6.23	167.27	7/21/2017	
<b>Average</b>	173.50	6.23	167.27		
<b>Max</b>			167.27		



<b>MCR</b>	<b>McCLYMONT &amp; RAK ENGINEERS, INC.</b>	<b>GROUNDWATER</b>
	<b>GEO-ENVIRONMENTAL CONSULTANTS</b>	

Project: Proposed Residential Development  
 Location: 1637 - 1645 Bathurst Street, Toronto, ON  
 Date: October-17  
 Project #: G5168

**TABLE 4**  
**DISCHARGE ESTIMATION OF CONSTRUCTION DEWATERING**

Site Parameters	Units
Initial Water Level before Dewatering	167.27 (m)
Lowest Water Level during Construction Dewatering	163.59 (m)
Length of Site X	108.00 (m)
Width of Site W	28.00 (m)
Equivalent Radius $r_e$	31.03 (m)
Hydraulic Conductivity of Aquifer (k)	0.50 (m/day)
Aquifer Bottom Elevation	161.59 (m)
Applied Radius of Influence (Ro)	26.56 (m)
Height btw Initial Water Level and Aquifer Bottom (H)	5.68 (m)
Height btw Lowest Water Level and Aquifer Bottom ( $h_w$ )	2.00 (m)
Radius of Influence (R)	57.58 (m)
Factor of Safety (FS)	1.50

$$Q = \frac{\pi k (H^2 - h_w^2)}{\ln(R / r)}$$

Estimated steady-state discharge of dewatering	107.68 (m <sup>3</sup> /day)
	19 (USG/min)

<b>MCR</b>	<b>McCLYMONT &amp; RAK ENGINEERS, INC.</b>	<b>GROUNDWATER</b>
	<b>GEO-ENVIRONMENTAL CONSULTANTS</b>	

Project: Proposed Residential Development  
 Location: 1637 - 1645 Bathurst Street, Toronto, ON  
 Date: October-17  
 Project #: G5168

**TABLE 5**  
**DISCHARGE ESTIMATION OF PERMANENT DRAINAGE SYSTEM**

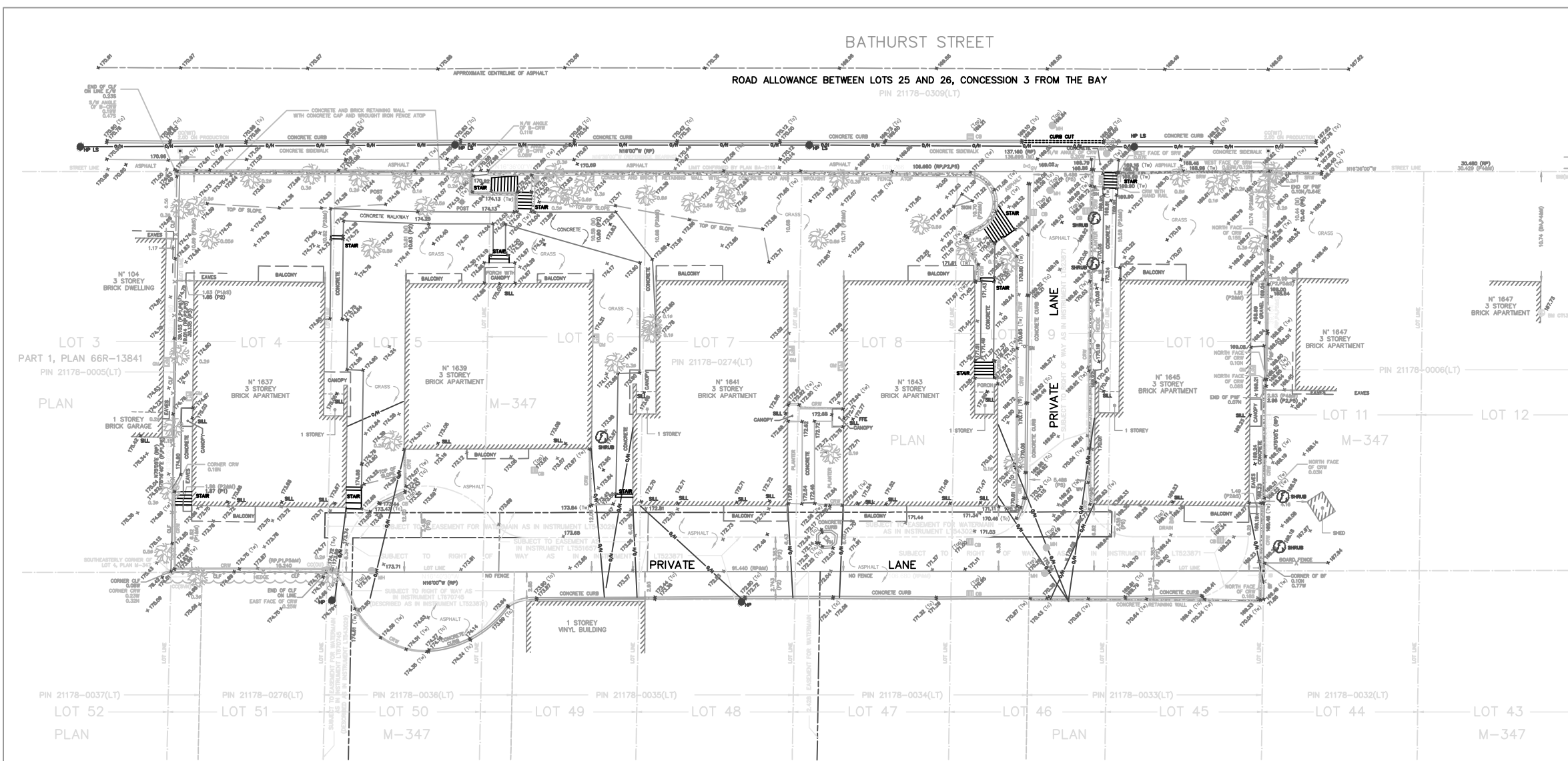
Site Parameters	Units
Initial Water Level before Dewatering	167.27 (m)
Lowest Water Level under PDS conditions	166.59 (m)
Length of Site X	108.00 (m)
Width of Site W	28.00 (m)
Equivalent Radius $r_e$	31.03 (m)
Hydraulic Conductivity of Aquifer (k)	0.50 (m/day)
Aquifer Bottom Elevation	165.59 (m)
Applied Radius of Influence (Ro)	4.91 (m)
Height btw Initial Water Level and Aquifer Bottom (H)	1.68 (m)
Height btw Lowest Water Level and Aquifer Bottom ( $h_w$ )	1.00 (m)
Radius of Influence (R)	35.93 (m)
Factor of Safety (FS)	1.50

$$Q = \frac{\pi k (H^2 - h_w^2)}{\ln(R / r)}$$

Estimated steady-state discharge of dewatering	29.24 (m <sup>3</sup> /day)
	5 (USG/min)

## **APPENDIX A**





**BOUNDARY AND TOPOGRAPHIC SURVEY OF  
LOTS 4 TO 10 INCLUSIVE  
PLAN M-347  
CITY OF TORONTO**

SCALE 1:200

KRCMAR SURVEYORS LTD. 2016

METRIC: DISTANCES SHOWN HEREON ARE IN METRES AND CAN BE  
CONVERTED TO FEET BY DIVIDING BY 0.3048

**BEARING**  
BEARINGS SHOWN HEREON ARE ASTRONOMIC AND ARE REFERRED TO THE  
EASTERLY LIMIT OF BATHURST STREET AS SHOWN ON PLAN BA-2115, HAVING  
A BEARING OF N16° 36' 00"W.

**ELEVATION**  
ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE RELATED TO CITY OF  
TORONTO BENCH MARK No. CT1355, HAVING AN ELEVATION OF 167.729 METRES.

**LEGEND**

■	DENOTES SURVEY MONUMENT FOUND
□	DENOTES SURVEY MONUMENT PLANTED
SB	DENOTES STANDARD IRON BAR
B	DENOTES IRON BAR
CC	DENOTES CUT CROSS
U	DENOTES MEASURED
(U)	DENOTES SET
(U)	DENOTES ORIGIN UNKNOWN
(WT)	DENOTES WITNESS
(BA)	DENOTES PLAN BA-2115
(M)	DENOTES PLAN M-347
(P)	DENOTES PLAN OF SURVEY BY C.E. DOTTERILL LTD., O.L.S. DATED AUGUST 28, 1984
(P)	DENOTES PLAN OF SURVEY BY M.S. WONG O.L.S., DATED MAY 9, 1945
(P)	DENOTES PLAN OF SURVEY BY UNWIN, MURPHY & ESTEN LTD., O.L.S. DATED DECEMBER 22, 1945
(P)	DENOTES PLAN OF SURVEY BY C. RUBENS & SONS, O.L.S., DATED JULY 22, 1952
(P)	DENOTES SPEIGHT & VAN NOSTRAND LTD., O.L.S. DATED JULY 22, 1952
(SW)	DENOTES BRICK AND CONCRETE RETAINING WALL
B-CRW	DENOTES BOARD FENCE
CLF	DENOTES CHAIN LINK FENCE
CRW	DENOTES CONCRETE RETAINING WALL
PWF	DENOTES POST & WIRE FENCE
SRW	DENOTES STONE RETAINING WALL
(T)	DENOTES TOP OF CURB

ALL BUILDING TIES TAKEN TO BRICK, UNLESS OTHERWISE NOTED.

TOTAL SITE AREA = 4161.1 m<sup>2</sup>

**MUNICIPAL ADDRESSES**  
Nos. 1637, 1639, 1641, 1643 AND 1645 BATHURST STREET, TORONTO.

**SURVEYOR'S CERTIFICATE**

I CERTIFY THAT:  
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH  
THE SURVEY ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT  
AND THE REGULATIONS MADE UNDER THEM.  
2. THE SURVEY WAS COMPLETED ON THE 17th DAY OF FEBRUARY, 2016

DATE FEBRUARY 17, 2016

**TOM KRCMAR**  
ONTARIO LAND SURVEYOR

**ASSOCIATION OF ONTARIO  
LAND SURVEYORS**  
PLAN SUBMISSION FORM  
1966846

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FIELD:	D.L.	DRAWN:	C.L.	CHECKED:	S.N.R.	JOB NO.	16-012
DWG NAME:	16-012/01	PLAT INFO:	11:35 16/Feb/2016	WORK ORDER NO:	18558		
1137 Centre Street, Thornhill ON L4J 3M6 905.738.0953 F 905.738.9221 <a href="http://www.krcmar.ca">www.krcmar.ca</a>							

**KRCMAR**

## **APPENDIX B**



# 1637 Bathurst St.

1637-1645 Bathurst Street  
Toronto, Ontario

## Starlight Investments

Project: 17023  
Date: 2017/11/22  
Issued for: COORDINATION

ARCHITECTURAL DRAWING LIST	
SHEET NUMBER	SHEET NAME
000 GENERAL	
A001	CONTEXT PLAN
A002	SITE STATISTICS
A050	BUILDING MASSING
100-200 PLANS	
A100	SITE PLAN
A101	MAIN (PARKING) LEVEL PLAN
A102	PIT LEVEL PLAN
A201	GROUND FLOOR PLAN
A202	02 LEVEL PLAN
A203	03 LEVEL PLAN
A204	04 LEVEL PLAN
A205	ROOF TERRACE LEVEL PLAN
400 ELEVATIONS	
A401	ELEVATIONS - EAST AND WEST
A402	ELEVATIONS - NORTH AND SOUTH
500 SECTIONS	
A501	SECTION NORTH-SOUTH
A502	SECTIONS EAST-WEST

### PROJECT CONSULTANTS

#### STRUCTURAL

Jablonsky Ast and Partners  
1129 Leslie Street  
Don Mills ON M3C 2K5  
Telephone 416 447 7405  
Fax 416 447 2771  
[www.astint.on.ca](http://www.astint.on.ca)

#### MECHANICAL & ELECTRICAL

REINBOLD ENGINEERING GROUP  
212, 214 King St W  
Toronto ON M5H 3S6  
t. 647 352 1166

#### TRAFFIC

LEA Consulting Ltd.  
Suite 900, 625 Cochrane Drive,  
Markham, ON.  
L3R 9R9 CANADA  
TEL:905-470-0015, ext. 249  
FAX: 905-470-0030  
WEB: [www.LEA.ca](http://www.LEA.ca)

#### LANDSCAPE

MSLA  
(Marton Smith Landscape Architects Inc.)  
170 The Donway W. Suite 206  
North York, ON. M3C 2G3  
416 492.9966 ext.21  
F. 416 492.0426  
[www.msla.ca](http://www.msla.ca)

#### PLANNING

Walker, Nott, Dragicevic Associates Limited  
90 Eglinton Avenue East, Suite 970,  
Toronto, ON M4P 2Y3  
t: 416-968-3511 ext.116 f: 416-960-0172  
[www.wndplan.com](http://www.wndplan.com)

#### CIVIL

LEA Consulting Ltd.  
Suite 900, 625 Cochrane Drive,  
Markham, ON.  
L3R 9R9 CANADA  
TEL: 905-470-0015, ext. 249  
FAX: 905-470-0030  
WEB: [www.LEA.ca](http://www.LEA.ca)

#### GEOTECH

McClymont & Rak Engineers Inc.  
111 Zenway Blvd., Unit 4  
Vaughan, Ontario  
L4H 3H9  
P: 416 675 0160  
F: 905 851 1722



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ISSUE RECORD

REVISION RECORD

North

**RAW**

405-317 ADELAIDE STREET  
WEST  
TORONTO CANADA M5V 1P9  
+1 416 599 9729  
[WWW.RAWDESIGN.CA](http://WWW.RAWDESIGN.CA)

17023

1637 Bathurst St.

Starlight  
Investments

COVER

A000





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17023

1637 Bathurst St.

Starlight  
Investments

CONTEXT PLAN

1 : 1000

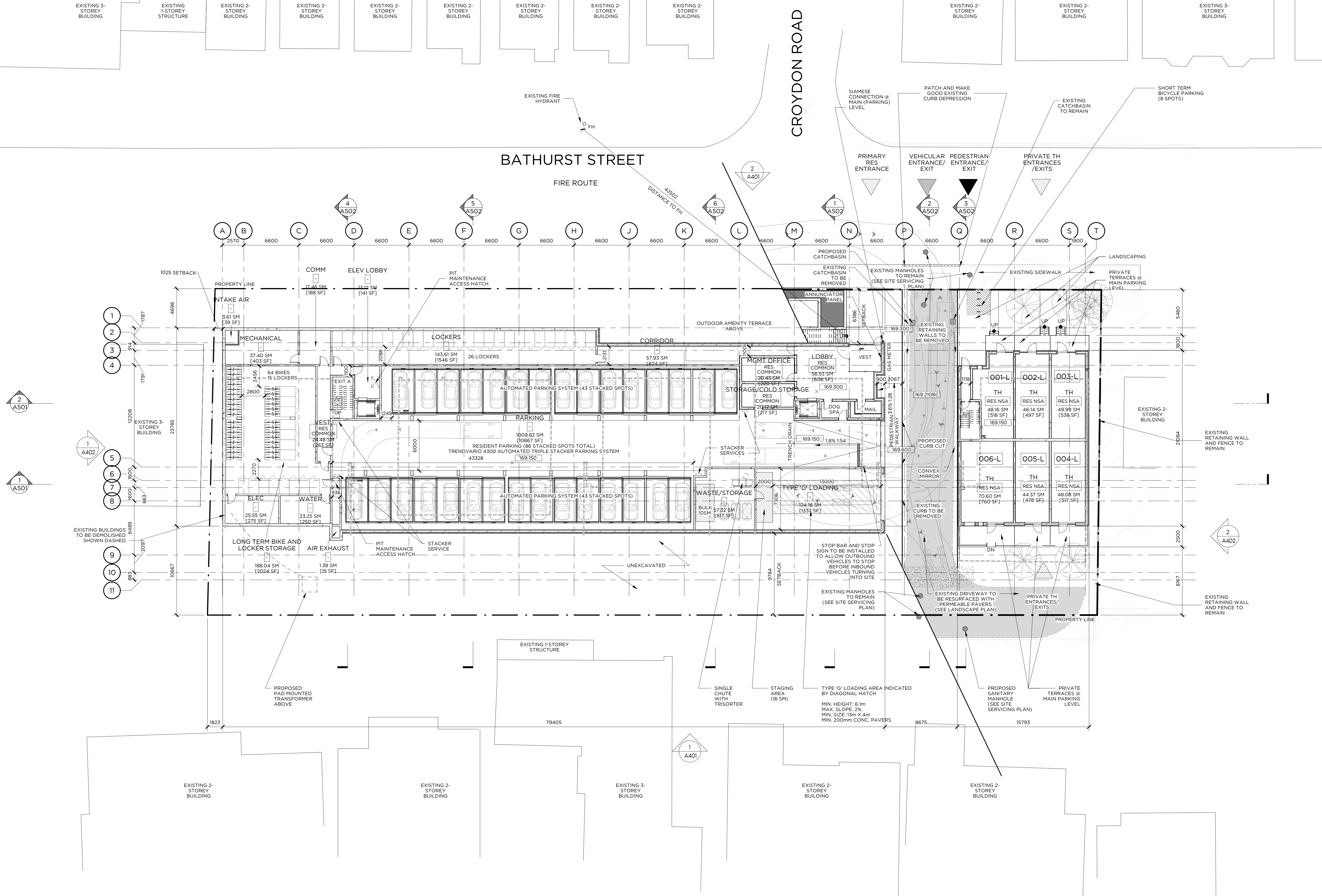
A001





# A100





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1637 Bathurst St.

Starlight  
Investments

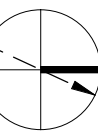
MAIN (PARKING)  
LEVEL PLAN

1 : 200

A101

## CRIME RECORD

VISION RECORD



rth

5-317 ADELAIDE STREET  
EST  
TORONTO CANADA M5V 1P9  
416 599 9729  
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7023

537 Bathurst St.

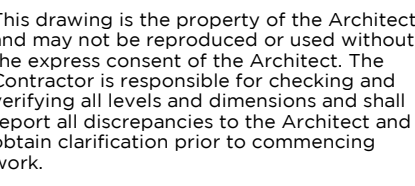
tarlight  
investments

## IT LEVEL PLAN

: 200

# A102





REVISION RECORD



105-317 ADELAIDE STREET  
WEST  
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17023  
—  
1637 Bathurst St.

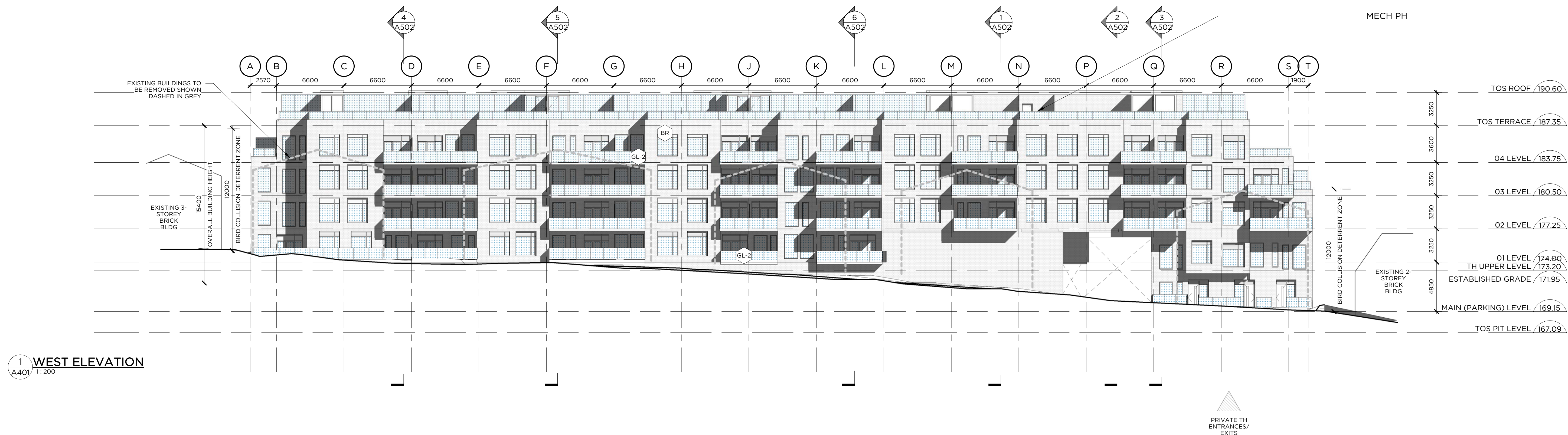
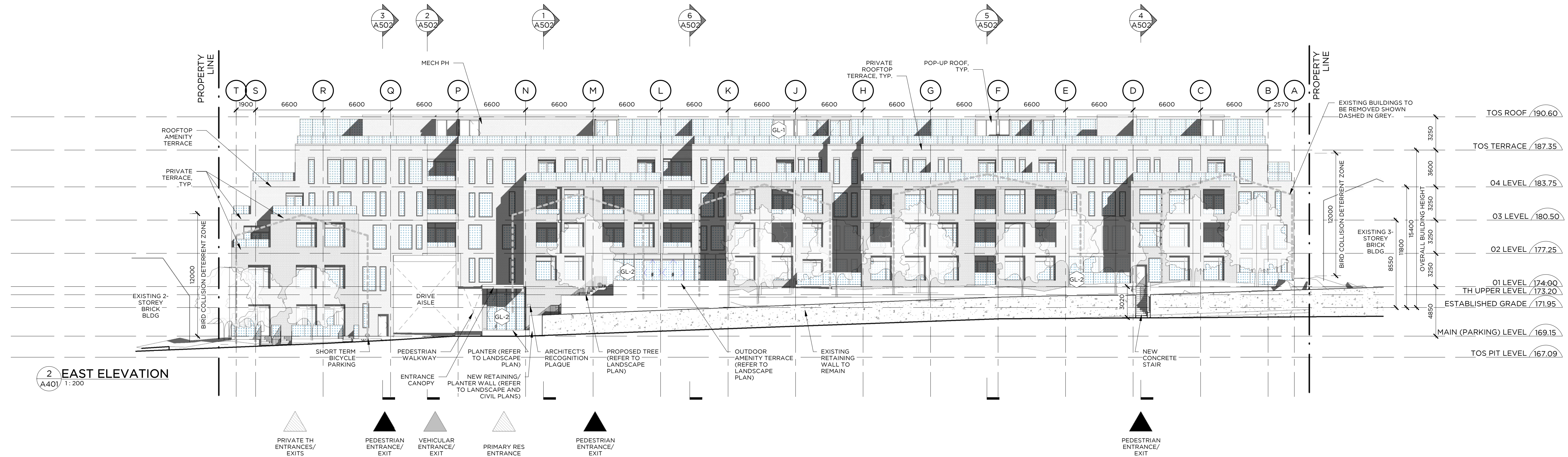
Starlight  
Investments

## GROUND FLOOR PLAN

1 : 200

A201





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ISSUE RECORD

REVISION RECORD

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**RAW**

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1637 Bathurst St.

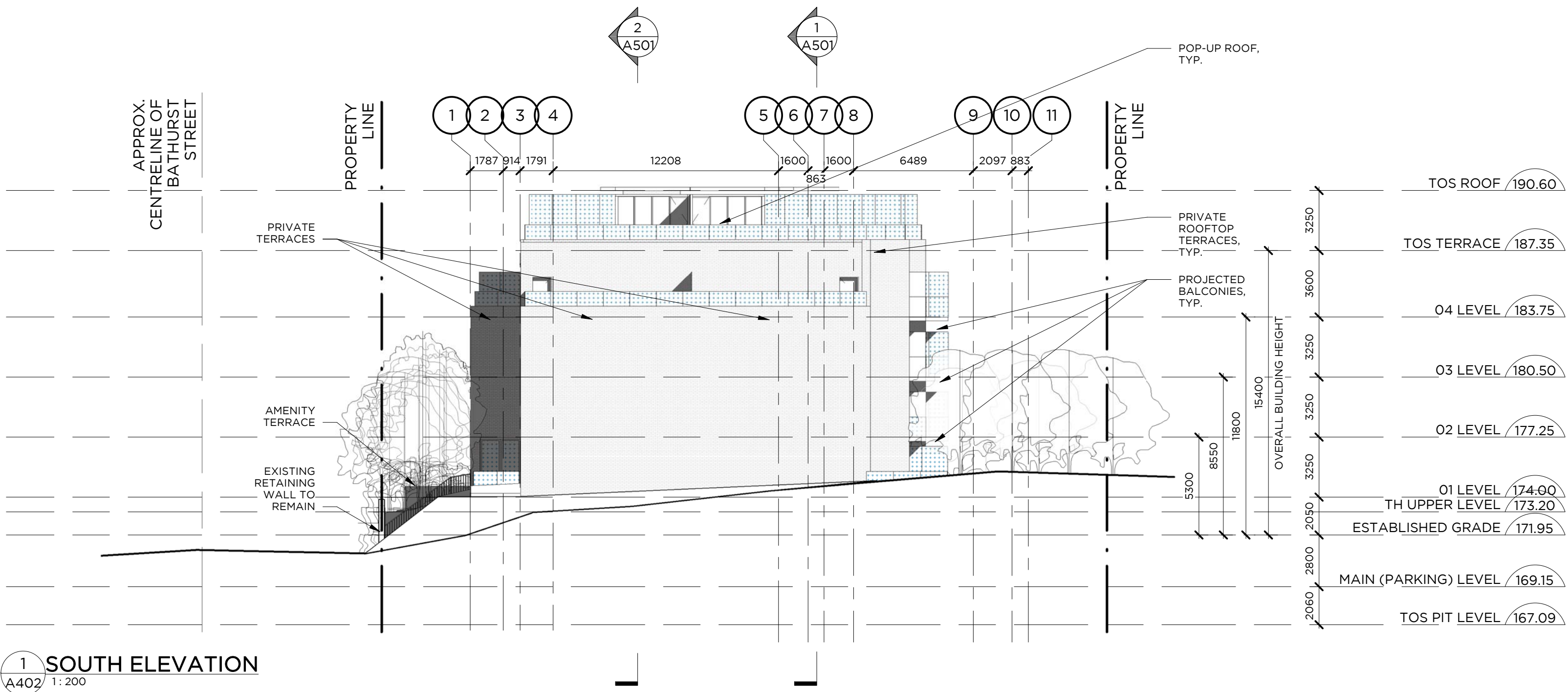
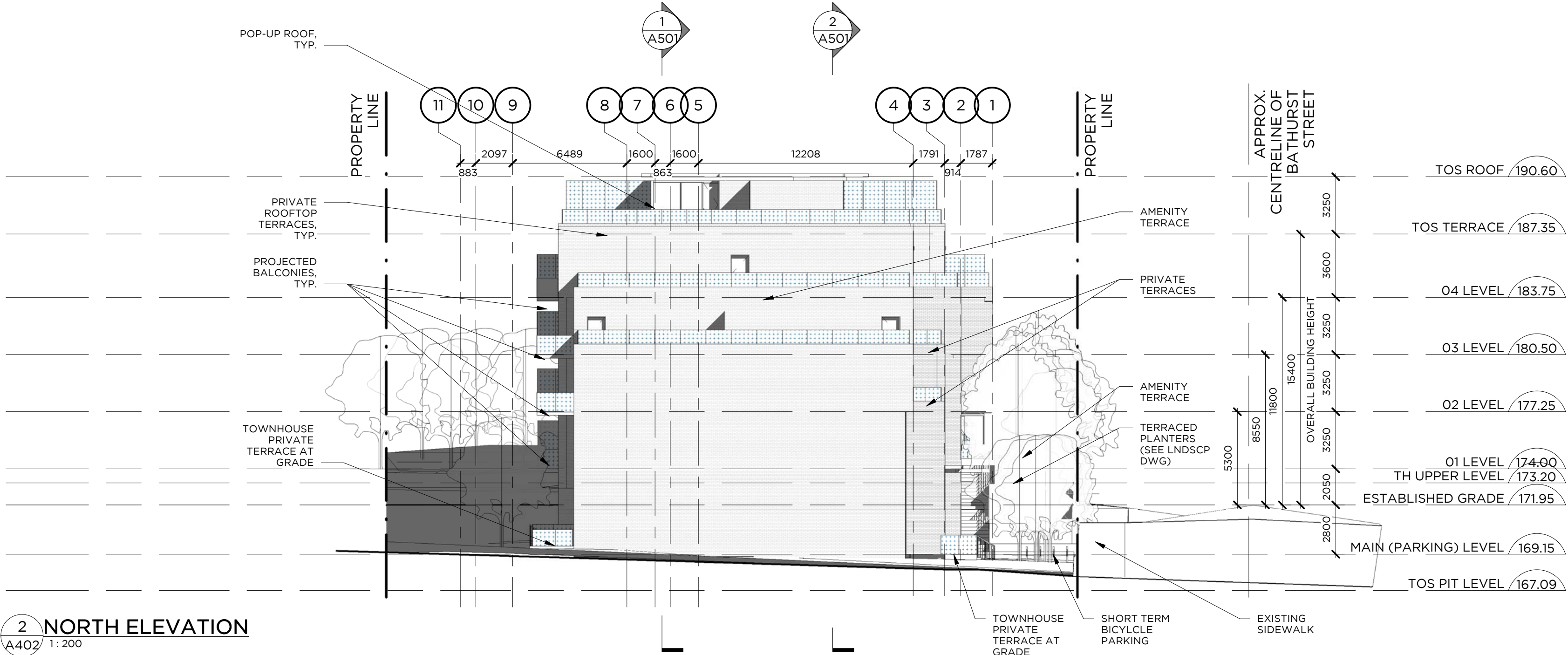
Starlight  
Investments

ELEVATIONS -  
EAST AND WEST

1:200

A401





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ISSUE RECORD

REVISION RECORD

North

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17023

1637 Bathurst St.

Starlight  
Investments

ELEVATIONS -  
NORTH AND  
SOUTH

1 : 200

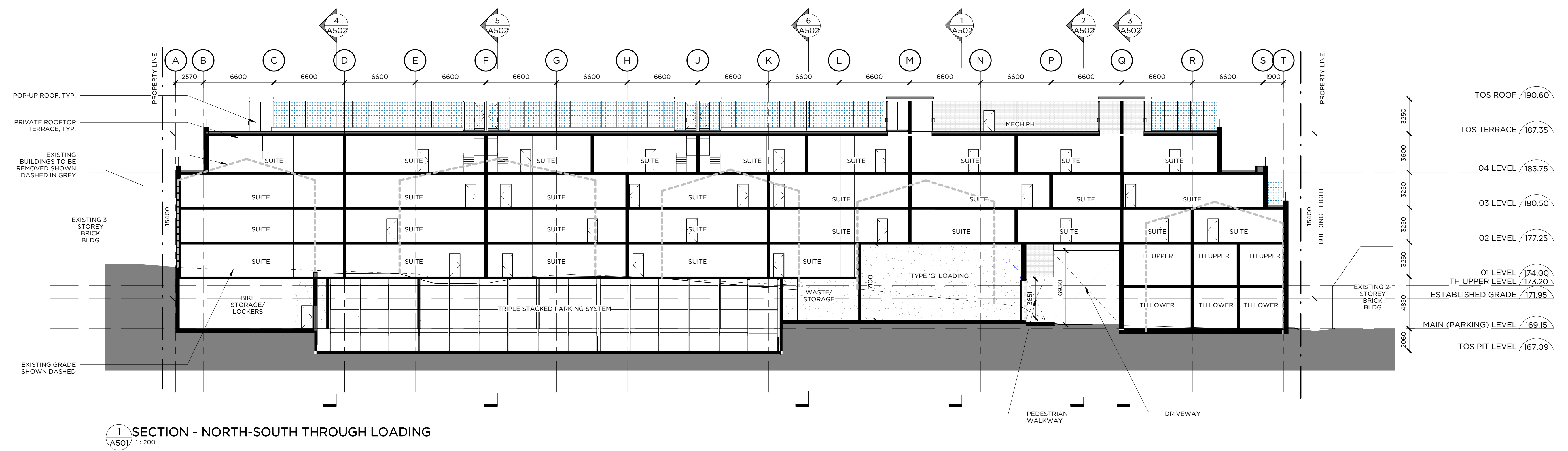
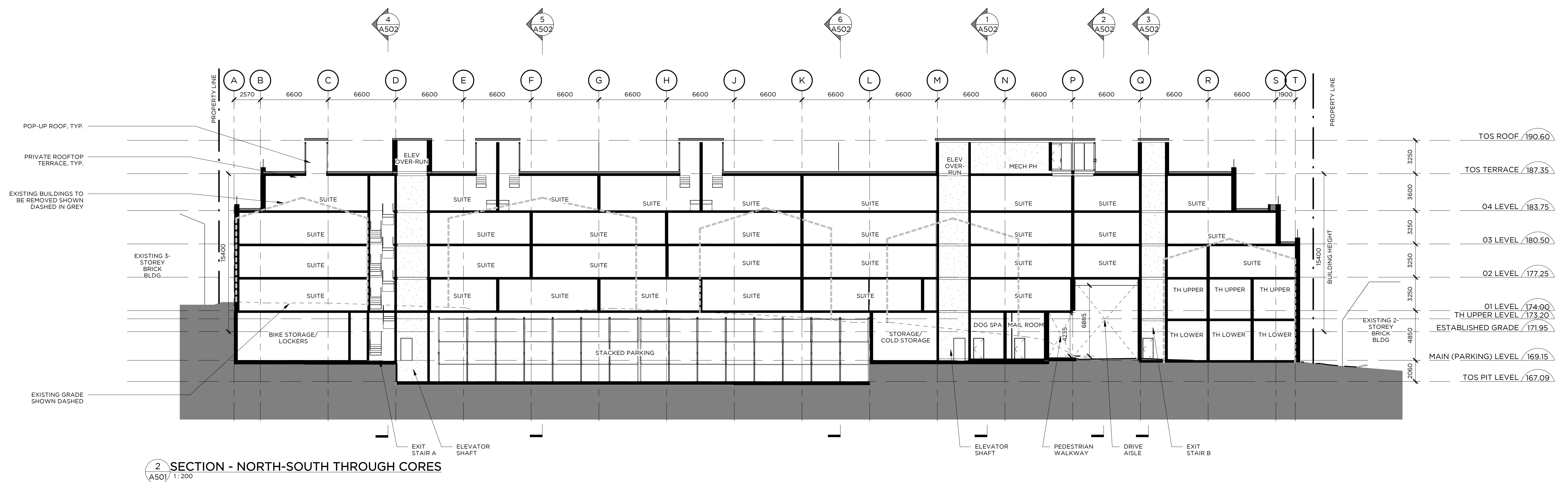
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1637 Bathurst St.

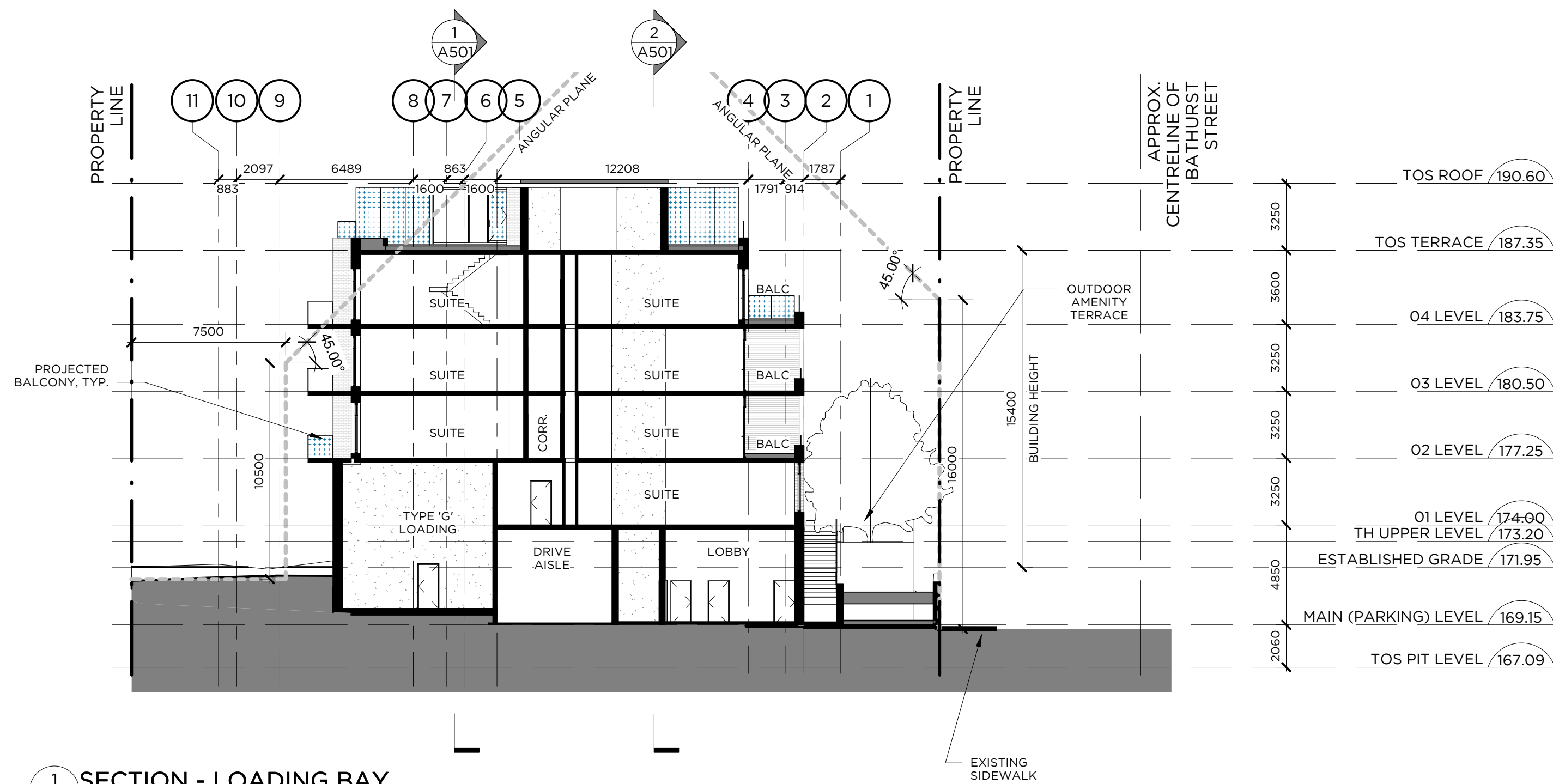
Starlight  
Investments

SECTION  
NORTH-SOUTH

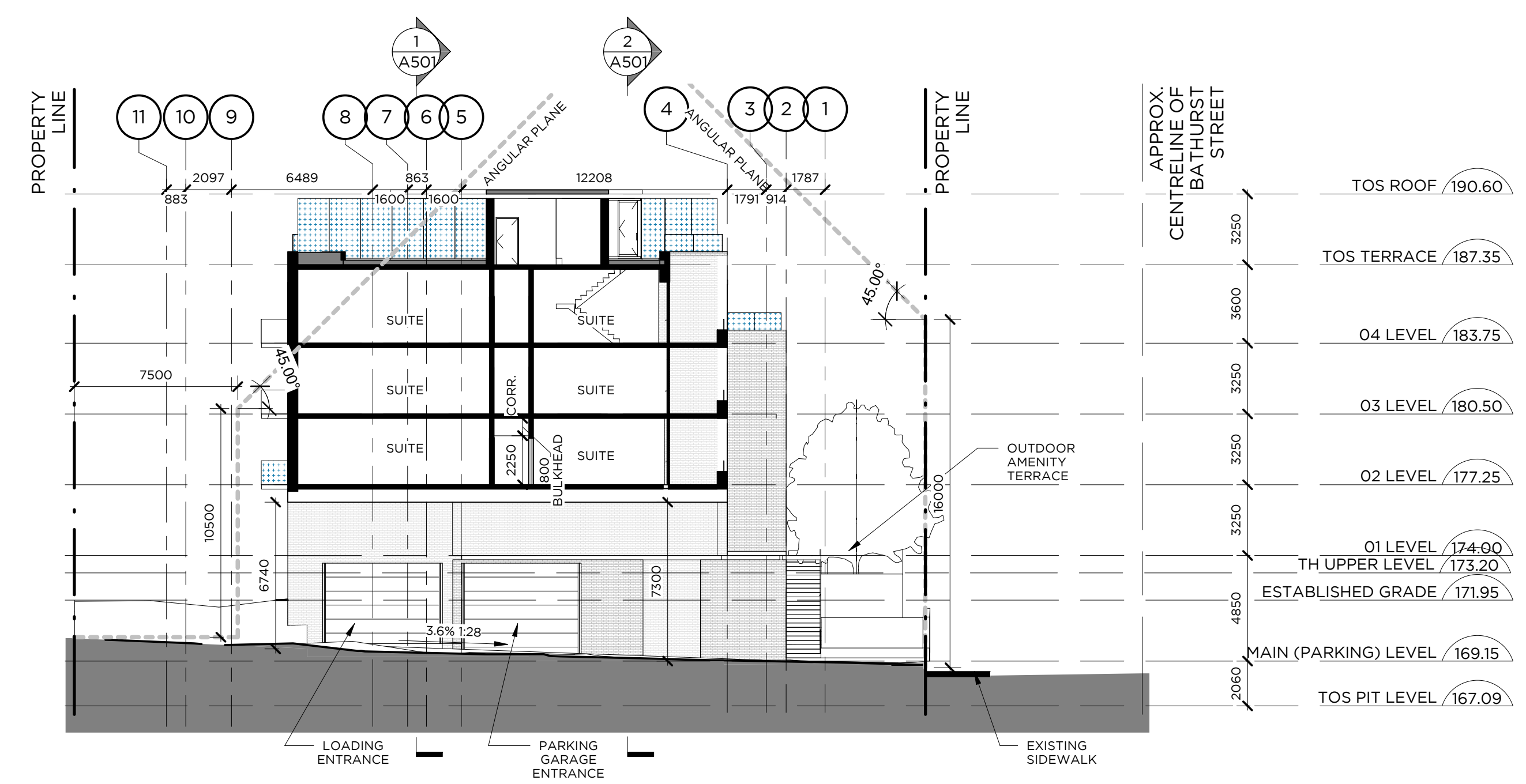
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A501

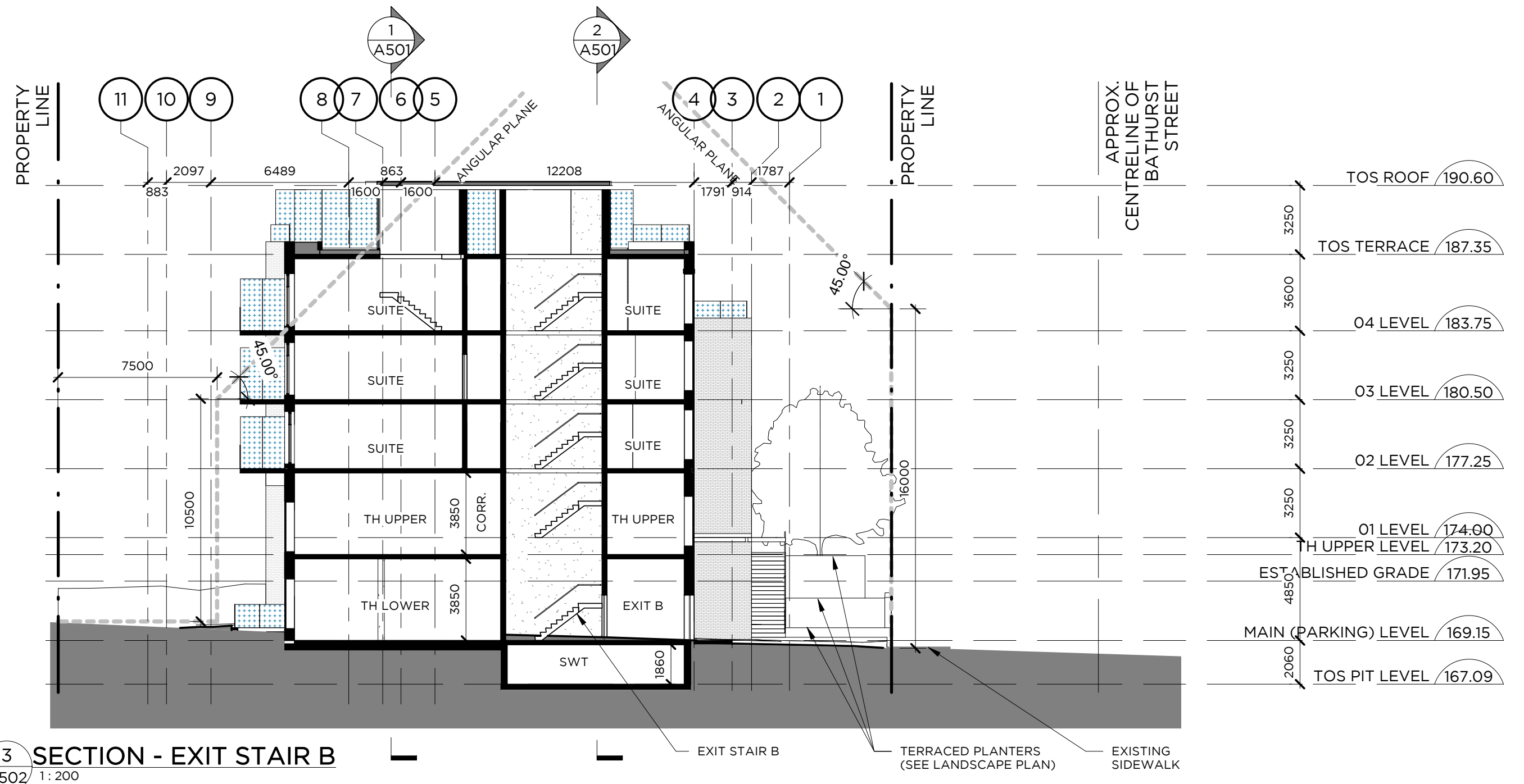




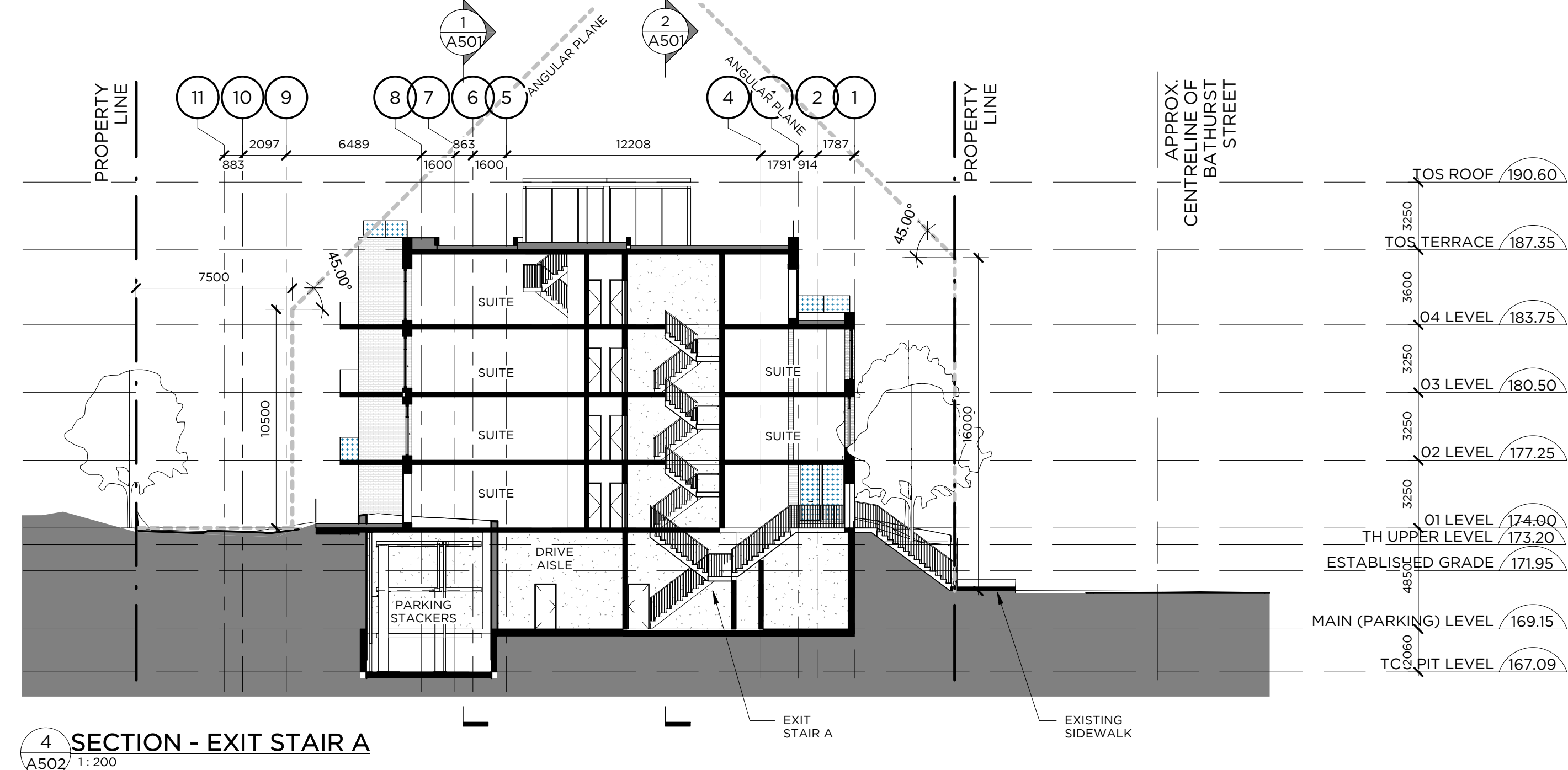
1 SECTION - LOADING BAY  
A501 1:200



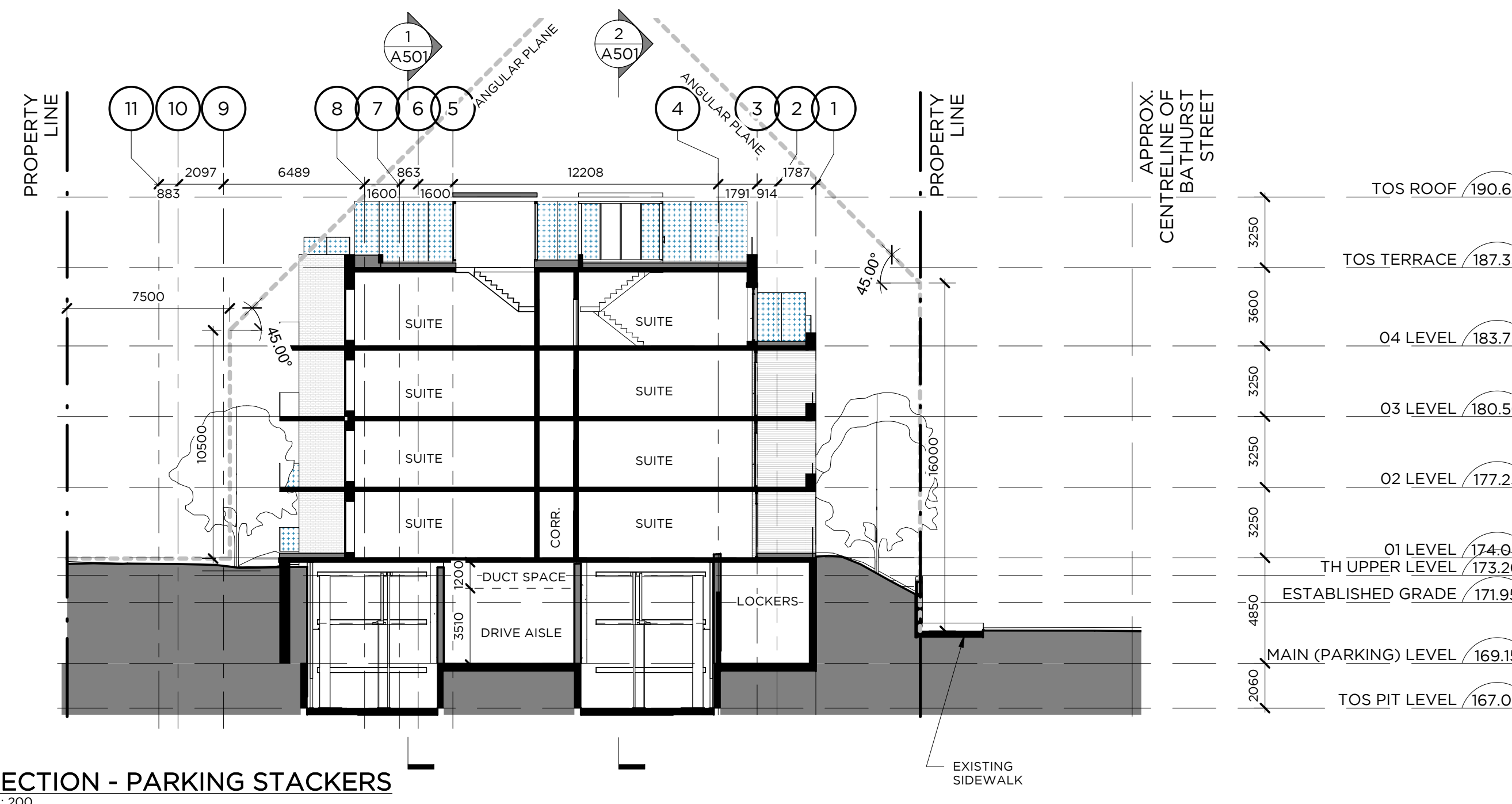
2 SECTION - VEHICULAR ENTRANCE  
A502 1:200



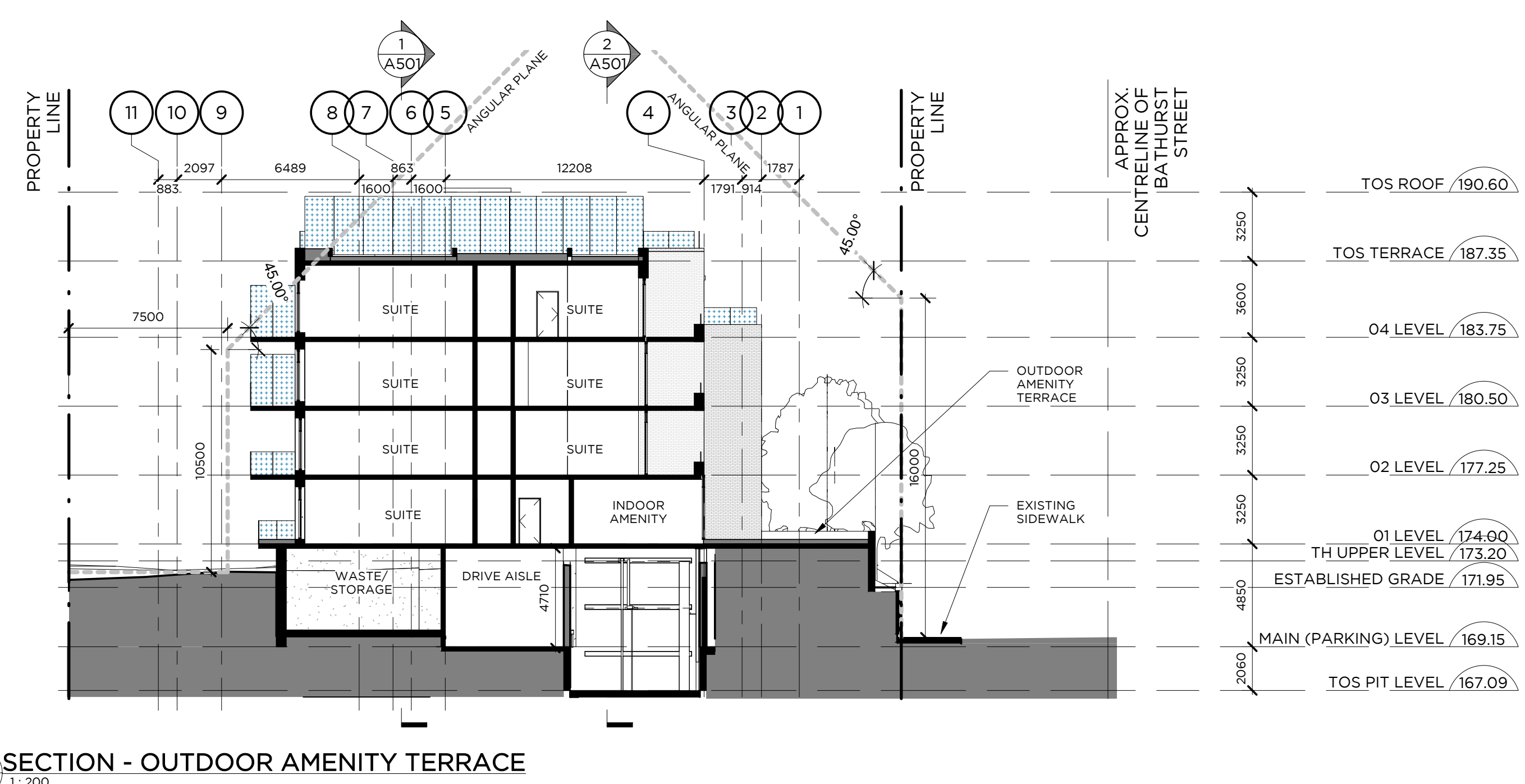
3 SECTION - EXIT STAIR B  
A502 1:200



4 SECTION - EXIT STAIR A  
A502 1:200



5 SECTION - PARKING STACKERS  
A502 1:200



6 SECTION - OUTDOOR AMENITY TERRACE  
A502 1:200

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ISSUE RECORD

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17023

1637 Bathurst St.

Starlight  
Investments

SECTIONS  
EAST-WEST

1:200

A502

## **APPENDIX C**

# RECORD OF BOREHOLE 1

PROJECT : G5168  
 LOCATION : 1637 Bathurst Street, Toronto, Ontario  
 STARTED : July 6, 2017  
 COMPLETED : July 6, 2017

**MC CLYMONT & RAK  
 ENGINEERS, INC.**

SHEET 1 OF 1  
 DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE		SAMPLES		ORGANIC VAPOUR READINGS (ppm)				SHEAR STRENGTH: Cu, KPa				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	%				WATER CONTENT, PERCENT					
								% LEL (hexane)				wp   w   wl					
		GROUND SURFACE		173.50													
		75 mm ASPHALT		173.48													
		FILL: clayey silt, some sand and gravel, trace of brick pieces, brown, moist, stiff.		172.74	1	SS	36								Flush Mount Cover		
		SANDY SILT TILL: some clay, trace of gravel, brown, moist, dense.		171.98	2	SS	31										
		SANDY SILT: brown, moist, very dense.		171.21	3	SS	55										
		CLAYEY SILT TILL: some sand, trace of gravel, brown, moist, hard.		171.21	4	SS	66								Bentonite		
					5	SS	>100										
					6	SS	54										
		-grey below 4.9 m depth.															
					7	SS	90								9.15 m Long 50 mm ID PVC Riser		
		SANDY SILT TILL: some clay, trace of gravel, grey, moist, very dense.		167.10													
		CLAYEY SILT: grey, moist to wet, hard.		165.88	8	SS	>100										
					9	SS	80								165.00 Silica Sand		
		SILTY CLAY: grey, moist, hard.		164.05											164.35		
		SANDY SILT: grey, wet, very dense.		162.83	10	SS	50								3.05 m Long 50 mm ID Well Screen		
		CLAYEY SILT TILL: some sand, trace of gravel, grey, moist, hard.		162.53													
					11	SS	>100								161.30		
		End of Borehole		161.06													
		Note: 1) Borehole remained dry on completion of drilling. 2) Soil samples were screened using a RKI Eagle gas meter with methane response mode off. 3) Water level was measured at 6.23 m bgs on July 21, 2017.		12.44													

**GROUNDWATER ELEVATIONS**

▽ SHALLOW/SINGLE INSTALLATION

WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION

WATER LEVEL (date)

LOGGED : NS

CHECKED : LM

# RECORD OF BOREHOLE 2

PROJECT : G5168  
 LOCATION : 1637 Bathurst Street, Toronto, Ontario  
 STARTED : August 14, 2017  
 COMPLETED : August 14, 2017

**MC CLYMONT & RAK  
 ENGINEERS, INC.**

SHEET 1 OF 1  
 DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE			SAMPLES			ORGANIC VAPOUR READINGS (ppm)				SHEAR STRENGTH: Cu, KPa				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	100 200 300 400				nat V -  rem V -  U -					
								% LEL (hexane)				WATER CONTENT, PERCENT					
								20 40 60 80				wp  w  wl					
		GROUND SURFACE		171.95													
2	POWER BORING SOLID STEM AUGER	FILL: silty sand, brown, moist, compact. -trace of organics and rootlets in the upper 350 mm.			1	SS	16									Flush Mount Cover	
					2	SS	18										
				170.43 1.52													
		SANDY SILT: brown, moist, compact.			3	SS	17										
				169.66 2.29													
		SANDY SILT TILL: trace of clay and gravel, brown, moist, very dense to dense.			4	SS	70										
					5	SS	77										
		-some clay below 4.55 m depth.			6	SS	33										
		CLAYEY SILT TILL: trace of sand and gravel, grey, moist, hard.															
				167.10 4.85													
4		-moist to wet below 6.1 m depth.			7	SS	30									9.15 m Long 50 mm ID PVC Riser	
6		SANDY SILT TILL: trace of clay and gravel, grey, moist, very dense.			8	SS	75									163.45 Silica Sand 162.80	
8																3.05 m Long 50 mm ID Well Screen 	
10					9	SS	53									159.75	
12																	
14					10	SS	>100										
12																	
14																	
14		End of Borehole			11	SS	>100										
14		Note: 1) Water level was measured at 11.28 m bgs on completion of drilling. 2) Soil samples were screened using a RKI Eagle gas meter with methane response mode off.															

## GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION  
 WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION  
 WATER LEVEL (date)

LOGGED : NB  
 CHECKED : LM

# RECORD OF BOREHOLE 3

PROJECT : G5168  
 LOCATION : 1637 Bathurst Street, Toronto, Ontario  
 STARTED : June 17, 2017  
 COMPLETED : August 14, 2017

**MC CLYMONT & RAK  
 ENGINEERS, INC.**

SHEET 1 OF 1  
 DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE		SAMPLES			ORGANIC VAPOUR READINGS (ppm)				SHEAR STRENGTH: Cu, KPa				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	100 200 300 400				20 40 60 80					
								% LEL (hexane)				WATER CONTENT, PERCENT					
		GROUND SURFACE		174.55													
	POWER BORING SOLID STEM AUGER	FILL: silty sand, to sandy silt, brown, moist, loose. -trace of organics and rootlets in the upper 350 mm.		173.79 0.76	1	SS	7										
		SANDY SILT TILL: trace of clay and gravel, brown, moist, compact to very dense.		2	SS	29											
2				3	SS	60											
				4	SS	35											
				5	SS	36											
4																	
			-oxidized fissures below 3.05 m depth.														
			-grey below 4.55 m depth.			6	SS	30									
6																	
						7	SS	24									
8					8	SS	47										
10					9	SS	38										
12					10	SS	73										
14		SILTY SAND: grey, wet, very dense.		162.26 12.29	11	SS	56										
		SANDY SILT TILL: trace of clay and gravel, grey, moist, very dense.		162.05 12.65													
		End of Borehole															
		Note: 1) Water level was measured at 10.97 m bgs on completion of drilling. 2) Soil samples were screened using a RKI Eagle gas meter with methane response mode off.															

## GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION  
 WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION  
 WATER LEVEL (date)

LOGGED : AR/OM/NB  
 CHECKED : LM



## **APPENDIX D**



MCCLYMONT & RAK ENG. INC  
ATTN: Jeremy Bobro  
111 ZENWAY BLVD.  
UNIT 4  
VAUGHAN ON L4H 3H9

Date Received: 28-AUG-17  
Report Date: 06-SEP-17 13:42 (MT)  
Version: FINAL

Client Phone: 416-675-0160

## Certificate of Analysis

Lab Work Order #: L1982331  
Project P.O. #: NOT SUBMITTED  
Job Reference: G5168  
C of C Numbers: 15-611920  
Legal Site Desc:

Mathy Mahadera  
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 95 West Beaver Creek Road, Unit 1, Richmond Hill, ON L4B 1H2 Canada | Phone: +1 905 881 9887 | Fax: +1 905 881 8062  
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## ANALYTICAL GUIDELINE REPORT

L1982331 CONTD....

Page 2 of 7

06-SEP-17 13:42 (MT)

G5168

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte									
L1982331-1	BH1									
Sampled By:	CLIENT on 28-AUG-17 @ 07:30									
Matrix:	WATER									
<b>Physical Tests</b>							#1	#2		
pH		7.95		0.10	pH units	29-AUG-17	6.00-11.5	6.0-9.5		
Total Suspended Solids		8.8		2.0	mg/L	01-SEP-17	350	15		
<b>Anions and Nutrients</b>										
Fluoride (F)		<0.20	DLDS	0.20	mg/L	31-AUG-17	10			
Total Kjeldahl Nitrogen		<0.15		0.15	mg/L	30-AUG-17	100			
Phosphorus, Total		0.0211		0.0030	mg/L	01-SEP-17	10	0.4		
<b>Cyanides</b>										
Cyanide, Total		<0.0020		0.0020	mg/L	05-SEP-17	2	0.02		
<b>Bacteriological Tests</b>										
E. Coli		0		0	CFU/100m L	30-AUG-17		200		
<b>Total Metals</b>										
Aluminum (Al)-Total		0.144		0.010	mg/L	30-AUG-17	50			
Antimony (Sb)-Total		0.00028		0.00010	mg/L	30-AUG-17	5			
Arsenic (As)-Total		0.00246		0.00010	mg/L	30-AUG-17	1	0.02		
Cadmium (Cd)-Total		<0.000010		0.000010	mg/L	30-AUG-17	0.7	0.008		
Chromium (Cr)-Total		0.00077		0.00050	mg/L	30-AUG-17	4	0.08		
Cobalt (Co)-Total		<0.00010		0.00010	mg/L	30-AUG-17	5			
Copper (Cu)-Total		<0.0010		0.0010	mg/L	30-AUG-17	2	0.04		
Lead (Pb)-Total		0.00021		0.00010	mg/L	30-AUG-17	1	0.12		
Manganese (Mn)-Total		0.0167		0.00050	mg/L	30-AUG-17	5	0.05		
Mercury (Hg)-Total		<0.000010		0.000010	mg/L	29-AUG-17	0.01	0.0004		
Molybdenum (Mo)-Total		0.00433		0.000050	mg/L	30-AUG-17	5			
Nickel (Ni)-Total		0.00058		0.00050	mg/L	30-AUG-17	2	0.08		
Selenium (Se)-Total		0.000173		0.000050	mg/L	30-AUG-17	1	0.02		
Silver (Ag)-Total		<0.000050		0.000050	mg/L	30-AUG-17	5	0.12		
Tin (Sn)-Total		0.00087		0.00010	mg/L	30-AUG-17	5			
Titanium (Ti)-Total		0.00227		0.00030	mg/L	30-AUG-17	5			
Zinc (Zn)-Total		0.0104		0.0030	mg/L	30-AUG-17	2	0.04		
<b>Speciated Metals</b>										
Chromium, Hexavalent		<0.0010		0.0010	mg/L	30-AUG-17	2	0.04		
<b>Aggregate Organics</b>										
BOD		<2.0		2.0	mg/L	03-SEP-17	300	15		
Oil and Grease, Total		<2.0		2.0	mg/L	30-AUG-17				
Animal/Veg Oil & Grease		<2.0		2.0	mg/L	01-SEP-17	150			
Mineral Oil and Grease		<1.0		1.0	mg/L	30-AUG-17	15			
Phenols (4AAP)		0.0045		0.0010	mg/L	30-AUG-17	1.0	0.008		
<b>Volatile Organic Compounds</b>										
Benzene		<0.50		0.50	ug/L	30-AUG-17	10	2		
Chloroform		<1.0		1.0	ug/L	30-AUG-17	40	2		
1,2-Dichlorobenzene		<0.50		0.50	ug/L	30-AUG-17	50	5.6		
1,4-Dichlorobenzene		<0.50		0.50	ug/L	30-AUG-17	80	6.8		
cis-1,2-Dichloroethylene		<0.50		0.50	ug/L	30-AUG-17	4000	5.6		
Dichloromethane		<2.0		2.0	ug/L	30-AUG-17	2000	5.2		
trans-1,3-Dichloropropene		<0.50		0.50	ug/L	30-AUG-17	140			

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

**Ontario Toronto Sanitary Discharge Sewer By-Law 100-2016 (FEB 4,2016) = [Suite] - ON\_Toronto Sanitary+Storm Sewer By-Law (JAN,2000)**

**#1: Ontario Toronto Sanitary Discharge Sewer By-Law**

**#2: Ontario Toronto Storm Sewer By-Law**



## ANALYTICAL GUIDELINE REPORT

G5168

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte									
L1982331-1	BH1									
Sampled By: CLIENT on 28-AUG-17 @ 07:30										
Matrix: WATER										
<b>Volatile Organic Compounds</b>										
	Ethylbenzene	<0.50		0.50	ug/L	30-AUG-17	160	2		
	1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L	30-AUG-17	1400	17		
	Tetrachloroethylene	<0.50		0.50	ug/L	30-AUG-17	1000	4.4		
	Toluene	<0.50		0.50	ug/L	30-AUG-17	16	2		
	Trichloroethylene	<0.50		0.50	ug/L	30-AUG-17	400	7.6		
	o-Xylene	<0.50		0.50	ug/L	30-AUG-17				
	m+p-Xylenes	<1.0		1.0	ug/L	30-AUG-17				
	Xylenes (Total)	<1.1		1.1	ug/L	30-AUG-17	1400	4.4		
	Surrogate: 4-Bromofluorobenzene	97.0		70-130	%	30-AUG-17				
	Surrogate: 1,4-Difluorobenzene	101.8		70-130	%	30-AUG-17				
<b>Polycyclic Aromatic Hydrocarbons</b>										
	Acenaphthene	<0.010		0.010	ug/L	05-SEP-17				
	Anthracene	<0.010		0.010	ug/L	05-SEP-17				
	Benzo(a)anthracene	<0.010		0.010	ug/L	05-SEP-17				
	Benzo(a)pyrene	<0.010		0.010	ug/L	05-SEP-17				
	Benzo(b)fluoranthene	<0.010		0.010	ug/L	05-SEP-17				
	Benzo(e)pyrene	<0.050		0.050	ug/L	05-SEP-17				
	Benzo(ghi)perylene	<0.010		0.010	ug/L	05-SEP-17				
	Benzo(k)fluoranthene	<0.010		0.010	ug/L	05-SEP-17				
	Chrysene	<0.010		0.010	ug/L	05-SEP-17				
	Dibenz(a,h)acridine	<0.050		0.050	ug/L	05-SEP-17				
	Dibenz(a,j)acridine	<0.050		0.050	ug/L	05-SEP-17				
	Dibenzo(a,h)anthracene	<0.010		0.010	ug/L	05-SEP-17				
	Dibenzo(a,i)pyrene	<0.050		0.050	ug/L	05-SEP-17				
	7H-Dibenzo(c,g)carbazole	<0.050		0.050	ug/L	05-SEP-17				
	1,3-Dinitropyrene	<1.0		1.0	ug/L	05-SEP-17				
	1,6-Dinitropyrene	<1.0		1.0	ug/L	05-SEP-17				
	1,8-Dinitropyrene	<1.0		1.0	ug/L	05-SEP-17				
	Fluoranthene	<0.010		0.010	ug/L	05-SEP-17				
	Fluorene	<0.010		0.010	ug/L	05-SEP-17				
	Indeno(1,2,3-cd)pyrene	<0.010		0.010	ug/L	05-SEP-17				
	Naphthalene	<0.010		0.010	ug/L	05-SEP-17				
	Perylene	<0.010		0.010	ug/L	05-SEP-17				
	Phenanthrene	<0.010		0.010	ug/L	05-SEP-17				
	Pyrene	<0.010		0.010	ug/L	05-SEP-17				
	Surrogate: 2-Fluorobiphenyl	87.4		40-130	%	05-SEP-17				
	Surrogate: d14-Terphenyl	91.6		40-130	%	05-SEP-17				
	Surrogate: p-Terphenyl d14	96.5		40-130	%	05-SEP-17				
	Total PAHs	<1.7		1.7	ug/L	05-SEP-17	5	2		
<b>Phthalate Esters</b>										
	Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	01-SEP-17	12	8.8		
	Surrogate: 2-fluorobiphenyl	95.2		40-130	%	01-SEP-17				
	Surrogate: p-Terphenyl d14	99.8		40-130	%	01-SEP-17				
<b>Semi-Volatile Organics</b>										
	3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	01-SEP-17	2	0.8		

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

**Ontario Toronto Sanitary Discharge Sewer By-Law 100-2016 (FEB 4,2016) = [Suite] - ON\_Toronto Sanitary+Storm Sewer By-Law (JAN,2000)**

**#1: Ontario Toronto Sanitary Discharge Sewer By-Law**

**#2: Ontario Toronto Storm Sewer By-Law**



## L1982331 CONTD....

Page 4 of 7

06-SEP-17 13:42 (MT)

**G5168**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.  
Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:  
**Ontario Toronto Sanitary Discharge Sewer By-Law 100-2016 (FEB 4,2016) = [Suite] - ON\_Toronto Sanitary+Storm Sewer By-Law (JAN,2000)**  
**#1: Ontario Toronto Sanitary Discharge Sewer By-Law** **#2: Ontario Toronto Storm Sewer By-Law**

Reference Information

Sample Parameter Qualifier key listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference***
625-33DCBENZIDINE-WT	Water	3,3-Dichlorobenzidine	SW846 8270
Aqueous samples are extracted and extracts are analyzed on GC/MSD.			
625-BIS-2-PHTH-WT	Water	Bis(2-ethylhexyl)phthalate	SW846 8270
Aqueous samples are extracted and extracts are analyzed on GC/MSD.			
625-DNB-PHTH-WT	Water	Di-n-Butyl Phthalate	SW846 8270
Aqueous samples are extracted and extracts are analyzed on GC/MSD.			
625-PAH-LOW-WT	Water	EPA 8270 PAH (Low Level)	SW846 8270
Aqueous samples are extracted and extracts are analyzed on GC/MSD. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.			
625-PCP-WT	Water	Pentachlorophenol	SW846 8270
BOD-WT	Water	BOD	APHA 5210 B

This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

CN-TOT-WT                      Water                      Cyanide, Total                      ISO 14403-2

Total cyanide is determined by the combination of UV digestion and distillation. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.

When using this method, high levels of thiocyanate in samples can cause false positives at ~1-2% of the thiocyanate concentration. For samples with detectable cyanide analyzed by this method, ALS recommends analysis for thiocyanate to check for this potential interference

CR-CR6-IC-WT                      Water                      Chromium +6                      EPA 7199

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

EC-WW-MF-WT                      Water                      E. Coli                      SM 9222D

A 100 mL volume of sample is filtered through a membrane, the membrane is placed on mFC-BCIG agar and incubated at 44.5 –0 .2 °C for 24 – 2 h.  
Method ID: WT-TM-1200

F-IC-N-WT                      Water                      Fluoride in Water by IC                      EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HG-T-CVAA-WT                      Water                      Total Mercury in Water by CVAAS                      EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT                      Water                      Total Metals by CRC ICPMS                      EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

NP,NPE-LCMS-WT                      Water                      Nonylphenols and Ethoxylates by LC/MS-MS                      J. Chrom A849 (1999) p.467-482

Water sample are filtered with direct injection and analyzed by LCMS/MS.

OGG-SPEC-CALC-WT                      Water                      Speciated Oil and Grease A/V Calc                      CALCULATION

Sample is extracted with hexane, sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.

OGG-SPEC-WT                      Water                      Speciated Oil and Grease-Gravimetric                      APHA 5520 B

The procedure involves an extraction of the entire water sample with hexane. Sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.

Reference Information

P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is deteremined colourimetrically after persulphate digestion of the sample.			
PAH-EXTRA-WT	Water	Sanitary Sewer Use By-Law Additional PAH	SW846 8270
PAH-SUM-CALC-WT	Water	TOTAL PAH's	CALCULATION
Total PAH represents the sum of all PAH analytes reported for a given sample. Note that regulatory agencies and criteria differ in their definitions of Total PAH in terms of the individual PAH analytes to be included.			
PCB-WT	Water	Polychlorinated Biphenyls	EPA 8082
PCBs are extracted from an aqueous sample at neutral pH with aliquots of dichloromethane using a modified separatory funnel technique. The extracts are analyzed by GC/MSD.			
PH-WT	Water	pH	APHA 4500 H-Electrode
Water samples are analyzed directly by a calibrated pH meter.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.			
SOLIDS-TSS-WT	Water	Suspended solids	APHA 2540 D-Gravimetric
A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104–1°C for a minimum of four hours or until a constant weight is achieved.			
TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-N
Sample is digested to convert the TKN to ammonium sulphate. The ammonia ions are heated to produce a colour complex. The absorbance measured by the instrument is proportional to the concentration of ammonium sulphate in the sample and is reported as TKN.			
VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260
Aqueous samples are analyzed by headspace-GC/MS.			
XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
Total xylenes represents the sum of o-xylene and m&p-xylene.			

\*\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody numbers:			
15-611920			
The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:			
Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA		

## Reference Information

### GLOSSARY OF REPORT TERMS

*Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.*

*mg/kg - milligrams per kilogram based on dry weight of sample*

*mg/kg ww - milligrams per kilogram based on wet weight of sample*

*mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight*

*mg/L - unit of concentration based on volume, parts per million.*

*< - Less than.*

*D.L. - The reporting limit.*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*

*Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information.*





**Environmental**

## Quality Control Report

Workorder: L1982331

Report Date: 06-SEP-17

Page 1 of 12

Client: MCCLYMONT & RAK ENG. INC  
111 ZENWAY BLVD. UNIT 4  
VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>625-33DCBENZIDINE-WT Water</b>								
Batch	R3815818							
<b>WG2604506-2 LCS</b>								
3,3'-Dichlorobenzidine			92.1		%		50-140	31-AUG-17
<b>WG2604506-3 LCSD</b>		<b>WG2604506-2</b>						
3,3'-Dichlorobenzidine		92.1	94.2		%	2.2	50	31-AUG-17
<b>WG2604506-1 MB</b>								
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	31-AUG-17
Surrogate: p-Terphenyl d14			117.7		%		40-130	31-AUG-17
<b>625-BIS-2-PHTH-WT Water</b>								
Batch	R3815818							
<b>WG2604506-2 LCS</b>								
Bis(2-ethylhexyl)phthalate			89.1		%		50-140	31-AUG-17
<b>WG2604506-3 LCSD</b>		<b>WG2604506-2</b>						
Bis(2-ethylhexyl)phthalate		89.1	89.8		%	0.8	50	31-AUG-17
<b>WG2604506-1 MB</b>								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	31-AUG-17
Surrogate: 2-fluorobiphenyl			95.9		%		40-130	31-AUG-17
Surrogate: p-Terphenyl d14			117.7		%		40-130	31-AUG-17
<b>625-DNB-PHTH-WT Water</b>								
Batch	R3815818							
<b>WG2604506-2 LCS</b>								
Di-n-butylphthalate			95.8		%		50-150	31-AUG-17
<b>WG2604506-3 LCSD</b>		<b>WG2604506-2</b>						
Di-n-butylphthalate		95.8	96.3		%	0.5	50	31-AUG-17
<b>WG2604506-1 MB</b>								
Di-n-butylphthalate			<1.0		ug/L		1	31-AUG-17
Surrogate: 2-Fluorobiphenyl			95.9		%		40-130	31-AUG-17
Surrogate: p-Terphenyl d14			117.7		%		40-130	31-AUG-17
<b>625-PAH-LOW-WT Water</b>								
Batch	R3815626							
<b>WG2604506-2 LCS</b>								
Acenaphthene			76.9		%		50-140	31-AUG-17
Anthracene			82.6		%		50-140	31-AUG-17
Benzo(a)anthracene			83.5		%		50-140	31-AUG-17
Benzo(a)pyrene			82.2		%		60-130	31-AUG-17
Benzo(b)fluoranthene			70.5		%		50-140	31-AUG-17
Benzo(ghi)perylene			72.8		%		50-140	31-AUG-17





## Quality Control Report

Workorder: L1982331

Report Date: 06-SEP-17

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Client: MCCLYMONT & RAK ENG. INC  
111 ZENWAY BLVD. UNIT 4  
VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>625-PAH-LOW-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R3815626</b>							
<b>WG2604506-1 MB</b>								
Benzo(ghi)perylene			<0.010		ug/L		0.01	31-AUG-17
Benzo(k)fluoranthene			<0.010		ug/L		0.01	31-AUG-17
Chrysene			<0.010		ug/L		0.01	31-AUG-17
Dibenzo(a,h)anthracene			<0.010		ug/L		0.01	31-AUG-17
Fluoranthene			<0.010		ug/L		0.01	31-AUG-17
Fluorene			<0.010		ug/L		0.01	31-AUG-17
Indeno(1,2,3-cd)pyrene			<0.010		ug/L		0.01	31-AUG-17
Naphthalene			<0.010		ug/L		0.01	31-AUG-17
Perylene			<0.010		ug/L		0.01	31-AUG-17
Phenanthrene			<0.010		ug/L		0.01	31-AUG-17
Pyrene			<0.010		ug/L		0.01	31-AUG-17
Surrogate: 2-Fluorobiphenyl			91.0		%		40-130	31-AUG-17
Surrogate: p-Terphenyl d14			108.1		%		40-130	31-AUG-17
<b>625-PCP-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R3815818</b>							
<b>WG2604506-2 LCS</b>								
Pentachlorophenol			135.8		%		50-140	31-AUG-17
<b>WG2604506-3 LCSD</b>		<b>WG2604506-2</b>						
Pentachlorophenol		135.8	128.6		%	5.4	50	31-AUG-17
<b>WG2604506-1 MB</b>								
Pentachlorophenol			<0.50		ug/L		0.5	31-AUG-17
Surrogate: 2,4,6-Tribromophenol			96.5		%		40-150	31-AUG-17
<b>BOD-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R3819507</b>							
<b>WG2603861-2 DUP</b>		<b>L1982338-1</b>						
BOD		<2.0	<2.0	RPD-NA	mg/L	N/A	20	03-SEP-17
<b>WG2603861-3 LCS</b>								
BOD			98.2		%		85-115	03-SEP-17
<b>WG2603861-1 MB</b>								
BOD			<2.0		mg/L		2	03-SEP-17
<b>CN-TOT-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R3819126</b>							
<b>WG2608454-7 DUP</b>		<b>L1981658-1</b>						
Cyanide, Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	05-SEP-17
<b>WG2608454-6 LCS</b>								



## Quality Control Report

Workorder: L1982331

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Client: MCCLYMONT & RAK ENG. INC  
111 ZENWAY BLVD. UNIT 4  
VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>CN-TOT-WT</b>	<b>Water</b>							
<b>Batch</b>	<b>R3819126</b>							
<b>WG2608454-6</b>	<b>LCS</b>							
Cyanide, Total			89.9		%		80-120	05-SEP-17
<b>WG2608454-5</b>	<b>MB</b>							
Cyanide, Total			<0.0020		mg/L		0.002	05-SEP-17
<b>WG2608454-8</b>	<b>MS</b>	<b>L1981658-1</b>						
Cyanide, Total			86.5		%		70-130	05-SEP-17
<b>CR-CR6-IC-WT</b>	<b>Water</b>							
<b>Batch</b>	<b>R3815465</b>							
<b>WG2605635-4</b>	<b>DUP</b>	<b>WG2605635-3</b>						
Chromium, Hexavalent		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	30-AUG-17
<b>WG2605635-2</b>	<b>LCS</b>							
Chromium, Hexavalent			101.6		%		80-120	30-AUG-17
<b>WG2605635-1</b>	<b>MB</b>							
Chromium, Hexavalent			<0.0010		mg/L		0.001	30-AUG-17
<b>WG2605635-5</b>	<b>MS</b>	<b>WG2605635-3</b>						
Chromium, Hexavalent			100.1		%		70-130	30-AUG-17
<b>EC-WW-MF-WT</b>	<b>Water</b>							
<b>Batch</b>	<b>R3814887</b>							
<b>WG2603801-3</b>	<b>DUP</b>	<b>L1982331-1</b>						
E. Coli		0	0		CFU/100mL	0.0	50	30-AUG-17
<b>WG2603801-4</b>	<b>DUP</b>	<b>L1982330-1</b>						
E. Coli		0	0		CFU/100mL	0.0	50	30-AUG-17
<b>WG2603801-1</b>	<b>MB</b>							
E. Coli			0		CFU/100mL		1	30-AUG-17
<b>F-IC-N-WT</b>	<b>Water</b>							
<b>Batch</b>	<b>R3816951</b>							
<b>WG2606002-4</b>	<b>DUP</b>	<b>WG2606002-3</b>						
Fluoride (F)		0.035	0.033		mg/L	7.6	20	31-AUG-17
<b>WG2606002-2</b>	<b>LCS</b>							
Fluoride (F)			99.1		%		90-110	31-AUG-17
<b>WG2606002-1</b>	<b>MB</b>							
Fluoride (F)			<0.020		mg/L		0.02	31-AUG-17
<b>WG2606002-5</b>	<b>MS</b>	<b>WG2606002-3</b>						
Fluoride (F)			94.8		%		75-125	31-AUG-17
<b>HG-T-CVAA-WT</b>	<b>Water</b>							



## Quality Control Report

Workorder: L1982331

Report Date: 06-SEP-17

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Client: MCCLYMONT & RAK ENG. INC  
111 ZENWAY BLVD. UNIT 4  
VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>HG-T-CVAA-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R3813882</b>							
<b>WG2603551-3 DUP</b>		<b>L1982330-1</b>						
Mercury (Hg)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	29-AUG-17
<b>WG2603551-2 LCS</b>								
Mercury (Hg)-Total			95.9		%		80-120	29-AUG-17
<b>WG2603551-1 MB</b>								
Mercury (Hg)-Total			<0.000010		mg/L		0.00001	29-AUG-17
<b>WG2603551-4 MS</b>		<b>L1982331-1</b>						
Mercury (Hg)-Total			88.1		%		70-130	29-AUG-17
<b>MET-T-CCMS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R3815386</b>							
<b>WG2604469-4 DUP</b>		<b>WG2604469-3</b>						
Aluminum (Al)-Total		0.0416	0.0433		mg/L	3.9	20	30-AUG-17
Antimony (Sb)-Total		0.00011	0.00011		mg/L	7.2	20	30-AUG-17
Arsenic (As)-Total		0.00267	0.00273		mg/L	2.5	20	30-AUG-17
Cadmium (Cd)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	30-AUG-17
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	30-AUG-17
Cobalt (Co)-Total		0.00101	0.00098		mg/L	2.4	20	30-AUG-17
Copper (Cu)-Total		0.0015	<0.0010	RPD-NA	mg/L	N/A	20	30-AUG-17
Lead (Pb)-Total		0.000098	0.000100		mg/L	2.2	20	30-AUG-17
Manganese (Mn)-Total		0.335	0.333		mg/L	0.8	20	30-AUG-17
Molybdenum (Mo)-Total		0.00524	0.00528		mg/L	0.7	20	30-AUG-17
Nickel (Ni)-Total		0.00304	0.00292		mg/L	3.9	20	30-AUG-17
Selenium (Se)-Total		0.000053	0.000054		mg/L	2.5	20	30-AUG-17
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	30-AUG-17
Tin (Sn)-Total		0.00020	0.00019		mg/L	3.9	20	30-AUG-17
Titanium (Ti)-Total		0.00138	0.00154		mg/L	11	20	30-AUG-17
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	30-AUG-17
<b>WG2604469-2 LCS</b>								
Aluminum (Al)-Total			101.8		%		80-120	30-AUG-17
Antimony (Sb)-Total			102.2		%		80-120	30-AUG-17
Arsenic (As)-Total			99.7		%		80-120	30-AUG-17
Cadmium (Cd)-Total			97.8		%		80-120	30-AUG-17
Chromium (Cr)-Total			98.1		%		80-120	30-AUG-17
Cobalt (Co)-Total			97.3		%		80-120	30-AUG-17
Copper (Cu)-Total			97.3		%		80-120	30-AUG-17



## Quality Control Report

Workorder: L1982331

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Client: MCCLYMONT & RAK ENG. INC  
111 ZENWAY BLVD. UNIT 4  
VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-CCMS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R3815386</b>							
<b>WG2604469-2</b>	<b>LCS</b>							
Lead (Pb)-Total			99.2		%		80-120	30-AUG-17
Manganese (Mn)-Total			100.1		%		80-120	30-AUG-17
Molybdenum (Mo)-Total			100.4		%		80-120	30-AUG-17
Nickel (Ni)-Total			97.3		%		80-120	30-AUG-17
Selenium (Se)-Total			95.1		%		80-120	30-AUG-17
Silver (Ag)-Total			97.9		%		80-120	30-AUG-17
Tin (Sn)-Total			100.9		%		80-120	30-AUG-17
Titanium (Ti)-Total			97.0		%		80-120	30-AUG-17
Zinc (Zn)-Total			92.9		%		80-120	30-AUG-17
<b>WG2604469-1</b>	<b>MB</b>							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	30-AUG-17
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	30-AUG-17
Arsenic (As)-Total			<0.00010		mg/L		0.0001	30-AUG-17
Cadmium (Cd)-Total			<0.000010		mg/L		0.00001	30-AUG-17
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	30-AUG-17
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	30-AUG-17
Copper (Cu)-Total			<0.0010		mg/L		0.001	30-AUG-17
Lead (Pb)-Total			<0.000050		mg/L		0.00005	30-AUG-17
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	30-AUG-17
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	30-AUG-17
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	30-AUG-17
Selenium (Se)-Total			<0.000050		mg/L		0.00005	30-AUG-17
Silver (Ag)-Total			<0.000050		mg/L		0.00005	30-AUG-17
Tin (Sn)-Total			<0.00010		mg/L		0.0001	30-AUG-17
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	30-AUG-17
Zinc (Zn)-Total			<0.0030		mg/L		0.003	30-AUG-17
<b>WG2604469-5</b>	<b>MS</b>	<b>WG2604469-3</b>						
Aluminum (Al)-Total			106.2		%		70-130	30-AUG-17
Antimony (Sb)-Total			106.8		%		70-130	30-AUG-17
Arsenic (As)-Total			102.8		%		70-130	30-AUG-17
Cadmium (Cd)-Total			91.2		%		70-130	30-AUG-17
Chromium (Cr)-Total			101.0		%		70-130	30-AUG-17
Cobalt (Co)-Total			94.4		%		70-130	30-AUG-17
Copper (Cu)-Total			81.7		%		70-130	30-AUG-17



## Quality Control Report

Workorder: L1982331

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Client: MCCLYMONT & RAK ENG. INC  
111 ZENWAY BLVD. UNIT 4  
VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-CCMS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R3815386</b>							
<b>WG2604469-5 MS</b>		<b>WG2604469-3</b>						
Lead (Pb)-Total			92.6		%		70-130	30-AUG-17
Manganese (Mn)-Total			N/A	MS-B	%		-	30-AUG-17
Molybdenum (Mo)-Total			102.1		%		70-130	30-AUG-17
Nickel (Ni)-Total			91.2		%		70-130	30-AUG-17
Selenium (Se)-Total			95.3		%		70-130	30-AUG-17
Silver (Ag)-Total			93.5		%		70-130	30-AUG-17
Tin (Sn)-Total			99.7		%		70-130	30-AUG-17
Titanium (Ti)-Total			103.1		%		70-130	30-AUG-17
Zinc (Zn)-Total			89.9		%		70-130	30-AUG-17
<b>NP,NPE-LCMS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R3815568</b>							
<b>WG2603506-3 DUP</b>		<b>L1981071-1</b>						
Nonylphenol		<1.0	<1.0	RPD-NA	ug/L	N/A	30	30-AUG-17
<b>WG2603506-2 LCS</b>								
Nonylphenol			90.0		%		75-125	30-AUG-17
<b>WG2603506-1 MB</b>								
Nonylphenol			<1.0		ug/L		1	30-AUG-17
<b>WG2603506-4 MS</b>		<b>L1981071-1</b>						
Nonylphenol			115.0		%		50-150	30-AUG-17
<b>OGG-SPEC-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R3814935</b>							
<b>WG2604542-2 LCS</b>								
Oil and Grease, Total			90.5		%		70-130	30-AUG-17
Mineral Oil and Grease			85.8		%		70-130	30-AUG-17
<b>WG2604542-3 LCSD</b>		<b>WG2604542-2</b>						
Oil and Grease, Total		90.5	95.2		%	5.1	40	30-AUG-17
Mineral Oil and Grease		85.8	88.7		%	3.3	40	30-AUG-17
<b>WG2604542-1 MB</b>								
Oil and Grease, Total			<2.0		mg/L		2	30-AUG-17
Mineral Oil and Grease			<1.0		mg/L		1	30-AUG-17
<b>P-T-COL-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R3816448</b>							
<b>WG2606056-3 DUP</b>		<b>L1981588-6</b>						
Phosphorus, Total		0.0112	0.0114		mg/L	1.6	20	01-SEP-17
<b>WG2606056-2 LCS</b>								



## Quality Control Report

Workorder: L1982331

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Client: MCCLYMONT & RAK ENG. INC  
111 ZENWAY BLVD. UNIT 4  
VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>P-T-COL-WT</b>								
<b>Water</b>								
<b>Batch</b>	<b>R3816448</b>							
<b>WG2606056-2</b>	<b>LCS</b>							
Phosphorus, Total			102.2		%		80-120	01-SEP-17
<b>WG2606056-1</b>	<b>MB</b>							
Phosphorus, Total			<0.0030		mg/L		0.003	01-SEP-17
<b>WG2606056-4</b>	<b>MS</b>	<b>L1981588-6</b>						
Phosphorus, Total			90.2		%		70-130	01-SEP-17
<b>PAH-EXTRA-WT</b>								
<b>Water</b>								
<b>Batch</b>	<b>R3816542</b>							
<b>WG2604506-2</b>	<b>LCS</b>							
Benzo(e)pyrene			96.9		%		50-150	01-SEP-17
1,3-Dinitropyrene			107.6		%		50-150	01-SEP-17
1,6-Dinitropyrene			110.4		%		50-150	01-SEP-17
Dibenz(a,h)acridine			122.3		%		50-150	01-SEP-17
1,8-Dinitropyrene			88.9		%		50-150	01-SEP-17
Dibenz(a,j)acridine			83.3		%		50-150	01-SEP-17
7H-Dibenzo(c,g)carbazole			105.5		%		50-150	01-SEP-17
Dibenzo(a,i)pyrene			83.0		%		50-150	01-SEP-17
<b>WG2604506-3</b>	<b>LCSD</b>	<b>WG2604506-2</b>						
Benzo(e)pyrene		96.9	92.2		%	5.0	50	01-SEP-17
1,3-Dinitropyrene		107.6	108.6		%	1.0	50	01-SEP-17
1,6-Dinitropyrene		110.4	111.9		%	1.3	50	01-SEP-17
Dibenz(a,h)acridine		122.3	120.2		%	1.8	50	01-SEP-17
1,8-Dinitropyrene		88.9	87.7		%	1.4	50	01-SEP-17
Dibenz(a,j)acridine		83.3	82.7		%	0.8	50	01-SEP-17
7H-Dibenzo(c,g)carbazole		105.5	102.5		%	2.9	50	01-SEP-17
Dibenzo(a,i)pyrene		83.0	82.2		%	0.9	50	01-SEP-17
<b>WG2604506-1</b>	<b>MB</b>							
Benzo(e)pyrene			<0.050		ug/L		0.05	01-SEP-17
1,3-Dinitropyrene			<1.0		ug/L		1	01-SEP-17
1,6-Dinitropyrene			<1.0		ug/L		1	01-SEP-17
Dibenz(a,h)acridine			<0.050		ug/L		0.05	01-SEP-17
1,8-Dinitropyrene			<1.0		ug/L		1	01-SEP-17
Dibenz(a,j)acridine			<0.050		ug/L		0.05	01-SEP-17
7H-Dibenzo(c,g)carbazole			<0.050		ug/L		0.05	01-SEP-17
Dibenzo(a,i)pyrene			<0.050		ug/L		0.05	01-SEP-17







## Quality Control Report

Workorder: L1982331

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Client: MCCLYMONT & RAK ENG. INC  
111 ZENWAY BLVD. UNIT 4  
VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>SOLIDS-TSS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R3816692</b>							
<b>WG2605657-3 DUP</b>		<b>L1982179-1</b>						
Total Suspended Solids		171	167		mg/L	2.4	20	01-SEP-17
<b>WG2605657-2 LCS</b>								
Total Suspended Solids			100.7		%		85-115	01-SEP-17
<b>WG2605657-1 MB</b>								
Total Suspended Solids			<2.0		mg/L		2	01-SEP-17
<b>TKN-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R3815895</b>							
<b>WG2604585-3 DUP</b>		<b>L1981802-2</b>						
Total Kjeldahl Nitrogen		5.01	4.99		mg/L	0.4	20	30-AUG-17
<b>WG2604585-2 LCS</b>								
Total Kjeldahl Nitrogen			101.2		%		75-125	30-AUG-17
<b>WG2604585-1 MB</b>								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	30-AUG-17
<b>WG2604585-4 MS</b>		<b>L1981802-2</b>						
Total Kjeldahl Nitrogen			N/A	MS-B	%		-	30-AUG-17
<b>VOC-ROU-HS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R3814814</b>							
<b>WG2593382-4 DUP</b>		<b>WG2593382-3</b>						
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-AUG-17
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-AUG-17
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-AUG-17
Benzene		1.82	1.75		ug/L	3.9	30	30-AUG-17
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	30-AUG-17
cis-1,2-Dichloroethylene		16.4	15.5		ug/L	5.3	30	30-AUG-17
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	30-AUG-17
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-AUG-17
m+p-Xylenes		<1.0	<1.0	RPD-NA	ug/L	N/A	30	30-AUG-17
o-Xylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-AUG-17
Tetrachloroethylene		3.57	3.35		ug/L	6.4	30	30-AUG-17
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-AUG-17
trans-1,3-Dichloropropene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-AUG-17
Trichloroethylene		0.99	0.90		ug/L	9.5	30	30-AUG-17
<b>WG2593382-1 LCS</b>								
1,1,2,2-Tetrachloroethane			87.0		%		70-130	30-AUG-17
1,2-Dichlorobenzene			94.6		%		70-130	30-AUG-17



## Quality Control Report

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Client: MCCLYMONT & RAK ENG. INC  
111 ZENWAY BLVD. UNIT 4  
VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-ROU-HS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R3814814</b>							
<b>WG2593382-1</b>	<b>LCS</b>							
1,4-Dichlorobenzene			98.1		%		70-130	30-AUG-17
Benzene			97.8		%		70-130	30-AUG-17
Chloroform			96.2		%		70-130	30-AUG-17
cis-1,2-Dichloroethylene			94.0		%		70-130	30-AUG-17
Dichloromethane			97.9		%		70-130	30-AUG-17
Ethylbenzene			89.1		%		70-130	30-AUG-17
m+p-Xylenes			91.8		%		70-130	30-AUG-17
o-Xylene			89.6		%		70-130	30-AUG-17
Tetrachloroethylene			93.8		%		70-130	30-AUG-17
Toluene			89.4		%		70-130	30-AUG-17
trans-1,3-Dichloropropene			82.0		%		70-130	30-AUG-17
Trichloroethylene			96.8		%		70-130	30-AUG-17
<b>WG2593382-2</b>	<b>MB</b>							
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	30-AUG-17
1,2-Dichlorobenzene			<0.50		ug/L		0.5	30-AUG-17
1,4-Dichlorobenzene			<0.50		ug/L		0.5	30-AUG-17
Benzene			<0.50		ug/L		0.5	30-AUG-17
Chloroform			<1.0		ug/L		1	30-AUG-17
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	30-AUG-17
Dichloromethane			<2.0		ug/L		2	30-AUG-17
Ethylbenzene			<0.50		ug/L		0.5	30-AUG-17
m+p-Xylenes			<1.0		ug/L		1	30-AUG-17
o-Xylene			<0.50		ug/L		0.5	30-AUG-17
Tetrachloroethylene			<0.50		ug/L		0.5	30-AUG-17
Toluene			<0.50		ug/L		0.5	30-AUG-17
trans-1,3-Dichloropropene			<0.50		ug/L		0.5	30-AUG-17
Trichloroethylene			<0.50		ug/L		0.5	30-AUG-17
Surrogate: 1,4-Difluorobenzene			101.6		%		70-130	30-AUG-17
Surrogate: 4-Bromofluorobenzene			94.6		%		70-130	30-AUG-17

# Quality Control Report

Workorder: L1982331

Report Date: 06-SEP-17

Client: MCCLYMONT & RAK ENG. INC  
111 ZENWAY BLVD. UNIT 4  
VAUGHAN ON L4H 3H9

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Contact: Jeremy Bobro

## Legend:

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Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

## Sample Parameter Qualifier Definitions:

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Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

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## Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

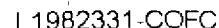
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The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



**Canada Toll Free: 1 800 668 9878**



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REFER TO BACK PAGE FOR ALL LOCATIONS AND SAMPLING INFORMATION

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

WHITE - LABORATORY COPY      YELLOW - CLIENT COPY

OCTOBER 2015 FROM